

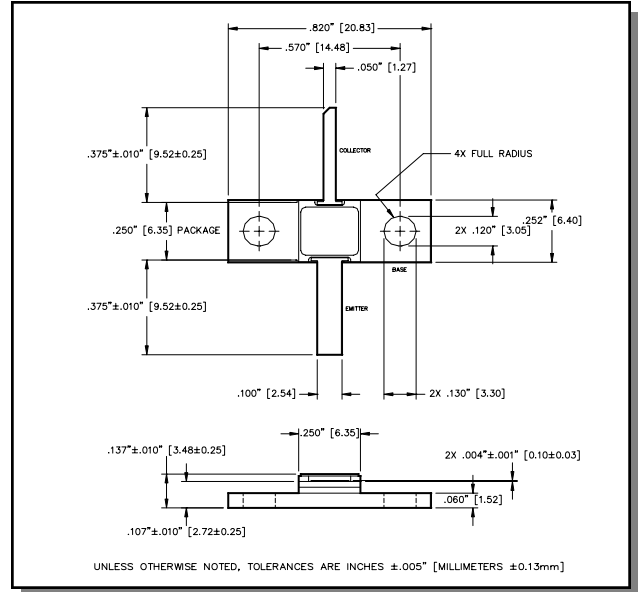
Radar Pulsed Power Transistor
25W, 1.2-1.4 GHz, 150µs Pulse, 10% Duty

M/A-COM Products
Released, 30 May 07

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

Outline Drawing



Absolute Maximum Ratings at 25°C

| Parameter | Symbol | Rating | Units |
|---------------------------|-----------|-------------|-------|
| Collector-Emitter Voltage | V_{CES} | 70 | V |
| Emitter-Base Voltage | V_{EBO} | 3.0 | V |
| Collector Current (Peak) | I_C | 2.8 | A |
| Power Dissipation @ +25°C | P_{TOT} | 67 | W |
| Storage Temperature | T_{STG} | -65 to +200 | °C |
| Junction Temperature | T_J | 200 | °C |

Electrical Specifications: $T_C = 25 \pm 5^\circ\text{C}$ (Room Ambient)

| Parameter | Test Conditions | Frequency | Symbol | Min | Max | Units |
|-------------------------------------|--|-----------------------|--------------|-----|-------|-------|
| Collector-Emitter Breakdown Voltage | $I_C = 25\text{mA}$ | | BV_{CES} | 60 | - | V |
| Collector-Emitter Leakage Current | $V_{CE} = 40\text{V}$ | | I_{CES} | - | 2.5 | mA |
| Thermal Resistance | $V_{CC} = 28\text{V}$, $P_{out} = 25\text{W}$ | F = 1.2, 1.3, 1.4 GHz | $R_{TH(JC)}$ | - | 2.6 | °C/W |
| Output Power | $V_{CC} = 28\text{V}$, $P_{out} = 25\text{W}$ | F = 1.2, 1.3, 1.4 GHz | P_{IN} | - | 2.8 | W |
| Power Gain | $V_{CC} = 28\text{V}$, $P_{out} = 25\text{W}$ | F = 1.2, 1.3, 1.4 GHz | G_P | 9.5 | - | dB |
| Collector Efficiency | $V_{CC} = 28\text{V}$, $P_{out} = 25\text{W}$ | F = 1.2, 1.3, 1.4 GHz | η_C | 50 | - | % |
| Input Return Loss | $V_{CC} = 28\text{V}$, $P_{out} = 25\text{W}$ | F = 1.2, 1.3, 1.4 GHz | RL | - | -6 | dB |
| Load Mismatch Tolerance | $V_{CC} = 28\text{V}$, $P_{out} = 25\text{W}$ | F = 1.2, 1.3, 1.4 GHz | VSWR-T | - | 3:1 | - |
| Load Mismatch Stability | $V_{CC} = 28\text{V}$, $P_{out} = 25\text{W}$ | F = 1.2, 1.3, 1.4 GHz | VSWR-S | - | 1.5:1 | - |

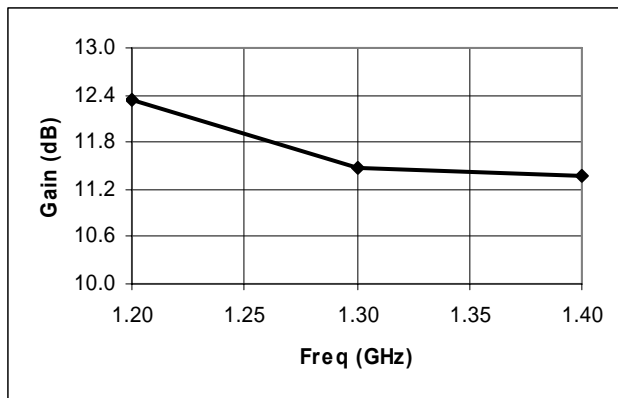
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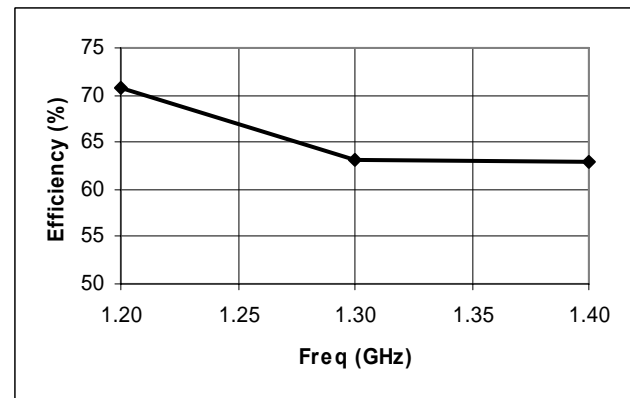
Typical RF Performance

| Freq. (GHz) | Pin (W) | Pout (W) | Gain (dB) | Ic (A) | Eff (%) | RL (dB) | VSWR-S (1.5:1) | VSWR-T (3:1) |
|-------------|---------|----------|-----------|--------|---------|---------|----------------|--------------|
| 1.2 | 1.46 | 25 | 12.34 | 1.26 | 70.7 | -16.5 | S | P |
| 1.3 | 1.78 | 25 | 11.48 | 1.41 | 63.2 | -11.7 | S | P |
| 1.4 | 1.83 | 25 | 11.36 | 1.42 | 62.8 | -8.2 | S | P |

Gain vs. Frequency



Collector Efficiency vs. Frequency



RF Test Fixture Impedance

| F (GHz) | Z _{IF} (Ω) | Z _{OF} (Ω) |
|---------|---------------------|---------------------|
| 1.2 | 2.1 - j4.5 | 3.7 + j0.9 |
| 1.3 | 2.1 - j3.9 | 3.6 + j0.4 |
| 1.4 | 2.2 - j3.4 | 3.0 + j0.2 |

