

## 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  $\Omega$  and 75  $\Omega$  systems.

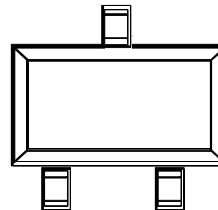
These parts are offered with Sn/Pb plating, as well as with 100 % matte Sn plating on the RoHS compliant part numbers.

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 ) 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.

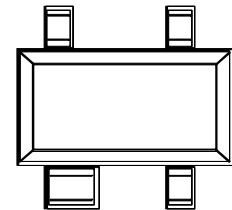
These Silicon Medium Barrier, 8 V Schottky Diodes are Useful in Detector, Limiter, Mixer, and Surge Protection Applications for Operating Frequency Bands from D.C. through 6 GHz.

### Package Outlines

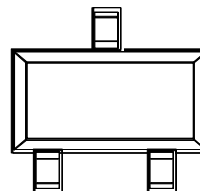
SOT-23 (287)



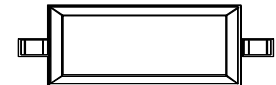
SOT-143 (1068)



SOT-323 (1146)

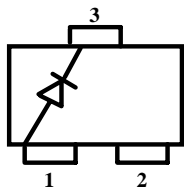


SOD-323 (1141)

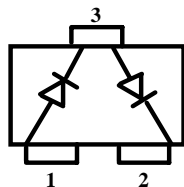


**Configurations**

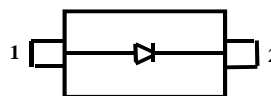
Top View



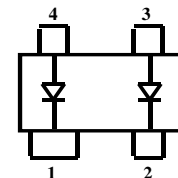
**Single**  
MA4E1338A-287T  
MA4E1338A-1146T



**Series Pair**  
MA4E1338B-287T  
MA4E1338B-1146T



**Single**  
MA4E1338A-1141T  
MADS-001338-12790T



**Unconnected Pair**  
MA4E1338E-1068T

**Standard Part Numbers and RoHS Equivalentents**

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  
Schottky Diodes

MA4E1338 Series  
V4

**Maximum Ratings @ 25 °C (unless otherwise specified)<sup>1</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.

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**

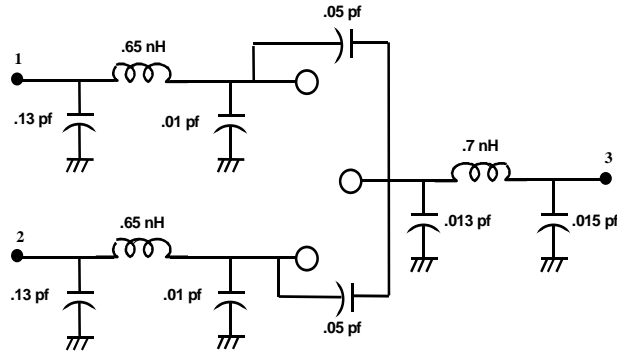
Parameter	Condition	Symbol	Specification
Forward Voltage	$I_F = 1 \text{ mA}$	$V_F$	360 mV max.
Delta Forward Voltage	$I_F = 1 \text{ mA}$	$\Delta V_F$	20 mV max. (for series pair and unconnected pair configurations)
Forward Voltage	$I_F = 10 \text{ mA}$	$V_F$	500 mV max.
Total Capacitance	$V_R = 0 \text{ V}$ $F = 1 \text{ MHz}$	$C_T$	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.

Silicon Medium Barrier  
Schottky Diodes

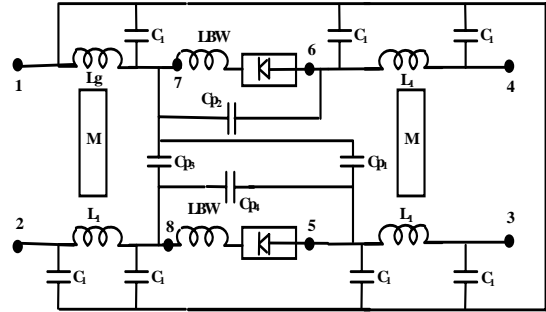
MA4E1338 Series  
V4

Circuit Models

SOT-23

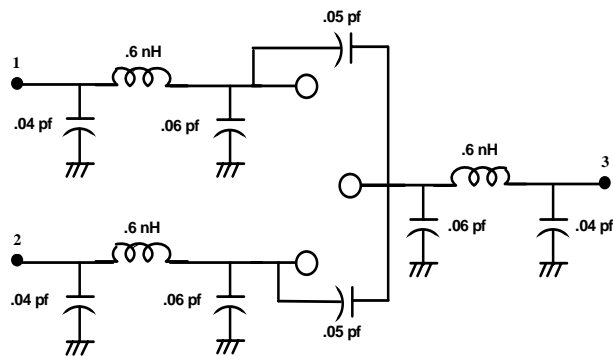


SOT-143

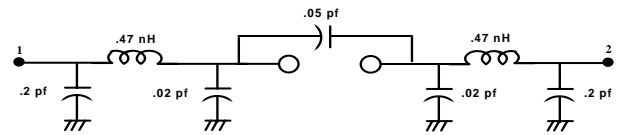


LBW = 0.08nH, Lg = 0.36nH, L1 = 0.31nH, M = 0.12nH, C1 = 0.01pF,  
Cp1 = 0.05pF, Cp2 = 0.10pF, Cp3 = 0.05pF, Cp4 = 0.03pF

SOT-323



SOD-323

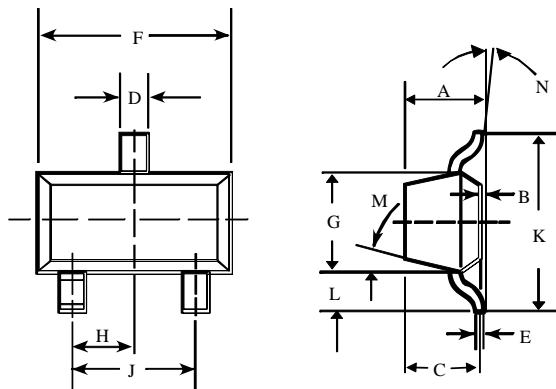


Silicon Medium Barrier  
Schottky Diodes

MA4E1338 Series  
V4

Case Styles

SOT-23

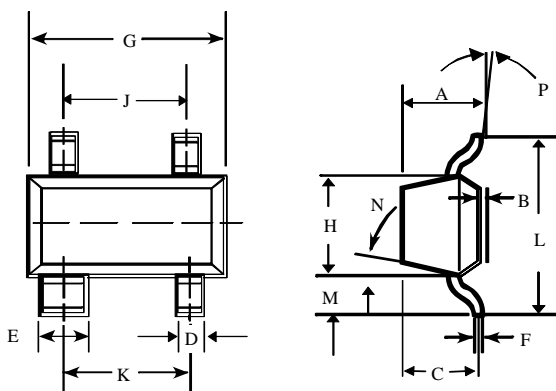


SOT-23 (Case Style 287)

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>1</sup>			
N	2° . . . 30°			

Note: 1. Applicable on all sides

SOT-143



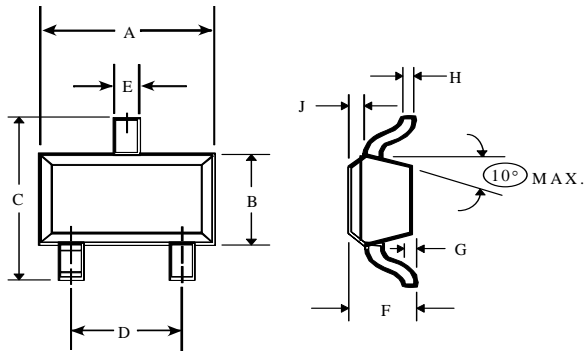
SOT-143 (Case Style 1068)

DIM.	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	-	0.044	-	1.10
B	-	0.044	-	1.10
C	-	0.040	-	1.00
D	0.030	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. <sup>1</sup>			
P	2° . . . 30°			

Note: 1. Applicable on all sides

**Case Styles (Cont'd)**

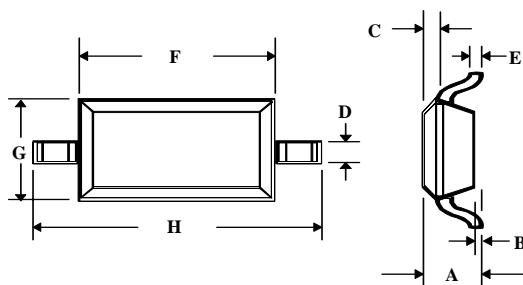
**SOT-323**



**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**

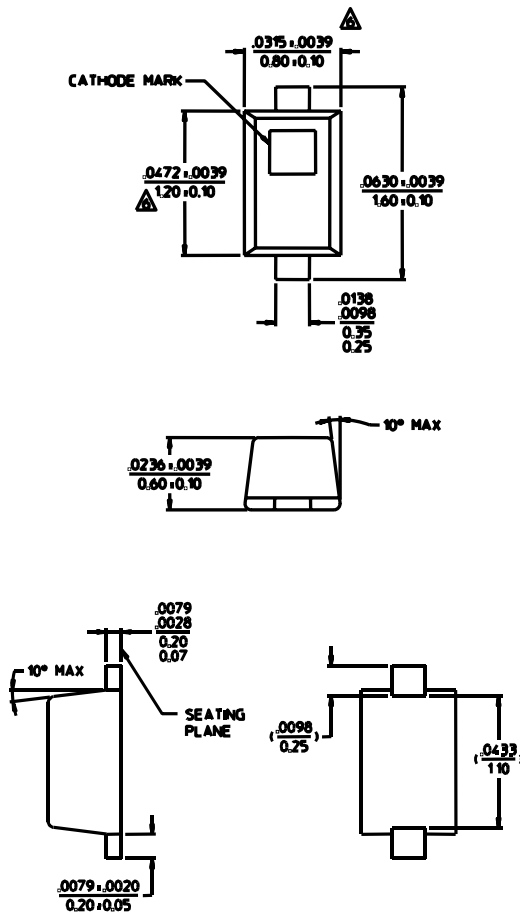


**SOD-323 (Case Style 1141)**

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

Case Styles (Cont'd)

ODS-1279



Package Parasitics

Ls = .6 nH  
Cp = .10 pF