**M89 SERIES**

Crystal Oscillator | 5.0V | CMOS | 5x7mm Gull Wing Leads* | Military Grade

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**Features**
- Ruggedized Design
- High-Shock & Vibration
- Industry Standard Package
- ECCN - EAR 99
- Shortest Lead Time
- Smallest Hi-Rel Package
- Radiation Tolerant to 30 krad TID
- Best Stability Over Temperature
- Customer Support & Service
- See M88 Datasheet for 3.3V Operation
- Robust, Rugged, High Shock Crystal Support (3 or 4 point Crystal Mount)

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**Mechanical SPECIFICATIONS**

- **Dimensions:**
  - Width: 5x7 mm
  - **Gull Wing Leaded** Ceramic SMD Package
  - **Pad 1, ESD Symbol**

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**Electrical SPECIFICATIONS**

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<thead>
<tr>
<th>CODE</th>
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<th>Frequency Range (MHz)</th>
<th>Supply Current @ 5.0V ±10% (mA)</th>
<th>Rise/Fall Time (ns)</th>
<th>Symmetry min/max (%)</th>
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**How To ORDER**

```
M89 B 06 A - 1M000000
```

**Part Number**
- FMI      YYWW
- s/n

---

**Pin Number Function**
1. No Connect or TriState Enable
2. Ground (case)
3. Output
4. Supply V (Vcc)

---

**Standard PIN CONFIGURATION**

<table>
<thead>
<tr>
<th>Pin Number</th>
<th>Function</th>
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<tbody>
<tr>
<td>1</td>
<td>No Connect or TriState Enable</td>
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<tr>
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**Output Frequency**

- **5 ppm per year**
- **10 ppm per year**

**Stability over Operating Temperature**

- **-55ºC to +150ºC (ppm)**
- **-55ºC to +125ºC (ppm)**
- **-55ºC to +105ºC (ppm)**
- **-20ºC to +70ºC (ppm)**

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**CMOS Output, 15 pF Load**

- Output Voltage - Logic "0" is Vcc x 0.1 Vdc
- Output Voltage - Logic "1" is Vcc x 0.9 Vdc
- Start-up Time: 10 msec max

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**How To ORDER**

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**FREQUENCY MANAGEMENT**

15302 Bolsa Chica Street
Huntington Beach, CA 92649

**Ph. 714 373 8100**
**Fx. 714 373 8700**

Sales@FrequencyManagement.com

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Screening, B & C LEVELS

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<th>Screening</th>
<th>Method</th>
<th>Condition</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Destruct Bond Pull</td>
<td>MIL-STD-883, Method 2023</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>Internal Visual</td>
<td>MIL-STD-883, Method 2017</td>
<td></td>
<td>C</td>
</tr>
<tr>
<td>Stabilization (Vacuum Bake)</td>
<td>MIL-STD-883, Method 1008</td>
<td></td>
<td>C</td>
</tr>
<tr>
<td>Temperature Cycling</td>
<td>MIL-STD-883, Method 1010</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>Constant Accelereration</td>
<td>MIL-STD-883, Method 2001</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>Seal: Fine Leak</td>
<td>MIL-STD-883, Method 1014</td>
<td></td>
<td>C</td>
</tr>
<tr>
<td>Seal: Gross Leak</td>
<td>MIL-STD-202, Method 112</td>
<td></td>
<td>D</td>
</tr>
<tr>
<td>Electrical Test</td>
<td>Functional Test Only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marking &amp; Serialization</td>
<td>MIL-STD-1285</td>
<td></td>
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<tr>
<td>Electrical Test</td>
<td>Nominal Vcc &amp; Extremes and Nominal Temp and Extremes</td>
<td></td>
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</tr>
<tr>
<td>Burn-in (no-load)</td>
<td>+125°C, Nominal Supply Voltage and Burn-in load, 48 hours min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burn-in (load)</td>
<td>+125°C, Nominal Supply Voltage and Burn-in load, 160 hours min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>External Visual &amp; Mechanical</td>
<td>MIL-STD-883, Method 2009.10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Final Electrical Test

a) Input current, output frequency, output waveform, are tested at \( +23°C \pm 2°C \)
b) Frequency stability is tested over the specified temperature range; at both extremes and at \( +25°C \) at a minimum of 5 temperature increments

note: Recording of test data is by lot # and then serial #

Environmental COMPLIANCE

<table>
<thead>
<tr>
<th>Environmental</th>
<th>Specification</th>
<th>Method</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vibration – Sine</td>
<td>MIL-STD-202</td>
<td>Method 204</td>
<td>Condition D</td>
</tr>
<tr>
<td>Vibration – Random</td>
<td>MIL-STD-202</td>
<td>Method 214</td>
<td>Condition 1</td>
</tr>
<tr>
<td>Shock</td>
<td>MIL-STD-202</td>
<td>Method 213</td>
<td>Condition I</td>
</tr>
<tr>
<td>Seal Test</td>
<td>MIL-STD-883</td>
<td>Method 1014</td>
<td>Condition A1</td>
</tr>
<tr>
<td>Seal Test</td>
<td>MIL-STD-883</td>
<td>Method 1014</td>
<td>Condition C1</td>
</tr>
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<td>Temperature Cycling</td>
<td>MIL-STD-883</td>
<td>Method 1010</td>
<td>Condition B</td>
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<tr>
<td>Constant Acceleration</td>
<td>MIL-STD-883</td>
<td>Method 2001</td>
<td>Condition A</td>
</tr>
<tr>
<td>Thermal Shock</td>
<td>MIL-STD-202</td>
<td>Method 107</td>
<td>Condition B</td>
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Military Reference Specifications

- MIL-PRF-55310: Oscillators, Crystal Controlled, General Specification For
- MIL-PRF-38534: Hybrid Microcircuits, General Specification For
- MIL-STD-1866: Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies and Equipment

Materials

1. Package Materials:
   - Ceramic, Alumina 90% min
2. External Lead Plating Material:
   - Gold plated Kovar, 0.15 µm (60 µ inch) min, over 2.0 µm (80 µ inch) min Nickel

Products for Space Applications

Contact us for assistance with your specification. We will provide you with the technical support and the required documentation.

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