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.

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 communications 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

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

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)

Environmental Specifications

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

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

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