MEST2G-150-10-CM30

Pin Diode Switch Element

Features
- High Power Handling 150 W @ 1.0 GHz or less
- Low Insertion Loss:
  - 0.05 dB @ 0.5 GHz
  - 0.06 dB @ 1.0 GHz
- Medium Isolation: 10 dB @ 0.5 GHz
- RoHS* Compliant

Description
The MEST2G-150-10-CM30 is a thermal to ground series diode switch element (EST2G) in an Aluminum Nitride package. This part is designed for a reliable high power switch application up to 150 watts. Usable up to 1.0 GHz.

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Units</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakdown Voltage ($V_{BR}$)</td>
<td>$I_R = 10 , \mu A$</td>
<td>V</td>
<td>500</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Leakage Current ($I_R$)</td>
<td>$V_R = 100 , V$</td>
<td>nA</td>
<td>—</td>
<td>80</td>
<td>250</td>
</tr>
<tr>
<td>Forward Voltage ($V_F$)</td>
<td>$I_F = 100 , mA$</td>
<td>V</td>
<td>—</td>
<td>900</td>
<td>—</td>
</tr>
<tr>
<td>Series Resistance ($R_S$)</td>
<td>$I_F = 100 , mA, 100 , MHz, 2 , Parallel , Diodes$</td>
<td>$\Omega$</td>
<td>—</td>
<td>0.22</td>
<td>—</td>
</tr>
<tr>
<td>Total Capacitance ($C_T$)</td>
<td>$V_R = 50 , V, 1 , MHz, 2 , Parallel , Diodes$</td>
<td>pF</td>
<td>—</td>
<td>1.0</td>
<td>—</td>
</tr>
<tr>
<td>Lifetime (t)</td>
<td>$I_F = 10 , mA, I_R = 6 , mA, 50%$</td>
<td>ns</td>
<td>—</td>
<td>3200</td>
<td>—</td>
</tr>
<tr>
<td>I-Region (w)</td>
<td>I-Layer</td>
<td>$\mu m$</td>
<td>—</td>
<td>80</td>
<td>—</td>
</tr>
</tbody>
</table>
| Input / Output Return Loss ($I/OR_L$) | $I_F = 100 \, mA, 0.5 \, GHz$  
$I_F = 100 \, mA, 1.0 \, GHz$ | dB    | 27     | 32     | 26     |
| Insertion Loss ($I_L$)           | $I_F = 100 \, mA, 0.5 \, GHz$  
$I_F = 100 \, mA, 1.0 \, GHz$ | dB    | —      | 0.06   | 0.15   |
| Isolation ($I_{ISO}$)            | $V_R = 10 \, V, 0.5 \, GHz$  
$V_R = 10 \, V, <1.0 \, GHz$ | dB    | 8      | 10     | 6      |

**Pin Diode Switch Element**

### Absolute Maximum Ratings\(^1,2\)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakdown Voltage ((V_{R}))</td>
<td>500 V</td>
</tr>
<tr>
<td>Forward Current ((I_{FDC}))</td>
<td>500 mA</td>
</tr>
<tr>
<td>Thermal Resistance ((\theta_{JC}))</td>
<td>25°C/W</td>
</tr>
<tr>
<td>Junction Temperature ((T_J))</td>
<td>-40°C to 175°C</td>
</tr>
<tr>
<td>Storage Temperature ((T_{STG}))</td>
<td>-55°C to +150°C</td>
</tr>
<tr>
<td>Mounting Temperature ((T_{MTG}))</td>
<td>+260°C per JEDEC STD-J-20C</td>
</tr>
</tbody>
</table>

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: \(T_A = 25°C\), \(Z_O = 50 \Omega\), -10 dBm Small Signal

**Insertion Loss**

**Isolation**

**Input Return Loss**

**Output Return Loss**
Pin Diode Switch Element

**Resistance vs. Bias Current, 100 MHz**

**Junction Temperature vs. Input Power**

Mounted on Heat Sink @ TA = 25°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

Outline (CM30)

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

Notes:
2. Dimensions in mils [mm]
Pin Diode Switch Element

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