MAVR-0000xx Series

Surface Mount Hyperabrupt Wide-Band Tuning Varactors

Rev. V8

Features

- Low Cost
- Very High Capacitance Ratio from 1 to 8 Volts
- Surface Mount Package
- High Quality Factor
- Useful for Battery Applications
- SPC Monitored Ion Implantation for Excellent C-V Repeatability
- Available in Tape and Reel
- Lead-Free
- RoHS* Compliant

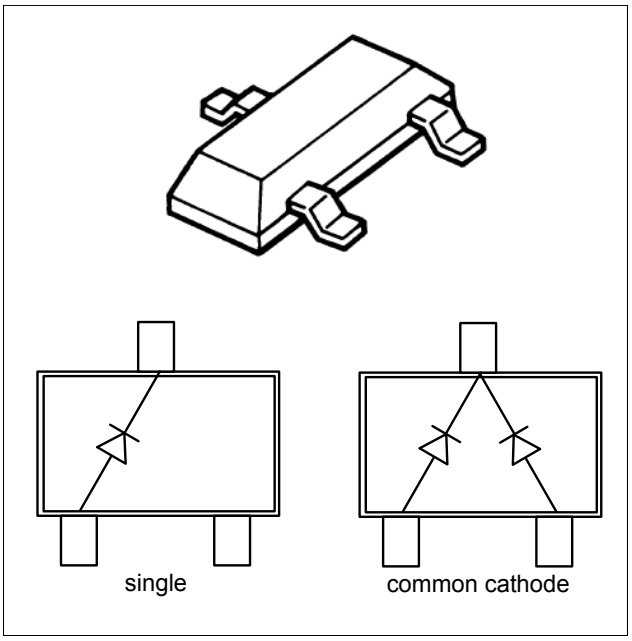
Description

The MAVR-000079 - 83 series of silicon hyperabrupt junction tuning varactors is produced with ion implantation and advanced epitaxial growth techniques. These diodes have thermal oxide passivation, and feature very high capacitance ratio and quality factor. They are well suited for use from the sub-HF through UHF frequency range. The standard capacitance tolerance is ±10%, with tighter tolerances available. Capacitance matching at one or more bias voltages is also available. These diodes are offered with standard Sn/Pb plating, as well as 100% matte Sn plating.

Applications

This series of hyperabrupt junction tuning varactors is suggested for usage where a large frequency change is required with only a small change in tuning voltage. This series is appropriate for usage in wide band voltage controlled oscillators and voltage controlled filters which require the largest rate of change of capacitance with voltage. The large change in capacitance from 1 to 8 volts makes them very attractive for battery operated or other systems with limited available control voltage. This varactor series can be used in VCO's and VTF's from approximately 100 KHz through the UHF frequency band.

SOT-23 (ODS-287)



Ordering Information

Part Number	Single Configuration
MAVR-000079-0287FT	tape and reel
MAVR-000080-0287AT	tape and reel
MAVR-000081-0287AT	tape and reel
MAVR-000082-0287AT	tape and reel
MAVR-000083-0287AT	tape and reel

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 for additional data sheets and product information.

For further information and support please visit:
https://www.macom.com/support

Electrical Specifications @ T_A = +25°C

Breakdown Voltage @ I_R = 10 mA, V_b = 12 V Minimum
Reverse Leakage Current @ V_R = 10 V, I_R = 100 nA Maximum
Temperature Coefficient of Capacitance @ V_R = 8 V, TCC = 400 ppm/°C Typical

Part #	Ct @ 1 MHz (pF)					Capacitance Ratio @ 1 MHz Ct_{1V}/Ct_{8V}	Q @ 50 MHz
	V_R = 1 V	V_R = 2.5 V		V_R = 4 V	V_R = 8 V	V_R = 1 V / 8 V	V_R = 4 V
	Min.	Min.	Max.	Max	Max.	Typ.	Typ.
MAVR-000079-0287FT	87.4	48.7	59.5	27.3	11.8	9.1	80
MAVR-000080-0287AT	40.0	22.3	27.3	13.1	5.5	8.9	150
MAVR-000081-0287AT	16.2	9.1	11.1	5.2	2.4	8.5	300
MAVR-000082-0287AT	11.5	6.6	8.0	3.8	1.8	8.2	350
MAVR-000083-0287AT	7.9	4.5	5.5	2.6	1.3	7.8	450

Absolute Maximum Ratings[1,2]

Parameter	Absolute Maximum
Reverse Voltage	12 V
Forward Current	50 mA
Power Dissipation	50 mW @ +25°C
Operating Temperature	-65°C to +125°C
Storage Temperature	-65°C to +125°C

1. Operation of this device above any one of these parameters may cause permanent damage.
2. Please refer to application note M538 for surface mounting instructions.

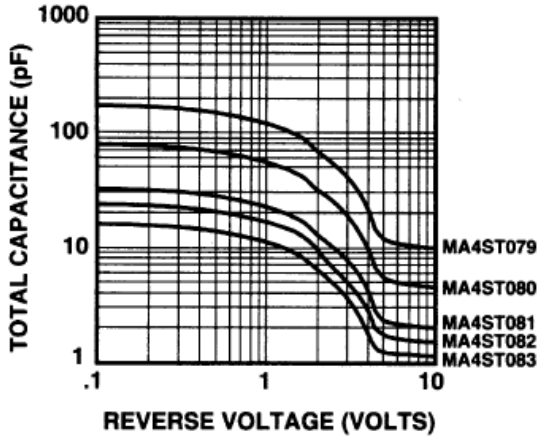
Handling Procedures

Please observe the following precautions to avoid damage:

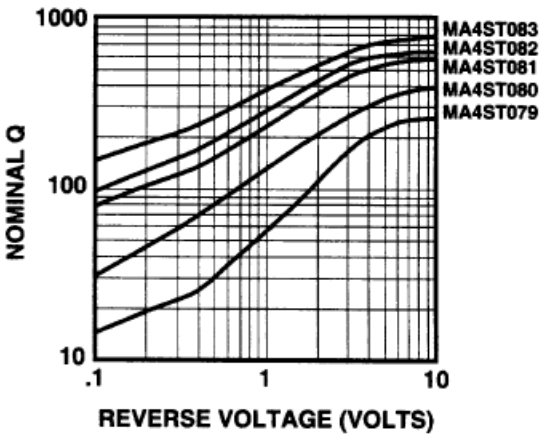
Static Sensitivity

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 devices.

Total Capacitance vs. Reverse Voltage



Nominal Q vs. Reverse Voltage



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 for additional data sheets and product information.

For further information and support please visit:
https://www.macom.com/support

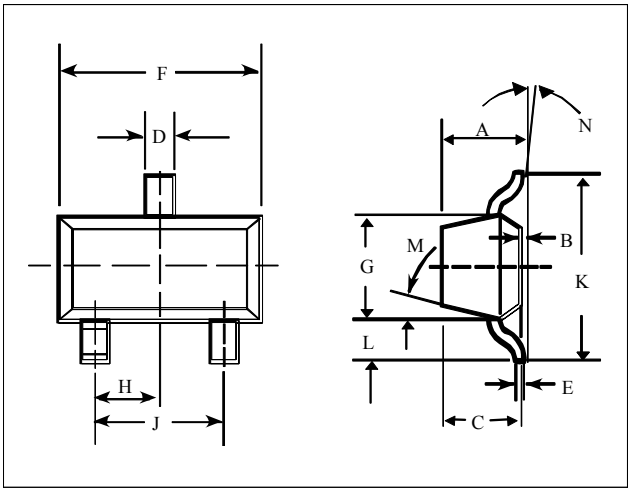
Mounting Information

The illustration indicates the recommended mounting pad configuration for the SOT-23 package. 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.

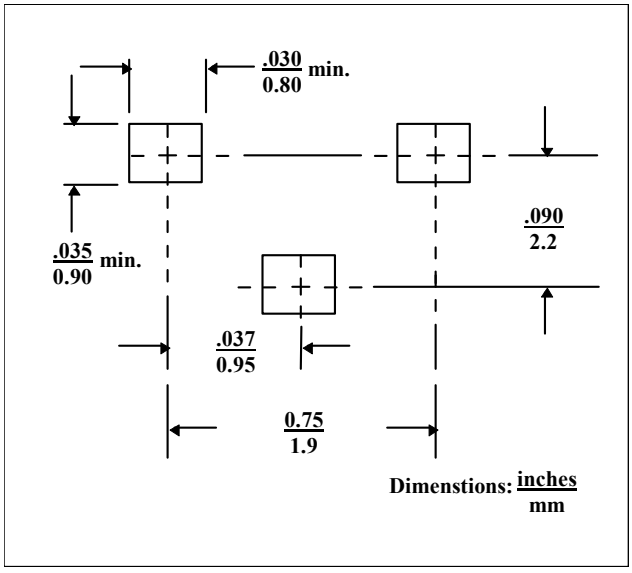
Permanent attachment is performed by a reflow soldering procedure during which the tab temperature does not exceed +275°C and the body temperature does not exceed +250°C, for standard models and +260°C for the RoHS compliant devices.

Please refer to Application Note M538 for surface mounting instructions.

SOT-23 (Case Style 287)



SOT-23



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.			
N	2° . . .30°			

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 for additional data sheets and product information.

For further information and support please visit:
https://www.macom.com/support

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.