

Features

- Surface Mount Packages (SOT-23, SC70 3LD, SOD-323, SC-79)
- High Q at Low Voltages
- High Capacitance Ratio at Low Voltages
- SPC Process for Superior C-V Repeatability
- Available as Single and Common Cathode Pairs
- Tape and Reel Packaging
- Designed for Commercial Wireless Applications
- RoHS* Compliant and 260°C Reflow Compatible

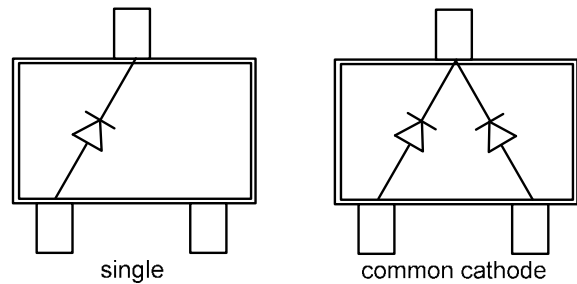
Description

The MAVR-000200 series are ion-implanted, hyperabrupt junction, silicon tuning varactors in SOT-23, SC70 3LD, SOD-323 and SC-79 surface mount packages. This series of varactors is designed for high Q and low voltage operation. Each varactor type has a typical Q greater than 400 at -2 V. These diodes are offered with 100% matte Sn plating.

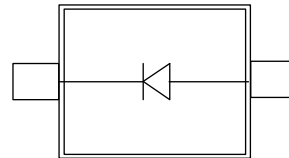
The MAVR-000200 series tuning varactors are ideally suited for wide band tuning and low phase noise applications where the supply voltage is limited to 5 volts or less. These varactors have been specifically designed for use in wireless communications up to the 2.4 GHz band. Applications include VCOs and voltage tuned filters.

Configurations

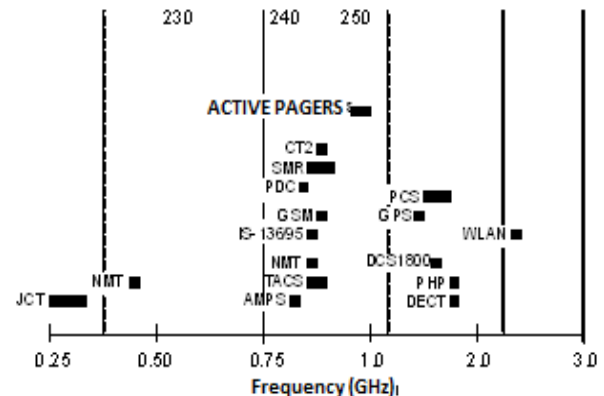
Top View (SOT-23, SC70 3LD)



Top View (SOD-323, SC-79)



Typical Device Selection by Frequency



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

Electrical Specifications @ $T_A = +25^\circ\text{C}$

Breakdown Voltage @ $I_R = 10\mu\text{A}$, $V_b = 12\text{ V Minimum}$

Reverse Leakage Current @ $V_R = 10\text{V}$, $I_R = 100\text{ nA Maximum}$

Base Part Number	Capacitance (C_T) ¹ (pF)			Capacitance Ratio $C_{T0.5} / C_{T4.0}$	Q Factor $f = 50\text{ MHz}$ $V_R = 2.0\text{ V}$	
	$f = 1\text{ MHz}$, $V_R = 2.0\text{ V}$		$f = 1\text{ MHz}$ $V_R = 4.0\text{ V}$			
	Min.	Nom.	Max.	Max.	Typ.	Typ.
MAVR-000230-XXXXXX	4.5	5.0	6.0	3.1	3.5	400
MAVR-000240-XXXXXX	3.0	3.5	4.2	2.3	3.5	450
MAVR-000250-XXXXXX	2.3	2.7	3.5	1.8	3.5	450

1. Capacitance @ 1 MHz

Absolute Maximum Ratings^{2,3}

@ $T_A = +25^\circ\text{C}$ (Unless Otherwise Noted)

Parameter	Absolute Maximum
Reverse Voltage	12 V
Forward Current	50 mA
Total Power Dissipation	250 mW
Operating Temperature	-55°C to $+125^\circ\text{C}$
Storage Temperature	-55°C to $+125^\circ\text{C}$

- Exceeding any one or combination of these limits may cause permanent damage to this device.
- MACOM does not recommend sustained operation near these survivability limits.

Handling Procedures

Please observe the following precautions to avoid damage:

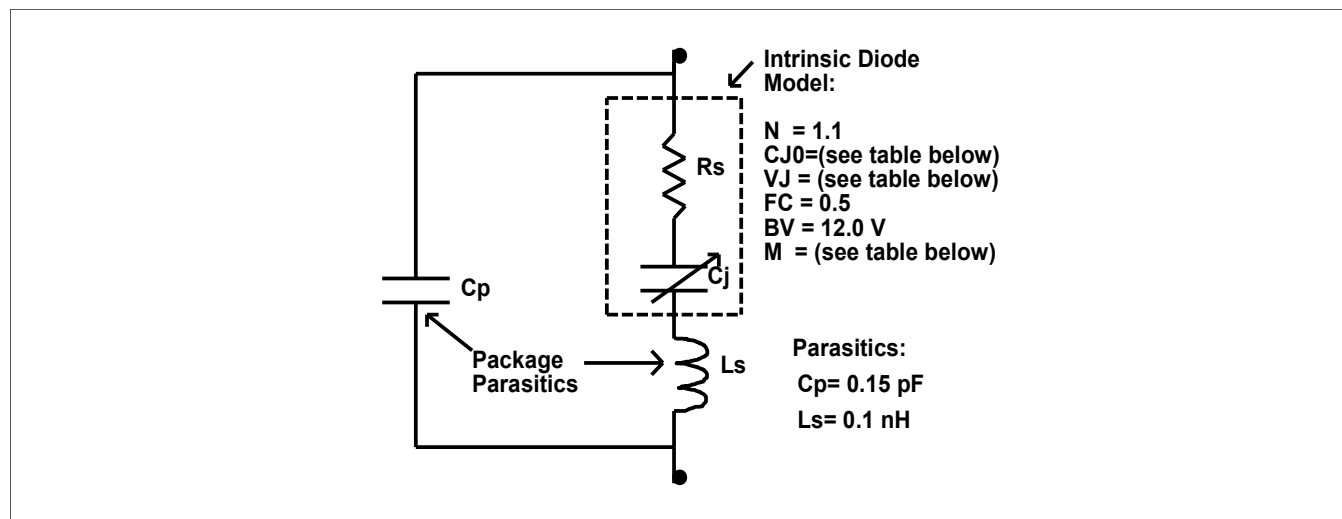
Static Sensitivity

Silicon Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

Part Number Designations

Ordering Part Number	Package Style	Diode Configuration	Diode Marking
MAVR-000230-0287AT	SOT-23	Single	V5J
MAVR-000230-0287FT	SOT-23	Common Cathode	V5K
MAVR-000230-11410T	SOD-323	Single	5J
MAVR-000240-0287AT	SOT-23	Single	V5L
MAVR-000240-11410T	SOD-323	Single	5L
MAVR-000240-1146FT	SC-70	Common Cathode	5M
MAVR-000250-0287AT	SOT-23	Single	V5N
MAVR-000250-0287FT	SOT-23	Common Cathode	V5P
MAVR-000250-11410T	SOD-323	Single	5N
MAVR-000250-1146FT	SC-70	Common Cathode	5P
MAVR-000250-12790T	SC-79	Single	No Marking

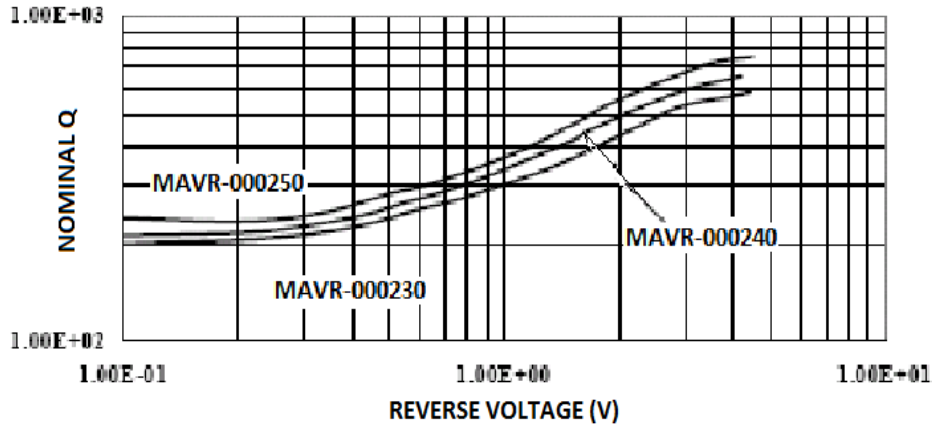
Spice Model



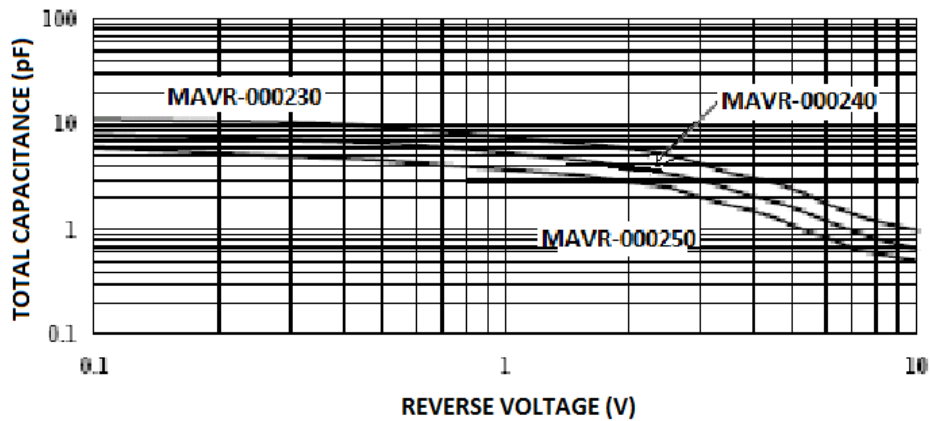
Base Part No.	C_{j0} (pF)	V_j (V)	M
MAVR-000230	12.0	4.085	2.228
MAVR-000240	8.16	4.930	2.520
MAVR-000250	6.19	4.774	2.458

Typical Performance Curves

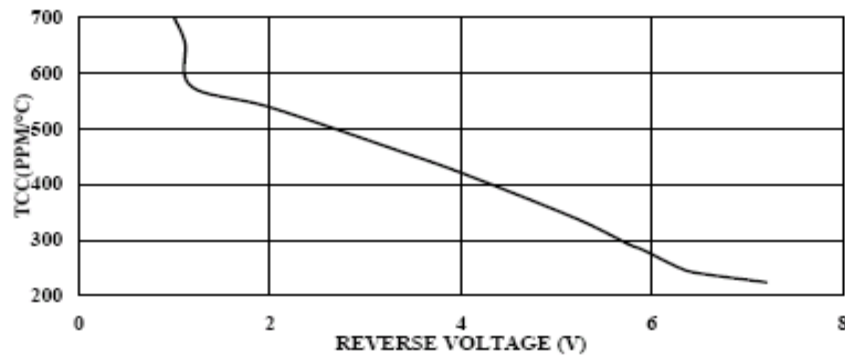
NOMINAL Q at 50 MHz vs REVERSE VOLTAGE



TOTAL CAPACITANCE VS REVERSE VOLTAGE at 1MHz

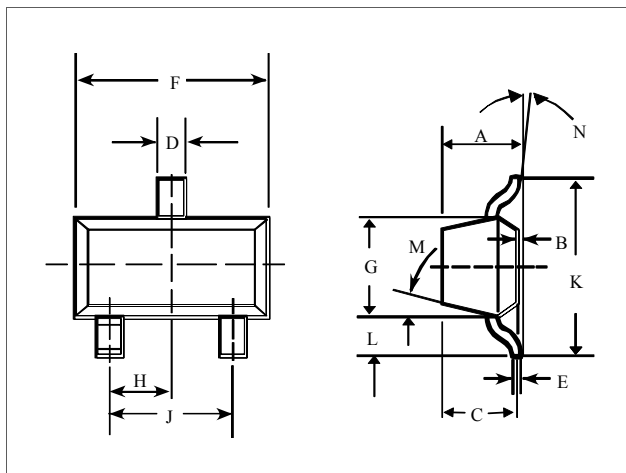


NOMINAL CHANGE in CAPACITANCE with TEMPERATURE



Case Styles

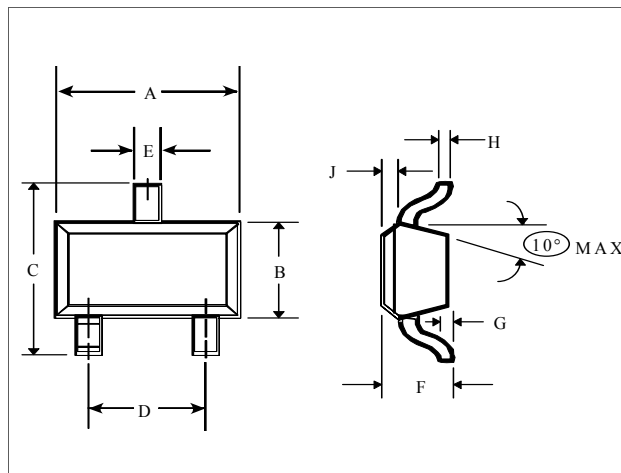
SOT-23 (Case Style 287)



Dim.	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
A	—	0.048	—	1.22
B	—	0.008	—	0.20
C	—	0.040	—	1.00
D	0.013	0.020	0.35	0.50
E	0.003	0.006	0.08	0.15
F	0.110	0.119	2.80	3.00
G	0.047	0.056	1.20	1.40
H	0.037 typical		0.95 typical	
J	0.075 typical		1.90 typical	
K	—	0.103	—	2.60
L	—	0.024	—	0.60
Dim.	GRADIENT			
M	10° max. ⁴			
N	2° . . . 30°			

4. Applicable on all sides

SC-70, 3 Lead (Case Style 1146)



Dim.	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
A	0.071	0.087	1.80	2.21
B	0.045	0.053	1.14	1.35
C	0.071	0.094	1.80	2.39
D	0.047	0.057	1.19	1.45
E	0.010	0.016	0.25	0.41
F	0.031	0.039	0.79	1.00
G	0.000	0.004	0.00	0.10
H	0.004	0.007	0.10	0.18
J	0.004	0.010	0.10	0.25

MAVR-000200 Series

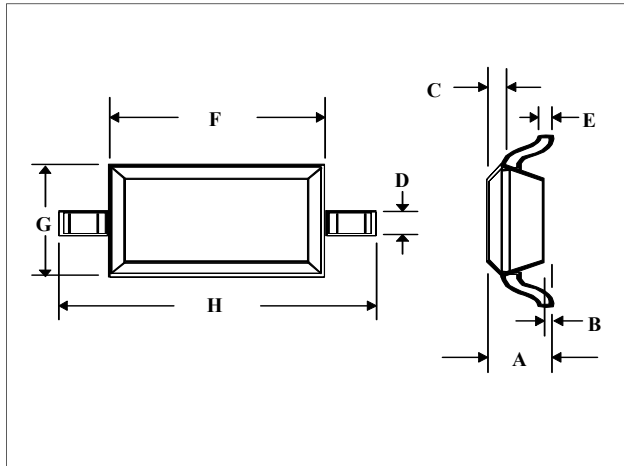


Low-Voltage / High Q Si Hyperabrupt Varactors

Rev. V6

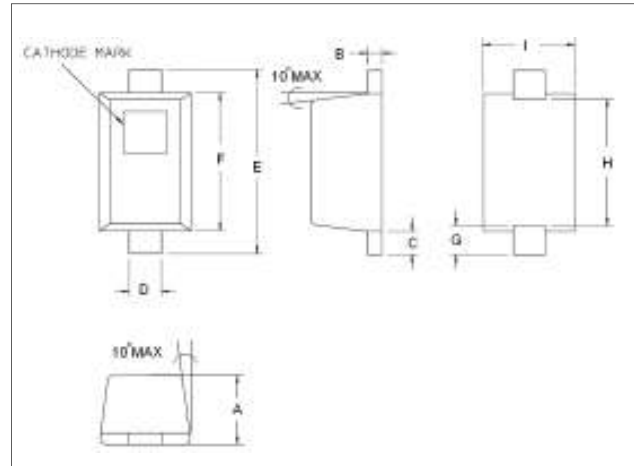
Case Styles

SOD-323 (Case Style 1141)



Dim.	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
A	—	0.043	—	1.1
B	—	0.004	—	0.1
C	—	0.008	—	0.2
D	0.010	0.016	0.25	0.41
E	0.003	0.006	0.07	0.15
F	0.063	0.075	1.6	1.9
G	0.045	0.057	1.14	1.45
H	0.091	0.106	2.3	2.7

SC-79 (Case Style 1279)



Dim.	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
A	.0197	.0276	0.50	0.70
B	0.003	0.008	0.07	0.20
C	0.006	0.010	0.15	0.25
D	0.010	0.014	0.25	0.35
E	0.059	0.067	1.50	1.70
F	0.043	0.051	1.09	1.30
G	.0098 nominal		0.250 nominal	
H	.0433 nominal		1.10 nominal	
I	.027	.035	0.68	0.89

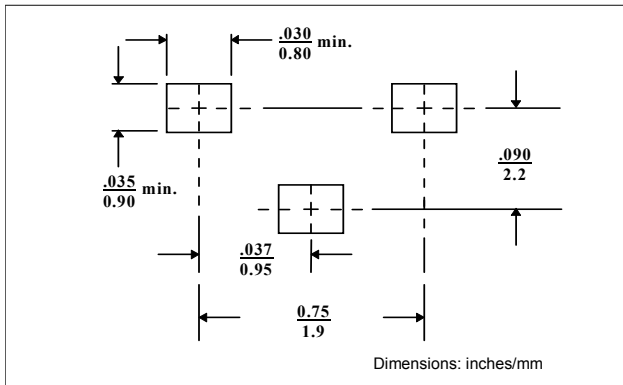
Mounting Information

The illustration indicates the recommended mounting pad configuration for the SC-79, SC70 3LD, SOT-23 and SOD-323 packages. Solder paste containing flux should be screened onto the pads to a thickness of 0.005 - 0.007 inches. The plastic package is placed in position, firmly adhering to the solder paste.

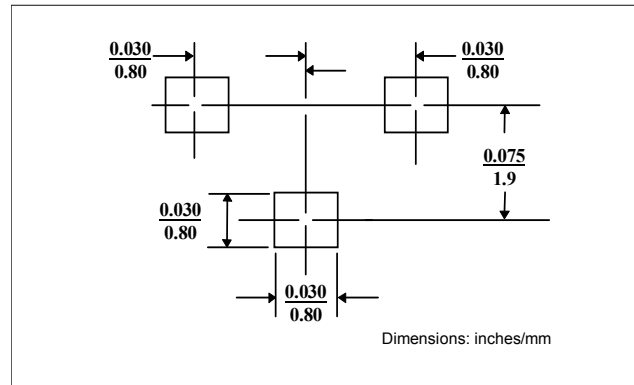
Permanent attachment is performed by a reflow soldering procedure during which the tab temperature does not exceed +275°C and the body temperature does not exceed +260°C.

Please refer to Application Note M538 for surface mounting instructions.

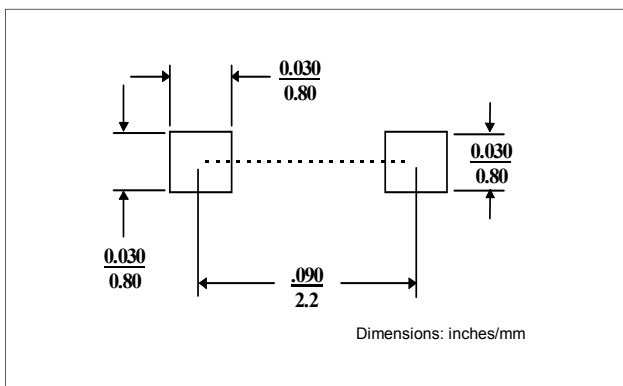
SOT-23 (Case Style 287)



SC-70, 3 Lead (Case Style 1146)



SOD-323 (Case Style 1141)



SC-79 (Case Style 1279)

