MVME8105
NXP® QorIQ® P5020 VME64x SBC

- XP QorIQ P5020 2.0 GHz
- 4GB DDR3-1333 MHz ECC memory soldered down
- 512KB MRAM
- Two PMC/XMC sites
- Embedded NAND Flash (8GB eMMC)
- Up to two USB 2.0 ports
- Up to three Ethernet ports (two ports on front panel)
- Up to five Serial ports
- Two GPIO
- BSP support including Wind River VxWorks, Linux and Green Hills Integrity

RoHS 6/6 COMPLIANT

The SMART Embedded Computing MVME8105 is a high performance 6U VME SBC featuring the NXP QorIQ P5020 2.0 GHz processor supporting high speed DDR3-1333 MHz with ECC. It offers expanded IO and memory features with multiple USB, Serial and Ethernet ports. Memory includes up to 4GB DDR3, 512KB MRAM non-volatile memory, and 8GB eMMC NAND Flash.
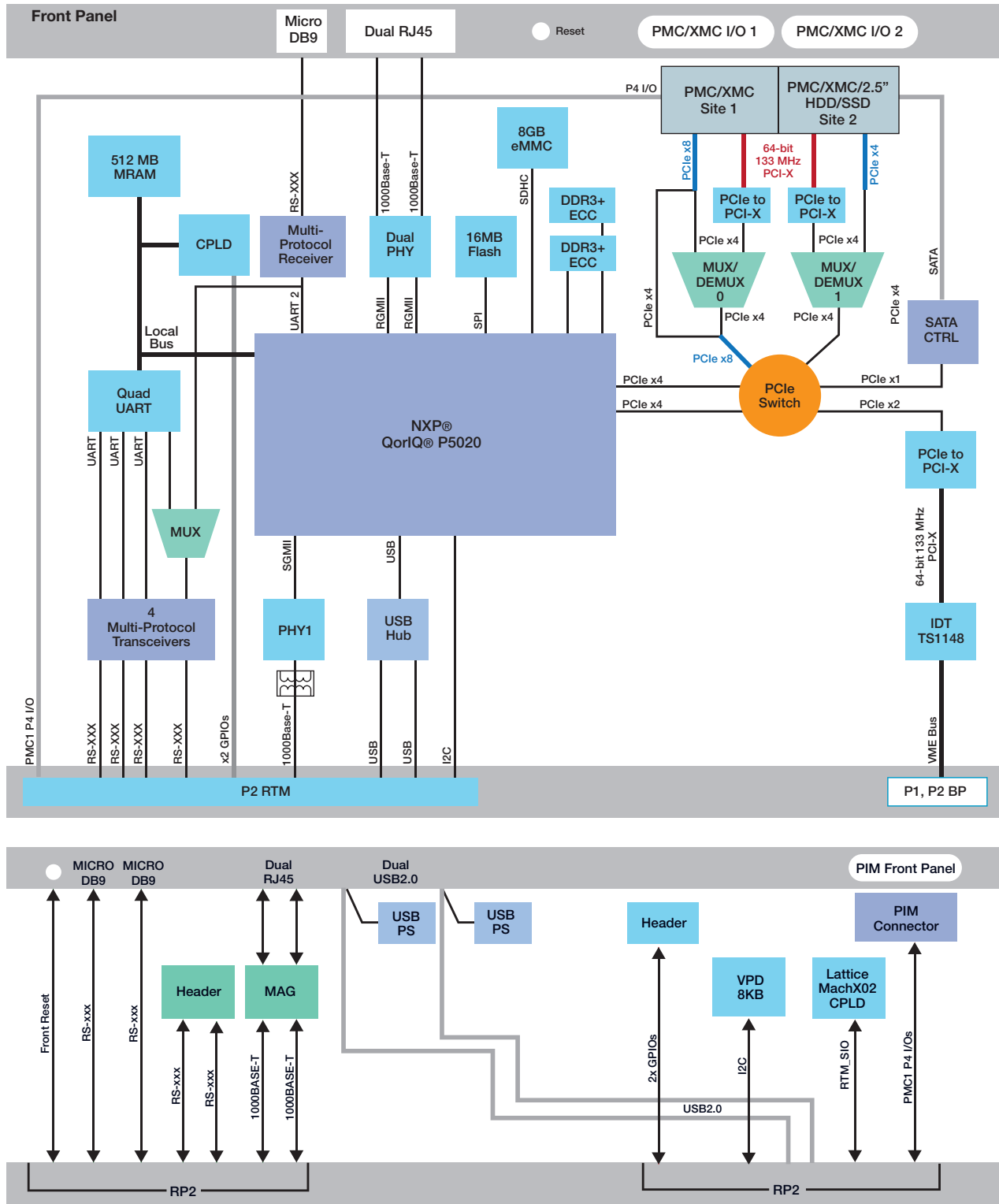
The MVME8105 provides an expansion to SMART EC's VMEbus product family to prolong current programs while providing more computing performance and data throughput. Compared to other variants of the MVME8100 series, the MVME8105 is designed to match the highest computing power with an elimination of the VXS interface. In addition, it increases the number of Gigabit Ethernet ports to two (2) on the front panel, which is suitable for applications requiring higher Ethernet connection capacities.

Supporting a full range of BSPs including Wind River VxWorks, Linux and Green Hills Integrity, the MVME8105 is suitable for a range of high end industrial control such as SPE and photo lithography, and C4ISR (including Radar/Sonar) and it is also an ideal SBC solution for the high performance mission/safety critical applications.

SMART™ Embedded Computing

MVME8105 Block Diagram

Front Panel

Micro DB9   Dual RJ45   Reset   PMC/XMC I/O 1   PMC/XMC I/O 2

P4 I/O

PMC/XMC Site 1   PMC/XMC/2.5" HDD/SSD Site 2

512 MB MRAM

8GB eMMC

64-bit 133 MHz PCI-X

PCIe x8

PCIe to PCI-X   PCIe to PCI-X

PCIe x4

SATA

CPLD   Multi-Protocol Receiver   Dual PHY   16MB Flash   DDR3+ ECC   DDR3+ ECC

SDHC   RS-XXX   1000Base-T   1000Base-T   RGMII   RGMII   SPI

PCIe x4   MUX/DEMUX 0   MUX/DEMUX 1

PCIe x4   PCIe x4

SATA CTRL

Local Bus

UART 2

Quad UART

NXP® QorIQ® P5020

PCIe x8   PCIe Switch

PCIe x4   PCIe x1
PCIe x4   PCIe x2

UART   UART   UART

MUX

PCIe to PCI-X

SGMII   USB

64-bit 133 MHz PCI-X

4 Multi-Protocol Transceivers   PHY1   USB Hub

IDT TS1148

PMC1 P4 I/O   RS-XXX   RS-XXX   RS-XXX   RS-XXX   x2 GPIOs   1000Base-T   USB   USB   I2C

VME Bus

P2 RTM   P1, P2 BP

PIM Front Panel

MICRO DB9   MICRO DB9   Dual RJ45   Dual USB2.0   Header   PIM Connector

USB PS   USB PS

Header

VPD 8KB   Lattice MachX02 CPLD

Front Reset   RS-xxx   RS-xxx

Header   MAG

RS-xxx   RS-xxx   1000BASE-T   1000BASE-T

2x GPIOs   I2C   RTM_SIO   PMC1 P4 I/Os

USB2.0

RP2   RP2

Hardware Specifications

PROCESSOR

- NXP QorIQ P5020
- 2.0 GHz: ENP1 variants (28 W)

MEMORY

- Designed for 4GB of 64-bit DDR3-1333 ECC SDRAM soldered down
- 16MB SPI ROM for boot code (in 1+1 redundant 8MB banks/devices)
- 512KB MRAM for data storage
- 8GB NAND Flash with eMMC interface

BACKPLANE I/O

- P1
  - VME64x & 2eSST
- P2
  - VME64x & 2eSST
  - PMC1 I/O (64 signals)
  - Two USB 2.0
  - VME64x & 2eSST
  - Four RS232/422/485
  - One 10/100/1000BaseT Ethernet
  - Two GPIO

OTHER FEATURES

- Real Time Clock with battery backup
- Real time counters
- Watchdog

EXPANSION MODULE

- Site 1 supports PMC or XMC (PCI-X/PCIe x8)
- Site 2 supports PMC or XMC (PCI-X/PCIe x4) or alternatively supports a mounting kit for a 2.5" SATA HDD or SSD

FRONT PANEL CONNECTIVITY

- Two Gigabit Ethernet (RJ-45)
- One RS232/422/485 console (Micro-DB9)
- Two PMC/XMC

REAR TRANSITION MODULE

- MVME8110-RTM (or VXS1-RTM1)
  - Two USB 2.0 ports (Type A)
  - Two RS232/422/485 ports (Micro-DB9)
    - One port is switchable between a console and standard COM port
  - Two RS232/422/485 ports (internal headers)
  - Two 10/100/1000BASE-T Ethernet ports (RJ-45)
  - One PMC Interface Module (PIM) site
  - Two GPIO (internal headers)
  - Reset switch

POWER REQUIREMENTS

- ENP1: 38 W idle, 42 W typical, 54 W max

Software and Firmware Specifications

BOOT

- UBoot binary and source code

BOARD SUPPORT PACKAGES

- VxWorks (available from Wind River)
- Linux

Estimated MTBF

MTBF estimated per Telcordia SR-332, issue 2, ground fixed, controlled environment, unit ambient air temperature of 40 °C is 600,000 hours at 60% confidence level. Contact SMART EC for alternative environments or temperatures.

All Modules

ENVIRONMENTAL

Ruggedization Level	ENP1
Cooling Method	Forced Air
Operating Temperature	0 °C to +55 °C
Storage Temperature	−40 °C to +85 °C
Vibration Sine: (10min/axis)	2G, 5 - 500 Hz
Vibration Random: (1hr/axis)	.002 g2/Hz, 15 to 2000 Hz[1]
Shock	20 g/11 mS
Humidity	to 95% RH
Conformal Coating	No

Note 1: Flat 15-1000 Hz, -6 db/octave 1000 Hz − 2000 Hz [MIL-STD 810F Figure 514.5C-17]

ELECTROMAGNETIC COMPATIBILITY (EMC)

- SMART EC board products are tested in a representative system to the following standards:
  - U.S.: FCC Part 15, Subpart B, Class A (non-residential)
  - Canada: ICES-003, Class A (non-residential)
  - CE Mark per European EMC Directive 2004/108/EC with Amendments; Emissions: EN55022 Class A; Immunity: EN55024
  - KCC Mark (in process)

DOCUMENTATION

- Installation and Use Manuals
- Programmers Reference Manual
- Release Notes
- OS Release Notes and User Guide

Ordering Information	
Part Number	**Description**
Boards	
MVME8105-01E	P5020 2.0 GHz, 4GB DDR3, 2PMC/XMC, ENP1, IEEE
Rear Transition Modules	
MVME8110-RTM	RTM FOR MVME8100/8105/8110, without P0, IEEE
Accessories	
SERIAL-MINI-D2	Serial cable - Micro D sub connector to standard DB-9
ACC/CABLE/SER/DTE/6E	Serial cable, RD 009, 2M, 2 DTE MD/D, RJ45 to DB9

SOLUTION SERVICES

SMART Embedded Computing provides a portfolio of solution services optimized to meet your needs throughout the product lifecycle. Design services help speed time-to-market. Deployment services include worldwide technical support. Renewal services enable product longevity and technology refresh.

CONTACT DETAILS

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