Radar Pulsed Power Transistor
2W, 1.2-1.4 GHz, 100µs Pulse, 10% Duty

Features
- NPN silicon microwave power transistors
- Common base configuration
- Broadband Class C operation
- High efficiency inter-digitized geometry
- Diffused emitter ballasting resistors
- Gold metallization system
- Internal input and output impedance matching
- Hermetic metal/ceramic package
- RoHS compliant

Absolute Maximum Ratings at 25°C

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Rating</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector-Emitter Voltage</td>
<td>( V_{CES} )</td>
<td>65</td>
<td>V</td>
</tr>
<tr>
<td>Emitter-Base Voltage</td>
<td>( V_{EO} )</td>
<td>3.0</td>
<td>V</td>
</tr>
<tr>
<td>Collector Current (Peak)</td>
<td>( I_C )</td>
<td>0.5</td>
<td>A</td>
</tr>
<tr>
<td>Power Dissipation @ +25°C</td>
<td>( P_{TOT} )</td>
<td>10.3</td>
<td>W</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>( T_{STG} )</td>
<td>-65 to +200</td>
<td>°C</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>( T_J )</td>
<td>200</td>
<td>°C</td>
</tr>
</tbody>
</table>

Electrical Specifications: \( T_C = 25 \pm 5°C \) (Room Ambient)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Frequency</th>
<th>Symbol</th>
<th>Min</th>
<th>Max</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector-Emitter Breakdown Voltage</td>
<td>( I_C = 4mA )</td>
<td></td>
<td>( BV_{CES} )</td>
<td>65</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>Collector-Emitter Leakage Current</td>
<td>( V_{CE} = 40V )</td>
<td></td>
<td>( I_{CES} )</td>
<td>-</td>
<td>0.50</td>
<td>mA</td>
</tr>
<tr>
<td>Thermal Resistance</td>
<td>( V_{CC} = 28V, Pin = 0.40W )</td>
<td>F = 1.2, 1.3, 1.4 GHz</td>
<td>( R_{THJC} )</td>
<td>-</td>
<td>17</td>
<td>°C/W</td>
</tr>
<tr>
<td>Output Power</td>
<td>( V_{CC} = 28V, Pin = 0.40W )</td>
<td>F = 1.2, 1.3, 1.4 GHz</td>
<td>( P_{OUT} )</td>
<td>2.0</td>
<td>-</td>
<td>W</td>
</tr>
<tr>
<td>Power Gain</td>
<td>( V_{CC} = 28V, Pin = 0.40W )</td>
<td>F = 1.2, 1.3, 1.4 GHz</td>
<td>( G_P )</td>
<td>7.0</td>
<td>-</td>
<td>dB</td>
</tr>
<tr>
<td>Collector Efficiency</td>
<td>( V_{CC} = 28V, Pin = 0.40W )</td>
<td>F = 1.2, 1.3, 1.4 GHz</td>
<td>( \eta_C )</td>
<td>40</td>
<td>-</td>
<td>%</td>
</tr>
<tr>
<td>Input Return Loss</td>
<td>( V_{CC} = 28V, Pin = 0.40W )</td>
<td>F = 1.2, 1.3, 1.4 GHz</td>
<td>( RL )</td>
<td>-</td>
<td>-6</td>
<td>dB</td>
</tr>
<tr>
<td>Load Mismatch Tolerance</td>
<td>( V_{CC} = 28V, Pin = 0.40W )</td>
<td>F = 1.2, 1.3, 1.4 GHz</td>
<td>( VSWR-T )</td>
<td>-</td>
<td>3:1</td>
<td>-</td>
</tr>
<tr>
<td>Load Mismatch Stability</td>
<td>( V_{CC} = 28V, Pin = 0.40W )</td>
<td>F = 1.2, 1.3, 1.4 GHz</td>
<td>( VSWR-S )</td>
<td>-</td>
<td>1.5:1</td>
<td>-</td>
</tr>
</tbody>
</table>
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Typical RF Performance

<table>
<thead>
<tr>
<th>Freq. (GHz)</th>
<th>Pin (W)</th>
<th>Pin (W)</th>
<th>Gain (dB)</th>
<th>Ic (A)</th>
<th>Eff (%)</th>
<th>RL (dB)</th>
<th>VSWR-S (1.5:1)</th>
<th>VSWR-T (3:1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>0.40</td>
<td>2.3</td>
<td>7.60</td>
<td>0.18</td>
<td>45.7</td>
<td>-11.3</td>
<td>S</td>
<td>P</td>
</tr>
<tr>
<td>1.3</td>
<td>0.40</td>
<td>2.4</td>
<td>7.80</td>
<td>0.19</td>
<td>45.5</td>
<td>-13.6</td>
<td>S</td>
<td>P</td>
</tr>
<tr>
<td>1.4</td>
<td>0.40</td>
<td>2.4</td>
<td>7.69</td>
<td>0.20</td>
<td>42.8</td>
<td>-17.5</td>
<td>S</td>
<td>P</td>
</tr>
</tbody>
</table>

Gain vs. Frequency

Collector Efficiency vs. Frequency

RF Test Fixture Impedance

<table>
<thead>
<tr>
<th>F (GHz)</th>
<th>Z_{IF} (Ω)</th>
<th>Z_{OF} (Ω)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>9.5 - j6.3</td>
<td>13.1 + j35.8</td>
</tr>
<tr>
<td>1.3</td>
<td>8.6 - j4.9</td>
<td>17.7 + j35.5</td>
</tr>
<tr>
<td>1.4</td>
<td>8.1 - j3.6</td>
<td>17.0 + j40.6</td>
</tr>
</tbody>
</table>

ADVANCED: Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.

PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.
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Test Fixture Circuit Dimensions

Test Fixture Assembly