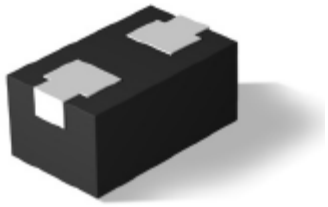
# Silicon PIN Diode Switch Element

**MSWSE-010-15S**
**Rev. V2**

## Features

- Small Size (40 x 24 mils)
- Broadband Performance up to 3 GHz
- Supports up to 10 W Power
- Low Insertion Loss, 0.15 dB
- Cost effective choice for switch applications
- RoHS* Compliant



0402 (Molded Plastic DFN Package)

## Applications

- ISM

## Description

The MSWSE-010-15S is a PIN diode switch element designed for medium incident power applications, up to 10 W CW. It has low insertion loss and medium isolation below 3 GHz.

## Electrical Specifications: $T_A$ = +25°C

| Parameter | Test Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Breakdown Voltage | $I_R$ = 10 µA | 200 | — | — | V |
| Forward Voltage | $I_F$ = 50 mA | — | 870 | 950 | mV |
| Junction Capacitance | $V_R$ = -50 V, 1 MHz | — | 0.13 | — | pF |
| Total Capacitance | $V_R$ = -50 V, 1 MHz | — | 0.17 | 0.22 | pF |
| Series Resistance | $I_F$ = 30 mA, 500 MHz<br>$I_F$ = 100 mA, 500 MHz | — | 0.8<br>0.6 | 1.0<br>0.8 | Ω |
| Lifetime | $I_F$ = 10 mA, $I_R$ = 6 mA , 50% | — | 650 | 900 | ns |
| I-Region | I-Layer | — | 10 | — | mm |
| Insertion Loss | $I_F$ = 50 mA, 1 GHz<br>$I_F$ = 50 mA, 2 GHz | — | 0.05<br>0.10 | —<br>0.25 | dB |
| Input Return Loss | $I_F$ = 50 mA, 1 GHz<br>$I_F$ = 50 mA, 2 GHz | 25<br>— | 30<br>25 | — | dB |
| Isolation | $V_R$ = 50 V, 1 GHz<br>$V_R$ = 50 V, 2 GHz | 15<br>— | 20<br>15 | — | dB |

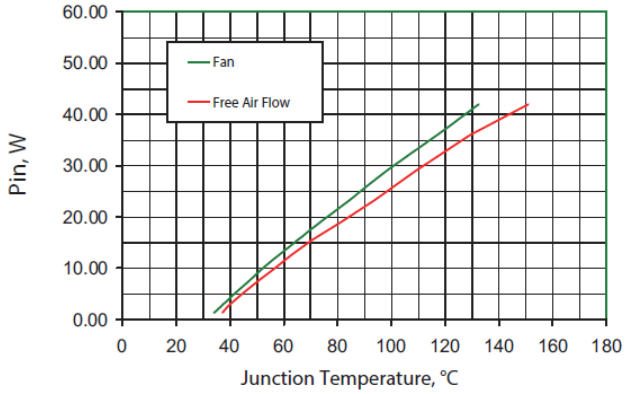
* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

## Absolute Maximum Ratings[1,2]

| Parameter | Absolute Maximum |
|---|---|
| Breakdown Voltage | 200 V |
| Forward Current | 200 mA |
| Thermal Resistance | 35 W CW |
| Junction Temperature | +175°C |
| Storage Temperature | -55°C to +150°C |
| Solder Temperature | +260°C per JEDEC STD-J-20C |

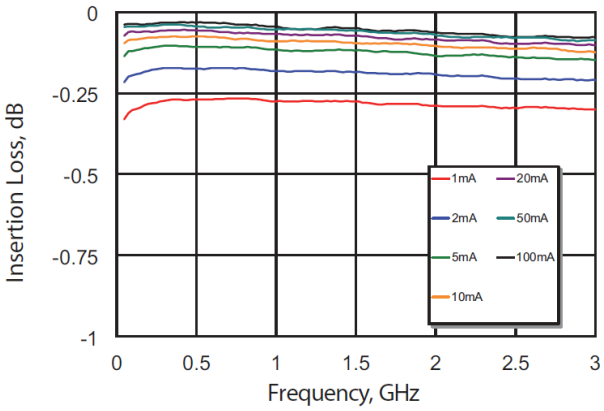
1. Exceeding any one or combination of these limits may cause permanent damage to this device.
2. MACOM does not recommend sustained operation near these survivability limits.

## Junction Temperature vs. Input Power Mounted on Heatsink $T_A$ = 25°C, 1.3 GHz

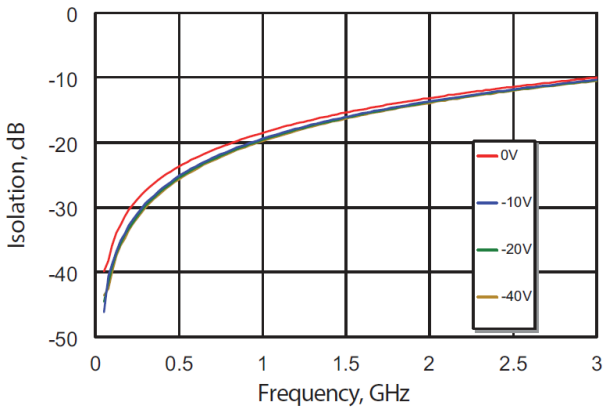



## Typical RF Performance Curves @ +25°C

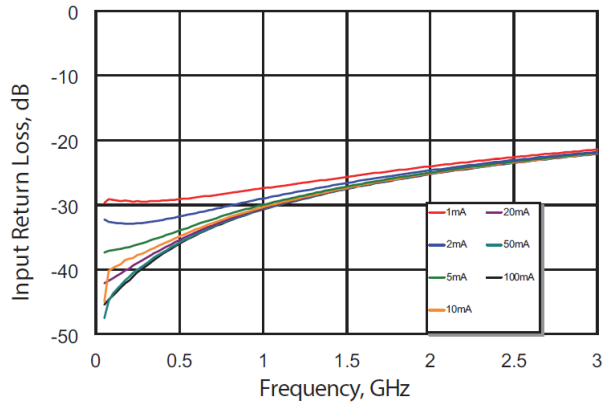
***Insertion Loss***



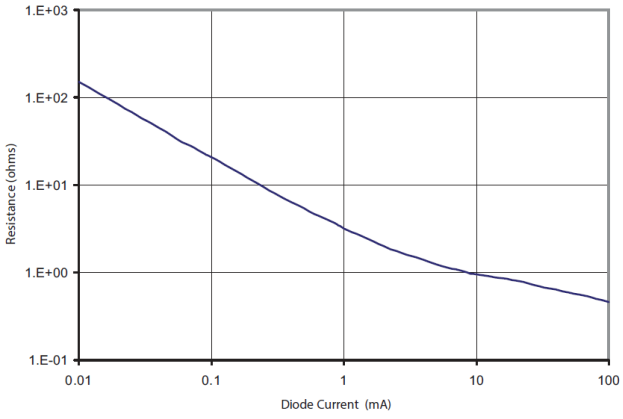

***Isolation***



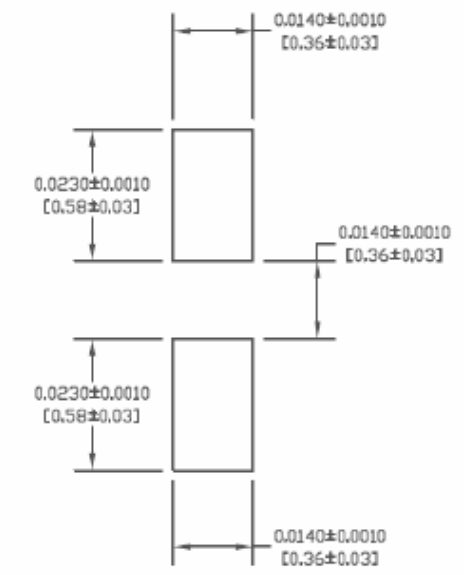

***Input Return Loss***



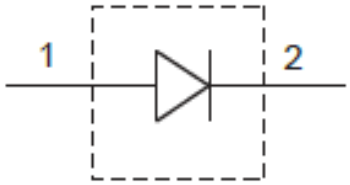

***Series Resistance vs. Current***



## PCB Layout




## Schematic




## Outline (0402)