PENGUIN™ SOLUTIONS

Penguin Edge™ MVME8100

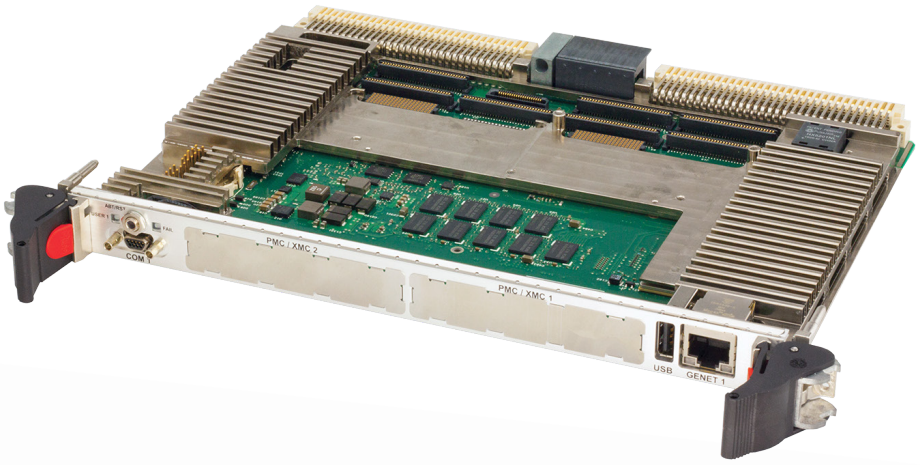
NXP® QorIQ® P5020 VME64x/VXS SBC

- NXP QorIQ P5020 1.8/2.0GHz
- Up to 8GB DDR3-1333MHz ECC Memory
- 512KB FRAM
- Two PMC/XMC sites
- Embedded NAND Flash (8GB eMMC)
- 2 x 4 PCIe or 2 x 4 SRIO connectivity to VXS backplane P0
- Up to three USB 2.0 ports
- Up to five Ethernet ports
- Up to five Serial ports
- Four GPIO
- Extended temperature and conduction cooled variants

The Penguin Edge™ MVME8100 is a high performance 6U VME/VXS SBC featuring the NXP® QorIQ® P5020 processor supporting high speed DDR3-1333MHz with ECC. It offers expanded IO and memory features with PCIe and SRIO fabric connectivity and multiple USB, Serial and Ethernet ports. Memory includes up to 8GB DDR3, 512KB FRAM non-volatile memory, and 8GB eMMC NAND Flash.

The MVME8100 is offered in commercial and fully rugged variants for extreme environments with extended shock, vibration, temperatures and conduction cooling. It is designed for a range of high end industrial control such as SPE and photo lithography and C4ISR, including Radar/Sonar. It will provide technology insertion to prolong current programs while providing more computing performance and data throughput.

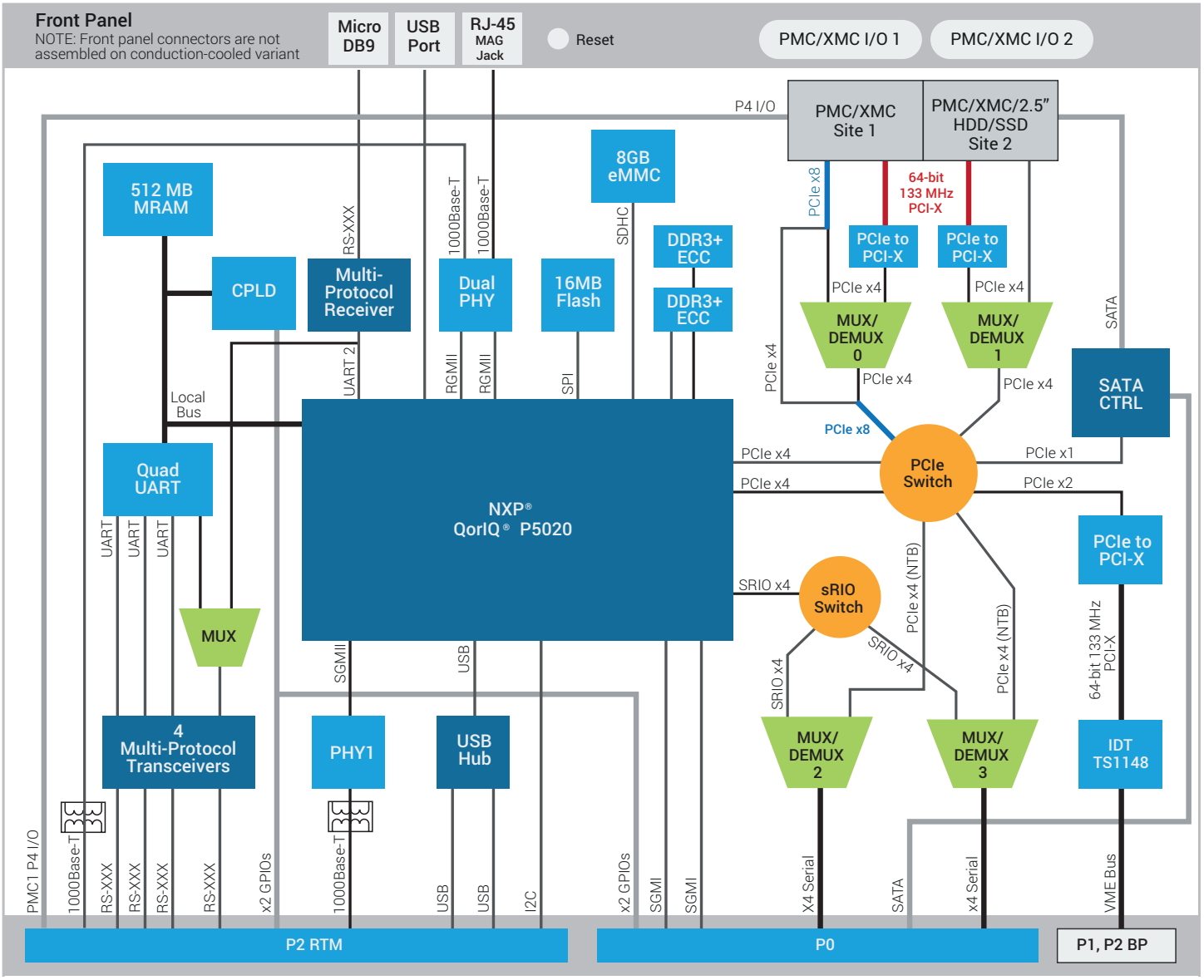
The MVME8100 supports a full range of BSPs including Linux, Wind River VxWorks, and Green Hills Integrity.



RoHS 6/6 COMPLIANT

PENGUIN™ EDGE

MVME8100 Block Diagram



Hardware Specifications

Processor

- NXP QorIQ P5020
- 1.8GHz: ENP4 variant
- 2.0GHz: ENP1 variants

Memory

- Designed for 8GB 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 SD/EMMC interface

Backplane I/O

- P0
  - Two SERDES GbE (VITA 41.6) (dedicated)
  - Up to two SRIO x4 links (VITA 41.2)
  - Up to two PCIe x4 links (VITA 41.4); root or end-point
  - One SATA 6GB
  - Two GPIO
- P1
  - VME64x & 2eSST
- P2
  - PMC1 I/O (64 signals)
  - Two USB 2.0
  - VME64x & 2eSST
  - Four RS-232/422/485
  - Two10/100/1000BaseT 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
  A: ontact EC or consult installation/use manual for requirements for rugged (ENP4) SSD modules

Front Panel Connectivity

- One GbE (RJ-45)
- One RS-232/422/485 console (Micro-BD9)
- One USB 2.0 (Type A)

Power Requirements

- ENP1: 38W idle, 42W typical, 54W max
- ENP4: 65W @ 85°C card edge

Software and Firmware Specifications

Boot

- UBoot binary and source code

Board Support Packages

- VxWorks available through 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 564,000 hours (ENP1 version), 577,000 hours (ENP4 version) at 60% confidence level. Contact Penguin Edge for alternative environments or temperatures.

All Modules

Environmental

Ruggedization Level 3	ENP1	ENP4
Cooling Method	Forced Air	Conduction
Operating Temperature	0°C to +55°C	–40°C to +85°C
Storage Temperature	–40°C to +85°C	–55°C to +105°C[3]
Vibration Sine (10min/axis)	2G, 5 - 500Hz	10G, 15 to 2000Hz
Vibration Random (1hr/axis)	.002g2/Hz, 15 to 2000Hz[1]	0.1g2/Hz, 15 to 2000Hz (12 GRMS)[2]
Shock	20 g/11mS	40g/11mS
Humidity	to 95% RH	to 100% RH
Conformal Coating	No	Acrylic

Note 1: Flat 15-1000Hz, -6 db/octave 1000Hz – 2000Hz [MIL-STD 810F Figure 514.5C-17]
Note 2: +3db/octave 15-300Hz, Flat .1g2 300-1000Hz, -6db/octave 1000Hz – 2000Hz [MIL-STD 810F Figure 514.5C-8]
Note 3: ENP4 storage temperatures exceed NAND flash limits of -40° to -85°C. Data degradation can occur.
RoHS (reduction of hazardous substances) status— ENP1: RoHS II, ENP4: RoHS 5/6 lead solder

Electromagnetic Compatibility (EMC)

- Penguin Edge 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 (ENP1)

Ordering Information	
Part Number	**Description**
Boards	
MVME8100-202200401E	P05020 2.0GHz, 4GB DDR3, 2PMC/XMC, ENP1 IEEE
MVME8100-04CC	P05020 1.8GHz, 4GB DDR3, 2PMC/XMC, ENP4, conformal coated
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, RJ-45 to DB-9

Contact Us

+1 602-438-5720
info@penguinsolutions.com
www.penguinsolutions.com/edge/

About Penguin Solutions

Penguin Solutions accelerates customers' digital transformation with the power of emerging technologies in HPC, AI, and IoT with solutions and services that span the continuum of edge, core, and cloud. The company designs highly advanced infrastructure, machines and networked systems that enable the world's most innovative enterprises and government institutions to build the autonomous future, drive discovery and amplify human potential. The Penguin Edge portfolio covers system on modules, single board computers and application-ready platforms that extend insight, intelligence, and analytical capabilities closer to where the data is generated - optimizing a range of use cases across industries and rugged environments.

PENGUIN™ SOLUTIONS

Penguin Solutions is a trade name used by SMART Embedded Computing, Inc., a wholly owned subsidiary of SMART Global Holdings, Inc. Penguin Edge is a trademark owned by Penguin Computing, Inc., a wholly owned subsidiary of SMART Global Holdings, Inc. NXP and QorIQ are trademarks of NXP B.V. All other logos, trade names, and trademarks are the property of their respective owners. Specifications are subject to change without notice. For full legal terms and conditions, please visit www.penguinsolutions.com/edge/legal/.

©2022 SMART Embedded Computing, Inc.