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.

• Freescale Multi-core QorIQ™ P3/P4/P5 processor
• Highly configurable payload profile
• Crosspoint switch
• Advanced Board Management Controller (aBMC)
• XMC mezzanine site
• Air-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-2473 is an air-cooled 3U OpenVPX Single Board Computer for ground applications. It is specifically designed for the most demanding applications, which require very high compute capabilities.

The BuiltSAFE RIOV-2473 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/P5 processor designed for combined data and control plane processing. The processor design is well suited for applications which are highly compute-intensive, I/O intensive or both. The crosspoint switch gives flexibility to the payload profile configuration in accordance to OpenVPX, enabling support of PCIe, GbE and 10GbE over VPX.

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.

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Technical Specifications

Compliance
3U OpenVPX (VITA 65)/VPX (VITA 46)/VPX REDI (VITA 48)
Commercial air-cooled VPX (VITA 48.1)

Power Consumption
minimum typical maximum units
- 40 50 Watts

Processor
Freescale QorIQ P3041 (4 cores) @ 1.3 GHz  
Freescale QorIQ P4080 (8 cores) @ 1.2 GHz  
Freescale QorIQ P5020 (2 cores) @ 2.0 GHz  
(A) Applies to “A” model  
(J) Applies to “J” model  
(R) Applies to “R” model

Memory
1/2/8 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)
Up to 8x SGMII on VPX-P1/P2
Up to 2x XAUI on VPX-P1/P2 (VITA 46.7)
1x UART on VPX-P2
3x COM port via mini USB connector
1x Aurora debug on VPX-P2

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

<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>A1</td>
<td>Commercial Air*</td>
<td>Forced Air*</td>
<td>0°C to 55°C [AC1]</td>
<td>5-100 Hz: increase at 3 dB/octave, 100-1000 Hz: 0.04 g²/Hz, 1000-2000Hz: decrease at 6 dB/octave</td>
<td>20g, 11ms saw-tooth, three axes</td>
</tr>
</tbody>
</table>

*The required air-flow is defined separately for each product.

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>-65°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 Optional</td>
<td></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-2473AF: Commercial air-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)
- RIOV-2473AH: Commercial air-cooled 3U OpenVPX SBC with QorIQ P4080 @ 1.2 GHz, 2 MB L3, 8 GB DDR3, 2 GB NAND, 128 MB NOR, 256 KB NVRAM (1” Pitch)
- RIOV-2473JE: Commercial air-cooled 3U OpenVPX SBC with QorIQ P3041 @ 1.3GHz, 1 MB L3, 1 GB DDR3, 2 GB NAND, 128 MB NOR, 256 KB NVRAM (1” Pitch)
- RIOV-2473RF: Commercial air-cooled 3U OpenVPX SBC with QorIQ P5020 @ 1.2GHz, 2 MB L3, 2 GB DDR3, 2 GB NAND, 128 MB NOR, 256 KB NVRAM (1 pitch)
- 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