

Silicon Abrupt Tuning Varactor Diodes

Rev. V1

Features

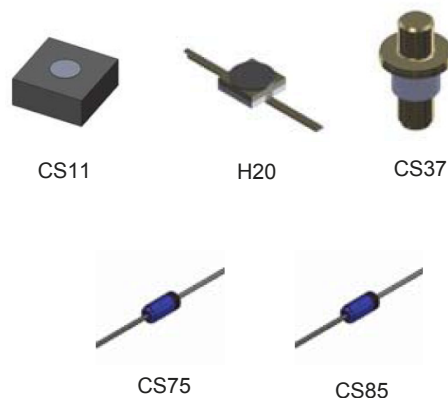
- Low Series Resistance
- High Q
- Extensive Selection of Capacitance Values
- RoHS* Compliant

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: $T_C = +25^\circ\text{C}$

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

(Continued next page)

* Restrictions on Hazardous Substances, European Union Directive 2011/65/EU.

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

Part Number	Reverse Voltage V_B $I_R = 10 \mu\text{A}$	Junction Capacitance ¹ C_J $V_R = 4 \text{ V}, 1 \text{ MHz}$	Capacitance Ratio C_R C_{T0} / C_{T90}	Quality Factor Q $V_R = 4 \text{ V}, 50 \text{ MHz}$
	Minimum	Typical	Minimum	Minimum
MTV4090-11	90	3.9	8	800
MTV4090-12	90	4.7	8	800
MTV4090-13	90	5.6	8	800
MTV4090-14	90	6.8	8	750
MTV4090-15	90	8.2	8	750
MTV4090-16	90	10.0	8	750

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

Absolute Maximum Ratings

Parameter	Absolute Maximum
Device Dissipation	250 mW
Operating Temperature	-55°C to $+150^\circ\text{C}$
Storage Temperature	-65°C to $+100^\circ\text{C}$

Package Style	Package Capacitance (pF)	Series Inductance (nH)
	Typical	Typical
CS11	0	0.12
H20	0.20	0.12
CS37	0.19	0.40
CS75	0.25	1.20
CS85	0.30	1.50

Handling Procedures

Please observe the following precautions to avoid damage:

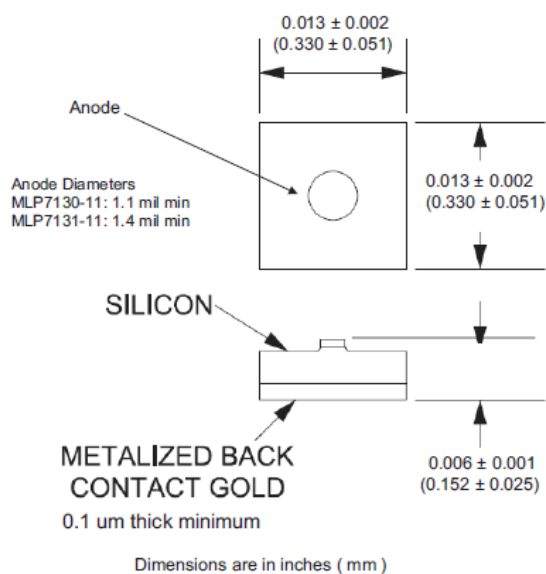
Static Sensitivity

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.

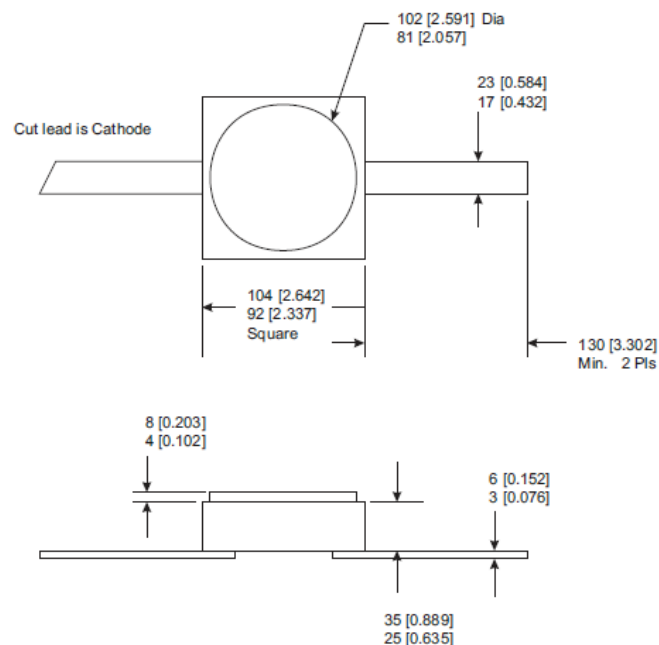
Moisture Sensitivity

These electronic devices are rated MSL 1.

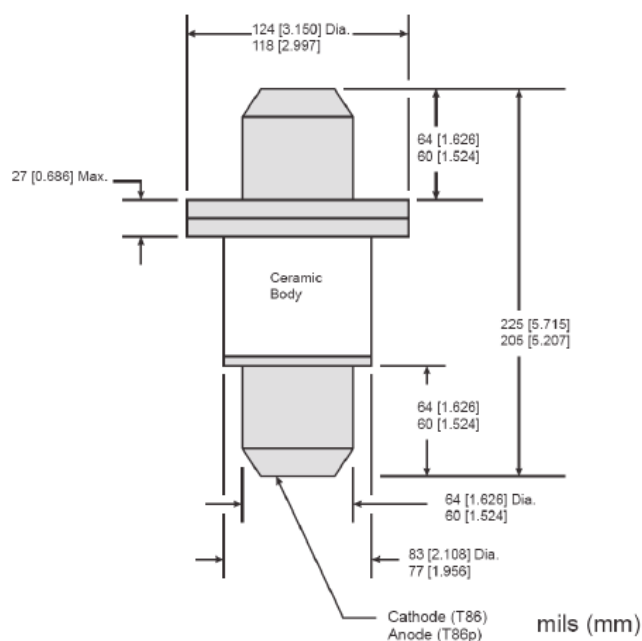
Outline Drawing - CS11



Outline Drawing - CS20 (H20)

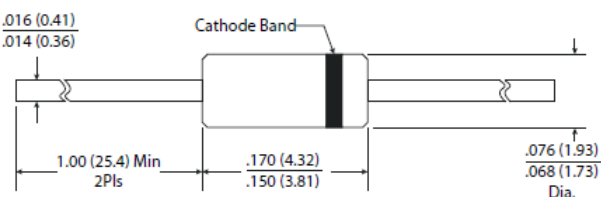


Outline Drawing - CS37 (T86)

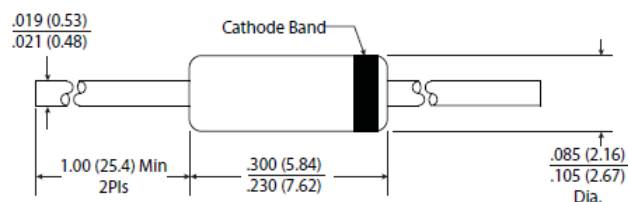


Package Capacitance (C_{PKG}) = 0.17 pF

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	
-11	CS11 (C11), Silicon Die
-20	H20, Surface Mount, Ceramic Package
-37	CS37 (T86), Pill Package, Ceramic Body
-75	CS75 (A15), Glass Axial Leaded (Hermetic)
-85	CS85, Glass Axial Leaded

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 estoppel 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.