Hybrid Products Group

Standard and Custom Products for HiRel Applications

Microsemi
Microsemi Hybrid Products Group

Microsemi's Hybrid Products Group designs and manufactures high-reliability micro-circuit assemblies incorporating multi-technology semiconductor components in a variety of hermetic packages.

Our products include linear and digital microcircuits, op-amps, logic arrays, multiple discrete assemblies, analog control circuits and power hybrids.

In addition to custom manufacturing, Microsemi also produces a standard product line consisting of linear and switching regulators and solid-state relays. Our products have applications in ground-based military equipment, missiles, aircraft and satellites.

The Hybrid Products Group has more than 40 years experience producing reliable, high-quality components and hermetic assemblies. We can provide fast prototype turnaround on your new designs.

Call Microsemi today. Our engineers are ready to help you find solutions and achieve your design goals.
**Product Types**
- Linear & Digital Microcircuits
- Custom SCD Assemblies
- Replacements for Burr-Brown, Teledyne, Fairchild, National Hybrids
- Linear Regulators
- Point-of-Load Switchers
- Solid-State Relays

**Product Applications**
- Rad-Hard Power Supplies
- Rad-Hard Satellite Heater Controls
- Launch Systems
- Avionics Power Control
- Booster Controls
- Guidance System Power

**Meeting High Reliability Requirements for**
- MIL-STD- 883
- MIL-STD- 750
- MIL-PRF-38535
- MIL-PRF-38534
- MIL-PRF- 19500
**Point-of-Load Switching Regulators**

- Output Currents of 1A, 3A, 4.5A, 15A
- Rad-Tolerant to 300Krad TID (MIL-STD-883, Method 1019.6)
- SEU to 55 MeV
- Class H & K Screening
- Complete Assembly — Only 1 Voltage Set Resistor Required
- Surface Mount Packaging

**Typical Application**

```
+ Vbus 60W DC-DC 90% - 12V
       + 5V + 12V
  8565 (85%) 8564S (85%) 8572 (90%)
+4V to 1.3Vout, 3A +4.0 to 0Vout 0V to +3.0V, 5A
   Logic 4.0A (Single) 8.0A Parallel
   FPGA
```

**Linear Regulators**

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
<th>Critical Parameters</th>
<th>Packages</th>
</tr>
</thead>
<tbody>
<tr>
<td>8601</td>
<td>Pos., Linear, 3A, Fixed &amp; Adj</td>
<td>VLDO= 0.300V (3A), (5A), Rad-Hard to 300Krad+</td>
<td>5 Pin MO-078</td>
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<tr>
<td>8605R</td>
<td>Pos., Linear, 5A, Fixed w/Remote Sense</td>
<td>VLDO= 0.300V (3A), 0.400V (5A) Rad-Hard to 300Krad+</td>
<td>5- Pin MO-078, 8-Pin SMT</td>
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<tr>
<td>117</td>
<td>Pos. Linear, Adj., 1.25A, Vin= 40V</td>
<td>Rad-Hard to 300Krad</td>
<td>D2</td>
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<td>127</td>
<td>Dual, 1A, Pos. &amp; Neg.Linear regulator</td>
<td>Rad-Hard to 300 Krad</td>
<td>8-Pin, TO-254</td>
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</tbody>
</table>

- Adjustable or Fixed Output Voltages: 1.265V to 5.0V
- Vin= +3.3V
- Vdropout < 300mV typ.
- 3A & 5A Load Versions
- Shutdown Control
- Internal Capacitors per MIL-PRF-123 or MIL-PRF-55365
Solid-State Relays

- 250V Operation
- Accepts Logic Level Inputs, (+3.0V - 5.5V)
- 1A & 10A Max Current
- Class H & K Screening Levels
- Surface Mount & Thru-Hole Packages
- Normally Open or Normally Closed Operation
- TID > 300Krad; SET= 85 MeV
- Buffered Inputs
Design & Construction Features

- Moly/CRS/AlSiC/CuW/Kovar bases
- Matched CTE Packaging
- DBC, Thick Film & Thin Film Assemblies
- Gold Flash Package
- Gold or Solder Component Terminations
  Eliminates Tin Whisker Issues
- Low Thermal Resistance
- 60% Capacitor Voltage De-rating at 125°C
- 50% Current Margins (Internal Components)
- All Internal Components Selected from:
  - MIL-PRF-123
  - MIL-PRF-55356
  - MIL-T-27

Custom & Standard Product Features

- Radiation Tolerance to 1 MRad
- High-Efficiency Regulators
- Output Currents to 20A+
- High-Density Packaging
- In-House Quality Conformance Inspection (QCI)
- Custom Lead-forming

HiRel Screening

<table>
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<tr>
<th>TEST</th>
<th>C</th>
<th>H</th>
<th>K</th>
<th>MIL-STD-883</th>
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<td>Element Evaluation</td>
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<td>Non-Destruct Wirebond</td>
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<tr>
<td>Pull Pre-Cap Visual</td>
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<td>Temperature Cycle</td>
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<td>Constant Acceleration</td>
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<td>PIND</td>
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<td>Pre-Burn In Electrical</td>
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<td>Burn-In</td>
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<td>External Visual</td>
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Processes & Capabilities

• Design, Development, Production
• DBC, Thick & Thin Film Technologies
• Multi-layer Substrates
• Mixed Signal Custom Circuits
• Chip & Wire
• Eutectic, Solder & Epoxy die attach:
  .0007” - .003” Gold Wire-bonding
  .001” - .020” Aluminum Wire-bonding
• Active Trim
• Large Diameter Wire/Power Applications
• Seam Seal/Resistance Weld
• Lead Forming
• Environmental Screening and Quality Conformance Inspection to MIL-PRF-38534