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™ MFCC-8550**

PrPMC/PMC Air-cooled Freescale QorIQ P2 processor module

- Freescale® QorIQ® P2020 processor
- Xilinx Spartan®-6 LXT user-programmable FPGA
- Advanced Board Management Controller (aBMC)
- Commercial 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 MFCC-8550 is an air-cooled PMC/XMC processor module for ground applications. It is designed for the most demanding applications requiring high compute capabilities.

The MFCC-8550 combines a fast, dual-core, multi-function PowerPC processor, high-speed links and bridging (PCIe, Gigabit Ethernet) with a programmable FPGA for application development.

An Advanced Board Management Controller (aBMC) is implemented for configuration management, event logging and other supporting tasks. It monitors and controls the system continuously, ensuring reliability and safety even in the case of failure conditions.

**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
PrPMC: VITA 20, VITA 32
XMC: VITA 42

Power Consumption
Minimum typical maximum units
- 8 12* Watts
* Without user FPGA functionality

Processor
Freescale QorIQ P2020 (2 cores) @ 1.2 GHz

Memory
512 MB DDR3 SDRAM @ 6.4 GB/s peak with ECC protection
2 GB Flash (NAND)
128 MB Flash (NOR)
256 KB NVRAM

User-Programmable FPGA/User I/O Lines
Xilinx Spartan-6 LXT FPGA with 128 MB DDR3 SDRAM
31x user-specific LVDS pairs (six pairs clock capable) on PMC-P4

Buses
1x 32-bit PCI 3.0 bus at 33/66 MHz on PMC-P1/P2 (G) (I)

Links/Connections
1x PCIe x2 on XMC-P5 (VITA 42.3) (H) (I)
3x high-speed links on user-programmable FPGA to XMC-P6 (I) (II)
2x 1000Base-T on RJ-45 connectors
1x USB 2.0 host/device on XMC-P6 connector
1x USB 2.0 host/device on mini USB connector
1x RS-485 on µDB9 connector
2x RS-232 on XMC-P6 connector
(G) Applies to “G” model
(H) Applies to “H” model
(I) Applies to “I” model

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
Onboard JTAG test port

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 56°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>-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>
<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>
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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>
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</tbody>
</table>

Product Ordering

MFCC-8550GF Air-cooled PrPMC with QorIQ P2020 @ 1.2 GHz, 512 MB DDR3, 2 GB NAND, 128 MB NOR, 256 KB NVRAM, Spartan-6 LXT with 128 MB DDR3
MFCC-8550HF Air-cooled XMC with QorIQ P2020 @ 1.2 GHz, 512 MB DDR3, 2 GB NAND, 128 MB NOR, 256 KB NVRAM, Spartan-6 LXT with 128 MB DDR3
MFCC-8550IF Air-cooled PrPMC/XMC with QorIQ P2020 @ 1.2 GHz, 512 MB DDR3, 2 GB NAND, 128 MB NOR, 256 KB NVRAM, Spartan-6 LXT with 128 MB DDR3
OWW-36410A VxWorks® BSP for MFCC-8550/56
OWW-36410E VxWorks 653 BSP for MFCC-8550/56
OWX-36410L Linux® Toolbox for MFCC-8550/56

INNOVATION THAT MATTERS™

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