

Silicon PIN Diode Switch Element

Rev. V1

Features

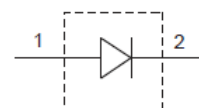
- Small Size (40 x 25 mils)
- Broadband Performance up to 6 GHz
- Supports up to 5 W Power
- Low Insertion Loss: 0.3 dB
- RoHS* Compliant

Description

The MSWSE-005-10S is a PIN diode SPST switch element designed for medium incident power applications up to 5 W CW. It has low insertion loss and medium isolation below 6GHz.



(0402)
Molded Plastic DFN Package

Electrical Specifications: $T_A = +25^\circ\text{C}$

Parameter	Test Conditions	Min.	Typ.	Max.	Units
Breakdown Voltage	$I_R = 10 \mu\text{A}$	200	—	—	V
Forward Voltage	$I_F = 50 \text{ mA}$	—	980	1050	mV
Junction Capacitance	$V_R = 50 \text{ V}, 1 \text{ MHz}$	—	0.035	0.05	pF
Total Capacitance	$V_R = 50 \text{ V}, 1 \text{ MHz}$	—	0.08	0.12	pF
Series Resistance	$I_F = 30 \text{ mA}, 500 \text{ MHz}$ $I_F = 100 \text{ mA}, 500 \text{ MHz}$	—	2.0 1.4	2.5 1.8	Ω
Lifetime	$I_F = 10 \text{ mA}, I_R = 6 \text{ mA}, 50\%$	—	180	300	ns
Insertion Loss	$I_F = 50 \text{ mA}, <2.7 \text{ GHz}$ $I_F = 50 \text{ mA}, <6.0 \text{ GHz}$	—	0.25 0.50	0.4 —	dB
Isolation	$V_R = 50 \text{ V}, <2.7 \text{ GHz}$ $V_R = 50 \text{ V}, <6.0 \text{ GHz}$	13 —	16 10	—	dB
Input Return Loss	$V_R = 50 \text{ V}, <6.0 \text{ GHz}$	16	20	—	dB

* Restrictions on Hazardous Substances, European Union Directive 2011/65/EU.

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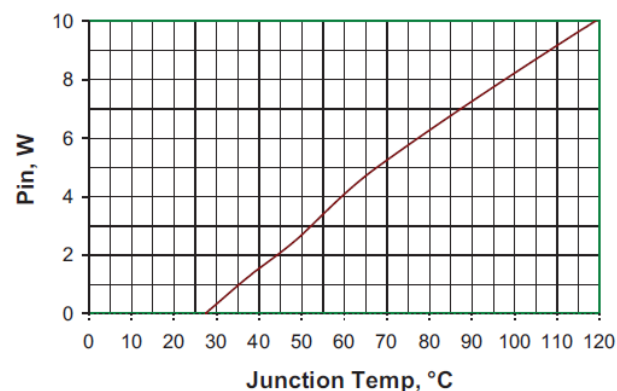
Absolute Maximum Ratings^{1,2}

Parameter	Absolute Maximum
Breakdown Voltage	200 V
Forward Current	200 mA
Thermal Resistance	50°C/W
Junction Temperature	+175°C
Storage Temperature	-55°C to +150°C
Solder Temperature	+260°C per JEDEC STD-J-20C

1. Exceeding any one or combination of these limits may cause permanent damage to this device.
2. MACOM does not recommend sustained operation near these survivability limits.

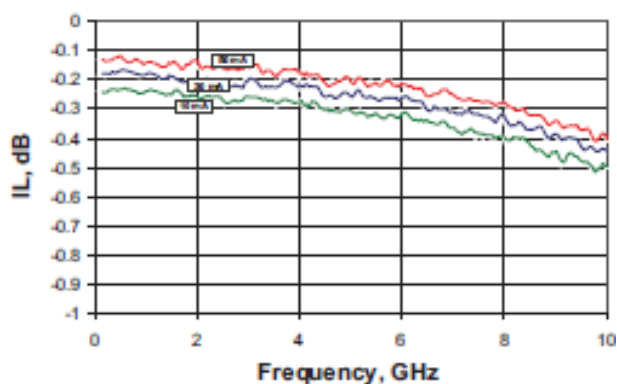
Junction Temperature vs. Input Power

1.3 GHz, $T_A = 25^\circ\text{C}$, PCB Mounted on Heat Sink

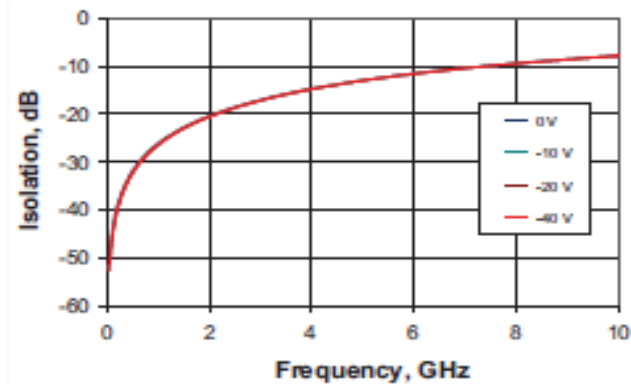


Typical RF Performance Curves @ +25°C

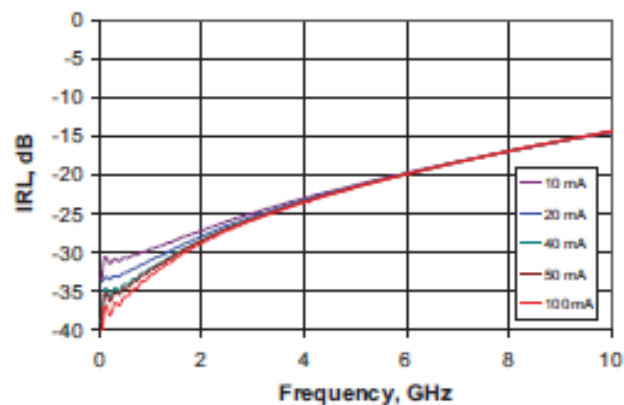
Insertion Loss



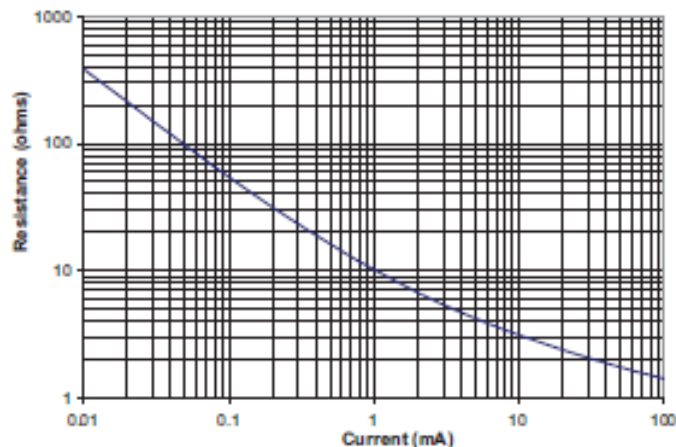
Isolation



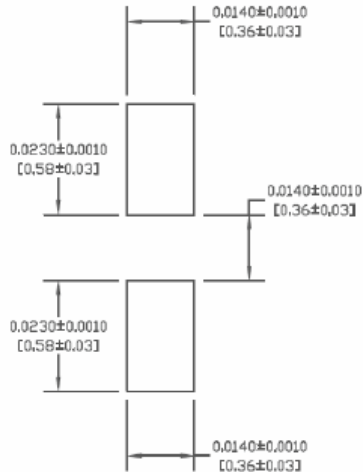
Input Return Loss



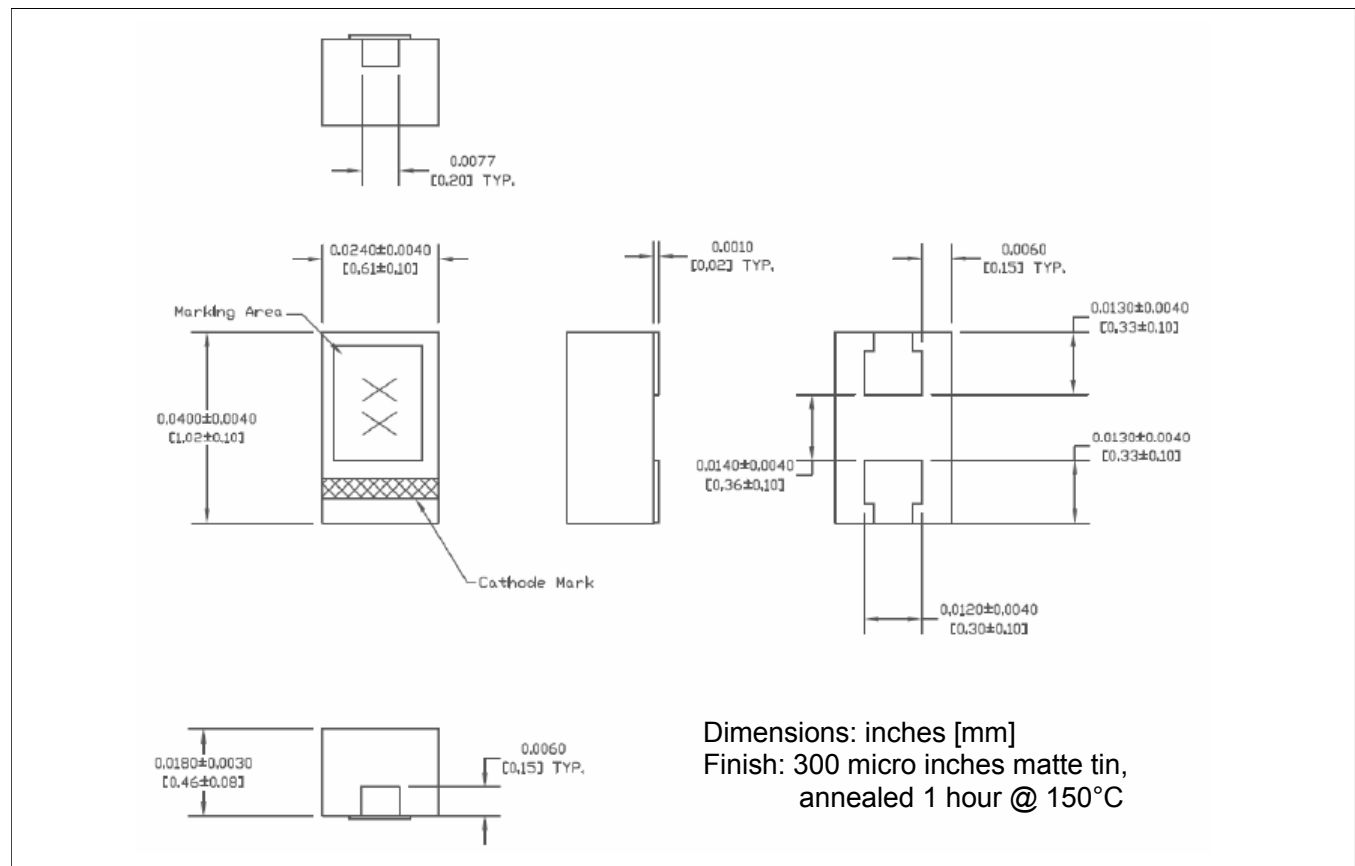
Series Resistance vs. Current, 500 MHz



PCB Layout



Outline



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