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 comms processing save time and cost while decreasing risk.

The BuiltSAFE VCP-2864 is a 3U OpenVPX low-latency frame grabber module for video applications requiring rugged air or conduction cooling. It is specifically designed for the most demanding applications. Two SDI and a Camera Link input interfaces enables the VCP-2864 to simultaneously capture up to three HD video streams and forward them to a PCIe output. Filters can be applied to the captured streams to crop frames or scale down the stream frame rate. A JPEG 2000 compression (consult factory) engine is available on-board with the ability to compress one HD or two SD streams. Additionally, the BuiltSAFE VGP-2864 can output two HD video streams via SDI. One of the streams is received via PCIe, while the other one is received via HDMI.

The built-in XMC site has been primarily designed to house an BuiltSAFE VCP-8166DA: a Mercury video capture/H.264 compression mezzanine card. Together with the VCP-2864, this mezzanine card adds a forth HD stream that can be simultaneously captured from this single 3U OpenVPX slot solution. The H.264 compression engine enables the additional stream captured by the VCP-8166DA mezzanine to be compressed before being forwarded to PCIe output.

A Board Management Controller (BMC) is implemented for configuration management 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.
Technical Specifications

Compliance
3U OpenVPX (VITA 65)/VPX (VITA 46)/VPX REDI (VITA 48)
Air-cooled VPX (VITA 48.1): “B/DA21LN” model
Conduction-cooled VPX (VITA 48.2): “C/DA41LN” model
SMpte 292M/SMpte 274M/SMpte 296M
HDMI 1.3

Power Consumption
Minimum          typical          maximum          units
-               11        13        Watts

Memory
Dual 128 MB DDR3 SDRAM at 5.3 GB/s peak for FPGA
32 MB Flash SPI (Quad SPI)

FPGA/User-Programmable/User I/O Lines
Xilinx Kintex™-7 FPGA
User-specific I/O lines on VPX-P2

Frame Grabber
Raw video in parallel: up to 2x 1080p30 (HD-SDI) and 1x Base Configuration
Camera Link input SXGA @ 60 fps

Inputs
1x HDMI 1.3 on VPX-P2/XMC-J6
2x HD-SDI on VPX-P2/XMC-J6
1x Analog video: CVBS monochrome/RGBHV on VPX-P2/XMC-J6
1x Camera Link on VPX-P1

Outputs
1x HDMI 1.3 on VPX-P2/XMC-J6
2x HD-SDI on VPX-P /XMC-J6

Switches / Bridges
1x PCIe Gen2 switch (6 ports)

High-Speed Links/Connections
2x PCIe x4 on VPX-P1 (VITA 46.4)
1x PCIe x8 on XMC-J5 (VITA 42.3)

Sites
1x XMC site (VITA 42.3) for VCP-8166DA native support

Board Management Controller (BMC)
Power management
Temperature sensing (thermal sensors on critical positions)

Development / Debug
Onboard JTAG test port
Rear I/O transition module
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>C4</td>
<td>Extended range CC</td>
<td>Conduction</td>
<td>-40°C to 85°C [CC4]</td>
<td>5-100 Hz: increase at 3 dB/octave, 100-1000 Hz: 0.1 g²/Hz, 1000-2000Hz: decrease at 6 dB/octave</td>
<td>40g, 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>-56°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>
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</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>
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</tr>
<tr>
<td>Conformal coating</td>
<td>IPC-CC-830 Optional</td>
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<tr>
<td>Materials</td>
<td>REACH compliant</td>
<td>ROHS variants as an option</td>
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<tr>
<td>Flammability</td>
<td>UL 94 Class V-0</td>
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<tr>
<td>Quality</td>
<td>EN 9100:2008</td>
<td></td>
</tr>
</tbody>
</table>

Product Ordering

VCP-2864B0 | Air-cooled 3U OpenVPX frame grabber module (1” Pitch)
VCP-2864C0 | Conduction-cooled 3U OpenVPX frame grabber module (0.8” - 1” Pitch)
VCP-2864DA21LN | Air-cooled 3U OpenVPX JPEG 2000 Codec module (1” Pitch)
VCP-2864DA41LN | Conduction-cooled 3U OpenVPX JPEG 2000 Codec module (0.8” - 1” Pitch)
DGX-34280D | Linux® Toolbox and video API library for VCP-2864

Related Hardware Products

RTM-6487A0 | Rear I/O Transition Module for video module (8x SMB, 3x micro HDMI, 2x VGA, 2x mini Stereo Jack, 1x CameraLink, 1x RJ45, 1x mini USB)
VCP-8166DA | Conduction-cooled H.264/AVC Codec XMC