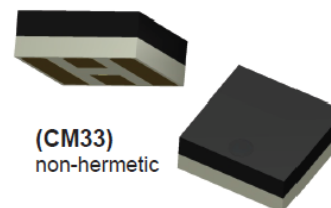


### Features

- Low Insertion Loss:
  - 0.10 dB @ 1.0 GHz
  - 0.15 dB @ 2.6 GHz
- Medium Isolation: 16 dB @ 1 GHz
- RoHS\* Compliant



### Description

The MEST2G-100-20-CM33 is a Thermal To Ground Series diode Switch Element in an Aluminum Nitride package. This part is designed for reliable high power switch applications up to 100 watts and with a frequency range to 2.6 GHz.

### Electrical Specifications: $T_C = +25^\circ\text{C}$ (unless otherwise specified)

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Breakdown Voltage ( $V_{BR}$ )	$I_R = 10 \mu\text{A}$	V	500	—	—
Leakage Current ( $I_R$ )	$V_R = 100 \text{ V}$	nA	—	—	100
Forward Voltage ( $V_F$ )	$I_F = 100 \text{ mA}$	V	—	900	950
Lifetime (t)	$I_F = 10 \text{ mA}$ , $I_R = 6 \text{ mA}$ , 50%	ns	—	2000	—
Input / Output Return Loss (I/OR <sub>L</sub> )	$I_F = 100 \text{ mA}$ , 1.0 GHz $I_F = 100 \text{ mA}$ , 2.6 GHz	dB	25 21	38 34	—
Insertion Loss ( $I_L$ )	$I_F = 100 \text{ mA}$ , 1.0 GHz $I_F = 100 \text{ mA}$ , 2.6 GHz	dB	—	0.10 0.15	0.20 0.25
Isolation ( $I_{SO}$ )	$V_R = 10 \text{ V}$ , 0.5 GHz $V_R = 10 \text{ V}$ , <1.0 GHz	dB	14 —	16.5 10.0	—

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

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

Parameter	Absolute Maximum
Breakdown Voltage ( $V_R$ )	500 V
Forward Current ( $I_{FDC}$ )	500 mA
Thermal Resistance ( $\theta_{JC}$ )	18°C/W
Junction Temperature ( $T_J$ )	-40°C to 175°C
Storage Temperature ( $T_{STG}$ )	-55°C to +150°C
Mounting Temperature ( $T_{MTG}$ )	+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.

### Handling Procedures

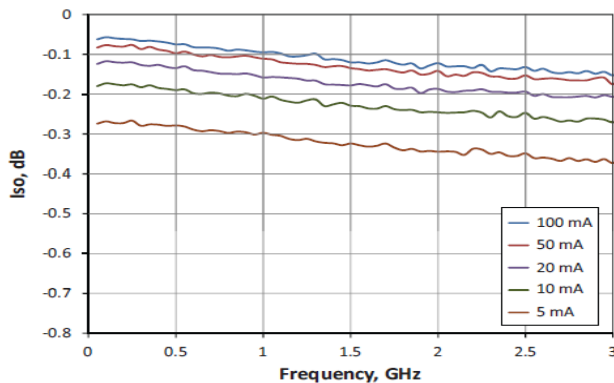
Please observe the following precautions to avoid damage:

### Static Sensitivity

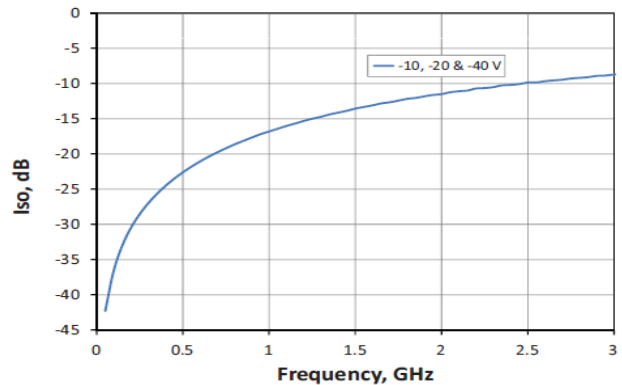
These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these Class 0 (HBM) devices.

### Typical Performance Curves: $T_A = 25^\circ\text{C}$ , $Z_O = 50 \Omega$ , -10 dBm Small Signal

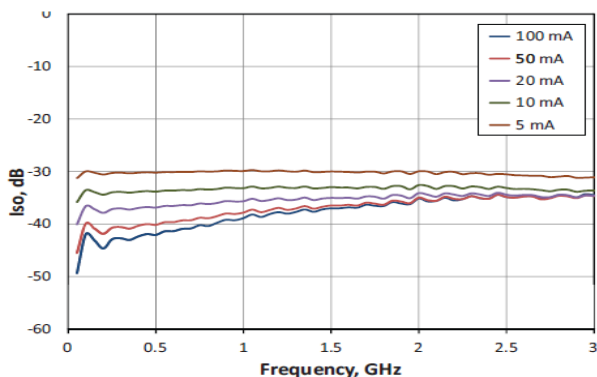
**Insertion Loss**



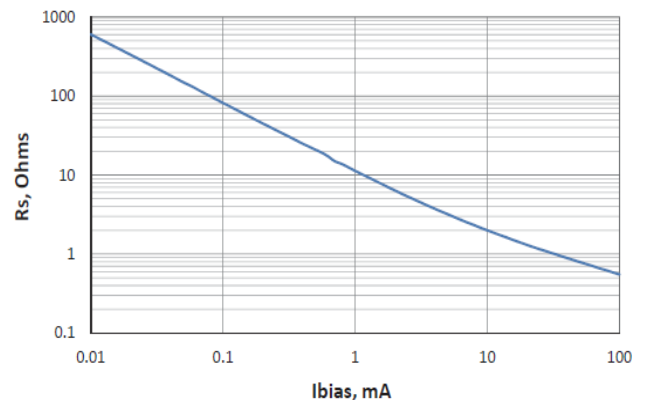
**Isolation**



**Input / Output Return Loss**

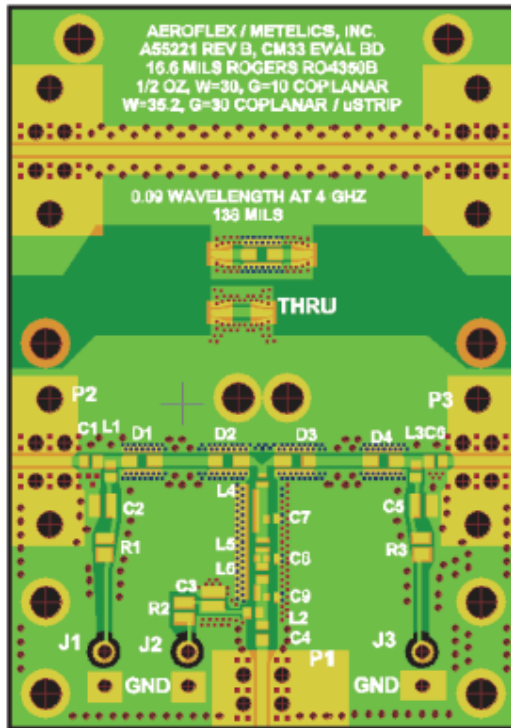


**Series Resistance vs. Current, 500 MHz**



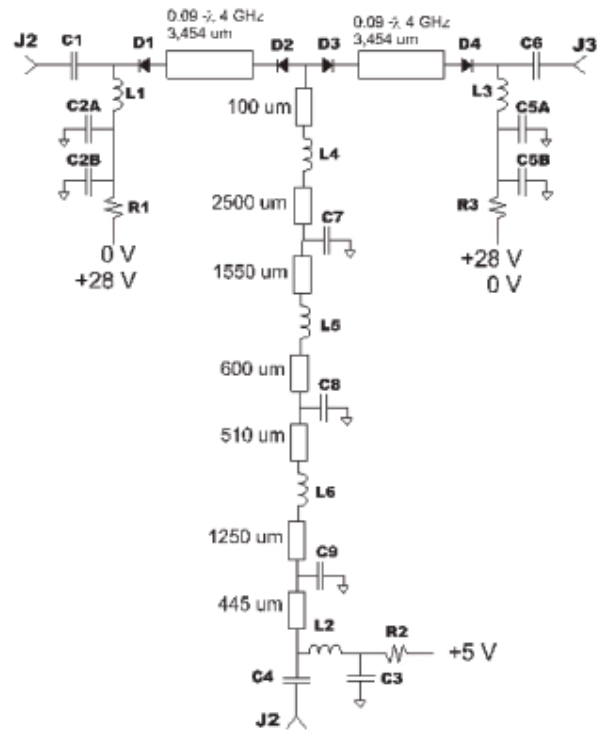
## Pin Diode Switch Element

Rev. V1



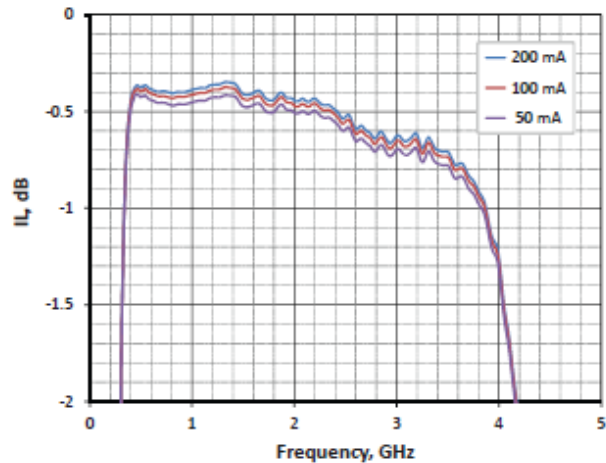
Scale: 2X

Actual size: 1.5 [38.1] x 2.1 [53.3]

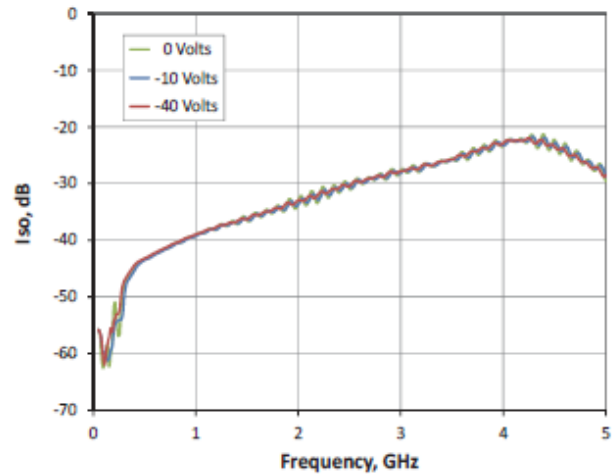


Item	Qty	Value	Description	MFG	PN
C1, C2A, C3A, C4, C5A, C6	6	10 pF	Chip Capacitor, 0402 PKG, 200V 5%	ATC	ATC600L100JT200T
C2B, C3B, C5B	3	100 pF	Chip Capacitor, 0603 PKG, 250V 5%	ATC	ATC600S101JT250XT
C7	1	0.8 pF	Chip Capacitor, 0402 PKG, 200V +/-0.05pF	ATC	ATC600L0R8AT200T
C8	1	0.7 pF	Chip Capacitor, 0402 PKG, 200V +/-0.05pF	ATC	ATC600L0R7AT200T
C9	3	0.2 pF	Chip Capacitor, 0402 PKG, 200V +/-0.05pF	ATC	ATC600L0R2AT200T
L1, L2, L3	3	27 nH	Chip Inductor, 0402 PKG, 10%	ATC	ATC0402WL27KT
L4, L5	2	1.7 nH	Chip Inductor, 0402 PKG, 5%	Coilcraft	0302CS-1N7XJLU
L6	1	1 nH	Chip Inductor, 0402 PKG, 5%	Coilcraft	0402CS-1N0XJLU
R1, R3	2	0 ohm	Chip resistor, 1 Amp 0603 PKG	KOA Speer or equivalent	RK73Z1JTTDD
R2	1	33 ohm	Chip resistor, 1/2 W 1210 PKG	KOA Speer or equivalent	RK73B2ETTDD330J
D1, D2, D3, D4	4	na	PIN Diode Series Switch	Metelics	MEST2G-100-20-CM33
J1, J2, J3	3	na	50 ohm RF SMA Connector edge Jack	Johnson Emerson	142-0761-811
PCB	1	na	Demo Board, 16.6 mils Rogers RO4350B	Metelics	A55211 REV B
PCB	1	na	Demo Board, 16.6 mils Rogers RO4350B	Metelics	A55221 REV B

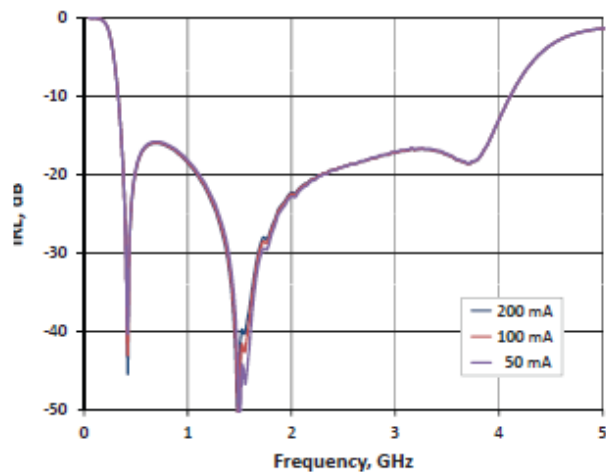
### Insertion Loss



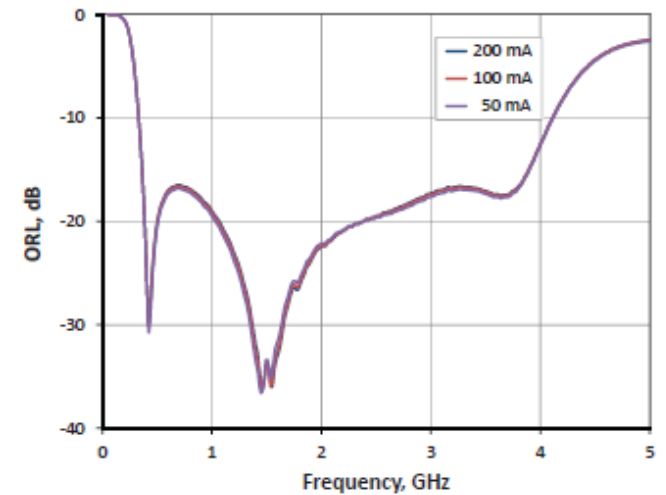
### Isolation



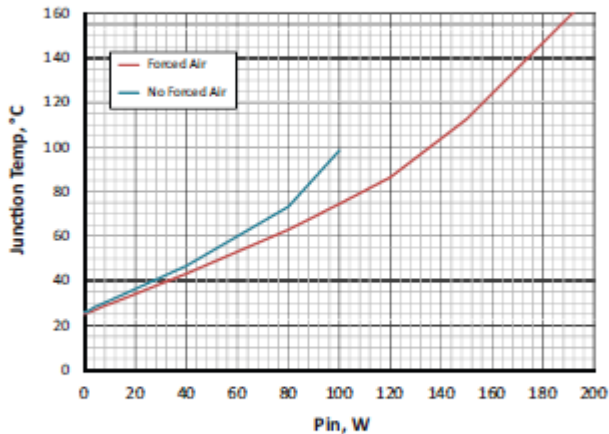
### Input Return Loss



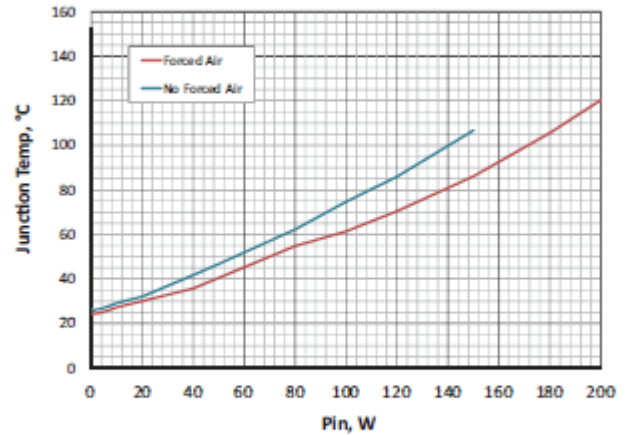
### Output Return Loss



Junction Temperature vs Input Power PCB<sup>[1]</sup> Mounted on Heat Sink, 25 °C Ambient, 1.3 GHz and 50 mA Bias



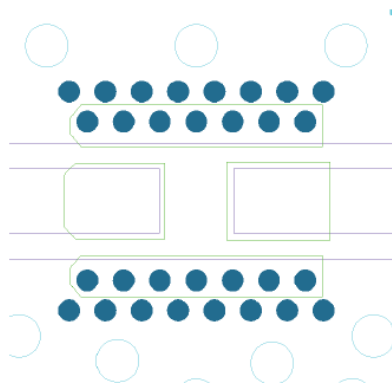
Junction Temperature vs Input Power PCB<sup>[1]</sup> Mounted on Heat Sink, 25 °C Ambient, 1.3 GHz and 100 mA Bias



Notes:

1. 16.6 mils Rogers RO4350B with ½ oz. copper clad and copper filled and plated over 10 mil diameter vias under package thermal ground.

### PCB Layout

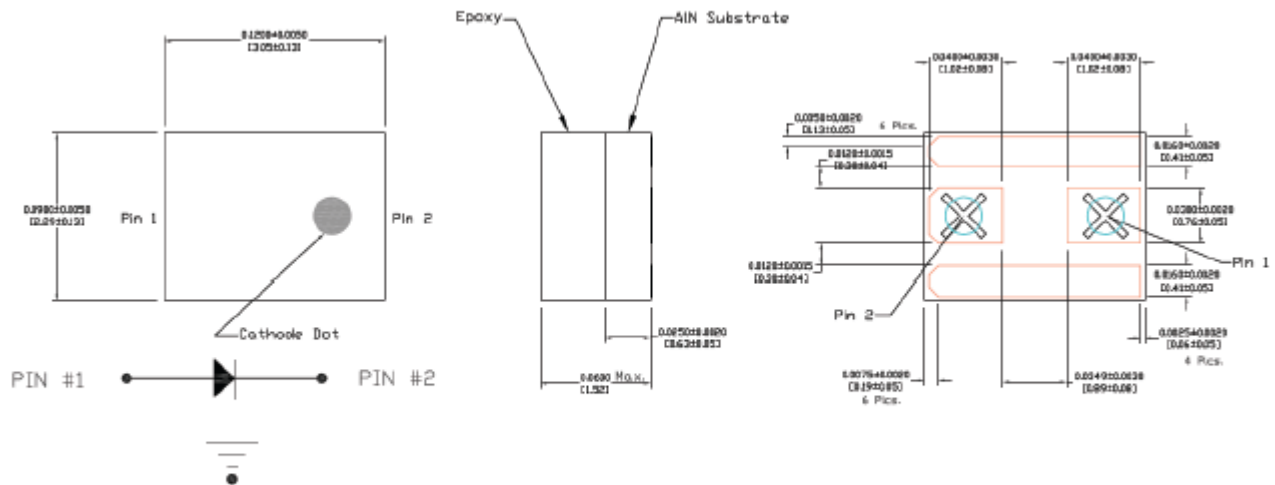


Copper filled and plated over 10 mil diameter vias on 17 mil centers.

Solder mask (in green) should provide 60 um clearance between copper pad and solder mask. Rounded pkg pads should have matching rounded solder mask openings. On the outer edges of package, use 100 um clearance.

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

### Outline (CM33)



Pin function for Silicon PIN diode.  
 1. Anode  
 2. Cathode

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