MVME8100
NXP® QorIQ® P5020 VME64x/VXS SBC

The SMART Embedded Computing MVME8100 is a high performance 6U VME/VXS SBC featuring the NXP QorIQ P5020 processor supporting high speed DDR3-1333 MHz 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 8 GB DDR3, 512 K FRAM non-volatile memory, and 8 GB 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.
MVME8100
Data Sheet

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)
- 512 kB 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 6 GB
  - Two GPIO
- P1
  - VME64x & 2eSST
- P2
  - PMC1 I/O (64 signals)
  - Two USB 2.0
  - VME64x & 2eSST
  - Four RS232/422/485
  - 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: Contact SMART EC or consult installation/use manual for requirements for rugged (ENP4) SSD modules.

**FRONT PANEL CONNECTIVITY**
- One GbE (RJ-45)
- One RS232/422/485 console (Micro-BD9)
- One USB 2.0 (Type A)

**POWER REQUIREMENTS**
- ENP1: 38 W idle, 42 W typical, 54 W max
- ENP4: 65 W @ 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 SMART EC for alternative environments or temperatures.

All Modules

<table>
<thead>
<tr>
<th>ENVIRONMENTAL</th>
<th>ENP1</th>
<th>ENP4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruggedization Level 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling Method</td>
<td>Forced Air</td>
<td>Conduction</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>0 °C to +55 °C</td>
<td>~40 °C to +85 °C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>−40 °C to +85 °C</td>
<td>−55 °C to +105 °C</td>
</tr>
<tr>
<td>Vibration Sine (10min/axis)</td>
<td>2G, 5 - 500 Hz</td>
<td>10G, 15 to 2000 Hz</td>
</tr>
<tr>
<td>Vibration Random (1hr/axis)</td>
<td>.002 g^2/Hz, 15 to 2000 Hz^1</td>
<td>0.1 g^2/Hz, 15 to 2000 Hz (12 GRMS)^2</td>
</tr>
<tr>
<td>Shock</td>
<td>20 g/11 mS</td>
<td>40 g/11 mS</td>
</tr>
<tr>
<td>Humidity</td>
<td>to 95% RH</td>
<td>to 100% RH</td>
</tr>
<tr>
<td>Conformal Coating</td>
<td>No</td>
<td>Acrylic</td>
</tr>
</tbody>
</table>

Note 1: Flat 15-1000 Hz, -6 db/octave 1000 Hz – 2000 Hz [MIL-STD 810F Figure 514.5C-17]
Note 2: +3 db/octave 15-300 Hz, Flat 1g2 300-1000Hz, -6 db/octave 1000 Hz – 2000 Hz [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)

- 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 (ENP1)

DOCUMENTATION

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

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boards</strong></td>
<td>P05020 2.0GHz, 4GB DDR3, 2PMC/XMC, ENP1 IEEE</td>
</tr>
<tr>
<td>MVME8100-04CC</td>
<td>P05020 1.8GHz, 4GB DDR3, 2PMC/XMC, ENP4, conformal coated</td>
</tr>
<tr>
<td><strong>Accessories</strong></td>
<td></td>
</tr>
<tr>
<td>SERIAL-MINI-D2</td>
<td>Serial cable - Micro D sub connector to standard DB-9</td>
</tr>
<tr>
<td>ACC/CABLE/SER/DTE/6E</td>
<td>Serial cable, RD 009, 2M, 2 DTE MD/D, RJ45 to DB9</td>
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</table>

### 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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