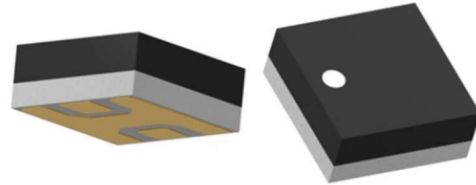


## PIN Diode Shunt Switch Element

Rev. V1

### Features

- Supports up to 35 W Power
- Low Insertion Loss:
  - <0.10 dB @ 1 GHz
  - <0.35 dB @ 6 GHz
  - <0.70 dB @ 10 GHz (with input tuning)
- High Isolation:
  - >40 dB @ 2 GHz
- RoHS\* Compliant



(CM35)  
non-hermetic

### Description

A broadband, high linearity, medium power shunt switch element in a 4.06 x 4.06 mm thermally highly conductive Alumina Nitride surface mount package. This part is designed for reliable power switch applications up to 35 watts and with a frequency range from 1 MHz to 10 GHz (with input tuning).

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

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Breakdown Voltage ( $V_B$ )	$I_R = 10 \mu\text{A}$	V	200	—	—
Forward Voltage ( $V_F$ )	$I_F = 50 \text{ mA}$	mV	—	900	950
Insertion Loss ( $I_L$ )	$V_F = -40 \text{ V}, <2 \text{ GHz}$ $V_F = -40 \text{ V}, <6 \text{ GHz}$ $V_F = -40 \text{ V}, <10 \text{ GHz}$	dB	—	0.15 0.35 0.70	0.30 — —
Isolation ( $I_{SO}$ )	$I_F = 100 \text{ mA}, <1 \text{ GHz}$ $I_F = 10 \text{ mA}, <6 \text{ GHz}$	dB	35 —	42 32	—
Input / Output Return Loss ( $R_L$ )	$V_F = -40 \text{ V}, <2 \text{ GHz}$ $V_F = -40 \text{ V}, <6 \text{ GHz}$ $V_F = -40 \text{ V}, <10 \text{ GHz}$	dB	25 — —	30 30 20	—
Minority Carrier Lifetime ( $T_L$ )	$I_F = 10 \text{ mA}, I_R = 6 \text{ mA}, @ 50\%$	ns	—	3000	—

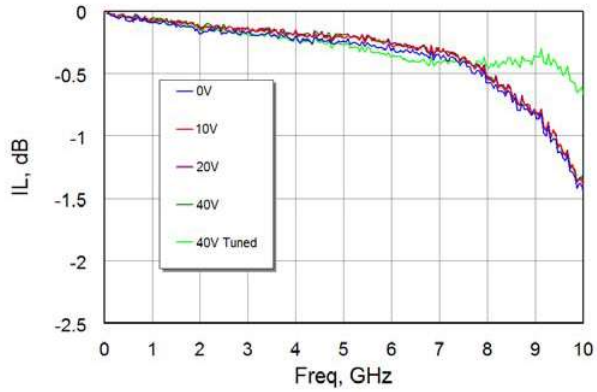
### Absolute Maximum Ratings

Parameter	Absolute Maximum
Reverse Voltage	200 V
Forward Current	200 mA
Thermal Resistance	10°C/W
Junction Temperature	-40°C to +175°C
Storage Temperature	-55°C to +150°C
Assembly Temperature	+260°C, Per JEDEC STD-J-20C

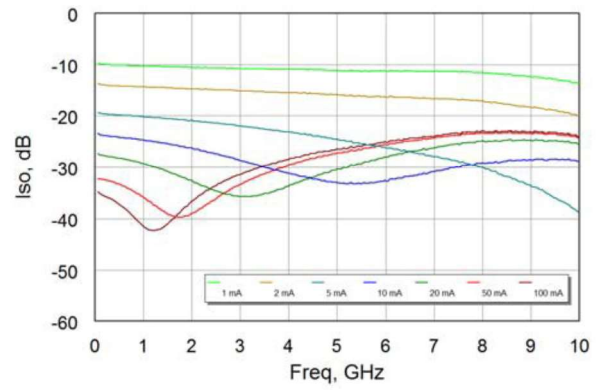
1 \* Restrictions on Hazardous Substances, European Union Directive 2011/65/EU.

### Typical Performance Curves

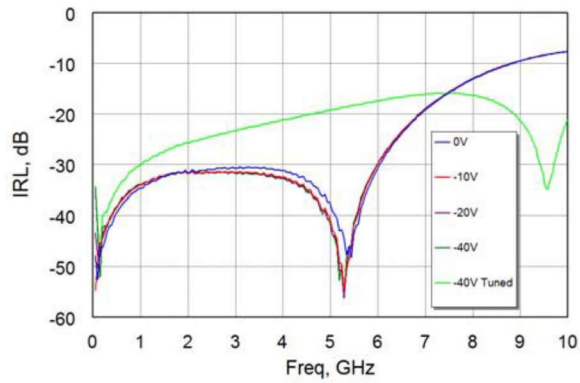
**Insertion Loss**



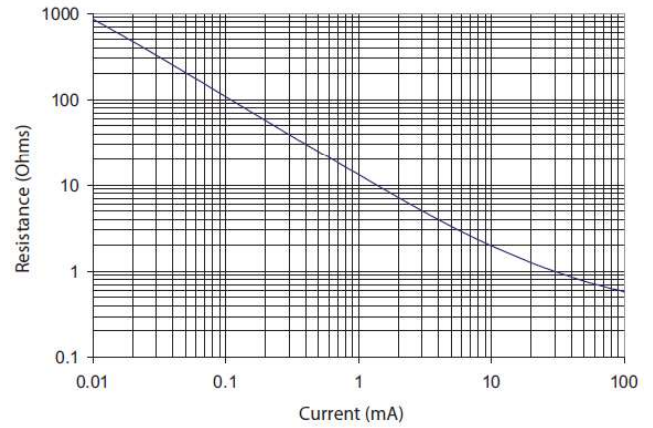
**Isolation**



**Return Loss**

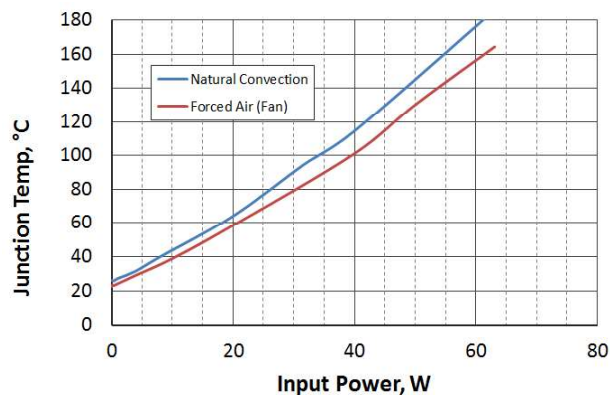


**Resistance vs. Bias Current @ 500 MHz**

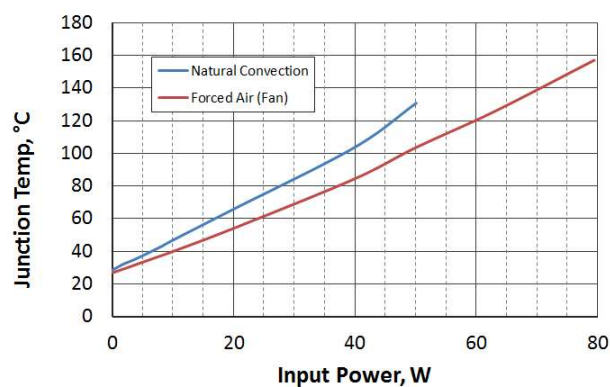


### Typical Performance Curves

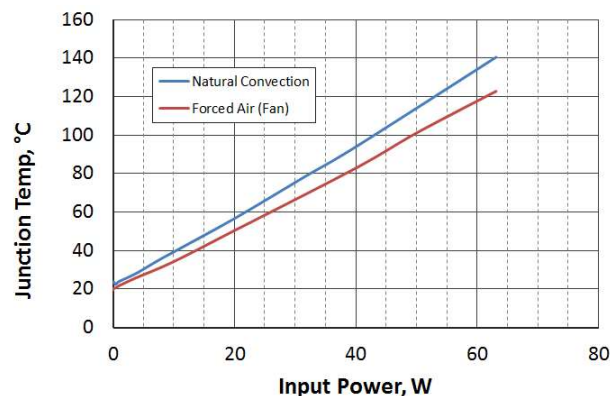
**Junction Temperature vs. Input Power**  
**PCB<sup>1</sup> Mounted on Heat Sink**  
 $T_A = 25^\circ\text{C}$ , 1.3 GHz, 50 mA Bias



**Junction Temperature vs. Input Power**  
**PCB<sup>1</sup> Mounted on Heat Sink**  
 $T_A = 25^\circ\text{C}$ , 1.3 GHz, 100 mA Bias

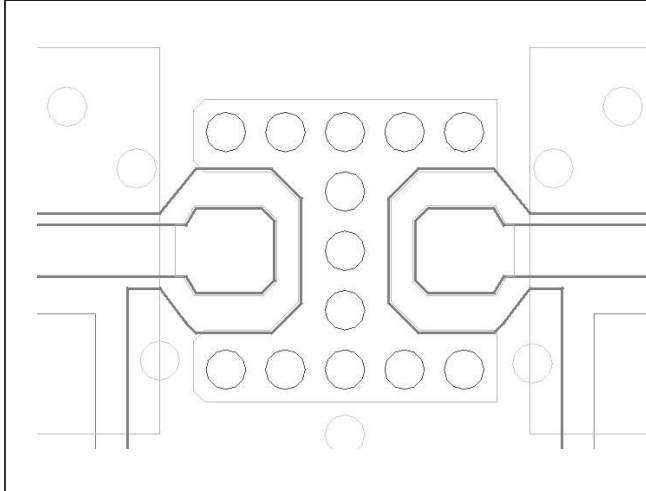


**Junction Temperature vs. Input Power**  
**PCB<sup>1</sup> Mounted on Heat Sink**  
 $T_A = 25^\circ\text{C}$ , 1.3 GHz, 200 mA Bias



1. 20 mils Rogers RO4350B with 1 oz. copper clad and copper plated thru 10 mil diameter vias under package thermal ground.

### Printed Circuit Board Layout

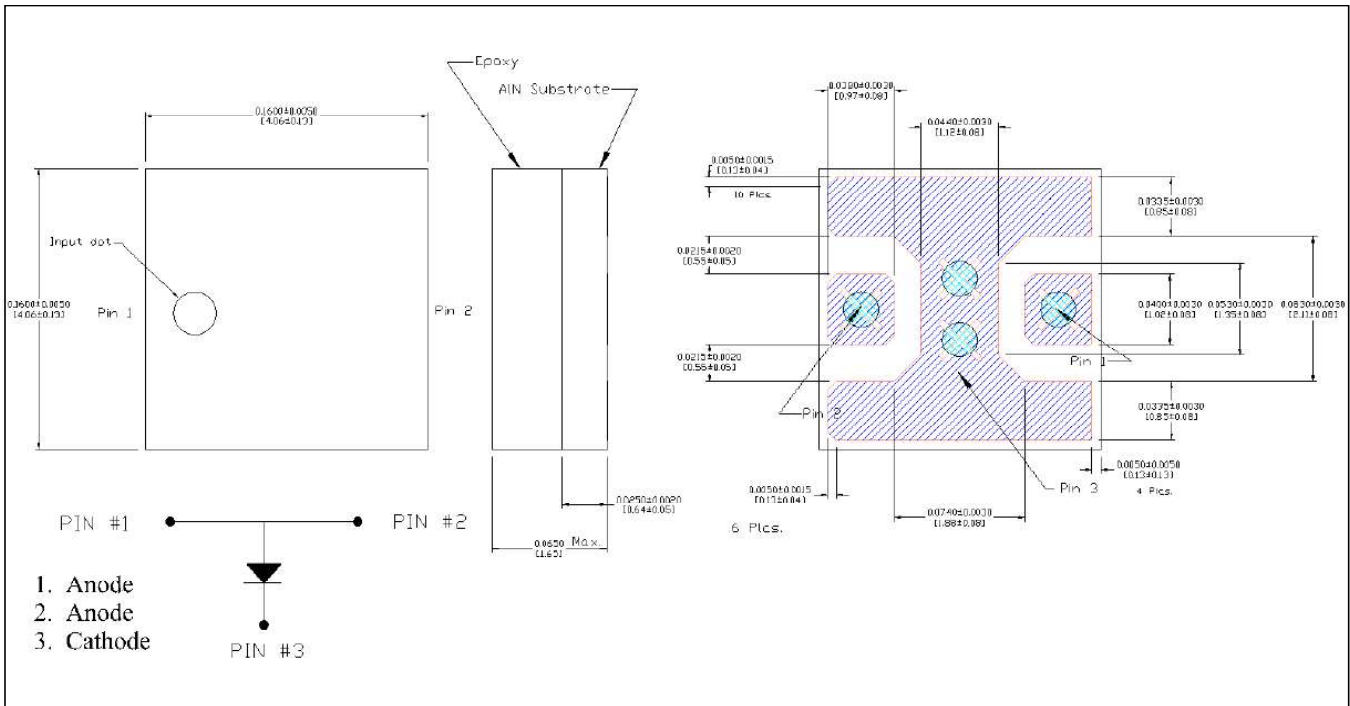


For RF ground and thermal vias use copper filled and plated over 10 mil diameter vias on 17 mil centers.

Solder mask should provide 60  $\mu\text{m}$  clearance between copper pad and solder mask. Rounded package pads should have matching rounded solder mask openings. On the outer edges of package, use 100  $\mu\text{m}$  clearance.

For the solder paste stencil design, use circles or squares such that only get 60 to 80% solder paste coverage.

### Outline (CM35)



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