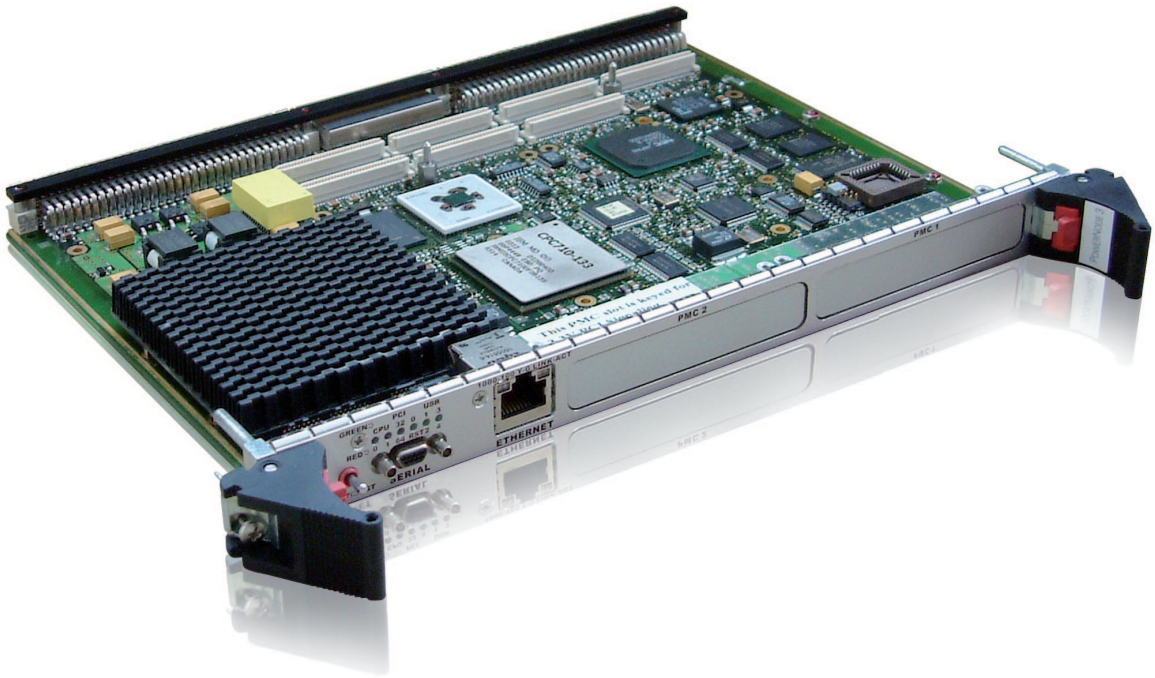
kontron

» PowerNode3 «



Low Power Dual 1 GHz MPC7457 6U VME Board

» Two PCI Mezzanine Card Sites

» 512 KB Internal L2 Cache Clocked at Processor Frequency

» 2 MB Onboard L3 Cache per Processor + 2 MB private SRAM

» VME 2eSST (150 MB/s) Capability

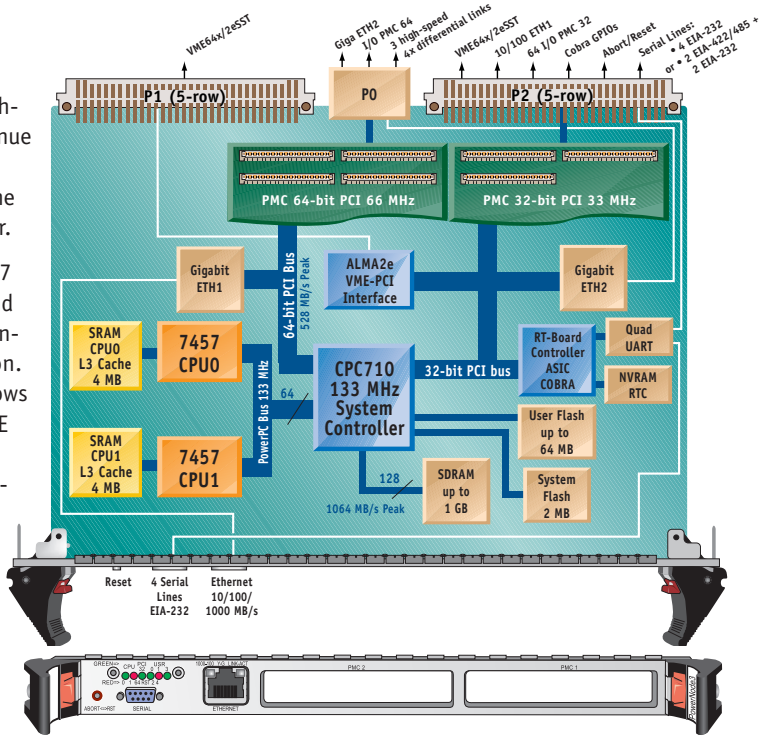
» Rugged Version available for Harsh Environment Applications

PowerNode3

Low Power Dual 1 GHz MPC7457 6U VME Board

The PowerNode3 is a major leap forward in Kontron's technological excellence. As the PowerPC™ experts, we continue to track the evolution of PowerPC technology, and we provide a high-performance Computing Node based on the PowerPC MPC7457 technology, breaking the 1 GHz barrier.

With its AltiVec vector processing unit, the PowerPC 7457 (G4+) is ideally suited for Signal Processing functions and leading-edge computing. It combines outstanding and unprecedented performance level with low power dissipation. Compared to any 7455 solutions, the 7457 processor allows a dual 1 GHz application to fit into severe embedded VME thermal constraints. In addition, the PowerNode3 meets Kontron´s technology insertion policy which offers customers a clear performance upgrade path while protecting long-term investments in application software.



PowerPC G4+ 7457: Outstanding Performance for Demanding Signal Processing Application

The PowerNode3 features the PowerPC G4+ 7457 from Motorola, delivering 1 GHz performance with less than 8W.

Manufactured using Motorola's Silicon-On-Insulator (SOI) process technology, the new MPC7457 represents an optimal high-performance choice for power dissipation-sensitive applications. The processor includes 512 KB of onchip L2 cache (a 2x increase over the MPC7455's L2 cache) with support for up to 2 MB of backside L3 cache and 2 MB of private SRAM.

ASIC Innovation for Better Performance, Seamless Software Upgrade and Long-Term Support

To maintain an innovative edge, Kontron aligns itself with key organizations and industry leaders. Our close development partnership with IBM has given Kontron early access to the latest chip designs and has resulted in jointly-designed ASICs for optimizing onboard resource access.

AVIGNON High-Performance Host Bridge

AVIGNON, the host bridge (part number CPC710), benefits from the accumulated experience of both partners since the beginning of the PowerPC. It performs as a crossbar between the processors, the main memory, and the PCI busses. This crossbar function is a key to implementing a high-performance computing node.

ALMA2e Low Power VME Bridge

ALMA2e is the PCI/VMEbus bridge that interfaces the PCI bus of Avignon with the VME 2eSST and/or VME64 bus with an outstanding sustained performance of 150 MB/s. Furthermore, due to its small die size, ALMA2e surpasses the competition for low power designs.

COBRA Real-Time Board Controller

COBRA is dedicated to the control of interrupts and other realtime functions. The interrupt controller features an OpenPIC compliant device including multiprocessor support.

Leading Edge Architecture

Memory: The PowerNode3 features a unique memory architecture with the highest available bandwidth. In a dual G4+ architecture, the highest possible bandwidth from the memory sub-system is needed to constantly and efficiently feed the multiple Altivec engines in every PowerPC G4+.

The symmetrical topology of the PowerNode3 memory subsystem offers the highest bandwidth and latency capabilities required when processing large amounts of data simultaneously from both G4+s. Acquisition can be performed directly into a shareable area of the main memory, and each G4+ can immediately start to work concurrently on the data set without any unnecessary buffer copies. This is by far the lowest possible latency for critical complex algorithms such as distributed and collaborative signal processing applications (e.g. beam forming).

I/O: Two PCI busses allow Avignon to manage two data flows concurrently. Combined with high-performance networking PMCs, it allows versatile configurations to meet the various requirements of complex data-flow architectures.

Software Offering

With the increased computing power and the versatility of the PowerPC G4+, it is now possible to use COTS hardware and software to build innovative solutions to handle signal processing applications such as sonar, radar and medical imaging. But brute force number crunching is not enough to deliver a complete working system with dozens of VME G4+ boards and associated PMC I/O links. To lower the time-tomarket for such complex systems, Kontron designed PowerLine, a set of tools that covers key areas: low-level message passing with DDlink VI and a full machine supervisor in the system.

Single-Source Customer Service

Leveraging more than 20 years of new product development and customer support in embedded and rugged computers, Kontron offers a wide range of integration and maintenance services, from product warranty and start-up assistance to the delivery of fully tested preintegrated systems and one-stop shop delivery of qualified racks and PMCs.

Product Warranty and Services

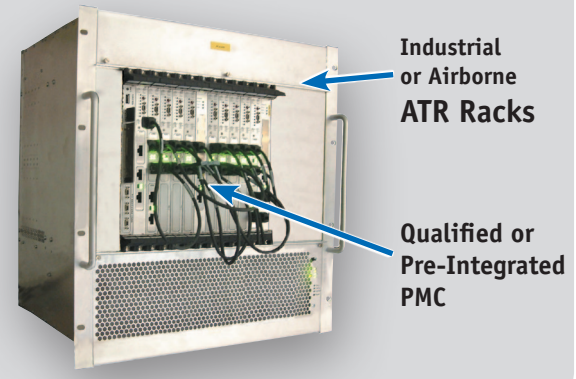
All of Kontron´s hardware products are covered by a two-year return-to-factory warranty.

Several service programs are available, including update services, hotline access, product repair and exchange services, technical assistance, on-site or remote technical assistance.

ISO 9001: Kontron´s ISO 9001 certification is just another way for us to back our commitment to quality products and customer service.

Finally, in addition to its standard support services, Kontron offers customized consultation to system integrators.

Full Pre-Integrated System



Technical Information

System processor and Chipset	
Processor	One or two superscalar PowerPC 7457 processors operating at 1 GHz
Cache Structure	L1: 32 KB instruction cache and 32 KB data cache per processor L2: 512 KB clocked at full CPU speed
MIPS	10.4 FFT GFlops
Altivec™ vector unit	
Memory	
Global Memory	512 MB or 1 GB onboard SDRAM with ECC
User Flash	Up to 64 MB of contiguous directly accessible, 32-bit wide flash memory for OS and application code
System Flash	2 MB Flash Device
Onboard Controllers	ALMA2e VME-PCI Interface CP710 System Controller Host Bridge COBRA Real-Time I/O Controller
VME Interface	ALMA2e V64 and 2eSST VME/PCI bridge with semaphore registers A32/A24/A16 master slave D64 (MBLT)/D32 (BLT)/D16/D08 master/slave 5-row connectors
PCI Interface	PMC 1: PCI R2 compliant (32 bits) 5V and 3.3V signaling, 1 PMC slot, 33 MHz PCI frequency (44 MHz option available), DMA engine: DRAM <=> PCI PMC 2: PCI R2 compliant (32/64 bits) 3.3V signaling, 1 PMC slot (up to 3 with carrier card), 33 or 66 MHz PCI frequency, DMA engine: DRAM <=> PCI
Real-Time I/O	
Interrupt Controller	32 I/O device interrupt inputs, and 4 interprocessor interrupts
Real-Time Controller	connection to PCI bus Rev. 2, ISA-like interface for serial ports, large non-volatile memory interface (NVRAM, Flash, ...), optimized messge passing with four high-density FIFOs, GPIOs, four highly programmable 32-bit global timers
Rear I/O via P0&P2	
Serial Ports	Four simplified (Rx, Tx) EIA-232 ports or two simplified (Rx,Tx) EIA-422/EIA-485 ports on P2
Ethernet	One 10/100/1000BASE-T Ethernet port (build option on P2)
General Purpose I/Os	Four GPIO on P2
PMC I/Os	64 PCI 32 on P2 - 64 PCI 64 on P0 or three differential x4 high-speed links on P0, following PICMG 2.17/2.18
Extension	
Rear Transition Module	VME64 I/O CP2IOS2BC (rear I/O via P2) - VME64 I/O PBV36-P0-CN300-00 (rear I/O via P0&P2)
Front Panel Interface	
Serial Ports	Four simplified (Rx, Tx) EIA-232 ports
Ethernet	One 10/100/1000BASE-T Ethernet port (build option) on P2 - One 10/100/1000BASE-T Ethernet port on P0
Software	Power-on Built-In Test, and Initiated Built-In Test testing over 95% of board features BSPs available for LynxOS, Linux Fedora Core 3 and VxWorks RTOS

Technical Information

Power @ 1 GHz	Dual
Maximum Power Requirement	45 W
Miscellaneous	
Debug	Extra connectors interface ICE/JTAG tools to any of the two processors
Weight	Standard Air-Cooled: 490g approx. - Rugged Conduction-Cooled: 830g approx.
Build Options	Standard Air-Cooled (SA), Extended Temperature (WA), Rugged Air-Cooled (RA) or Rugged Conduction-Cooled (RC) Releases SDRAM: 512 MB, 1024 MB Flash: No Flash, 32 MB, 64 MB PMC 32 slot VIO Key (PCI signaling voltage): 5V or 3.3V First Ethernet Link (ETH1): Front panel or routed to backplane

Environmental Specifications

	SA Standard Commercial	WA Extended Temperature	RA Rugged Air-Cooled	RC Rugged Conduction-Cooled
Conformal Coating	Optional	Standard	Standard	Standard
Airflow	1.2 m/s	1.5 m/s	1.8 m/s	NA
Temperature	VITA 47-Class AC1	VITA 47-Class AC2	VITA 47-Class AC3	VITA 47-Class CC4
Cooling Method	Convection	Convection	Convection	Conduction
Operating	0° to +55°C	-20° to +65°C	-40° to +75°C	-40° to +85°C
Storage	-45° to +85°C	-45° to +85°C	-45° to +100°C	-45° to +100°C
Vibration Sine (Operating)	5-200 Hz - 2g	5-200 Hz - 2g	5-2,000 Hz - 3g	5-2,000 Hz - 5g
Random	VITA 47-Class V1	VITA 47-Class V1	VITA 47-Class V2	VITA 47-Class V3
Shock (Operating)	10g/16 ms Half Sine	10g/16 ms Half Sine	40g/20 ms Half Sine	40g/20 ms Half Sine
Altitude (Operating)	-1,000 to 15,000 ft	-1,000 to 33,000 ft	-1,000 to 33,000 ft	-1,000 to 50,000 ft
Relative Humidity	90% without condensation	95% without condensation	95% without condensation	95% without condensation

Ordering Information

Article	Part.-No.	Description
Standard Air Cooled (SA Class)		PPCG4+ 7457 Processor - Front Panel Ethernet - L3 Cache 2MB is default
PowerNode3	VEGA1SAA03200000	One Processor - 1000 MHz/133 MHz - 512 MB SDRAM - 64 MB Flash - PMC32 VIO set for 5V signalling PMCs
PowerNode3	VEGA1SAA02210000	One Processor - 1000 MHz/133 MHz - 256 MB SDRAM - 64 MB Flash - PMC32 VIO set for 3.3V signalling PMCs
PowerNode3	VEGA2SAA02000000	Two Processors - 1000 MHz/133 MHz - 256 MB SDRAM - No Flash - PMC32 VIO set for 5V signalling PMCs
PowerNode3	VEGA2SAA02100000	Two Processors - 1000 MHz/133 MHz - 256 MB SDRAM - 32 MB Flash - PMC32 VIO set for 5V signalling PMCs
PowerNode3	VEGA2SAA03000000	Two Processors - 1000 MHz/133 MHz - 512 MB SDRAM - No Flash - PMC32 VIO set for 5V signalling PMCs
PowerNode3	VEGA2SA803110000	Two Processors - 1000 MHz/100 MHz - 512 MB SDRAM - 32 MB Flash - PMC32 VIO set for 3.3V signalling PMCs
PowerNode3	VEGA2SA803200000	Two Processors - 1000 MHz/100 MHz - 512 MB SDRAM - 64 MB Flash - PMC32 VIO set for 5V signalling PMCs
PowerNode3	VEGA2SAA02210000	Two Processors - 1000 MHz/133 MHz - 256 MB SDRAM - 64 MB Flash - PMC32 VIO set for 3.3V signalling PMCs
PowerNode3	VEGA2SAA03200000	Two Processors - 1000 MHz/133 MHz - 512 MB SDRAM - 64 MB Flash - PMC32 VIO set for 5V signalling PMCs
Rugged Air-Cooled (RA Class)		Ethernet routed to front panel - PMC32 VIO set for 5V signalling PMCs - L3 Cache 2MB is default
PowerNode3	VEGA2RA803210000	Two PPCG4+ 7457 Processors - 1000 MHz/100 MHz - 512 MB SDRAM - 64 MB Flash
Rugged Conduction-Cooled (RC Class)		PPCG4+ 7457 Processor - Ethernet routed to backplane - L3 Cache 2MB is default
PowerNode3	VEGA1RC804201000	One Processor - 1000 MHz/100 MHz - 256 MB SDRAM - 64 MB Flash - PMC32 VIO set for 5V signalling PMCs
PowerNode3	VEGA2RC802201000	Two Processors - 1000 MHz/100 MHz - 256 MB SDRAM - 64 MB Flash - PMC32 VIO set for 5V signalling PMCs
PowerNode3	VEGA2RC803201000	Two Processors - 1000 MHz/100 MHz - 256 MB SDRAM - 64 MB Flash - PMC32 VIO set for 5V signalling PMCs
PowerNode3	VEGA2RC803211000	Two Processors - 1000 MHz/100 MHz - 512 MB SDRAM - 64 MB Flash - PMC32 VIO set for 3.3V signalling PMCs

CORPORATE OFFICES

Europe, Middle East & Africa

Oskar-von-Miller-Str. 1
85386 Eching/Munich
Germany

Tel.: +49 (0)8165/ 77 777
Fax: +49 (0)8165/ 77 219

info@kontron.com

North America

14118 Stowe Drive
Poway, CA 92064-7147
USA

Tel.: +1 888 294 4558
Fax: +1 858 677 0898

info@us.kontron.com

Asia Pacific

17 Building,Block #1,ABP.
188 Southern West 4th Ring Road
Beijing 100070, P.R.China

Tel.: + 86 10 63751188
Fax: + 86 10 83682438

info@kontron.cn

Intel Embedded Alliance Premier

#PowerNode3# 05032010MB
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