Raptor MX

1.3 GHz PowerPC Performance & Onboard MIL-STD-1553

- Air-cooled, 6U VME single-board computer
- PowerPC 7455/57 with AltiVec™ up to 1.3 GHz
- Single or dual CPU
- Up to 2 MB L3 backside cache plus 2 MB private memory
- 100/133 MHz integrated system/memory controller
- Dual 64-bit PCI buses
- Up to 1 GB SDRAM
- Up to 64 MB Flash (NOR)
- Up to 512 MB Flash (NAND)
- Two 64-bit PMC sites
- Two dual-redundant MIL-STD-1553 ports
- I/O: Serial (6), IEEE 1394 (2), 10/100 Ethernet (3) and USB 1.1/2.0 (2)
- Multiple temperature & ruggedization levels
- DSP ready with Curtiss-Wright's Math Library
- VxWorks,® INTEGRITY™ or Linux™ (SMP)

Single or Dual PowerPC 7455/57

Available in a single or dual CPU configuration, the Raptor MX features the latest, most advanced generation of PowerPC G4 processor – the 7455/57, available in clock speeds up to 1.3 GHz. The processor is supported by three levels of enhanced cache memory, resulting in a dramatic speed and efficiency gain over the earlier 7410 series boards. On the Raptor MX, the 512 KB L2 cache (7457) joins the L1 on-chip. Now integrated with the CPU core, the L2 operates at speeds matching the frequency of the processor. Its eight-way associativity provides better system coverage – locating data faster and more efficiently. The 7455/57 provides up to 2 MB of L3 backside cache as well as an optional 2 MB of private memory (7457 only) which functions as a high-speed "scratch pad" memory.

The Raptor MX complements the 7455/57 processor with the Discovery™ advanced system controller – a single chip that integrates fast memory, dual PCI buses and abundant I/O functionality, all routed through a high-bandwidth crossbar.

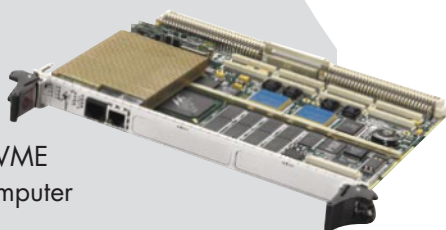### MIL-STD-1553 Plus Redundancy of All Onboard I/O

The Raptor MX marries 1.3 GHz performance to the highest density, entirely redundant I/O offering available on a single-slot, 6U VME board. This extensive I/O offering includes three 10/100 Ethernet ports, up to six RS-232/422/485 serial ports, 16 discrete I/O lines, and either two IEEE 1394 channels or two USB 1.1/2.0 ports.

Key to avionics system support are the two dual-redundant, multi-function 1553B channels which provide the crucial network fail-over capability and enhanced system fault-tolerance inherent in the 1553 standard.

The board further extends I/O flexibility by providing two on-board, 64-bit PMC sites. Curtiss-Wright offers a full line of PMC modules and carrier boards to meet additional I/O requirements.

Software Support

Curtiss-Wright offers extensive board support packages for multiprocessor VxWorks, Integrity and Symmetric Multiprocessing (SMP) Linux. The

For more information on our broad range of high-integrity computing solutions, please visit our website at **www.cwcembedded.com** .

CURTISS WRIGHT *Controls*
Embedded Computing

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Raptor MX ships with S.T.A.R./ASTRix,™ Curtiss-Wright's comprehensive system monitor, configuration and diagnostic firmware, including power-up and initiated Built In Self Test (BIST).

For DSP applications, Curtiss-Wright offers its own extensible math library containing several hundred of the most common DSP functions, as well as supporting the Vector Signal & Image Processing Library (VSIPL) standard. This hand-coded library has been optimized for the PowerPC and AltiVec technologies and supports VxWorks, Integrity and Linux.

Features

PCI Processor
◆ Single or dual PowerPC 7455/57 733 MHz, 1 or 1.3 GHz

Memory: (on-board, 100/133 MHz)
◆ Main memory: 256, 512 MB or 1 GB SDRAM supporting parity/ECC
◆ L3 backside cache: 2 MB per CPU, 2 MB private memory per CPU (opt. on 7457)
◆ Flash: 64 MB (NOR) assigned to boot and alternate boot with flexible write protect options
◆ Flash: 512 MB (NAND) (opt.)
◆ NVRAM (clock/calendar): 128 KB; NVRAM (no back-up required): 32 KB (opt.)

VME Interface
◆ Interface: VME64x, A32, D64
◆ PCI-to-VME interface: Tundra Universe II; PCI Buses: (dual 64-bit PCI buses)
◆ PCI bus 0: 64-bit/66 MHz supports one PMC site
◆ PCI bus 1: 64-bit/33 MHz supports VME, 1394, 1553, USB, & one PMC site

PMC I/O
◆ Two standard 64-bit PMC sites: 3.3V (optional 5V) signaling; PMC I/O routed front and/or rear
◆ Controlled impedance and differential pair support on PMC I/O

On-board I/O
◆ Ethernet: three auto-sensing 10/100 Base-T
◆ Serial: four asynchronous RS-232/422/485 with up to two modem control channels
◆ Serial: two sync./async. RS-232/422/485
◆ IEEE 1394: two channels, 400 Mb/s (opt.)
◆ USB: two ports, USB 1.1 or 2.0 (opt.)
◆ 1553: two ports, dual-redundant 1553B

Physical Specifications
◆ 6U form factor: 9.187" (233.35 mm) x 6.690" (169.93 mm) x .070" (17.78 mm)
◆ Weight (board only): 16 oz (450g)

Power Requirement: (depends on configuration)
◆ Single PPC 7457 @ 1 GHz: +5.0V +5%/-2.5%, 7.6 A typical @ 5.00V (38 W)

Environmental & Reliability
◆ Standard operating temperature: 0° to +50° C
   Extended temperature: -20° to +71° C; Extreme temperature: -40° to +71° C
   Ambient with forced air cooling; 200-600 LFM dep. on configuration
◆ Ruggedization options:
   Level R0: benign; 0 random/0 shock; Level R1: 6.25G RMS random /20G shock
   Level R2: 8.9G RMS random/30G shock
◆ Storage temperature: -50° to 100° C
◆ Humidity: 0–95% RH non-condensing
◆ Altitude: battery, capacitor and EEPROM back-up options, high-altitude configurations available. Call for more information

Other Features
◆ Five multicolored status LEDs, eight user-programmable LEDs and one reset switch
◆ Sixteen single-ended or eight differential discrete I/O pins
◆ Programmable interrupts – priority of any interrupt source can be set in software
◆ Two 32-bit counters can broadcast interrupts to all CPUs simultaneously
◆ Eight 32-bit general purpose counters
◆ Two interprocessor doorbell interrupts per CPU
◆ Enhanced watchdog timer
◆ TOD clock/calendar
◆ Eight general purpose DMA controllers
◆ System Management Bus (SMB) support
◆ I2O Message Unit

Options
◆ VxWorks, Linux, Linux SMP or Integrity BSP
◆ Temperature/ruggedization levels
◆ Conformal coating
◆ Flash File Manager (ECC & wear leveling)
◆ JTAG/COP debug connector
◆ Other options include CPU speed, SDRAM size, Flash size and additional private memory (cache)

Accessories
◆ PIM Carrier Transition Module (TYR5)
◆ DROM: removable boot Flash
◆ Curtiss-Wright's DSP Math Library
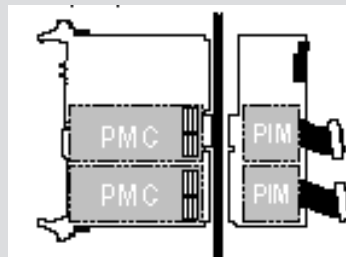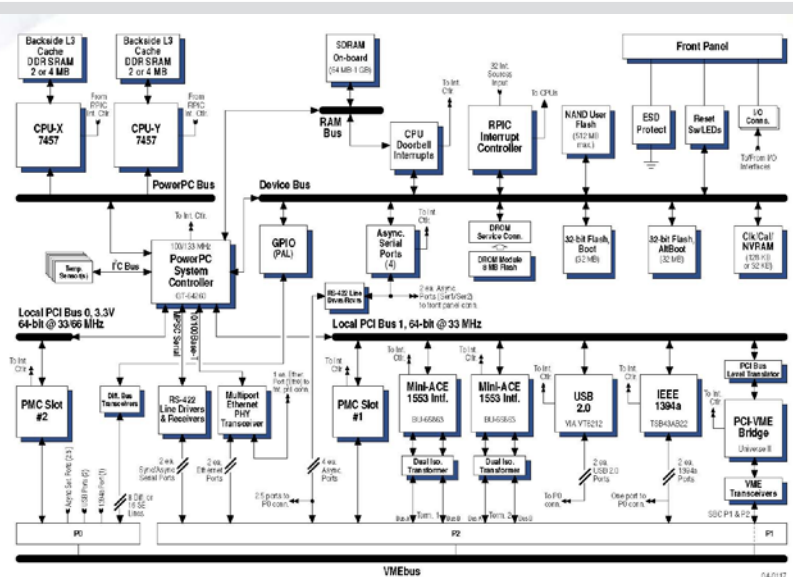
PIM Carrier Transition Module

Rear I/O option for lab use

The TYR5 is a PIM Carrier Transition Module that matches the I/O options available on the Raptor MX, including two industry-standard PIM sites that correspond with the on-board PMC sites. The TYR5 provides easy connectivity for rear-routed I/O for use in a development or lab environment.