Features
- Low Series Resistance
- High Q
- Extensive Selection of Capacitance Values
- RoHS* Compliant

Description
The MTV4090 Series tuning varactors are silicon abrupt junction devices. They offer the highest Q and lowest resistance available in 90 volt tuning devices.

A unique silicon passivation process assures greater stability, reliability, and low leakage currents at higher temperatures.

The MTV4090 Series tuning varactors are used for both narrow and wide band tuning through X-band. These devices are used in circuits requiring a high Q voltage variable capacitance such as tunable filters and amplifiers, voltage controlled oscillators, frequency synthesizers, and continuous phase shifters. They are also useful as frequency and phase modulators in communications applications.

Electrical Specifications: $T_C = +25^\circ$C

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Reverse Voltage $V_B$ $I_R = 10 , \mu A$</th>
<th>Junction Capacitance† $C_J$ $V_R = 4 , V$, 1 MHz</th>
<th>Capacitance Ratio $C_R$ $C_{T0} / C_{T90}$</th>
<th>Quality Factor $Q$ $V_R = 4 , V$, 50 MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>Typical</td>
<td>Minimum</td>
<td>Minimum</td>
<td>Minimum</td>
</tr>
<tr>
<td>MTV4090-01</td>
<td>90</td>
<td>0.8</td>
<td>8</td>
<td>1000</td>
</tr>
<tr>
<td>MTV4090-02</td>
<td>90</td>
<td>1.0</td>
<td>8</td>
<td>1000</td>
</tr>
<tr>
<td>MTV4090-03</td>
<td>90</td>
<td>1.2</td>
<td>8</td>
<td>900</td>
</tr>
<tr>
<td>MTV4090-04</td>
<td>90</td>
<td>1.4</td>
<td>8</td>
<td>900</td>
</tr>
<tr>
<td>MTV4090-05</td>
<td>90</td>
<td>1.6</td>
<td>8</td>
<td>850</td>
</tr>
<tr>
<td>MTV4090-06</td>
<td>90</td>
<td>1.8</td>
<td>8</td>
<td>850</td>
</tr>
<tr>
<td>MTV4090-07</td>
<td>90</td>
<td>2.2</td>
<td>8</td>
<td>850</td>
</tr>
<tr>
<td>MTV4090-08</td>
<td>90</td>
<td>2.7</td>
<td>8</td>
<td>850</td>
</tr>
<tr>
<td>MTV4090-09</td>
<td>90</td>
<td>3.3</td>
<td>8</td>
<td>800</td>
</tr>
<tr>
<td>MTV4090-10</td>
<td>90</td>
<td>3.6</td>
<td>8</td>
<td>800</td>
</tr>
</tbody>
</table>


Visit www.macom.com for additional data sheets and product information.
MTV4090-x Series

Silicon Abrupt Tuning Varactor Diodes

Rev. V1

Electrical Specifications: \( T_C = +25^\circ C \)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Reverse Voltage ( V_R ) 90</th>
<th>Junction Capacitance ( C_J ) 3.9</th>
<th>Capacitance Ratio ( C_R / C_{T90} ) 8</th>
<th>Quality Factor ( Q ) 800</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTV4090-11</td>
<td>10 ( \mu A )</td>
<td>4 ( V ), 1 MHz</td>
<td>8</td>
<td>800</td>
</tr>
<tr>
<td>MTV4090-12</td>
<td>10 ( \mu A )</td>
<td>4.7</td>
<td>8</td>
<td>800</td>
</tr>
<tr>
<td>MTV4090-13</td>
<td>10 ( \mu A )</td>
<td>5.6</td>
<td>8</td>
<td>800</td>
</tr>
<tr>
<td>MTV4090-14</td>
<td>10 ( \mu A )</td>
<td>6.8</td>
<td>8</td>
<td>750</td>
</tr>
<tr>
<td>MTV4090-15</td>
<td>10 ( \mu A )</td>
<td>8.2</td>
<td>8</td>
<td>750</td>
</tr>
<tr>
<td>MTV4090-16</td>
<td>10 ( \mu A )</td>
<td>10.0</td>
<td>8</td>
<td>750</td>
</tr>
</tbody>
</table>

1. Total Capacitance \( (C_T) \) values will vary depending upon the desired packaging type \((C_J + \text{package} = C_T)\).

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device Dissipation</td>
<td>250 mW</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-55°C to +150°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-65°C to +100°C</td>
</tr>
</tbody>
</table>

Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these HBM Class 0 devices.

Moisture Sensitivity

These electronic devices are rated MSL 1.

<table>
<thead>
<tr>
<th>Package Style</th>
<th>Package Capacitance (pF)</th>
<th>Series Inductance (nH)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Typical</td>
<td>Typical</td>
</tr>
<tr>
<td>CS11</td>
<td>0</td>
<td>0.12</td>
</tr>
<tr>
<td>H20</td>
<td>0.20</td>
<td>0.12</td>
</tr>
<tr>
<td>CS37</td>
<td>0.19</td>
<td>0.40</td>
</tr>
<tr>
<td>CS75</td>
<td>0.25</td>
<td>1.20</td>
</tr>
<tr>
<td>CS85</td>
<td>0.30</td>
<td>1.50</td>
</tr>
</tbody>
</table>

M/A-COM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice. Visit [www.macom.com](http://www.macom.com) for additional data sheets and product information.
Silicon Abrupt Tuning Varactor Diodes

Outline Drawing - CS11

Outline Drawing - CS20 (H20)

Outline Drawing - CS37 (T86)

Outline Drawing - CS75 (A15)

Outline Drawing - CS85

Note: Dimensions are in inches (mm)
### Ordering Information

**Example Part: MTV4090-01-XX, replace –XX with desired case style suffix**

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-11</td>
<td>CS11 (C11), Silicon Die</td>
</tr>
<tr>
<td>-20</td>
<td>H20, Surface Mount, Ceramic Package</td>
</tr>
<tr>
<td>-37</td>
<td>CS37 (T86), Pill Package, Ceramic Body</td>
</tr>
<tr>
<td>-75</td>
<td>CS75 (A15), Glass Axial Leaded (Hermetic)</td>
</tr>
<tr>
<td>-85</td>
<td>CS85, Glass Axial Leaded</td>
</tr>
</tbody>
</table>
MTV4090-x Series

Silicon Abrupt Tuning Varactor Diodes

Rev. V1

M/A-COM Technology Solutions Inc. All rights reserved.
Information in this document is provided in connection with M/A-COM Technology Solutions Inc ("MACOM") products. These materials are provided by MACOM as a service to its customers and may be used for informational purposes only. Except as provided in MACOM’s Terms and Conditions of Sale for such products or in any separate agreement related to this document, MACOM assumes no liability whatsoever. MACOM assumes no responsibility for errors or omissions in these materials. MACOM may make changes to specifications and product descriptions at any time, without notice. MACOM makes no commitment to update the information and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to its specifications and product descriptions. No license, express or implied, by estoppels or otherwise, to any intellectual property rights is granted by this document.

THESE MATERIALS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, CONSEQUENTIAL OR INCIDENTAL DAMAGES, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. MACOM FURTHER DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. MACOM SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS, WHICH MAY RESULT FROM THE USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.