

## Silicon PIN Diode Switch Element

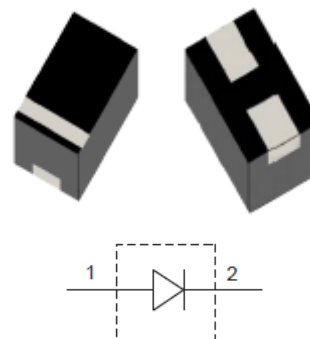
Rev. V1

## Features

- Small Size (50 x 30 mils)
- Broadband Performance up to 6 GHz
- Supports up to 4 W Power when Cold Switched
- Low Insertion Loss: 0.5 dB
- RoHS\* Compliant

## Description

The MSWSE-005-15 is a PIN diode SPST switch element designed for medium incident power applications up to 4 W CW. It has low insertion loss and medium isolation below 6 GHz.

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 MHz	—	0.035	0.05	pF
Total Capacitance	$V_R = 50\ \text{V}$ , 1 MHz	—	0.11	0.15	pF
Series Resistance	$I_F = 30\ \text{mA}$ , 500 MHz $I_F = 100\ \text{mA}$ , 500 MHz	—	2.0 1.4	2.5 1.8	$\Omega$
Lifetime	$I_F = 10\ \text{mA}$ , $I_R = 6\ \text{mA}$ , 50%	—	180	300	ns
Insertion Loss	$I_F = 50\ \text{mA}$ , <2.7 GHz $I_F = 50\ \text{mA}$ , <6.0 GHz	—	0.25 0.50	0.4 —	dB
Isolation	$V_R = 50\ \text{V}$ , <2.7 GHz $V_R = 50\ \text{V}$ , <6.0 GHz	13 —	16 10	—	dB
I-Layer	—	—	15	—	$\mu\text{m}$

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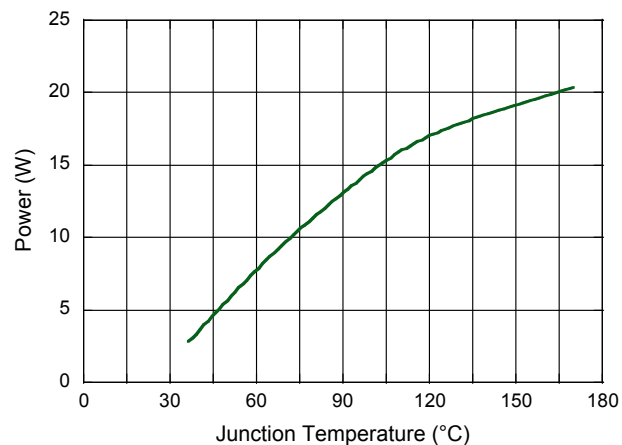
Rev. V1

Absolute Maximum Ratings<sup>1,2</sup>

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

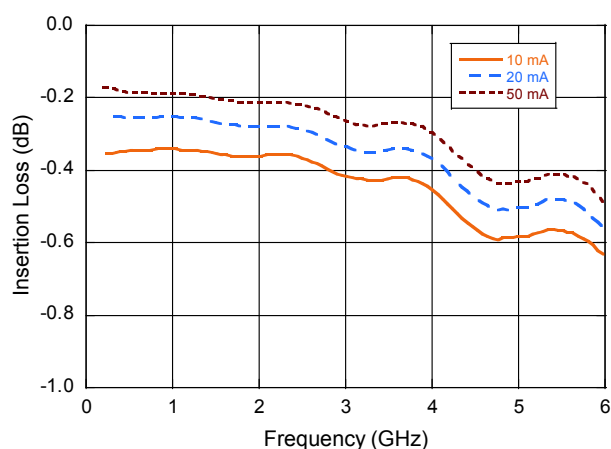
1. Exceeding any one or combination of these limits may cause permanent damage to this device.
2. MACOM does not recommend sustained operation near these survivability limits.

## Junction Temperature vs. Input Power

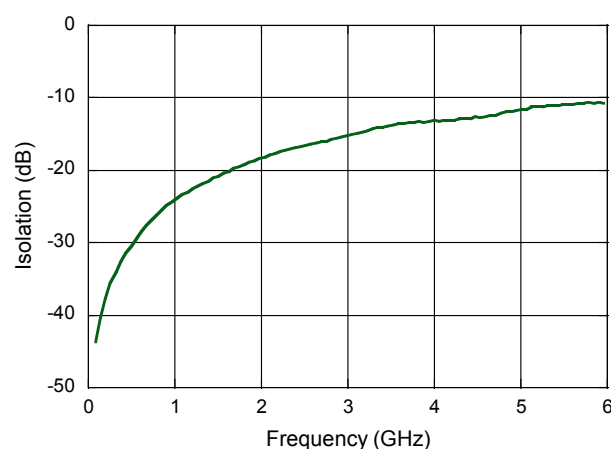
1.3 GHz,  $T_A = 25^\circ\text{C}$ , PCB Mounted on Heat Sink

## Typical RF Performance Curves @ +25°C

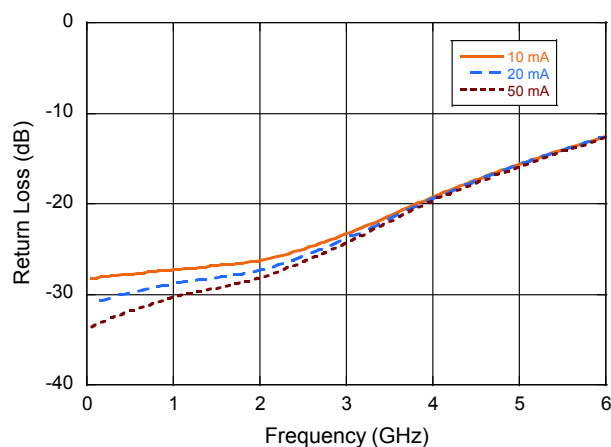
## Insertion Loss



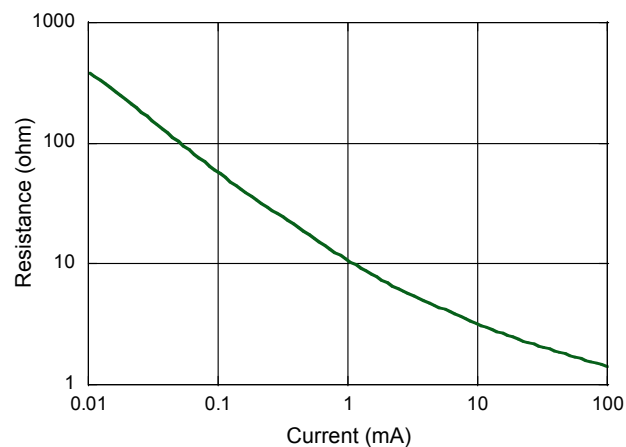
## Isolation



## Input Return Loss



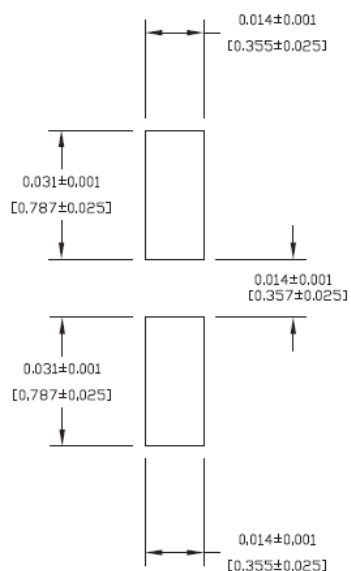
## Series Resistance vs. Current, 500 MHz



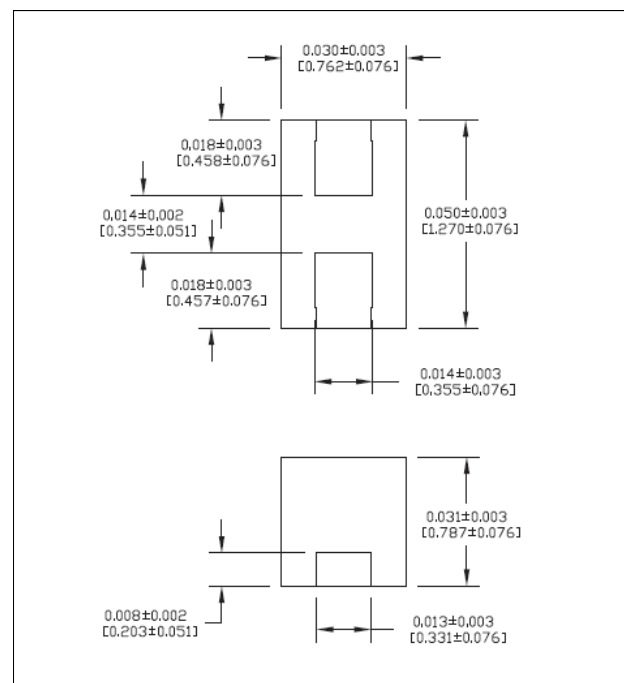
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## PCB Layout



## Outline



Dimensions: inches [mm]  
 Finish: 300 micro inches matte tin,  
 annealed 1 hour @ 150°C

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