OpenVPX / SOSA Aligned Chassis Manager—Mezzanine

SHM300 Chassis Management Card

SHM300 KEY FEATURES

- Designed for OpenVPX systems and aligned to the SOSA™ Technical Standard
- Tier 3+ version
- Compliant to VITA 46.11 for VPX System Management
- SlotSaver design to fit as mezzanine behind backplane without taking up a slot
- Allows full access of VITA 66/67 interfaces (RF and Optical housings) on backplane
- Chassis Discovery of Chassis FRU Information Storage Options (physical/backplane)
- Redundant, bussed System IPMB
- Cooling Management using VITA 46.11 fan control messages
- FRU discovery/confirmation and SDR-based sensor initialization
- Full Sensor Data Repository (local cache)
- Chassis Control & Event handling
- PolarFire® FPGA
- Icicle Kit development version available for prototyping in test/dev enclosure
- Customized versions available

Pixus offers OpenVPX Chassis Managers in standard designs as well as customized form factors. The SHM300 is a highly configurable Chassis Management Controller (ChMC) that targets VITA 46.11, Hardware Open Systems Technologies (HOST), C5ISR/EW Modular Open Suite of Standards (CMOSS), and Sensor Open System Architecture (SOSA) system management capabilities in an OpenVPX environment. The versatile approach allows the implementation of Tier 3+ requirements.

Similar to VITA 46.11, the SOSA aligned chassis manager interfaces across the IPMB bus on the backplane to monitor plug in cards (that have an IPMC), re-boot modules, control fan speeds, etc.

Optional features include chassis manager centric authentication and attestation, anti-tamper features, a JTAG multiplexing interface, and other secure out-of-band features.

Conformal coating on the SHM300 OpenVPX Chassis Manager is optional.
### Specifications

<table>
<thead>
<tr>
<th>Architecture</th>
<th>Physical Dimensions</th>
<th>~121.6 mm x 50mm</th>
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<tbody>
<tr>
<td></td>
<td>Panel Interface</td>
<td>LEDs, RJ-45, &amp; USB interface</td>
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<td>Standards</td>
<td>VITA Type</td>
<td>VITA 46.11, SOSA Technical Standard</td>
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<td>Configuration</td>
<td>Power Usage</td>
<td>1.3W at idle, under 5W typical (preliminary data)</td>
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<td>Temperature</td>
<td>Operating temperature: 0 to 70°C, (extended temperature option of -40°C to +85°C—consult factory)</td>
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<td>Storage temperature: -55°C to +100°C</td>
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<td>PCB</td>
<td>FR-4 or equivalent</td>
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<td>Other</td>
<td>MTBF</td>
<td>MIL Handbook 217-F @ TBD Hrs.</td>
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<td>Certifications</td>
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<td></td>
<td>Warranty</td>
<td>Two years</td>
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<td>Trademarks and logos</td>
<td>The Pixus Logo is a registered trademark of Pixus Technologies Inc. other registered trademarks are the property of their respective owners. Specs. subject to change without notice.</td>
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## OpenVPX / SOSA Aligned Chassis Manager—Mezzanine

### Drawings—Preliminary

![Diagram](https://example.com/diagram.png)

### Standard Pinout

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<th>Pin</th>
<th>Signal</th>
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<th>J2</th>
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- **Left Diagram:** Edgeview with large RTC battery backup
- **Right Diagram:** Edgeview with small or no RTC battery backup
General Information

FPGA and Main Memory

PolarFire FPGA from Microchip, MPFS095T

- 4 GB SDRAM
- 64 GB EMMC

General Information

- Highly configurable design
- Supports up to 16 backplane slots
- Up to 16 MP ports (can also be used for GPIO)
- Up to 40 GPIO available
- Up to 4 direct analog temperature sensor interfaces (options for more available) and up to 2x I2C ports
- 3x remote LEDs that are configurable (can support Over-temperature, Fan Fail, and Power Status for example)
- Supports RESTful Web Service and Remote Management Control Protocol (RMCP). REST resources include text, JSON, XML
- Supports GDISCRETE, NVMRO, and SYSRESET outputs

External Interfaces

- Supports up to 16 backplane slots
- Directly supports up to 3 Fan interfaces (PWM, etc) and up to 3 Power Supply Units (PSUs)
- External interfaces include 3 LEDs, 1x USB port, 1x Ethernet 10/100/1000BASE-T port. 1000BASE-KX is also accessible via the backplane only

Technical data in this datasheet is subject to change. Consult factory for details.
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System Management Interface

The Ethernet (10/100/1000 Base-T and KX) interface supports Remote Management Control Protocol (RMCP) sessions based on IPMI v1.5 that allow System Management Software (like IPMItool and higher-level software using OpenIPMI) to interact with the Chassis Manager and underlying FRUs using standard IPMI and VITA 46.11 messages.

Chassis Control

- Chassis Manager Hard Reset (Reboot)
  - IPMI/CLI command or user defined input (ChMC GPIO)

Chassis Activation

- IPMI/CLI command or user defined input (ChMC GPIO)
- Scripting for power-up and shut-down sequences
- Orderly Power-up
- Orderly Shut-down
- Power-Cycle

Optional – control for INHIBIT* signal

- Kill command (immediate shut-down)
- Optional – monitor input power available
- Optional – payload power good (discrete or ‘sensor based’)
- Optional – safety interlock input via Chassis Hard Reset
- IPMI/CLI command or user defined input (ChMC GPIO)
- Initiate FRU CONTROL[Cold Reset] request to each FRU
- Optional – pulse SYSRESET* signal

Chassis Diagnostic

- IPMI/CLI command or user defined input (ChMC GPIO)
- Initiate FRU_CONTROL[Diasnostic IRQ] request to each FRU
- Optional – pulse user defined signal (ChMC GPIO)

Chassis LED support

- Up to 3 VITA 46.11 LEDs with 1-wire or 2-wire connections (3 color)
- ChM State, Payload Power State, Health State, User Defined - Event Handling - Enable/Disable ChM’s System

Event Logging

- Choose: none, all, critical, selected sources: sensor_types
- Enable/Disable event forwarding (push) to SMI

Select number of SEL entries to store

- Linear – overflow or keep N when full (volatile)
- Circular – over-write oldest when full (volatile)
- Cache – Non-volatile, save N entries/file

Updates VITA 46.11 sensors for each FRU based on events (and periodic polling)

- ChM implements VITA 46.11 sensors that ‘aggregate’ readings across all FRUs
- Updates Cooling Management settings based on Temperature events
- Enable/Disable Platform Event Filtering (PEF)
- Take Chassis Control actions
- OEM actions
- Send FRU_CONTROL[x] command
- Pulse user defined GPIO[x]
- External Alerts are not currently supported
OpenVPX / SOSA Aligned Chassis Manager—Mezzanine

Icicle Development Kit

Configured with software for SHM300
For use in a lab/test environment
Comes with cabling to a OpenVPX backplane header
SHM300-30-XXX (see ordering options on configuration page)

Image courtesy of Microsemi
Ordering Options
SHM300 Hardware Management Card

SHM300-A0-CDE-XX

A = ShMM Controller

0 = SHM300 Mezzanine
1 = ChassisBerry (EOL fixed lab/test version, no longer available for new designs)
2 = Other
3 = Icicle Polarfire SoC Kit, fixed/lab test version

C = Real Time Clock (RTC) Battery Backup

0 = None
1 = 1 Farad
2 = 5 Farad
3 = Other

D = Temperature Range

0 = Commercial (0 C to +70 C)
1 = Industrial/MIL (-40 C to +85 C)
2 = Other

E = Conformal Coating

0 = None
1 = Humiseal 1A33 Polyurethane
2 = Humiseal 1B31 Acrylic