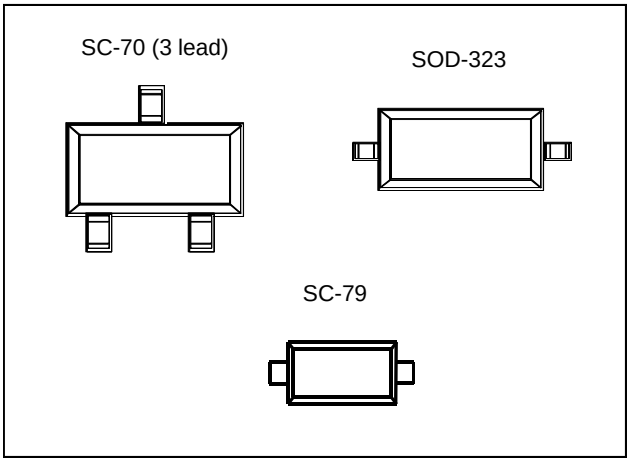
MA4ST1200 Series

Low Tuning Voltage / Low Rs Silicon Hyperabrupt Varactor Diode

Rev. V8

Features

- Low Series Resistance at Low Tuning Voltages
- High Capacitance Ratio at Low Tuning Voltages
- Surface Mount Plastic Packages : SC-79, SOD-323, SC-70 (3L)
- SPC Process for Superior C vs V Repeatability
- Lead-Free (RoHs Compliant) equivalents available with 260°C reflow compatibility



Description

M/A-COM's MA4ST1200 series is a highly repeatable, UHCVD/ion-implanted, hyperabrupt silicon tuning varactor in a cost effective surface mount package. This series of varactors is designed for high capacitance ratio, and high Q for low battery voltage operation. It is efficient for wide band tuning and low phase noise application where the supply voltage is limited to 5 volts or less. The Varactors are offered as Singles in SC-79, and SOD-323 along with a Common Cathode version offered in the SC-70, 3 Lead. These diodes are offered with standard Sn/Pb plating , as well as with 100% matte Sn plating on our RohS compliant equivalent devices.

Absolute Maximum Ratings [1,2] @ T_A=+25 °C (Unless Otherwise Noted)

Parameter	Absolute Maximum
Reverse Voltage	12 V
Forward Current	50 mA
Operating Temperature	-55 °C to +125 °C
Storage Temperature	-55 °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

Part Number	RoHs Compliant Part Number	Configuration	Package	Package Cp (pF)	Package Ls (nH)
	MAVR-001230-12790T	Single	SC-79	0.10	0.6
	MAVR-001240-12790T	Single	SC-79	0.10	0.6
	MA4ST1231-1141T	Single	SOD-323	0.11	1.2
	MA4ST1241-1141T	Single	SOD-323	0.11	1.2
MA4ST1230CK-1146T	MA4ST1231CK-1146T	Common Cathode	SC-70 (3L)	0.12	1.3
MA4ST1240CK-1146T	MA4ST1241CK-1146T	Common Cathode	SC-70 (3L)	0.12	1.3

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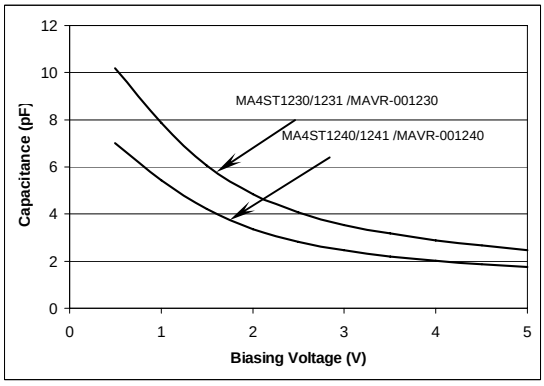
Electrical Specifications @ T_A = +25 °C

Breakdown Voltage @ I_R = 10μA, V_b = 12 V Minimum
Reverse Leakage Current @ V_R =10V, I_R = 100 nA Maximum

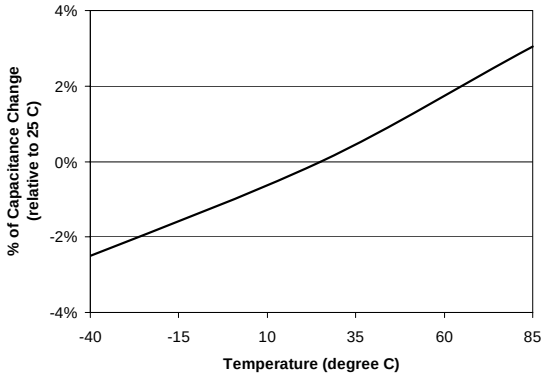
Part No. Base[1]	RoHs Compliant Part Number Base[1]	Ct (pF)[2]					Capacitance Ratio	Rs[3] (Ohm)	
		V_R = 0.5V	V_R = 2.0V			V_R = 4.0V	$Ct_{0.5}/Ct_{4.0}$	V_R = 2.0 V	
		Typ.	Min.	Nom.	Max.	Typ.	Typ.	Typ.	Max.
MA4ST1230	MA4ST1231 MAVR-001230-XXXXX	10.1	4.2	4.7	5.6	2.75	3.67	0.40	0.70
MA4ST1240	MA4ST1241 MAVR-001240-XXXXX	7.1	3.0	3.4	3.8	2.05	3.46	0.40	0.70

1. The prefix defines package style, configuration and packaging information. Contact representative for complete part identification.
2. Capacitance @ 1 MHz
3. Series Resistance @ 100 MHz

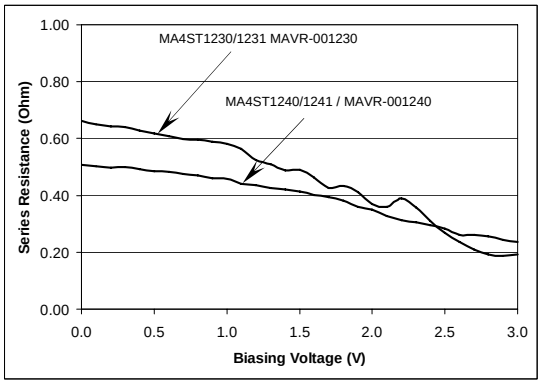
Typical Capacitance vs. Biasing Voltage



Typical Capacitance Change vs. Temperature



Typical Rs vs Biasing Voltage



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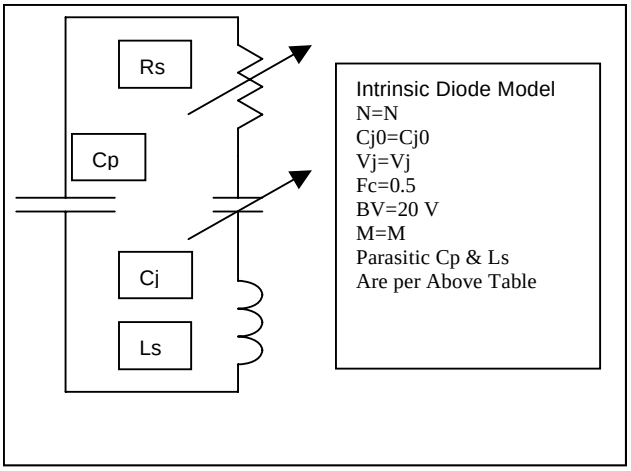
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Typical Capacitance Values

V_R (V)	MA4ST1230 Ct (pF)	MA4ST1240 Ct (pF)
0.5	10.170	7.016
1.0	7.839	5.424
1.5	6.062	4.213
2.0	4.840	3.370
2.5	4.053	2.829
3.0	3.527	2.466
3.5	3.155	2.208
4.0	2.877	2.016
4.5	2.661	1.865
5.0	2.488	1.746

Spice Model



Part Number	N	CJO (pF)	Vj (V)	M
MA4ST1230	1.1	12.7	3.136	2.6
MA4ST1240	1.1	8.65	3.170	2.6

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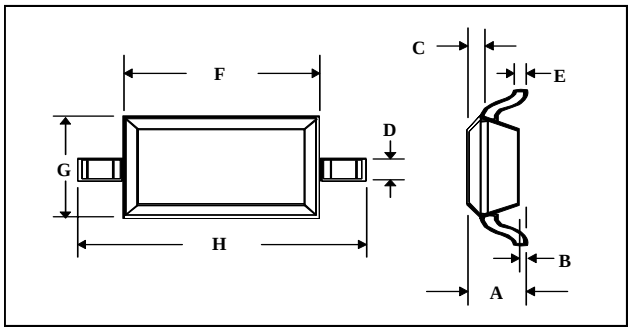
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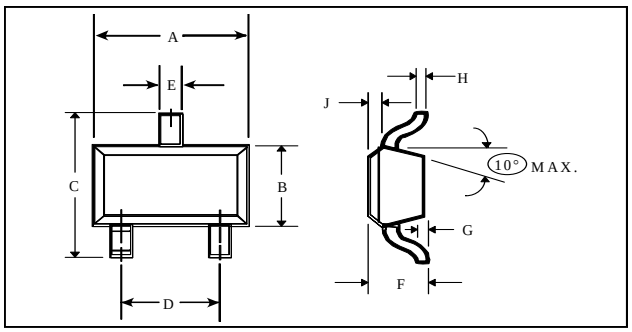
Case Styles

SOD-323 (Case Style 1141)



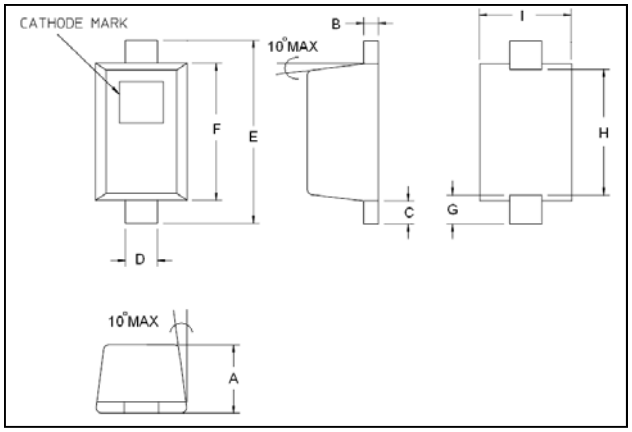
	INCHES		MILLIMETERS	
DIM.	MIN.	MAX.	MIN.	MAX.
A	—	0.043	—	1.1
B	—	0.004	—	0.1
C	—	0.008	—	0.2
D	0.010	0.016	0.25	0.41
E	0.003	0.006	0.07	0.15
F	0.063	0.075	1.6	1.9
G	0.045	0.057	1.14	1.45
H	0.091	0.106	2.3	2.7

SC-70, 3 Lead (Case Style 1146)



	INCHES		MILLIMETERS	
DIM.	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

SC-79 (Case Style 1279)



	INCHES		MILLIMETERS	
DIM.	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

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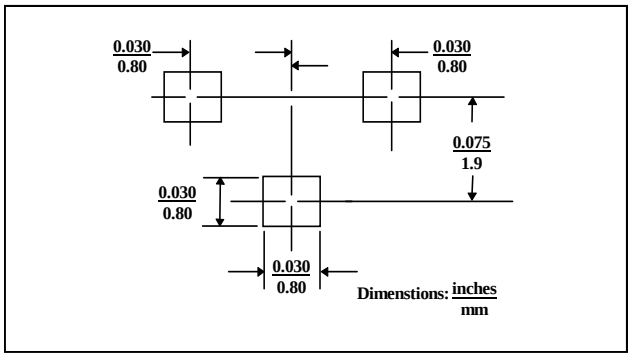
Mounting Information

The illustration indicates the recommended mounting pad configuration for the SC-79, SOT-323 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.

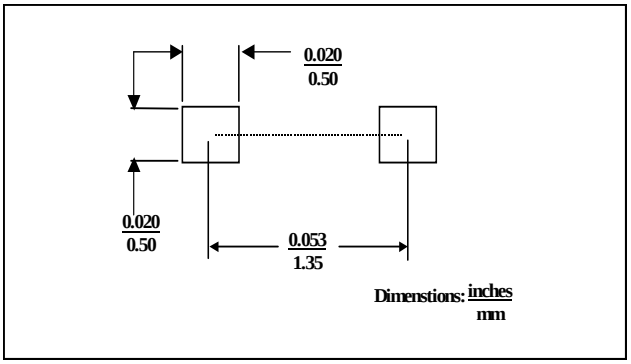
Permanent attachment is performed by a reflow soldering procedure during which the tab temperature does not exceed +275 °C and the body temperature does not exceed +250 °C, for standard models and +260 °C for the RoHS compliant devices.

Please refer to Application Note M538 for surface mounting instructions.

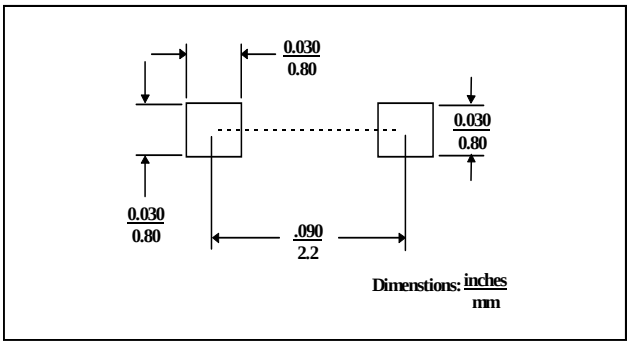
SC-70, 3 Lead (Case Style 1146)



SC-79 (Case Style 1279)



SOD-323 (Case Style 1141)



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