

Silicon Medium Barrier Schottky Diodes

MA4E1338 Series
V4

Features

- RF & Microwave Medium Barrier Silicon 8 V Schottky Diode
- Available as Single Diode, Series Pair or Unconnected Pair Configurations.
- Low Profile Surface Mount Plastic Package
- **Lead Free (RoHS Compliant) Equivalents Available With 260 Deg. C Reflow Capability**

Description and Applications

The MA4E1338 series is a silicon medium barrier Schottky diode suitable for use in mixer, detector and limiter circuits. These diodes are also suitable for usage in anti-parallel, shunt power surge protection circuits for 50 Ω and 75 Ω systems.

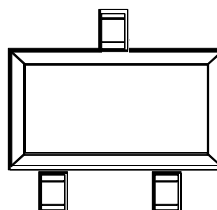
These parts are offered with Sn/Pb plating, as well as with 100 % matte Sn plating on the RoHS compliant part numbers.

The MA4E1338 Series of Schottky diodes is available in the SOT-23 (case style 287), SOT-143 (case style 1068), SOT-323 (case style 1146) and the SOD 323, (case style 1141) plastic package. These packages are supplied on tape and reel for automatic pick and place assembly and for surface mount placement to circuit boards, as indicated by a "T" to the P/N suffix.

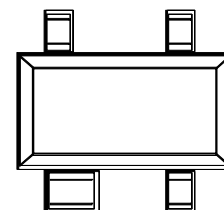
These Silicon Medium Barrier, 8 V Schottky Diodes are Useful in Detector, Limiter, Mixer, and Surge Protection Applications for Operating Frequency Bands from D.C. through 6 GHz.

Package Outlines

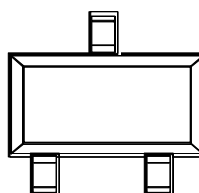
SOT-23 (287)



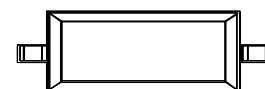
SOT-143 (1068)



SOT-323 (1146)



SOD-323 (1141)

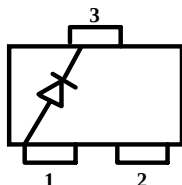


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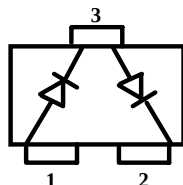
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Configurations

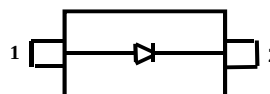
Top View



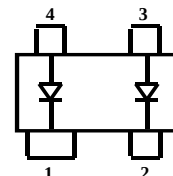
Single
MA4E1338A-287T
MA4E1338A-1146T



Series Pair
MA4E1338B-287T
MA4E1338B-1146T



Single
MA4E1338A-1141T
MADS-001338-12790T



Unconnected Pair
MA4E1338E-1068T

Standard Part Numbers and RoHS Equivalents

Standard Part Number	RoHS Compliant Part Number	Package Style
MA4E1338A-287T	MA4E1338A1-287T	SOT-23
MA4E1338A-1146T	MA4E1338A1-1146T	SOT-323
MA4E1338B-287T	MA4E1338B1-287T	SOT-23
MA4E1338B-1146T	MA4E1338B1-1146T	SOT-323
MA4E1338A-1141T	MA4E1338A1-1141T	SOD-323
N/A	MADS-001338-12790T	SC-79
MA4E1338E-1068T	MA4E1338E1-1068T	SOT-143

**Silicon Medium Barrier
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Maximum Ratings @ 25 °C (unless otherwise specified)¹

Parameter	Unit	Values
Operating Temperature	°C	-55 to +125
Storage Temperature	°C	-55 to +125
Total Power Dissipation (RF and D.C.)	mW	250
Continuous Forward Current	mA	30
Surge Forward Current, @ t < 10 ms	mA	100
Reverse Voltage	V	8
Soldering Temperature (Standard Part #)	°C	+235 for 5 sec.
Soldering Temperature (RoHS Compliant Part #)	°C	+260 for 5 sec.

Operation of this device above any one of the Maximum Rated parameters may cause permanent damage.

* Please refer to Application Note M538 for surface mounting instructions.

Electrical Specifications @ +25 °C

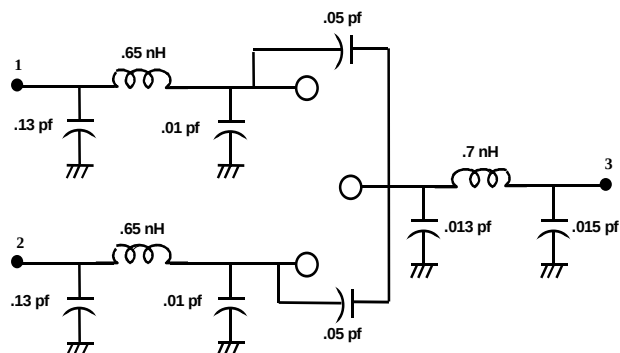
Parameter	Condition	Symbol	Specification
Forward Voltage	$I_F = 1 \text{ mA}$	V_F	360 mV max.
Delta Forward Voltage	$I_F = 1 \text{ mA}$	ΔV_F	20 mV max. (for series pair and unconnected pair configurations)
Forward Voltage	$I_F = 10 \text{ mA}$	V_F	500 mV max.
Total Capacitance	$V_R = 0 \text{ V}$ $F = 1 \text{ MHz}$	C_T	1.0 pF max.
Reverse Leakage Current	$V_R = 1 \text{ V}$	I_R	100 nA max.
Reverse Voltage Breakdown	$I_R = 10 \text{ } \mu\text{A}$	V_b	8 V min.

Silicon Medium Barrier Schottky Diodes

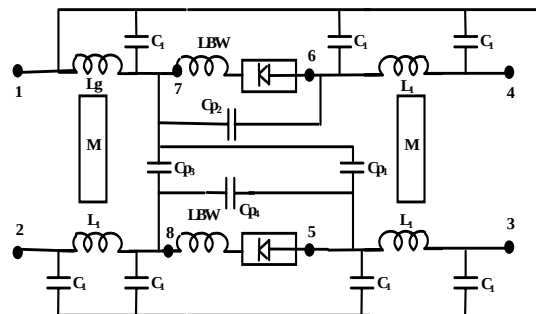
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Circuit Models

SOT-23

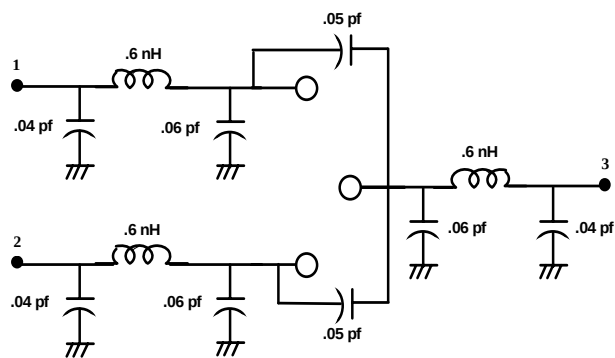


SOT-143

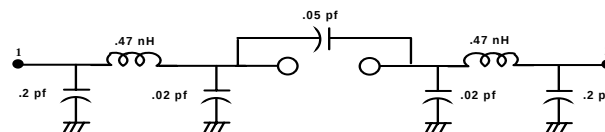


LBW = 0.08nH, Lg = 0.36nH, L1 = 0.31nH, M = 0.12nH, C1 = 0.01pF, Cp1 = 0.05pF, CP2 = 0.10pF, Cp3 = 0.05pF, Cp4 = 0.03pF

SOT-323



SOD-323

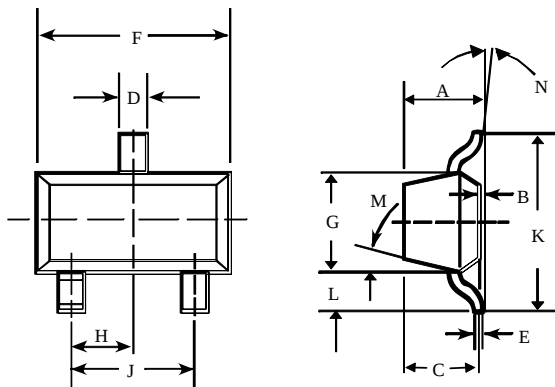


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Case Styles

SOT-23

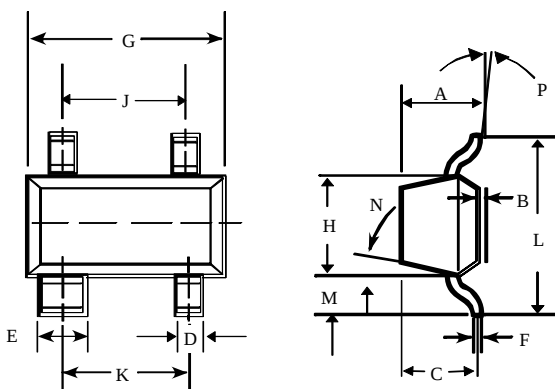


SOT-23 (Case Style 287)

	INCHES		MILLIMETERS	
DIM.	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. ¹			
N	2° . . . 30°			

Note: 1. Applicable on all sides

SOT-143



SOT-143 (Case Style 1068)

	INCHES		MILLIMETERS	
DIM.	MIN.	MAX.	MIN.	MAX.
A	-	0.044	-	1.10
B	-	0.044	-	1.10
C	-	0.040	-	1.00
D	0.030	0.035	0.75	0.90
E	0.013	0.020	0.35	0.50
F	0.003	0.006	0.08	0.15
G	0.110	0.119	2.80	3.00
H	0.047	0.056	1.20	1.40
J	0.075 typical		1.90 typical	
K	0.075 typical		1.90 typical	
L	-	0.103	-	2.6
M	-	0.024	-	0.6
DIM.	GRADIENT			
N	10° max. ¹			
P	2° . . . 30°			

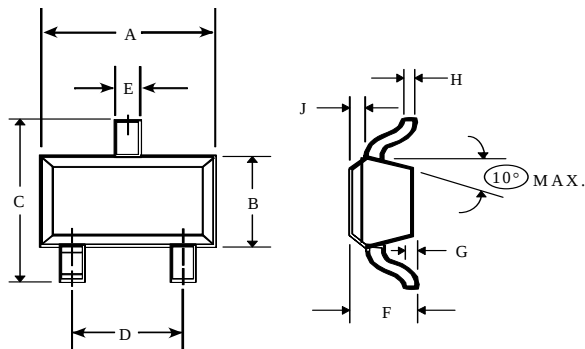
Note: 1. Applicable on all sides

**Silicon Medium Barrier
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Case Styles (Cont'd)

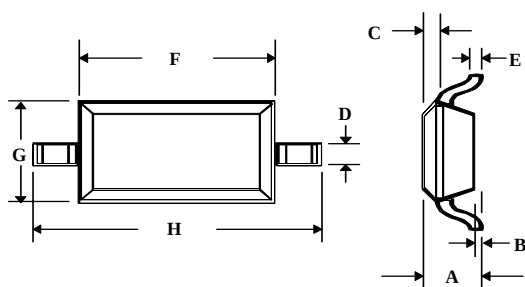
SOT-323



SOT-323 (Case Style 1146)

DIM.	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.063	0.087	1.6	2.2
B	0.045	0.053	1.15	1.35
C	0.079	0.087	2.0	2.2
D	0.047	0.055	1.2	1.4
E	0.008	0.016	0.2	0.4
F	0.031	0.039	0.8	1.0
G	–	0.004	–	0.1
H	0.003	0.006	0.08 typical	0.15
J	0.004	0.010	0.1	0.25

SOD-323



SOD-323 (Case Style 1141)

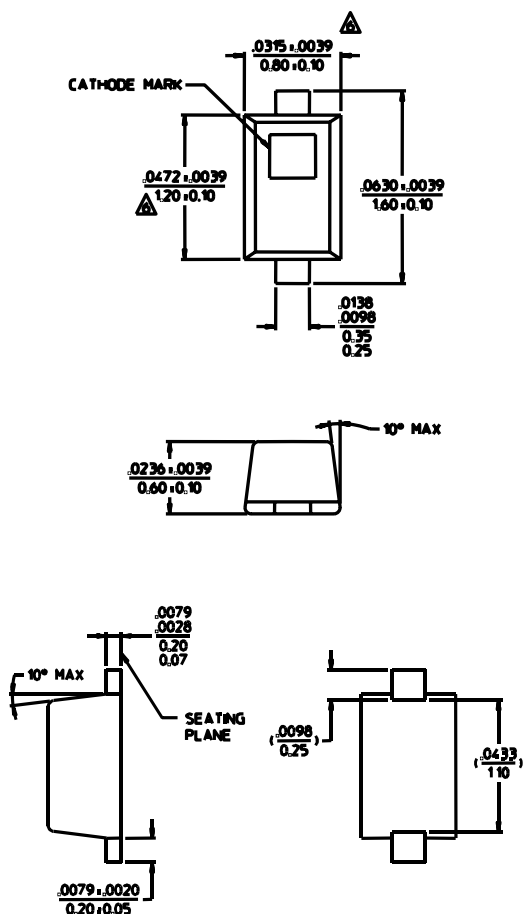
DIM.	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	–	0.043	–	1.1
B	–	0.004	–	0.1
C	–	0.008	–	0.2
D	0.010	0.016	0.25	0.4
E	0.003	0.006	0.08	0.15
F	0.063	0.075	1.6	1.9
G	0.045	0.057	1.15	1.45
H	0.091	0.106	2.3	2.7

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Case Styles (Cont'd)

ODS-1279



Package Parasitics

Ls = .6 nH

Cp = .10 pF