CompactPCI® and AdvancedTCA® Systems

5th Annual Complete Product Resource Guide

The Magazine for Developers of Open Communication, Industrial, and Rugged Systems

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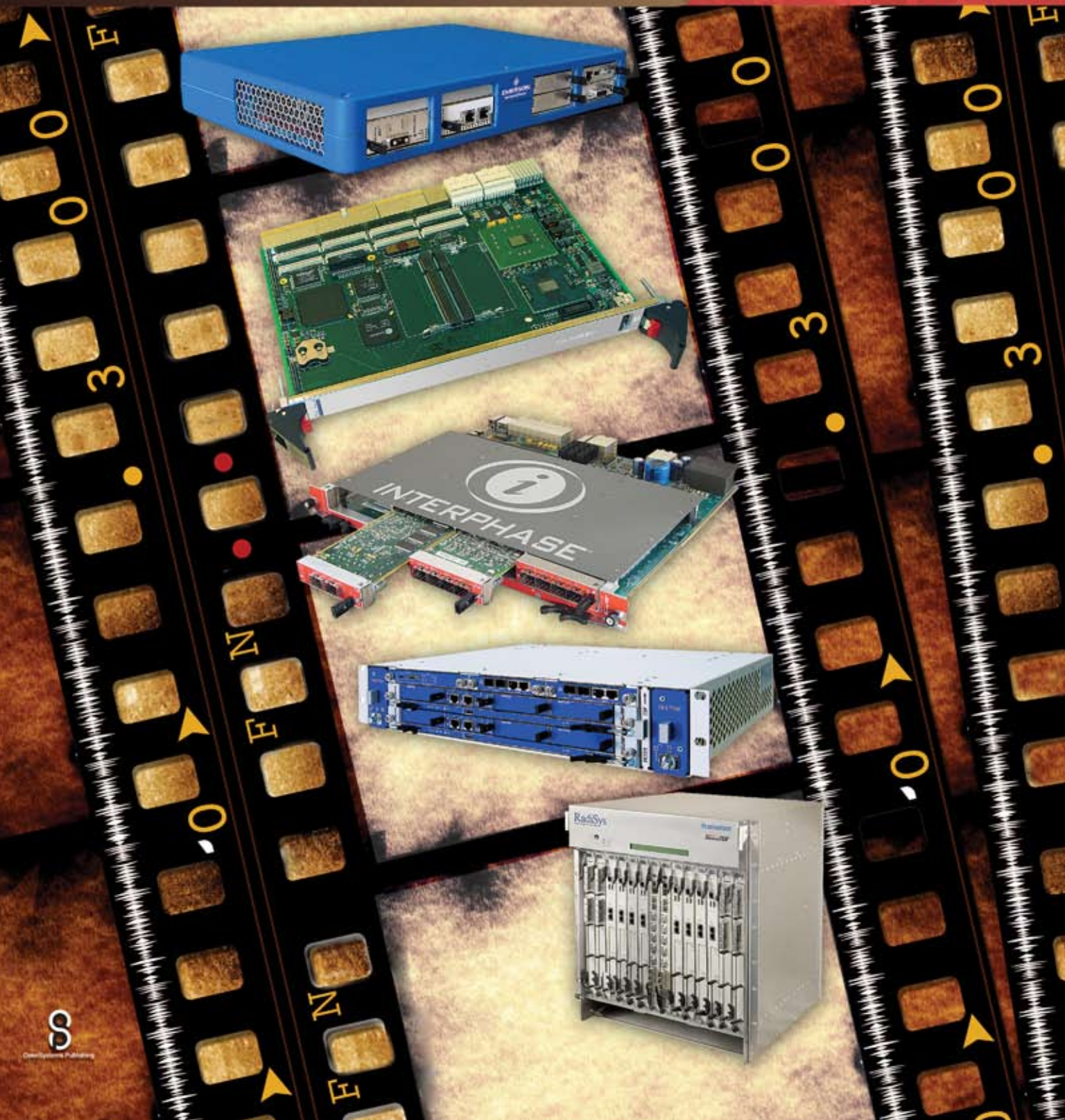
MARCH 2008 VOLUME 12 NUMBER 2



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The RadiSys Promentum SYS-6010 is a 10-Gigabit AdvancedTCA Application Ready Platform.

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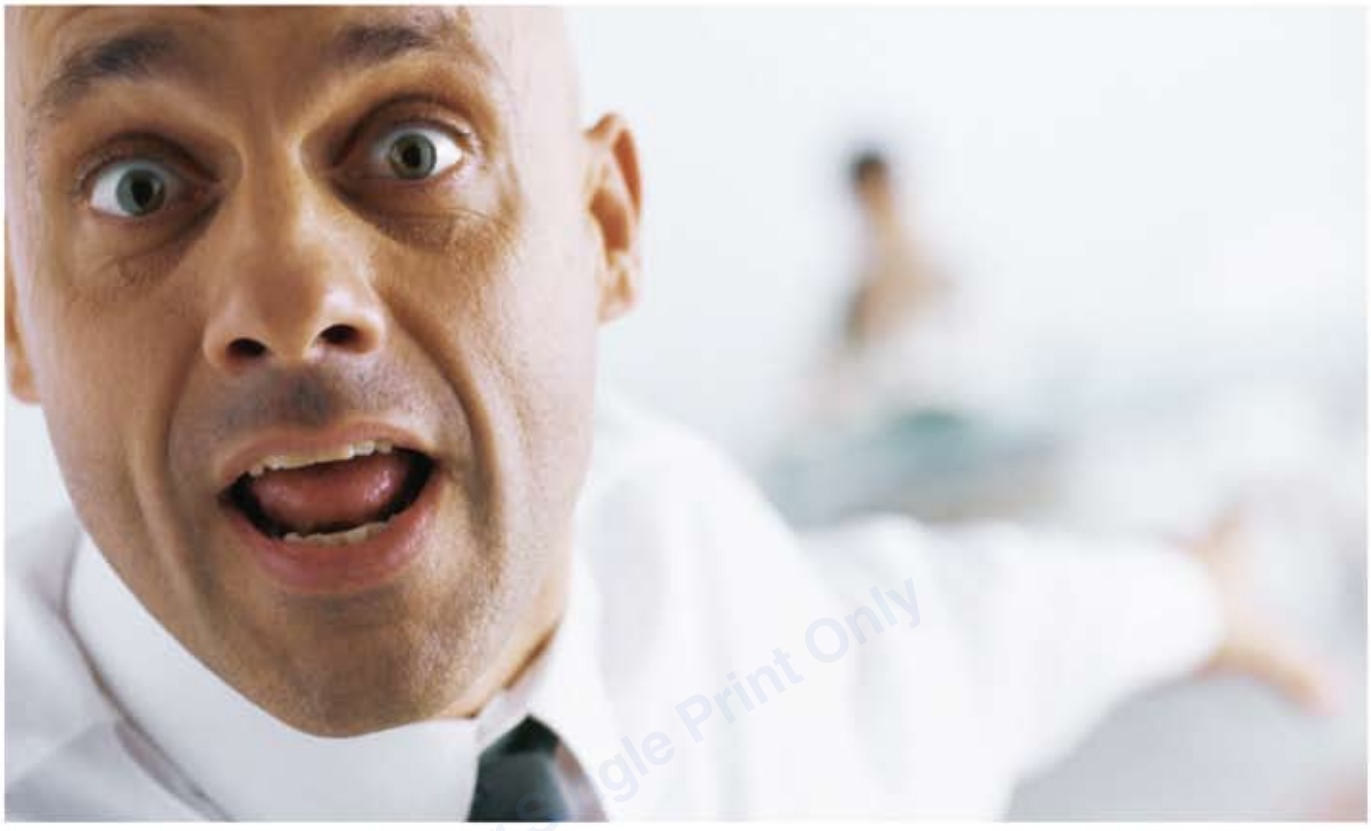

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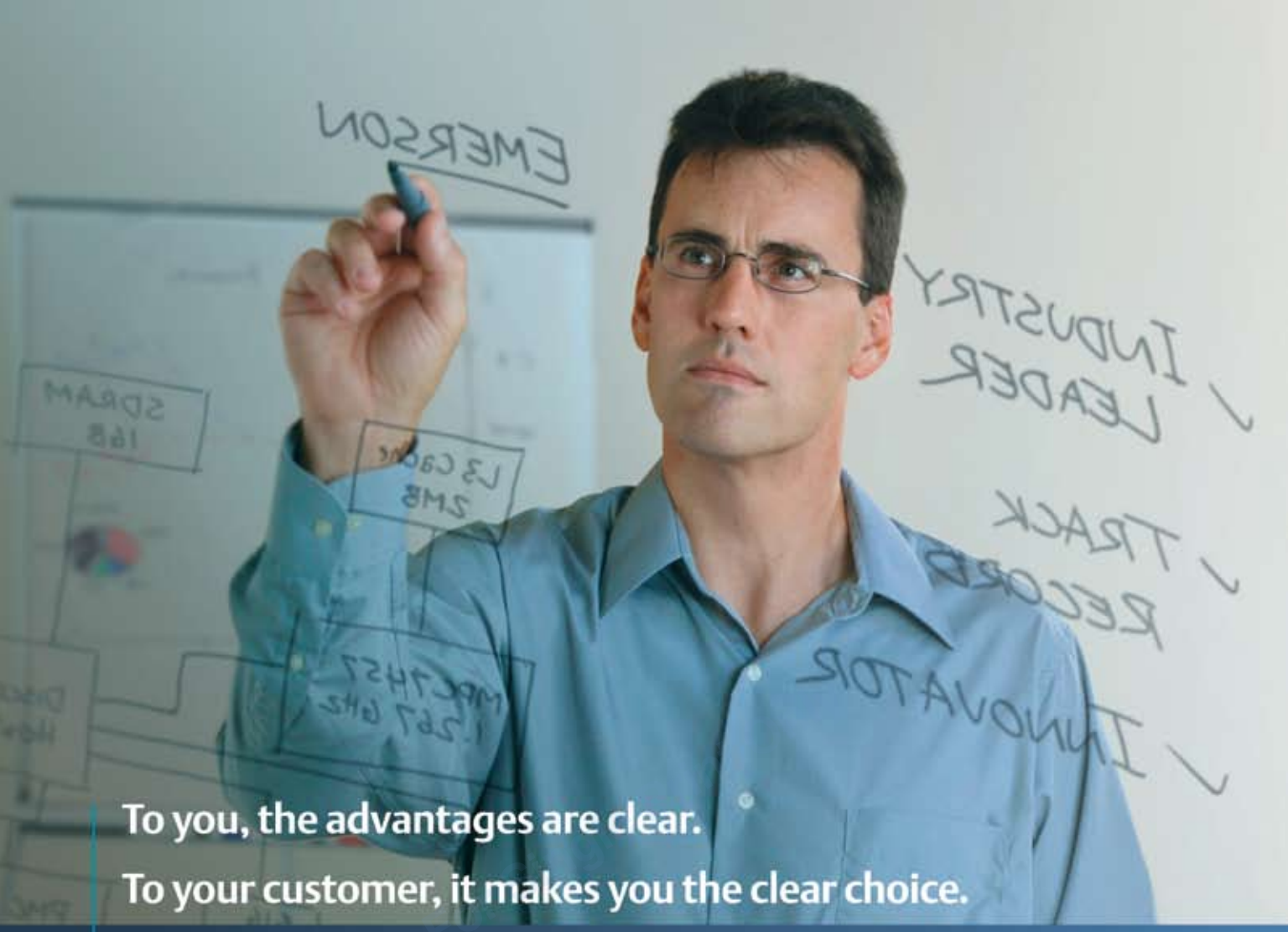

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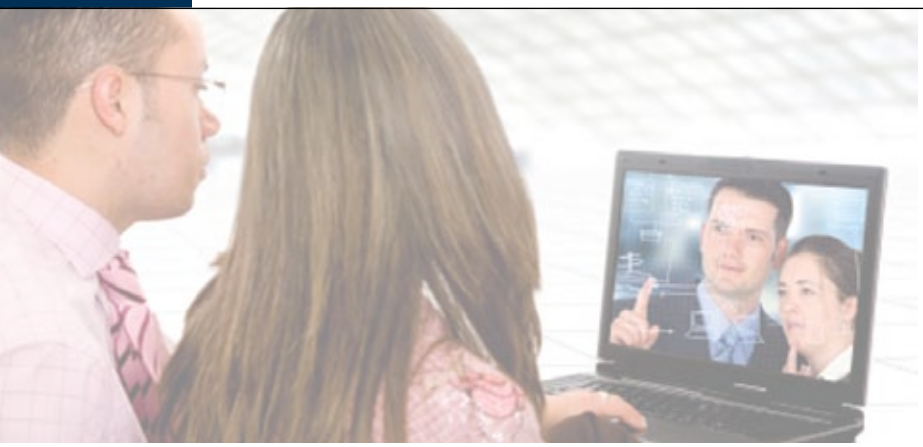
EDITOR'S FOREWORD

Why get into this business?

By Joe Pavlat



One answer to that question comes with a glance at this 2008 edition of the *CompactPCI and AdvancedTCA Systems Resource Guide*, which shows a diverse and growing embedded computing ecosystem. Many new products appear this year, and they point to both AdvancedTCA's wide ranging adoption and field deployment and to the continuing intense interest in MicroTCA in its many flavors.

More specific answers to my question appear in this issue's interview with Stephen Dow, who led the charge in the recent acquisition of Motorola's Embedded Communications Computing group by Emerson Network Power. Stephen is a colleague and a good friend, and I was curious as to why Emerson, which is not exactly known in embedded computing circles, would want to get into the business. His answers are quite thoughtful and illuminating, and they tell me that Emerson is going to be a major global player in AdvancedTCA, MicroTCA, and other segments of the embedded computing business. His enthusiasm is infectious.

This issue also includes my recent Q&A with Jasmin Ajanovic and Kevin Bross from Intel about PCI Express Gen2 and the PCI-SIG roadmap for the future of that technology. Jasmin is a key contributor to the PCI-SIG and Kevin is, well, an all around Renaissance Man. In the interview, they describe the speed and feature set improvements between Gen1 and Gen2 and explain what can be expected from Gen3 in the future. One gem I took away from the conversation is that the SIG is working on some important enhancements to Gen2 right now. These involve I/O virtualization and I/O sharing and provide some of the capability originally planned for the now defunct Advanced Switching Initiative. These will get around some of the problems of single root topologies and make high availability architectures using PCI Express much more doable.

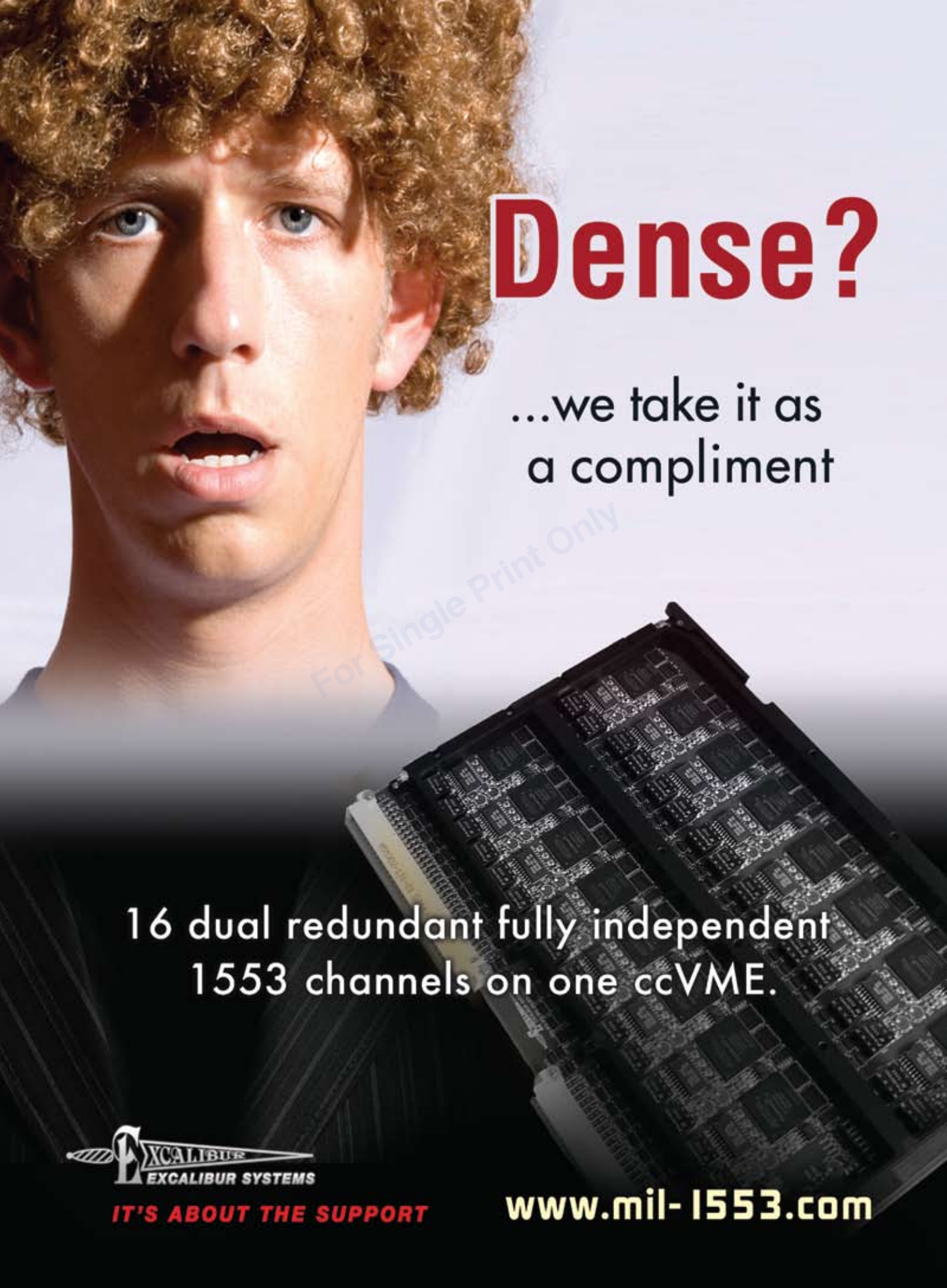
In a related article Ian Dobson from IDT goes into detail about designing with PCI Express, how it can be used for control plane applications, and how it can improve system availability and redundancy.

In recent months we have noted with interest that AdvancedTCA is being considered for and being used in applications outside of the traditional telecom space due to its energy efficiency as measured by computing power per watt and its volumetric efficiency when compared to a rack full of 1U servers. Most of this is due to the technology's efficient power conversion architecture, and it is increasingly being regarded as "green" technology. Stefan Karapetkov from Polycom explains another "green" aspect of AdvancedTCA, which is the company's use of AdvancedTCA platforms for sophisticated remote collaboration and video conferencing tools. A major benefit of that, of course, is fewer miles driven and fewer plane trips taken, which reduces both carbon emissions and stress and headaches on the part of the traveler.

Devashish Paul from Tundra Semiconductor describes the advantages of using the RapidIO interconnect to build low-cost, low-latency wireless basestations using MicroTCA. He covers how to use the emerging PICMG AMC.4 standard to provide true 10 Gbps data transfer within this system, pointing out how RapidIO's built-in Quality of Service and traffic priority management features help achieve this speed.

Rounding out this month's editorial is an article by Herman Abel and Ian Colville of Aculab describing the design of a very flexible, DSP-based CompactPCI board for voice processing. One of the main applications for the board is voice conferencing. The trend is that businesses are looking to avoid the hassles of air travel with better remote collaboration tools. The use of CompactPCI as a platform was mandated by Aculab's customer, and it appears the technology is alive and well.

Joe Pavlat, Editorial Director



Acquisition offers growth opportunities

An interview with Stephen Dow, Emerson Network Power Embedded Computing

With the acquisition by Emerson of Motorola Embedded Communications Computing (MECC), Stephen Dow became President of the Embedded Computing business of Emerson Network Power. Here Joe Pavlat, *CompactPCI and AdvancedTCA Systems* Editorial Director, and Stephen discuss an acquisition of interest to many in the embedded space.

***Joe* – Stephen, Emerson isn't considered much of an embedded computing player outside of its power control systems for data centers. So, give us your 50,000-foot view of the transition from Motorola Embedded Communications Computing (MECC) to Emerson and how you see things going forward.**

***Stephen* –** Emerson Network Power has been growing rapidly through a variety of acquisitions. Its core business, as you mentioned, is power supplies and power systems. It's not just for data centers though; they also acquired Huawei's power supply business, as well as Nortel's and Ericsson's. Their Network Power Group, where the Embedded Computing business resides, also supplies the chargers for Nokia and Motorola. So Emerson does quite a bit of business with the same telco customers as MECC.

Emerson has been very successful targeting growth by acquiring businesses that are adjacent to their current product lines. The company sees embedded computing as adjacent to its power business and since MECC has many of the same customers, it makes good business sense for Emerson to grow its business through this acquisition.

Emerson recognized that the commercialization of power supplies was coming to fruition, which is why they bought the power supply companies, and the reason companies like Huawei, Motorola, and Ericsson don't build power supplies any more is because you can get them commercially better, cheaper, faster. In other words, Emerson saw an opportunity for exponential growth and went after it.

Emerson believes that embedded computing is about to hit the same kind of ramp – that the opportunity for commercialization of board-level products and system-level products in the embedded space is on the verge of experiencing a significant growth period – which is already evident in the number of traditional COTS-based industries in addition to telecom (for example, military, aerospace, medical, and industrial automation) that have expressed interest in open standards architecture.

An important distinction from the way many companies operate is that each of Emerson's businesses must stand on its own and meet its own plan. If one division is struggling, it does not come and hammer the rest of them; Emerson expects you to run your business as a business.

***Joe* – So what makes it exciting for you to run this business?**

***Stephen* –** Think of it – this new business has the DNA that includes Motorola's embedded computing business, Artesyn, Force Computers, Heurikon, Blue Wave Systems, Mizar, Prolog, NetPlane, and Spider Software! These companies have been in this business a long time, and for the first time they have been brought together with a very clear direction and very clear support to go ahead and grow. This is a big business, this is prime time, and Emerson is expecting it to grow. And that's very exciting!

Plus, you consider Emerson's financial track record. It is a $23 billion dollar company that is 117 years old. It has 51 years of consecutive dividends to shareholders. Emerson has had only three CEOs in the last 50 years. Clearly it is doing something right.

I treat this opportunity like I now have a $700 million start-up that I get to run. That is the way Emerson wants me to manage the business and attack the market. And as you know, Joe, I do not "NOT succeed." The market opportunity is there, the company support is there, and I have every intention of growing this business and our leadership position. And that's what makes it exciting to me!

***Joe* – Motorola has very good global reach, and many AdvancedTCA and CompactPCI deployments are outside of North America. Does Emerson have the same reach outside North America that Motorola does?**

***Stephen* –** More than 50 percent of Emerson's business is outside the U.S. and I have a tremendous amount of Emerson support in Europe and Asia. In fact, my relationships with companies like Nokia-Siemens, Ericsson, Alcatel-Lucent and Huawei, for example, are strengthened now because they already do quite a bit of business with Emerson. And these companies do not consider Emerson a competitor.

***Joe* – That was always the challenge under the Motorola banner. What can Emerson bring to the embedded space, the telco space, and the enterprise space that Motorola could not?**

***Stephen* –** The very first thing that will happen is a rejuvenation of the embedded computing business. With Motorola, embedded computing was not core to its business. But Emerson doesn't think that way – it thinks about acquiring businesses that will increase value to the shareholders.

Emerson took a look at this business and said, "You know, this embedded computing stuff is pretty good so what's wrong with doing medical applications or military applications if it is all embedded computing?" The answer was – "Nothing!"

It does indeed focus us on the telcos, where, as you know, our AdvancedTCA product line is designed in at practically every major TEM. And we have volume production going with every single one of those applications within multiple programs.

The enterprise space, though, is different ground. We have identified a new *carrier enterprise* product space where we believe AdvancedTCA is a good fit. However, we are not interested in competing with IBM or HP in data center applications.

Our focus will be to clearly delineate between carrier network or carrier enterprise and identify those things that our AdvancedTCA products do well – NEBS compliance, high availability, flexibility, longevity of supply – those characteristics of AdvancedTCA that

can address mission-critical applications that are not currently met by enterprise class servers. The benefits of AdvancedTCA are well positioned for the all-IP network and the convergence of applications in what might commonly be referred to as the network data center.

***Joe* – Speaking of adding value beyond hardware, how do you see OpenSAF as taking the work of the Service Availability Forum forward?**

***Stephen* –** I have been actively involved. People might ask why would we take our middleware and high availability software and make it freely available? It comes back to commercialization. If more people have access to this type of technology, the market will adapt faster, and the results will benefit the entire industry. We are enabling people to download our high availability firmware, our middleware, and apply it to their applications.

Some of the OpenSAF founders (including Sun) see opportunities for taking advantage of standard middleware product that is SA Forum-compliant and that allows the migration of applications faster for the carriers and for the TEMs. So you get the ability to have commercialization of some of the products available across the board. If Nokia-Siemens or Motorola can move their applications faster to new platforms, then the ability to adapt AdvancedTCA into new applications will happen sooner rather than later.

And I will tell you that we've seen a tremendous amount of interest in AdvancedTCA, and it is our fastest growing market segment. We've doubled year over year, and I expect this trend to continue.

***Joe* – Highly available systems have traditionally been required in the telecom space but less so in other markets. What opportunities is Emerson pursuing to build highly available systems for other markets?**

***Stephen* –** We are already working on it. We have announced a two-slot AdvancedTCA system (Figure 1, courtesy Emerson Network Power), ideal for carrier enterprise applications, which will allow TEMs to move their applications to a smaller footprint, with the same high availability middleware on that platform. We are also in the process of making that available on MicroTCA platforms and the biggest pickup has been in the military – and not always just hardened systems – many are communications applications. So with open standards, standard products, and open middleware, customers are not locking themselves into a particular vendor, and we are seeing a tremendous interest in areas that would not traditionally be considered high availability.

Figure 1

***Joe* – How do you see MicroTCA ramping up? To which markets and when?**

***Stephen* –** MicroTCA has so many options, and can do so many things, that there was no tipping point application [where one would say] "It works really well for this and it is better than anything else." So part of the reason MicroTCA has not taken off as quickly as people might have wanted it to is because they have to ask "Which version of MicroTCA do we want and what kind of form factor for what kind of application?" Some people said this will always be a low-cost solution, lower cost than AdvancedTCA. Yet at the same time we see people putting Cavium processors and DSPs on MicroTCA – that does not make it low cost.

Last year, we announced a joint effort with Hybricon to develop a proof-of-concept for a MicroTCA conduction-cooled platform that demonstrates MicroTCA's viability across a number of industries with demanding environments.

We're also seeing interest from the enterprise space. Our first design win for MicroTCA was the aggregation system for a point-of-sale vendor. But the strongest feedback we have been getting for MicroTCA is in military and aerospace – that looks like the first space in which MicroTCA is going to realize any kind of volume.

***Joe* – What does Emerson need from the standards bodies?**

***Stephen* –** First, higher bandwidth fabric. 10 Gig is very important, because we are now seeing that with real 10 Gig systems, the telcos can do applications that were previously unavailable.

One of the other things we have pushed hard on is backwards compatibility – we are not abandoning it. We are ensuring we maintain compatibility through 10GBASE-KR.

Customers also want more bandwidth. The issue is that even though there are companies that can do 40 Gig platforms now – mesh, full mesh, and in some cases that includes 100 Gigs in the lab – this is not commercially viable yet; it is not standard.

So, as the embedded computing industry leader, Emerson will continue to support open standards and use commercially available products, not only to provide the performance customers need, but also to continue to demonstrate cost and value in an open market.

Stephen C. Dow *is the President of the Embedded Computing business of Emerson Network Power, headquartered in Tempe, Arizona. Stephen joined Emerson with its acquisition of Motorola's Embedded Communications Computing group in January 2008. As Vice President and General Manager of Motorola's embedded computing business, Stephen was responsible for streamlining its operational efficiencies and continuing the organization's positive momentum as a global leader in the embedded computing space.*

Prior to Motorola, Stephen held CEO positions for Espion International, as well as Channel Access, a sales, marketing, and systems integration business serving manufacturers in the embedded computer space, which he cofounded. Stephen spent 14 years with Force Computers, prior to cofounding Channel Access. During his career with Force Computers, he progressed through several positions of increasing responsibility in sales and marketing, culminating as Chief Operating Officer & General Manager of the Americas. As COO, Stephen was responsible for all operations of an international company, which grew from under $3 million in revenues to over $150 million in revenues during his tenure.

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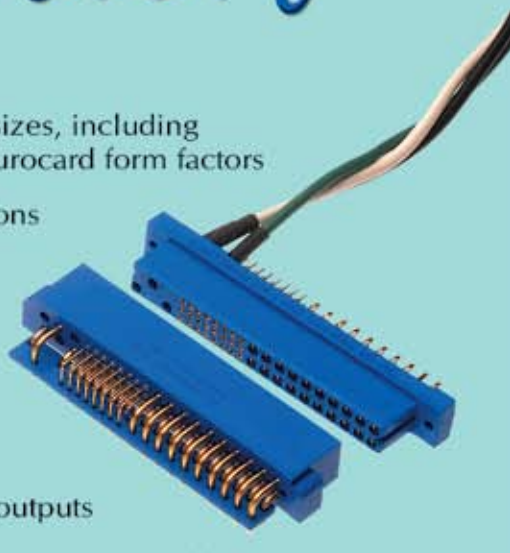

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40 Years of Service to the Electronic Industry

CompactPCI media processing board wears more than one hat

By Herman Abel and Ian Colville

Aculab is a supplier of specialist, DSP-based media processing and signaling protocol support. The company developed its Prosody X cPCI, a high density IP media processing resource board, to meet large enterprise and telco-grade communication requirements. Here Herman and Ian describe how Prosody X cPCI successfully met the requirements of two different clients. One client develops voice and data gateway solutions with secure interoperability features for the defense market. The other is a pioneer in the reservation-less telephone conferencing business.

High-grade secure voice and data gateway

One of the largest Private Finance Initiative (PFI) contractors, providing defense and security systems worldwide, was developing a voice and data gateway solution with secure interoperability features. As a leading systems integrator, they are acknowledged experts in the areas of information systems and networks, secure end-to-end communications solutions, and battlespace management systems.

The client's traditional suppliers were having difficulty meeting the stringent demands placed upon them. While requirements for operating system support, military standard voice codecs, and data communications modem functionality were understood and to a large extent available, a crucial factor concerned the channel density that the small form factor gateway required.

Voice compression and transcoding are DSP-intensive tasks and warrant a degree of flexibility not often found in a COTS product line. The solution had to achieve a guaranteed channel count performance, regardless of the combination of codecs in use. Or to put it another way, the client required sufficient DSP processing power to support 120 channels of all supported codecs in any configuration.

A network connectivity perspective

The client designed the planned gateway from a network connectivity perspective, requiring 120 channels of secure, high-grade voice and data in a small form factor. The gateway was intended to allow the use of many existing compliant devices to achieve end-to-end encrypted speech and data services and interconnects to existing secure speech networks. Two models were to be produced for so-called red and black network enclaves.

The client needed an enabling technology solution that would allow it to offer the first such compliant gateway devices in the United Kingdom.

The procurement specification listed support for both commercial and military standard voice codecs. Additional requirements included a V.32 data communications modem and Q.931-based ISDN signaling protocols, Q.SIG and EuroISDN (a.k.a. ETS300). Time frames already committed to meant that Aculab was asked to develop the necessary capabilities in a just a few short months.

Rigorous demands for data rates, latency (delay), Mean Opinion Score (MOS) quality assessments, and throughput performance were stipulated as was the need for the resultant software and APIs to run on the QNX operating system.

The client insisted on a single card CompactPCI form factor solution in order to be able to convert speech or modem data from ISDN to RTP/UDP/IP packet data in the small form factor package they set out to manufacture. Network interfaces and termination were to be standard E1/T1 presented via RJ-45 connectors on RoHS- and standards-compliant hardware.

Aculab's Prosody X cPCI platform, shown in Figure 1, includes IP-to-TDM gateway functionality as a standard option. It has the necessary capabilities and importantly, the inherent flexibility in design, to be able to cope with the client's requirements.

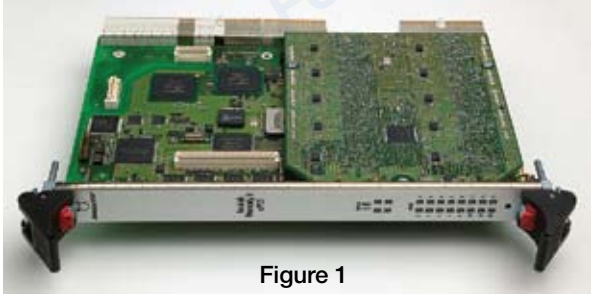

Figure 1

Aculab developed and tested software, firmware, and APIs to run on the QNX operating system and participated in client testing of the resultant software packages.

Apart from porting its regular media processing resources to QNX, Aculab also ported a multichannel, multithread, real-time implementation of the 600/1200/2400 bps enhanced Mixed Excitation Linear Prediction (MELPe) vocoder to its Prosody X DSPs. The U.S. and NATO standard MELPe vocoder (MIL-STD-3005, STANAG 4591) provides complete, state-of-the art, low-rate voice communications.

Aculab designed the MELPe, G.711, and G.729d codecs to be software selectable on a per-call basis and to support 120 channels in any configuration as demanded. In addition, the conventional media processing resources of the Prosody X cPCI card, including recording and playback of G.711 A-law voice data on any channel at any time, were employed.

The payload size and format of the RTP/UDP/IP packets generated by the Prosody X cPCI card met the constraints requested by the client in order to minimize the end-to-end delay of the system. Crucially, in order to ensure this is achievable, the jitter buffer is adaptive within "n" frames and is software selectable. On the ISDN side, Aculab's standard signaling protocol portfolio supplied the detailed support for Q.SIG and EuroISDN, specifically overlap receiving.

In the era of ever-growing road traffic congestion and the continuous difficulties related to air travel, the increased use of telephony conferencing services is seen by many as a sensible substitution for the face-to-face way of doing business.

A conferencing solution based on the newest voice compression technology

Improved telephony conference voice quality leads to a better user experience and, as a result, to increased service usage.[1] Many businesses are looking to reduce their travel expenditures and the costs associated with the time lost as a result of business travel, while maintaining or even improving productivity. In the era of ever-growing road traffic congestion and the continuous difficulties related to air travel, the increased use of telephony conferencing services is seen by many as a sensible substitution for the face-to-face way of doing business.

A well-established supplier of reservation-less conferencing services across several key vertical markets, including financial services, health care, legal, and higher education, needed to enhance its service with a wideband voice conferencing feature. Based on the newest voice compression technology – the transmission of double the bandwidth of the audio spectrum – this solution produces noticeably superior voice quality compared to traditional analog, digital, and IP telephony.

As a leader in the "free" conferencing market segment, processing tens of millions of call minutes each month, the company wanted to design a new-generation platform capable of delivering a very large-scale wideband conferencing service and sought a strategic relationship with an enabling technology supplier, Aculab.

Essential criteria for vendor selection included:

- Broader functionality integration possibilities than were possible with the third-party media server alternative
- Simplified deployment
- Higher scalability
- Improved load balancing
- Better fault tolerance
- Higher redundancy
- Greater service reliability

A new conferencing algorithm to operate on a set of Aculab's media processing platforms would enable a wideband matrix conferencing facility with an unlimited number of participants in a single voice conference.

In addition, the requirements included the ability to seamlessly mix voice streams originating from both wideband and narrowband endpoints. Moreover, the wideband variant had to support a full set of essential conferencing features, including:

- The selective mixing of the loudest or active speakers
- Independent volume and gain control for each participant
- Active speaker detection
- Active speaker notification via the Contributing Source Real-time Control (CSRC) protocol field of the Real-time Transport Protocol (RTP) media stream
- Dual-Tone Multi-Frequency (DTMF) events suppression

The requirements also included an additional set of generic media processing functions, such as: compressed voice recording and playback; transcoding among a set of low-bit rate codecs (G.723.1, G.729, iLBC); support for the encrypted version of the RTP stream (SecureRTP); DTMF detection and generation; DTMF tones relay and user indications via the IETF RFC 2833; and the ability to provide integration with a third-party speech engine (Automatic Speech Recognition [ASR], Text To Speech [TTS]) utilizing the standard Media Resource Control Protocol (MRCP) interface.

An additional major requirement included integration of a new wideband speech codec, Internet Speech Audio Codec (iSAC), initially developed by a third party. While Aculab had a wealth of experience in integration of numerous VoIP and mobile voice codecs, the work on optimizing iSAC performance required a special expertise and deep knowledge of the DSP technology. Integration efforts required reengineering of the packet processing sequencer because the work involved a wideband codec with a variable and adjustable bit rate.

Options in place to enable high density

When the client presented these requirements, Prosody X cPCI, designed as a media processing platform for IP applications, with high density narrowband conferencing functionality as a standard option, had recently been introduced. The client, a long term partner, was well-positioned to fine-tune its feature development.

Prosody X cPCI had options in place to enable high density, feature-rich narrowband conferencing with more than 1000 channels per media processing board and 18000 conferencing parties per single CompactPCI chassis. This was also the case with the media processing functionality used to provide the service. Aculab made a commitment to develop extended functionality requirements for the wideband voice conferencing platform.

Following initial delivery, Aculab was actively involved in supporting the client to develop and integrate its service platform application with Aculab's software and APIs. The final solution is providing the client with industry-leading conferencing capabilities. A scalable, redundant, high density solution, with more than 225 wideband iSAC encoded streams mixed per single board and more than 4000 per CompactPCI chassis, ensures the client's ability to provide a top-grade conferencing service with minimal operational cost.

References

[1] Communicating naturally – the opportunities of wideband coding, *BT Technology Journal*, Springer Netherlands, Volume 24, Number 2/ April, 2006, pages 159-166.

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10 Gbps RapidIO in MicroTCA for wireless networking

By Devashish Paul

RapidIO switching can be used for both processor aggregation on baseband cards and backplane connectivity between cards to create low-cost basestations in a MicroTCA form factor. Devashish guides us through the various off-the-shelf elements with AMC.4 compliance that can be used to develop such basestations.

As wireless networks move to services requiring higher data rates and more services per subscriber, equipment vendors must optimize capital expenditures when deploying new services such as WiMAX, evolved Wideband Code Division Multiple Access (eWCDMA), Time Division Synchronous Code Division Multiple Access (TD-SCDMA), which is the Chinese 3G standard, or 3G Long Term Evolution (LTE).

Between the conflicting requirements for more data per subscriber, more subscribers per line card, lower cost per supported subscriber, ease of deployment, and equipment cost structures, equipment vendors have had to press hard on standards bodies, silicon vendors, and system vendors to deliver high-performance turnkey solutions. Short design cycles pressure system vendors into leveraging standards wherever possible.

The higher data rates in WiMAX, eWCDMA, TD-SCDMA, and 3G LTE lead to, among other things, increased processing requirements. What with OFDMA processing for those standards that use Orthogonal Frequency Domain Multiplexing, as well as the Verterbi and Turbo decoding processing loads, the "on card" connectivity is pushing 10 Gbps for *actual* data rates. Moreover, as the number of subscribers grows, not only are 10 Gbps links required on baseband cards between processing, but 10 Gbps is also used on backplanes.

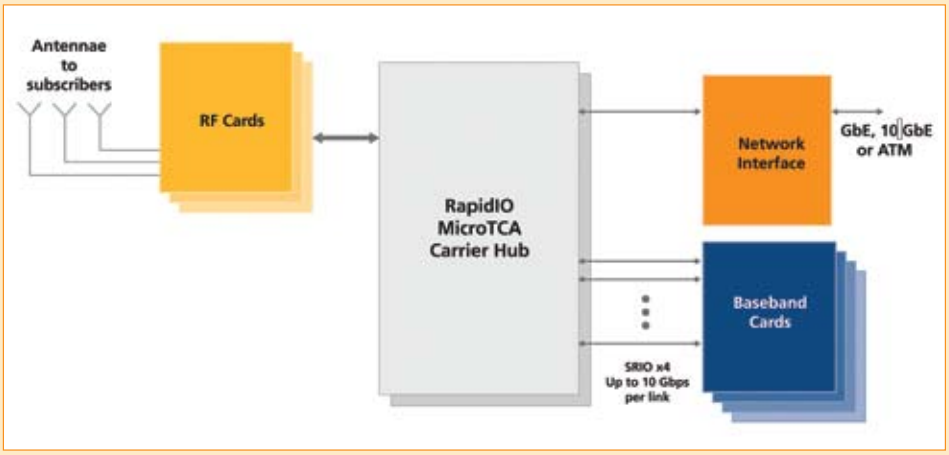

Figure 1

The MicroTCA form factor offers an ideal standards-based solution for low-cost basestation development. The AMC.4 specification offers RapidIO 10 Gbps connectivity on primary lanes, making the job of system vendors easier than ever. The RapidIO interconnect shines as the interconnect of choice for both onboard and backplane interconnect.

System architecture using MicroTCA and the AMC.4

PICMG defines MicroTCA as an equipment form factor targeted for telecom and enterprise networking applications. It offers many of the benefits of the AdvancedTCA specification (PICMG 3.0) in a much smaller form factor, making it suitable for applications, such as wireless basestations, where performance must be delivered at low cost. The MicroTCA specification calls for backplane bandwidth ranging from 1 to 12+ Gbps, ensuring its sufficient inter-card capacity for most of today's and tomorrow's wireless applications.

A MicroTCA system as defined by PICMG is a collection of interconnected elements consisting of at least one AdvancedMC (AMC) card, at least one MicroTCA Carrier Hub (MCH), and the interconnect, power, cooling, and mechanical resources needed to support them. PICMG's AMC series of specifications defines the lane mapping on AMC cards to support PCI Express (PCIe), RapidIO, and Ethernet backplanes. The AMC.4 specification (RapidIO) in a MicroTCA system enables wireless baseband designers to quickly develop systems leveraging up to 10 Gbps of actual data rate.

Figure 1 shows a typical architecture for a wireless baseband system. In the context of MicroTCA, the Radio Frequency, Network Interface, and Baseband Cards are all AMC form factors. They are connected across the backplane with an MCH, in this case leveraging RapidIO switching for the data plane and optionally for the control plane. The RF TDM data from multiple antennae may be combined into one stream and passed to the MCH, where a Serial RapidIO switch multicasts the same stream to all the baseband cards.

The baseband cards extract the actual data or voice signals out of the combined stream, leveraging the processing capabilities of FPGAs, DSPs, and microprocessors to implement multiple tasks, including OFDMA processing as well as Verterbi and Turbo decoding.

RapidIO in a MicroTCA backplane

Until recently, off-the-shelf solutions with RapidIO were not readily available for MicroTCA backplanes. Now multiple MicroTCA carrier cards, such as the Tundra Tsi578 MSM (MicroTCA Switching Module) shown in Figure 2, are available from vendors, including Mercury Computer Systems and N.A.T., leveraging RapidIO switches to offer connectivity between AMC cards and the carrier hub. These cards support up to 12 RapidIO AMCs each, connected at up to 10 Gbps of actual data rate, leveraging the AMC.4 specification, as well as front panel 10 Gbps RapidIO. In the context of wireless systems, we will see how this can be useful especially in the case of real estate limited AMC cards where the functionality of one baseband card may have to be split over two, thus requiring the transmission of high data rates between cards.

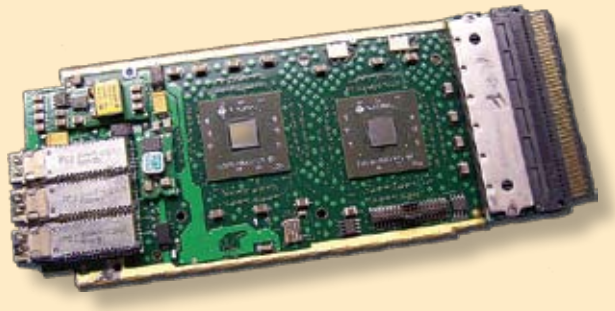

Figure 2

This is an even greater concern in WiMAX and LTE systems that need RapidIO's x4 mode to transmit 10 Gbps of actual data between processing elements. Moreover, when actual user data rates start to exceed 100 Mbps each, the aggregate load created by numerous users is quite significant. To accommodate the multigigabit data rates, systems can be easily designed using 10 Gbps, which overprovisions the links today for the expected traffic. As traffic grows, the same architecture can continue to support the links by leveraging the QoS and priority management features available in RapidIO switches and endpoints. All of this makes 10 Gbps RapidIO ideal for chip-to-chip (onboard) interconnect as well as board-to-board (across the backplane) in a MicroTCA chassis.

MicroTCA backplanes and signal integrity

When designing systems with 10 Gbps of data going across serial links on a backplane, signal quality attenuates due to trace lengths. The attenuation is more dramatic for high-frequency harmonics that also get phase shifted. The signal integrity issues from the MCH card differ for each one of the AMC cards due to the length of each trace.

The outcome is that the signal that is transmitted by a switch on one AMC card and received at the MCH card can often be severely compromised, to the point that the eye diagram is barely visible.

To achieve a clean eye diagram, the first step can involve amplifying the transmitted signal. However this approach only increases overall system power consumption (which is at a premium in the MicroTCA chassis) while also elevating the noise floor. Moreover, it does not solve the problem of phase shifting of high-frequency signals over the length of the backplane link.

A feature available in RapidIO switches that allows the designer to tune the *pre-emphasis* on the transmitted signal, which in effect amplifies and phase shifts the high-frequency harmonics to account for the effects of the transmission line, results in a clean eye diagram at the receiver. This feature must be available on a per port basis on the switch, given that each port connects to a link of a different length with differing impedance and noise characteristics. On the receive side switches also have the ability to perform *receive equalization*, also on a per port basis. In this case the received signal is taken and "conditioned" to amplify high-frequency harmonics and phase shift those harmonics to account for some of the negative impact of the link.

An AMC form factor card, the Serial RapidIO Signal Analyzer from Tundra Semiconductor (see Figure 3), is an example of a tool that enables system designers to adjust MicroTCA chassis switches for high quality board-to-board high-speed signals. This solution includes software that is placed in each AMC slot and used to analyze the quality of the eye.

Figure 3

The card can be used inside MicroTCA chassis and in standalone mode. One of the biggest values is seeing the quality of the eye diagram as actually received inside the die of the switch after it has traversed the balls and packaging. Conventional solutions only allow the user to see the eye before the package is traversed, by placing down a scope outside of the actual switch's package. The accompanying On Chip Scope Software (OCS) can run on a PC and communicate to the hardware via USB to set transmit and receive parameters.

10 Gbps interprocessor connectivity on baseband cards

As bandwidth grows in wireless baseband to 100 Mbps and more per user, the processing load on DSPs, processors, and FPGAs becomes increasingly onerous. System vendors put silicon in place to implement system-level software and firmware and not to terminate an interconnect protocol between processing elements. Moreover, in voice and video applications low latency is a key attribute for system-level performance, which is further impacted by involving the software stack to terminate the interconnect protocol. Using RapidIO, the DSPs and processors can terminate the interconnect in silicon without eating into processor cycles and at the same time minimize latency.

RapidIO excels when shipping data in small packets, which is typically the case for embedded solutions, where latency and congestion in endpoints associated with long packets is undesirable.

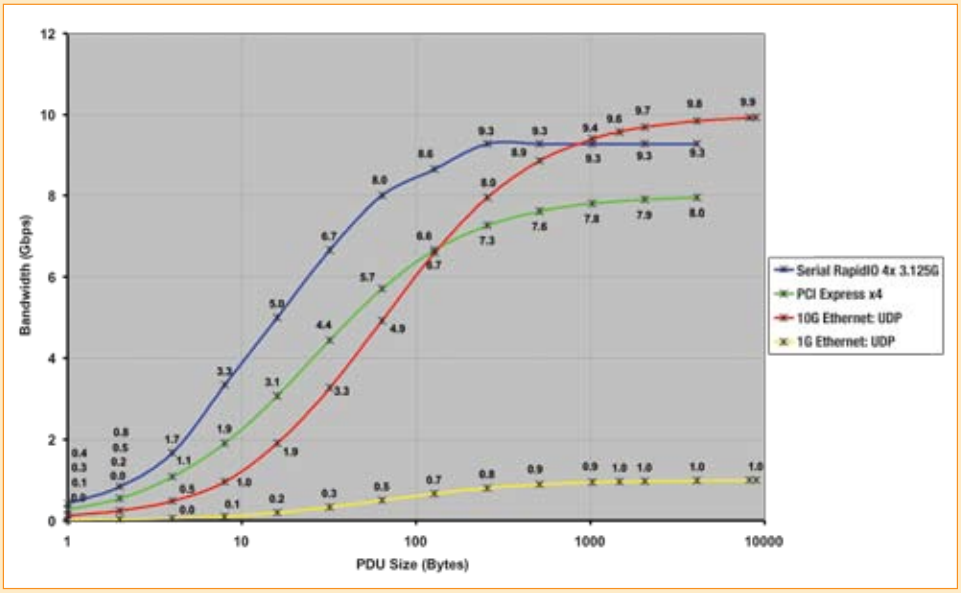

Figure 4

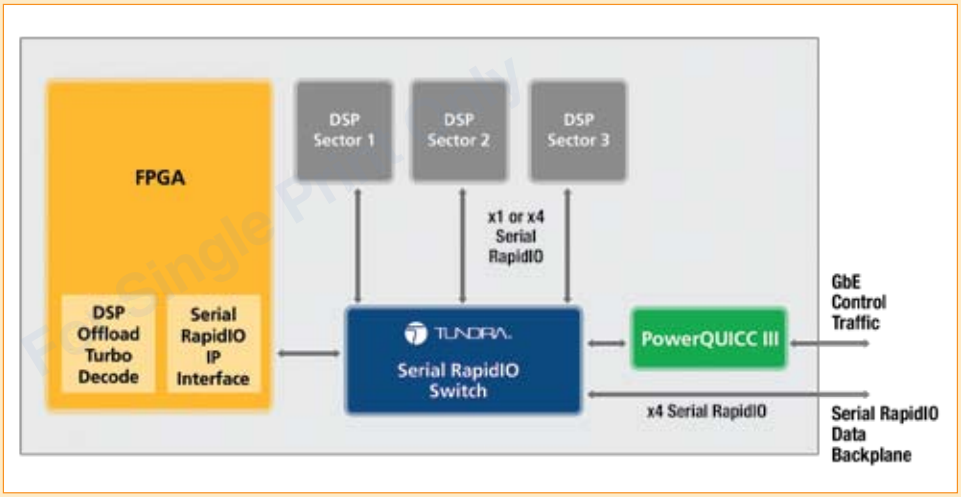

Figure 5

RapidIO provides a three-layer protocol that is completely terminated in hardware, with zero software intervention, which makes it ideal for embedded applications. Processor resources are thereby allocated completely to system-level application code, and latency is minimized as a result of eliminating the need to involve software in terminating a software stack.

We need to look at the actual data rates for various embedded system interconnect protocols. In next generation wireless systems, the actual data bandwidth needed is significantly higher than in 3G applications as the data rate per subscriber grows beyond 100 Mbps in LTE. Available bandwidth on links between processing elements should ideally be up to 10 Gbps, providing some overprovisioning, while at the same time leaving room for growth leveraging RapidIO's various QoS features.

When studying the available bandwidth the key attribute to focus on is the actual data rate of the protocol, when 8b/10b encoding and header overhead is removed. When examining strictly data payload, RapidIO compares favorably to other protocols not optimized for the embedded computing space (Figure 4).

RapidIO excels when shipping data in small packets, which is typically the case for embedded solutions, where latency and congestion in endpoints associated with long packets is undesirable. Even with short packets of up to 64 bytes an actual efficiency of 67 percent is achieved, while at 256 byte PDUs, over 90 percent efficiency is achieved. This is a substantial advantage compared to using PCI Express or Gigabit Ethernet. While Ethernet shines in WAN implementations, the features that make it strong there make it a weaker choice in MicroTCA systems. Ethernet's high tolerance for packet loss, lack of flow control, and lack of automated hardware recovery for bit errors make it ineffective for 10 Gbps data interconnect between processing elements on baseband cards in a MicroTCA chassis.

Available hardware today

Implementing baseband cards in MicroTCA has never been easier than it is today. There are a number of off-the-shelf options featuring FPGAs, processors, and DSPs all leveraging RapidIO for local interconnect as well as RapidIO for backplane connectivity leveraging the AMC.4 spec. With a number of new RapidIO enabled multicore DSPs from TI and Freescale coming to the market in the past year, the ecosystem has expanded substantially. In essence, they use a mix of DSPs and FPGAs with x4 RapidIO connectivity at 3.125 Gbaud to offer 10 Gbps of actual data rate connectivity between processing elements. These AMC solutions can be used to implement *out-of-the-box* baseband processing. The solutions can be single card AMCs or a base plus a mezzanine, given the space limitations of the AMC form factor.

The beauty of a RapidIO based implementation is that it offers flexible partitioning between different processing elements in a baseband card, while ensuring minimal latency and no processing overhead when passing data between elements. Figure 5 shows a logical block diagram of elements used in a wireless baseband line card.

Moving to fourth generation networks, whether it is LTE or WiMAX, vendors are generally performing the Orthogonal Frequency Division Multiplexing Access (OFDMA) protocol in

FPGAs or ASICs. The wireless operator and vendor community has moved toward an emerging consensus that OFDMA is more robust, more spectrum-efficient, and more amenable to supporting Multiple Antenna Systems (MAS) than CDMA. Various AMC solutions featuring onboard FPGAs work well for this implementation. In addition to the onboard FPGAs, DSPs with specific accelerators for Verterbi and Turbo Decode are then used to complete processing tasks. Embedded processors are often used to perform MAC processing tasks, while also being leveraged for system bring up and control plane functions. All of these elements are optimally connected using RapidIO switches. Today, numerous AMCs offer solutions with different I/O features, FPGAs, and DSP selection to optimize out-of-the-box wireless baseband card design. They include but are not limited to :

- CommAgility AMC-D4F1 with quad Texas Instruments TCI6482 DSPs, 8144AMC-S with quad MSC8144 multicore DSP
- CommAgility AMC 6487 with triple Texas Instruments TCI6487 DSPs
- Mercury MTI203 WiMAX AMC
- Texas Instruments TCI6484 EVM with dual Texas Instruments TCI6484
- Tundra Tsi620 MultiProtocol RapidIO Switching Card

Conclusion

Over the past few years the ecosystem for developing wireless basestations using MicroTCA and RapidIO has substantially expanded. Today there are off-the-shelf components readily available that allow System OEMs to develop basestations using the MicroTCA form factor while leveraging the true 10 Gbps connectivity of RapidIO. With the move to WiMAX and LTE developments, 10 Gbps links between processing elements on AMCs and from AMC to AMC across the backplane become increasingly important. With today's AMC solutions and switch cards along with tools for backplane link characterization, the building blocks are commercially available to get to market quickly. System OEMs can then add their value by implementing firmware and software for the application-level functionality that requires OFDMA PHY processing, MAC layer processing, Turbo Decode, and Verterbi processing in the available processing elements offered on the AMCs.

Devashish Paul *is Tundra's Product Marketing Manager for Serial RapidIO switching products. Over the past 10 years he has run product lines in the semiconductor and networking industry at companies like Semiconductor Insights, Solidum Systems, Mosaid Semiconductor, and Nortel. Prior to his commercial career, he had a successful eight-year career in the Canadian Air Force where he was a Systems Engineer for airborne radar systems for both the CP-140 and the F-18 Program. Devashish has a Masters in Electrical Engineering in Digital Signal Processing and an MBA from the University of Ottawa. His Bachelor's degree in Electrical Engineering is from the Royal Military College of Canada.*

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AdvancedTCA – Green conferencing for data centers

By Stefan Karapetkov

Stefan presented the content of this article at the first Green Technology World Conference in Los Angeles, California in September 2007. He analyzes the conferencing and collaboration trends and the new requirements for infrastructure equipment in the corporate or service provider's data center. Stefan also highlights the environmental and technological benefits of using AdvancedTCA for conferencing and collaboration applications.

Introduction

The complexity of the global economy has led to new business models where companies match the most efficient locations and human resources with the value adding task. Business is therefore not defined in a traditional company building as it was 20 years ago. Its boundaries are blurring, and business now includes close partners, remote experts, and employees on the road.

In this highly distributed world, team collaboration is a key success factor. Many companies rely on regular face-to-face meetings to create strong teams, but recent changes in the global economy make this approach impossible to scale and sustain. First, oil prices increased and travel became expensive. Second, the environment became an important social issue, and companies imposed travel restrictions to support their green initiatives. On top of that, a confluence of issues from terrorism to operational and financial issues among airlines to extreme weather has made travel more time consuming and unpredictable, making it less dependable and efficient.

In response, high-performance teams started to rely on remote collaboration technologies to work more effectively across distances. Audio conferencing provides the foundation for team

interaction, but now an emergence of high-definition video with high-quality audio is delivering on the promise of lifelike collaboration for geographically dispersed workers.

Not only can this new communications technology decrease carbon dioxide emissions, reduce the business travel carbon footprint (Figure 1), and save oil for other uses, but it also delivers a wide range of business benefits:

- Connectivity is instant
- Productivity is not impacted by long security lines or jet lag
- Meetings do not get cancelled because of delayed or cancelled flights

However, the processing-intensive conferencing equipment is a power hog, generates plenty of heat in the data center, and needs a lot of cooling. How do we select a hardware architecture that can meet the high-performance requirements for current and future conferencing and collaboration while delivering on the promise for green data center technology?

Performance requirements for conferencing and collaboration

As mentioned above, only high-quality audio and visual communications can deliver the experience required for efficient interaction of high-performance teams. Therefore, one of the key market trends is towards higher quality audio and video.

Video quality can be improved in two ways: improving compression techniques and increasing the available network bandwidth. Compression technology moved over the last 10 years from ITU-T H.261 to H.263, then to H.264; each of these standards delivered higher compression and required higher DSP performance. The DSP manufacturers responded with a new generation of chips that allows real-time encoding and decoding of higher quality video streams.

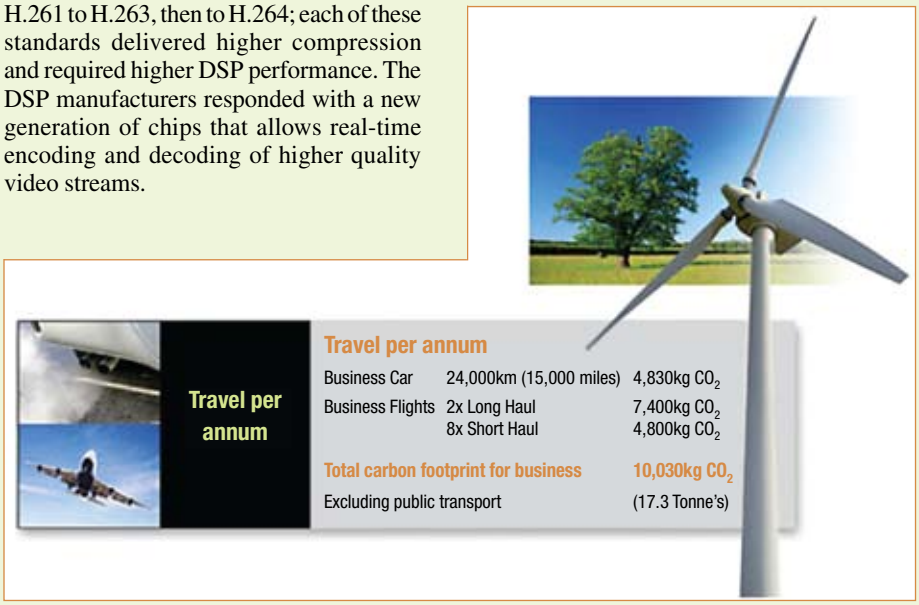

Figure 1

H.264 is implemented in most video endpoints today. Figure 2 shows the bandwidth required for transmitting video of certain quality compressed in H.264 format. The *Y* axis shows the video quality. Bandwidth requirements for transmitting video with this quality across the network is shown on the *X* axis.

So as resolution has increased, so have the requirements for processing and bandwidth. But in the area of video quality improvement, there is no end in sight. HD 720p (1280x720 pixels) will be followed by 1080p (1920x1080 pixels) and then 4K (3840x2160 pixels). There have also been initial experiments with three-dimensional (3D) images that create an even more realistic illusion of a face-to-face meeting.

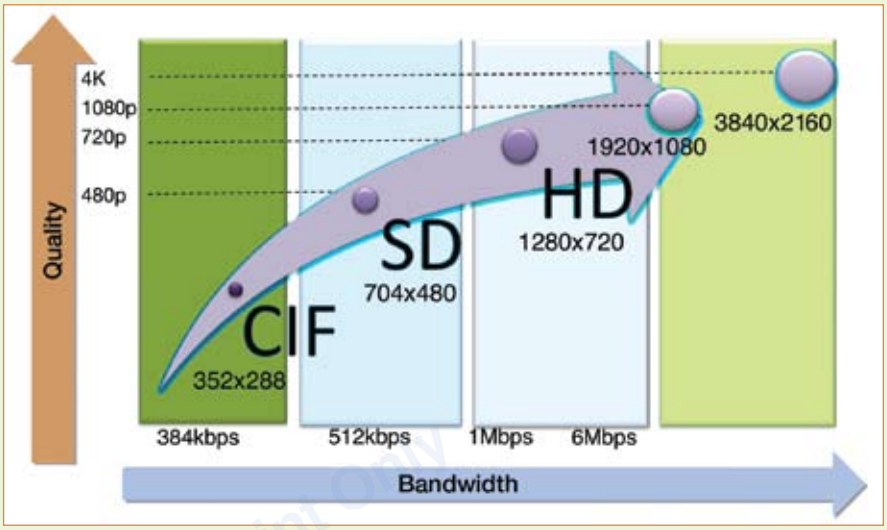

Figure 2

Three trends

This trend towards higher video quality means that conferencing and collaboration equipment has to be able to support higher input/output data rates, host a larger number of more powerful DSPs, and process larger data volumes.

The second major trend is that standard video calls become visual collaboration sessions that include shared multimedia content. While rudimentary content sharing allowed participants to see still images or presentations, today's multimedia content sharing includes X-ray and microscope images, full-motion video, architectural CAD drawings, digital animation, and the like.

The third trend is that visual communication is moving out of the conference room and reaching the enterprise user's desktop and will next move to mobile devices. The result is that enterprises that had several dozens or several hundreds of video endpoints are now looking to scale to thousands and tens of thousands of systems. This trends leads to the requirement for much higher scalability and availability of the conferencing and collaboration equipment.

Multipoint conferencing

Point-to-point conferencing is the basic communications scenario in which two parties are connected on a call. Even more performance is required when multiple parties have to be connected through a conferencing server into a multiparty conference.

Conferencing and collaboration servers today have to support dozens and sometimes hundreds of users simultaneously and, if the trend towards desktop video continues, will need to support thousands of users in the future. In the multipoint scenario, each

Figure 3

audio-video stream goes into the server, is processed there, and then goes out of the server. Figure 3 summarizes the multipoint conferencing and collaboration concept.

The conferencing and collaboration server "touches" every stream and processes the audio and video for every user, so its performance directly impacts the end-user experience. It therefore must be reliable, scalable, and support high-speed input/output interfaces.

Consider this example of a realistic scenario for the not-so-distant future: if the server supports 100 simultaneous users, and each of these users is connected at 4 Mbps (3 Mbps for live HD video and another 1 Mbps for content sharing), the total bit rate going into the server is 100 x 4 Mbps = 400 Mbps. Even the highest quality audio, for example, Siren 22 Stereo, does not need more than 128 kbps, and is therefore left out of the calculation. Assuming symmetric connections (4 Mbps going back to each user), the server must support another 400 Mbps outwards.

Impact on data centers

The natural location for a conferencing and collaboration server is in the corporate or service provider's data center. What is the best way to quantify the impact of these applications on the data center?

A recent survey of data center managers by Emerson Network Power indicated that power and cooling are the most critical resources in data centers today[1]. The survey showed that more than 96 percent of the data centers will run out of power and cooling capacity by 2011. Additionally, 40 percent of the respondents said that even today their main problems are around power and cooling. The steep increased power consumption in data centers was noticed even on the federal level. In July 2006, the House of Representatives passed H.R. 5646, which calls for the EPA's Energy Star program to conduct a study on power use in data centers. The bill refers to the current spending of $3.3 billion per year for power in data centers.

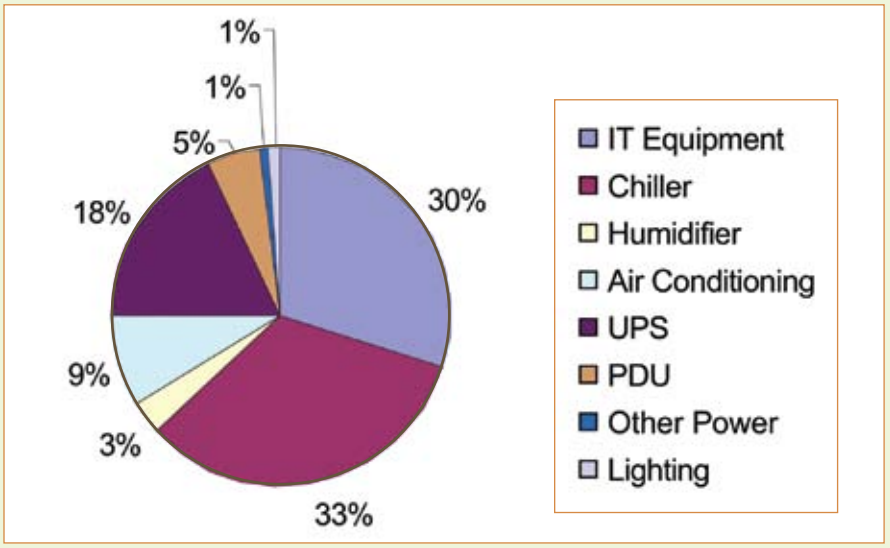

Figure 4

Looking at power consumption is the best way to estimate the impact of conferencing and collaboration on the data center. Let's assume an 8U server chassis with 14 blades. Based on current technology, one blade usually draws ≤ 200 W. 14 blades therefore need 2800 W (2.8 kW) or the equivalent of two standard household irons. Now let's assume five of these chassis are stacked in a rack-mount or server rack arrangment; the result is 2.8 kW * 5 = 14 kW (equivalent to 10 household irons). Then we will need to modify that by the number of racks in the room. But it gets worse! The power necessary for powering up the equipment is only 30 percent of the power necessary to run a data center. Figure 4 depicts the power consumption split.

The IT equipment in the data center consumes only 30 percent of the power. Another 42 percent is used for climate control: 33 percent for chiller (chillers feed cold liquid to the data center) and 9 percent for air conditioning. From the remaining 28 percent, 18 percent is used by Uninterruptible Power Supply (UPS), and 5 percent by Power Distribution Units (PDU). The data center needs therefore more than three times the energy used by the servers themselves; consequently, any reduction of the power consumption in servers leads to 3x power savings in the data center.

Blade servers and power efficiency

Blade servers have been around for a while but did not deliver serious power savings over regular rack mountable 1U servers in the past – up until 2003-2004. Only recently have they reached the technical maturity that allows them to clearly surpass other server technologies with regards to power use efficiency.

Recent studies show that blade servers allow four-fold increase of the processor density and for 20-30 percent decrease of power consumption. This is a very new technology in the beginning of its adoption curve. According to Gartner Dataquest, 2006 sales of blade servers were 850,000 units or 10 percent of the server market. By 2011, Gartner expects the sales to grow to 2.3M units or 22 percent of the server market. AdvancedTCA, as the only standard for blade servers, will be a

substantial part of this growth. Figure 5 shows the Polycom Media Processing Module (MPM), an AdvancedTCA blade that is inserted into the Polycom RMX 2000 conferencing server.

The technology improvements in blade servers allow for less power/Hz than standalone servers. The use of a DC power option provides the greatest savings because data centers usually have large-scale DC power distribution throughout. There is no need for conversion from 110/220V AC to 48 V DC in each chassis, and this increases power use efficiency. Consolidation at the rack level provides higher cooling efficiency, compared to cooling separate 1U servers with the equivalent of one blade. Other AdvancedTCA power management features include:

- Dynamic optimization of airflow and power consumption
- The ability to stay within a predetermined power budget
- The ability to monitor temperature levels and energy use at blade, enclosure, and rack levels.

All of the factors just noted assure continuous operation of the AdvancedTCA based system under optimum power consumption.

AdvancedTCA versus closed box architecture

In the video communications space, there are still some attempts to implement high-performance servers in a proprietary closed box. While there is no argument that this approach is less efficient from power saving perspective, we have to also consider the impact on the environment when rapid advancements in DSP technology lead to rapid product obsolescence. The result is what is referred to as a *forklift upgrade,* and that has very high true cost to customers and society as a whole. Table 1 compares the two hardware architectures.

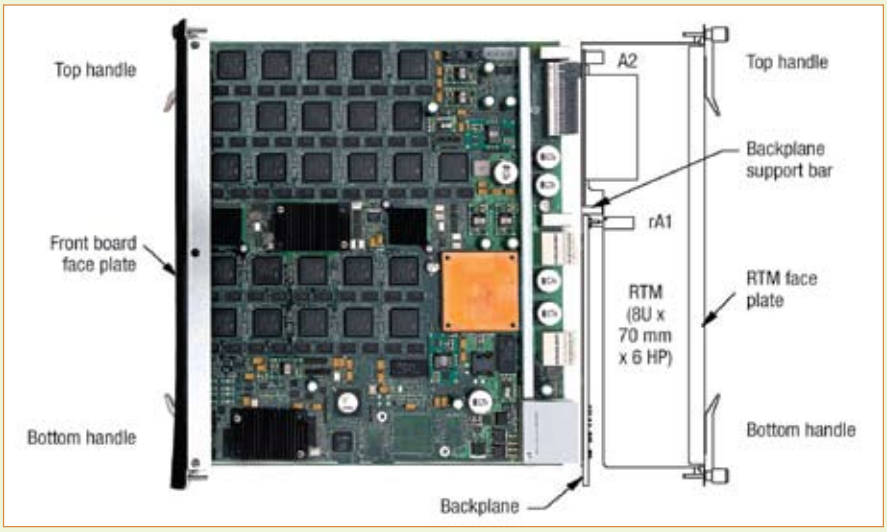

Figure 5

Let's look first at the impact on the customer's business. In addition to the cost of the new server, customers experience disruption in service. Customers have to assign employees to assist the installation team and grant access to the facility. Configuration has to be copied from the old server to the new one.

The closed box approach is also extremely damaging to the environment. As soon as the DSP technology changes and the server models designed for higher resolutions and speed hit the market, the older servers become obsolete and have to be replaced. Recycling these boxes is difficult – everything including power supplies, backplanes, and fans has to go.

However adding a blade with new functions into the AdvancedTCA chassis does not interrupt operations, thanks to AdvancedTCA support of hot swappable blades. In addition, all components that rarely change and are built into the chassis – power supplies, fans, and the like – continue to be used after the blade has been replaced.

Conclusion

When designing equipment for the data center, vendors should select hardware architectures not only based on technical requirements but also based on requirements for reduced power consumption, upgradeability, and other factors limiting the impact on the environment.

Polycom has taken steps in this direction through the introduction of AdvancedTCA hardware architecture in its product line. AdvancdTCA allows for substantial power savings in the data center, simplifies upgrades, and reduces the need for recycling.

References

[1] http://www.liebert.com/information_pages/NewsRelease.aspx?id=2386

AdvancedTCA	Closed Box
Add blades to standard chassis to scale	Stack more servers to scale
Hot-swap blades as requirements change	Forklift upgrade when technology moves on
Mix and match blades – do not discard them	Recycling complete server is expensive
Keep the chassis for a long time	Replace closed box frequently

Table 1

Stefan Karapetkov *is Emerging Technologies Director at Polycom, Inc., where he focuses on visual communications market and technology analysis. Prior to Polycom, he spent more than 10 years with Siemens in product management, new technology development, and enterprise product definition. He has been involved in Voice over IP since 1997. Stefan's MBA is from Santa Clara University and he holds an MS degree in Engineering from the University of Chemnitz (Germany). He is fluent in English, German, Russian, and Bulgarian.*

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FEATURE

PCIe provides an ideal mix of robustness and cost effectiveness for the types of traffic found in communications control plane applications.

The role of PCI Express in communications control plane applications

By Ian Dobson

PCI Express (PCIe) is becoming increasingly interesting to communications platform designers for use as a control plane interconnect. Ian examines the methods for scaling the bandwidth of a PCIe interconnect within a backplane or midplane system, the implementation of redundancy models in PCIe, the support for the types of traffic encountered in a communications control plane application, and some of the additional features offered by PCIe that can enhance its robustness and utility within these applications.

PCIe provides an ideal mix of robustness and cost effectiveness for the types of traffic found in communications control plane applications. A communications platform's control plane usually consists of a pair of system control cards connected to each other via a mate link and to the line cards in the rest of the system in a dual-star configuration. Traffic usually runs to and from the active control card and the individual line cards in a hub and spoke pattern. Some consideration must be made for traffic running from one line card to another, but this is the exception rather than the rule.

Aside from systems deep in the core of the communications networks, most platforms will need to be designed to support a mixture of line cards, where some will have embedded CPUs and others will not. This consideration, along with the need to provide a range of bandwidth options to this breadth of line card capacities in a cost-effective manner, makes PCIe a strong contender for any new communications system platform design.

Use of PCIe features in communications systems

The feature of PCIe that is giving it the most traction today as a system-wide control plane interconnect is that of scalability. PCIe links support automatic link width negotiation. When a link is brought up, the two ends exchange packets to train the link for optimal signal propagation. As part of this process, the two end points also agree on the number of lanes they will support across the link. This capability is very useful when supporting a range of optional plug-in modules, which may require different link widths. Unused lanes are powered down once the negotiation is completed. However, the PCIe specification only requires a device to negotiate to full width or a x1 width. Other intermediate widths are optional.

At a physical level, each link within a lane represents an independent stream. So, although they are all clocked at a common frequency, there are no skew limits from lane to lane.

Each link can also negotiate with its link partner as to whether to run in PCIe Gen1 mode at 2.5 Gbps or in Gen2 mode at 5 Gbps. This negotiation is performed at link training time. Both ends of the link come up at Gen1 speed and, if both ends are capable and enabled to run at Gen2 speeds, then they up-convert to that operating speed. This throttling up and down is done at the data link layer and is hence invisible to upper layers of software.

Another Release 2.0 PCIe specification feature is the ability to dynamically adjust the operating width of a link while operational. When a link becomes idle, the data link layers at the two ends can agree to reduce the link width and then later agree to restore it as traffic density increases. This allows the bandwidth and power consumption to scale with the offered load on the link.

Enhanced availability

Designers can use a number of features at the physical and data link layers of the PCIe protocol to enhance a communications system's availability. PCIe packets are protected by a link-layer Cyclic Redundancy Check (CRC) and sequence number when moving between two entities. The bus also provides an optional end-to-end CRC capability to supply an extra layer of data integrity protection. As another related option, an advanced error reporting capability can help isolate the location of any failure.

Additionally, any PCIe link that consists of multiple PCIe lanes, such as a x8 width link, supports automatic lane reversal. This feature allows the user to define if Lane 0 is on the logical left or logical right of the link and is very helpful in preventing the "crossover" of traces when laying out a printed circuit board. This capability is especially important in modular systems, such as those often used in communications applications, because it supports optimal layouts on individual modules, rather than forcing designers to comply with the same link order. To this end, PCIe also supports automatic polarity reversal. In communications systems, these features may also prove useful in the reduction of signal coupling on dense backplane layouts.

Using the automatic link width negotiation feature in conjunction with auto-lane reversal enables continued system operation in the presence of a failure of a single lane within a link. The link can be reset and automatically negotiate to employ the usable half of the link. Although this feature utilizes only half the bandwidth, it does provide an open channel for recovery of key information or for partial functioning of the module.

Finally, PCIe also provides a link-level retry capability. This function retries the transfer of packets between two adjacent PCIe devices without any intervention of higher-level software when an error or a lost acknowledgement occurs.

On-card control plane

Control plane accesses to devices usually involve access to registers or the movement of blocks of data into and out of memory. This function is well-suited to the memory-based paradigm used in PCIe. In addition, designers of control plane functions within a card tend to use a hierarchical model where a single housekeeper CPU manages every individual device on the card. This approach is also well-matched to the PCIe model.

Finally, traffic patterns in a control plane on a single card are almost exclusively between the housekeeper CPU and each individual device, rather than peer-to-peer between devices.

Although PCIe allows multiple priorities of traffic, control plane traffic within a single card is usually low enough in bandwidth to avoid the need to segregate different types of traffic from one another.

The statements just made also apply to I/O modules or even "dumb" line or resource cards that lack their own housekeeping processor and are managed by the processor on a main line card or central control card. Figure 1 shows a PCIe control plane in a modular line interface card.

Backplane switching control plane between smart cards

The distributed processing model has always been the architecture of choice for larger communications systems, such as edge and core nodes, and it is becoming increasingly common in access nodes. In this architecture, each card's address domain remains separate so that the same software can be run on multiple instances of the same card type without changes.

The more complex data processing demands of edge and core nodes usually require that each line interface card perform most or all of the processing of its own data. Given the number and complexity of the devices present on each card, these cards usually feature their own housekeeping processor. In many cases, these processors also handle any exception cases referred from the data path. The presence of these processors on most or all of the line interface cards changes the nature of control plane communications across the backplane. It is now based on an interprocessor communications model, which usually involves message passing and interrupts, rather than direct register access.

Within this model, the housekeeping processor on each card is responsible for the management of all the devices local to that card (and any subtended I/O modules). It is also responsible for managing all messages exchanged with housekeeper processors on other cards as well as for communication between the card and the main control processor in the system.

A number of approaches to this type of communication exist. One approach, which will not be discussed here, is to treat each card as an independent node in a network and communicate between them using an address-independent networking protocol, such as Ethernet. Although workable, these approaches can add considerable overhead that is unnecessary within a chassis, such as network topology discovery.

Within the PCI family, interdomain communication can be facilitated by the use of a function that will isolate the topology and addressing scheme of the domain behind one of its ports from the details of domains behind its other ports. These functions are widely referred to as nontransparent bridges. This function can be implemented within an embedded processor or separately. When integrated with a processor, the resulting device is called an endpoint processor.

Interprocessor communication via endpoint processors

An increasing number of processors are now capable of supporting address remapping for their transactions. With these devices, designers can move data directly from the memory of one module into the memory of another using a memory-based addressing scheme even though the modules use separate addressing domains.

This technique allows designers to use PCIe, with its memory-based addressing scheme, as a system-wide interconnect for control plane transactions. This approach offers several advantages over solutions in use today. First, it simplifies the job of hardware and software designers by eliminating the need for them to learn a proprietary protocol. It also simplifies the system design by eliminating the need to translate packet encoding, priority classifications, and flow control between two protocols. Finally, the use of PCIe as a system-wide interconnect for control plane transactions also promises to reduce transfer latency and memory bandwidth requirements by removing translations and the multiple handling of data inherent in message queuing. Finally, a memory-based interconnect scheme can enhance diagnostic capability through the main control CPU by supporting direct access to devices on the local card and the placement of predetermined patterns into memory structures on a card-under-test.

Interprocessor communication via standalone nontransparent bridges

A nontransparent PCIe bridge device appears to the domain on each port as a PCIe endpoint. It consumes any transactions directed to it and generates new, altered transactions on its other port for many of them. The manipulations for altering those transactions are

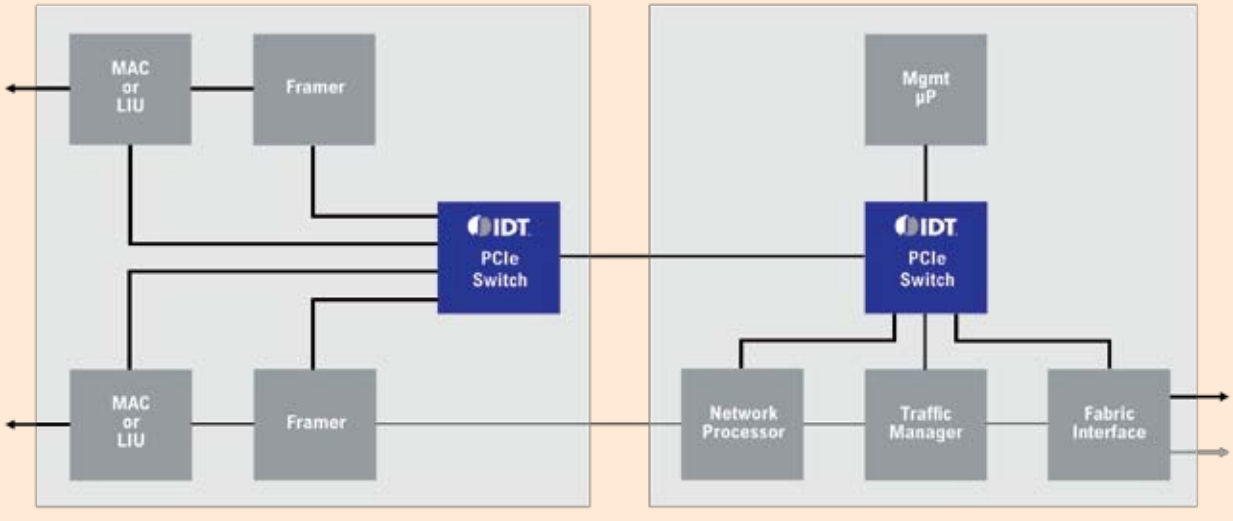

Figure 1

not standardized, nor are the registers for setting them up, although most component suppliers offer fairly similar transpositions and other interprocessor communications services, such as scratchpad registers, doorbell interrupts, and others.

Redundancy and PCIe

Any discussion of backplane switching in a communications environment has to address the topic of redundancy. As mentioned earlier, a number of the features in PCIe help monitor system operation, including advanced error reporting. Support for operation at reduced bandwidth in the face of a single lane failure in a PCIe link or in the face of lower traffic demand was also discussed. However, what can be done in a PCIe system that requires a module to be switched out? Any redundancy scheme involving PCIe must address the specification's rule that only allows one port of a PCIe switch or bridge to be used as the upstream port. This rule was designed to prevent inadvertent or malicious reconfiguration of PCIe switches and bridges by peripheral devices.

Redundancy models

When the application involves switching out of a failed downstream element, the N+1 and 1:1 redundancy models can be supported simply by reprogramming the switch to redirect the traffic from the failed element to the standby element. Some examples of this approach include a line processing card talking to several I/O modules or the replacement of a dumb line card in a system. If a situation involves the replacement of a failed upstream element, such as a central control, a processing card, or a switch fabric element, then the downstream elements must be fooled into believing they are still receiving commands and data from the same upstream element. This can be accomplished by using a 2:1 mux designed for PCIe signals to indicate which of two upstream elements will actually drive traffic into the downstream element. However, this structure can support only the 1:1 redundancy model. The preferred method for implementing upstream redundancy (see Figure 2) is to place a 3-port nontransparent PCIe switch on the intelligent line cards, with the upstream port pointed toward the active fabric/control card complex and the nontransparent port pointing toward the inactive partner. This architecture allows traffic to run between the active and inactive control cards, and between the inactive control complex and all the line cards to ensure the links remain healthy. Simple switchover mechanisms within the nontransparent switches allow activity to be swapped with minimal delay and traffic loss.

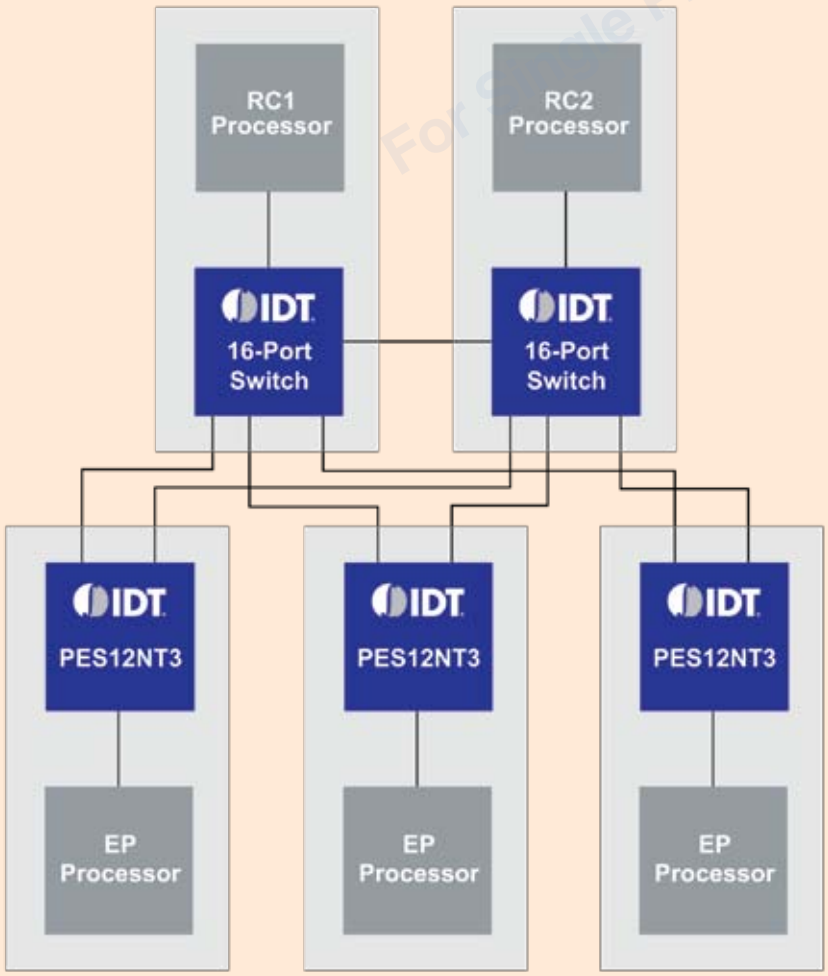

Figure 2

Conclusion

Given its ability to extend signal reach and reduce pin count, PCIe will quickly become the CPU port protocol of choice. The availability of multiple CPUs with PCIe ports, including most CPU and housekeeper types favored in communications systems, will lead to a rapid adoption of PCIe in the on-card control plane. Wherever a CPU on one card controls devices directly on another card, PCIe can be used to extend the control protocol across the backplane as a natural extension of the on-card model.

Control planes between intelligent cards in communications systems typically use a message-passing paradigm. In intelligent cards, this approach is driven in large part by the need to isolate the address spaces on each card from one another. However, with the increased availability of nontransparent functions in switches and endpoint processors, they will be able to achieve this goal by using a shared memory model of data transfer. This shared memory model can provide higher data transfer efficiencies and lower latencies by eliminating the multiple-copy bottleneck present in most message-passing models.

These advantages, coupled with the high degree of scalability and flexibility in the PCIe interconnect, will see PCIe used increasingly in the system-wide control planes of communications systems.

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PCI Express Gen2/Gen3 update

An interview with
Jasmin Ajanovic and
Kevin W. Bross, Intel
conducted by
Joe Pavlat

Two individuals closely tied to PCI Express Gen2/Gen3 and embedded/communications development, Jasmin Ajanovic and Kevin W. Bross, spoke with Joe Pavlat, Editorial Director, recently. Jasmin drives architecture and protocol specification within the PCI-SIG as a chair of PCIe Protocol Workgroup and PCIe Bridge Workgroup. He is a Senior Principal Engineer for the Digital Enterprise Group at Intel Corporation. Kevin is a Modular Systems Architect with Intel's Embedded and Communications Group. Since 2002 Kevin has been working with AdvancedTCA spec development and with other PICMG standards efforts.

***Joe* – What's the capsule history of PCI Express?**

Jasmin – PCI Express (PCIe) is a member of the PCI architectural family. It's a technology that has evolved across two generations, and a third generation of PCIe is currently in development.

In 2003, the PCIe Gen1 serial interconnect was introduced at 2.5 Gigatransfers per second (GTps). Gen2 doubles the speed of Gen1. Everything is backwards compatible, but Gen2 brings important enhancements to the table. Intel is shipping Gen2-compatible products now.

Current work within PCI-SIG is focused on third-generation PCIe development. In parallel, the PCI-SIG is developing architectural extensions to support emerging I/O virtualization and device sharing applications. The PCI-SIG is developing these specs to extend the capabilities of PCIe.

Graphics accelerators and a number of other interesting applications are driving Gen3. We have a number of extensions on the table geared toward supporting those applications.

The work in progress on PCIe (Gen3) includes doubling the bandwidth (although not necessarily doubling the operational frequency due to a new encoding method).

***Joe* – How do you double the bandwidth without doubling the clock rate?**

Jasmin – We use a different encoding scheme – not 8b/10b – that will maintain the embedded clock and will provide encoding and scrambling at close to 0 percent overhead compared to 8b/10b's 20 percent. Now we can be more efficient from a bandwidth point of view. The tradeoff here was that, while intuitively one would think that if the current generation is 5 GTps, then we need to go to 10 GTps. However, we found that 10 GTps really pushed the limits of the existing systems and could break the compatibility with those systems, that is, connectors, cards, and backplanes, and would significantly reduce the length of the channel, thus preventing us from meeting the needs of existing applications. So the decision was made to go to 8 GTps with a different encoding scheme. Table 1 (courtesy Intel) depicts theoretical raw max bandwidths for x16 wide PCIe Gen1, Gen2, and target Gen3. Note that effectively achieved bandwidths on actual products depend on a number of factors (implementation of data buffering and flow control, packet data payload size, and application workload, to name a few), and therefore the numbers in Table 1 should be used only as a reference points.

***Joe* – Walk us through some of the Gen2 extensions you believe will be of particular interest in the embedded space.**

Jasmin – One is that Gen2's 5 GTps speed increase is paired with capabilities to manage and configure the speed, link speed management, and bandwidth notification. Embedded developers now also have Function Level Reset, which provides an architected mechanism to better control a resetting of the functionality of the PCIe attached device. Function Level Reset should resolve deficiencies of the inherited legacy reset mechanism.

Access Control Services allow management of peer-to-peer communications in systems with multiple agents connected to either root ports or to a switch.

Completion timeout control is interesting for the embedded space because it is much better architected in Gen2. It specifies a set of timeout choices. So, depending on your topology, the completion timeout may be connected over a long path with multiple links involved in a complex hierarchy. In that case, the completion of the transaction may take a significant amount of time to traverse the topology, making it helpful to have variable timeout capability.

***Joe* – What is the larger context in which PCI-SIG began work on Gen3?**

Jasmin – When the PCI-SIG started looking at the new types of applications emerging on PCIe, including accelerators and the deployment of PCIe in telecom and embedded systems, we identified that across the stack there would be a number of different desired enhancements and extensions to incorporate – from signaling speed up to and including power management (important for any type of system these days), improving protocol efficiencies, and including an enhanced mechanism for synchronization and control/status exchange.

One example is latency reduction, a mechanism for decreasing average access times of PCIe peripherals to host memory by optimizing data allocation and retention within system cache hierarchy. In addition to improving the latency, this could very significantly reduce the power consumption, at least based on the workloads that we looked at for server and client applications.

Another improvement targeting distributed processing environments such as those of the embedded telecom space is atomic read-modify-write transactions, which will come in very handy for synchronizing operations. This is a new capability that will be introduced in Gen3, but it is not tied only to Gen3 speeds. It can also be supported when the latest generation of devices operates at Gen1 or Gen2 speeds.

	Raw Bit Rate	Link BW	BW/lane/way	BW* x16
PCIe 1.x	2.5 GTps	2 Gbps	~250 MBps	~8 GBps
PCIe 2.0	5.0 GTps	4 Gbps	~500 MBps	~16 GBps
PCIe 3.0	8.0 GTps	8 Gbps	~1 GBps	~32 GBps

*Bidirectional bandwidth

Table 1

***Kevin* – When you scale back to a slower link speed, it goes back to 8b/10b encoding, so you maintain backwards compatibility, right?**

Jasmin – Yes. From day one we knew that PCIe would go through successive speed increases, and we conceived a link speed management mechanism. This mechanism really came into its own in the PCIe 2.0 spec, where we are going from Gen1 to Gen2. We are also providing the plumbing to go beyond that in terms of managing the speed. One example is management of the link width for interfaces that are more than x1 wide.

So the assumption has been that there is a requirement for backwards compatibility. PCIe components that are capable of using Gen2 speed must be able to work at Gen1 speed as well when initially configured. In addition, components configured to operate at Gen2 speed must be able to downshift to Gen1 in the case of increased transmission errors that could be attributed to marginal designs or environmental impact. Downshifting is not necessarily just for reliability reasons – it might also take place between two devices that are capable of speaking at Gen2 speed, but decide to speak at Gen1 speed due to power reduction requirements.

With the existing PCIe software configuration mechanism as implemented in mainstream software operating systems, there are limits to how much of peripheral's local memory can be mapped to a system memory. That limitation is being addressed with the BAR renegotiation mechanism. This mechanism, like most of other new capabilities, is agnostic to the operational speed of the interface – it can be used at Gen 1, 2, or 3 speeds.

Another enhancement in this area that relates to embedded computing needs is the capability for the switch (as well as other components) to report internal errors as an extension to the existing Advanced Error Reporting mechanism.

In addition to the power management that we have today at a device-level state, we are trying to add capability for high-powered devices that require substantial allocation of the power distribution and the thermal budget to be managed dynamically by the platform.

PCI Express cards can consume from 25 W up to 225 W, and there is a proposal for 300 W. In a system with several high-power adapters, typically not all adapters consume the maximum power all the time. However, system vendors do not have a choice other than to provision the power/thermal solution required for the worst case. A new Gen3 extension for dynamic power resource management will allow an optimized, cost-reduced power/thermal solution where platform software will manage allocation of power based on the needs of adapters. The system manages the power allocation to the individual cards so that they don't draw more power than their dynamically allocated budget, even though the maximum power draw from all these cards could be much higher than the allowed power draw.

***Kevin* – Jasmin, you have identified a number of features that are in addition to the faster speed. Can you talk briefly about how those features are available even at lower speeds?**

Jasmin – If you have a device that is compliant to the PCIe 2.0 spec, that device can operate at the 5 GTps and 2.5 GTps speeds. The assumption is that if the device is compliant to the 2.0 spec, it was designed at the time when the additional capabilities were available, so even if that device is operating at 2.5 GTps (Gen1 speeds), it will support these capabilities.

Extrapolating this to the next generation, Gen3, all of these capabilities will be available at 2.5, 5, and 8 GTps.

***Joe* – Gen2 is released. Are there going to be any more enhancements to Gen2?**

Jasmin – The PCI-SIG is currently defining additional capabilities for I/O virtualization and device sharing for which specifications will be complete before PCIe 3.0 is delivered. These capabilities are geared primarily toward the server blade market but can find significant use in other markets such as embedded.

***Joe* – One of the limitations of PCIe has been the inability to have multiple roots talking to a peripheral. Does PCIe Gen2 overcome the problem of not being able to have multiple root complexes talking to a peripheral?**

Jasmin – Yes. There is something called the Multi-Root Sharing specification that is part of PCI-SIG I/O virtualization development.

It is possible to connect multiple root complexes to a multi-root-aware switch that connects to the peripherals beneath, which, if support sharing capability exists, can be assigned in a flexible manner to particular root complexes.

Joe – That is important, because it enables redundant, highly available systems, which have been difficult to do with PCIe. In a pure Gen2 system I presume that because the speed is higher that the trace lengths must be shorter, and that skew requirements and crosstalk requirements are tighter? Is this true? Can you use the same trace length and same size motherboards and I/O slots in Gen2 as in Gen1 or do things get tightened up?

Jasmin – It requires a tighter reference clock, and some of the budgets that allowed sloppiness in Gen1 have disappeared. As far as channel length, my understanding is that Gen2 does not require compromise on the channel length of the motherboard, but it does require more disciplined design of the motherboard. Trade-offs can be made. I can use cheaper materials or fewer layers, but that will shorten my interconnect channel.

Kevin – Some backplanes use higher grade substrates (most AdvancedTCA backplanes, for example) and are not just a typical motherboard.

Jasmin – The PCI-SIG PCIe technology was developed primarily for mainstream applications, where you need to support a "50-cent" motherboard connector on a traditional PC, but for those systems that use better quality materials for connectors and backplanes, it affords the opportunity for longer channel lengths at the same speeds. However, the PCI-SIG did not extend the development effort to these other specialized form factors, and that would be the value-add the telecom developer could provide.

Kevin – In the AMC.1 specification, currently undergoing revision, we had members who did some signal integrity analysis, looking at both Gen1 and Gen2, to understand the impact of both signaling rates.

Joe – There are not a lot of AdvancedTCA systems using PICMG 3.4 (PCIe) native backplane communication out there. Do you think Gen2 would work on an existing AdvancedTCA backplane if you wanted? Would the connector handle it, and would the backplane handle it?

Kevin – In general, I would say a qualified "yes." It depends on the particular backplane geometry. Designers have been doing things like putting the hub slots in the middle so the routing distance is as short as possible.

During the testing we have done, at PICMG Interoperability Workshops and internally, we have seen a number of backplanes that are good well beyond 5 Gigabits. The Gen2 speeds are certainly achievable.

Joe – Most of what AdvancedTCA provides is Ethernet across the backplane and PCIe as a local bus.

Kevin – The one difference I would say, there are some clients out there who are using PCIe across the Update Channel as a board-to-board kind of I/O expansion. This is similar to PICMG 3.4.

Joe – How does the demise of Advanced Switching affect potential applications for PCIe?

Kevin – The mainstream and server applications for PCIe have done some things that were similar to what ASI was originally targeting. For example, the multi-root capability and I/O virtualization begin to provide some of the same basic capabilities with the mainstream PCIe feature set without requiring a totally different protocol.

Joe – A few of the Gen2 enhancements do some of the things many were hoping Advanced Switching would do.

Jasmin – I would agree that the I/O virtualization and I/O sharing specs will replace to a large degree what could potentially have been done with Advanced Switching, and in a backwards-compatible manner because Advanced Switching branched off from the mainstream PCIe development.

In addition, Gen3 extensions include new protocol mechanisms, such as Multicast, that are specifically geared towards addressing needs of embedded/telecom applications. Multicast capability provides support in PCIe fabric (Root Complex and Switches) where a single transaction/payload can be delivered to multiple recipients in an optimized manner from a performance/power standpoint.

Joe – That is significant as this recovers some of the functionality that was planned for AS.

Kevin – There are also a lot of things in terms of latency control that have long been important in the communications space that are now becoming important in more of the mainstream PCI space as well.

Jasmin – With regard to economy of scale we should note that In-Stat predicted 440 million PCIe-based devices by 2010. When you consider this in light of PCI-SIG's 800 members, many of them very active, it's a large ecosystem.

Not all of the products will be applicable, but it gives you the ability to cherry-pick the products or cherry-pick partners to develop more specialized products for embedded markets.

Joe – **I noticed there is a revision 2. What is the significant change in the mechanics?**

Jasmin – There is no change in the mechanical aspect; the connector is the same. There are stricter guidelines for routing the traces on the add-in card to the component itself. The Gen1 and Gen2 connector are the same mechanically, that is, they use the same pinout. Also, with regard to electrical properties, it is the same connector.

Kevin – Quite a few elements were part of Gen1 definition but included in the Card Electromechanical (CEM) specification. A number of those items got moved into the Gen2 baseline spec for Gen2 signaling rates, and the like, so they are no longer found in the CEM spec.

Jasmin – I would like to point out that it is important to understand the product level flexibility that PCIe increased signaling rates provide. Let's say that to meet your goals with a Gen1 product you needed to have a x2 or x4 PCIe interface. Well, when you go to Gen2 or Gen3, you can reduce the footprint of the interface while preserving the same bandwidth. The assumption here is that you do not necessarily need more performance, but you will reduce the cost of the device and reduce the power that device consumes. Power for the links is directly proportional to the number of lanes driven from the device, so the whole infrastructure becomes more optimized, costing less and consuming less power.

With regard to economy of scale we should note that In-Stat predicted 440 million PCIe-based devices by 2010.

One can opt for better cost, lower power, or increased performance, and that will depend on the application.

Kevin – As noted earlier, if you are doing high-speed interconnects, a number of techniques can be used to improve the signal integrity; some designers are looking at doing a 12 degree rotation of the traces on the actual substrate so that signals are not going directly parallel to the weave of the fiberglass but are actually cutting across them to get better signal integrity. There are many other techniques like that, if you are looking at higher speed requirements.

Joe – **What is the main thing to take away from this discussion we've had about PCIe?**

Jasmin – PCIe is becoming one of the broadest deployed industry interconnect standards. With a very strong membership, PCI-SIG is working on delivering architectural extensions and enhancements that will extend the life of this technology and make it more applicable for other areas such as blade servers and embedded/telecom.

Jasmin Ajanovic *is a Senior Principal Engineer for the Digital Enterprise Group at Intel Corporation. Jasmin has 26 years of experience in the architecture development and system design of the communication and computer industry. After joining Intel in 1991, he spent a number of years working on PC architecture, enabling technologies and product development. He was chief architect of a number of successful products including several PCI chipset families. During the last eight years, Jasmin was responsible for the development of Intel's I/O architecture and interconnect technologies. This includes development of PCI Express (PCIe), an industry standard which drives architecture and protocol specification, within the PCI-SIG as a chair of PCIe Protocol Workgroup and PCIe Bridge Workgroup. Jasmin holds approximately 50 industry patents.*

Kevin W. Bross *is a Modular Systems Architect with Intel's Embedded and Communications Group. Since 2002 he has been working with AdvancedTCA spec development, various revisions since then, and with other PICMG standards efforts. Kevin has also been involved with groups such as Telcordia, ATIS, the SCOPE Alliance, and groups within Intel in defining revisions to NEBS specs, the definition of Intel AdvancedTCA products, and the design of Intel's new data centers.*

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Schroff MicroTCA backplanes are designed with transfer rates of up to 10 Gbps per port to meet any future high speed requirements and are protocol independent. As the industry leader in MicroTCA design, we have many existing backplanes available and can customize a backplane design to meet your exact performance and price requirements. The complex topology requires excellent experience in backplane design in order to accommodate the large number of traces on the smallest possible number of layers without detriment to performance. Precisely this is why Schroff MicroTCA backplanes are among the best on the market.

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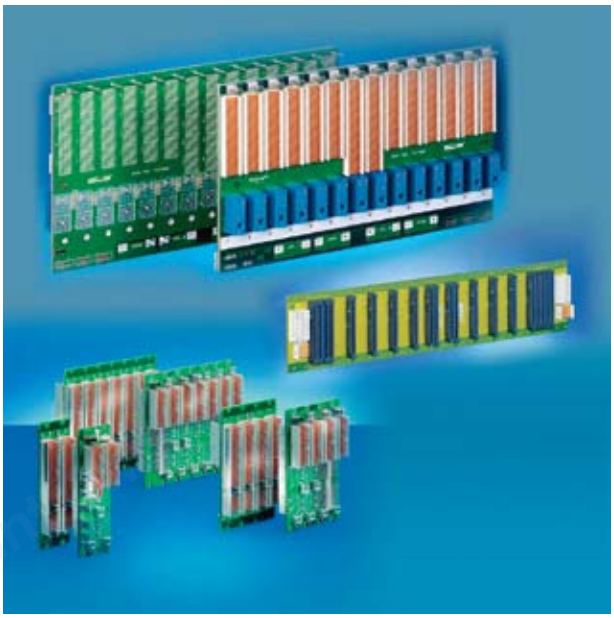

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FEATURES

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FEATURES

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ATCA-7150 Blade

The ATCA-7150 AdvancedTCA® processor blade delivers a combination of performance and flexibility to help drive the successful implementation of next-generation telecom networks. It builds on the AdvancedTCA® standard to provide the right product at the right time to meet the needs of the telecom industry.

With two Dual-Core Intel® Xeon™ processors, the ATCA-7150 blade is the highest performance processing blade in an AdvancedTCA form factor. It also provides Gigabit Ethernet (GbE) interfaces to the PICMG 3.0 base interface and the PICMG 3.1 fabric interface in a dual star configuration. Several other network configurations are available.

An array of main memory options and two local mass storage options add to the performance and flexibility of the ATCA-7150 processor blade.

FEATURES

- High performance processor blade with SMP support
- Two, Dual-Core Intel Xeon (2.13 GHz) LV processors
- Multiple software packages including operating system
- PICMG 3.0 GbE base interface support
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ATCA-9301 Blade

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Data plane elements in 4G wireless applications, including WiMAX and next-gen IPTV networks, will see dramatic increases in throughput and packet processing with the ATCA-9301 blade.

FEATURES

- Two Cavium OCTEON 5860 processors – 16 750 MHz MIPS64 cores each for high bandwidth packet processing
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iNAV® 74PF

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FEATURES

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FEATURES

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ATCA-F 0 Dual Socket F AdvancedTCA® Blade

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Promentum™ ATCA-7220

The Promentum™ ATCA-7220 Dual OCTEON™ PLUS Packet Processing Module is the industry's first blade to enable highest density of GbE interfaces in a single slot. With significantly higher processing power and bandwidth access than other platforms available today, the ATCA-7220 module enables a complete solution for packet processing applications such as Radio Network Controllers, Session Border Control (SBC), security gateways, edge routers, and media gateways.

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The Smart FrontEnd allows offloading preprocessing from the Cavium Processors, enhances manageability of the processors, and enables flexibility of data flow to and from the processors. With superior density and throughput for each slot, the ATCA-7220 helps companies minimize capital expenditures by reducing the amount of equipment needed.

The new module features RadiSys' optimized IP data path software, which improves manufacturers' ability to accelerate time to market and time to revenue. In addition, the future-proof AdvancedTCA platform gives manufacturers a clear path to migrate easily to the next generation of OCTEON processors. The combination of ATCA-7220 with fully validated IP data path software such as IPV4/V6 forwarding, load balancing, and IPS, along with the award winning 10 G AdvancedTCA Platform, enables equipment manufacturers to accelerate their time to market and money.

FEATURES

- Single-slot PICMG 3.0/3.1 (Option 1 and 9) compliant
- Dual OCTEON™ Plus multi-core processors, each with: up to 900 MHz clock rate Up to 16 GB ECC SDRAM 128 MB RLDRAM (optional) 128 M
- High bandwidth I/O – 10 GbE and 1 GbE front and rear 4*10 GbE or 1 GbE (SFP+) front I/O 6*1 GbE (SFP) front I/O 16*1 GE or 4*10 GE rear I/O (optional)
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Promentum MPCBL0050

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The Promentum MPCBL0050 also supports an AMC and hard drive on the RTM. This fifth-generation design achieves significant performance improvements for compute-intensive and database-access applications including IP Multimedia Subsystems (IMS), wireless control plane, and IPTV.

The MPCBL0050 SBC is optimized to support first-generation AdvancedTCA chassis that limit front-board power to less than 200 W. It also interoperates with AdvancedTCA products from RadiSys Corporation and with third-party building blocks meeting the PICMG 3.0 specification.

FEATURES

- High performance Intel® based AdvancedTCA® blade based on the Dual-Core Intel Xeon LV5218 process that provides 4 processor cores
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- Supports a variety of Operating Systems including MontaVista Linux Carrier Grade Edition (CGE) 4.0; Validated with RHEL 4u4 and RHEL 5
- This fifth-generation design achieves significant performance improvements for compute-intensive and database-access applications including IP Multimedia Subsystems (IMS), wireless control plane, and IPTV

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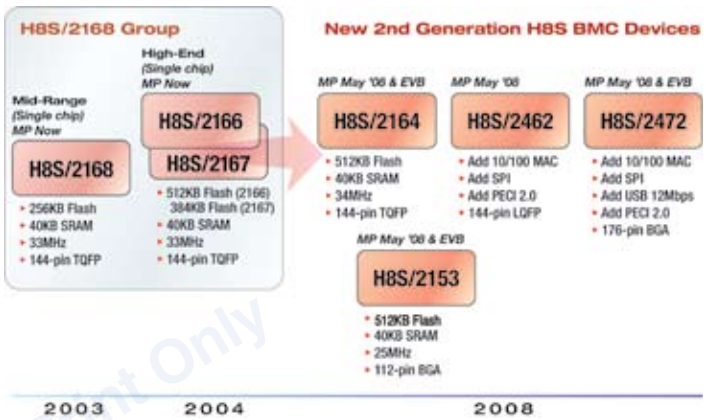
Renesas has the world's broadest range of board management controllers for AdvancedTCA, AMC, and µTCA applications, including IPMCs, MMCs, MCMCs, and EMMCs. For the best solutions for new designs, check out our expanding selection of 16-bit devices with LPC in the H8S/2100 and H8S/2400 series, some of which include PECI, Ethernet, USB, SPI, and 16550 functions.

Consider the new H8S/2153, for example. This space saving (10 mm x10 mm, 112-pin BGA) second-generation microcomputer has a 25MHz H8S/2600 CPU, 40KB of SRAM, 512KB of flash, 4 channels of I2C, and LPC, plus other key peripherals with field-proven functional modules from the H8S/2168 family. The H8S/2153's software compatibility makes it easy to port firmware from our first-generation solutions; its SRAM memory map is identical, too.

For more information on these or other Renesas products, contact webmaster.america@renesas.com.

Or visit our website: www.renesas.com.



H8S BMC Feature Overview

BMC Feature	H8S/2168, 67, 66	H8S/2153	H8S/2164	H8S/2462	H8S/2472
Package - Pins	TQPF-144	BGA-112	TQFP-144	LQFP-144	BGA-176
Clock Freq	33MHz	25MHz	34MHz	34MHz	34MHz
CPU	H8S/2000	H8S/2600	H8S/2600	H8S/2600	H8S/2600
On-chip SRAM Size	40KB	40KB	40KB	40KB	40KB
Flash Size	256K, 384K, 512K	512KB	512K	512K	512K
User Boot Flash Size	8KB	16KB	16KB	16KB	16KB
I2C channels	6	4	6	6	6
External bus width (for SRAM)	16-bit	None	16-bit	16-bit	16-bit
Glueless External Bus I/F	No	-	Selectable	Selectable	Selectable
16550 with Snoop	None	None	Yes	Yes	Yes
SCI serial	3 ch @ 115.2Kb	2 ch @ 115.2Kb	2 ch @ 115.2Kb	2 ch @ 115.2Kb	2 ch @ 115.2Kb
Total Serial Channels Available	3 ch	2 ch	3 ch	3 ch	3 ch
SPI	None	None	None	Yes	Yes
10/100 Ethernet MAC	None	None	None	1 ch	1 ch
USB Full-speed Function Interface	None	None	None	None	Yes-EP0-EP3
PECI 2.0 Support	None	None	None	Yes	Yes
H/W Multiplier	None	Yes	Yes	Yes	Yes
14-bit PWM	4 ch	4 ch	4 ch	4 ch	4 ch
LPC	3 ch	3 ch	3 ch	3 ch	3 ch
E10A-USB Debugger	Yes	Yes	Yes	Yes	Yes

ERNI Electronics
3005 East Boundary Terrace • Midlothian, VA 23112
804-228-4100
www.erni.com

AdvancedTCA Zone 1 Power Connector

The AdvancedTCA Zone 1 Power Connector combines eight size-16 contacts along with twenty-two size-22 contacts. Based on stamped contacts and by adding the use of a high conductivity copper alloy the power contacts are capable of carrying 16 A and the signal contacts 2 A. The female contacts lead-in design combined with cavity protection prevent the contacts from being damaged. Contacts that were plated subsequently don't have any bare ends and therefore are suitable for long term usage in critical environments. The contact terminals provide compliant press-fit zones for easy assembly to the PCB and are flat-rock compatible (no need for special press-in tools). The connector meets all PICMG 3.0 performance requirements.

FEATURES

- In accordance with the PICMG 3.0 standard
- Gold over nickel plating in contact area, tin plating on PCB terminals
- Controlled plating thickness at female mating point
- RoHS compliant
- Reliable and proven press-fit zone
- Standard flat rock press-in tools

For more information, contact: info.usa@erni.com.

RSC# 32156 @ www.compactpci-systems.com/rsc

Resource Guide 2008 CompactPCI and AdvancedTCA Systems Connectors

ERNI Electronics
3005 East Boundary Terrace • Midlothian, VA 23112
804-228-4100
www.erni.com

ERmetZD

The PICMG EXP.0 specification was developed to incorporate the PCI Express technology into the popular PICMG 2.0 CompactPCI form factor. This specification was intended for 3U CompactPCI, military, PXI, and aerospace markets. The specification makes use of legacy CompactPCI connectors (ERmet 2mm HM), high speed differential connectors (ERmet ZD), and a new "mini" Hard Metric connector. This "mini" HM connector is defined as a 5 row by 8 column connector. ERNI offers a 3-pair/10-wafer ERmet ZD as well as the ERmet 2mm HM connector type B8 with integrated coding elements for preventing incompatible board/slot configurations (for example, an RIO card in a PXI slot).

FEATURES

- Designed around the popular CompactPCI form factor
- Integrated coding elements for preventing incompatible board/slot configurations
- 40 signal pins in a 5 row by 8 column configuration

For more information, contact: info.usa@erni.com.

RSC# 20395 @ www.compactpci-systems.com/rsc

HARTING

1370 Bowes Road • Elgin, IL 60123
877-741-1500
www.HARTING-USA.com

AdvancedTCA® & MicroTCA™ Power Connectors

HARTING's comprehensive offering of AdvancedTCA® and MicroTCA™ power connectors are designed to meet PICMG standards and performance requirements.

Designed in accordance with the PICMG 3.0 specification, HARTING's AdvancedTCA® hybrid power connectors feature 8 power contacts (AWG size 16), rated to 16 A with 22 signal contacts (AWG size 22) for critical management functions.

HARTING's 96-position MicroTCA™ hybrid power connector is ideal for use in MicroTCA™ Power Supply Units (PSUs). The 24 power contacts are rated to 9.3 A @ 80% derating (IEC 60 512 method), and the 72 signal contacts supply crucial management and power functions to the system. The connectors are designed in accordance with the PICMG MTCA.0 R1.0 symmetric footprint.

FEATURES

- Four-stage sequential contact engagement for hot swap capability
- Proven reliability with HARTING press-in technology
- Robust design of AdvancedTCA® power connector has a female guide receptacle and male peg for reliable blind mating
- MicroTCA™ power connectors have integrated coding and guiding features for accurate placement and blind mating
- Durability – Selectivity gold plated, AdvancedTCA® power connectors guarantee a minimum of 250 mating cycles
- Durability – Selectively gold and palladium nickel plated, MicroTCA™ connectors guarantee 200 mating cycles

For more information, contact: more.info@HARTING.com

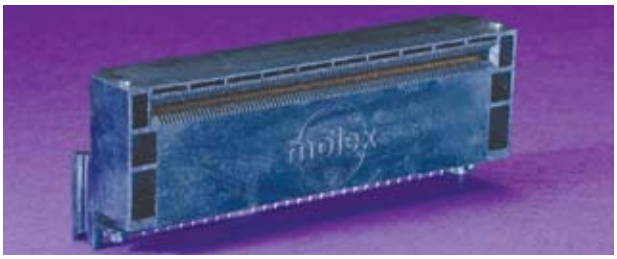
RSC# 35881 @ www.compactpci-systems.com/rsc

Connectors CompactPCI and AdvancedTCA Systems Resource Guide 2008

Molex

2222 Wellington Court • Lisle, IL 60532
630-969-4550
www.molex.com

AdvancedMC B+



AdvancedMC™ B+ connectors from Molex support the next generation of mezzanine card standards and speeds of 12.5 Gbps.

These 170-circuit connectors support the AdvancedMC base specification as developed by PICMG. Molex AMC.0 B+ connectors feature controlled impedance and reduced crosstalk, plus a footprint launch optimized for high-speed data rates. The design enables the connector to achieve 12.5 Gbps signal transmission.

This enhanced footprint further reduces crosstalk by managing inter-pair affinity and incorporating additional ground vias for isolation, resulting in crosstalk of less than 3% at 12.5 Gbps.

FEATURES

- B+ style connector meets PICMG AdvancedMC™ specification and industry-standard requirements
- Controlled impedance and reduced crosstalk
- Press-fit contacts for simpler application to PCB and superior signal integrity
- Footprint launch optimized for high-speed data rates
- Design enables 12.5 Gbps signal transmission
- Crosstalk of less than 3%, with adjacent Tx and Rx

For more information, contact: amerinfo@molex.com

RSC# 32835 @ www.compactpci-systems.com/rsc

Positronic Industries, Inc.

423 North Campbell Avenue • Springfield, MO 65806
800-641-4054
www.connectpositronic.com

Power Connector

VPB Power Connector Series

Plug-in boards used in today's computing platforms must provide higher reliability and greater functionality, and require more power than ever before. Many next generation platforms deliver bulk voltage to boards. DC to DC converters are used to supply the various voltage requirements on the board. This allows systems to adapt as semiconductor voltages change.

The VP series was developed as a dedicated interface between backplanes and boards. These connectors are capable of providing power, system management and high voltage auxiliary circuits to each slot within the platform. Some options provide outstanding blind mating capability that can be used to align the board during insertion.

FEATURES

- Compliant to PICMG 3.0 AdvancedTCA® Zone 1 connector requirements
- Alternate variants of the VP series have been selected by VITA for specifications currently under development
- Low contact resistance. Power/signal contacts in a single package
- Up to 8 power contacts rated at 16 amps per contact at a 30 °C temperature rise
- Up to four levels of sequential mating. Integral blind mating featues. Options for coplanar mounting
- Proven performance and customer support provide an excellent value

For more information, contact: info@connectpositronic.com

RSC# 18673 @ www.compactpci-systems.com/rsc

Infranet, Inc.

5F Cowell B/D 66-1 Banpo-Dong Seocho-Gu • Seoul, 137-040
Korea, South
82-2-3479-8500
www.infranet.co.kr

USPS-3200 Series

USPS-3200 series is a fully AdvancedTCA 3.0 and 3.1 compliant switch blade that provides 48 Gigabit Ethernet service for interfacing with node boards via Base Interface and Fabric Interface. USPS-3200-2 is fully compliant with PICMG 3.1 option 2 and USPS-3200-9 option 9, each of which enables users to excel in demanding and diverse systems.

Infranet also provides USPS-3000 series: USPS-3000B designed for Base Interface only and the USPS-3000F supporting Fabric Interface. To meet the needs of a variety of applications, AdvancedTCA chassis, such as the 14-slot UniPlat-3000 and 5-slot UniPlat-3005, are available.

FEATURES

- Fully PICMG 3.0/3.1 option 2 compliant
- Support optionally PICMG 3.1 option 9 to specific slot
- 48 ports GbE non-blocking Switch Fabric
- Shelf Manager interface
- Wire speed L2 Switch, L3 Static Routing
- Management Interface (SNMP,CLI)

For more information, contact: sales2@infranet.co.kr

RSC# 35822 @ www.compactpci-systems.com/rsc

Fujitsu Microelectronics America
1250 E. Arques Avenue • Sunnyvale, CA 94085
800-866-8608
www.us.fujitsu.com/micro

20-port 10 GbE IC

Fujitsu's next-generation high-density switch chip embeds 20 high-bandwidth, full-duplex 10 Gbps ports into a single, integrated, small-footprint package. Each port has the flexibility to support either 10 Gbps serial, XAUI, or CX4. In addition, the adaptive equalization capability on each port can increase reach for XAUI, CX4, and 10 Gbps serial applications, as well as eliminate the need for external re-timer circuits, reducing board space, power consumption, and cost. With 10 Gbps serial capabilities on each port, the MB8AA3020 allows direct connection to optical XFP modules on any port, eliminating the use of third-party SerDes chips. This reduces board complexity, improves cost, and reduces time to market. MB8AA3020 offers a total of 400 Gbps of non-blocking aggregate switching capacity in both cut-through and store-and-forward mode of operation. A switching latency of 300 ns, including 10 GbE SerDes in cut-through mode, makes the switch ideally suited for high-density, latency-sensitive applications.

As a result of being fabricated with 90nm technology, the MB8AA3020 switch chip provides the lowest-power-consumption, high-port density 10 GbE switch chip in the industry, making the MB8AA3020 well suited for high density, low-power applications. The Fujitsu MB8AA3020 20-port 10 GbE switch chip provides eight priority classifications per port, which allows priority switching based on DiffServ, MAC address, VLANs, extended VLANs, and ports. The MB8AA3020 also provides several carrier-grade Ethernet features including priority PAUSE, backward congestion notification, and early class-based watermark capabilities for congestion notification.

FEATURES

- 10 Gbps serial capabilities enable the use of XFP modules without requiring third-party SerDes chips
- Adaptive-equalization algorithm eliminates need for external re-timer circuit in CX4 cabling, saving power, latency, and cost
- Redundant GbE ports gives users a high availability, agnostic management interface not tied to any particular processor chip
- On-chip micro-engine increases flexibility and simplifies software development, reducing time to market
- Delivers 400+ Gbps, non-blocking, aggregate switching bandwidth through 3 MB of proprietary, multistream shared buffer memory
- Supports state-of-the-art Congestion Management, with on-chip 10 Gbps serial SerDes
- 20-port 10 Gbps switching operations at wire speed; 2 Gigabit Ethernet management ports; and on-chip micro-engine reduces S/W development
- Integrated XAUI/CX4 SerDes and 10 Gbps serial capabilities for all 20 high-speed ports
- Adaptive equalization eliminates the need for external clock re-timer circuit in CX4 applications
- Low power consumption; large 2.9 MB integrated memory; 90 nm technology; small (35 mm x 35 mm) foot print
- EEPROM interface used for initialization; two I2C interfaces; two MDIO interfaces; advanced class Ethernet features

Tundra Semiconductor

603 March Road • Ottawa, ON K2K 2M5 Canada
+1 613-592-0714
www.tundra.com

RapidIO Switches

Tsi578™, Tsi576™, Tsi574™, and Tsi620™ Serial RapidIO® Switches set industry benchmarks for high performance and low power consumption. Providing up to 80 Gbps aggregate bandwidth, the Tsi57x family enables customers to develop high performance systems for DSP processor and FPGA interconnect, with the Tsi578 as an ideal solution for backplanes. The Tsi620 provides the functionality of both a RapidIO Switch and of a non-transparent RapidIO-to-PCI Bridge. The Switch offers 50 Gbps aggregate bandwidth, while the Bridge enables legacy systems to link to the high-bandwidth RapidIO interconnect. The Tsi620 contains all the benefits of Tundra's RapidIO Switch family, adding interfaces to PCI-enabled processors, and interface to non-SerDes low-cost FPGAs.

FEATURES

- Superior real time image processing resolution, size, and frames per second in military and medical applications
- Best in class switch for backplane and processor aggregation with 80 Gbps of pure non-blocking bandwidth
- Lowest power dissipation (120-200 mW per port), identical for long and short reach links
- Tsi57x family supports IEEE 1149.6 JTAG testing
- Highest signal integrity solution with tools to program pre-emphasis and equalization
- Tsi620 offers RapidIO to PCI bridging and RapidIO to XGMII to non-SerDes FPGAs to lower system cost

For more information, contact: sales@tundra.com

RSC# 35872 @ www.compactpci-systems.com/rsc

Chomerics, Division of Parker Hannifin Corporation

77 Dragon Court • Woburn, MA 01888
781-935-4850 • Fax 781-933-4318
www.chomerics.com

EMI aTCA Faceplate

AdvancedTCA blank faceplates made with PREMIER® EMI shielding thermoplastic provide high performance and save up to 40 percent in cost over metal versions by eliminating machining and other secondary operations. The advantages of thermoplastic injection molding technology over metal fabrication technology can be realized without problems of plating and delaminating. PREMIER faceplates have incorporated secondary features into the overall design, thus reducing component and assembly costs. Blank faceplates are manufactured in a single step injection molding process saving up to 50 percent in weight while providing effective EMI shielding. Chomerics uses AdvancedTCA compliant designs and components to enable easy system integration.

FEATURES

- Shielding effectiveness up to 85 dB for proven compliance with NEBS, FCC, and EU standards
- High tensile and flexural strength and modulus for compliance with insertion/extraction needs and durability
- Compliance with Telecom flammability resistance; UL 94 V-0 @ 1.5 mm, 5 VA @ 2.0 mm, > than 28 percent oxygen index
- Recyclable; conforms to WEEE and TCO, RoHS
- Elimination of secondary processing steps for up to 40 percent lower total cost of ownership
- Low impedance for grounding needs

For more information, contact: chomailbox@parker.com

RSC# 35999 @ www.compactpci-systems.com/rsc

Schroff
5500 Wayzata Boulevard • Golden Valley, MN 55416
763-656-5351
www.schroff.us

IEA-R Handle

Schroff offers a comprehensive line of standard AdvancedTCA and AdvancedMC products including the new IEA-R handle!

Schroff's full line of AdvancedTCA front panel products allow seamless integration of AdvancedTCA boards into systems. All standard front panel kits are available in either extruded aluminum or stainless steel and are designed to accommodate the new, IEA-R handle.

The IEA-R handle features a robust, die-cast latch to stand up to "ruggedized" applications. This die-cast metal latching mechanism is ideal for applications that require added strength and durability. The metal latch securely fastens to the front panel without rubbing or sliding along the edge of the panel, significantly reducing wear over the life of the product.

In addition to AdvancedTCA products, Schroff offers a full line of AdvancedMC carriers and front panel assemblies which support Quad or Tri light pipe configurations. All AMC products are expertly designed to fully comply to the AdvancedMC specification.

AdvancedTCA and AMC Custom Panels

- Quick turn prototyping
- Plating, Powder Coat, Silk Screening, and Overlays
- Component kitting and full assembly
- On-line 3D models and drawings
- Seamless migration from prototype to low, mid, and high volume production
- Worldwide manufacturing facilities

By logging on to www.a-tca.com, system designers can access an extensive library of downloadable drawings for both AdvancedTCA and AMC front panel products. The drawings are available in a variety of formats, including IGS, STEP, eDrawing, DXF, PDF, and JPG files. The CAD drawings give designers an effective starting point in the development process and can be modified to meet specific system requirements.

Quick-turn prototypes are available on standard AdvancedTCA and AMC front panel kits including customization options such as LED and connector cutouts, silk screening, and overlay identification for each specific board application.

For more information or to request a product sample of the new IEA-R handle, visit www.a-tca.com/bettergrip.

FEATURES

- Robust die-cast latch
- Intuitive inject/eject operation
- Industry-leading ergonomic design
- Push-button activation of micro-switch
- Positive locking with audible feedback
- ID labels for customization

XTech
80 Trim Way • Randolph, MA 02368
781-963-7200
www.xtech-outside.com

We Think Outside the Box
So You Can Think In It

Face Plates - AMCs

XTech is a full service supplier of mechanical assemblies for circuit boards. XTech offers a comprehensive line of mechanical face plate assemblies for AdvancedTCA, AdvancedMC, AMC carriers, and CompactPCI face plates.

All products are available in both standard and customized profiles to support all of your design requirements. XTech's operations can support all your production needs – from prototype, to full production – anywhere in the world. Not only is XTech your single, convenient source for AdvancedTCA faceplates, but we also offer an extensive range of value added services, including:

- In-house design assistance for custom assemblies
- Component kitting and full assembly
- Personalized, professional customer support to help you complete your project on time and on budget

As a full service supplier, XTech is 100 percent committed to serving the telecommunications and electronic systems industries' AdvancedTCA requirements and complying with PICMG standards. With over 50 years of experience, XTech brings extensive skill and knowledge across a wide variety of industries around the world.

Contact XTech today!

Visit www.xtech-outside.com or you can e-mail us at inquiry@xtech-outside.com for more information, and contact us any time for your AdvancedTCA application engineering support.

FEATURES

- Lighter than stainless steel
- Extruded aluminum assures a strong rigid face plate, eliminates costly post-process bending
- Variable wall thickness from 0.050" to 0.100" to accommodate connectors
- Full support for other mechanical components – sheet metal, castings, or plastic
- Fast turnaround for prototypes, production pieces, and custom orders
- Design assistance, finishing, labeling, and assembly
- An unlimited variety of customized profiles to integrate with all AdvancedTCA platforms
- Recessed face plate gallery area for label protects edges and assures alignment
- Extruded channel for EMI gasket prevents foam roll-over and protects gasket
- Unsurpassed EMI and RFI shielding
- Excellent heat dissipation
- Manufacturing support in the United States and Asia

Southco

P.O. Box 0116, 210 N. Brinton Lake Road • Concordville, PA 19331
610-459-4000
www.southco.com/ATCAresource

Faceplate Hardware

Southco AdvancedTCA access and alignment hardware provides the total solution of all faceplate hardware needed for complete PICMG 3.0 compliance.

Ergonomic Southco handles secure AdvancedTCA face-plates. The handles also ensure proper interface with microswitches to signal a graceful power-down sequence during hot-swap operation. All Southco AdvancedTCA-compliant hardware can be custom tailored to user-specified configurations. Optional custom-color powder-coated handles are available to enhance aesthetics or color-code components.

All of these Southco solutions provide finishes that are RoHS-compliant and other attributes gained from years of Southco access hardware experience – such as robust die-cast construction, ergonomic molded handle grips, and precision machining to ensure precise fit.

FEATURES

- Push-to-close handles actuate microswitches, while spring-loaded secondary catches lock boards in position
- Narrow handle design takes minimal space, yet provides ample ergonomic grip for easy board removal
- Handles fit faceplates from 0.8 mm to 2.5 mm thick, and accommodate lever-, plunger-, or custom-microswitches
- Captive screws are available in multiple styles for easy manual tightening, including color-coated knobs
- Alignment/grounding pins in multiple lengths feature smooth bullet-nose design for easy alignment/insertion
- Alignment and keying modules in multiple pin/receptacle configurations are economical and extremely durable

For more information, contact: info@southco.com

RSC# 21498 @ www.compactpci-systems.com/rsc

Emerson Network Power

5810 Van Allen Way • Carlsbad, CA 92008
1 (888) 412-7832 or 1 (760) 930-4600
www.powerconversion.com

ATC210

The Artesyn ATC210 dual-input bus converter is a fully integrated power conversion and power management module for use on latest-generation telecoms cards. It provides AdvancedTCA board designers with a compact and optimized front-end power solution for space-constrained blades and AdvancedMCs.

FEATURES

- Dual A and B -48 Vdc inputs accommodate wide -36 to -72 V input range
- Two independent, isolated dc outputs: up to 17.5 A @ 12 V and up to 1.8 A @ 3.3 V
- Power management functions include input ORing, inrush control and transient protection
- Optically-isolated hardware alarms for loss of A or B -48 Vdc input feeds
- I2C serial bus interface for monitoring, reporting and digital programming of fault thresholds
- Comprehensive protection against overload and fault conditions

For more information, contact: 760-930-4600

RSC# 32838 @ www.compactpci-systems.com/rsc

NEI

3501 East Plano Parkway • Plano, TX 75074
972-633-3400
www.NEI.com

A-5000

NEI's A-5000 AdvancedTCA high-reliability servers feature superior performance, advanced I/O capacity, and easier manageability to meet the growing demand of the communications industry's triple and quadruple play technologies in a fully redundant small 5U form factor. With carrier-grade high-reliability features such as NEBS, ETSI, and five-nines (99.999%) availability, the A-5000 addresses thermal management, shelf management and serviceability issues with high-availability features including redundant -48 VDC power, redundant management modules, hot swap tool-less single board computers, redundant Gigabit Ethernet switches, and industry-leading power and thermal capabilities.

FEATURES

- 5-slot AdvancedTCA system with full-mesh topology for 3.125 Gbps throughout
- Supports up to three AdvancedTCA node expansion boards
- Dual redundant 16-port ZNYX PICMG 3.0 Gigabit Ethernet base fabric switches and dual redundant shelf managers
- Provides cooling for 200W per blade with two 290 CFM front-removable fans, air baffles and filler panels
- Dual 25A PEMS with power on indicator provides up to 200W per AdvancedTCA blade and 30W per shelf manager at -48V DC
- Red Hat Linux Enterprise AS 3.0 update 5 and 4.0 optional

For more information, email sales@nei.com or call (800) 977-1010.

RSC# 34755 @ www.compactpci-systems.com/rsc

Resource Guide 2008 CompactPCI and AdvancedTCA Systems Servers

NEI
3501 East Plano Parkway • Plano, TX 75074
972-633-3400
www.NEI.com

A-13000

NEI's A-13000 14-slot AdvancedTCA platform features dual-star or full-mesh topology and supports dual redundant GbE base fabric switch blades, and dual redundant shelf managers as well as 12 AdvancedTCA node expansion in a 13U platform. With redundant pressure cooling, this high availability platform is especially desirable for access and wireless applications, core networking applications, transport and server applications, and even media and session controller applications.

NEI can assist you in building a complete customized AdvancedTCA solution and offers a comprehensive suite of services from integration and interoperability testing to deployment and branding.

FEATURES

- 14 tool-less hot swap AdvancedTCA slots in either a full-mesh or dual-star topology
- Supports up to 12 AdvancedTCA single board computers or other AdvancedTCA blades
- Dual redundant PICMG 3.0 GbE base fabric switch blades and dual redundant shelf managers
- Redundant Negative Pressure Cooling for even air distribution in the event of a fan failure
- Provides cooling for 200W per blade with (2) 290 CFM front-removable fans and air baffles and filler panels
- Supplies 200W power to AdvancedTCA slots, 30W to shelf managers, and 20W to RTM with quad 25A PEMs at -48 VDC

For more information, email sales@nei.com or call (800) 977-1010.

RSC# 34758 @ www.compactpci-systems.com/rsc

Sun Microsystems, Inc.
4150 Network Circle • Santa Clara, CA 95054
1-800-555-9SUN
http://sun.com/atca

Sun Netra CT900 ATCA Blade Server

The Sun Netra CT900 Server is the industry's fastest, densest, most reliable AdvancedTCA server. Built on the AdvancedTCA standards, the Netra CT900 Server lets you mix and match up to 12 UltraSPARC and AMD Opteron and soon Intel processor-based blades, running the Solaris Operating System, Windows, or Carrier Grade Linux, in the same enclosure. With up to 30 percent greater compute density, compared to competing systems, and a design that's meant for 5-6 nines availability, the Netra CT900 Server is an integrated system and an ideal consolidation platform for the most demanding carrier-grade applications. And here are Sun's newest ATCA blade servers:

Sun Netra CP3260 ATCA Blade Server

The Sun Netra CP3260 ATCA blade server is powered by UltraSPARC T2, world's fastest microprocessor. This time we've doubled our processing threads from 32 to 64 and more than doubled system performance, without changing the power and cooling requirements. Its potential for radical consolidation is huge, from virtualization services to implementing multiple telco workloads on its unified network platform architecture. With support for 10 GbE operation, this blade has been designed for your largest throughput and highest performance demands. For more information about this blade server, check out http://sun.com/netra/cp3260.

Sun Netra CP3220 ATCA Blade Server

If you want to boost the density of your data center to take full advantage of next-gen applications, the Sun Netra CP3220 ATCA blade server is a great way to start. It lets you choose Dual-Core or Quad-Core AMD Opteron processing in a single-socket design, backed by 32 GB of memory and 10 Gigabit Ethernet (10 GbE). For more information about this blade server, check out http://sun.com/netra/cp3220.

FEATURES

- High-density 12U, 14-slot design
- Mix and match Sun Netra CP3260, CP3220, CP3060, and CP3020 ATCA blades
- Run Solaris OS, Linux, and Windows side by side
- Dual redundant hot-swap Gigabit Ethernet switches, shelf managers, power, and fan modules
- Support for AdvancedRTMs, carrier-grade expansion cards for simplified rear access connectivity
- Sun Netra CP3260 ATCA blade with six- or eight-core UltraSPARC T2 processors with eight threads per core
- Extreme compute density per shelf and rack within an eco-friendly footprint
- Sun Netra CP3220 ATCA blade with single-socket, dual-core, four-core-ready AMD Opteron processor
- 10 GbE for breakthrough performance, lowered TCO, and investment protection for growing core networks
- Machine virtualization drives radical consolidation

Carlo Gavazzi Computing Solutions

10 Mupac Drive • Brockton, MA 02301
508-588-6110
www.cg-cs.com

633 Series

Carlo Gavazzi Computing Solutions 633 Series of 13U AdvancedTCA Systems meets the high-reliability, robust power requirements, thermal management demands, and NEBS needs of the Telecommunications, Enterprise, and Datacom marketplace.

The 633 Series of 13U AdvancedTCA systems is designed to the PICMG 3.0 AdvancedTCA specification. They support up to 14 slots at 30 mm pitch front and rear with either a Dual Star or Full Mesh backplane topology.

FEATURES

- 22.75" (13U) H x 17.2" W x 17.7" D
- Available with a 14-slot Dual Star or Full Mesh backplane
- Front removable push-pull intelligent cooling system that provides redundant cooling for 220 W front side
- Dual Shelf Management Modules
- 14-slot, 8U x 280 mm, 6HP (30 mm) sub rack and 14-slot, 8U x 100 mm, 6HP (30 mm) rear transition rack
- Dual redundant 48 V input intelligent power entry modules

For more information, contact: pr@cg-cs.com

RSC# 33709 @ www.compactpci-systems.com/rsc

Simclar

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www.simclar.com

TurboFabric ATCA

Simclar's 40 GigE enabled TurboFabric ATCA Platforms provide the ultimate in scalable AdvancedTCA performance. TurboFabric Chassis offer enhanced bandwidth Full-Mesh or Dual Star Backplane options delivering unprecedented switching capacity in an AdvancedTCA form factor system. Deployed today with 10 GigE cards, TurboFabric Chassis can be field-upgraded to 40 GigE performance, eliminating need for forklift upgrades and maximizing ROI for service providers.

Bandwidth scalablity is supported by a highly scalable thermal management system featuring entry-level 'Push-Only' performance providing CP-TA Class B4 cooling. Additional 'Pull' System fans trays can be field-retrofitted to create a 'Push-Pull' System providing cooling capacity beyond CP-TA Class B4 up to 50 CFM per slot.

FEATURES

- 13U,14 slot AdvancedTCA Chassis Architecture featuring highly scalable backplane and thermal management features
- 40 GigE enabled, IEEE 802.3ap 10GBASE-KR compliant Full-Mesh and Dual Star backplane options
- Entry-Level Push-Only thermal management system provides CP-TA Class B4 performance up to 50 CFM per slot
- Optional Upper Fan Tray enables upgrade to a 'Push-Pull' thermal system with performance beyond CP-TA B4
- Interlocking design enables up to 3 TurboFabric shelves to be stacked in a standard Telco Rack
- Radially configured dual redundant shelf controllers based on Pigeon Point ShMM enable Multi-Zone Fan Control

For more information, contact: atca@simclar.com

RSC# 34702 @ www.compactpci-systems.com/rsc

Sun Microsystems, Inc.
4150 Network Circle • Santa Clara, CA 95054
1-800-555-9SUN
http://sun.com/wimax

Sun Unified Network Platform (SUN-P) Architecture for the WiMAX ASN Gateway

The buildout of today's 4G networks such as WiMAX requires a dramatic increase in computational resources to adequately deliver flexible telecommunications services to mobile subscribers. Yet business conditions also necessitate that new markets are approached incrementally. The challenge for telecom carriers is to reduce the cost of serving the first subscriber in small or cost-sensitive markets. The Sun Unified Network Platform (SUN-P) Architecture for the WiMAX ASN Gateway offers a radically consolidated, scalable core network architecture based on a new generation of multicore/multithreaded processors. It provides a new approach to building the core network infrastructure, enabling telecom carriers to significantly reduce the cost to serve the first subscriber while providing massive scalability for network expansion. Telecom carriers can benefit from greater business flexibility as well as increased return on investment.

Customer Benefits

- Breakthrough economics based on virtualization technologies and Chip Multi-Threading (CMT) using next-generation UltraSPARC® T2 processors.
- Dramatic reduction in the cost to serve the first subscriber by consolidating both the Control Plane and Data Plane functions onto a single Sun Netra carrier grade rack or AdvancedTCA blade server. Check out the Sun WiMAX ROI tool here: http://sun.com/wimax
- Faster time to market due to greatly simplified application development in an open architecture with standardized interfaces and COTS solutions.
- Massive scalability by simply adding more processor threads or servers to increase throughput to levels that can exceed the capacity of proprietary-based solutions.

Sun and Partner WiMAX Offerings

- Based on the UltraSPARC T2-powered Sun Netra CP3260 ATCA blade server which runs on the Sun Netra CT900
- Sun Netra Data Plane Suite offers a complete carrier-grade packet processing solution
- ASNLite Gateway solution from Aricent delivers broad functionality for Control and Data Plane requirements
- SelfReliant Advanced Suite from GoAhead for managing application availability
- Carrier-grade policy management solutions for mixed-network deployment from Bridgewater Systems
- Web NMS carrier-grade network management solution from AdventNet

For more information check out http://www.sun.com/servers/netra/wimax/offerings.jsp

SANBlaze Technology

2 Clock Tower Place, Suite 550 • Maynard, MA 01754
978-897-1888
www.sanblaze.com

SB-ATCA1000

The SANBlaze SB-ATCA1000 is an AdvancedTCA carrier blade specifically engineered to provide multi-protocol IP storage services within an AdvancedTCA chassis, including iSCSI and NAS protocols (NFS and CIFS). Key hardware attributes of the ATCA1000 include redundant 10 Gigabit Ethernet Zone-2 fabric connections, redundant 1 Gigabit Ethernet Zone-2 base connections, four AMC slots, and compatibility with existing SANBlaze AMC disks modules and advanced RTM (Rear Transition Modules). The highly versatile board also features on board SAS with RAID1/0 and hot-plug support for SAS, SATA or SSD disks delivered in AMC.3 modules. Other storage features include hot sparing, LUN zoning, volume splitting, and I/O expansion capability to SANs and JBOD using AMC SAS and FC controllers.

FEATURES

- AdvancedTCA Storage Blade
- 4 mid-height AMC slots
- iSCSI and NAS (NFS, CIFS) support
- 10G and 1G Fabric connections
- Hardware RAID 0,1,1E
- Full line of AMC storage modules and controllers

For more information, contact: info@sanblaze.com

RSC# 34457 @ www.compactpci-systems.com/rsc

Hendon Semiconductors

1 Butler Drive • Hendon, SA 5014 Australia
+61 8 8348 5200
www.bus-buffer.com

PC Bus Buffers

The Hendon Semiconductors IES5501 and IES5502 bus buffers are compatible for extending I²C and other similar 2-wire bus systems where optimum performance is required. They feature very low input to output offset voltages, allowing buffer cascading and increasing system reliability.

The IES5501 and IES5502 significantly increase system noise margins on the Intelligent Platform Management Bus (IPMB) and are excellent for implementing cost-effective IPMB architectures. The hot insert feature of the IES5502 makes them ideal for use on Intelligent Platform Management Controller (IPMC) boards.

The buffers' wide allowable voltage range expands their potential in AdvancedTCA and CompactPCI power management systems, backplane management systems, and for bus voltage level translation.

FEATURES

- Fully I²C compliant and supports a wide range of 2-wire bus standards
- Very low input to output offset voltages allow multiple buffers in cascade or "daisy chain" configuration
- IES5502 has hot insert and 1 V pre-charge functionality
- Plugs into live backplanes
- Level shifting between bus voltages (1.8 V to 15 V)
- Superior response times

For more information, contact: hendon.info@ies-sa.com.au

RSC# 32828 @ www.compactpci-systems.com/rsc

Asis

11067 Caminito Arcada • San Diego, CA 92131
858-880-3967
www.asis-pro.com

6-Slot ATCA

The Perform Series 6-slot ATCA shelf was especially designed for the most demanding applications, where superior performance, availability and reliability justify the investment on a best-in-every-category solution.

Every aspect of the Perform Series 6-slot Push-Pull has been developed to surpass current solutions found in the market.

FEATURES

- More than **300 W** per slot using **push-pull** cooling;
- **Two 38 mm** fan trays containing 8 high-performance fans each
- **Multiple shelf management options**: Fully featured slim, high performance based on Pigeon Point™ 500 ShMM; Basic shelf manager: Asis' proprietary ShMM, limited features; Fan control board - mainly control the fans' speed based on temperature sensors measurement
- Optional **unique switch/shelf** manager combo board integrated into the shelf manager space to free hub slots for additional application blades
- **AC/DC configuration** for maximum flexibility: AC feature Asis' **three** proprietary redundant and hot swappable power Supplies of 1500 W each; DC features redundant and hot swappable 48 VDC PEM

For more information, contact: sales@asis-pro.com

RSC# 35332 @ www.compactpci-systems.com/rsc

Systems CompactPCI and AdvancedTCA Systems Resource Guide 2008

Comtel Electronics GmbH

Espace de l'Europe 18 • Neuchâtel, 2000 Switzerland
+41 (0) 3272 46300 • Fax +41 (0) 32724 0687
www.comtel-online.com

Comtel CO2-3U System

Comtel CO2-3U – 2-Slot 3U AC/DC Version

Comtel Electronics offers an AdvancedTCA® 3U, 2-slot horizontal Central Office shelf. The CO2-3U is available in 19" rack- mounted or desktop versions. It features redundant ShMC, redundant 48 VDC PEM, or redundant Quad 850 W AC/DC power supply and redundant cooling.

Benefits

RTM cooling more than 30 W per slot • High performance backplane that exceeds AdvancedTCA specification • Highly efficient packaging with a full 275 W per slot cooling, in horizontal 3U form factor

Contact Dov Cohen for customized applications to meet your system needs. **Sales@comtel-online.ch**

FEATURES

- 19" rack mounted 3U system; AC/DC economy; AdvancedTCA® version 2-slot horizontal front boards and RTM
- 2-slot high performance backplane; 6.25 Gbps with full mesh fabric connections; redundant system control
- Redundant – 48 VDC PEM and EMC filtered power feeds or quad redundant 850 W AC power supply
- Controllers available in three versions
- Push-pull cooling; hot-swap redundant fan trays
- High reliability bussed IPMI; fully PICMG 3.0 Rev 2.0 compatible; designed for compliance to NEBS and EN levels

For more information, contact: sales@comtel-online.ch

RSC# 36004 @ www.compactpci-systems.com/rsc

Comtel Electronics GmbH

Espace de l'Europe 18 • Neuchâtel, 2000 Switzerland
+41 (0) 3272 46300 Fax +41 (0) 3272 40687
www.comtel-online.com

CO14 Rackmount 13U

Comtel AdvancedTCA® CO14 – 13U, 14-slot Central Office Shelf
Comtel Electronics offers 19" rack-mount 13U system, Dual Star and Full Mesh backplane topologies. Designed for compliance to NEBS and EN levels.

Benefits

- Power distribution 300 W per slot
- RTM cooling up to 30 W per slot
- Highly efficient packaging with up to 300 W per slot cooling, in an abbreviated 13U form factor
- High-performance backplane that exceeds AdvancedTCA specification
- Predictive failure analysis reduces cost of ownership
- Quiet fans under no-failure conditions
- Industry standard SAF HPI through Shelf Manager

Contact Dov Cohen for customized applications to meet your system needs. **Sales@comtel-online.ch**

FEATURES

- 19" rack-mount 13U system 14-slot 8U front boards and RTM. Full Mesh and dual star topologies available
- 14-slot high performance backplane; 10 Gbps-Redundant ShMC Controller; 2 ShMC available, PPS and Motorola
- Dual -48 VDC PEM and EMC filtered power feeds; 300 W p/slot push-pull cooling with hot-swap redundant fan tray
- RTM cooling; high reliability bussed IPMI; SAF HPI compliant Shelf Manager
- Fully PICMG 3.0 Rev 2.0 compatible; designed for compliance to NEBS and EN levels

For more information, contact: sales@comtel-online.ch

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Resource Guide 2008 CompactPCI and AdvancedTCA Systems Systems

Kontron

14118 Stowe Drive • Poway, CA 92064-7147
1-800-526-ATCA
www.kontron.com

ATCA Platforms

Kontron prevalidates, pretests and, of course, provides what's needed for flexible integration of Kontron and third-party AdvancedTCA/AMC hardware. We offer GbE and 10 GbE AdvancedTCA and AMC platform elements, plus integration services that includes third-party hardware and carrier-grade OS and HA middleware solutions.

Available AdvancedTCA Integrated 'Ready-to-Go' Platforms OM9140 – AdvancedTCA 14-slot, 13U Integrated Platform: Ideal for exceptional transaction processing performance with low latency and High Availability (HA) in a redundant N+1 configuration.

OM9020 – AdvancedTCA 2-slot, 2U Integrated 10 GbE Platform: Solves the price vs. performance concerns of TEMs who need to design non-redundant systems for edge and access applications used in data center, regional CO, and enterprise networks.

FEATURES

- Faster time-to-market; development cost savings; reduced inventory costs; faster upgrades to new technology
- Achieve shorter lead times for build-to-order systems; global service and maintenance
- Designed for NEBS compliance; GbE and 10 GbE options; customization with multiple AMCs
- Ideal applications: transcoding/encoding processing with high performance, low latency and HA
- Call servers, media gateway; controllers, IMS-SCSF, HLR/HSS; OSS and BSS; Digital Rights Management (DRM)

For more information, contact: sales@us.kontron.com

RSC# 36013 @ www.compactpci-systems.com/rsc

Continuous Computing
9450 Carroll Park Drive • San Diego, CA 92121
858-882-8800
www.ccpu.com

Continuous Computing
Create | Deploy | Converge

FlexTCA Systems

- 10 GbE AdvancedTCA System for telecom applications
- Fully integrated with Trillium System Software

Continuous Computing's FlexTCA™ Systems provide a fully integrated solution to meet new service and capacity requirements for applications such as DPI, Security, IPTV, IMS, and more. FlexTCA is a unique solution as it provides full integration between fault-tolerant Trillium® protocol stacks, SAF-compliant HA middleware, platform management services, and a range of AdvancedTCA blades and chassis options. This unprecedented level of integration has the potential to reduce development time by as much as 24 months while enabling significantly lower development costs.

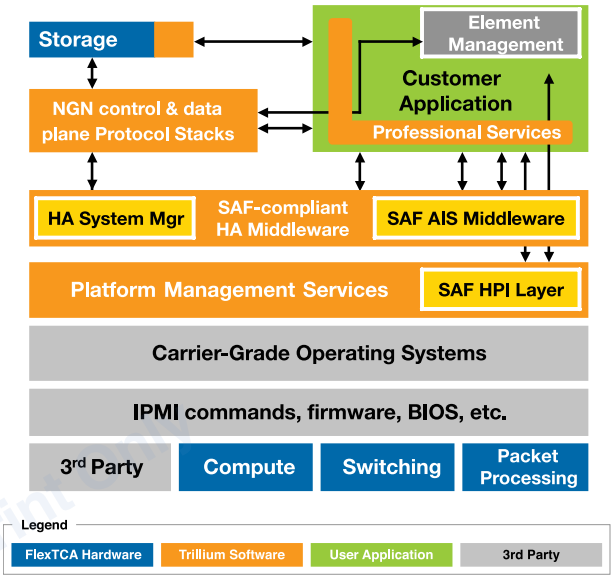
FlexTCA is designed for 99.999 percent availability and comes in a number of form factors to meet specific network capacities. It includes both general purpose x86 compute blades and specialized packet processing blades for DPI and security functions. The system is interconnected using dual star redundant 10 GbE switches with pre-integrated switch and link failover software.

Continuous Computing's Unified Management Interface (UMI) and remote Element Management System (EMS) provide the user with an entire view of the system including alarms, statistics, and events. This interface allows the user to manage their application as well as the hardware and software portions of the system.

The FlexTCA fully integrated system dramatically lowers development and deployment costs. Pre-integrated, off-the-shelf platforms avoid the extra cost, time, and resources associated with standard system integration and enable the customer's resource and development budgets to be focused on valued-added services.

Target Applications

- Deep Packet Inspection
- Security
- IPTV Edge Platforms
- Session Border Controllers and IMS Border Gateways
- IDS/IPS and Denial-of-Service (including DDOS)
- IMS CSCF, HSS, and Softswitch
- 3G/4G Wireless Access Gateways



FEATURES

- Fully integrated and regulatory compliance-tested (EMC, thermals, and safety)
- SAF-compliant HA middleware
- Unified Management Interface to hardware and protocol software
- Integrated HA telecom protocol stacks (such as Trillium SIP)
- System-wide diagnostics and remote management
- Scalable, flexible, and cost-effective solution

Emerson Network Power
2900 South Diablo Way, Suite 190 • Tempe, AZ 85282
1-800-759-1107 or 1-602-438-5720
emersonnetworkpower.com/embeddedcomputing

EMERSON Network Power

Centellis 2000

The Centellis™ 2000 AdvancedTCA® platform integrates chassis, cooling, power distribution, and shelf management into an off-the-shelf platform solution on which you can add your service-related hardware and software. The small form factor chassis enables reuse of existing AdcancedTCA® hardware and software providing a significant reduction in development cost and reducing time-to-market for new systems.

With an architecture designed for 5 NINES availability, the Centellis 2000 enables scalable reliability through the use of either independent or redundant functions throughout the chassis. All electronic modules, blades, and cards are field replaceable units. The platform minimizes both planned and unplanned downtime and provides continuous service during fault recovery In addition to redundancy of all active system components; the Centellis 2000 supports high availability through hot-swappable key system components.

Designed to meet NEBS requirements, the system features front-to-rear cooling and is designed to meet the stringent Communications Platform Trade Association (CP-TA) B.4 thermal profile. This profile enables any combination of AdvancedTCA blades and rear transition modules within the AdvancedTCA specification limits.

Supporting both central office and data center requirements, the system is capable of accepting either DC or AC power. Power modules can be installed singularly for the most cost-effective implementation or with redundancy, offering the highest level of system reliability and network up-time.

The Centellis 2000 is ideal for data-intensive central office and enterprise networking applications. The low profile makes the Centellis 2000 the optimal candidate for distributed networking functions, low density subscriber areas, or specialized applications. Target applications include distributed control plane functions, IMS/IPTV subsystems, 4G wireless applications, and edge networking and routing. With a 10G data path between blades and to user slots, full 10 GbE deep packet inspection appliances can be created, especially when combined with many-core processing blades.

FEATURES

- 3U, 19" chassis with two horizontal blade slots
- Front-to-rear cooling
- Fault-resilient design; front maintenance and rear cabling
- Integrated shelf management for inventory data, remote upgrade, electronic keying, thermal management, and network based remote access
- Built-in GbE switches for non-blocking base channel switching
- AC and DC power versions available
- Fabric channel connects the two blades directly
- Additional user slots for OEM customization
- 5 NINES availability in central office environments

Mercury Computer Systems, Inc.
199 Riverneck Road • Chelmsford, MA 01824
866-627-6951
www.mc.com

Ensemble™ AdvancedTCA® Application Platform

The Ensemble™ AdvancedTCA® Application Platform is a standards-based solution built around the power, functionality, and scalability of Serial RapidIO®, AdvancedMC® (AMC), and AdvancedTCA®. By supporting a variety of I/O sources and heterogeneous processing endpoints, the plaform thereby reduces integration costs, improves efficiency, and minimizes risks in design of next-generation applications.

With a large range of chassis and AMCs, Ensemble systems have enormous flexibility to offer exactly the right high-performance system for your density, processing power, and I/O requirements. Our AdvancedTCA solutions range from individual AMCs to systems with 100 FPGAs in a 14-slot chassis. The Ensemble family is a complete AdvancedTCA product line: chassis, carrier blades, switch blades, multiprocessor software, and the widest range of processor AMCs available.

Ensemble systems are deployed across multiple industries to address the toughest applications, such as sophisticated adaptive beamforming for satellite communications, test equipment with multiple processing elements, telecom trials/demo platforms, long-range radar systems, and high-bandwidth low-latency wireless test beds.

FEATURES

- Completely integrated 10 Gbps AdvancedTCA system solution
- Modular configurations based on AMC form factor
- Scalable with 2-, 5- and 14- or 16-slot configurations
- Supports hot-swappable AMC modules
- Serial RapidIO AdvancedTCA application development and deployment
- Fully integrated systems reduce development costs
- Flexible modular configurations based on AMC form factor
- Production ready, fast time-to-market

Schroff
5500 Wayzata Boulevard • Golden Valley, MN 55416
763-656-5351
www.schroff.us

ATCA Systems

Schroff AdvancedTCA System solutions integrate key technologies – power entry, thermal management, high-speed backplane design, and shelf management – to provide today's system integrators with leading edge solutions for the communications market. High performance thermal solutions handle the 200+ W per slot required for the newest generation of blades for chassis from 2 to 16 slots. With data speeds pushing 10 Gbps on the high speed fabric interface – backplane design is a critical element of an AdvancedTCA system. Schroff provides a range of topologies from dual star to triple replicated mesh – featuring leading edge techniques such as backdrilling and quad routing. Shelf Management is the control and management infrastructure for high availability AdvancedTCA systems. Leveraging Pigeon Point technology, Schroff has developed a cost effective management infrastructure in our chassis that combines I2C for managing FRUs, with IPMC for Blade interface. In addition we offer both bused and radial IPMB topology options standard in the family of Schroff AdvancedTCA system solutions. A common shelf manager carrier is interchangeable in all Schroff AdvancedTCA product platforms.

Available products include:
2-slot 15X replicated Mesh AC and DC systems for enterprise and development applications.

5/6-slot AC and DC systems with Triple Replicated Mesh Backplanes for both carrier grade telecom and enterprise requirements; features include optional shelf management and shelf alarm panel.

14/16-slot 12U and 13U Dual Star and Full Mesh DC Systems; available in both radial or bused IPMB – these systems are "NEBS" ready solutions targeted at the Telecom market. A 14-slot AC version is available for enterprise applications.

FEATURES

- Broadest range of 2- to 16- slot AdvancedTCA systems
- AC and DC options for both NEBS Telco and cost sensitive Enterprise requirements
- Backplane topology options including Dual Star, Full Mesh, and Triple Replicated Mesh with Bused or Radial IPMB
- Proven high performance thermal solutions for 200 watts per slot and beyond
- Schroff Shelf Management Architecture based on Pigeon Point ShMM-500 technology
- Full range of accessory products including air baffles, front panels, test boards, cabinets
- Engineered custom configurations to meet your exact requirements

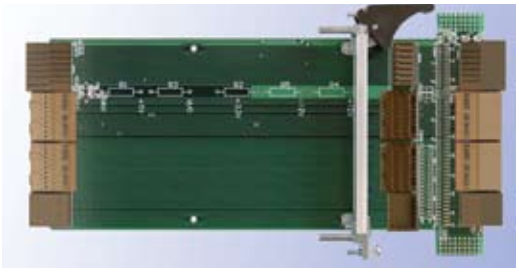
AZ-Com, Inc.

3343 Vincent Road, Suite D • Pleasant Hill, CA 94523
925-947-1000
www.az-com.com

CompactPCIe Protodev

CompactPCI Express extender and development board. The CompactPCIe board is designed to aid development test and debugging of CompactPCI cards and systems. It allows access to the both sides of the DUT for monitoring and probing. An optional R/A connector enables plugging probes directly under DUT. Power load option allows power consumption of up to PICMG EXP.0 R1.0 specified limits. Monitoring option allows remote monitoring of all three voltages, currents and temperatures via RJ-45 connector. Prototyping contains 0.1" and 2 mm hole patterns.

For other related products and custom configurations please visit www.az-com.com or call sales at 925-947-1000.



FEATURES

- PICMG EXP.0 R1.0 compliant
- Matched impedance for minimum signal distortion
- Available for System, Type1, Hybrid,and Switch slots
- Load settings - 12 V -> 15 A max, 3.3 V -> 7.8 A max, 5 V -> 7.8 A max, 5 -> Vaux 1 A
- 3U and 6U versions available

For more information, contact: sales@az-com.com

RSC# 35855 @ www.compactpci-systems.com/rsc

Boards CompactPCI and AdvancedTCA Systems Resource Guide 2008

Eurotech Group

via F.lli Solari 3/a • Amaro - UD, 33020 Italy
+39-0433-485411
www.eurotech.com

A6EXP8021

The A6EXP8021 is a high-performance CPU board which rapidly supports the CompactPCI Express standard. It comes equipped with an Intel®Core™Duo L2400 (1.66 GHz) or Intel®Core2™Duo L7400/T7400 processor (1.5 GHz).

Memory boasts higher reliability due to the SEC/DED/x4 SDDC features of the E7520 server chipset, and PC2-3200 DIMM can be installed using dual channel architecture.

CompactPCI Express can be used for 4 x4 or 2 x8 lanes, and is compatible with various backplanes.

In addition, standard interfaces, such as GbE, Serial ATA, and USB 2.0, are installed, making it very user friendly

FEATURES

- CompactPCI Express-compatible RoHS advanced system board, 6U, 2-slot width
- Equipped with Intel®Core™Duo L2400 or Intel®Core2™Duo L7400/T7400; L1 cache: 32KB/32KB, L2 cache 2MB/4MB
- Main memory: 2 DDR2 DIMM sockets (dual channel). Supports PC2-3200 Registered DIMM, max 4 GB
- Equipped with GbE (2 ports), Serial ATA (2 ports) and USB2.0 (4 ports)
- Equipped with GbE (2 ports), Serial ATA (2 ports), USB2.0 (4 ports), and USB2.0 (4 port)
- Equipped with passive heatsink, fanless; on-board Compact Flash available

For more information, contact: cpci@eurotech.com

RSC# 35854 @ www.compactpci-systems.com/rsc

Dynatem, Inc
23263 Madero, Suite C • Mission Viejo, CA 92691
949-855-3235
www.dynatem.com

EPD

The EPD is a 6U single-slot CompactPCI Express platform based on the Intel® low-power Core-Duo (Yonah) processor. Future versions will also support the 1.5 GHz L7400 Core2 Duo processor.

The EPD also provides full support for PICMG 2.16. Backplane PCI Express bus connections via ADF connectors XJ2 and XJ3, support either two x8 connections in two-link configuration or four x4 connections in four-link configuration. One blue LED in front panel with "Hot Swap" support.

The Intel E7520 chipset acts as the central hub for all data passing between the core system elements including processor, memory, PCI Express I/O, and legacy I/O subsystems. The EPD routes x20 PCI Express to the backplane.

Two PMC sites are provided with 64-bit/66 MHz PCI-X routed to both sites. One of the two PMC sites also supports XMC modules with x4 PCI Express. Both sites have rear I/O accessibility.

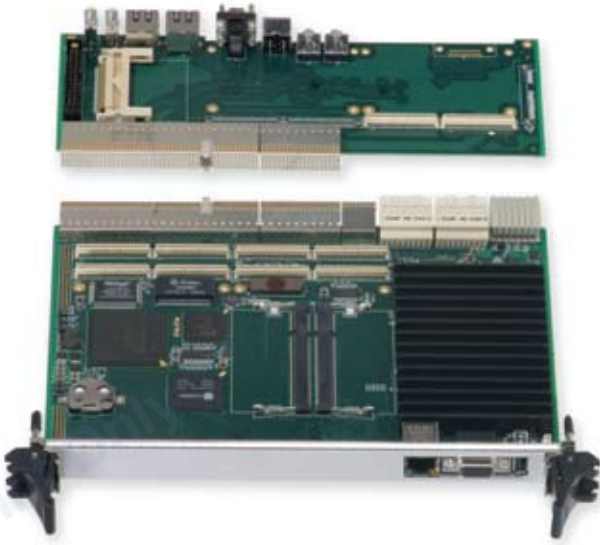
Two SO-CDIMM sockets support a total of 1, 2, or 4 GB if ECC DDR-2 533 MHz memory. Retention clips provide some vibration immunity.

A Silicon Motion SM 712 ultra low-power display controller with 4 MB on-chip memory is provided. One HD-DB15 VGA connector is located on the front panel. Higher resolution graphic solutions are made possible via the PCI Express compatible XMC site.

One RJ-45 connector on the front panel provides 10/100/1000 Ethernet from the on-board Intel 82541EB. Two additional on-board 10/100/1000 Ethernet using Intel's 82546 GB PCI-X with support for either two ports routed to the PICMG 2.16 compatible pins on the backplane or to the rear transition module.

Additional I/O includes two USB 2.0 ports, three COM ports, two SATA, two IDE, floppy, and printer interface.

The XPDRTM optional 6U x 80 mm CompactPCI Express rear I/O transition module is also available with form factor per PICMG EXP.0 specification with connectors RXJ4, RJ3, RJ4, and RJ5 loaded. It includes interfaces for 2x USB, 2x Ethernet, PMC interface module interface headers, interface for SATA hard drive, CompactFlash, audio interface header, parallel port connector, two serial connectors, and standard floppy connector.



FEATURES

- 6U CompactPCI Express form factor per PICMG EXP.0 system slot specification
- PICMG 2.16 compatible
- Pentium Core-Duo Processor @ 1.66 GHz
- Supports two PMC sites, one of which optionally supports XMC modules
- E7520 chipset for PCIe support and high memory bandwidth
- Single-slot, 4HP design with option for additional 1-slot storage module
- Full support for Windows XP, Linux, VxWorks, LynxOS

Hartmann Elektronik GmbH
Motorstra. 43 • Stuttgart, D-70499 Germany
49-711-13989-0
www.hartmann-elektronik.de

cPCI-Express Backplane

The new cPCI-Express Backplane from Hartmann Elektronik has two bridges: (1) CompactPCI to CompactPCI Express, (2) CompactPCI Express to CompactPCI, making our cPCI-Express Backplane a hybrid board. CompactPCI CPUs are able to communicate with CompactPCI Express boards and also the other way round.

Hartmann Elektronik developed this cPCI-Express Backplane as an Evaluation Platform, for testing new boards and complete systems. Hartmann Elektronik will widen the product range for CompactPCI and PCI Express backplanes and bridge-boards. The target is to offer the customer all required bridge-boards to connect laptops, personal computers, and industrial computers to each other by an Express-Connection.

This is the new product range of one of the leading backplane producers.

HARTMANN ELEKTRONIK
A Phoenix Mecano Company

FEATURES

- LEFT: CompactPCI system slot and two CompactPCI legacy slots
- RIGHT: CompactPCI Express system slot + switch slot + hybrid slot + Type 1 slot + three Type 2 slots
- MIDDLE: CompactPCI Express hybrid slot + CompactPCI Express Type 2 slot + CompactPCI legacy slot
- BRIDGES: CompactPCI Express and CompactPCI world are connected together by two bridges
- Power input by screw connection (20 A/screw) and by ATX connector (6 A/pin). 1 V/76A 5 V/50 A 3.3 V/64 A GND/192 A
- According to PICMG EXP.0 R1.0; CompactPCI 32-bit without rear I/O; Also available as complete system platform

For more information, contact: info@hartmann-elektronik.de

RSC# 32155 @ www.compactpci-systems.com/rsc

IDEA

BIG IDEAS DESERVE PERSPECTIVE.

A LARGER PAGE.

COLLABORATE WITH RADISYS

Big ideas call for a collaborative partner like RadiSys®. As a team, we combine your ideas with innovative technologies and engineering expertise, giving you the edge to bring your idea into reality.

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Your focus will be on developing products that make you stand out. Our focus will be on helping you get there faster.

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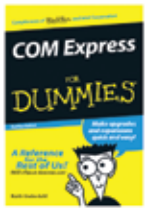

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www.radisys.com/com-express

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www.kontron.com

Kontron ETXexpress - a COM Express Solution

Truly scaleable embedded solutions, Kontron ETXexpress Computer-On-Modules are 100 percent COM Express solutions. Kontron ETXexpress modules are built around advanced processors and chipsets from various suppliers including Intel® up to the 2 GHz Intel® Core™ 2 Duo T7500 processor – ETXexpress-MC. Computer-On-Modules, such as the Kontron ETXexpress-WPM, offer the integrated features of the Intel 3100 Express chipset and are ideal for use in communications applications. Kontron ETXexpress modules also offer advantages for ultra mobile applications with available solutions in the form of microETXexpress modules and the upcoming nanoETXexpress modules. For additional information on all of the Kontron ETXexpress COM Express solutions, visit www.kontron.com/ETXexpress.

FEATURES

- 100 percent COM Express compliant
- Processing performance up to 2 GHz Intel® Core™ 2 Duo processors
- Low power VIA and AMD CPU based modules also available
- Up to 4 MB system memory on ETXexpress COMs with dual channel memory support
- ETXexpress, microETXexpress, nanoETXexpress – Size options all following the COM Express standard pin-outs
- Request a sample today and start evaluating immediately

For more information, contact: info@us.kontron.com

RSC# 35717 @ www.compactpci-systems.com/rsc

Resource Guide 2008 CompactPCI and AdvancedTCA Systems Boards

PDSi Pinnacle Data Systems, Inc.

6600 Port Road, Suite 100 • Groveport, OH 43125
614-748-1150 fax 614-409-1269
www.pinnacle.com/products2/comexpress/module/

COMX-S1 COM Express

PDSi's new AMD Socket S1 COM Express Module (COMX-S1) is a low cost, compact, embeddable computing core with the capability to drive a broad range of OEM applications especially where video output is required. Several performance levels are available, from the ultra low-watt AMD Sempron™ processors (ideal for fanless applications) to the dual-core muscle of AMD Turion™ X2 Mobile Technology. The AMD M690 series chipset delivers exceptional built-in graphics. COMX-S1 significantly reduces initial platform design time while enabling convenient serviceability and future upgradeability – just unplug and update the COM Module and leave your application-specific I/O carrier in place. Bring increased flexibility and modularity to your applications. For a customized application to your systems, please contact rob.ellis@pinnacle.com

FEATURES

- Supports AMD Socket S1 family including AMD Sempron and AMD Turion X2 Dual-core mobile technology
- Perfect for embedded OEM applications requiring future upgradeability. Extended availability assured
- AMD M690 Series Chipset for flexible multi-output video including dual LVDS, analog VGA, optional TV Out
- PICMG Type 2 compatible: 4 PCIe, 8 USB, 4 SATA II, 1 Ethernet port
- MicroATX Carrier Board and packaged Development Systems available for rapid startup
- Up to 2 GB DDR2 667 SDRAM (1 – 200 pin SODIMM socket)

For more information, contact: rob.ellis@pinnacle.com

RSC# 35178 @ www.compactpci-systems.com/rsc

Annapolis Micro Systems
190 Admiral Cochrane Drive #130 • Annapolis, MD 21401
410-841-2514
www.annapmicro.com

Four Channel Clock Synchronization Board

The Four Channel Clock Distribution Board distributes a common clock and synchronized control signal triggers to multiple cards in the system. This 6U VME64X/VXS board provides four high speed, ultra low jitter, ultra-low skew differential bulkhead mounted clock outputs, two ultra-low skew differential vertical SMA on-board clock outputs, and four ultra-low skew and clock synchronized singled ended bulkhead mounted control signal triggers.

A jumper set at board installation time or via optional P2 Serial Port determines which one of the 2 installed clock sources is active. Manufacturing options for Clock Source 0 are Single Ended or Differential External Clock, a PLL ranging from 700 MHz – 3 GHz with an On-Board Reference Oscillator, or a PLL ranging from 700 MHz – 3 GHz with a 10 MHz External Reference. Manufacturing options for Clock Source 1 are a PLL ranging from 700 MHz – 3 GHz with an On-Board Reference Oscillator, a PLL ranging from 700 MHz – 3 GHz with a 10 MHz External Reference or an On-Board Low Frequency Oscillator ranging up to 800 MHz.

The four control trigger outputs can originate from a high precision external source via front panel SMA, from a manual pushbutton on the front panel, or from software via an optional Backplane P2 Connector Serial Port. These trigger outputs are synchronized to the distributed clock to provide precise output timing relationships.

Annapolis Micro Systems is a world leader in high-performance, COTS FPGA-based boards and processing for radar, sonar, SIGINT, ELINT, DSP, FFTs, communications, Software-Defined Radio, encryption, image processing, prototyping, text processing, and other processing intensive applications.

Annapolis is famous for the high quality of our products and for our unparalleled dedication to ensuring that the customer's applications succeed. We offer training and exceptional special application development support, as well as more conventional support.

FEATURES

- 4 Synchronized Differential Front Panel Clock Outputs up to 3 GHz with Typical Skew of 5 ps
- Ultra-low Clock Jitter and Phase Noise – 275fs with 1280 MHz PLL and external 10 MHz Reference
- On-board PLL's Manufacturing Options provide Fixed Frequencies of 700 MHz – 3 GHz, Locked to Internal or External Reference
- On-board Low Frequency Oscillator provides Fixed Frequencies up to approximately 800 MHz
- Four Synchronized Trigger Outputs, always Synchronized with the Output Clock, with Typical Skew of 5 ps
- Jumper Selectable Trigger Output Levels of 3.3V PECL, 2.5V PECL, or 1.65V PECL
- Source Trigger from Front Panel SMA, Pushbutton, or Optional P2 Serial Port
- Cascade boards to provide up to 16 sets of outputs
- Compatible with standard VME64X and VXS 6U backplanes
- Universal clock input supports wide range of signal options, including signal generator sine wave
- Differential clock input permits multiple standards including: LVDS, 3.3V PECL, 2.5V PECL, and 1.65V PECL
- Clock and Trigger Outputs Compatible with all Annapolis Micro Systems, Inc. Wildstar™ 2 PRO I/O Cards and Wildstar™ 4/5 Mezzanine Cards

Everyware™

A3pci7512

3U PowerPC G4 CompactPCI board

- Freescale MPC7447A PowerPC G4 Processor (1GHz)
- 32KB instruction/data L1 cache and 512KB on-chip L2 cache
- DDR2-400 SO-DIMM socket
- Tundra Tsi108 bridge
- Gigabit Ethernet (2 chs) and RS232C serial port (2 chs)
- miniSD memory card socket
- 512KB boot ROM (FLASH memory)
- Battery-powered backup of 32KB SRAM and real-time clock
- 256B serial EEPROM for storing booting information
- Powered by 5V or 3.3V supplied from the CompactPCI bus

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DIGITAL TECHNOLOGIES FOR A BETTER WORLD

VME cPCI PMC PC/104 EBX EPIC ComExpress

KineticSystems
900 North State Street • Lockport, IL 60441
815-838-0005
www.kscorp.com

cPCI ADC-CP266

The CP266 is a single-width, 6U, CompactPCI module with 32 or 64 16-bit analog output channels. These independent analog channels provide ±10 V full-scale outputs. The channel update rate is 2 ms, and each output is accurate to ±1 mV. The power-up state of the analog outputs can be set to independent user-defined values. Paired output signals are provided to eliminate ground offset effects. The analog outputs are available at a single 68-pin SCSI II shielded connector (32-channel option) or a pair of 68-pin SCSI II shielded connectors (64-channel option).

The CP266 comes with a Plug and Play driver for configuring and using the device and application examples to illustrate its basic functionality.

FEATURES

- 32 or 64 independent analog output channels with 16-bit resolution
- ±10 V full-scale output
- Low drift
- Single gain and offset adjustments
- 2-pole, Bessel output filter on each channel
- Power-on reset to zero volts

For more information, contact: mkt-info@kscorp.com

RSC# 21632 @ www.compactpci-systems.com/rsc

Analog I/O CompactPCI and AdvancedTCA Systems Resource Guide 2008

KineticSystems
900 North State Street • Lockport, IL 60441
815-838-0005
www.kscorp.com

cPCI Product-CP387

The CP387 is a single-width, 6U, CompactPCI module with up to 256 digital input/output channels. The CP387 base board supports 128 channels of TTL I/O. Four mezzanine card sites, which can be populated with an assortment of I/O options such as isolated input, isolated output, relay output, AC switch output, and differential I/O, to extend the capability of the CP387. The mezzanine card concept allows multiple digital I/O types to be configured within a single module to match the application requirements.

The module includes Pattern Recognition and Change Of State detection. Both operations can be used on the base card as well as span to the mezzanine channels. Input and output strobes are provided for connection to external sources.

FEATURES

- 256 digital Input/Output channels
- 128 base card channels
- 4 mezzanine card sites for added I/O capability such as TTL and Differential I/O, Isolated Input and Output, etc.
- Change Of State and Pattern Recognition
- Programmable contact-bounce suppression on inputs
- Input and Output strobes

For more information, contact: mkt-info@kscorp.com

RSC# 21633 @ www.compactpci-systems.com/rsc

KineticSystems
900 North State Street • Lockport, IL 60441
815-838-0005
www.kscorp.com

cPCI/PXI ADC-CP213

The CP213 6U CompactPCI/PXI 16-bit ADC provides up to 128 analog input channels and on-board signal conditioning with programmable gain. The core of a measurement system is its ADC, and selecting the right one is essential. While other vendor solutions require external signal conditioning modules, ours is built-in to provide higher performance at a better price – starting at $20/channel!

The CP213 has 2 channels that are configurable as isothermal reference channels for temperature measurements and 16 digital I/O channels that may be configured as digital I/O or attached to a frequency in, counter in, or timer out channel.

Typical applications of CP213 include temperature measurements, general-purpose data acquisition, and Automatic Test Equipment (ATE).

FEATURES

- 32, 64, or 128 channels of analog input with programmable gain per channel
- 16 multifunction digital I/O channels; can be attached to 2 frequency, 2 counter, and 2 timer channels
- 16-bit resolution
- Programmable scan rates of <1 S/s through 100 kS/s
- Optional 10 Hz to 1 kHz low pass filters
- Precision on-board reference for end-to-end calibration

For more information, contact: mkt-info@kscorp.com

RSC# 30671 @ www.compactpci-systems.com/rsc

Advantech Corporation
38 Tesla, Suite 100 • Irvine, CA 92618
800-557-6813
www.advantech.com/applied

Core™2 Duo Ruggedized 6U cPCI Board

The **MIC-3392MIL** board is based on Advantech's MIC-3392 6U CompactPCI® blade. This power-efficient CompactPCI SBC is based on Intel's low power Core™ Duo/Core™2 Duo LV/ULV processors with high MIPS-per-watt performance. It is specifically designed to meet the unique requirements of ruggedized applications in the defense industry, such as transportation. MIC-3392MIL uses PCIe technology to maximize I/O throughput and the board supports up to 3 GB of 667 MHz DDR2 RAM and an onboard Type I CompactFlash slot. In addition, it supports Rear Transition Board MIC-3392MIL-RIO for rear I/O connectivity. Its components and PCB mounting placements are designed for the implementation of either a conduction cooling plate or a standard heatsink targeted for forced convection environments.

Trusted ePlatform Services

FEATURES

- Supports board-mounted Intel® Core™ Duo LV processor L2400 or the 64-bit Core™2 Duo ULV processor U7500
- Intel® 945GME chipset supports 533/667 MHz FSB
- Up to 4 GB DDR2 533/667 memory with SODIMM expansion
- Comprehensive I/O capability, with two dual GbE through RIO, SATA HDD, CompactFlash, VGA port and two USB 2.0 ports
- PICMG 2.16, R1.0 Packet Switching Backplane Specification compliant
- PICMG 2.9, R1.0 IPMI Specification compliant

For more information, contact: CTinfo@advantech.com

RSC# 35982 @ www.compactpci-systems.com/rsc

Advantech Corporation

38 Tesla, Suite 100 • Irvine, CA 92618
800-557-6813
www.advantech.com/applied

Trusted ePlatform Services

ADVANTECH

Core™2 Duo 6U cPCI Board

MIC-3392 is a CompactPCI high performance, power-efficient SBC based on the Intel® Core™2 Duo processor. Two execution cores with intelligent power management features allow significantly greater performance per watt over previous Intel processors, with a 667 MHz FSB. The board uses PCIe technology to maximize I/O throughput, and supports up to 3 GB of 667 MHz DDR2 RAM (6.4 GBps throughput), an onboard 2.5" Serial ATA HDD, and a CompactFlash slot. The two front-accessible PCIe GbE ports provide a bi-directional bandwidth of 2 GBps. For further expansion options, MIC-3392 supports Rear Transition Boards and PCI Mezzanine Cards.

FEATURES

- Supports Intel® Core™2 Duo processor
- Intel® 945GM chipset supports 533/667 MHz FSB
- Up to 3 GB (DDR2 533/667) memory with SODIMM expansion
- Comprehensive I/O capability: Dual GbE, SATA, CompactFlash
- One 64-bit/66 MHz PMC expansion slot, and optional second 64-bit/66 MHz PMC expansion slot
- PICMG 2.16, IPMI 2.0, and NEBS ready

For more information, contact: CTinfo@advantech.com

RSC# 35984 @ www.compactpci-systems.com/rsc

Blades and SBCs CompactPCI and AdvancedTCA Systems Resource Guide 2008

Continuous Computing

9450 Carroll Park Drive • San Diego, CA 92121
858-882-8800
www.ccpu.com

Continuous Computing
Create | Deploy | Converge

FlexCompute™ cPCI-CD1215

The cPCI-CD1215 targets the application needs of next generation, IP-centric telecom equipment manufacturers by using Intel Core 2 Duo technology to improve price, performance, and power of CompactPCI applications. It features a single 1.5 GHz Intel Core 2 Duo processor, 2-way SMP, 4 MB shared L2 cache, Intel 64 architecture and 667 MHz Front Side Bus (FSB) for 5.33 Gbps peak bandwidth.

FEATURES

- Up to 4 GB of DDR2-400 (PC2-3200) SDRAM, with ECC protection
- 64-bit 66-MHz PMC site with support for rear I/O module (PIM) on RTM
- Universal-mode 64-bit 66 MHz CompactPCI bus support
- Design accommodates PMC, memory module, and HDD simultaneously
- Onboard Ethernet switch supports PICMG 2.16 Ethernet ports, dual ports in to the CPU complex
- PICMG 2.9 support for remote inventory, monitoring, and control over IPMI

For more information, contact: sales@ccpu.com

RSC# 32084 @ www.compactpci-systems.com/rsc

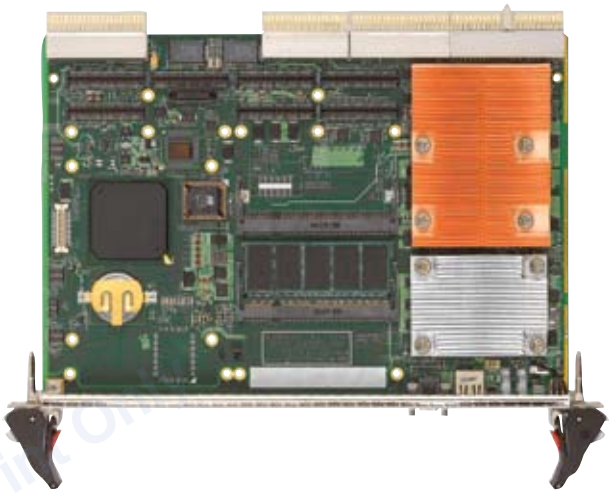
Emerson Network Power
2900 South Diablo Way, Suite 190 • Tempe, AZ 85282
1-800-759-1107 or 1-602-438-5720
www.emersonnetworkpower.com/embeddedcomputing

CPCI7200 Board

The Emerson Network Power CPCI7200 Single Board Computer (SBC) uses the Intel® Core™2 Duo processor and E7520 + 6300ESB chipset. The single-slot configuration is ideal for thermally constrained environments and includes dual GbE interfaces and dual channel 3.2 GBps high speed, double data rate DDR2, for a combined maximum bandwidth of 6.4 GBps.

The CPCI7200 is a low-power, high-performance SBC that offers full hot swap compliance per PICMG® 2.1 and supports the PICMG 2.9 System Management and PICMG 2.16 CompactPCI® Packet Switching Backplane open specifications. In addition to the PICMG 2.16 variants, the CPCI7200 offers other value-added features including the PLX6466 PCI-to-PCI Bridge (PPB) for universal CompactPCI system- or peripheral-slot functionality.

In addition, the CPCI7200 board supports the Intelligent Platform Management Interface (IPMI) specification for full board remote system and platform management as well as Baseboard Management Controller (BMC) and peripheral mode. Overall, with the value-added PLX6466 and GbE/PICMG 2.16 features, the CPCI7200 board is a superior choice for telecom applications like softswitches, control plane media-transport nodes, wireless gateways, and control plane CompactPCI and PICMG 2.16 systems as well as industrial automation, aerospace, and medical applications such as railway control, on board flight information systems, and medical imaging.



FEATURES

- 1.06 or 1.5 GHz Intel Core2 Duo processor
- 533 or 667 MHz front side bus
- Intel® E7520 + 6300ESB dual channel 3.2 GBps memory controller
- 2 GB ECC-protected DDR2-400
- Dual on-board GbE interfaces
- Support for PICMG 2.16 and PICMG 2.0 CompactPCI Packet Switching Backplane specification
- Full PICMG 2.1, R2.0 Hot Swap specification compliance
- One or two PCI Mezzanine Card (PMC) site
- Hard disk drive accessory kits optional
- Optional rear transition module in PICMG 2.16 and rear I/O variants
- PLX6466 PCI-to-PCI bridge technology

Innovative Integration

2390-A Ward Avenue • Simi Valley, CA 93065
805-578-4260
www.innovative-dsp.com

Quixote

Quixote is a 64-bit CompactPCI 6U board for advanced signal capture, generation, and co-processing. It combines one C6416 DSP with a two- or six- million-gate Virtex-II FPGA, utilizing the best of both worlds in signal processing technology to provide extreme processing flexibility and efficiency and deliver unmatched performance. Dual 105 MHz analog input/output integrate signal capture and waveform generation right on the FPGA external interface. One PMC site facilitates integration of off-the shelf or custom PMC mezzanine boards. Finally a PCI-to-StarFabric bridge offers two 2.5 Gbps ports to the new PICMG 2.17 switched interconnect backplane, for up to 625 MBps board-to-board or chassis-to-chassis communication.

FEATURES

- 1 GHz TMS320C6416 DSP and 2- to 6-MGATE Virtex-II FPGA
- 32 MB SDRAM, 8 MB ZBT SBSRAM, and AD6645 and AD9764 converters
- 64/32 bit CompactPCI, 66 MHz, 5 V/3.3 V and complex trigger modes with HW event logging
- PMC site with Jn4 to FPGA DIO and PICMG 2.17 StarFabric compliant
- Applications include: Software Defined Radio, wireless IP and RADAR, development and hardware testing
- Physical Layer Field Testing, ultra-fast flexible data acquisition, vector signal generation and electronic warfare

For more information, contact: sales@innovative-dsp.com

RSC# 32861 @ www.compactpci-systems.com/rsc

Advantech Corporation

38 Tesla, Suite 100 • Irvine, CA 92618
800-557-6813
www.advantech.com/applied

2U CompactPCI Enclosure with 4-slot BP

Designed for small to medium scale CT applications such as enterprise VoIP gateways and Integrated Access Devices (IADs), MIC-3056 is a 2U CompactPCI enclosure that can accommodate four 6U CompactPCI CPU boards. It is cost-effective and space-conscious, and its modular design is also hot-swappable from the front, allowing for easy installation, maintenance and upgrades. The hot-swappable fans conveniently assist users during system management and maintenance. MIC-3056 also monitors the internal temperature via an optional chassis management module to avoid overheating. The 300 W ATX 1+1 redundant power supply design not only enhances its reliability but also makes this 2U platform especially suitable for mission-critical applications in hazardous environments.

FEATURES

- 4-slot 6U CompactPCI® backplane
- AC ATX 300 W + 300 W redundant (1+1) power supply
- PICMG 2.5 (CompactPCI Computer Telephony) compliance
- Hot-swappable fans provide outstanding ventilation
- Supports rear I/O
- Optional chassis management module

For more information, contact: CTinfo@advantech.com

RSC# 35856 @ www.compactpci-systems.com/rsc

Advantech Corporation
38 Tesla, Suite 100 • Irvine, CA 92618
800-557-6813
www.advantech.com/applied

Trusted ePlatform Services

ADVANTECH

4U CompactPCI Enclosure with Storage

MIC-3043 is a 4U enclosure designed for mission-critical and high-reliability applications such as Networking, Telecom, Computer Telephony Integration, and Image Processing. It is equipped with a hot-swappable CompactPCI redundant power supply and hot-swappable fan modules to minimize MTTR. It supports IEEE 1101.11 rear I/O transition boards and offers two hot-swappable SCSI/SATA or removable IDE HDD bays and one slim CD-ROM. The MIC-3043 enclosure has a high-quality backplane that supports impedance control and 64-bit/66 MHz cards for full compatibility. With an optional Chassis Management Module, CPU board temperature and voltage can be monitored and digital I/O lines remotely controlled via a Web-based interface, enabling users to remotely avert system failure.

FEATURES

- 6-slot 6U CompactPCI® backplane
- Supports two hot-swappable SCSI/SATA or removable IDE HDD bays
- Built-in IDE slim-type CD-ROM
- AC or DC CompactPCI 250 W + 250 W redundant (1+1) power supply
- Supports hot-swappable fan modules
- Built-in alarm module

For more information, contact: CTinfo@advantech.com

RSC# 35983 @ www.compactpci-systems.com/rsc

Resource Guide 2008 CompactPCI and AdvancedTCA Systems Chassis and Enclosures

Carlo Gavazzi Computing Solutions
10 Mupac Drive • Brockton, MA 02301
508-588-6110
www.cg-cs.com

CARLO GAVAZZI

535 Series

Carlo Gavazzi's 535 Series is designed to meet the demands of telecom and enterprise applications with a high availability, high performance open architecture RoHS and NEBS Level 3 compliant platform that contains an IPMI System Manager and Fabric technology.

The 535 Series, a CompactPCI 2.16 Compliant Switch Fabric platform, contains redundant IPMI System Management Cards, along with dual AC or DC input 600 or 400 Watt PICMG 2.11 power supplies. This platform provides the system integrator with increased flexibility in designing a system, enabling the use of both legacy bus based and next generation fabric base boards.

FEATURES

- Redundant IPMI System Manager
- CompactPCI 2.16 fabric backplane with two fabric switch slots and legacy 64-bit/33 MHz Bus
- RoHS and NEBS Level 3 compliant
- Hot Swap 400 or 600 Watt power supply
- Front replaceable speed-controlled and monitored fan tray
- 15.75" (9U) high x 12" deep enclosure rack mountable

For more information, contact: pr@cg-cs.com

RSC# 35873 @ www.compactpci-systems.com/rsc

Carlo Gavazzi Computing Solutions

10 Mupac Drive • Brockton, MA 02301
508-588-6110
www.cg-cs.com

585 Series

Carlo Gavazzi Computing Solutions 585 Series is a portable 8-slot CompactPCI lightweight aluminum enclosure, excellent for high availability datacom/telecom, industrial automation, and mobile test environments.

Highly serviceable and maintainable, the 9U high 585 Series features a flush card cage accommodating either five or eight 6U x 160 mm CompactPCI boards housed in a vertical orientation. The rightmost slot is double-wide and reserved as the system (CPU) slot. The backplanes support H.110, the IPMB as specified in PICMG 2.9 rev. 1.0, 5.0, or 3.3-volt keying and Hot Swap.

FEATURES

- 15.75"H (9U) x 11.6" W x 11.7"D chassis
- 8-slot 6U CompactPCI backplane with Front and Rear I/O (C2.26 available)
- One 5.25" x 1.63". One 3.5" x 1.0"accessible peripheral bay and one 3.5" internal bay
- 320 W autosense ATX power supply
- Dual 50/93 CFM fans
- H.110 and hot swap compliant

For more information, contact: pr@cg-cs.com

RSC# 35874 @ www.compactpci-systems.com/rsc

Chassis and Enclosures CompactPCI and AdvancedTCA Systems Resource Guide 2008

Kaparel

97 Randall Drive, Unit B • Waterloo, ON N2V 1C5 Canada
519-725-0101 ext 208
www.kaparel.com

AdvancedTCA Enclosure Family

Rittal Electronic Systems – the complete know-how.
What really counts is reliability. Rittal Shelf Management Concepts incorporates innovative components to produce reliably systems available up to Level 5 for AdvancedTCA and MicroTCA. Everything is fully assembled, ready to run, and individually configured. The same naturally applies equally for CompactPCI, VME, and VME64x. One supplier, one manufacturer, one quality standard. As the leading system supplier, Rittal is your one-stop partner for electronic know-how and a reliable promise of all-inclusive competence – worldwide.

Case solutions in 5U, 12U, 13U, or cube design. Climate control concepts up to 200 W/board and more. High speed backplanes up to 10 Gbps.

FEATURES

- Rittal Electronic Systems – the complete know-how. What really counts is reliability
- Case solutions in 5U, 12U, 13U, or cube design; climate control concepts up to 200 W/board and more
- High speed backplanes up to 10 Gbps – Variable Shelf Management Concepts – Rittal incorporates innovative components to produce reliable systems available up to Level 5 for AdvancedTCA and MicroTCA
- Fully assembled, ready to run, and individually configured for CompactPCI, VME, and VME64x
- One supplier, one manufacturer, one quality standard: Rittal, your one-stop partner for electronic know-how

For more information contact: pkuepfer@kaparel.com

RSC# 30136 @ www.compactpci-systems.com/rsc

PDSi Pinnacle Data Systems, Inc.

6600 Port Road, Suite 100 • Groveport, OH 43125
614-748-1150 fax 614-409-1269
www.pinnacle.com/products2/compactpci/

ComputeNode™

PDSI's ComputeNode line offers a range of NEBS Level 3-compliant CompactPCI chassis in sizes from 1U to 4U. With horizontal design and superior air cooling functionality, ComputeNode chassis are cost-effective platforms providing the highest levels of quality and manageability in mission-critical applications. PDSi carrier-grade chassis include cPSB (PICMG 2.16) and CompactPCI backplanes, redundant hot-swappable fans, and hot-swappable front accessible AC or dual-feed DC power modules. All 2U and larger platforms include PDSi's unique Alert!Node™ alarm card, an intelligent out-of-band chassis management controller for comprehensive fan and power monitoring. PDSi offers OEM design, integration and support services around these platforms. Customization, platform integration, and long-term support services are available. Contact rob.ellis@pinnacle.com.

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FEATURES

- Full family of 1U through 4U chassis, CompactPCI, and cPSB (PICMG 2.16)
- Proven NEBS Level 3 compliant designs for high speed, high availability telecom and networking applications
- Built-in Alert!Node alarm card for out-of-band chassis management
- Redundant, hot-swappable AC or DC Power Supplies with Filters and Dual Feed option
- Redundant, hot-swappable front and rear Fans for superior cooling and serviceability

For more information, contact: rob.ellis@pinnacle.com

RSC# 15569 @ www.compactpci-systems.com/rsc

Resource Guide 2008 CompactPCI and AdvancedTCA Systems Chassis and Enclosures

Twin industries

2303 Camino Ramon, Suite 106 • San Ramon, CA 94583
925-866-8946
www.twinind.com

CPCI Extender Card

Twin Industries CompactPCI extender cards come in a wide variety of 3U and 6U form factors. Our extender cards serve as critical tools for engineering development and test applications. Several versions are available for applications that follow the CompactPCI mechanical specification, but have custom signaling environments.

Part# 2000-6U-EXTM-LF (lead free) follows the 64-bit CompactPCI specification for J/P 1-2. All data signals have clearly marked probing points. All voltages are protected by replaceable fuses. Multilayer PCB with power and ground planes. Probing points are provided for all J/P 3-5 signals. 2 mm headers allow for easy attachment of analyzer probes.

For more information contact our sales department at: 925-866-8946 or sales@twinind.com

FEATURES

- Monitor CompactPCI boards in active systems
- Debug in space-restricted areas
- Probing points for all signals
- Power and ground planes
- Replaceable fuses for all voltages
- Quick-turn customization

For more information, contact: sales@twinind.com

RSC# 32873 @ www.compactpci-systems.com/rsc

Vector Electronics & Technology, Inc.
11115 Vanowen Street • North Hollywood, CA 91605
800-423-5659
www.vectorelect.com

Vector Series 2370

Vector Series 2370 offers the lowest profile per slot of the Vector enclosure group. The series accepts 6U x 160 mm front loading cards as well as optional 6U x 80 mm slots in chassis heights from 1U to 5U. Economical embedded ATX or dual-redundant, hot-swappable power supplies are also available. Vector Series 2370 is fully 1101.10 and 1101.11 compliant and designed for compliance with UL and FCC requirements. Vector Series 2370 can accommodate any 6U CompactPCI, VME, or VME64x backplane.

Model	No. Slots	Height
2371	2	1.72" 1U
2372	4	3.44" 2U
2375	6	5.22" 3U
2376	8	6.97" 4U
2377	10	8.72" 5U

FEATURES

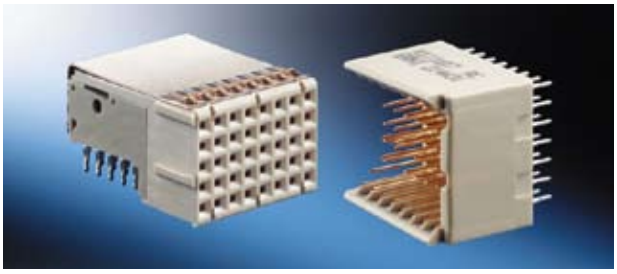
- 19" rack-mount, rack brackets removable
- 6U form factor, up to 2-10 slots
- Side air intake/exhaust
- 1101.10 and 1101.11 compliant
- Plug-in fan trays
- Rear mounted fused RFI AC input filter
- Rear power switch

ERNI Electronics

3005 East Boundary Terrace • Midlothian, VA 23112
804-228-4100
www.erni.com

ERmet 2mm HM EXP.0/eHM

The PICMG EXP.0 specification was developed to incorporate the PCI Express technology into the popular PICMG 2.0 CompactPCI form factor. This specification was intended for the 3U CompactPCI, military, PXI, and aerospace markets. The specification makes use of legacy CompactPCI connectors (ERmet 2mm HM), high speed differential connectors (ERmet ZD), and a new "mini" Hard Metric connector. This "mini" HM connector is defined as a 5 row by 8 column connector. ERNI offers a 3-pair/10-wafer ERmet ZD as well as the ERmet 2mm HM connector type B8 with integrated coding elements for preventing incompatible board/slot configurations (for example, an RIO card in a PXI slot).



FEATURES

- Designed around the popular CompactPCI form factor
- Integrated coding elements for preventing incompatible board/slot configurations
- 40 signal pins in a 5 row by 8 column configuration

For more information, contact: info.usa@erni.com.

RSC# 30185 @ www.compactpci-systems.com/rsc

Resource Guide 2008 CompactPCI and AdvancedTCA Systems Connectors

Positronic Industries, Inc.

423 North Campbell Avenue • Springfield, MO 65806
800-641-4054
www.connectpositronic.com

Power Connector

PCI Power Connector Series

Compact Power Connectors are designed for use in a wide variety of platforms. Positronic developed the PCIH series in the 47 contact variant specifically for use with 3U and 6U CompactPCI® in-rack modular power supplies as detailed in the PICMG® 2.11 Power Interface Specification. For any application where system power requirements have exceeded the capabilities of commonly used power connectors for plug-in modules, the Compact Power Connector is an excellent choice.

FEATURES

- High power density
- Low contact resistance – 0.0007 ohms
- Five package sizes, multitude of power/signal contact variants
- Variety of terminations including crimp contact panel mount and A.C. pass through
- Coplanar mounting options available
- Three level sequential mating
- Superior blind-mating capability
- Efficient current distribution of multi-voltage outputs
- Line and neutral are 5mm recessed for safety
- A.C or D.C. input with "electrical keying" and mechanical keying options

For more information, contact: info@connectpositronic.com

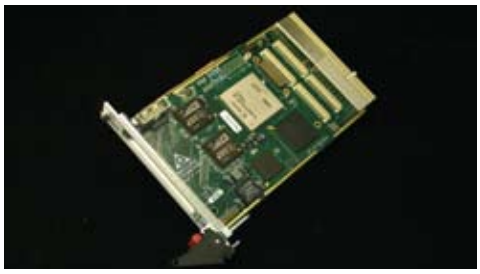
RSC# 35851 @ www.compactpci-systems.com/rsc

Innovative Integration
2390-A Ward Avenue • Simi Valley, CA 93065
805-578-4260
www.innovative-dsp.com

Duet 3U 64 bit

Duet is a dual-DSP coprocessor board that features a 4M or 5M Virtex-II Pro user reconfigurable FPGA, plus a PMC/XMC module site with JN4 and Rocket I/O connectivity to the baseboard Virtex FPGA. Unusually dense and small, Duet is packaged as a 3U CompactPCI board with an advanced architecture that provides superb inter-processor connectivity and direct hardware access to high-performance PMC-based external analog and communications modules, to deliver blazing performance and extreme flexibility for advanced signal capture and real-time processing applications.

Duet is an ideal platform for integrating high performance DSP and I/O into advanced signal processing, data acquisition, and real-time applications such as telecom, RADAR, SONAR, and wireless communications.



FEATURES

- 1 GHz TMS320C6416 DSP (x2), 64 MB SDRAM per processor
- Flexible internal/external communication mesh
  - 64-bit/66 MHz CompactPCI
- PMC/XMC site with Jn4 to FPGA and 4 Rocket I/O per VITA 42 external data port, up to 12 Gbps
- 4M or 5M Virtex-II Pro FPGA
  - Up to two 2 MB private DDR SBSRAM
- Up to two 128 MB private DDR SDRAM, dedicated 800 MBps links between DSPs, 3U CompactPCI with PXI support
- Applications: High-end co-processing, wireless, broadband communications, RADAR, video, biometrics, and more.

For more information, contact: sales@innovative-dsp.com

RSC# 32856 @ www.compactpci-systems.com/rsc

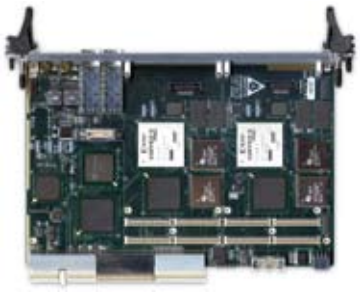
DSPs and FPGAs CompactPCI and AdvancedTCA Systems Resource Guide 2008

Innovative Integration
2390-A Ward Avenue • Simi Valley, CA 93065
805-578-4260
www.innovative-dsp.com

Quadia

Quadia is a quad-DSP, dual FPGA, dual PMC sites, CompactPCI board with an advanced architecture that provides the best inter-processor connectivity and access to the finest external interfaces available today, to deliver blazing performance and extreme flexibility for advanced signal capture and real-time processing applications.

The board features four C6416 DSPs, split in two independent clusters each hosting a PMC site and one large FPGA for end-user code, a central FPGA routing interprocessor communication, end-user FPGA communication, external port serial I/O for PCI Express or other private link, global memory, and PCI interface. Quadia is an ideal platform for integrating high performance DSP and I/O into advanced signal processing, data acquisition, and real-time applications such as telecom, RADAR, SONAR, and wireless communications.



FEATURES

- 1 GHz TMS320C6416 DSP (x4)
- 64 MB SDRAM per processor
- 64-bit/66 MHz CompactPCI
- Flexible internal/external communication mesh
- Two PMC sites with Jn4 to FPGA
- External data port, up to 12 Gbps

For more information, contact: sales@innovative-dsp.com

RSC# 19180 @ www.compactpci-systems.com/rsc

Active Silicon Ltd

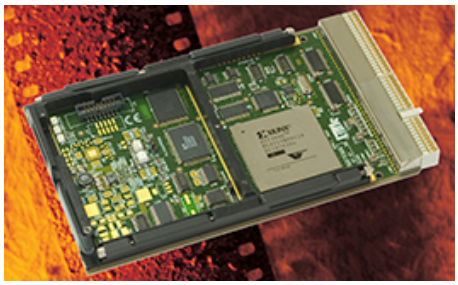
17 Wilson Street, Suite 13 • Chelmsford, MA 01824
978-244-0490
www.activesilicon.com

Phoenix-D48CL-CPCI

Active Silicon designs and manufactures frame grabbers and customized vision systems. The technology has been used and proven in applications that range from scientific research, medical imaging and security, to avionics and space robotics.

The Phoenix range of high performance digital frame grabbers includes 3U and 6U CompactPCI boards supporting image acquisition from Camera Link sources. They are designed to interface to today's demanding cameras with support for multi tap, high-bit depth and high-speed pixel clock settings.

The Phoenix Software Developers Kit has been specifically designed for OEM integration with a common API across all supported operating systems, which include Windows, Linux, MAC OS X, QNX, DOS and VxWorks.



FEATURES

- Dual Base/single Medium Camera Link acquisition
- Optional conduction cooled assembly
- Wide range of Linescan and Areascan cameras supported
- Extended temperature range
- Extensive Opto-isolated, TTL and LVDS triggering and I/O lines
- Data formatting for real-time processing and/or display

For more information, contact: info@activesilicon.com

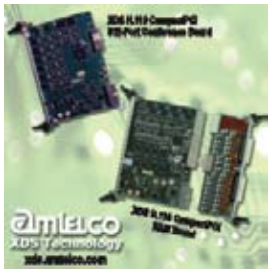
RSC# 32055 @ www.compactpci-systems.com/rsc

Amtelco

4800 Curtin Drive • McFarland, WI 53558
800-356-9224, 608-838-4194
www.xds.amtelco.com/h110.htm

AMTELCO XDS CTI Boards

AMTELCO XDS offers a complete line of H.110 CompactPCI boards to meet your specific application needs. The XDS H.110 CompactPCI boards utilize the proven XDS Infinity series processor and feature a H.110 compliant CT bus, a CompactPCI compliant host processor bus, and H.110 mechanical form factor. AMTELCO software driver packages are distributed free of charge to XDS customers, with open source code for the driver and all supporting applications. Software drivers are available for most common operating systems, including Microsoft Windows, 2000/XP/NT, Linux, UnixWare, and Solaris. Each XDS H.110 CompactPCI board is equipped with a processor that can control lower level functions. The XDS analog port boards include Loop Start, E&M, and Station/Operator.



FEATURES

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- XDS H.110 32-Port BRI Board – provides BRI network connections; drives ISDN phones; PBX switch connections
- XDS H.110 32-Port Station Board–functions as an interface to analog phones; can be programmed per port
- XDS H.110 512-Port Conference Board – is ideal for larger conference applications with enhanced conferencing
- XDS H.110 MC-3 Multi-Chassis Interconnect Board – connects 20+ PC chassis with fully dynamic timeslot switching

For more information, contact: xds@amtelco.com

RSC# 35669 @ www.compactpci-systems.com/rsc

Amtelco

4800 Curtin Drive • McFarland, WI 53558
800-356-9224, 608-838-4194
www.xds.amtelco.com/h110.htm

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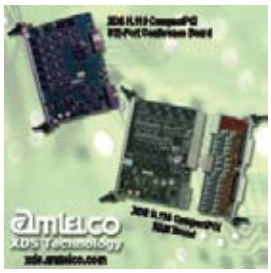
amtelco XDS Technology



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For more information, contact: xds@amtelco.com

RSC# 35669 @ www.compactpci-systems.com/rsc

Advanced Micro Peripherals Ltd.

Unit 1, Harrier House, Sedgeway Business Park • Cambridge
CB6 2HY United Kingdom
+44 (0)1353 659500
www.ampltd.com/osp3/mpeg4cpci.html

MPEG4CPCI

The MPEG4CPCI is a 3U CompactPCI 4-channel MPEG4 Codec. It provides high performance capturing and compression of up to four concurrent analog NTSC or PAL video and audio inputs to MPEG4 for storage or further processing at full resolution and full frame rates. The MPEG4CPCI can also decompress and play back MPEG4 recordings from storage. Additionally, incoming video can be viewed on the host screen. This multiple simultaneous functionality is enabled by the MPEG4PCI's 32-bit PCI architecture.

High performance MPEG4 video data compression and reduced bus utilization allows multiple MPEG4CPCI cards to be deployed within a CompactPCI system for multi-channel video recording and streaming applications.

The MPEG4CPCI has a suite of Windows, Linux, and QNX drivers.

Advanced Micro Peripherals
THE EMBEDDED VIDEO EXPERTS

FEATURES

- Four asynchronous live NTSC/PAL inputs
- 4 x D1 size MPEG4 encode at full frame rate
- MPEG4 decode/playback
- Text overlay – time and date stamp
- Video preview to system VGA, NTSC/PAL
- Multiple MPEG4CPCI cards per system

For more information, contact: sales@ampltd.com

RSC# 33487 @ www.compactpci-systems.com/rsc

Murata Power Solutions

11 Cabot Boulevard • Mansfield, MA 02048
508-339-3000
www.murata-ps.com/newproducts.html

cPCI200A-1

The cPCI200A-1C is a 200 W AC power supply packaged in a 3Ux4HP form factor, allowing designers of CompactPCI systems to achieve new levels of space efficiency in their chassis. The high-efficiency unit was optimized for deployment in chassis with airflows as low as 250 LFM, thus providing a solution to otherwise challenging thermal limitations. This AC input unit targets enterprise applications. It operates from a global input range of 90-264 VAC with PFC to EN61000-3-2. This supply supports hot-swap, N+1 redundant operation and complies with PICMG 2.11 as well as the underlying CompactPCI standards. The cPCI200A-1C is RoHS-compliant and features thermal warning, ORing FETs, and current sharing to make it a preferred choice for your most demanding application.

FEATURES

- Active power correction – complies with EN61000-3-2
- 90-264 VAC global input operating range
- 200 W of power in a 3U x 4HP package
- PICMG 2.11 compliant, with 47-pin connector option
- Low airflow – requires as little as 250 LFM of airflow
- Fault tolerant N+1 configuration – output fault isolation

For more information, contact: sales@murata-ps.com

RSC# 34786 @ www.compactpci-systems.com/rsc

Eurotech Group

via F.lli Solari 3/a • Amaro - UD, 33020 Italy
+39-0433-485411
www.eurotech.com

A3pci7512

The A3pci7512 is a CompactPCI bus CPU board with Freescale MPC7447A PowerPC G4 Processor (1 GHz). It is equipped with a 32 KB instruction/data L1 cache and a 512 KB on-chip L2 cache and a DDR2-400 SODIMM memory socket. Serving as host, the board is equipped with a Tundra Tsi108 bridge. Additional features include a Gigabit Ethernet (2 chs) and RS-232C serial port (2 chs) and miniSD memory card socket as an external mass-storage device.

The A3pci7512 incorporates 512 KB boot ROM and a lithium battery-powered backup of 32 KB SRAM and has a real-time clock. 256 B serial EEPROM is installed for storing booting information.

FEATURES

- Freescale MPC7447A PowerPC G4 Processor (1 GHz).
- Tundra Tsi108 bridge
- GbE (2 chs) and RS-232C serial port (2 chs)
- miniSD memory card socket
- 3U (single-height), single-slot width
- Powered by 5 V or 3.3 V supplied from the CompactPCI bus

For more information, contact: cpci@eurotech.com

RSC# 35853 @ www.compactpci-systems.com/rsc

Kontron
14118 Stowe Drive • Poway, CA 92064-7147
1-888-294-4558
www.kontron.com

CP6001 and CP6923

In today's demanding world, designers need smart solutions. Kontron's 6U CompactPCI CP6001 and CP6923 were designed with exactly that in mind. The CP6001 is a rugged Intel® Core™ 2 Duo CPU and is a perfect fit with the CP6923 PICMG 2.16 rugged Ethernet switch board. Both the CP6001 and the CP6923 boards are available in three rugged levels: R1-Standard, R2-Rugged Air-Cooled, R3-Conduction-Cooled. (R3-Conduction-Cooled versions shown here.)

With up to 8 GB of USB or 2 GB soldered flash, the CP6001 enables construction of a highly shock and vibration resistant system with non-rotating, non-volatile memory.

The CP6923 board supports all relevant standards on carrier grade L2 and L3 switching and routing. Together, these 6U CompactPCI boards provide a cost-effective solution for rugged systems.

FEATURES

- CP6001
  - Up to 8 GB of USB or 2 GB soldered flash
  - Based on the Intel Mobile 945GM chipset with a front side bus of up to 667 MHz and ICH7-R Southbridge
  - Two independent video outputs to the rear I/O (2x DVI – 1x DVI and 1x HDMI)
- CP6923
  - 24x GbE ports
  - Leading edge technology based on BCM5650X chip
  - Copper, optical, rear I/O version; hot swap; IPMI-comprehensive firmware package

For more information, contact: info@us.kontron.com

RSC# 36014 @ www.compactpci-systems.com/rsc

Processor Boards CompactPCI and AdvancedTCA Systems Resource Guide 2008

Kontron
14118 Stowe Drive • Poway, CA 92064-7147
1-888-294-4558
www.kontron.com

CP6014 2 Quad-Core

Depend on Kontron to help you build your next application with CompactPCI processor boards that deliver incredible performance and versatility. Kontron introduces its 6U CompactPCI CP6014, a Dual Intel® Quad-Core Xeon® LV L5408 (45 nm technology) processor board, complemented by the cost-optimized Intel® 5100 MCH chipset and the Intel® I/O Controller Hub 9R. Discover what eight processor cores on one board can do to open up new market opportunities and provide tremendous system upgrade opportunities.

The CP6014 targets storage, wireless infrastructure, security, voice, and the medical market segments. When taken in conjunction with the advantages of virtualization software, the CP6014 can now address new data-intensive applications such as video recognition and medical imaging.

FEATURES

- Dual Intel® Quad-Core Xeon®; Dual Intel® Dual-Core Xeon®
- Intel® 5100 MCH chipset and Intel® I/O Controller Hub 9R
- 2.13 GHz core frequency (45 nm); 1066 MHz FSB; and on-die L2 cache of 12 MB (2x6 MB)
- 16 GB DDR2 memory (4 DIMM sockets) with IOAT DMA for 0fast data transfer
- SSD on USB, with 1, 2, or 4 GB; 4 SATA/SAS ports (onboard mezzanine and rear I/O)
- 2 COMs RS-232 (1 front, 1 rear or 2 rear); 3 USB 2.0 ports (1 front and 2 rear I/O); Supports IPMI V1.5

For more information, contact: info@us.kontron.com

RSC# 36016 @ www.compactpci-systems.com/rsc

Trenton Technology
2350 Centennial Drive • Gainesville, GA 30504
770-287-3100
www.TrentonTechnology.com

CP16

Trenton's CP16 uses the Intel® Pentium® M processor to provide maximum processing capability and thermal performance. Key features designed into the CP16 include a front access PMC slot, local storage options, dual Gigabit Ethernet ports, and support for up to 2 GB of DDR220/266 memory. A rear transition module, RTM25, is available with or without dual Ultra320 SCSI interfaces and provides rear access to the SBC's I/O ports and status LEDs. PICMG® 2.16 (Packet Switching Backplane), 2.1/2.12 (Hot Swap), 2.9 (IPMI) compliance, and features like a local storage option and the ability to turn off the CompactPCI® bus enable the CP16 to excel in a wide variety of either CompactPCI system board or server blade computing applications.

FEATURES

- PICMG® 2.16 Packet Switching Backplane and PICMG® 2.1 (Hot Swap) support
- Intel® Pentium® M processor with the Intel® E7501 chipset
- Supports up to 2 GB of DDR200/266 plug-in memory modules
- Dual Gigabit Ethernet and Enhanced ATI® video
- Ability to turn off the CompactPCI® bus for server blade applications
- Optional Rear Transition Module available with or without dual Ultra320 SCSI

For more information, contact: jrenehan@TrentonTechnology.com

RSC# 16537 @ www.compactpci-systems.com/rsc

Conduant Corp.
1501 South Sunset Street, Suite C • Longmont, CO 80501
303-485-2721 fx 303-485.5104
www.conduant.com/products/bigriver-dm-425-3u.html

Big River DM425-3U

The Big River™ DM-425-3U storage unit provides disk storage resources to PXI/CompactPCI (CPCI) and PXI/CPCI Express based systems. By providing an internal enclosure for disk storage, the DM-425-3U allows high speed storage applications to be designed around a standard PXI/CPCI chassis. With capacities of up to 1 TB in a single unit, the DM-425-3U can provide abundant storage capacity in a very small volume. When combined with a StreamStor™ PXI/CPCI recording controller, the DM-425-3U provides storage capacity for streaming applications such as: DIGITAL SIGNAL PROCESSING (DSP) – HIGH SPEED DATA ACQUISITION – RADAR and SONAR - MEDICAL IMAGING - TELEMETRY - SATELLITE DOWNLOAD - HIGH RESOLUTION VIDEO.

FEATURES

- Provides disk storage resources to PXI or CompactPCI (CPCI) systems and PCI Express based systems
- Internal enclosure for disk storage allows for applications to be designed around a standard PXI/CompactPCI chassis
- Capacities up to 1 TB in a unit. DM-425-3U can provide abundant storage capacity in a very small volume
- Use in a PXI/CompctPCI 3U chassis with variations available for both PCI Express and PCI-based architectures
- With PCI Express SATA controller, unit integrates with OS for more capacity in JBOD or s/w RAID configuration
- Storage for streaming applications: DSP, hi-speed DAQ, radar, sonar, and telemetry. Contact Ken ken@conduant.com

For more information, contact: info@conduant.com

RSC# 35518 @ www.compactpci-systems.com/rsc

Amtelco

4800 Curtin Drive • McFarland, WI 53558
800-356-9224, 608-838-4194
www.xds.amtelco.com/h110.htm

AMTELCO XDS CTI Boards

AMTELCO XDS offers a complete line of H.110 CompactPCI boards to meet your specific application needs. The XDS H.110 CompactPCI boards utilize the proven XDS Infinity series processor and feature a H.110 compliant CT bus, a CompactPCI compliant host processor bus, and H.110 mechanical form factor. AMTELCO software driver packages are distributed free of charge to XDS customers, with open source code for the driver and all supporting applications. Software drivers are available for most common operating systems, including Microsoft Windows, 2000/XP/NT, Linux, UnixWare, and Solaris. Each XDS H.110 CompactPCI board is equipped with a processor that can control lower level functions. The XDS analog port boards include Loop Start, E&M, and Station/Operator.

XDS Technology

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For more information, contact: xds@amtelco.com

RSC# 35669 @ www.compactpci-systems.com/rsc

Switches CompactPCI and AdvancedTCA Systems Resource Guide 2008

DSS Networks, Inc.

23 Spectrum Pointe, Suite 202 • Lake Forest, CA 92630
949-716-9051
www.dssnetworks.com/v3/Products.asp

Ethernet Switches

DSS Networks designs and manufactures high-speed, intelligent Gigabit Ethernet Switches and NICs for embedded computing platforms. All our switches offer various levels of management from the VLANs, aggregation and failover all the way to switch chips with on-chip, content-aware packet engines for fast filter process, routing, QoS, and much more. Coupled with our broad line of interface cards with various port densities across a number of bus architectures in both copper and fiber interface, DSS Networks deploys the best total networking solutions for your embedded requirements.

Please call or email sales at sales@dssnetworks.com or visit our website for more details.

dss networks
The Gigabit Experts™

FEATURES

- PMC 8 port GbE Layer 2 switch: 4 Independent external ports, 2 host ports via PCI-X, 2 1000X via PMC P4
- VME VITA 31.1 & CompactPCI PICMG 2.16 solutions: 12 port Gigabit Ethernet switch, with Fiber Uplink Options
- PCI Express GbE Layer 2 switch: 4 Independent external ports, 4 host ports via PCI Express
- Add a GbE switch to your VME system without changing out your backplane or burning a slot!
- Ruggedized extended temperature models available (-40 °C to +85 °C) and MIL-SPEC conformal coating (-R1, -R2)
- Aggregate up to 4 GbE ports in a single PMC site; send your requirements for a custom application by calling or emailing sales at sales@dssnetworks.com

For more information, contact: sales@dssnetworks.com

RSC# 33226 @ www.compactpci-systems.com/rsc

Performance Technologies

205 Indigo Creek Drive • Rochester, NY 14626
585-256-0200
www.pt.com

CPC6620

The CPC6620 is the most advanced PICMG® 2.16 embedded Ethernet switch available. Featuring support for IPv6* routing and for 10 Gb switch ports, the CPC6620 switch joins Performance Technologies' line of award-winning switches and continues a long tradition of high availability, fault-tolerant solutions. It is the ideal interconnect and uplink for network-centric, packet-based systems. While switch throughput is approximately twice that of other switches, users retain the robustness, reliability, and hot-swap capabilities of the 2.16 standard. The CPC6620 features an 800 MHz processor, ECC-protected memory, an optional CompactFlash® site, front panel SFP connector options, and a broad array of management, rear panel I/O, and uplink choices.

FEATURES

- 24 10/100/1000BASE-T + 2 10 Gb CX-4 Ethernet Ports
- Wire-Speed, Non-Blocking IPv4/IPv6* Switching & Routing
- 96 Gbps Switching Speed
- Support for both 2.16 Fabric and Non-2.16 Modes
- Front or Rear Panel Uplinks
- Real-Time Continuous Integrity Checks for Non-Stop Networking

*IPv6 software upgrade available Q4 2008.

For more information, contact: info@pt.com

RSC# 33607 @ www.compactpci-systems.com/rsc

Continuous Computing

9450 Carroll Park Drive • San Diego, CA 92121
858-882-8800
www.ccpu.com

1 GbE Bladed Compute System

Continuous Computing's 1 GbE Bladed Compute System consists of redundant gigabit switching with up to 38 Intel Core 2 Duo (dual core) compute nodes in the industry-leading Flex21™ CompactPCI chassis. In addition to exceptional computing resources, the Flex21 shelf can provide over 1.5 Terabytes of storage as well as a wide range of both payload and signaling line cards.

PROCESSING

- Up to 38 Intel Core 2 Duo low voltage compute nodes
- High capacity in-shelf storage

SWITCHING

- Dual redundant 1 GbE switch for packet backplane

FEATURES

- 3rd generation NEBS-compliant Flex21 supporting 90 W per slot
- One GbE backplane fabric and TDM backplane
- Integrated shelf managers with IPMI and console connectivity
- Trillium® protocol packages for IMS and NGN
- Low cost development licenses available
- On-site Trillium Professional Services available

For more information, contact: sales@ccpu.com

RSC# 36002 @ www.compactpci-systems.com/rsc

PCI-SYSTEMS Inc.

13 C Street, Suite D • Laurel, MD 20707
301-362-1233
www.pcisystems.com

VPX Rugged Chassis

VPX Conduction-Cooled Rugged Enclosures

PCI-SYSTEMS Inc. manufactures a variety of COTS conduction-cooled chassis for VPX, VME, CompactPCI, and CompactPCI Express, based on 3U, 6U, ATR, and ARINC 600 form factors.

A unique design allows the user to select different top and bottom parts for the enclosure to get an air-cooled, conduction-cooled (cold plate), or liquid-cooled chassis.

Current CPU boards are available with x4 or x8 lane PCI Express configuration and include an Intel Core Duo board based on the Intel 3100 chipset with ECC and a P.A. SEMI PWRficient™ 1682M dual core PowerPC processor board.

The 3U conduction-cooled chassis comes with a 6-slot backplane, 220 W Modular PS with 12-36 VDC input, and an AC input adapter.

FEATURES

- COTS modular designed conduction-cooled chassis for VPX, VME, CompactPCI, and CompactPCI Express applications
- Two level maintenance models include 3U, 6U, ATR, ARINC 600, and custom
- Air-, conduction- (cold plate), or liquid-cooled chassis
- VPX 8-slot versions have PCI Express x8 lanes per slot and a 64-lane switch
- Intel Core Duo board based on the Intel 3100 with ECC and a P.A. SEMI 1682M dual core PowerPC available
- Short delivery time, custom designs welcome

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KineticSystems

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PXI Product-P635

KineticSystems' P635 is a single-width, 3U, PXI bus module with 8 frequency measurement channels. This counter module can be used to monitor a variety of pulse sources. Moreover, its unique circuitry allows the monitoring of a wide range of frequencies without changing any module settings.

TTL inputs are provided as well as differential input circuits, with a programmable high-frequency noise filter and hysteresis to provide high noise immunity. The analog path also includes programmable gain control. The gain control sets the input switching threshold, while the filter provides a 3 dB rolloff at 50 kHz. AC or DC coupling of the differential inputs is programmable on a per-channel basis.

FEATURES

- Eight frequency counter channels
- Frequency range from 0.06 Hz to 100 kHz
- Differential and TTL inputs provided
- Differential input range 20 mV to 20 V
- Programmable AC/DC differential inputs
- Programmable observation window: 1 ms to 1.025 sec

For more information, contact: mkt-info@kscorp.com

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WILDSTAR 4 VXS

Annapolis Micro Systems is a world leader in high-performance, COTS FPGA-based processing for radar, sonar, SIGINT, ELINT, DSP, FFTs, communications, Software-Defined Radio, encryption, image processing, prototyping, text processing, and other processing intensive applications. Our tenth-generation WILDSTAR 4 for VME64X/VXS uses Xilinx's newest Virtex-4 FPGAs for state-of-the-art performance. It accepts one or two I/O mezzanine cards in one VME64x or VXS slot, including Quad 250 MHz 12 Bit ADC, Single 2.5 GHz 8 Bit ADC, Quad 130 MHz 16 Bit ADC, Dual 2.3/1.5 GSps 12 Bit DAC, Quad 600 MSps 16 Bit DAC, Universal 3 Gbit Serial I/O (Rocket I/O, 10 GbE, InfiniBand), and Tri XFP (OS 192, 10G Fibre Channel, 10 Gb Ethernet). Our boards work on Windows, Linux, Solaris, IRIX, ALTIX, VxWorks and others. We support our board products with a standardized set of drivers, APIs and VHDL simulation models.

Develop your application very quickly with our CoreFire™ FPGA Application Build. It transforms the FPGA development process, making it possible for theoreticians to easily build and test their algorithms on the real hardware that will be used in the field. CoreFire, based on dataflow, automatically generates distributed control fabric between cores.

Our extensive IP and board support libraries contain more than 1,000 cores, including floating point and the world's fastest FFT. With a graphical user interface for design entry, hardware-in-the-loop debugging, and proven, reusable, high-performance IP modules, WILDSTAR 4 for VME64x/VXS, with its I/O cards, provides extremely high overall throughput and processing performance. The combination of our COTS hardware and CoreFire allows our customers to make massive improvements in processing speed, while achieving significant savings in size, weight, power, person-hours, dollars, and calendar time to deployment.

Famous for the high quality of our products and for our unparalleled dedication to ensuring that the customer's applications succeed, we offer training and exceptional special application development support, as well as more conventional support.

FEATURES

- Four Virtex-4 FPGA Processing Elements – Two XC4VFX100 or XC4VFX140, and two XC4VSX55 or XC4VLX40, LX80, LX100 or LX160
- Up to 6 GB DDR2 DRAM in 12 Banks or up to 2 GB DDR2 DRAM and up to 64 MB DDRII or QDRII SRAM
- Available for either VME64x or VXS Backplane
- High-Speed DMA Multi-Channel PCI Controller
- Programmable Flash to store FPGA images and for PCI Controller
- Full CoreFire Board Support Package for fast and easy application development
- VHDL model, including source code for hardware interfaces and ChipScope Access
- Host Software: Windows, Linux, VxWorks, etc.
- Available in both commercial and industrial temperature grades/Integrated heatsink for cooling and stiffness
- Proactive Thermal Management System – Board Level current measurement and FPGA temperature monitor, accessible through Host API
- Save time and effort. Reduce risk with COTS boards and SW. Achieve world-class performance – WILD solutions outperform the competition
- Includes one-year hardware warranty, software updates, and customer support; training available

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WILDSTAR 5 Blade

Perfect Blend of Processors and Xilinx Virtex 5 FPGAs. Eleventh Annapolis Generation.

Direct Seamless Connections – No data reduction between: external sensors and FPGAs, FPGAs and processors over IB or 10 GE backplane, FPGAs and standard output modules.

Ultimate Modularity – From zero to six Virtex 5 Processing FPGA/Memory Modules, and two Virtex 5 I/O FPGAs. Accepts one or two Standard Annapolis WILDSTAR 4/5 I/O Mezzanines: Quad 130 MSps thru Quad 500 MSps A/D, 1.5 GSps thru 2.2 GSps A/D, Quad 600 MSps DAC, InfiniBand, 10G Ethernet, SFPDP.

Fully Integrated into the IBM Blade Management System – Abundant Power and Cooling to ensure maximum performance.

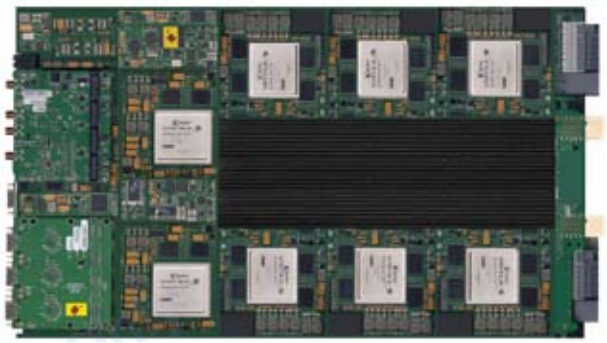
Annapolis Micro Systems, Inc. is a world leader in high-performance, COTS FPGA-based processing – radar, sonar, SIGINT, ELINT, DSP, FFTs, communications, Software-Defined Radio, encryption, image processing, prototyping, text processing, and other processing intensive applications.

We support our board products with a standardized set of drivers, APIs and VHDL simulation models.

Develop your application very quickly with our CoreFire™ FPGA Application Builder, which transforms the FPGA development process, making it possible for theoreticians to easily build and test their algorithms on the real hardware that will be used in the field. CoreFire, based on dataflow, automatically generates distributed control fabric between cores. Extensive IP and board support libraries contain more than 1000 cores, including floating point, and the world's fastest FFT. A Graphical user interface for design entry supports hardware-in-the-loop debugging, and provides proven, reusable, high-performance IP modules.

WILDSTAR 5 for IBM Blade, with its associated I/O Cards, provides extremely high overall throughput and processing performance. The combination of our COTS hardware and CoreFire allows our customers to make massive improvements in processing speed, while achieving significant savings in size, weight, power, person-hours, dollars, and calendar time to deployment.

Achieve world-class performance – WILD solutions outperform the competition.



FEATURES

- From two to eight Virtex 5 FPGA Processing Elements – LX110T, LX220T, LX330T, or FXT. Six are pluggable w/power module and memory
- Up to 10.7 GB DDR2 DRAM per WILDSTAR 5 for IBM Blade Board
- 144 x 144 crossbar. 3.2 Gb per line. Two external PPC 440s – 1 per each I/O FPGA
- Full CoreFire Board Support Package for fast easy application development
- VHDL model, including source code for hardware interfaces and ChipScope Access
- Available in both commercial and industrial temperature grades
- Proactive Thermal Management System – Board Level current measurement and FPGA temperature monitor, accessible through Host API
- Includes one year hardware warranty, software updates, and customer support. Training available
- Blade Management Controller. USB, RS-485, Ethernet, KVM, 16 RIO, Switch to 1 GbE over backplane
- Save time and effort and reduce risk with COTS boards and software
- We offer training and exceptional special application development support, as well as more conventional support
- Famous for the high quality of our products and our unparalleled dedication to ensuring that the customers applications succeed

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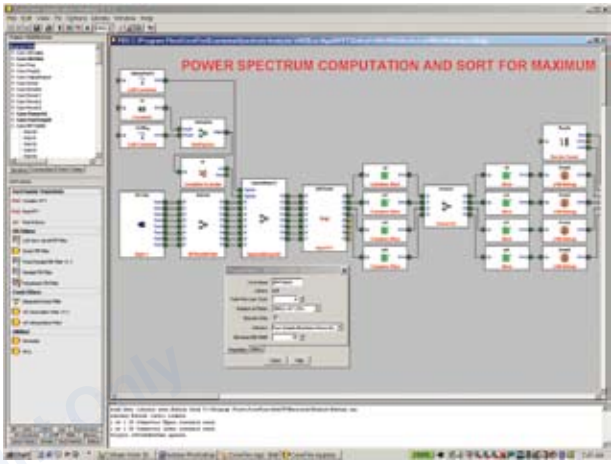
CoreFire

Develop your application very quickly and easily with our CoreFire™ FPGA Application Builder, which transforms the FPGA development process, making it possible for theoreticians to easily and quickly build and test their algorithms on the real hardware that will be used in the field.

Use CoreFire's graphical interface to drag and drop library elements onto the design window. Modify your input and output types, numbers of bits, and other core variables by changing module parameters with pull-down menus. The modules automatically provide correct timing and clock control. Insert debug modules to report actual hardware values for hardware-in-the-loop debugging. Hit the Build button to check for errors and as-built core sizes and to build an encrypted EDIF file. Use the Xilinx ISE tool to place and route each FPGA design. Modify and use the jar file or the C program created by the CoreFire Build to load your new file into your WILDSTAR II and I/O card hardware. Use the CoreFire Debugger to view and modify register and memory contents in the FPGA and to step through the dataflow of your design running in the real physical hardware.

Our extensive IP and board support libraries contain more than 1,000 proven, reusable high-performance cores, including FIR and CIC filters, a channelizer, and the world's fastest FFT. We support conversion between data types: bit, signed and unsigned integers, single precision floating point, integer and floating point complex, and arrays. A few of the newly added array cores include array composition and decomposition; slice, parallelize, serialize, repack, split, merge, reorder, rotate, and concatenate transformations; matrix math, sliding windows, and convolutions.

The combination of our COTS hardware and CoreFire enables our customers to make massive improvements in processing speed while achieving significant savings in size, weight, power, person-hours, dollars, and calendar time to deployment.



FEATURES

- Dataflow-based – automatically generates intermodule control fabric
- Drag-and-drop graphical interface
- Work at high conceptual level – concentrate on solving algorithmic problems
- Hardware-in-the-loop debugging
- More than 1,000 modules incorporate years of application experience
- Reduce risk with COTS boards and software
- Save time to market
- Save development dollars
- Easily port completed applications to new technology chips and boards
- Training and custom application development available
- Achieve world-class performance – WILD solutions outperform the competition
- Annual node locked or networked license; includes customer support and updates

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SFPDP UNI6 I/O

The Annapolis Micro Systems Inc.'s FPGA based WILDSTAR family provides 24 SFPDP channels per VME slot.

The Annapolis SFPDP Cards (UNI3 or UNI6) come with an easy to use Serial FPDP interface supporting up to 12 lanes of 2.5 Gb full duplex data. Three frame types are supported: Normal Data Fiber Frame, Sync Without Data Fiber Frame, and Sync with Data Fiber Frame in Point-to-Point Mode.

The card has three individually configurable, industry standard 4X connectors, providing four lanes per connector, with dedicated signal conditioners to ensure clean communication. It supports up to 7.5 GB full duplex per I/O card and a wide variety of readily available copper and fiber cables.

Up to two serial I/O cards and two LVDS I/O cards can reside on each WILDSTAR 4 or WILDSTAR 5 VME/VXS main board, with half that number for the PCIX or PCIe. The SFPDP card (UNI6) also supports Rocket I/O protocol at up to 75 Gb full duplex per I/O card, three ports of 10G full duplex InfiniBand per I/O card or 10G full duplex Ethernet per I/O Card.

No other FPGA board vendor can match the volume of data we can send straight into the heart of the processing elements and then straight back out again.

An FPGA based High Performance processing engine thrives on data streaming in and out at high rates of speed. The FPGAs should be part of a balanced and unified system architecture, providing maximum performance, with Memory, Processing Power, and I/O Speeds designed and integrated for performance, scalability and growth.

Annapolis Micro Systems, Inc.'s WILDSTAR 4 (Xilinx Virtex 4 based) and WILDSTAR 5 (Xilinx Virtex 5 based) families of FPGA based processing boards also support an extensive set of extremely high quality A/D and D/A boards.

Annapolis Micro Systems, Inc. is a world leader in high-performance COTS FPGA-based processing for radar, sonar, SIGINT, ELINT, Digital Signal Processing, FFTs, communications, software radio, encryption, image processing, and other processing intensive applications.

We are famous for the high quality of our products and for our unparalleled dedication to ensuring that the customers' applications succeed.

FEATURES

- Three individually configurable 4X connectors – four lanes per connector
- Up to four 2.5 Gb full duplex Serial FPDP ports per connector
- Up to 25 Gb full duplex Rocket I/O per connector
- Up to 10 Gb full duplex InfiniBand per connector
- Up to 10 Gb full duplex Ethernet per connector
- Optional Onboard oscillators for other line rates like Fiber Channel
- I/O card plugs onto WILDSTAR 4 or 5 VME/VXS/IBM Blade Chassis/PCI-X/PCI Express main board
- JTAG, ChipScope, and Serial Port access
- Proactive thermal management system. Available in both commercial and industrial temperature grades
- Includes one year hardware warranty, software updates, and customer support
- We offer training and exceptional special application development support, as well as more conventional customer support
- Full CoreFire Board Support Package for fast easy application development. VHDL model, source code for hw interfaces, Chip Scope Access

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Tri XFP I/O Card

Annapolis Micro Systems, Inc. is a world leader in high-performance Commercial Off-the-Shelf FPGA-based processing for radar, sonar, SIGINT, ELINT, digital signal processing, FFTs, communications, software radio, encryption, image processing, prototyping, text processing, and other processing intensive applications.

The Annapolis Tri XFP I/O Card, which works with the WILDSTAR 4/5 Family Architecture, has three 10 Gb individually configured XFP connectors, each with its own XAUI to XFI converter. Industry-standard pluggable fiber optic transceivers can be purchased from Annapolis or from other vendors. The Tri XFP provides up to 30 Gb Full Duplex I/O directly between the outside world and the Rocket I/O pins on the Xilinx Virtex-II Pro or Virtex-4 I/O FPGA on the WILDSTAR 4 main board. No other vendor provides that volume of data straight into the heart of the processing elements and then back out again.

Two I/O cards can reside on each WILDSTAR 4 or WILDSTAR 5 VXS or PCI-X/E board, with up to 30 million user reprogrammable gates.

The Tri XFP card will support 10 Gb Ethernet, 10 Gb Fibre Channel, and OC-192. Although the protocols will be provided as black box solutions with few modifications by users allowed, more adventurous users who choose to develop their own communications protocols from the basics already have access to all the board resources through VHDL source for the interfaces to SRAM, signal conditioners, LAD bus, I/O bus, and PPC flash. CoreFire users will have the usual CoreFire board support package.

The Tri XFP is the first of many I/O cards Annapolis will be releasing for its new WILDSTAR 4/5 Architecture Family, which uses Xilinx Virtex-4 and Virtex-5 FPGAs for processing elements. WILDSTAR 4 is the 10th generation of Xilinx FPGA processing-based COTS boards from Annapolis.

Annapolis is famous for the high quality of our products and for our unparalleled dedication to ensuring that the customers' applications succeed. We offer training and exceptional special application development support, as well as more conventional customer support.

FEATURES

- Up to 10 Gb Full Duplex Ethernet per connector
- Up to 10 Gb Fibre Channel
- OC-192
- Three 10 Gb XFP connector
- Accepts industry-standard pluggable transceivers
- Available in both commercial and industrial temperature grades
- Includes one-year hardware warranty, software updates, and customer support
- One or two I/O cards fit on a single WILDSTAR 4/5 processing board
- New I/O form factor for improved thermal performance
- First of many WILDSTAR 4/5 Family I/O cards, including superior performance A/D, D/A, and additional high-speed communication cards
- Save time and effort and reduce risk with COTS boards and software
- Achieve world-class performance; WILD solutions outperform the competition

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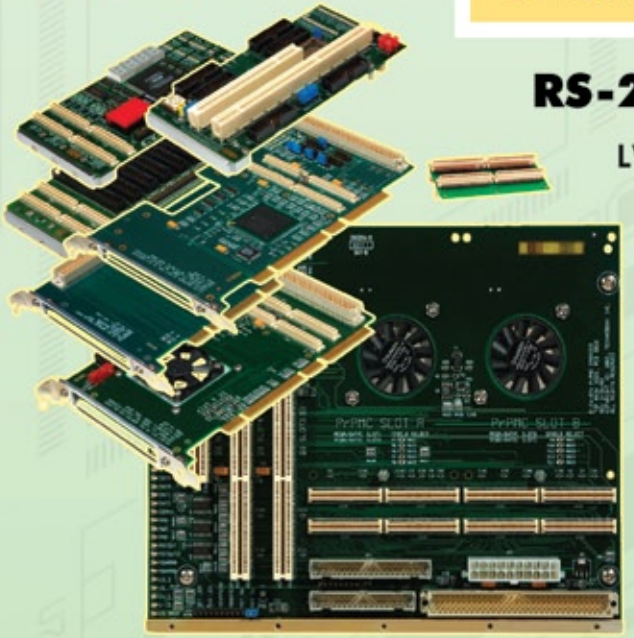

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ATMIV

The ATMIV is a high performance AMC controller designed for use in all aspects of telecoms networks. The ATMIV includes support for ATM host termination, switching, and L2/L3/L4 or higher interworking between GbE interfaces and ATM interfaces. With support for AAL2 and AAL5, the ATMIV has the ability for real-time voice and video over AAL2, as well as signaling and IP over AAL5 in 3G networks.

The ATMIV enables development flexibility in building the next generation infrastructure and can be configured in many different ways depending on customer specifications and preferred architecture.

Application Examples:

- 3G RNC, MSC, SGSN, and Node B
- Voice over packet
- Video streaming
- Broadband networks
- ATM to IP gateways
- Femtocell access controllers

FEATURES

- 4 x OC-3/STM-1 or 2 x OC-12/STM-4 trunks
- ATM AAL2 and AAL5 on a single trunk
- Onboard IP to AAL2, IP to AAL5 interworking
- AAL2 and AAL5 termination and switching
- AMC form factor for next generation AdvancedTCA and MicroTCA platforms
- Uses state-of-the-art Wintegra WinPath2 Processor

For more information, contact: sales@adax.co.uk

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HDCIII

The Adax HDCIII is an eight trunk SS7/ATM signaling controller providing a high density, high performance solution for next generation and IMS networks. Designed to exceed your system requirements, the HDCIII provides superior scalability, flexibility, and price performance ratios, making it the perfect choice for your SS7/ATM signaling needs.

The HDCIII is available in PMC, AMC, PCI-X, and PCIe form factors, all of which share a common software driver and have a consistent API for application portability.

Application Examples:

- Signaling gateways
- Media gateway controllers
- SGSN, GGSN, MSC, HLR, VLR, and BSS nodes
- VAS applications such as SMS, roaming, and billing
- Test and measurement applications
- Simulation and monitoring systems

FEATURES

- Eight software selectable trunks of full E1, T1, or J1 per card
- Two, four, and eight trunk card options available
- A combination of up to 248 MTP2 LSLs and 8 MTP2 HSLs
- Simultaneous support for MTP2 LSLs, HSLs, and SS7 ATM AAL5
- Supports up to 256 channels of one or a combination of protocols on one card, including FR, HDLC, X25, and LAPB/D/F/V5
- PMC, AMC, PCI-X, and PCIe board formats supported from a single driver

For more information, contact: sales@adax.co.uk

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ADVANTECH

Core™ Duo / Core™2 Duo PrAMC

MIC-5602 is a highly integrated single-width, mid-size processor AMC that offers the low-power, high-performance Intel Core™ Duo/Core™2 Duo processor LV or Celeron™ M processors with the high-performance Intel® 3100 chipset. It also includes 1 or 2 GB of soldered DDR2 400 MHz memory with ECC for higher MTBF and optimum cooling. To facilitate development, test, and integration while providing typical network connectivity, the front panel offers a GbE connector, serial port, and USB 2.0 host port. MIC-5602 maximizes AMC edge connector connectivity for the best design flexibility. A Module Management Controller monitors onboard conditions and manages hot swap operation for field upgrades or module replacement without the need to power down the underlying system.

FEATURES

- Supports Intel® Core™ Duo / Core™2 Duo processor LV
- Intel® 3100 chipset 400/533 MHz FSB
- Up to 2 GB DDRII 400 MHz SDRAM with ECC
- One GbE (RJ-45), one USB 2.0 port, and one console port (mini-USB) to front panel
- AMC connector routes dual GbE SerDes x2, SATA x2, USB x2, dual PCIe x4, or single PCIe x8
- Supports IPMI v1.5 and Serial-over-LAN function

For more information, contact: CTinfo@advantech.com

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ADVANTECH

Pentium® M / Celeron M PrAMC

Advantech's **MIC-5601** is a highly integrated single-width, mid-size, processor AMC. Based on low-power, high performance Intel® Celeron® M ULV and Pentium® M LV processors combined with the high performance Intel® 3100 chipset, it includes 1 or 2 GB of soldered DDR2 400 MHz memory with ECC for higher MTBF and optimum cooling. To facilitate development, test, and integration while providing typical network connectivity, the front panel offers a GbE connector, serial port, and USB 2.0 host port. MIC-5601 maximizes AMC edge connector connectivity for the best design flexibility. A Module Management Controller monitors onboard conditions and manages hot swap operation for field upgrades or module replacement without the need to power down the underlying system.

FEATURES

- Supports Intel® Pentium® M processor LV or Celeron® M processor ULV
- Intel® 3100 chipset 400/533 MHz FSB
- Up to 2 GB DDRII 400 MHz SDRAM with ECC
- One Gigabit Ethernet (RJ-45), one USB 2.0 port, and one console port (mini-USB) to front panel
- AMC connector routes dual Gigabit Ethernet SerDes (x2), SATA (x2), USB (x2), dual PCIe x4, or single PCIe x8
- Supports IPMI v1.5 and Serial-over-LAN function

For more information, contact: CTinfo@advantech.com

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PrAMC-7210 AMC

The Emerson Network Power PrAMC-7210 is designed to the AdvancedMC™ (AMC) specifications, making it usable in both AdvancedTCA® carriers as well as MicroTCA™ based applications. The PrAMC-7210 makes a perfect fit for applications looking for control plane processing, and other processor intensive applications that need not only faster data transfers based on Gigabit Ethernet or PCI Express interfaces, but also multi-core processing performance.

The PrAMC-7210 can scale up to 1.5 GHz CPU speeds with memory sizes from 2 GB to 4 GB (2 GB standard), allowing the software reuse for application developers. The Intel 3100 chipset supports integrated north and south bridges, 4-channel DMA engine, DDR2-400 memory, USB, UART, SATA and PCI Express controllers. This reduces both the on-board real estate as well as power consumption. This leaves room for additional features like USB, additional memory, and so on. PrAMC-7210 can augment already deployed systems with more processing power required to support new feature development, and easy migration path based on standard interfaces like PCI Express and Gigabit Ethernet.

The Module Management Controller (MMC) implementing IPMIv1.5 based management and hot-swap feature allows for module replacement or field upgrades, reducing the system down time to almost zero. Carrier Grade Linux brings forth the high availability features required for telecom applications.

FEATURES

- Intel® Core™ 2 Duo processor core with 4 MB L2 cache, running at 1.5 GHz
- 667 MHz front side bus, connecting processor and Intel® 3100 chipset
- 2 GB (possible up to 4 GB) DDR-400 memory with ECC support
- MontaVista CGE or Wind River PNE Linux operating environment
- Basic Blade Services compliant to the Service Availability Forum™ (SA Forum) Hardware Platform Interface (HPI) layer
- AMC front panel support for USB 2.0, Intel® 82551 based 10/100 Fast Ethernet, and serial console port
- 2 MB of BIOS flash with boot failover support
- Offered in both mid-size (7211) and full-size (7210) AMC variants
- AMC.1 PCI Express: One x8 PCI Express link routed to AMC fabric ports 4-11 supporting auto-negotiation to lower lane-widths, and port bifurcation
- AMC.2 Gigabit Ethernet: Two SerDes links on AMC fabric port 0 and 1 respectively
- AMC.3 SATA: Two SATA links on AMC fabric port 2 & 3 respectively
- JTAG support for debugging

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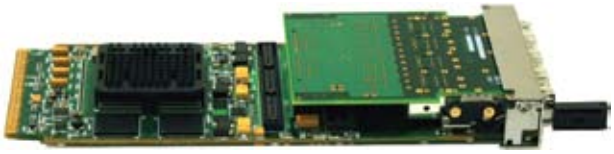
CEN-RL20™

CorEdge Networks' Programmable 20 Gbps FPGA Advanced Mezzanine Card (AMC), CEN-RL20™, is customizable to support a wide range of user requirements. Based on a Xilinx Virtex-5 FPGA, the CEN-RL20™ provides high-speed and programmable SerDes links to the AMC connector and front panel I/O connectors. Using off-the-shelf Intellectual Property (IP), a wide variety of backplane and front panel interfaces can be supported including 1 GbE, 10 GbE, XAUI, PCI Express, Serial RapidIO, SONET, and more.

The flexible architecture of the CEN-RL20™ makes it an ideal solution for multiple MicroTCA/AdvancedTCA applications including 3G wireless equipment, SONET, Carrier Grade Ethernet, GPON, security systems, military/medical imaging solutions, and multi-service routers.



FEATURES

- Xilinx Virtex 5 FPGA provides I/O, processing, and functional customization
- 20 Gbps low latency design
- Wirespeed pattern recognition and policy enforcement
- Multiple 1 GbE, 10 GbE, PCI Express, and Serial RapidIO interfaces
- Numerous off-the-shelf PHY, memory, and co-processor options
- Open interfaces for custom daughter module design

For more information, contact: sales@coredgenetworks.com

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AdvancedMCs CompactPCI and AdvancedTCA Systems Resource Guide 2008

Interphase
2901 North Dallas Parkway, Suite 200 • Plano, TX 75093
214-650-5000
www.iphase.com

iNAV® 31K

The iNAV® 31K AdvancedMC 10 Gbps fabric interface Carrier Card is a flexible, high-performance addition to next generation systems. It meets the needs of a wide variety of applications in AdvancedTCA 3.1 systems, including I/O, processing, and storage.

The iNAV 31K features include a high performance Ethernet switch with 24 gigabit ports and up to two 10 gigabit ports, an optional 8-port PCI Express switch, advanced Telecom Clock management, and a Linux®-based Board Management Processor that provides full local and remote management.

Advanced fully managed Ethernet Switching technology supports features such as complex VLANs, Rapid Spanning Tree, Link Aggregation, and Multicast.

FEATURES

- Supports four single-width, mid-size AdvancedMCs or up to two double-width, mid-size AMCs
- Supports 1/10 Gigabit (AdvancedTCA 3.1 Option 1 & 9) links to the AdvancedTCA Fabric, as well as Base Interface links
- Optional x4 PCI Express links to each AMC bay, with support for a Processor AMC and SAS/SATA disk AMCs
- Advanced Telecom Clock management accepts clock from and to any AMC bay and can drive a clock to any bay
- Powerful Linux®-based PowerQUICC III Board Management Computer with PCIe and GbE access to all
- The iNAV® 31K provides an ideal environment for delivery of highly integrated subsystems

For more information, contact: fastnet@iphase.com

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Interphase
2901 North Dallas Parkway, Suite 200 • Plano, TX 75093
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iSPAN® 36CA

The iSPAN 36CA AdvancedMC™ 4-port GbE Packet Processing solution delivers a high capacity line rate engine for use in AdvancedTCA, MicroTCA, and other proprietary form-factors to address the needs of IPSEC acceleration, policy management and routing, and content inspection and management in the emerging 3G/4G, IMS, and Voice over IP infrastructure application elements.

The iSPAN 36CA is an AdvancedMC implementation of the Cavium Networks next generation 58xx multi-core Octeon Network Services Processor family. With AMC.1 and AMC.2 connectivity and optional RLDRAM for pattern matching, this AdvancedMC can be used on SBCs and carriers in AdvancedTCA, MicroTCA, and proprietary platforms.

INTERPHASE®
Designed To Perform. Designed To Last.™

FEATURES

- Cavium Networks Octeon 58xx on-board processor up to 600 MHz, with support for 4 to 12 cores
- 4x GbE interfaces on front panel
- 4x GbE + 4x PCIe interfaces to the AMC connector with management support across either interface
- Up to 1 GB of DDR2 SDRAM, optional RLDRAM for pattern matching and fast lookup, and optional PSRAM for error logs
- Available software solutions for applications such as IPSEC acceleration, and TCP/IP and SRTP offload
- Experienced professional services group for custom application development and application enhancements

For more information, contact: jparenzan@iphase.com

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Interphase
2901 North Dallas Parkway, Suite 200 • Plano, TX 75093
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www.iphase.com

iSPAN® 3639

The iSPAN 3639 AdvancedMC™ 4- or 8-port T1/E1/J1 communications controller from Interphase delivers a comprehensive high-capacity connectivity solution for use with AdvancedTCA and MicroTCA platform solutions to deliver a wide range of Voice over IP, wireless, and IP Multi-Media Subsystem (IMS) infrastructure application elements.

The iSPAN 3639 incorporates the Freescale PowerQUICC III communications controller to deliver high performance and high capacity processing of signaling traffic. With the addition of an optional FPGA with support for TDM switching and I-TDM protocol conversion together with ISDN or CAS signaling protocol support, the 3639 can be used for full capacity media termination and media switching applications.

INTERPHASE®
Designed To Perform. Designed To Last.™

FEATURES

- 4 or 8 individually software selectable T1/E1/J1 interfaces, with Front or Rear access connectivity options
- On-board support for SS7 MTP-2 (LSL/HSL), ATM, SAAL, ISDN, CAS, Frame Relay, HDLC, and I-TDM
- Complete Linux Software Development Suite (iWARE) with firmware, host driver, API, tools, and samples
- Single width, mid-size or full-size, PICMG AMC.0 R2.0 compliant
- PCI Express (AMC.1) and Gigabit Ethernet (AMC.2) connectivity. Telecom clocks TCLKA/B/C/D support
- Freescale™ PowerQUICC III™ onboard processor @ 833 MHz

For more information, contact: fastnet@iphase.com

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Interphase
2901 North Dallas Parkway, Suite 200 • Plano, TX 75093
214-650-5000
www.iphase.com

iSPAN 3650

The iSPAN® 3650 AdvancedMC Quad OC-3/STM 1 interworking card is part of a new paradigm in communications processing subsystems. Based on the easy to program Wintegra™ WinPath2™ packet processor, purpose built for I/O processing tasks in network access environments, the iSPAN 3650 offers an extensive set of protocols and multi-protocol interworking that reduce application development cycles and improve time to market.

The iSPAN 3650 delivers unprecedented performance in IP traffic interworking between ATM AAL5 and Ethernet with its gateway on a card capability. Specialized functions include packet routing/classification, layer 2 and layer 3 traffic switching, and VPN tag switching.

FEATURES

- Four OC-3/STM 1 or one OC-12/STM 4 SFP interfaces
- High Performance: 36,000 PVCs, 1 M/s AAL2 CPS packets, 50,000 Active CIDs, Full wire speed
- Multi Protocol: AAL1, AAL2 and AAL5, ATM and PPP over SONET/SDH
- Carrier Grade Availability with APS support terminated on physically separate 3650 cards
- Embedded MIPS 24K 450 MHz processor for onboard control processing
- Telecom clocks can be input and output on AdvancedMC CLK1 and CLK2

For more information, contact: fastnet@iphase.com

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Interphase
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iSPAN 3676

Designed especially for high-availability, high-bandwidth access applications, the iSPAN 3676 provides OC-3/STM-1 ATM network interface connectivity.

Today's networks require scalable, high-performance platforms with the flexibility to allow network capacity to keep pace with customer's demands. The iSPAN 3676 controller meets the needs of a variety of applications, including IP switching and routing, Internet connections and other applications that require the Quality of Service (QoS) guarantees provided by ATM.

FEATURES

- Single-width, mid-height AdvancedMC
- Single or Dual OC-3/STM-1 interfaces via SFP optics
- PCI Express (AMC.1) interface to the carrier
- Multimode/Single mode fiber
- Mindspeed™ RS8236 155 Mbps ATM SAR
- Support for ATM
- AAL5 and AAL0 Adaptation Layers 2

For more information, contact: fastnet@iphase.com

RSC# 32653 @ www.compactpci-systems.com/rsc

Kontron
14118 Stowe Drive • Poway, CA 92064-7147
888-294-4558
www.kontron.com

AM4010 and AM4100

The Kontron AM4010 and Kontron AM4100 modules are powerful multi-core processor AMCs for use in both AdvancedTCA and MicroTCA applications.

The AM4010 is a highly integrated CPU board implemented as a single mid-size or full-size AdvancedMC. The design is based on the Intel® Core™ Duo and the Intel® Core™ 2 Duo processors combined with the Intel® 3100 server-class chipset.

The AM4100 is a sophisticated AdvancedMC module designed for performance demanding applications such as protocol processing or data management systems. Built around the state-of-the-art Freescale dual-core PowerPC MPC8641D, the board addresses the ever-increasing need of equipment manufacturer for cost-effective and modular processing capabilities.

FEATURES

- AM4010: Intel® Core™ Duo or Intel® Core™ 2 Duo, scalable up to 1.66 GHz
- AM4010: Up to 2 GB SDRAM memory (soldered) with ECC running at 400 MHz
- AM4010: Single-width, full-size or mid-size
- AM4100: Freescale dual-core MPC8641D PowerPC, 1.0/1.33/1.5 GHz
- AM4100: 0.5/1/2 GB soldered SDRAM memory
- AM4100: Single-width, full-size or mid-size

For more information, contact: info@us.kontron.com

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Resource Guide 2008 CompactPCI and AdvancedTCA Systems AdvancedMCs

Kontron
14118 Stowe Drive • Poway, CA 92064-7147
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www.kontron.com

AM4520 SAS AMC

AMC modules are key to extend the value of AdvancedTCA platforms designed for multiple applications in wireless, IMS, and IPTV networks. These modules conserve valuable AdvancedTCA system slots and ensure greater economies of scale and reduced OPEX.

The Kontron AM4520 AMC SAS module is the ideal high performance, highly reliable storage media for next generation systems demanding higher Input/Output Per Second (IOPS) performance in space-constrained networks. Mid-size or full-size, the AM4520 module offers up to 146 GB storage capacity. As a hot swappable Field Replaceable Unit (FRU), the AM4520 also follows the same stringent carrier grade RASM feature set, namely – Reliability, Availability, Serviceability, Maintainability.

FEATURES

- Full-size/mid-size (AMC.0 Rev 2.0); AMC.3 compliant; Management through IPMI 1.5 implementation
- Up to 146 GB capacity; 10,000 rpm, 4.1 ms average seek time; 8 MB cache buffer for improved performance
- S.M.A.R.T. technology capable
- Power On Hour (POH) IPMI counter support to diagnose disk usage in terms of number of hours

For more information, contact: info@us.kontron.com

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Southco

P.O. Box 0116, 210 N. Brinton Lake Road • Concordville, PA 19331
610-459-4000
www.southco.com/ATCAresource

AMC Handles

Southco AMC Module Handles satisfy all types of standard module faceplates – compact, mid-size, and full-size. Our AMC Carrier Handles stow neatly to avoid interfering with module insertion. Both provide microswitch actuation for safe hot-swapping and maximum configuration flexibility.

Ergonomic design enhances the user experience through intuitive use, making it easy to remove and secure modules quickly. Flush-handle designs provide a clean look when inserted, and protect against potential snagging or improper operation. Robust die-cast construction delivers long-lasting reliable performance.

All of these Southco components feature RoHS-compliant finishes, and are available with custom-color powder-coated handles for enhanced aesthetics or color-coding.

FEATURES

- Robust module handles resist torque, provide a positive detent feel at each of three distinct detent points
- Unique flush handle design offers less protrusion than standard handles and has a streamlined look
- Carrier handles provide ample clearance for all size configurations of AdvancedMC modules
- Carrier handles feature intuitive operation – extend and rotate to de-activate microswitch, pull to release
- Snap-in light pipe brackets include light pipe housing and light pipes in a one-piece assembly
- Standard and custom light pipe brackets are available for AMC.0 R1.0 and AMC.0 R2.0 standards

For more information, contact: info@southco.com

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AdvancedMCs CompactPCI and AdvancedTCA Systems Resource Guide 2008

Yamaichi Electronics USA Inc

475 Holger Way • San Jose, CA 95134
408-715-9100
www.yeu.com

CN074-340-0003

Our NEW dual-slot AMC connector which can stack two mid-size modules at 1U height. Yamaichi's unique connector mounting technology, CMT (Compression Mount Technology), requires less PCB inner layers. Our CN074 AdvancedMC combines our CMT and patented flexible circuit board, YFLEX. This combination reduces insertion loss and cross talk to the absolute minimum. Our CN080 complies with the MicroTCA design, having 170 contacts on 0.75mm pitch. The CN084 fits perfectly into the aggregated AMC backplane connectors with low insertions force and is available in various combinations. We also offer a variety of 2mm hard metric connectors. Receptacle & Plug that comply with the CompactPCI backplaneI/O interconnect. Yamaichi also provides AdvancedTCA and CompactPCI Power.

FEATURES

- Compression to Carrier Board and Backplane Connection
- Differential Impedance of 100(+/-) 10
- Low Cross Talk
- GR-1217-CORE Compliant
- 1U Height
- 12.5Gbps, RoHS Compliant

For more information, contact: info@yeu.com

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Xalyo Systems
Riant-Coteau 7 • Gland, 1196 Switzerland
+41-22-9950001
www.xalyo.com

XS-AMC2

XS-AMC2 is an Advanced Mezzanine Card (AMC) which offers high-end ATM and IP services at an attractive price.

XS-AMC2 provides termination, switching and interworking capabilities from any port to any port.

XS-AMC2 performance and features are ideally suited for applications such as Wireless networking, Voice over Packet, DSLAM, and Media Signaling Gateways.

Using the state of the art Wintegra's™ WinPath2™ Network Processor, XS-AMC2 is the perfect interface to handle both ATM and IP simultaneously.

XS-AMC2 on-board 24K MIPS processor can run advanced protocols (for example, 3GPP, SS7, ATM, VoIP) while the Network Processor handles all the data path.

XS-AMC2 I/O ports are highly configurable and supports a mix of:

OC-3/STM-1
OC-12/STM-4
10BASE-T
100BASE-TX
100BASE-FX
1000BASE-T
1000BASE-X

Compliant with PICMG Advanced Mezzanine Card AMC.0, AMC.1 and AMC.2, XS-AMC2 can be used on AdvancedTCA™, MicroTCA™ and proprietary platforms.

XS-AMC2 architecture allows bypassing the bottleneck of current systems by handling all the processing on-board carrier board but also optimizes bus transfers while doing termination.

FEATURES

- WinPath2™ Network Processor
- ATM AAL0, AAL1, AAL2, and AAL5
- 4 x OC-3/STM1 (ATM and POS)
- 1 x OC-12/STM-4 (ATM and POS)
- 4 x Gigabit Ethernet
- Automatic Protection Switching (APS)
- PICMG® AMC.0 R2.0, AMC.1 and AMC.2 TypeE2, and 2
- On-board 32-bit MIPS 24K™
- Encryption, Security
- 3 x 128 MB DDR2 with ECC, 32 MB Flash EPROM
- SFP Optical Transceivers
- Linux, Solaris and VxWorks®

ALPHI Technology Corp.

6202 South Maple Avenue, Suite 120 • Tempe, AZ 85283
480-838-2428
www.alphitech.com

CPCI-6713-4IP

The CPCI-6713B-4IP module provides a 6U high performance flexible I/O scheme that supports industry standard Industry Packs. For applications requiring low cost, high density I/O or unique combinations, the CPCI-6713B-4IP is the perfect solution. The Local DSP can be used to simply move data to and from the CompactPCI bus or provide pre processing functions such as local PID controls, FFTs, digital filtering, etc. Custom application software can be downloaded to the DSP via the CompactPCI bus. A very low cost version without DSP is also available, CPCI-SIP.

The TMS320C67x DSP generation is supported by the TI eXpressDSP™ set of industry development tools, which includes a highly optimizing C/C++ Compiler, the Code Composer Studio™ IDE, JTAG-emulation, and DSP/BIOS. For further information contact Serge Roussel at sales@alphitech.com.

FEATURES

- Supports four (4) independent Industry Pack Modules – 8/32 MHz operation
- High-performance Floating-Point Digital Signal Processor TMS320C6713B @ 300 MHz
- 64 KB L2 Unified Cache. Mapped RAM and 192 KB additional L2 Mapped RAM. Dual 32-bit general purpose timers
- 32 MB of SDRAM
- JTAG emulator port- drivers for Linux, Window XP, Labview, and others
- Over 50 applications on Industry Packs Modules solutions

For more information, contact: info@alphitech.com

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PMCs CompactPCI and AdvancedTCA Systems Resource Guide 2008

Innovative Integration

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www.innovative-dsp.com

VelociaPMC

VelociaPMC - Ultra-fast Reconfigurable I/O PMC/XMC Cards
The PMC module family integrates ultra-fast signal capture, generation, and co-processing on an advanced PMC architecture. Each card combines new generation analog devices with large user-reconfigurable Virtex-II Pro FPGA, ample DDR memory, and low jitter clocks/triggers on a 64/66 PCI with a private JN4 64-bit user I/O port and an XMC 4-lane Rocket I/O (per VITA 42) that connects straight to the FPGA of our Velocia CompactPCI boards or other carriers. This ultimate connectivity allows for rapid deployment of the most advanced systems.

FEATURES

- DR Module – 16 Channel Digital Receiver Four A/D 125MHz
- UWB Module – Ultra-wide Digital Receiver Dual A/D 250MHz
- TX Module – Digital Transmitter/Arbitrary Waveform Generator, (4) 1GHz DAC
- CG Module – Programmable Precision Clock Source; four clock outputs
- Best-in-class speed and analog fidelity; ample resources for hardware-assisted DSP
- Ultra-fast data stream with low latency; ultra-fast serial link to host card

For more information, contact: sales@innovative-dsp.com

RSC# 33240 @ www.compactpci-systems.com/rsc

Innovative Integration
2390-A Ward Avenue • Simi Valley, CA 93065
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www.innovative-dsp.com

X3-10M

The X3-10M is an XMC I/O module featuring eight simultaneously sampling 16-bit, 25 MSps A/D channels designed for high speed instrumentation and analysis for neuro-physical, high speed motion analysis, and high speed data acquisition applications.

Flexible trigger methods include counted frames, software triggering, and external triggering. The sample rate clock is either an external clock or on-board programmable PLL clock source.

Data acquisition control, signal processing, buffering, and system interface functions are implemented in a Xilinx Spartan3A DSP FPGA, 1.8M gate device. Two 512 Kx32 memory devices are used for data buffering and FPGA computing memory.

The logic can be fully customized using VHDL and MATLAB using the FrameWork Logic toolset.

FEATURES

- 8 simultaneously sampling 16-bit, 25 MSps A/Ds
- Programmable input: ±2 V, ±1 V, ±0.4 V, ±0.1 V
- High impedance, differential inputs
- Xilinx Spartan3A DSP, 1.8M gate FPGA
- 4 MB SRAM
- PCI Express
- Programmable Low Jitter PLL timebase

For more information, contact: sales@innovative-dsp.com

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Innovative Integration
2390-A Ward Avenue • Simi Valley, CA 93065
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www.innovative-dsp.com

X3-25M

The X3-25M is an XMC I/O module featuring two 16-bit, 25 MSPS A/D channels and two 16-bit, 50 MSps DAC channels designed for high speed stimulus-response, ultrasound, and servo control applications.

Flexible trigger methods include counted frames, software triggering, and external triggering. The sample rate clock is either an external clock or on-board programmable PLL clock source.

Data acquisition control, signal processing, buffering, and system interface functions are implemented in a Xilinx Spartan3 FPGA, 1M gate device. Two 1Mx16 memory devices are used for data buffering and FPGA computing memory.

The logic can be fully customized using VHDL and MATLAB using the FrameWork Logic toolset.

FEATURES

- Two 130 MSps, 16-bit A/D channels. Two 50 MSps, 16-bit DAC channels
- ±2 V, ±1 V, ±0.2 V input ranges ±2 V output range
- 16-bits front panel DIO (8 differential pairs)
- Xilinx Spartan3, 1M gate FPGA
- PCI Express
- 4 MB SRAM
- Programmable PLL timebase

For more information, contact: sales@innovative-dsp.com

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Innovative Integration
2390-A Ward Avenue • Simi Valley, CA 93065
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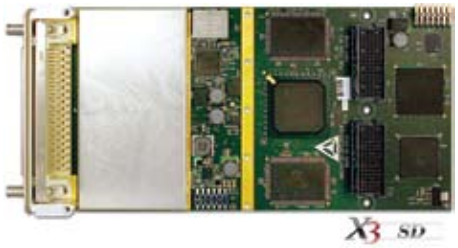
www.innovative-dsp.com

X3-SD PCIe XMC

The X3-SD is an XMC I/O module featuring 16 simultaneously sampling, sigma delta A/D channels designed for vibration, acoustic, and high dynamic range measurements. A precision, low-jitter timebase or external clock is used for sample rate generation. Sample rates up to 216 kHz, with <10 Hz programmable resolution, are supported as well as standard audio rates. Flexible trigger methods include counted frames, software triggering, and external triggering. Data acquisition control, signal processing, buffering, and system interface functions are implemented in an Xilinx Spartan3 FPGA, 1M gate device. Two 1Mx16 memory devices are used for data buffering and FPGA computing memory. The logic can be fully customized. Download data sheets and pricing now.



FEATURES

- Sixteen Input Channels >110 dB SFDR >105 dB S/N fully differential, ±10 V inputs
- Sample rates up to 216 ksps. Programmable oversampling modes Xilinx Spartan3, 1M gate FPGA 4 MB SRAM
- Programmable PLL timebase. Framed, software or external triggering Log acquisition timing and events
- 48-bits digital I/O on J16 Power Management features. XMC Module (75 mm x 150 mm)
- XMC Module (75 mm x 150 mm) PCI Express (VITA 42.3)
- Applications include vibration measurement, and audio and acoustic testing. Data acquisition

For more information, contact: sales@innovative-dsp.com

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Innovative Integration
2390-A Ward Avenue • Simi Valley, CA 93065
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www.innovative-dsp.com

X3-SDF

The X3-SDF is an XMC I/O module featuring 4 simultaneously sampling, sigma delta A/D channels designed for vibration, acoustic, and high dynamic range measurements. The A/D device has programmable output rates up to 24-bits @ 2.5 MSPS and 16-bits @ 20 MSPS using the programmable filter in the A/D. A precision, low-jitter timebase or external clock is used for sample rate generation. Sample rates up to 20 MSPS, with <10 kHz programmable resolution, are supported as well as external clocking. Trigger methods include counted frames, software, and external triggering. Data acquisition control, signal processing, buffering, and system interface functions are implemented in an Xilinx Spartan3 1M gate FPGA. Download data sheets and pricing now.

FEATURES

- Four simultaneous A/D channels >110 dB SFDR @ 625 ksps >105 dB S/N @ 2.5 MSPS
- Fully differential, ±5V inputs Programmable output resolution and sample rates up to 20 MSPS
- Programmable filters, Xilinx Spartan3, 1M gate FPGA 4 MB SRAM External or Programmable PLL timebase
- Framed, software or external triggering Log acquisition timing and events 48-bits digital IO on J16
- Power Management features XMC Module (75 mm x 150 mm) PCI Express (VITA 42.3)
- Applications: vibration measurement, audio, and acoustic testing or data acquisition

For more information, contact: sales@innovative-dsp.com

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Innovative Integration

2390-A Ward Avenue • Simi Valley, CA 93065
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www.innovative-dsp.com

X5-210M

The X5-210M is an XMC I/O module featuring four 14-bit 210 MSPS A/Ds with a Virtex5 FPGA computing core, DRAM and SRAM memory, and eight lane PCI Express host interface. An Xilinx Virtex5 LX110T (SX95T when available) with 512 MB DDR2 DRAM and 4 MB QDR-II memory provide a very high performance DSP core for demanding applications such as emerging wireless standards. The close integration of the analog I/O, memory and host interface with the FPGA enables real-time signal processing at extremely high rates exceeding 300 GMACs per second.

Get pricing and data sheets online now.

FEATURES

- Four 210 MSps 14-bit A/D channels ±1V, 50 ohm, SMA inputs and outputs 512 MByte DDR2 DRAM
- Xilinx Virtex5, LX110T FPGA (SX95T coming) 4 MByte QDR-II SRAM8 RocketIO private links, 2.5 Gbps each
- >1 GB/s, 8-lane PCI Express Host Interface Power Management features XMC Module (75 mm x 150 mm)
- PCI Express (VITA 42.3) fully customized using VHDL and MATLAB
- Applications: Software tuned radios, wireless receivers (up to 256ch.), radar, high speed data records, and FPGA IP Development

For more information, contact: sales@innovative-dsp.com

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Resource Guide 2008 CompactPCI and AdvancedTCA Systems PMCs

Innovative Integration

2390-A Ward Avenue • Simi Valley, CA 93065
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www.innovative-dsp.com

X5-400M

The X5-400M is an XMC I/O module featuring two 14-bit, 400 MSPS A/D and DAC channels with a Virtex5 FPGA computing core and PCI Express host interface on a standard XMC module. An Xilinx Virtex5 LX110T (SX95T when available) with 1 GB DDR2 DRAM and 4 MB QDR-II memory provide a very high performance DSP core for demanding applications such as emerging wireless standards. The close integration of the analog IO, memory and host interface with the FPGA enables real-time signal processing at extremely high rates exceeding 300 GMACs per second. The X5 XMC modules couple Innovative's powerful Velocia architecture with a high performance, 8-lane PCI Express interface that provides over 1 GB/s sustained transfer rates to the host. Get Pricing and Data Sheets online now.

FEATURES

- Two 400 MSPS, 14-bit A/D channels · Two 400 MSPS, 14-bit DAC channels
- ±1V, 50 ohm, SMA inputs and outputs · Xilinx Virtex5, LX110T FPGA (SX95T coming) 1 GB DDR2 DRAM
- 4 MB QDR-II SRAM8 Rocket IO private links, 2.5 Gbps each >1 GB/s, 8-lane PCI Express Host Interface
- Power Management features · XMC Module (75 mm x150 mm) PCI Express (VITA 42.3)
- Applications include: · Wireless Receiver and Transmitter · WLAN, WCDMA, WiMAX front end RADAR
- Electronic Warfare · High Speed Data Recording & Playback · High speed servo controls · IP development

For more information, contact: sales@innovative-dsp.com

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Trusted ePlatform Services

ADVANTECH

MicroTCA™ Carrier Hub

µTCA-5503 combines management infrastructure and necessary interconnect fabric resources in a single AMC module in order to support up to twelve AMCs in one MicroTCA shelf. It features a primary GbE fabric on Common Options Fabric A and MicroTCA Carrier Management Controller (MCMC) functions to configure and control the elements. The MCMC is the central authority in a MicroTCA shelf and has the ability to monitor and control the constituent AMCs. This control function makes use of IPMI links to each AMC, as well as presence detect, enable, and Geographic Address signals. Where redundancy is required, two MCHs permit the creation of highly reliable systems. For future pluggable enhancements, µTCA-5503 offers built-in expandability features.

FEATURES

- Layer 2 GbE switch for up to 12 AdvancedMC™ modules on Common Options Fabric A
- MCH update channel for Carrier Hub redundancy
- Front panel GbE uplink over RJ-45 or SFP
- Pigeon Point based MCMC with direct or switched 10/100 Management LAN port available on front panel
- Shelf and carrier management with OpenHPI support
- Switch Management and PCI Express fabric switching

For more information, contact: CTinfo@advantech.com

RSC# 35981 @ www.compactpci-systems.com/rsc

Carrier Hubs (MCH) CompactPCI and AdvancedTCA Systems Resource Guide 2008

CorEdge Networks
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www.coredgenetworks.com

CorEdge Networks

CEN-MCH™

CorEdge Network's MicroTCA Carrier Hub (CEN-MCH™) provides the central management, network connectivity, and clocking for MicroTCA systems. It supports up to twelve Advanced Mezzanine Cards (AMCs), two Cooling Units (CUs), up to four Power Modules (PMs), and a redundant MCH.

Numerous clock and fabric options are also supported. Fabric options include 10 GbE, PCI Express, and Serial RapidIO. Clocking module options include: PCI Express 100 MHz, Telco with 8 KHz and 19.44 MHz support, and GPS supporting 100 MHz, 30.72 MHz, and 1 PPS.

The scalable and flexible architecture of the CEN-MCH™ makes it an ideal solution for any type of MicroTCA application including 3G wireless equipment, WiMAX base stations, embedded computing systems, and more.

FEATURES

- Flexible and scalable architecture supports up to 12 AMCs, 2 CUs, and 4 PMs
- Full support for IPMI, redundancy, E-Keying, cooling management, hot insertion/extraction, and more
- Clock modules available for PCI Express, Telecom, and GPS applications
- Fabric modules available for PCI Express, SATA/SAS, 10 GbE, and Serial RapidIO
- Integrated Shelf Manager supporting RMCP based middleware connectivity
- Redundant MicroTCA Carrier Hub support

For more information, contact: sales@coredgenetworks.com

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CorEdge Networks

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www.coredgenetworks.com

CEN-MCH-10GbE™

CorEdge Networks' MicroTCA Carrier Hub (CEN-MCH™) allows for multiple fabric options. The base module of the MCH provides IPMI management and GbE. The optional fabric module enables different types of fabrics in the "fat pipe" region of the platform AMCs.

By adding high speed 10 Gbps capable fabric modules to the MCH, the aggregate bandwidth of a MicroTCA platform can scale to approximately 500 Gbps. This type of system performance is required for many edge telecommunications applications, including Unified Threat Management (UTM) systems, SGSN/GGSN wireless equipment, and IP Routers as well as Carrier Grade Ethernet Platforms, GPON Platforms, and Video Servers.

FEATURES

- Non-blocking, low latency 10 Gbps switching supporting up to 12 AMCs
- Two front panel 10 GbE connections for system uplink
- Advanced congestion management and flow control features
- VLAN, DiffServ, and eight classes of service per port
- 10 GbE connection between redundant MCHs
- Fully integrated management for health monitoring, power control, and reset

For more information, contact: sales@coredgenetworks.com

RSC# 35868 @ www.compactpci-systems.com/rsc

HARTING

1370 Bowes Road • Elgin, IL 60123
877-741-1500
www.HARTING-USA.com

AdvancedTCA® & MicroTCA™ Connectors

The HARTING AdvancedMC™ connector (B+ style) is fully compliant with the PICMG AMC.0 specification for use with AdvancedTCA® carrier boards or related applications; the HARTING MicroTCA™ connector is fully compliant with the PICMG MicroTCA™ specification for use with MicroTCA™ backplanes.

Both connectors are designed to support the full range of AdvancedMC™ data transmission speeds up to 12.5 Gbps while sharing a precision press-fit compliant pin designed for 0.55 mm plated PCB holes. This provides significant reliability advantages over other termination technologies. The footprints minimize PCB layer count, leading to PCB mfg cost reductions. The HARTING AdvancedMC™ connectors feaure ***con**:card+ technology for enhanced mating reliability. More information is available at www.concardplus.com.

FEATURES

- AdvancedTCA® and MicroTCA™ connectors: Press-fit termination technology for connection reliability and assembly
- Optimized footprint enables routing on low layer count; fully compliant with PICMG AMC.0 and MicroTCA™specs
- Excellent routing capabilities with wide-routing channels and low cross talk.

***con**:card+ Design® Enhancements

- GuideSpring offsets PCB finger tolerance deviations by constantly pressing module against the opposite wall
- GuideSpring secures module position against shocks and vibrations, preventing loss of contact and surface water
- Increased wear resistant via corrosion-resistant contact plating, surface and relaxation-resistant material

For more information, contact: more.info@HARTING.com

RSC# 36028 @ www.compactpci-systems.com/rsc

FCI
825 Old Trail Road • Etters, PA 17319-9351
800-237-2374
www.fci.com

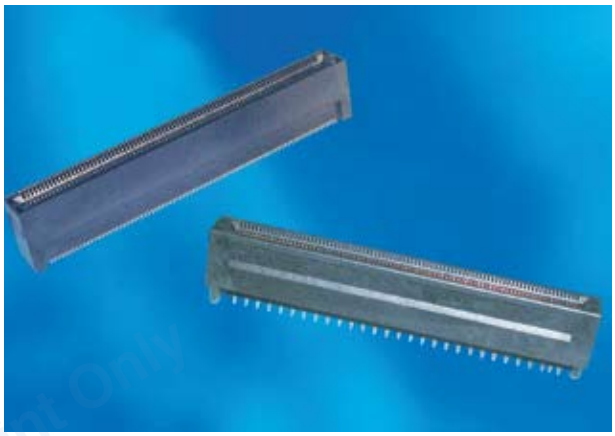
MicroTCA Backplane

FCI MicroTCA™ (µTCA™) vertical card-edge connectors provide 170 contacts on 0.75mm pitch and enable AdvancedMC™ modules to be plugged directly into a backplane. FCI offers options for press-fit or surface-mount (SMT) termination, and both connector versions are compatible with the PCB connector footprints that are defined in the MicroTCA specification. Customers can choose the termination option that best suits their system design and manufacturing preferences. The connector designs and PCB footprints are also optimized to support differential signaling with very low loss and crosstalk at speeds up to 12.5 Gb/s.

The press-fit connector version extends the use of MicroTCA architecture to thicker backplanes where proven press-fit technologies are often preferred. The surface-mount connnector supports systems that employ smaller and less complex backplanes and allows the use of more cost-effective, SMT reflow soldering processes. Capability for connector installation using conventional press-fit or SMT assembly processes, combined with connector designs that require no costly hardware, secondary mechanical retention or compensating board stiffeners, results in low total applied cost. Metal retention clips on the SMT connectors provide additional mechanical strength after soldering.

The MicroTCA standard, developed within PICMG®, defines a physically small but very powerful system in a shelf measuring 4U high by 300 mm deep. The MicroTCA system architecture reduces size and cost by eliminating the AdvancedTCA® carrier board and providing a chassis that accepts AdvancedMC™ modules directly. The MicroTCA form factor is expected to be ideal for communications equipment, such as core routers and IP-gateways, radio base stations and switching centers, and customer premises equipment, where small physical size and cost are key design constraints.

For more information, please visit our website at www.fci.com.



FEATURES

- Dual-row, 170-position card-edge interface with 0.75 mm contact pitch
- Options for press-fit or surface-mount (SMT) termination
- Compliant with the MicroTCA specification
- Press-fit termination for application to thicker and larger backplanes
- Surface-mount (SMT) termination with PCB footprint optimized for electrical performance
- Very low loss and crosstalk for low-voltage differential signaling at data rates up to 12.5 Gb/s per lane
- SMT footprint allows for increased flexibility in routing PCB traces
- Metal retention clips at SMT connector ends provide additional mechanical strength after soldering
- Lead-free and RoHS-compatible

FCI
825 Old Trail Road • Etters, PA 17319-9351
800-237-2374
www.fci.com

MicroTCA Power Input

FCI, a leading supplier of connectors and interconnect systems, offers D-Subminiature 7W2 connector options to enable 48V or 60V DC input connections to power modules used in MicroTCA™ shelves. Each power contact provides 24A current-carrying capacity. The shielded connectors are designed to fit the power module faceplate on the front side of a power module made in accordance with MicroTCA specifications.

FCI can provide the board-mount connectors, cable connectors, accessories, and cable assemblies needed for power input feeds to MicroTCA power modules. The board-mount connectors, available in single port or dual-stacked configurations for redundant input feeds, have the most compact footprint on the market, providing more space on the board for routing supplementary traces or placing additional components.

The board-mount connector offering includes through-hole options suitable for wave soldering or Pin-in-Paste (PiP) reflow soldering. PiP processing technology enables through-hole components to be soldered using conventional reflow soldering processes, which can result in lower applied costs by eliminating the need for a separate wave soldering operation in the process flow.

Designers can also choose between a cable connector having two standard solder bucket signal contacts or a version having a pre-installed shunt on the signal contacts used for First Mate Last Break (FMLB) functionality for lower applied cost. Power contacts are offered in both solder bucket and crimp versions for cable termination.

All MicroTCA power module input connectors meet the RoHS European Directive EU 2002/95/EC.

For more information, please visit www.fci.com.

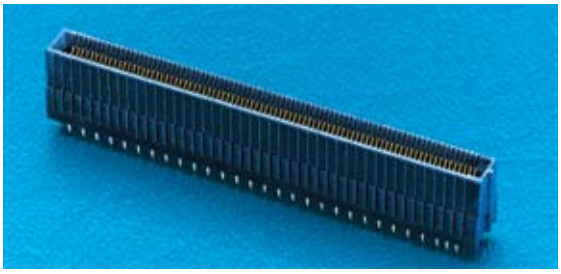
FEATURES

- Support for 48V or 60V DC input at 24A (shell size A)
- First Mate Last Break (FMLB) design
- Single or dual-stacked board-mount versions available
- Compact connector PCB footprint for efficient utilization of board space
- Solder-to-board and Pin-in-Paste (PiP) versions for through-hole reflow solder termination
- PiP versions are pick-and-place compatible
- Full grounding connection from shelf to PCB
- Threaded screw-locks and thumbscrews secure cable ends and withstand accidental unmating
- Cable ends are field repairable
- Touch-proof design on cable connector
- Cable hoods can be stacked side-by-side
- Cost saving option for shunt between signal contacts on cable connector

Molex
2222 Wellington Court • Lisle, IL 60532
630-969-4550
www.molex.com

molex®
one company › a world of innovation

Edge Connector



Molex has created a 170-circuit, 0.75 mm pitch press-fit, high-speed connector design suitable for use in MicroTCA and for other high-speed differential applications. Product performance will meet MicroTCA specifications, offering electrical performance to 10 Gbps, and easy press-fit termination to the backplane. It mates to an existing AMC.0 module. Application tooling is available.

By utilizing a simpler terminal design than other MicroTCA edge connectors, Molex is able to offer very competitive pricing. Arrangements to offer second sourcing for this connector have been finalized with Samtec. Special configurations with varying power, single ended, and differential signal combinations are available.

FEATURES

- Meets MicroTCA requirements
- Easy press-fit termination
- Cost effective terminal design
- Excellent high-speed differential performance
- Second source available
- Can be configured to serve many other high-speed interconnect needs

For more information, contact: amerinfo@molex.com

RSC# 36011 @ www.compactpci-systems.com/rsc

Connectors CompactPCI and AdvancedTCA Systems Resource Guide 2008

Molex
2222 Wellington Court • Lisle, IL 60532
630-969-4550
www.molex.com

molex®
one company › a world of innovation

MicroTCA Chassis

MicroTCA is emerging as an attractive form factor for low-end equipment and multiple applications. To enable customers to quickly develop MicroTCA systems, Molex has collaborated with Simon Industries to offer a small and sophisticated development chassis. It is equipped with the Molex backplane and connector, as well as an AC-to-DC power supply (mounted at the rear of the chassis). This makes it an ideal chassis to place on the desk lab bench for development and testing of cards, software, and middleware. The full redundancy capability of our dual-star backplane allows customers to test the functionality of their management chips as well as fail-over capability.

FEATURES

- Small, convenient size: 17.25" wide x 7.13" high x 10" deep (438 mm x 181 mm x 254 mm)
- Air input from all four sides; exhaust from three sides and the top enables full cooling functionality in 4U height
- Four compact slots to allow either 10 full-height slots or four compact and eight full-height slots (12 total)
- Excellent for new generation testing that requires higher speeds
- 10 Gbps backplane installed for direct comparison of Molex to other backplane solutions in a similar card cage
- Power supply on rear converts 110 or 220 VAC to 48 VDC that is wired to the front

For more information, contact: microtca@molex.com

RSC# 32834 @ www.compactpci-systems.com/rsc

Positronic Industries, Inc.

423 North Campbell Avenue • Springfield, MO 65806
800-641-4054
www.connectpositronic.com

Power Input

QB Series, MicroTCA™ Power Input Connector

More than twenty years ago, Positronic Industries, Inc. introduced the dual port, stacked D-subminiature connector to the electronics industry.

Recently, a combination D-subminiature version of the dual port connector was chosen as the MicroTCA™ power input interface. The dual port package provides for close spacing between the upper and lower connectors, allowing for a narrow input module face plate.

Placing a "dual connector" interface into the input power module during manufacturing is simplified. Only one connector unit need be placed onto the PCB.

A "uni-port" version of the QB Series power connector is offered for applications requiring a single power input.

FEATURES

- 7W2 variant meets µTCA 48 V input requirements
- 9W4 variant meets µTCA 12 V input requirements
- Dual port right angle PCB mount connector simplifies manufacturing
- A "uni-port" version is also available
- Crimp contact cable connectors offer ultra low profile 0backshells, allowing ease on in-cabinet cable routing

For more information, contact: info@connectpositronic.com

RSC# 31802 @ www.compactpci-systems.com/rsc

Carlo Gavazzi Computing Solutions

10 Mupac Drive • Brockton, MA 02301
508-588-6110
www.cg-cs.com

650 Series

Carlo Gavazzi Computing Solutions 650 Series of 2U MicroTCA Systems provide the features required to deploy up to 12 AdvancedMCs (AMCs) in an economical and low profile 2U 19" rack-mount chassis.

The chassis comes in two standard configurations: a) one MCH and 9 full-height, single-width AMCs or b) one MCH, 6 full-height, single-width and 6 half-height, single-width AMCs. In addition, a range of other customizable configurations for single and double-width, full- and half-height Advanced Mezzanine Card slots can also be achieved.

FEATURES

- Multiple configurations support half- and full-height, single- and double-width AMCs
- Up to 12 AMCs can be configured into a 2U rack space
- Push-pull controlled and monitored thermal management system for 40 W per AMC
- MCH and a 12-port backplane with base fabric connectivity support AMC.2 1000BASE-BX fabric
- SATA backplane connectivity
- 600 W universal input AC power supply

For more information, contact: pr@cg-cs.com

RSC# 33669 @ www.compactpci-systems.com/rsc

Elma Electronic Inc.

44350 S. Grimmer Blvd. • Fremont, CA 94538
510-656-3400
www.elma.com

MicroTCA

Elma has the widest selection of MicroTCA backplanes, system platforms, and more! Using a unique modular extrusion-based design, Elma can quickly and easily modify its MicroTCA platforms to various different configurations. Elma's MicroTCA product selection includes the features noted on the right:

FEATURES

- Backplanes: 14-slot star backplane · 14-slot dual star backplane · 10-slot dual star cube backplane · 6-slot dual star cube backplane
- System platforms:
  - 1U MicroBox™ Pico Chassis
  - 2.5U open card cage (for cabinet enclosure)
  - 4U, 5U subrack: Single modules, 14 slots
  - 6U subrack: Redundant fans, single modules, 14 slots
  - 7U subrack: Double modules, 14 slots
  - 7U cube: Single or double modules, 10 slots
  - 8U subrack: Redundant fans, double modules, 14 slots
- MicroTCA cabinet: 44U liquid-cooled MicroTCA cabinet enclosure
- MicroTCA components: handles and panels (coming soon!)

For more information, contact: sales@elma.com

RSC# 32876 @ www.compactpci-systems.com/rsc

Packaging CompactPCI and AdvancedTCA Systems Resource Guide 2008

Hybricon Corporation

12 Willow Road • Ayer, MA 01432
978-772-5422 x 261
www.hybricon.com

µTCA ATR Chassis

Hybricon Corporation is the only electro-mechanical packaging company in the industry that offers a complete line of both commercial and rugged µTCA enclosures, including: Rack-mount Development Chassis • Convection-Cooled ATRs • Conduction-Cooled ATRs

The Convection-Cooled ATR is a shock mounted µTCA card cage that has been specifically engineered to withstand some of the most extreme rugged environments.

The chassis uses top load µTCA/AMC cards and supports a front 150MM section and rear 75MM section, with air flowing through the two series front to back. The design of the chassis is intended to cool up to 80W per double width full height slot and 40W per single width full height slot at 10,000 feet altitude. Pressurized fans are mounted to the card cage at the front panel with a honeycomb air inlet panel and application specific I/O connectors.

To complement the full ATR-tall/long convection-cooled chassis, Hybricon is also leading the industry with the development of the first -ATR conduction-cooled single-width µTCA ATR. This rugged ATR design further extends the environmental boundaries in which the µTCA technology can be deployed.

Please contact Hybricon at 1-877-HYBRICON to discuss your rugged µTCA needs.

FEATURES

- Top load µTCA/AMC cards and supports a front 150MM section and rear 75MM section, with air flowing through the back
- Cools up to 80W per double-width full-height slot and 40W per single-width full-height
- Pressurized fans are mounted to the card cage at the front panel with a honeycomb air inlet panel and connectors

For more information, contact: cburden@hybricon.com

RSC# 35668 @ www.compactpci-systems.com/rsc

Simon Industries, Inc.
1003 Morrisville Parkway Suite 100 • Morrisville, NC 27560
919-469-2004
www.simonindustries.com

Ceres 1000

MicroTCA (Telecommunications Computing Architecture) is a PICMG standard, open architecture specification using field-replaceable, hot-swap capable, Advanced Mezzanine Cards.

MicroTCA™Table Top Development Platform
Simon Industries' MicroTCA table-top development chassis is well-suited for developing and debugging MicroTCA systems using full-height and half-height AdvancedMC modules. Utilizing the Molex Dual-Star backplane, the Simon Chassis can facilitate hardware and software development, accelerate time to market, and allow developers to evaluate various AdvancedMC cards, power supplies, and MCH products.

The Simon chassis features blind mating connectors to enable live replacement of the fan tray without powering down the chassis. The backplane features the Molex press-fit edge card connectors that are combined with precise launch geometry, minimizing reflections and enabling 10 Gbps over each differential pair. This allows the backplane to handle up to 4 times the bandwidth of other backplanes.

To minimize crosstalk, the design of the MicroTCA backplane employs spacing between pairs of at least 0.25 mm (0.010"). A Field Replaceable Unit Read Only Memory (FRU ROM) that facilitates communication of all important backplane characteristics to the MCH.

Backplane Configuration
Four compact slots to allow either 10 full-height AdvancedMC cards (or 4 compact and 8 full-height payload slots) for a total of 12 AdvancedMC slots. Fabric B on ports 2 and 3 is configured to support SAS or SATA drives in any of the slots, allowing customers to connect processor cards directly to storage drives. Slots for 2 MCH modules and 2 power supplies, make it easy to test hand-off features to the alternate MCH or power supply.

Cooling
The removable fan-tray is equipped with 10 high-performance 12 Vdc fans mounted beneath the card cage. The arrangement of these 80 mm fans provides optimized uniformly turbulent airflow to all slots of the card cage. When installed, the rear-mounted 1000 Watt power supply has its own independent cooling fans and air circulation path.

FEATURES

- Cabinet construction: Painted steel cabinet with stamped steel card guides
- Height: 6.98" (177 mm) Standard 4U; Width: 17.25" (438 mm); Depth: 8.50" (208 mm) without rear p/s; Depth: 10.25" (260 mm) with rear p/s
- 1000 Watt rear-mounted 115/240 Vac input p/s
- -48 Vdc to one or two MicroTCA-specified in-rack supplies
- Available for order without p/s

TTM Technologies, Inc.

15 Industrial Park Drive • Stafford Springs, CT 06076
860-684-8000
www.ttmtech.com

MicroTCA Chassis

TTM's MicroTCA based chassis family includes configurations for single-, double-, and quad-width AMC slots. These flexible cost-effective designs are supported by our world-wide PCB fabrication and assembly facilities.

High performance backplanes can support up to 12 AMCs, single or dual MCH and PSUs, and single or redundant cooling-unit interconnect.

All of the baseline chassis and backplane products are easily modified to meet customer specific applications.

Unique product features include 100 percent cost-effective sheetmetal construction, slot ESD clips, and plug-and-play slot adapters for single-width cards used in double-width chassis.

FEATURES

- 4U and 5U single-width AMC chassis support up to 50 W/slot cooling; 6U and 8U/9U double-width AMC chassis support up to 80 W/slot cooling
- Fan trays include IPM fan controller, hot-swap request switch, hot-swap LED, fan status LED, and ESD jack
- Flush or recessed chassis in 19" or ETSI rackmount configurations w/ NEBS compliant air filtering
- Single-star backplanes with single PSU slot. Dual-star backplanes with single or dual PSU slot(s)
- RoHS 5/6 or 6/6 compliance. Custom ruggedized ARINC404/600 configurations also available

For more information, contact: microTCA@ttmtech.com

RSC# 35850 @ www.compactpci-systems.com/rsc

CorEdge Networks

7600 Boone Avenue North, Suite 1 • Brooklyn Park, MN 55428
763-488-9750
www.coredgenetworks.com

CEN-MPWR™

CorEdge Networks' CEN-MPWR™ is a high current density, hot-swappable, and intelligent MicroTCA Power Module (PM). It accepts and conditions system input power, converts it to the appropriate levels, and radially feeds the power to MicroTCA shelf elements with channel-by-channel power control. The CEN-MPWR™ provides management and payload power for up to twelve Advanced Mezzanine Cards (AMCs), two Cooling Units (CUs), and two MicroTCA Carrier Hubs (MCH).

The flexible and efficient architecture of the CEN-MPWR™ enables multiple input power options at high current densities (up to 50 amps) in a 6HP form factor. It is an ideal solution for any type of MicroTCA application including 3G wireless equipment, WiMAX base stations, embedded computing systems, and more.

FEATURES

- Advanced FPGA based design
- Multiple Input power options: 48 VDC, 12 VDC, or 110/220 VAC
- Over-temperature, over-voltage, and over-current protection
- Redundant MicroTCA Power Module support
- Robust full featured Power Module Enhanced Module Management Controller (PM-EMMC)
- User accessible console with advanced integration utilities.

For more information, contact: sales@coredgenetworks.com

RSC# 33966 @ www.compactpci-systems.com/rsc

Emerson Network Power
5810 Van Allen Way • Carlsbad, CA 92008
1 (888) 412-7832 or 1 (760) 930-4600
www.powerconversion.com

MTC600 Series

Emerson Network Power's MTC600 series power modules provide a self-contained power solution for MicroTCA systems. The modules can support shelves, cubes and other system implementations, and are fully compliant with the PICMG MicroTCA.0 Revision 1.0 specification.

MTC600 power modules implement all the incoming power conversion, power management and power protection functionality necessary for a complete MicroTCA system comprising up to 12 AdvancedMCs, 2 MicroTCA Carrier Hubs and 2 Cooling Units. There are two versions available: an ac-input version, which accommodates 90 to 264 Vac and is suitable for use with single-phase supplies virtually anywhere in the world; and a -39.5 to -72 Vdc input version, which accommodates both -48 V and -60 V battery plants.

FEATURES

- Complete power supply, power management and power protection solution for MicroTCA systems
- Compact, high power-density, single-width module: dc-input module is 9 HP high, ac-input module is 12 HP high
- 600 watts output power
- 16 output channels, each capable of delivering 12 V @ 7.6 A payload power & 3.3 V @ 150 mA management power
- Provides sufficient power for 12 AMCs, 2 MCHs & 2 CUs
- Supports 1+1 input redundancy, N+1 output redundancy and hot-swap operation

For more information, contact: 760-930-4600

RSC# 36158 @ www.compactpci-systems.com/rsc

Ericsson Power Modules
6300 Legacy Drive • Plano, TX 75024
972-583-5567
www.ericsson.com/powermodules

ERICSSON
TAKING YOU FORWARD

ROA 117 5078/1

The ROA 117 5078/1 full-size (6HP) single-width, 355 W DC/DC MicroTCA power module provides power conversion from a -48 VDC input source to 16 independent 12 V channels for payload power and 3.3 V for management power. It is intended for use in applications based on the PICMG® Micro Telecommunications Computing Architecture (MicroTCA™) specification, which defines the requirements for a system that uses PICMG Advanced Mezzanine Cards (AdvancedMCs) connected to a common backplane.

As part of the MicroTCA power subsystem, the power module contains power entry circuitry, such as an EMI filter, transient protection, inrush current limiting, and input line conditioning, that provide an interface between the power source and the rest of the power subsystem. Holdup capacitance is also included for continuous operation during undervoltage transients on the input. The power module contains an Enhanced Module Management Controller (EMMC) which provides an interface to the Carrier Manager, permitting monitoring of the power module and the power distribution elements.

The design is based on a high degree of silicon integration and advanced technologies for energy management and communication within the system. The DC/DC conversion part uses synchronous rectification to achieve very high efficiency, minimizing power losses and component stress, and in combination with the excellent thermal management, it gives the power module very good reliability performance over the full temperature range. These attributes make the power module particularly suited for use in telecommunications and enterprise computer network equipment.

FEATURES

- Designed to meet PICMG® specification MTCA.0 R1.0
- Very high efficiency, 95% at half load
- 16 sets of payload and management power outputs
- EMMC for advanced energy management
- Full-size (6HP) single-width form-factor
- Designed in accordance with requirements set out in IEC60950-1 and equivalent standards

Advanced Thermal Solutions, Inc.

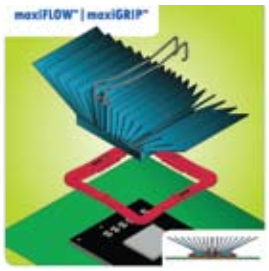
89-27 Access Road • Norwood, MA 02062
781-769-2800
www.qats.com

maxiFLOW/maxiGRIP

ATS' maxiFLOW™ heat sinks with the maxiGRIP™ attachment system take air cooling to the limit and help reduce the cost of design and increase reliability.

The maxiFLOW™ heat sink architecture features a low profile, spread fin array that maximizes surface area for more effective convection (air) cooling. The maxiGRIP™ system features a stainless steel spring clip and plastic frame clip to provide secure attachment to the component, eliminating the need to drill holes in the PCB.

ATS' maxiFLOW™ heat sinks with maxiGRIP™ clip attachment have been successfully deployed to cool hundreds of thousands of components used by the top telecom, datacom, OEM, and contract manufacturers in the world and are available in off-the-shelf and custom sizes.



FEATURES

- maxiFLOW™ spread fin array heat sinks are made of lightweight, extruded aluminum which maximizes air cooling
- Reduces device junction temperatures by more than 20%, compared to heat sinks of similar volume
- The system allows for the use of high-performance phase-change materials that improve heat transfer
- maxiGRIP™ system applies steady, even pressure to the device and eliminates the need to for holes in the PCB
- Offered in 16 off-the-shelf component sizes, from 17 mm x 17 mm to 45 mm x 45 mm, and three low profile heights
- Available for overnight delivery when ordered through ATS' exclusive distributor, Digi-Key, at www.digikey.com

For more information, contact: ats@qats.com

RSC# 35720 @ www.compactpci-systems.com/rsc

Resource Guide 2008 CompactPCI and AdvancedTCA Systems Systems

Comtel Electronics GmbH

Espace de l'Europe 18 • Neuchâtel, 2000 Switzerland
+41 (0) 3272 46300 • Fax +41 (0) 3272 40687
www.comtel-online.com

µTCA CUBE KIT

The Comtel µTCA The CUBE™ Starter Kit Development System complies with the latest telecommunication standard and allows the use of AMC cards directly on a backplane, thus reducing the costs for a system.

Possible configurations for eleven full-height/single-width AMC modules

Ten full-height AdvancedMC modules and two half-height-AdvancedMC modules give designers the option of using a double-width AdvancedMC module instead of two single-width AdvancedMC modules. For example: 1x GbE on Port 0; 2x SATA/SAS on Port 2; and three 4x PCI Express on Ports 4, 5, 6, and 7. The kit supports the JTAG connector for debug and test: The Processor AdvancedMC can communicate with adjacent SAS/SATA module via point-to-point connection. Contact Dov Cohen for customized applications to meet your system needs. **Sales@comtel-online.ch**

FEATURES

- 8U (H) 8.8"(W) and 10" (D): Two cubes can become one 19"size
- Backplane: MCH, AMC signals, power, fans and chassis EEPROM power distribution: 60+ W per compact AMC slot
- Fan trays: Two independent front access intelligent push-pull or only push cooling
- Air filter and front cable tray dedicated slots for two PM each with 16x 12 V and 16x 3.3 V
- One MCH and a JTAG controller board. Optional: Telco Alarm Contacts ; front LED display upper fan tray unit
- Backplane features: Supports AMC.0, AMC.1, AMC.2, AMC.3, and AMC.4 specs

For more information, contact: sales@comtel-online.ch

RSC# 36005 @ www.compactpci-systems.com/rsc

CorEdge Networks
7600 Boone Avenue North, Suite 1 • Brooklyn Park, MN 55428
763-488-9750
www.coredgenetworks.com

CEN-PICO™

CorEdge Networks' CEN-PICO™ series of 19" rack mountable MicroTCA platforms for applications such as WiMAX or 3G base stations. Networking, IPMI management, clock, and power infrastructure are provided by the CorEdge Networks' MicroTCA Carrier Hub (CEN-MCH™) and Power Module (CEN-MPWR™).

The CEN-PICO™ family of MicroTCA platforms is designed to meet cost-sensitive, enterprise class equipment requirements. 1U to 4U configurations are available supporting two to as many as twelve full-height AdvancedMCs in various single and double width combinations. All CEN-PICO™ platforms feature integrated JTAG controllers, intelligent cooling units, and dual front replaceable fan modules for system cooling.

FEATURES

- Complete plug-and-play MicroTCA/PicoTCA solution
- Clock modules available for PCI Express, Telecom, and GPS applications
- Fabric modules available for PCI Express, SATA/SAS, 10 GbE, and Serial RapidIO
- Supports single-wide and double-wide, full-height AMCs
- Supports AMC.0, AMC.1, AMC.2, AMC.3, and AMC.4 compliant modules
- Redundant MCH and PM solutions available

For more information, contact: sales@coredgenetworks.com

RSC# 35869 @ www.compactpci-systems.com/rsc

Emerson Network Power
2900 South Diablo Way, Suite 190 • Tempe, AZ 85282
1-800-759-1107 or 1-602-438-5720
www.emersonnetworkpower.com/embeddedcomputing

Centellis 500

Engineered for dependable embedded applications, the Centellis™ 500 is an innovative MicroTCA™ solution that is suitable for use in enterprise applications. It has been designed to be an economically viable solution by utilizing an injection molded plastic enclosure with the smallest number of internal components possible for low-cost high volume manufacture. The MicroTCA backplane, fans, power module, MicroTCA Carrier Hub (MCH), and card cage are included and the system is supplied fully tested including SpiderWare®M³ Platform Management software and an Advanced Mezzanine Card (AMC) module to speed your time to market.

Centellis 500 is a solidly constructed and engineered table-top or shelf placement MicroTCA system. As a complete system, the Centellis 500 ships ready to go out of the box with SpiderWare®M³ Platform Management software designed for quick system configuration through a set of graphical tools. It is supplied complete with MCH, a PrAMC-7211 Intel® Core™2 Duo based processor AMC, and a DC input power module. The MCH is a high performance and dependable solution that supports Gigabit Ethernet fabric to all the AMC payload slots. The MCH also provides individual status and power control to each AMC which allows hot swap. In addition to the standard AMC hot-swap and out-of-service LEDs, GbE link status LEDs are provided on the front panel for ease of operation.

An application development environment is provided by a PrAMC-7211 AMC with 2 GB of DRAM, 1 GB of on-board flash storage, and USB 2.0 connector on the front panel. The power module supports a standard -48 VDC power source with cabling to the front panel.

MicroTCA technology will be used in a wide range of applications such as VoIP gateways, packet processing, IP-PBX, network POS, industrial automation, telemedicare, healthcare office management, remote radiology, patient monitoring, and access gateways where reducing the capital cost of installing or extending next-generation network elements are very important. The Centellis 500 is uniquely suitable for a variety of enterprise deployment scenarios.

FEATURES

- Low profile, lightweight, solidly constructed injection molded plastic table-top, or shelf placement chassis is easily transported
- Three (3) available AMC mid-size expansion payload slots for application customization
- Best in class MicroTCA Carrier Hub
- Dynamic cooling for low noise enterprise deployment
- Managed system supporting hot-swap of AMC modules
- SpiderWare®M³ Platform Management software
- Fully FCC part 15 Class A certified for enterprise deployment
- PICMG® MicroTCA.0 R1.0, AMC.0 R2, AMC.2, AMC.3 compliant
- Highly robust AMC connectors stringently tested to prevent AMC insertion failure
- Extensively tested system passing vigorous 48 hour stress, power cycle and boot tests
- Star topology backplane supporting signal rates up to 3.215 Gbps
- 48 V MicroTCA power module for full MicroTCA compatibility

Kontron
14118 Stowe Drive • Poway, CA 92064-7147
888-294-4558
www.kontron.com

Kontron OM5080

This 2U integrated platform offers users a powerful, preconfigured platform that is deployment-ready. Integrating both the MCH and power module functionality into the chassis, the OM5080 is the lowest cost-per-slot platform offered by Kontron today. The OM5080 is targeted for carrier grade communication servers, but is a great fit for markets looking for high availability and high bandwidth multiprocessor and I/O intensive applications that need to be deployed in a small footprint. Although the OM5080 is available preconfigured, Kontron also offers full customization to ensure your application needs are met.

FEATURES

- CPU: 2x AM4010 Processor AMCs; 2U integrated carrier grade platform
- MCH: On Carrier (GbE, PCIe, SAS point-to-point)
- Storage: SAS/SATA AMCs (option)
- Configure option: 8 AMC slots (2 x AM4010, 6 slots for customization, 2x GbE per AMC, 8 GbE uplinks
- Configure option: 8 AMC slots (2x AM4010, 6 slots for customization, 5x GbE per AMC, 4x GbE + 2x 10 GbE uplinks
- Software: Linux Kernel 2.6 installed; IPMI compliant on carrier

For more information, contact: info@us.kontron.com

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Kontron OM6040

This five-slot MicroTCA system is well suited for compact size industrial PC applications. The OM6040 system is preconfigured and tested to speed up MicroTCA development.

FEATURES

- Integrated 150 W AC power supply
- Dual-Core Processor AMC module
- 1x MCH with PCEe switch (3rd party product from NAT); 1x AM4010 PrAMC 2 GB, 1.5 GHz; 1x AM45000 SATA HDD AMC 60 GB
- Bottom-to-top integrated fans
- Pre-installed WindRiver Linux

For more information, contact: info@us.kontron.com

NEI

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972-673-1316
www.NEI.com

U-3000

Geared towards telecommunications, medical, defense and industrial automation, NEI's U-3000 3U MicroTCA platform supplies fully redundant power, cooling and MCHs. The flexible horizontal design allows for either 10 single-wide AMCs or four double-wide with two single-wide AMCs. Compliant with the PICMG MTCA.0 R1.0 specification, the U-3000 platform can achieve levels of 10 Gbps interconnect bandwidth over the dual-star backplane. Able to interchange components with AdvancedTCA and with a lower total cost of ownership, the U-3000 is the best choice for carrier-grade wireless and access communications applications.

FEATURES

- Dual-star topology with a fully passive MTCA.0 R1.0 backplane for 10 Gbps throughput
- Flexible design supports either four double-wide and two single-wide AMCs or ten single-wide AMCs
- Dual, redundant, tool-less, front-accessible MCHs, power, and cooling
- NEBS Level 3 and ETSI compliant for high availability
- Dual redundant, hot-swap 600W AC or -48 VDC power supplies; provides power and cooling for up to 80W per slot
- 3U rack mount MicroTCA system for two post 19-24 inch racks

For more information, contact: email sales@nei.com or call (800) 977-1010.

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MicroTCA Systems

MicroTCA technology is targeted at low- to mid-range applications in markets including communications, medical image processing, defense, industrial, and embedded control. It brings both form factor and performance options enabling adoption for a wide range of applications, and this range of options brings both challenges and opportunities to application engineers. The key will be to balance the application requirements – and price considerations – then configure the best solution.

MicroTCA Mechanics

There are 6 different standard AdvancedMC module sizes that can be installed into a MicroTCA System. These AdvancedMCs are described as either Compact (3 HP), Mid-Size (4 HP) or Full-size (6 HP) (1 HP = 0.2" or 5.08 mm) and either Single (73.8 mm) or Double (148.8 mm). Based on these form factors, Schroff engineers designed a universal Card Guide Support Plate (CGSP) based on 1 HP spacing that provides the mechanical support the card guide requires, the open area for maximum airflow and also enough material for proper EMC shielding. The lower card guide has an integrated die-cast locking mechanism to work with a Schroff standard AdvancedMC latch and the upper card guide comes with an EMC clip installed. The card guides are designed to easily lock into the proper location without the need for hardware to secure the guide to the card guide plate. In addition, the card guides are specially designed to allow for a splitter kit to be installed in a double subrack that supports two single width AdvancedMCs stacked on top of each other. Schroff MicroTCA subracks are 205 mm deep and available in variable widths of up to 23 inches (ETSI).

These tested and proven mechanical building blocks, along with Schroff's EMMC Cooling Unit design and high performance backplanes combine to give a superior MicroTCA System. System Integrators can have confidence in these chassis as FloTherm models and empirical airflow reports are available to ensure proper cooling is available for the AMCs. Additionally, these systems are designed to meet the various environmental conditions and agency compliance requirements for their respective industries.

Schroff has been involved in the MicroTCA specification development since the beginning and has a wide range of 19-inch rack-mount chassis, table-top configurations, low cost systems, development systems, and ruggedized systems to offer. Schroff's products are designed to help you achieve a fast time-to-market with your next generation systems in a cost-effective, modular, and scalable manner.

- Table-Top Development Systems with various backplane topologies and subrack heights
- Optional AC input power supply and power feed through module
- Units in stock for immediate delivery
- 6 AMC slot table top cube systems and Industrial subrack configurations with integrated AC power supply
- 1U thru 8U 19-inch rack-mount Systems with EMMC Cooling Unit(s), various backplane topology schemes, and power options
- All AMC and MicroTCA hardware components validated and tested
- Proof-of-Concept ruggedized AMC hardware, MicroTCA systems including conduction-cooled ATR
- Optimized backplane design for lower layer count and high performance. Customization for price-and-performance features available
- Engineered thermal solutions for MicroTCA and high-impedance AMC modules based on thermal simulations and empirical testing and validation

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614-748-1150 • Fax 614-409-1269
www.pinnacle.com/products2/advancedmc/am2

AMC-A2 PrAMC Board

PDSi's newest AMD Socket AM2 AMC Processor Module (AMC-A2) is a high-performance computing module for use in AdvancedTCA and MicroTCA systems. Designed around AMD Athlon™ processors, the AMC-A2 provides exceptional computing power in the convenient and versatile AdvancedMC (AMC) form factor.

OEMs in telecom, datacom, military, aerospace, and medical industries will appreciate this robust, modular, cost-effective computing platform alternative. With AMD 64 technology and rigorous, innovative design, the AMC-A2 processor AMC represents a new plateau in performance-per-watt. Long-term availability and high reliability are assured for embedded xTCA solutions. Contact PDSi for customization requirements.

For a customized application to your systems, please contact rob.ellis@pinnacle.com.

FEATURES

- High performance hot swappable AdvancedMC processor module conforms to PICMG AMC.0 R2.0
- Supports AMD Athlon™ single- and dual-core processors with true multi-tasking for increased performance
- SOCDIMM socket supports DDR2 667 MHz ECC memory up to 2 GB
- Up to 8 GB optional onboard microDOC flash for local boot drive
- Front panel interfaces – 2 x USB 2.0, 1 x Serial. Pigeon Point module management
- Extended availability assured

For more information, contact: rob.ellis@pinnacle.com

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Molex
2222 Wellington Court • Lisle, IL 60532
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MicroTCA Backplane

Molex's MicroTCA backplane is ideal to evaluate the performance of various Advanced Mezzanine Cards, MicroTCA Carrier Hubs (MCH) modules, and power supplies. This dual-star backplane is configured with two MCH modules that provide full redundancy for both control and switching functions. The 10 Gbps performance will facilitate the development of state-of-the-art µTCA systems. The µTCA backplane has redundant power supplies located to the left and right of the MCH modules. Each power module is routed radially to each AdvancedMC and MCH slot, thus allowing the MCH to independently power up or down any slot. There are 12 centrally located payload slots for industry standard AdvancedMCs.

FEATURES

- Backplane for single wide AdvancedMC cards, 0.42 m by 0.12 m (16.82" by 5.00")
- 4 compact slots, which allows either 10 full-height slots or 4 compact and 8 full-height slots (12 total)
- Power system supports 80 watts per slot – the maximum allowed by the MicroTCA 1.0 specification
- Connectors for 2 power supplies and 2 MCHs for testing of handoff features when one power supply or MCH fails
- Molex EBBI™ fan tray connectors provide hot-swappable redundant connections to the fan tray
- Extra port allows a JTAG switch module for system level testing
- Design easily scalable to meet different customer applications and needs

For more information, contact: microtca@molex.com

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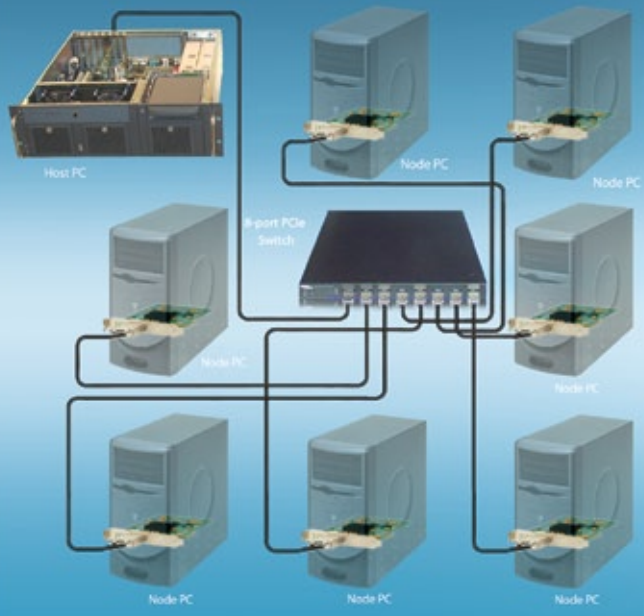

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2.0 GSps 10bit A/D

The Annapolis Single Channel 2.0 GSPS A/D I/O Card provides one 2.0 GHz A/D input with a resolution of 10 bits. The board has one e2v AT84AS004 that is fed by an onboard analog input circuit, which converts the single ended 50-Ohm SMA input into differential signals for the ADC. There is a universal single ended 50-Ohm SMA clock input and a High-Precision Trigger input allowing multiple A/D I/O cards to be synchronized together. Synchronization of A/D I/O cards can be facilitated by the Annapolis 4 or 8 Channel Clock Distribution Boards.

In concert with the WILDSTAR 4 or WILDSTAR 5 FPGA processing main boards, this mezzanine board supplies user-configurable real-time continuous sustained processing of the full data stream. Up to two A/D and up to two Serial I/O cards can reside on each WILDSTAR 4 or WILDSTAR 5 VME/VXS or IBM Blade main board or up to one A/D and up to one Serial I/O card on each PCI-X or PCI Express main board.

Our boards run on many different operating systems. We support our board products with a standardized set of drivers, APIs, and VHDL simulation models. VHDL source is provided for the interfaces to A/Ds, D/As, DRAM/SRAM, LAD Bus, I/O Bus, and PPC FLASH. CoreFire users will have the usual CoreFire board support package.

The combination of our COTS hardware and our CoreFire FPGA Application Development tool allows our customers to make massive improvements in processing speed, while achieving significant savings in size, weight, power, person-hours, dollars and calendar time to deployment.

Annapolis Micro Systems, Inc. is a world leader in high-performance COTS FPGA-based processing for radar, sonar, SIGINT, ELINT, Digital Signal Processing, FFTs, communications, software radio, encryption, image processing, prototyping, text processing, and other processing intensive applications.

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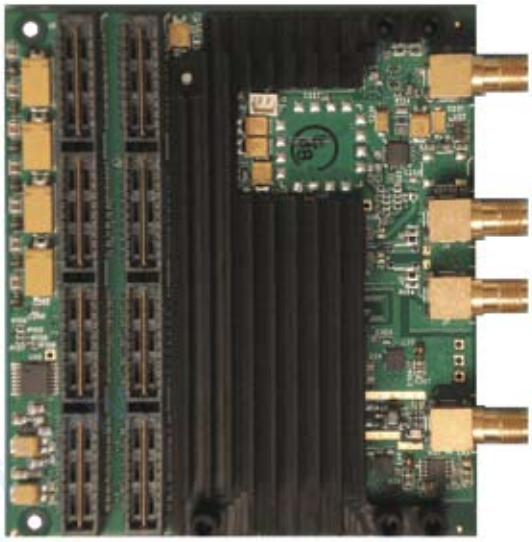

FEATURES

- One e2v AT84AS004 (2.0 GHz, 10-bit) A/D
- Four SMA front panel connectors: one 50-Ohm analog input, one single ended 50-Ohm clock input, or differential 1.65 V LVPECL clock input
- One high-precision trigger input with Fs precision. High-precision trigger input – 1.65 V LVPECL, 2.5 V LVPECL, 3.3 V LVPECL
- Analog input bandwidth is 100 KHz – 3.0 GHz
- I/O card plugs onto WILDSTAR 4 or 5 VME/VXS/PCI-X/ PCI Express/IBM Blade main boards
- JTAG, ChipScope, and serial port access
- Full CoreFire board support package for fast, easy application development
- VHDL model, including source code for board level interfaces
- Proactive thermal management system
- Includes one year hardware warranty, software updates, and customer support
- We offer training and exceptional special application development support, as well as more conventional customer support
- Designed and manufactured in the USA

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190 Admiral Cochrane Drive #130 • Annapolis, MD 21401
410-841-2514
www.annapmicro.com

Dual 4.0 GSps DAC

The Annapolis Micro Systems Dual Channel 4.0 GSps D/A I/O Card provides one or two 12-bit digital output streams at up to 4.0 GSps.

The board has one or two Max 19693 for 4.0 GSps, Max 19692 for 2.3 GSps, or Max 5859 for 1.5 GSps.

The Dual Channel DAC board has five SMA front connectors: 2 single-ended DAC Outputs, a high-precision trigger input with Fs precision, and a universal single or double ended 50-Ohm clock input. It has excellent Gain Flatness in the first 3 Nyquist Zones, ultra low skew and jitter saw based clock distributions, and mainboard PCLK sourcing capability.

In concert with the WILDSTAR 4 or WILDSTAR 5 FPGA processing main boards, this mezzanine board supplies user-configurable real-time A to D conversion and digital output. Up to two A/D or D/A and up to two Serial I/O cards can reside on each WILDSTAR 4 or WILDSTAR 5 VME/VXS or IBM Blade main board, or up to one A/D or D/A and up to one Serial I/O card on each PCI-X or PCI Express main board.

Our boards run on many different operating systems. We support our board products with a standardized set of drivers, APIs, and VHDL simulation models. VHDL source is provided for the interfaces to A/Ds, D/As, DRAM/SRAM, LAD Bus, I/O Bus, and PPC FLASH. CoreFire users will have the usual CoreFire board support package.

The combination of our COTS hardware and our CoreFire FPGA Application Development tool allows our customers to make massive improvements in processing speed, while achieving significant savings in size, weight, power, person-hours, dollars and calendar time to deployment.

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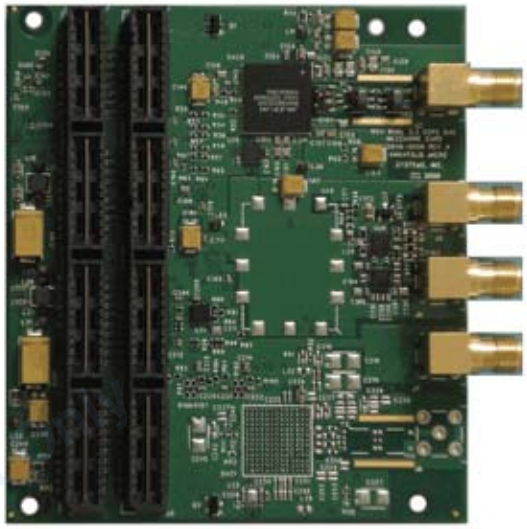

FEATURES

- One or two 12-bit Analog to Digital Converters: MAX 19693 for 4.0, MAX 19692 for 2.3, or MAX 5859 for 1.5 GSps
- Five SMA Front Panel Connectors: 2 single ended DAC Outputs, 1 High Precision Trigger Input with Fs Precision
- 1 Universal single or double ended 50-Ohm Clock Input
- High-Precision Trigger Input Mfg Options – 1.65 V LVPECL, 2.5 V LVPECL, 3.3 V LVPECL
- I/O card plugs onto WILDSTAR 4 or 5 VME/VXS/PCI-X/ PCI Express/IBM Blade main boards
- JTAG, ChipScope, and Serial Port access
- Full CoreFire Board Support Package for fast, easy application development
- VHDL model, including source code for board level interfaces
- Proactive thermal management system
- Industrial temperature range
- Includes one year hardware warranty, software updates, and customer support
- Designed and manufactured in the USA

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Quad 250/400/500 MSPS A/D I/O Card

The Annapolis Quad Channel 250/400/500 MSPS A/D I/O Card provides four A/D inputs with converter speeds of up to 250, 400, or 500 MHz and resolutions of 13,14 or 12 bits respectively. The board has four A/D Converters from TI (ADS5444, ADS5474, or ADS5463) fed by onboard analog input circuits which convert the single ended 50-Ohm SMA input into differential signals for the ADC.

There is an onboard ultra low jitter and skew clock distribution circuit to allow all four channels on a single A/D I/O board to be synchronized together. There is also an External Clock input and a Trigger input allowing multiple A/D I/O cards to be synchronized together. Synchronization of A/D I/O cards can be facilitated by the Annapolis 4 or 8 Channel Clock Distribution Boards.

In concert with the WILDSTAR 4 or WILDSTAR 5 FPGA processing main boards, this mezzanine board supplies user-configurable real-time continuous sustained processing of the full data stream. Up to two A/D I/O cards can reside on each WILDSTAR 4 or WILDSTAR 5 VME/VXS or IBM Blade main board or reside on one A/D I/O card on each PCI-X or PCI Express main board.

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Our boards run on many different operating systems. We support our board products with a standardized set of drivers, APIs, and VHDL simulation models. VHDL source is provided for the interfaces to A/Ds, D/As, DRAM/SRAM, LAD Bus, I/O Bus, and PPC FLASH. CoreFire users will have the usual CoreFire board support package.

The combination of our COTS hardware and our CoreFire FPGA Application Development tool allows our customers to make massive improvements in processing speed, while achieving significant savings in size, weight, power, person-hours, dollars, and calendar time to deployment.

FEATURES

- Four TI A/D converters of one of the speed and bit size types: ADS5444 250 MSps 13-bits, ADS5474 400 MSps 14-bit, ADS5463 500 MSps 12-bit
- Analog Input bandwidths of up to: 500 MHz for the 250 MSps A/D board, 1400 MHz for the 400 MSps A/D board, 2000 MHz for the 500 MSps A/D
- Six SMA Front Panel Connectors: Four 50-Ohm analog inputs, one single ended 50-ohm Clock Input, one Trigger Input
- Onboard Ultra Low Jitter and Skew Clock Distribution Circuit to allow syncronization of all four channels on a single I/O card
- I/O card plugs onto WILDSTAR 4 or 5 VME/VXS/PCI-X/ PCI Express/IBM Blade main boards
- JTAG, ChipScope, and Serial Port access
- Proactive thermal management system. Available in both commercial and industrial temperature ranges
- Full CoreFire Board Support Package for fast and easy application development and technology refresh
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- Includes one year hardware warranty, software updates, and customer support. Reduce risk with COTS
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WILDSTAR 5 PCI E

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Develop your application very quickly with our CoreFire™ FPGA Application Builder, which transforms the FPGA development process, making it possible for theoreticians to easily build and test their algorithms on the real hardware that will be used in the field. CoreFire, based on dataflow, automatically generates distributed control fabric between cores.

Extensive IP and board support libraries contain more than 1000 cores, including floating point and the world's fastest FFT. CoreFire uses a graphical user interface for design entry, supports hardware-in-the-loop debugging, and provides proven, reusable, high-performance IP modules. WILDSTAR 5 for PCI Express, with its associated I/O Cards, provides extremely high overall throughput and processing performance. The combination of our COTS hardware and CoreFire allows our customers to make massive improvements in processing speed, while achieving significant savings in size, weight, power, person-hours, dollars, and calendar time to deployment.

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FEATURES

- Up to three Xilinx Virtex 5 FPGA I/O processing elements – LX110T, LX220T, LX330T, or FXT
- Up to 7 GB DDR2 DRAM in 12 Memory Banks per WILDSTAR 5 for PCI Express Board or up to 2 GB DDR2 DRAM in two memory banks and up to 40 MB DDRII, QDRII SRAM, or up to 1.4 GB RLDRAM
- Programmable FLASH for each FPGA to Store FPGA Image
- 8x PCI Express bus. High-speed DMA Multichannel PCI Controller
- Supports PCI Express Standard External Power Connector. Available in commercial or industrial temperature ranges
- Full CoreFire Board Support Package for fast, easy application development. VHDL model, including source code for hardware interfaces and ChipScope access
- We offer training and exceptional special application development support, as well as more conventional support
- Includes one year hardware warranty, software updates, and customer support
- Proactive Thermal Management System – Board Level current measurement and FPGA temperature monitor, accessible through Host API
- Save time and effort and reduce risk with COTS boards and software
- Achieve world-class performance – WILD solutions outperform the competition

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iSPAN® 5639

The iSPAN 5639 PCI Express T1/E1/J1 communications controller from Interphase delivers a comprehensive high-capacity connectivity solution for use with PCI Express enabled rack-mount server solutions to deliver a wide range of Voice over IP, wireless, and IP Multi-Media Subsystem (IMS) infrastructure application elements.

With four or eight T1/E1/J1 interfaces and a powerful on-board processor, the iSPAN 5639 provides a high-capacity solution for signaling applications. With its high-performance PCI Express interface to the host, the iSPAN 5639 also enables rapid exchange of payload information and is hence ideal for HMP media server applications.

FEATURES

- Four or eight individually software selectable T1/E1/J1 interfaces
- Onboard support for SS7 MTP-2 (LSL/HSL), ATM, SAAL, Frame Relay, HDLC, and Host Media Interface
- Complete Linux Software Development Suite (iWARE) with firmware, host driver, API, tools and samples
- High bandwidth PCI Express host connectivity
- PCI Express standard-height, half-length form-factor
- Freescale™ PowerQUICC III™ on-board processor @ 833 MHz

For more information, contact: fastnet@iphase.com

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MPAC 3220 PCIe

The MPAC® 3220 telephony board is the first in a new range of Telesoft Technologies high density signaling and media telephony cards designed to fit into PCIe servers and chassis. It complements Telesoft's PCI and CompactPCI telephony boards, supporting common APIs across all cards.

The MPAC 3220 is a low-profile, single lane PCIe board that fits into any PCIe 1.1 compliant slot. Half the height and length of standard PCI boards, it represents the smallest form factor available, yet packs considerable performance.

It supports up to 4 E1/T1 interfaces plus 1 Gb Ethernet port, and up to 128 low-speed (LSL) or 2 high-speed (HSL: ATM or HDLC) SS7 signaling links in terminating or non-intrusive monitoring mode. With both TDM and IP ports it's ideal for inter-working between converged TDM, 2G/3G, and next generation IP networks.

FEATURES

- Half height/length, low-profile, single lane E1/T1/IP telephony board, compatible with wide range of chassis
- MPAC 32xx series of telephony boards has a base processing card and a configuration-specific mezzanine card
- Alternate mezzanine cards available in due course including STM-1/OC-3 that will expand the range of interfaces
- Supporting a broad range of SS7, ISDN, and IP based telephony APIs; ISUP, MAP, IS41, SIP/RTP, CES, SIGTRAN
- Suitable for deployment by SIs, OEMs, TEMs, application developers, includes lower layer APIs such as MTP2/3

For more information, contact: sales@telesoft-technologies.com

RSC# 35985 @ www.compactpci-systems.com/rsc

Tundra Semiconductor

603 March Road • Ottawa, ON K2K 2M5 Canada
613-592-0714
www.tundra.com

PCI Express Bridges

The Tundra Tsi384 and Tsi381/Tsi382, bridge between x4 PCIe and x1 PCIe respectively, to PCI-X and PCI standards. All parts are compliant to the latest specifications including PCI Express Base Specification 1.1. Delivering low latency, high performance, and simple design and board layout requirements, the Tsi384, Tsi382, and Tsi381 offer significant advantages in; cost, power, board space, and ease of design. The Tsi38x bridges offer extensive flexibility by supporting transparent, opaque, and non-transparent addressing modes. With best-in-class performance, solution cost and quality, these devices are providing customers access to new design opportunities in a wide range of PCI Express (PCIe) applications.

FEATURES

- Most advanced PCIe bridges: Compliant to the latest PCIe and PCI-X specifications
- Smallest footprint: Tsi382 x1PCIe to PCI bridge enables designs where board space is constrained
- Highest quality: Proven interoperability ensures lower development risk and design churn
- Simplest design: No power sequencing restrictions and only two power supply voltages required
- Highest performance: Low latency, high throughput, and innovative features provide significant advantages
- Pinout compatible with other PCIe bridges offering low risk replacement or second source for existing designs

For more information, contact: sales@tundra.com

RSC# 35975 @ www.compactpci-systems.com/rsc

Technobox, Inc.

140 Mount Holly Bypass – Unit 1 • Lumberton, NJ 08048-1114
609-267-8988
www.technobox.com

4733

The Technobox 4733 is a PMC-to-PCI Express adapter that permits use of a PMC card in a 4X, 8X, or 16X PCI Express slot. Built around the 8114 bridge chip, the primary side of the bridge is fixed at 2.5 GHz per lane in each direction. The secondary (PCI/PCI-X) side operates at 33, 66, 100, or 133 MHz (either 64 or 32 bits). XCAP and M66EN signals are supported by DIP switch settings to force operation at non-X or lower PCI clock frequencies. Activity LEDs located at the edge of the board give an indication of key PCI and PCI Express signals and voltages. The DIN connector provides access to the 64-pin user I/O on the mezzanine card. JTAG signals are brought out to headers allowing users the option of connecting the JTAG ports.

FEATURES

- Adapts a PMC or PMC-X to a PCIe site
- PLX 8114 Bridge
- 4 lanes PCIe
- 2.5 Gbps per lane (each direction)
- Industrial temperature
- RoHS compliant

For more information, contact: info@technobox.com

RSC# 35220 @ www.compactpci-systems.com/rsc

Technobox, Inc.
140 Mount Holly Bypass – Unit 1 • Lumberton, NJ 08048-1114
609-267-8988
www.technobox.com

4876 PCIe-to-XMC Adapter

The Technobox PCIe-to-XMC Adapter (P/N 4876) permits an engineer to adapt an existing PCIe solution to an XMC site on a carrier or single board computer. This is an especially useful tool for software development where an existing PCIe solution is to be ported to an XMC equivalent. Side One of the 4876 has a pair of XMC connectors for the P15 and P16 interfaces that mate with the host XMC site. A single 8x PCIe connector is located on the opposite side of the adapter, along with some headers and jumpers. Two 64-pin headers are provided to permit probing of various XMC signals from the P15 and P16 connectors. Pin assignments conform to VITA 42.0-2005 and VITA 42.10-200x. Headers allow access to I2C, JTAG, plus several XMC signals that do not pass over the PCIe bus.

FEATURES

- Adapts a PCIe card to an XMC site
- Supports up to 8 PCIe lanes
- 2.5 Gbps per lane (each direction)
- Permits access to P16 Signals, I2C, and JTAG
- LEDs show key XMC signals and voltages
- Accommodates external power
- RoHS compliant

For more information, contact: info@technobox.com

RSC# 32863 @ www.compactpci-systems.com/rsc

Carrier Cards CompactPCI and AdvancedTCA Systems Resource Guide 2008

Technobox, Inc.
140 Mount Holly Bypass - Unit 1 • Lumberton, NJ 08048-1114
609-267-8988
www.technobox.com

5243

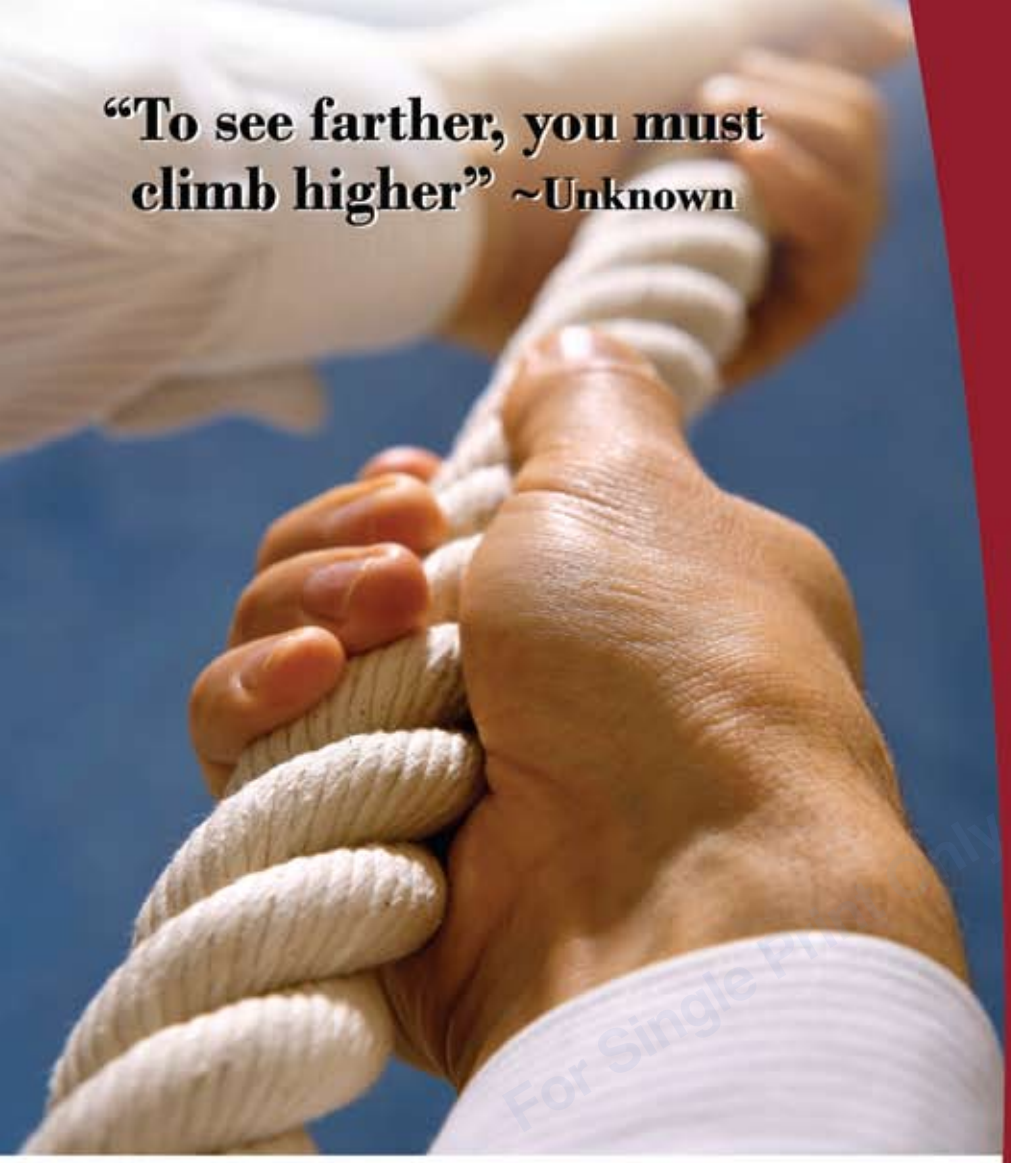
The Technobox 5243 allows use of a 32-bit PMC in a 1X, 4X, 8X, or 16X PCI Express slot. A single PCIe lane is supported and is composed of a 2.5 GHz transmit and a 2.5 GHz receive channel. Built around a PEX8111 transparent bridge, the primary side is fixed at 2.5 Gbps. The secondary side operates at 33 or 66 MHz and can be configured for 3 V or 5 V. The A and C rows of a 96-pin DIN connector connect with the 64-pin user I/O connector on the mezzanine card. A single status LED located at the edge of the board indicates working status for the PCIe lane. JTAG signals are brought out to headers.

FEATURES

- Adapts a PMC to a PCI Express site
- 1 lane PCI Express
- PLX 8111 Bridge
- Operational Status Indicator
- RoHS compliant

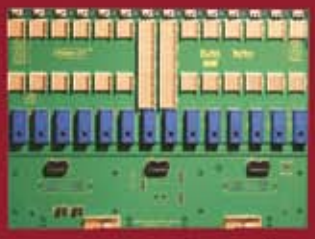
For more information, contact: info@technobox.com

RSC# 35862 @ www.compactpci-systems.com/rsc



CompactPCI/2.16

CompactPCI Express



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- Up to 1 GB DDR2-533 RAM
- 24-port GbE base interface switch

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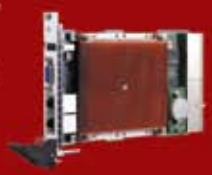

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