MA46410 thru MA46485 Series

GaAs Hyperabrupt Varactor Diode
Gamma = 1.0, 1.25, & 1.50

Features
- Constant Gamma = 1.0, 1.25 or 1.5
- High Q (up to 4000 at ~4 Volts)
- More Linear Frequency Tuning
- High and Nearly Constant Modulation Sensitivity
- Lead-Free (RoHs Compliant) equivalents available with 260°C reflow compatibility.

Description and Applications
The MA46450, MA46470 and MA46410 series of tuning varactors are hyperabrupt junction Gallium Arsenide diodes featuring constant gamma 1.0 (MA46450 series), 1.25 (MA46470 series) or 1.5 (MA46410 series). These diodes offer high Q (up to 4000) permitting excellent tuning performance from VHF through Ka band. Each part in this series exhibits the large change in capacitance versus bias voltage characteristic of hyperabrupt junctions. The standard capacitance tolerance is ±10%, with tighter tolerances available. Capacitance matching at one or more bias voltages is also available. All diode types are available in a wide selection of ceramic packages and in chip form. The constant gamma value of 1.0, 1.25 or 1.5 available with these diodes enables the circuit designer to produce significant improvements in circuit performance. Constant gamma tuning varactors permit more linear VCO frequency tuning than do conventional hyperabrupt tuning varactors. These varactors are particularly well suited for use in voltage tuned filters, analog phase shifters, and modulator circuits.

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse Voltage</td>
<td>Breakdown Voltage</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-65°C to +175°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>65°C to +200°C</td>
</tr>
</tbody>
</table>

1. Operation of this device above any one of these parameters may cause permanent damage. The maximum storage and operating temperature of the plastic ODS-1088 case style is 125°C.

TYPICAL JUNCTION CAPACITANCE vs TUNING VOLTAGE

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- North America  Tel: 800.366.2266 / Fax: 978.366.2266
- Europe        Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- Asia/Pacific   Tel: 81.44.844.8296 / Fax: 81.44.844.8298

Visit www.macomtech.com for additional data sheets and product information.
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<table>
<thead>
<tr>
<th>Part Number</th>
<th>Case Style</th>
<th>Total Capacitance</th>
<th>Total Capacitance Ratio</th>
<th>Q Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA46450</td>
<td>30</td>
<td>0.5</td>
<td>2.0-3.8</td>
<td>4000</td>
</tr>
<tr>
<td>MA46451</td>
<td>30</td>
<td>0.7</td>
<td>2.9-4.4</td>
<td>4000</td>
</tr>
<tr>
<td>MA46452</td>
<td>30</td>
<td>1.0</td>
<td>3.6-5.2</td>
<td>3000</td>
</tr>
<tr>
<td>MA46457</td>
<td>30</td>
<td>2.2</td>
<td>4.1-6.1</td>
<td>3000</td>
</tr>
<tr>
<td>MA46461</td>
<td>30</td>
<td>4.7</td>
<td>4.8-7.2</td>
<td>1500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Case Style</th>
<th>Total Capacitance</th>
<th>Total Capacitance Ratio</th>
<th>Q Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA46410</td>
<td>30</td>
<td>0.45-0.60</td>
<td>2.7-4.3</td>
<td>3000</td>
</tr>
<tr>
<td>MA46413</td>
<td>30</td>
<td>0.90-1.10</td>
<td>4.2-5.7</td>
<td>2500</td>
</tr>
<tr>
<td>MA46416</td>
<td>30</td>
<td>1.62-1.98</td>
<td>5.2-4.9</td>
<td>2500</td>
</tr>
<tr>
<td>MA46418</td>
<td>30</td>
<td>2.42-2.97</td>
<td>5.7-7.6</td>
<td>1800</td>
</tr>
<tr>
<td>MA46420</td>
<td>30</td>
<td>3.33-4.22</td>
<td>6.0-8.1</td>
<td>1800</td>
</tr>
<tr>
<td>MA46425</td>
<td>30</td>
<td>9.00-11.00</td>
<td>6.6-8.8</td>
<td>1200</td>
</tr>
</tbody>
</table>
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Typical Performance Curves

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Environmental Ratings PER MIL-STD-750

<table>
<thead>
<tr>
<th>Method</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage Temperature</td>
<td>1031 See Max. Ratings</td>
</tr>
<tr>
<td>Temperature Cycle</td>
<td>1051 10 cycles, -65°C to +175°C</td>
</tr>
<tr>
<td>Shock</td>
<td>2016 500 g/s</td>
</tr>
<tr>
<td>Vibration</td>
<td>2056 15 g/s</td>
</tr>
</tbody>
</table>

Case Styles (Dimensions are available upon request)

Typical Coaxial Packages

Typical Coplanar Packages

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