

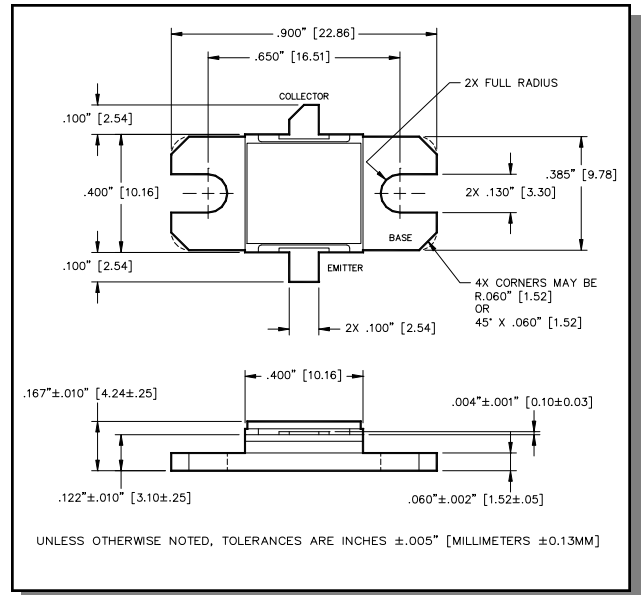
Radar Pulsed Power Transistor
50W, 2.2-2.6GHz, 100µs Pulse, 10% Duty

M/A-COM Products
Released, 20 Jun 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} | 63 | V |
| Emitter-Base Voltage | V_{EBO} | 3.0 | V |
| Collector Current (Peak) | I_C | 6.0 | A |
| Power Dissipation @ +25°C | P_{TOT} | 159 | 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 | $I_C = 15\text{mA}$ | | BV_{CES} | 65 | - | V |
| Collector-Emitter Leakage Current | $V_{CE} = 36\text{V}$ | | I_{CES} | - | 3.0 | mA |
| Thermal Resistance | $V_{CC} = 36\text{V}$, $P_{in} = 8\text{W}$ | $F = 2.25, 2.55\text{ GHz}$ | $R_{TH(JC)}$ | - | 1.1 | °C/W |
| Output Power | $V_{CC} = 36\text{V}$, $P_{in} = 8\text{W}$ | $F = 2.25, 2.55\text{ GHz}$ | P_{OUT} | 50 | - | W |
| Power Gain | $V_{CC} = 36\text{V}$, $P_{in} = 8\text{W}$ | $F = 2.25, 2.55\text{ GHz}$ | G_P | 8.0 | - | dB |
| Collector Efficiency | $V_{CC} = 36\text{V}$, $P_{in} = 8\text{W}$ | $F = 2.25, 2.55\text{ GHz}$ | η_C | 40 | - | % |
| Pulse Droop | $V_{CC} = 36\text{V}$, $P_{in} = 8\text{W}$ | $F = 2.25, 2.55\text{ GHz}$ | Droop | - | 1.0 | dB |
| Input Return Loss | $V_{CC} = 36\text{V}$, $P_{in} = 8\text{W}$ | $F = 2.25, 2.55\text{ GHz}$ | RL | - | -9 | dB |
| Load Mismatch Tolerance | $V_{CC} = 36\text{V}$, $P_{in} = 8\text{W}$ | $F = 2.25, 2.55\text{ GHz}$ | VSWR-T | - | 3:1 | - |
| Load Mismatch Stability | $V_{CC} = 36\text{V}$, $P_{in} = 8\text{W}$ | $F = 2.25, 2.55\text{ GHz}$ | VSWR-S | - | 1.5:1 | - |

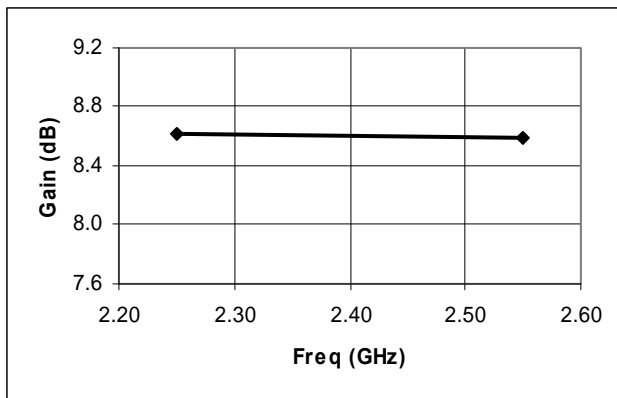
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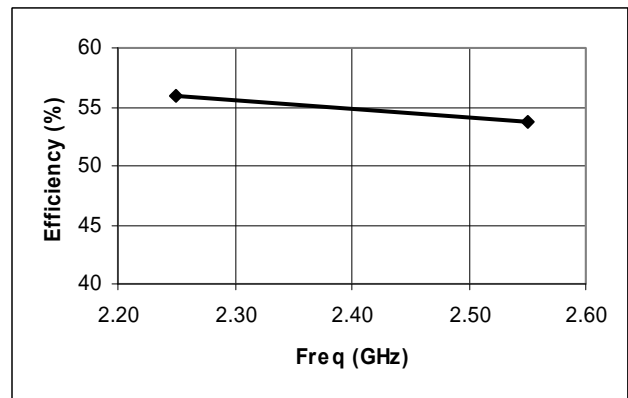
Typical RF Performance

| Freq. (GHz) | Pin (W) | Pout (W) | Gain (dB) | Ic (A) | Eff (%) | RL (dB) | Droop (dB) | VSWR-S (1.5:1) | VSWR-T (3:1) |
|-------------|---------|----------|-----------|--------|---------|---------|------------|----------------|--------------|
| 2.25 | 8.00 | 58.3 | 8.62 | 2.90 | 55.9 | 16.2 | 0.01 | S | P |
| 2.55 | 8.00 | 57.8 | 8.58 | 2.99 | 53.6 | 17.0 | 0.05 | S | P |

Gain vs. Frequency

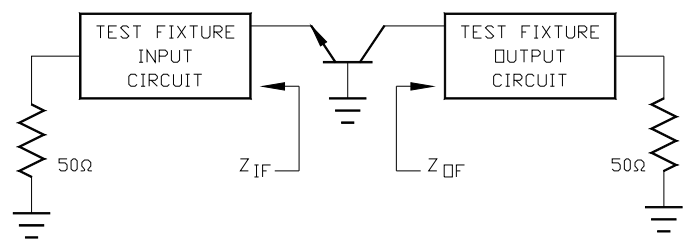


Collector Efficiency vs. Frequency



RF Test Fixture Impedance

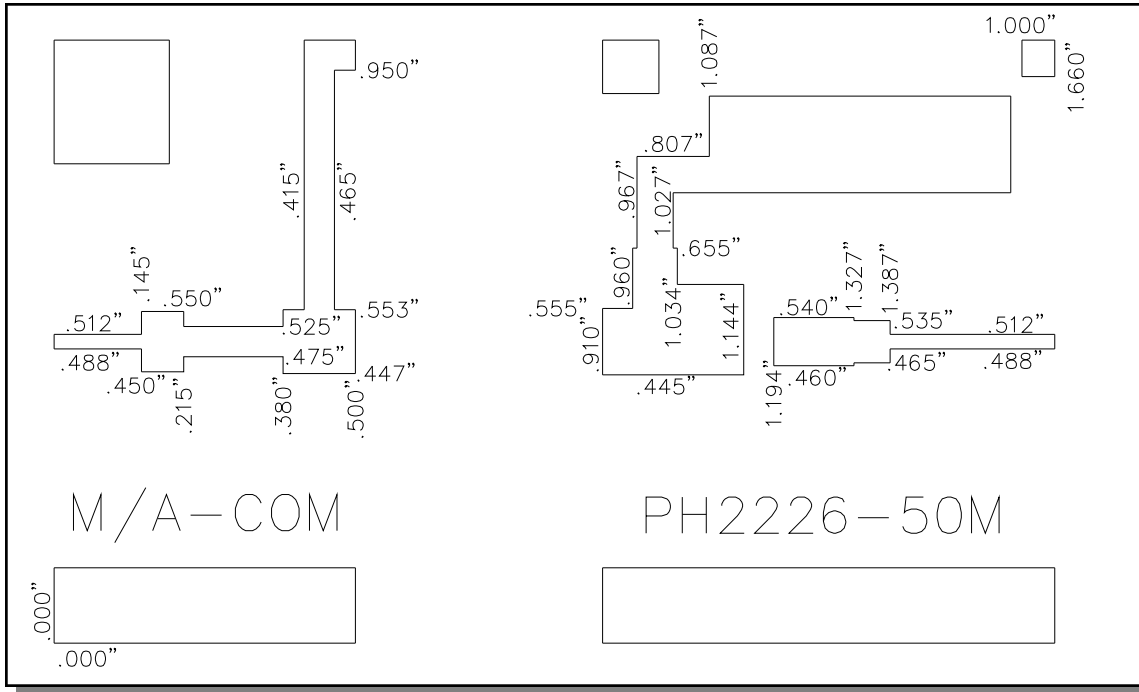
| F (GHz) | Z _{IF} (Ω) | Z _{OF} (Ω) |
|---------|---------------------|---------------------|
| 2.25 | 15.0 - j7.0 | 12.8 - j3.0 |
| 2.40 | 14.0 - j5.5 | 12.0 - j1.6 |
| 2.55 | 13.7 - j4.0 | 11.8 - j0.4 |



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Test Fixture Circuit Dimensions



Test Fixture Assembly

