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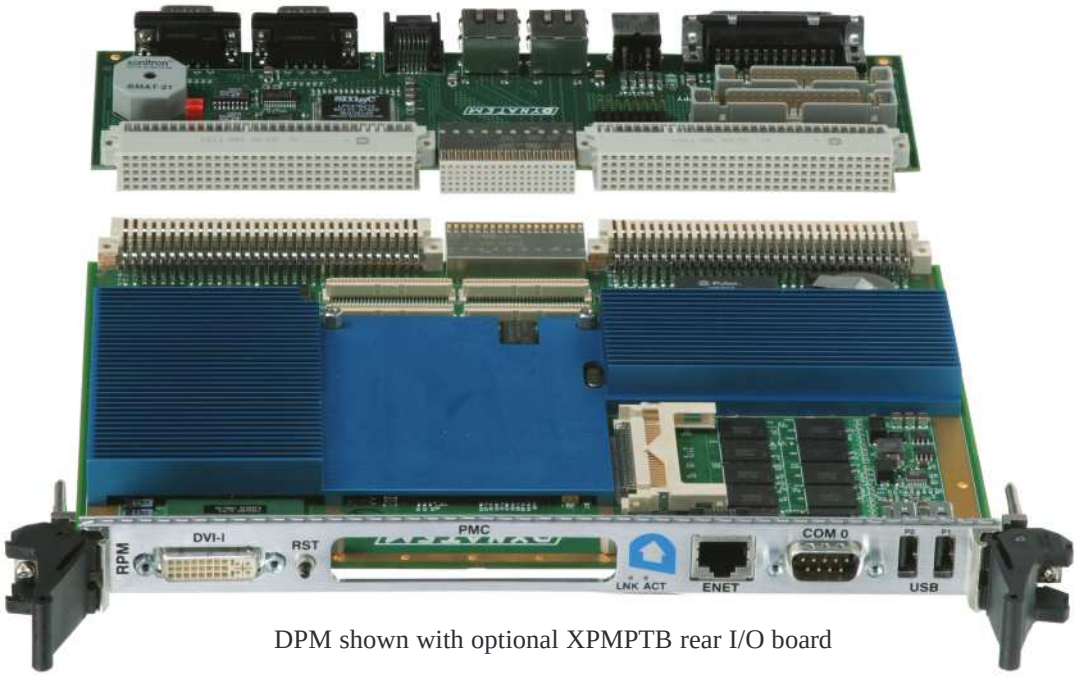
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VMEbus Pentium M Single Board Computer



DPM shown with optional XPMPTB rear I/O board

DPM

The DPM is a VMEbus (and VME64) compatible platform based on the Intel® low-power Pentium® M (Dothan) processor. The DPM takes advantage of the Pentium M's low-power consumption as a rugged Single Board Computer (SBC) and it is optionally available as an IEEE 1101.2-compliant, conduction-cooled VMEbus module with wedge locks and a full-board heat sink for high shock/vibration environments and temperature extremes.

The 855GME Graphics Memory Controller Hub (GMCH) and 6300ESB I/O Controller Hub (ICH) chipset supports PCI-X expansion, integrated VGA/DVO interface, USB 2.0, ATA/100, and Serial ATA (SATA). A DVI-I connector, two USB 2.0 ports, a 10/100BaseTX interface, and a COM port are all accessible from the front panel. On-board CompactFlash permits single-slot booting. Two VITA 31.1-compliant, 10/100/1000BaseTX ports are routed to the backplane. Conventional PC I/O is accessible with industry-standard connectors on optional rear I/O modules, as well as, SATA, VGA/DVO video, Gb Ethernet, and two more USB 2.0 ports. One PMC-X site is provided for additional I/O expansion.

Processor
Intel® Pentium® M Processor:

- 2 MB of L2 Advanced Transfer Cache
- Available in Ultra Low Voltage 1.0 GHz @ 5 W; Low Voltage at 1.4 GHz @ 10 W; or 1.8 GHz @ 21 W

Single-slot Operation
Single-slot VMEbus operation with an on-board CompactFlash disk for bootable mass storage

855GME and 6300ESB Chipset
400 MT/sec System Bus
Ultra ATA 100/66/33 IDE protocol
PCI-X expansion offers 64 bits @ 66 MHz data transfer capability
Integrated Graphics
Chipset includes DRAM controller, USB 2.0 interface, two Serial ATA/150 ports, RTC, NV-RAM, standard PC timers, Ultra DMA, and interrupt logic

DRAM
DDR-266 support with a memory bandwidth of 2.1 GB/s
Stuffing options for 512MB or 1GB
Supports ECC

VMEbus

Tundra Universe IID PCI-VMEbus interface provides 64-bit VMEbus transfer rates over 30 MB/sec

Full range of software drivers is available for different operating systems

Full Slot 1 (system controller) functions provided

Lower cost versions available without VMEbus

PMC Expansion

One PMC-X site with 64 bit @ 66 MHz bandwidth is available on-board

PMC-P4 is routed in accordance with VITA-35 P4V2-46dz (PMC-P4 to VME64x-P2-Rows-D,Z)

Ethernet

An Intel 82546 Ethernet controller supports two 10/100/1000BaseTX Ethernet ports routed to the P0 connector in compliance with VITA 31.1 for back plane fabric switching or for alternate routing to an optional rear I/O card

An 82559 provides one 10/100BaseTX port that is accessible from the front panel

Graphics

DVI-I connector integrates one digital and one analog output

Analog video output supports VGA to UXGA resolutions

Digital video output (DVO) port with up to 165 MHz dot clock, 12-bit interface with attached Silicon Image PaneLink transmitter

Supports a 5 meter cable

Compliant with DVI Specification 1.0

Optional VGA and DVO routing to P0 for rugged versions

IDE

Primary ATA/100 DMA IDE interface is accessible from the VMEbus P2 connector

PIO and bus master support

Secondary IDE port is routed to a Type II-compatible CompactFlash connector for on-board booting

BIOS

General Software's flash-based system BIOS with a variety of boot options, including CD-ROM and PXE over Ethernet

Customized versions available upon request

Watchdog

Programmable watchdog timer for system recovery

I/O interfaces accessible from the front panel

VGA/DVO, Dual USB, 10/100BaseTX port, and COM1

XPMPTB Rear I/O Transition Board

IDE and PMC I/O (routed through P2)

LPC version has on-board super I/O chip which produces standard PC I/O including two RS-232/422/485 ports, floppy disk controller, Mouse/Keyboard interface, and LPT1 header

Non-LPC version, COM2 (RS-232 only) and two distinct USB 2.0 ports are routed through P2 to rear I/O card

Non-LPC I/O is also accessible without XPMPTB

P0 version, two Serial ATA ports, two 0/100/1000BaseTX ports, and (routed through P0)

VGA/DVO routed to P0 in conduction-cooled versions without front panel I/O

P0 I/O can also be accessed without XPMPTB

Rugged Versions Available (RPM)

Wedge locks and conduction-cooled in compliance with IEEE 1101.2

Operating Temperature Range

Standard operating temperature range of -40°/+71°C

-40°/+85°C operation available for 1.0 GHz and 1.4 GHz versions (SpeedStep available for 1.8 GHz versions)

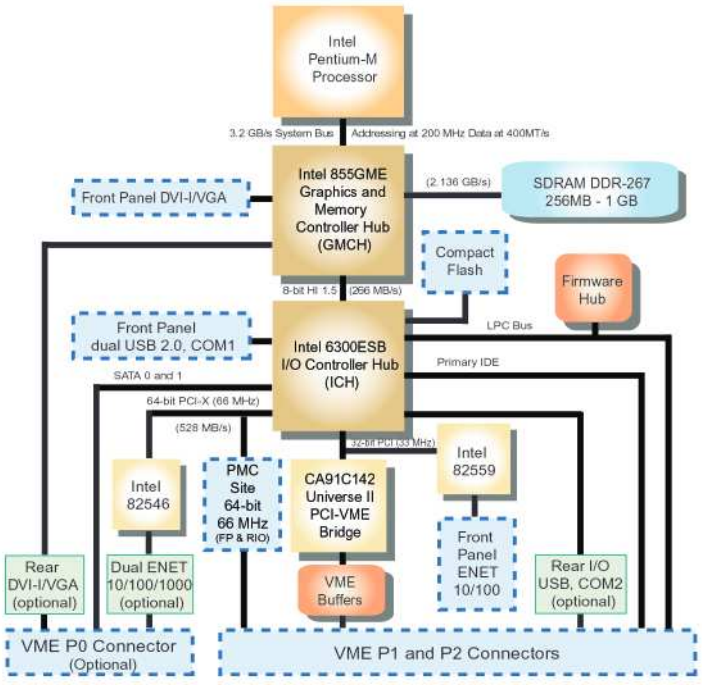
Power Requirements

3.5 A @ 5 VDC typical (1.4 GHz Pentium M)

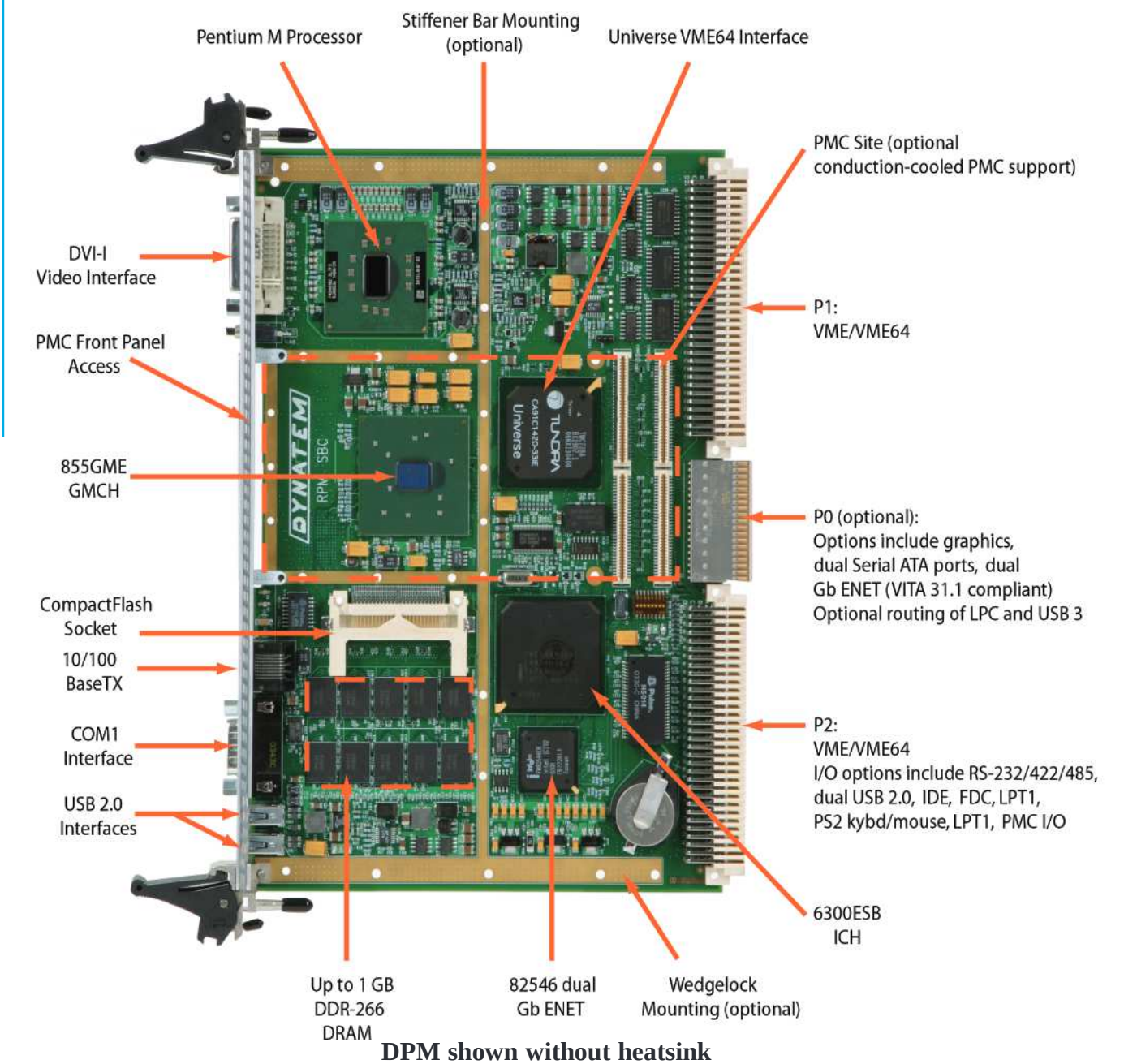
Net Weight

18.4 oz. with P0, 1 GB DDR267, no CompactFlash

17.94 oz. as above with no P0 connector



DPM Block Diagram



DPM shown without heatsink



DPM single-slot front panel

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DPM I/O Routing

I/O	Front Panel	Through P0	P2 w/o LPC	P2 with LPC
DVI-I Graphics*	1+	1+		
Serial ATA		2		
AC'97 CODEC		1		
10/100BaseT	1			
Gb Ethernet		2 (VITA 31.1)		
RS-232 COM 1 Port	1			
RS-232 COM 2 Port			1	
RS-232/422/485 COM 3/4 Port				2**
USB 2.0	2		2	
Floppy Disk Controller				1**
PS/2 Mouse/Kybd				1**
LPT1 Parallel Port				1**
IDE Interface			1	1

*** DVI graphics can be routed either to front panel or P0, but not both.**

**** Requires XPMPTB with super I/O device installed and LPC version of DPM**

XPMPTB provides industry standard connectors for I/O routed to P2 and P0. I/O can also be accessed directly from P0 and P2 except for I/O generated by Super I/O located on XPMPTB

Special routing available (for TBQ) with LPC and USB 3 routed to P0 instead of P2

Ordering Information:

Part#	Description
XPMxPPxL	Single-slot CPU board with 1.4 GHz Pentium-M. 512 MB DDR-267 DRAM. With DVI-I/VGA, dual USB 2.0, 10/100BaseT, COM1on front panel. PCI-X compatible PMC site with front and rear access. Support for up to 4 GB bootable CompactFlash. With no P0 connector. LPC routed to P2 (for versions using XPMPTB or XPMPTBP)
XPMQxxxx	256 MB Flash for DPM
XPMRxxxx	512 MB Flash for DPM
XPMSxxxx	1 GB Flash for DPM
XPMTxxxx	2 GB Flash for DPM
XPMUxxxx	4 GB Flash for DPM
XPMVxxxx	8 GB Flash for DPM
XPMWxxxx	16 GB Flash for DPM
XPMxQxxx	Upgrade to 1 GB DDR-266 memory
XPMxx8xx	Ultra low power 1.0 GHz Celeron M
XPMxxQxx	Upgrade to 1.8 GHz Pentium M
XPMxxxPx	P0 with dual 10/100/1000BaseT and dual SATA routed to backplane. VITA 31.1 compliant
XPMxxxGx	P0 with dual 10/100/1000BaseT, dual SATA and graphics routed to backplane. VITA 31.1 compliant
XPMxxxQx	Special TBQ version with graphics, SATA, LPC, one USB and IDE routed to TBQ
XPMxxxXx	No P0 connector
XPMxxxxX	No LPC routed to P2 (instead COM2, 2x USB 2.0 and IDE routed to P2 directly)
DPMxxxxx	With VME64 interface
XPMxxxxx-ER	-40°/+85° C operation (1.0 GHz and 1,4 GHz)
CONCOAT-XPM	Conformal coating
XPMPTBxy	Rear transition board for DPM/RPM. Supports IDE plus options below:
x = P	Supports P0 I/O including dual GbE, dual SATA.
x = G	Supports P0 I/O including dual GbE, dual SATA. Supports DVI interface for RPM and DPM if not routed to front panel
x = x	No P0 support
y = L	LPC support with Super I/O and connectors for has DB-9s for COM3 and COM4 (RS-232/422/485), PS/2 keyboard/mouse, LPT1 header, floppy interface on a header
y = y	No LPC, two USB 2.0 and COM2 (RS-232)
TBR	Transition board for DPM. Includes Super I/O device which provides 2 COM ports (RS232/422/485 via two front panel DB-9 connectors), PS/2 kybd/mouse, floppy disk interface. IDE routed from DPM supports on-board hard drive and CD-ROM drive. Interface to DPM via P2 -> P2 cabling for LPC and IDE interconnect.
TBQ	Transition board for DPM with front panel access for: PS/2 kybd/mouse, one COM port for RS-232/422/485, two 10/100/1000 BaseT, one audio Codec, SATA. Can also accommo date up to two on-board 2.5" SATA drives

See RPM for conduction-cooled versions

Special configurations can be quoted with alternate routing of graphics to P0, COM2 and USB routed to P2 or P0.

Pentium M

The Intel® Pentium® M processor was designed from the ground up with a new microarchitecture that delivers high performance with low power consumption. With its 90 nm processing technology and 2 MB of L2 advanced transfer cache, the Pentium M offers more performance per Watt. Second-generation Streaming SIMD Extensions (Streaming SIMD Extensions 2) capability adds 144 new instructions, including 128-bit SIMD integer arithmetic and 128-bit SIMD double-precision floating-point operation. The Pentium. The Pentium M also offers a dedicated hardware stack manager that employs sophisticated hardware control for improved stack management, advanced branch prediction capability, and a 400 MHz front side bus to the memory controller hub.

Chipset and 6300ESB ICH

The Intel® 855GME Graphics Memory Controller Hub (GMCH) and Intel® 6300ESB I/O Controller Hub (ICH) chipset create an optimized integrated graphics solution with a 400 MHz system bus and integrated 32-bit 3D core at 133 MHz.

855GME

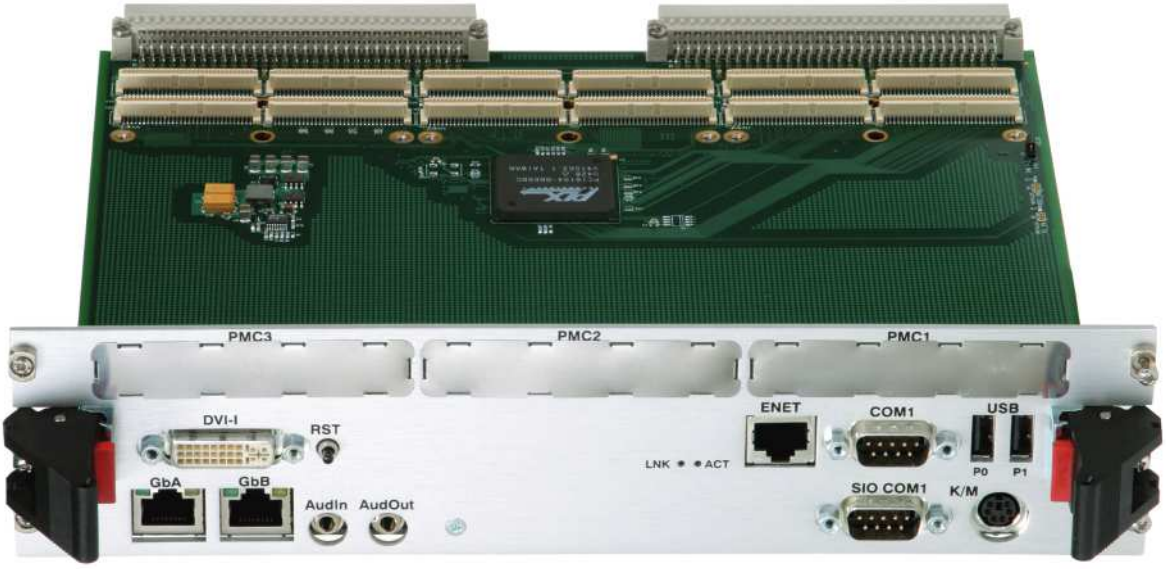
DRAM Controller

The 855GME (GMCH) provides a 266 MHz interface to DDR RAM (72 bits wide with ECC). The RPM can be populated with one or two banks of DRAM for 512 MB or 1 GB of total memory respectively. The GMCH system memory architecture is optimized to maintain open pages (up to 16-kB page size) across multiple rows. As a result, up to 16 pages across four rows is supported. To complement this, the GMCH will tend to keep pages open within rows, or will only close a single bank on a page miss.

Graphics Processor

The 855GME also has an advanced integrated graphical display controller. The RPM routes the two available DVO ports; one is accessible from the front panel while the other is brought out through the P0 connector to the system backplane. The DVO ports:

- Provide high-speed, 12-bit interfaces with 165 MHz dot clocks
- Supports DVO devices (TV-Out Encoders, TMDS & LVDS transmitters, etc.) with pixel resolutions up to 1600 x 1200 @ 85 Hz and up to 1048 x 1536 @ 72 Hz
- The two ports can be combined for one 24-bit, 330 MHz interface
- Compliant with DVI Specification 1.0



DPM shown with TBQ Transition board and XPMPMC3 3-PMC carrier. The TBQ transition board provides additional front panel I/O including dual Gb ENET, Audio In and Out, an additional COM Port and PS/2 KB/Mouse. The TBQ also offers on board SATA storage option.

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Tundra Universe IID CA91C142D PCI-VMEbus Interface

The PCI-VMEbus interface, based on the Tundra Universe IID CA91C142D, offers the following features:

- High-performance 64-bit VMEbus interface
- Integral FIFOs for write-posting allow the Universe IID to quickly relinquish the bus
- Programmable DMA controller with linked list support
- Full VMEbus system controller functionality
- Complete VMEbus address and data transfer modes: A32/A24/A16 master and slave; D64 (MBLT)/D32/D16/D08 master and slave

6300ESB

The 6300ESB I/O Controller Hub (ICH) provides most of the RPM's on-board I/O and it's the RPM's PCI-X expansion bridge. The ICH is designed as a low-power, high-performance I/O hub that features:

- 64-bit @ 66 MHz PCI-X expansion that is used on the RPM for the on-board PMC-X slot, the three Ethernet ports available on the RPM, and for the Universe IID PCI/VMEbus bridge
- Four USB 2.0 compliant ports: two of which are routed to the front panel while the other two may optionally be routed to the P2 connector to the back plane (if the LPC interface (also provided by the IHC) is not routed to the Super I/O device on the DPMPTB rear I/O module)
- Integrated IDE controller supports Ultra 100 DMA Mode Transfers up to 100 MB/sec read cycles and 88.88 MB/sec write cycles for a CompactFlash drive on-board and a primary IDE port that is routed through P2 to the RPMPTB
- Two Serial ATA ports providing 150 MB/sec data rates are routed through P0
- Standard PC functionality like a battery-backed RTC and 256-bytes of CMOS RAM, Power Management Logic, Interrupt Controller, Watchdog Timer, AC'97 CODEC, Integrated 16550 compatible UART's, and multimedia timers based on the 82C54

Intel 82546EB Dual Gigabit Ethernet Controller

The DPM supports two 10/100/1000BaseTX channels that are routed to the P0 connector in compliance with the Vita 31.1 Specification for backplane fabric switching. The Intel 82546EB Dual Port Gigabit Ethernet Controller incorporates two full Gigabit Ethernet MAC and PHY layer functions on a single, compact component. Routed from the ICH, the front side data path to the dual Ethernet port controller is 64 bits at 66 MHz. The Intel 82546EB offers the following features: 10, 100, and 1000BaseTX support with auto-negotiation; Dual 64KB configurable RX and TX packet FIFOs; 128-bit internal data path architecture for low latency data handling and superior DMA transfer rate performance; Built-in Phyceiver.

Intel 82559 Fast Ethernet Controller

The RPM The Intel 82559 offers the following features: 10BaseT and 100BaseTX support with auto-negotiation; Independent 3 KB receive and transmit FIFOs; Powerful on-chip DMA minimizes CPU overhead with zero wait-state burst transfers to system memory; Built-in Phyceiver.

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