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 processing save time and cost while decreasing risk.

The BuiltSAFE RIO4-8072 is a commercial, air-cooled 6U VME/VME64x Single Board Computer. It is available in three and five-row DIN connector versions and requires only +5V power, therefore it will fit in any VME enclosure.

The RIO4-8072 is the fourth generation of Mercury 6U VME PowerPC computing platform. Multiple models of the RIO4-8072 are available, according to the type of VME-P0 interface. Some models can be equipped with customer-specific I/O lines, communication or serial lines on the VME-P0.

For easy configuration of the I/O pinout and support of legacy pinout requirements a static routing module (FlexIO™) is placed in between the different I/O sources and the backplane connector. Combined with the onboard FPGA-based PCIe to VME bridge, FlexIO makes the BuiltSAFE RIO4-8072 ideal for legacy replacement in ground air-cooled applications.
FPGA/User-Programmable/User I/O Lines

Xilinx Virtex-5 LX30 user-programmable FPGA
(8kLUTs-6 free for user-defined applications)
16x user-specific I/O lines on VME-P2 (A) (D) (H)
64x user-specific I/O lines on PMC-J14 to VME-P2 (A) (D) (H) (R)
32x user-specific I/O lines on PMC-J24 to VME-P0 (A) (P)

Switches/Bridges

1x FlexIO static routing model (backplane configurable pin-out) (C) (P)

Buses

1x 64-bit VME64x 2xSST bus on VME-P1/P2
1x 32/64-bit PCI 2.2 bus at 33 MHz on VME-P0 (optional)
1x 64-bit PCI 2.2 bus at 33 MHz on PMC-J11/J12/J13/J21/J22/J23 (A) (D) (H) (R)
1x 64-bit PCI 2.2 bus at 33/66 MHz on PMC-J11/J12/J13/J21/J22/J23 (C) (P)

High-Speed Links / Connections

1x 10/100Base-TX / 1000Base-T on RJ45 connector (A) (D) (H) (R)
2x 10/100Base-TX / 1000Base-T on RJ45 connectors (A) (D) (H) (R)
2x RS-232 on μDB9 connector

PMC/XMC Sites

2x PMC sites (+5V tolerant)

Board Management Controller

Voltage monitoring
Temperature monitoring (thermal sensors on critical positions)

Development/Debug

Onboard JTAG test port
Xilinx ChipScope Pro FPGA debugging tool

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 AC</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>

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 6,000 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>
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<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>
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</tr>
<tr>
<td>Quality</td>
<td>EN 9100:2008</td>
<td></td>
</tr>
</tbody>
</table>

Product Ordering

RI04-8072AD  Air-cooled 6U VME SBC with MPC7448 @ 1 GHz, 1 MB L2, 256 MB, DDR2, 128 MB NAND, 64 MB NOR, 32 KB NVRAM, Virtex-5 LX (custom VME-P0)
RI04-8072CE  Air-cooled 6U VME SBC with MPC7448 @ 1 GHz, 1 MB L2, 512 MB, DDR2, 128 MB NAND, 64 MB NOR, 32 KB NVRAM, Virtex-5 LX (Pinout: v1)
RI04-8072DE  Air-cooled 6U VME SBC with MPC7448 @ 1 GHz, 1 MB L2, 512 MB, DDR2, 128 MB NAND, 64 MB NOR, 32 KB NVRAM, Virtex-5 LX (no VME-P0)
RI04-8072PE  Air-cooled 6U VME SBC with MPC7448 @ 1 GHz, 1 MB L2, 512 MB, DDR2, 128 MB NAND, 64 MB NOR, 32 KB NVRAM, Virtex-5 LX (Pinout: v2)
RI04-8072RE  Air-cooled 6U VME SBC with MPC7448 @ 1 GHz, 1 MB L2, 512 MB, DDR2, 128 MB NAND, 64 MB NOR, 32 KB NVRAM, Virtex-5 LX (3 rows, no VME-P0)

Related Hardware Products

OWL-30850A  Lynx OS® Bundled Package
OWW-30570K  VxWorks® BSP for RI04
OWW-37570B  VxWorks 653 BSP for RI04
OWX-30840H  Linux® Toolbox for RI04