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.

**BuiltSAFE™ RSL-5222**

*Conduction-cooled Serial I/O PMC Module*

- Reprogrammable FPGA with independent embedded serial controllers
- 4/8 configurable high-performance synchronous/asynchronous serial interface channels
- RS-232/422/485 Synchronous/asynchronous UART, HDLC, SDLC, 9-bit protocol
- User-specific I/O lines on PMC-P4
- Reprogrammable FPGAs and FlexIO™ flexibility

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 RSL-5222 is a serial I/O PMC module for ground/airborne applications requiring conduction or air-cooled processing. The RSL-5222 is a high-performance, low-SWaP solution that is optimized to meet the most demanding communication applications with up to 8 high-speed synchronous/synchronous serial channels.

Configured by hardware, each port is fully programmable and supports most serial I/O protocols. Mercury’s FlexIO™ technology enables the PMC-P4 I/O to be matched to specific applications.

The RSL-5222 supports a wide variety of physical interfaces, which can be individually selected as RS-232 or RS-422/485 without hardware configuration.

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
PMC (VITA 20)
IEEE 1386.1

Power Consumption
Typ. 4W

User defined I/O
User-specific I/O lines on PMC-P4
FlexIO module for flexible pin-out connectivity of serial channels/GPIO

High-Speed Links / Connections
4x or 8x software selectable channels:
Maximum data rate of 2 Mb/s (asynchronous) or 10 Mb/s (synchronous)
RS-232: RxD, RxC, TxD, TxC
RS-422/485: RxD_H/L, TxD_H/L, TxC_H/L
Synchronous/asynchronous UART, HDLC, SDLC, 9-bit protocol
Up to 16x GPIO (3V3TTL)
FIFOs:
Receive: 1KB, each channel
Transmit: 1KB, each channel
Oscillator:
14.7456 MHz to support standard asynchronous baud rates
User-supplied oscillator location is available for custom baud rate generation
Bus
One 32-bit PCI 3.0 bus at 33MHz on PMC-P1/P2 (5V tolerant)

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 [V2]</td>
<td>20g, 11ms saw-tooth, three axes [OS1]</td>
</tr>
<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>

* 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>-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>
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</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

- RSL-5222GD: Conduction-cooled serial I/O PMC
  (8 programmable synchronous/asynchronous channels)
- RSL-5222GE: Air-cooled serial I/O PMC
  (8 programmable synchronous/asynchronous channels)
  with mechanicals (†)
- SWW-39220B: VxWorks® driver license for RSL-5222G
  (†) I/O signals only available on connector PMC-P4

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