

Pin Diode Switch Element

Rev. V1

Features

- Power Handling 25 W @ 4 GHz or less @ 100 mA
- Low Insertion Loss: <0.4 dB @ 1 - 4 GHz
- Medium Isolation: >10 dB @ 2.0 GHz
- RoHS* Compliant

Description

The MEST2G-025-10-CM32 is a thermal to ground series diode switch element (EST2G) in an Aluminum Nitride package. This part is designed to handle up to 25 watts. Usable up to 4.0 GHz.



(CM32)
non-hermetic

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	200	—	—
Leakage Current (I_R)	$V_R = 100 \text{ V}$	nA	—	40	100
Forward Voltage (V_F)	$I_F = 100 \text{ mA}$	V	—	980	—
Series Resistance (R_S)	$I_F = 100 \text{ mA}$, 100 MHz	Ω	—	1.25	—
Total Capacitance (C_T)	$V_R = -50 \text{ V}$, 1 MHz	pF	—	0.22	—
Lifetime (t)	$I_F = 10 \text{ mA}$, $I_R = 6 \text{ mA}$, 50%	ns	—	2000	—
I-Region (w)	I-Layer	μm	—	140	—
Input / Output Return Loss (I/OR _L)	$I_F = 100 \text{ mA}$, 2 GHz $I_F = 100 \text{ mA}$, 4 GHz	dB	27 20	32 26	—
Insertion Loss (I_L)	$I_F = 100 \text{ mA}$, 2 GHz $I_F = 100 \text{ mA}$, 4 GHz	dB	—	0.06 0.07	0.15 0.15
Isolation (I_{SO})	$I_F = 400 \text{ mA}$, 2 GHz $I_F = 400 \text{ mA}$, 4 GHz	dB	8 —	10 6	—

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

Pin Diode Switch Element

Rev. V1

Absolute Maximum Ratings^{1,2}

Parameter	Absolute Maximum
Breakdown Voltage (V_R)	200 V
Forward Current (I_{FDC})	200 mA
Thermal Resistance (θ_{JC})	25°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

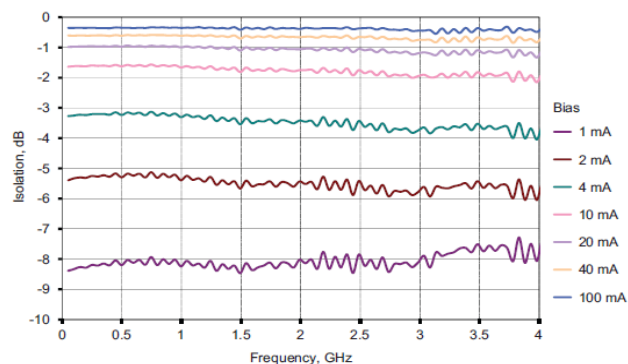
Please observe the following precautions to avoid damage:

Static Sensitivity

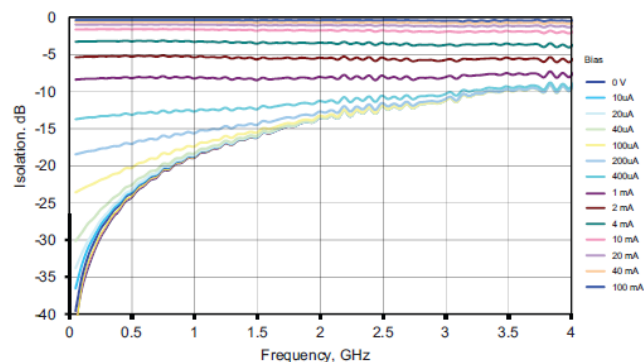
These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these Class 0 (HBM) devices.

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

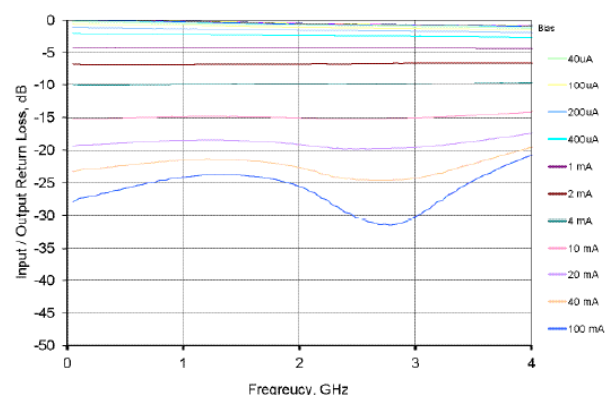
Insertion Loss



Isolation



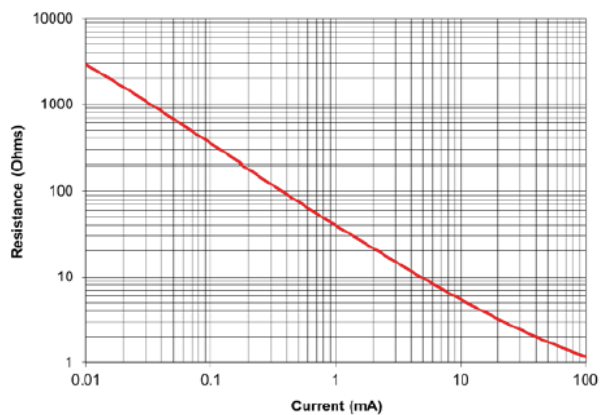
Input / Output Return Loss



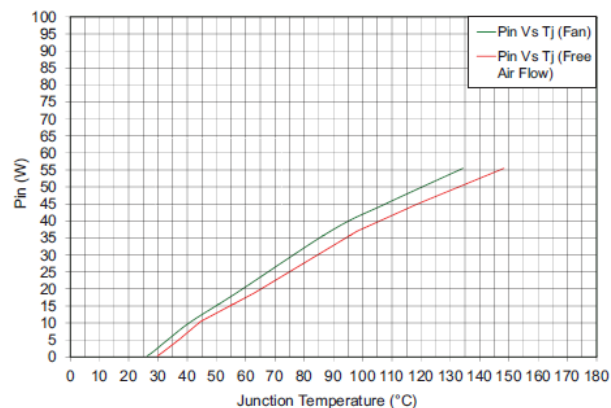
Pin Diode Switch Element

Rev. V1

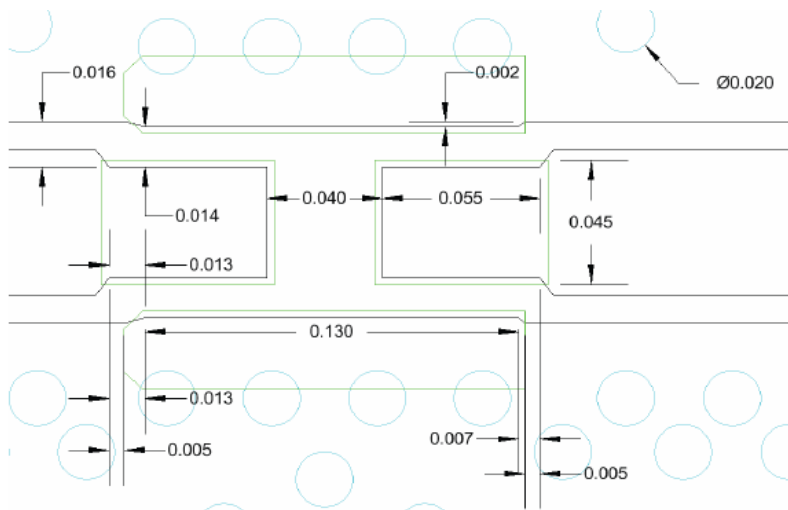
Resistance vs. Bias Current, 100 MHz



**Junction Temperature vs. Input Power
Mounted on Heat Sink @ $T_A = 25^\circ\text{C}$, 1.3 GHz**



PCB Layout



Plated through, filled and plated over vias

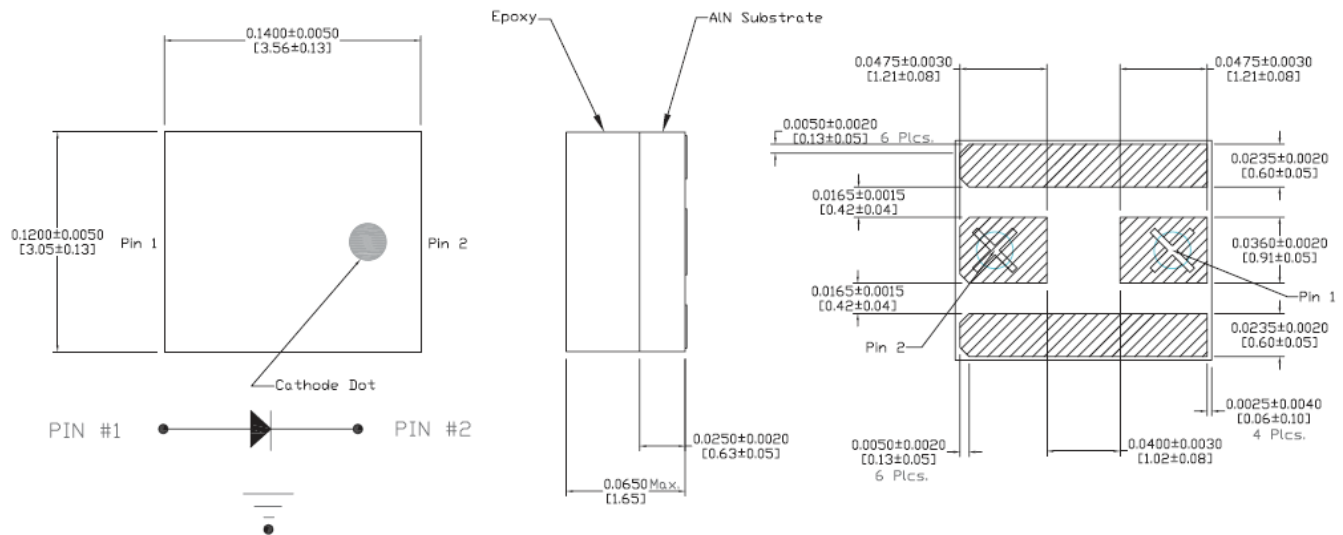
Solder mask should provide 60um clearance between copper pad and solder mask. Rounded pkg pads should have matching rounded solder mask openings.

Use circles or squares for the thermal land stencil design such that only get 60 to 80% solder paste coverage.

Pin Diode Switch Element

Rev. V1

Outline (CM32)



Pin function for Silicon PIN diode.

1. Anode
2. Cathode

Notes:

1. Metallization: 250-350 μ " Cu / 60-100 μ " Ni / 15-45 μ " Au
2. Dimensions in mils [mm]

M/A-COM Technology Solutions Inc. All rights reserved.

Information in this document is provided in connection with M/A-COM Technology Solutions Inc ("MACOM") products. These materials are provided by MACOM as a service to its customers and may be used for informational purposes only. Except as provided in MACOM's Terms and Conditions of Sale for such products or in any separate agreement related to this document, MACOM assumes no liability whatsoever. MACOM assumes no responsibility for errors or omissions in these materials. MACOM may make changes to specifications and product descriptions at any time, without notice. MACOM makes no commitment to update the information and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to its specifications and product descriptions. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document.

THESE MATERIALS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, CONSEQUENTIAL OR INCIDENTAL DAMAGES, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. MACOM FURTHER DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. MACOM SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS, WHICH MAY RESULT FROM THE USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.