

# iVPX7223 Series

3U VITA 46 VPX & VITA 65 OpenVPX Processor Board

■ Embedded Computing for  
Business-Critical Continuity™

## Fully rugged 3U SBC for extreme environments

- 2nd generation Intel® Core™ i7 2.20 GHz dual-core integrated processor
- Up to 8GB ECC-protected DDR3-1333, soldered down
- Intel® QM67 platform controller hub (PCH)
- 256Kbytes F-RAM
- PCI Express Fat Pipe fabric
- 1000BASE-BX/KX control plane
- SATA, USB and serial interfaces
- Integrated 2D/3D graphics with digital and VGA output
- One XMC site
- Optional rear transition module
- Extended temperature -40 °C to +85 °C and rugged variants
- Air and conduction cooled
- VITA 48 REDI two-level maintenance (2LM)

One of first in a new line of VPX products from Emerson Network Power, the 3U iVPX7223 features the dual-core 2nd generation Intel® Core™ i7 2.20 GHz processor with integrated graphics and memory controller and the mobile Intel® QM67 PCH chipset with leading edge I/O functionality. This high compute density platform offers both high speed fabric connectivity with PCI Express and Gigabit Ethernet control plane connectivity with data transfer rates up to 5Gbps. On-board memory includes 4GB DDR3-1333 memory (designed for 8GB), embedded USB flash, and 256KB non-volatile Ferroelectric Random Access Memory (F-RAM). Additional connectivity includes three USB 2.0 ports, two serial ports, three SATA ports, eight GPIO, DisplayPort, VGA and one XMC site for maximum flexibility.


The iVPX7223 is a fully rugged SBC for extreme environments with extended shock, vibration, temperatures and conduction cooling. It is designed for a range of industrial, communication and military/aerospace applications.

The iVPX7223 software support includes Solid and Stable BIOS with password protection and a wide range of operating systems including Wind River VxWorks, Linux, Microsoft® Windows® Embedded Standard 2009, Red Hat Fedora, Green Hills INTEGRITY, and LynuxWorks LynxOS.

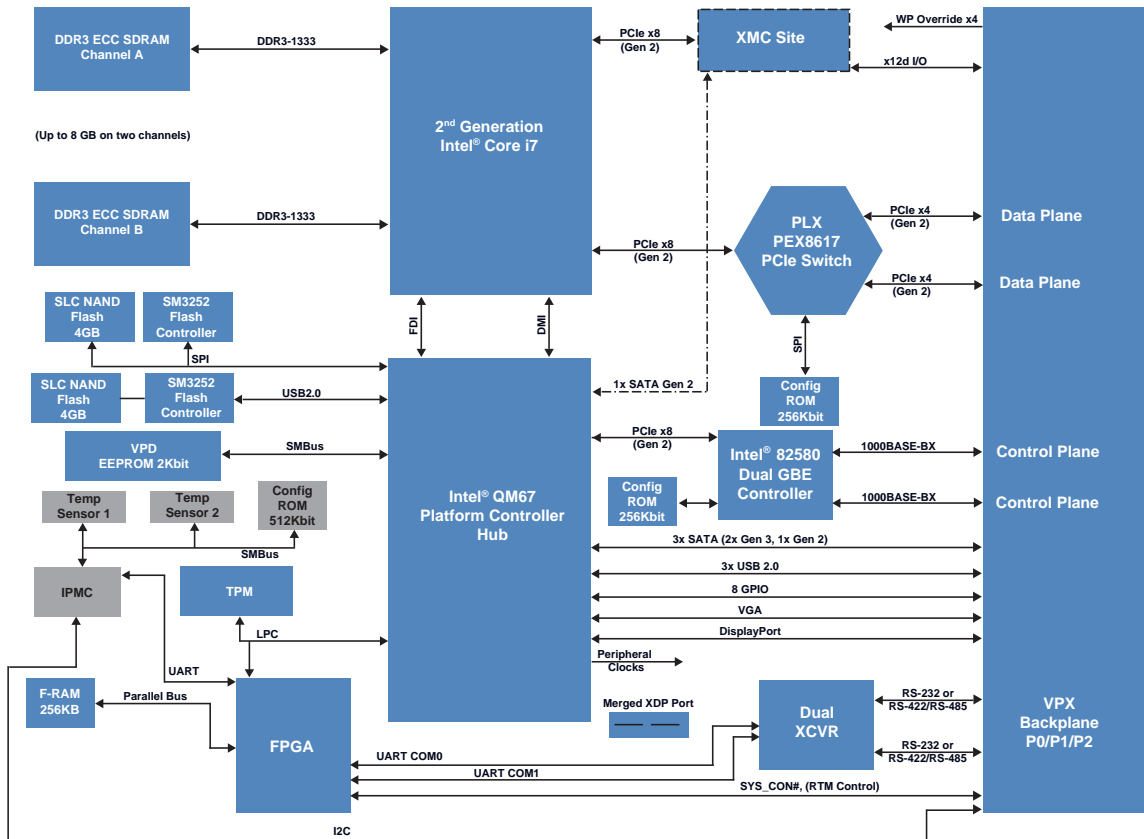


OpenVPX™

VPX REDI

  
**EMERSON**™  
Network Power

iVPX7223 Block Diagram



## Specifications

### PROCESSOR

- Dual-core 2nd generation Intel® Core™ i7-2655LE, 2.20 GHz, 4MB L2 cache, 25 W
- Dual DDR3-800/1066/1333 memory controller
- Two (2) PCI Express (PCIe) root controllers with 16 lanes Gen2 PCIe (max. 5.0 GT/s)
- x4 DMI interface to platform controller hub (PCH)

### CHIPSET

- Intel® QM67 PCH
- Eight (8) PCI Express root controllers and 8 lanes Gen2 PCIe (max. 5.0 GT/s)
- Six (6) 6x SATA controllers
- 14 USB 2.0 host controllers
- Three (3) digital displays (DP/eDP\*/HDMI/DVI/sDVO\*)
- One (1) analog display (CRT/VGA)
- SPI interface (2 CS#)
- LPC interface
- SMBus
- Programmable interrupt controller, watchdog timer, real-time clock
- Gigabit Ethernet controller 10/100/1000BASE-T\*

\* Not utilized in iVPX7223

### MEMORY

- 4GB dual-channel DDR3-1333 memory with ECC soldered down
- Support for 8GB memory

### USER FLASH/NVRAM MEMORY

- 4GB embedded USB flash
- 256KB F-RAM (NVRAM)

### BOOT FLASH MEMORY

- Dual UEFI in dual 8MB SPI flash devices
- Support for crisis recovery

### BACKPLANE I/O

- Two (2) 1000BASE-BX/KX Ethernet (Ultra Thin Pipe control plane)
- Two (2) PCIe x4 Gen2 (Fat Pipe data plane)
  - ▲ One port configurable with non-transparent bridging capability)
- One (1) DisplayPort
- One (1) VGA
- Three (3) USB 2.0
- Three (3) SATA (2x Gen3, 1x Gen2)
- Two (2) RS-232/RS-422/RS-485
- Eight (8) GPIO
- XMC X12d I/O
- SMBus
- IPMC I<sup>2</sup>C
- Selective Read-Only Override pins
- RTM control signals

### FRONT PANEL I/O (AIR COOLED ONLY)

- Air cooled
  - ▲ XMC front panel I/O
  - ▲ Reset switch
  - ▲ Status LEDs
- Conduction-cooled blade
  - ▲ Reset switch
  - ▲ Status LEDs

### ETHERNET CONTROLLERS

- x4 PCIe to 2x 1000BASE-BX/KX to OVPX backplane through 82580 Ethernet controller
- One (1) XMC site (1x SATA Gen2 routed to the XMC for an optional mutually-exclusive SSD mezzanine card)

### OPENVPX PROFILES

- Payload module profile
  - ▲ MOD3-PAY-2F2U-16.2.3-3
- Payload slot profile
  - ▲ SLT3-PAY-2F2U-14.2.3
  - ▲ SLT3-PAY-1F1F2U-14.2.4

### OPTIONAL TRANSITION MODULES

- Mini DisplayPort, VGA, USB 2.0, Ethernet, Serial, I<sup>2</sup>C, GPIO, SATA, XMC IO, write protect override switches

#### OTHER FEATURES

- Watchdog unit
- Trusted Platform Module (TPM)
- Intel® vPro™ Technology capable (supports Intel® TXT, VT, and TPM)
- VITA 46.11 system management IPMI V1.5 compliant
- Multiple 32-bit timers
- Temperature sensors
- Status and user LEDs
- Reset switch
- Locking ejector handles
- One of the CPU's two PCI Express ports is set up for future Gen3 compliance (going to the XMC site)

#### BIOS

- UEFI BIOS

#### POWER REQUIREMENTS

- Maximum for 2.20 GHz (IVPX7220), 4GB memory variant
  - ▲ 5.0 V 58 W (Estimated)

#### MTBF

- Calculated per Telcordia SR-332, Issue 1 and based on a ground fixed, controlled environment assuming an inlet air temperature of between 0 °C and 50 °C. 200,000 hours

#### ELECTROMAGNETIC COMPATIBILITY (EMC)

- Intended for use in systems meeting the following regulations:
  - ▲ US: FCC Part 15, Subpart B, Class A (non-residential)
  - ▲ Canada: ICES-003, Class A (non-residential)
- Emerson board products are tested in a representative system to the following standards:
  - ▲ CE Mark per European EMC Directive 89/336/EEC with Amendments; Emissions: EN55022 Class B; Immunity: EN55024

#### DOCUMENTATION

- Installation Guide and Technical Reference Manual
- Hardware Release Notes
- Linux Installation and Programmer's Guides

Environmental Requirements				
Ruggedization Level <sup>3</sup>	ENP1	ENP2	ENP3	ENP4
Cooling Method	Forced Air	Forced Air	Conduction	Conduction
Operating Temperature	0 °C to +55 °C	-40 °C to +71 °C	-40 °C to +71 °C	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C	-50 °C to +100 °C	-50 °C to +100 °C	-50 °C to +125 °C
Vibration Sine (10 min/Axis)	2G, 5 to 2000 HZ	10G, 15 to 2000 HZ	10G, 15 to 2000 HZ	10G, 15 to 2000 HZ
Vibration Random (1 Hr/Axis)	0.01g <sup>2</sup> /Hz, 15 to 2000 Hz	0.04g <sup>2</sup> /Hz, 15 to 2000 Hz (8GRMS) <sup>1</sup>	0.1g <sup>2</sup> /Hz, 15 to 2000 Hz (12GRMS) <sup>2</sup>	0.1g <sup>2</sup> /Hz, 15 to 2000 Hz (12GRMS) <sup>2</sup>
Shock	20g/11ms	30g/11ms	40g/11ms	40g/11ms
Humidity	to 95% RH	to 100% RH	to 100% RH	to 100% RH

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

Note 2: +3db/octave 15-300 Hz, Flat .1g<sup>2</sup> 300-1000 Hz, -6db/octave 1000-2000 Hz [MIL-STD 810F Figure 514.5C-8]

Note 3: Component and/or assembly screening shall be employed to satisfy feature/functional requirement (where feasible) when components are not available that meet ruggedization level requirements.

Ordering Information	
Part Number	Description
iVPX7223-22420	Intel® Core™ i7 2.20 GHz, 4GB DDR3 ENP2 .8" pitch
iVPX7223-22422	Intel Core i7 2.20 GHz, 4GB DDR3 ENP2 1" pitch
iVPX7223-22441	Intel Core i7 2.20 GHz, 4GB DDR3 ENP4 .85" pitch
iVPX7223-22441L	Intel Core i7 2.20 GHz, 4GB DDR3 ENP4 .85" pitch 2LM
iVPX7223-RTM2	7223 rear transition module ENP2

Please contact your sales representative for additional processor and memory variants.

## SOLUTION SERVICES

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