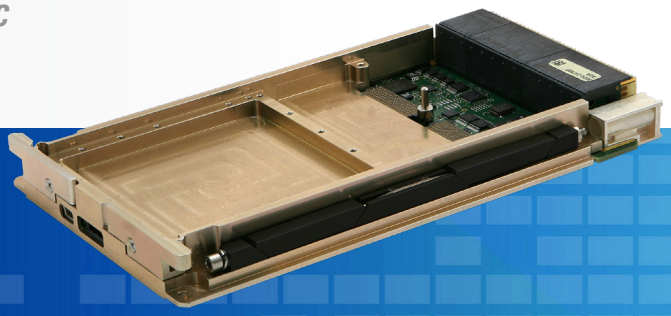
DATASHEET

BuiltSAFE™ RIOV-2478

Freescale QorIQ™ P3/P4 3U OpenVPX™ Single Board Computer (SBC



- **Freescale Multi-core QorIQ™ P3/P4 processor**
- **Highly configurable payload profile**
- **Advanced Board Management Controller (aBMC)**
- **XMC mezzanine site**
- **Rugged conduction-cooled packaging**

Mercury's BuiltSAFE™ products bring the highest level of flight safety assurance to aerospace and defense applications. Our proven, reusable Design Assurance Level (DAL) certified artifacts for mission computing, avionics, networking and datalink comms processing save time and cost while decreasing risk.

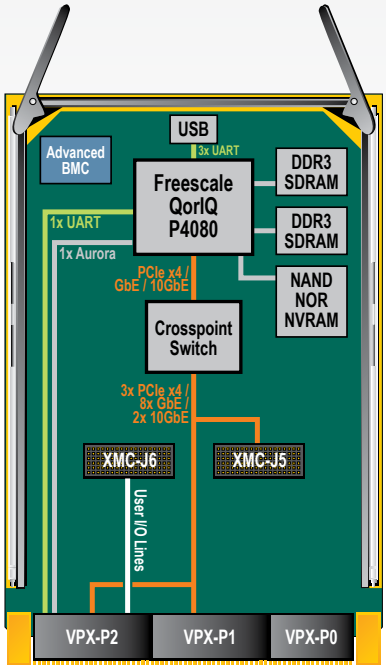
The BuiltSAFE RIOV-2478 is a 3U conduction-cooled, OpenVPX Single Board Computer for airborne applications. It is specifically designed for the most demanding applications, combining high compute and flight-worthiness capabilities within harsh environments.

The BuiltSAFE RIOV-2478 is a second generation 3U OpenVPX PowerPC compute platform. It combines a multi-core processor with modern interconnect high-speed links and an onboard crosspoint switch. It features a QorIQ P3/P4 processor designed for combined data and control plane processing. The processor design is suited for applications, which are highly compute-intensive, I/O intensive or both. The crosspoint switch permits flexibility of the payload profile configuration in accordance with VITA standards enabling support of PCIe, GbE and 10GbE over OpenVPX and XMC.

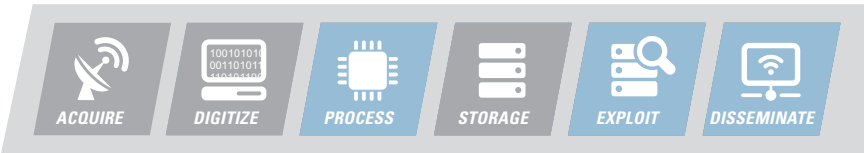
An Advanced Board Management Controller (aBMC) is implemented for event logging and other supporting tasks.

BuiltSAFE for Avionics

Mercury's expertise and experience in safety certifiable solutions has been built on successful execution of dozens of programs over three decades. This domain knowledge is the foundation of our BuiltSAFE portfolio of open architecture modules, systems and software for avionics, communications, video servers, and mission computing



Mercury Systems is a leading commercial provider of secure sensor and mission processing subsystems. Optimized for customer and mission success, Mercury's solutions power a wide variety of critical defense and intelligence programs.



Technical Specifications

Compliance

3U OpenVPX (VITA 65)/VPX (VITA 46) / VPX REDI (VITA 48)

Conduction-cooled VPX (VITA 48.2)

Power Consumption

minimum	typical	maximum	units
-	24(JP) / 40	50	Watts

(JP) Applies to "JP" model

Processor

Freescale QorIQ P4080 (8 cores) @ 1.2 GHz

Freescale QorIQ P3041 (4 cores) @ 800 MHz @ 1.3 GHz

Memory

1/2/4 GB DDR3 SDRAM

2 GB Flash (NAND)

128 MB Flash (NOR)

256 KB NVRAM

Switches/Bridges

1x crosspoint switch (40x40)

High-Speed Links/Connections

Up to 3x PCIe x4 Gen2 on VPX-P1/P2 (VITA 46.4) and XMC-J5 (VITA 42.3)

Up to 8x SGMII on OpenVPX-P1/P2 and XMC-J5

Up to 2x XAUI on OpenVPX-P1/P2 (VITA 46.7) and XMC-J5 (VITA 42.6)

1x UART on OpenVPX-P2

3x COM port via mini USB connector

1x Aurora debug on OpenVPX-P2

User I/O Lines

20x user-specific I/O lines on XMC-J6 to OpenVPX-P2

Sites

One XMC site (VITA 42.2, 42.3, 42.6)

Advanced Board Management Controller

CPU speed control logic

Advanced power management

Voltage and current monitoring

Temperature monitoring (thermal sensors on critical positions)

Advanced error reporting and logging

Development/Debug

Rear I/O transition module (CPU COP debug, GbE, 10GbE, Aurora debug)

Ruggedization Levels

Level	Description	Cooling Type	Operating Temperature	Vibration (1 hour per axis)	Operating Shocks
C3	Rugged CC	Conduction	-40°C to 70°C [CC3]	5-100 Hz: increase at 3 dB/octave, 100-1000 Hz: 0.1 g^2/Hz, 1000-2000Hz: decrease at 6 dB/octave	40g, 11ms saw-tooth, three axes

Environmental Specifications

Condition	Limits, standards	Comments
Non-operating temperature	-55°C to 105°C [C4]	
Humidity	95%	
Altitude	-1,500 to 60,000 feet	May require conformal coating
Fungus resistance	No nutrient materials	
Workmanship	IPC-A-160 class 3	
Soldering	IPC J-STD-001 class 3	
PCB Manufacturing	IPC-A-600 class 3	
Conformal coating	IPC-CC-830	Optional
Materials	REACH compliant	ROHS variants as an option
Flammability	UL 94 Class V-0	
Quality	EN 9100:2008	

Product Ordering

RIOV-2478AF	Conduction-cooled 3U OpenVPX SBC with QorIQ P4080 @ 1.2 GHz, 2 MB L3, 2 GB DDR3, 2 GB NAND, 128 MB NOR, 256 KB NVRAM (1" Pitch, 2LM)
RIOV-2478JR	Conduction-cooled 3U OpenVPX SBC with QorIQ P3041 @ 800 MHz, 1 MB L3, 4 GB DDR3, 2 GB NAND, 128 MB NOR, 256 KB NVRAM (1" pitch)
RIOV-2478JP	Conduction-cooled 3U OpenVPX SBC with QorIQ P3041 @ 800 MHz, 1 MB L3, 4 GB DDR3, 2 GB NAND, 128 MB NOR, 256 KB NVRAM (1" pitch, no crosspoint switch)
OWW-30780B	VxWorks® BSP for RIOV-2473/78
OWW-30780D	VxWorks 653 BSP for RIOV-2473/78
OWX-30780L	Linux® Toolbox for RIOV-2473/78

Note: Rear I/O Transition Module available upon request

3262.02E-0218-ds-RIOV-2478

mercury systems™

INNOVATION THAT MATTERS™

Mercury Mission Systems International S.A.
Avenue Eugène-Lance 38, PO Box 584
CH-1212 Grand Lancy 1 • Geneva – Switzerland
+41 (0)22 884 51 00

Corporate Headquarters
50 Minuteman Road • Andover, MA 01810 USA
(978) 967-1401 • (866) 627-6951 • Fax (978) 256-3599