

### 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

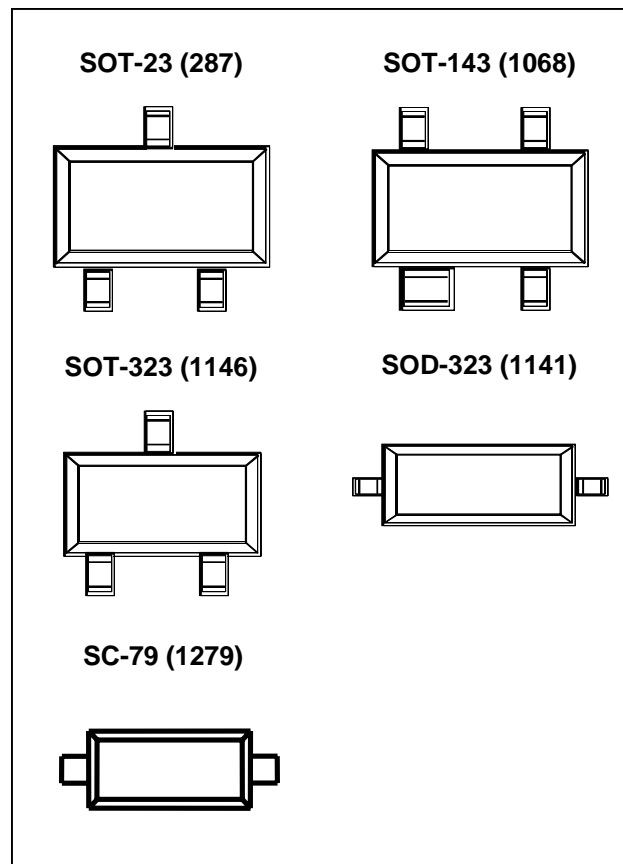
The MA4E1338 series is a silicon medium barrier Schottky diode suitable for use in mixer, detector and limiter circuits. These diodes are also suitable for usage in anti-parallel, shunt power surge protection circuits for 50  $\Omega$  and 75  $\Omega$  systems.

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), SC-79 (case style 1279) 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



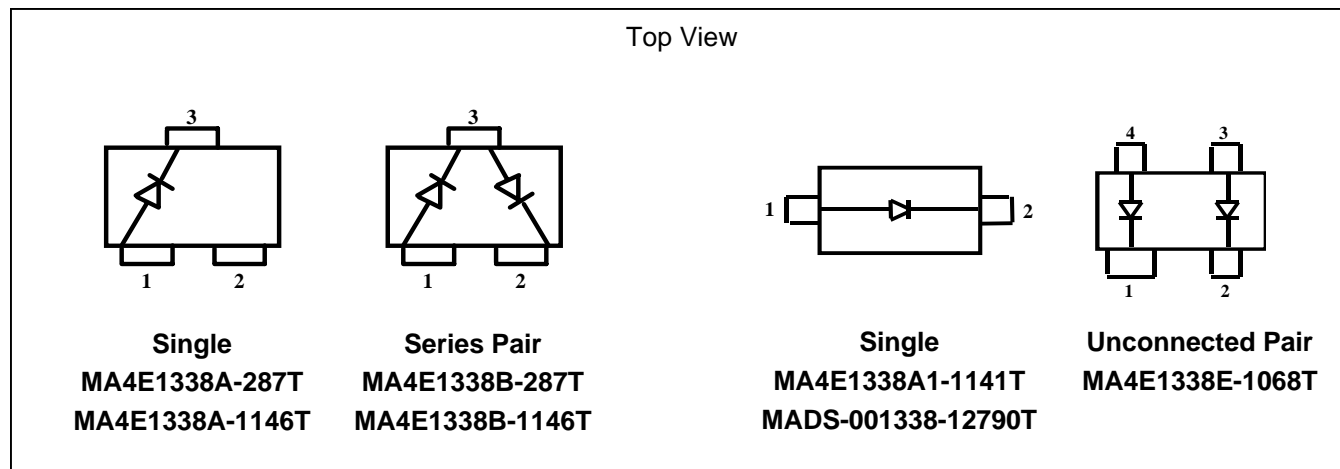
# MA4E1338 Series



## Silicon Medium Barrier Schottky Diodes

M/A-COM Products  
Rev. V8

### Configurations



### Standard Part Numbers and RoHS Equivalent

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
N/A	MA4E1338A1-1141T	SOD-323
N/A	MADS-001338-12790T	SC-79
MA4E1338E-1068T	MA4E1338E1-1068T	SOT-143

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### Maximum Ratings @ 25 °C (unless otherwise specified) <sup>1,2</sup>

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.
Electrostatic Discharge ( ESD ) Classification	-	1A

1. Operation of this device above any one of the Maximum Rated parameters may cause permanent damage.
2. Please refer to Application Note M538 for surface mounting instructions.
3. ESD rating based on Human Body Model.

### Electrical Specifications @ +25 °C

Parameter	Condition	Symbol	Specification
Forward Voltage	$I_F = 1 \text{ mA}$	$V_F$	360 mV max.
Delta Forward Voltage	$I_F = 1 \text{ mA}$	$\Delta V_F$	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.

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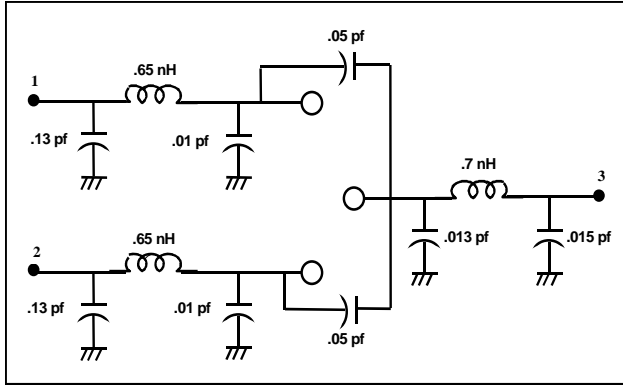
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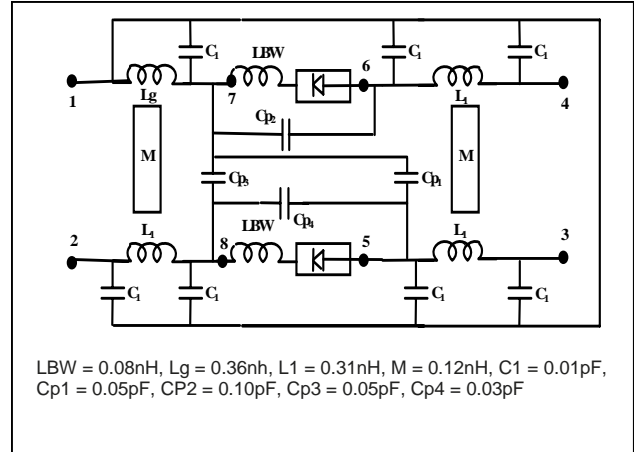
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### Circuit Models

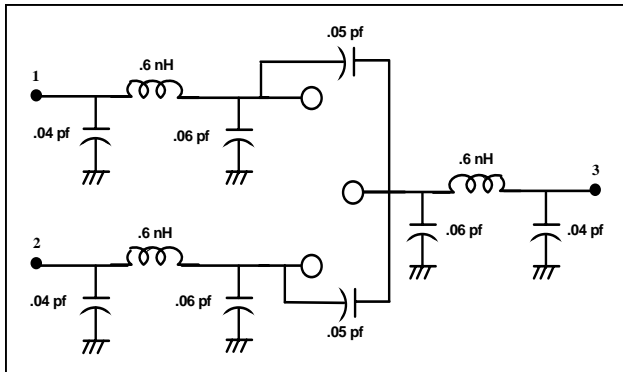
#### SOT-23



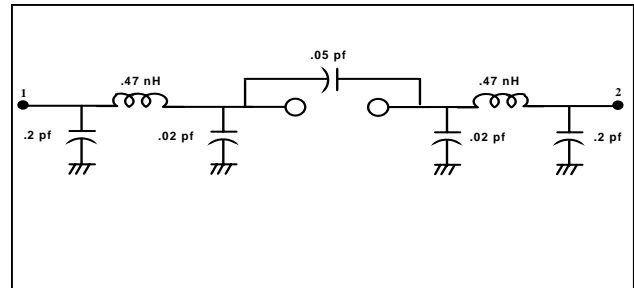
#### SOT-143



#### SOT-323

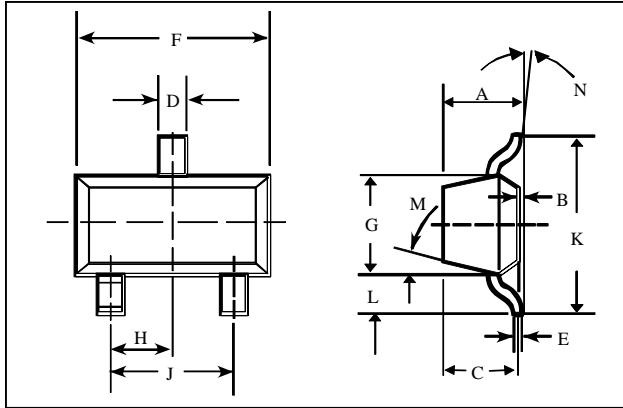


#### SOD-323



### Case Styles

#### SOT-23

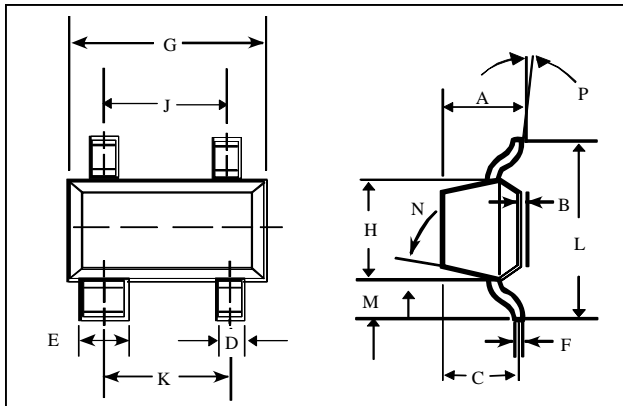


#### SOT-23 (Case Style 287)

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. <sup>3</sup>			
N	2° . . . 30°			

3. Applicable on all sides

#### SOT-143



#### SOT-143 (Case Style 1068)

DIM.	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	-	0.044	-	1.10
B	-	0.044	-	1.10
C	-	0.040	-	1.00
D	0.013	0.020	0.35	0.50
E	0.030	0.035	0.75	0.90
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. <sup>4</sup>			
P	2° . . . 30°			

4. Applicable on all sides

# MA4E1338 Series

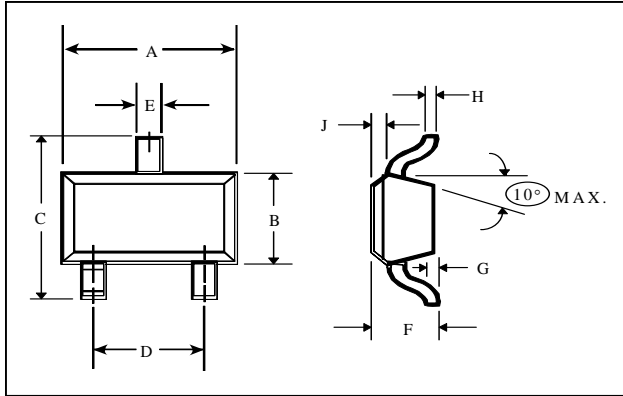


## Silicon Medium Barrier Schottky Diodes

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Rev. V8

### Case Styles (Cont'd)

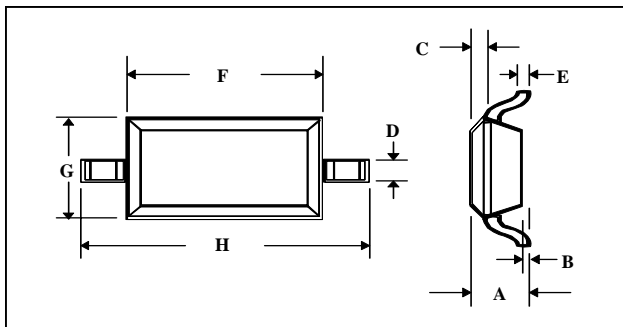
#### SOT-323



#### 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	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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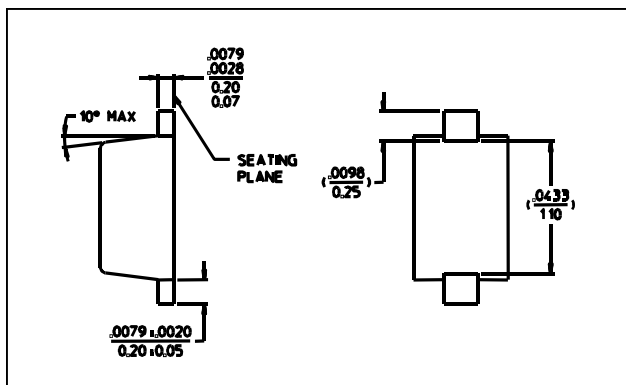
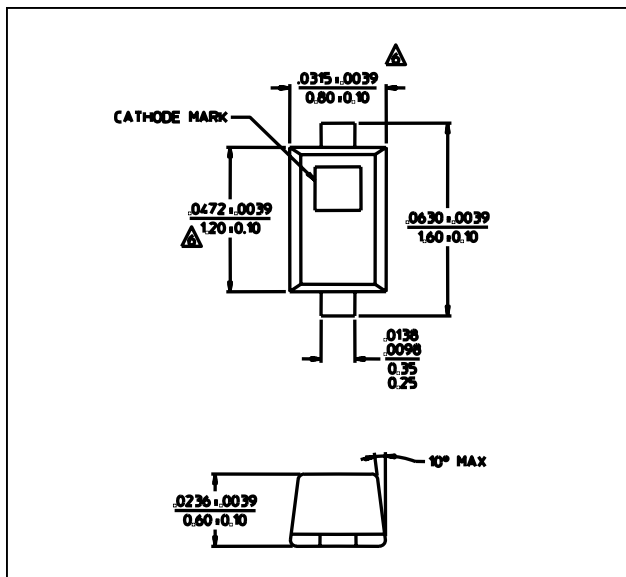


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### Case Styles (Cont'd)

#### ODS-1279



### Package Parasitics

$L_s = .6 \text{ nH}$   
 $C_p = .10 \text{ pF}$

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