

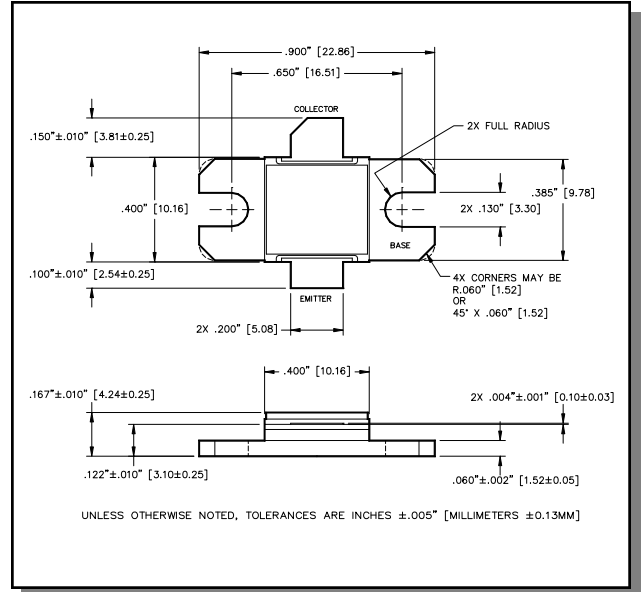
Radar Pulsed Power Transistor
75W, 2.7-3.1 GHz, 300µs Pulse, 10% Duty

M/A-COM Products
Released, 10 Aug 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} | 65 | V |
| Emitter-Base Voltage | V_{EBO} | 3.0 | V |
| Collector Current (Peak) | I_C | 7.0 | A |
| Power Dissipation @ +25°C | P_{TOT} | 220 | 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 | $I_C = 50\text{mA}$ | | BV_{CES} | 65 | - | V |
| Collector-Emitter Leakage Current | $V_{CE} = 36\text{V}$ | | I_{CES} | - | 7.5 | mA |
| Thermal Resistance | $V_{CC} = 36\text{V}$, $P_{out} = 75\text{W}$ | $F = 2.7, 2.9, 3.1\text{ GHz}$ | $R_{TH(JC)}$ | - | 0.8 | °C/W |
| Output Power | $V_{CC} = 36\text{V}$, $P_{out} = 75\text{W}$ | $F = 2.7, 2.9, 3.1\text{ GHz}$ | P_{IN} | - | 13.5 | W |
| Power Gain | $V_{CC} = 36\text{V}$, $P_{out} = 75\text{W}$ | $F = 2.7, 2.9, 3.1\text{ GHz}$ | G_P | 7.45 | - | dB |
| Collector Efficiency | $V_{CC} = 36\text{V}$, $P_{out} = 75\text{W}$ | $F = 2.7, 2.9, 3.1\text{ GHz}$ | η_C | 38 | - | % |
| Input Return Loss | $V_{CC} = 36\text{V}$, $P_{out} = 75\text{W}$ | $F = 2.7, 2.9, 3.1\text{ GHz}$ | RL | - | -6 | dB |
| Load Mismatch Tolerance | $V_{CC} = 36\text{V}$, $P_{out} = 75\text{W}$ | $F = 2.7, 2.9, 3.1\text{ GHz}$ | VSWR-T | - | 3:1 | - |
| Load Mismatch Stability | $V_{CC} = 36\text{V}$, $P_{out} = 75\text{W}$ | $F = 2.7, 2.9, 3.1\text{ GHz}$ | VSWR-S | - | 1.5:1 | - |

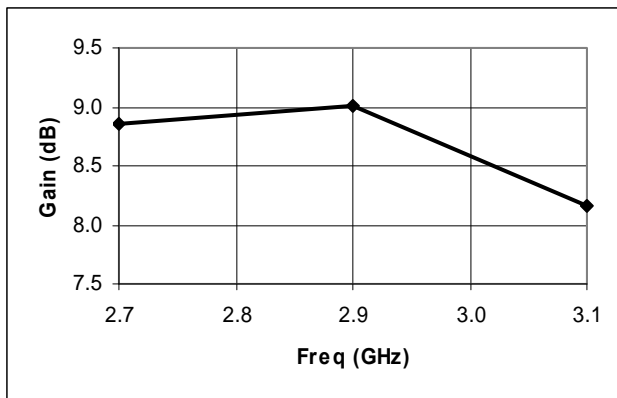
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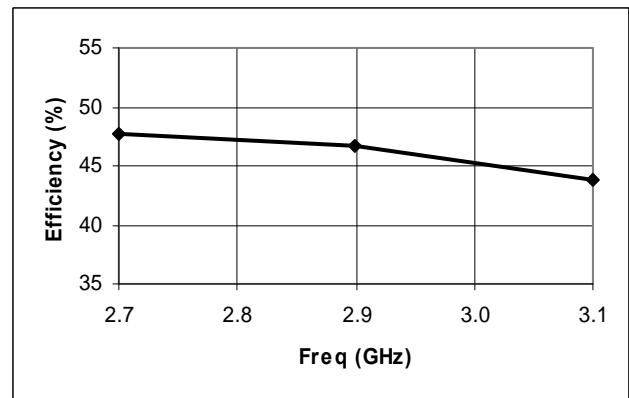
Typical RF Performance

| Freq. (GHz) | Pin (W) | Pout (W) | Gain (dB) | Ic (A) | Eff (%) | RL (dB) | VSWR-S (1.5:1) | VSWR-T (3:1) |
|-------------|---------|----------|-----------|--------|---------|---------|----------------|--------------|
| 2.7 | 9.8 | 75 | 8.86 | 4.40 | 47.8 | -11.0 | S | P |
| 2.9 | 9.4 | 75 | 9.01 | 4.50 | 46.7 | -18.5 | S | P |
| 3.1 | 11.5 | 75 | 8.16 | 4.80 | 43.8 | -17.7 | S | P |

Gain vs. Frequency

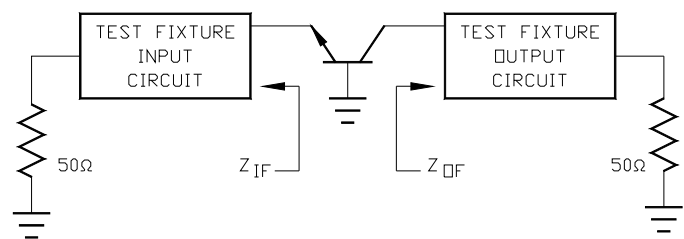


Collector Efficiency vs. Frequency



RF Test Fixture Impedance

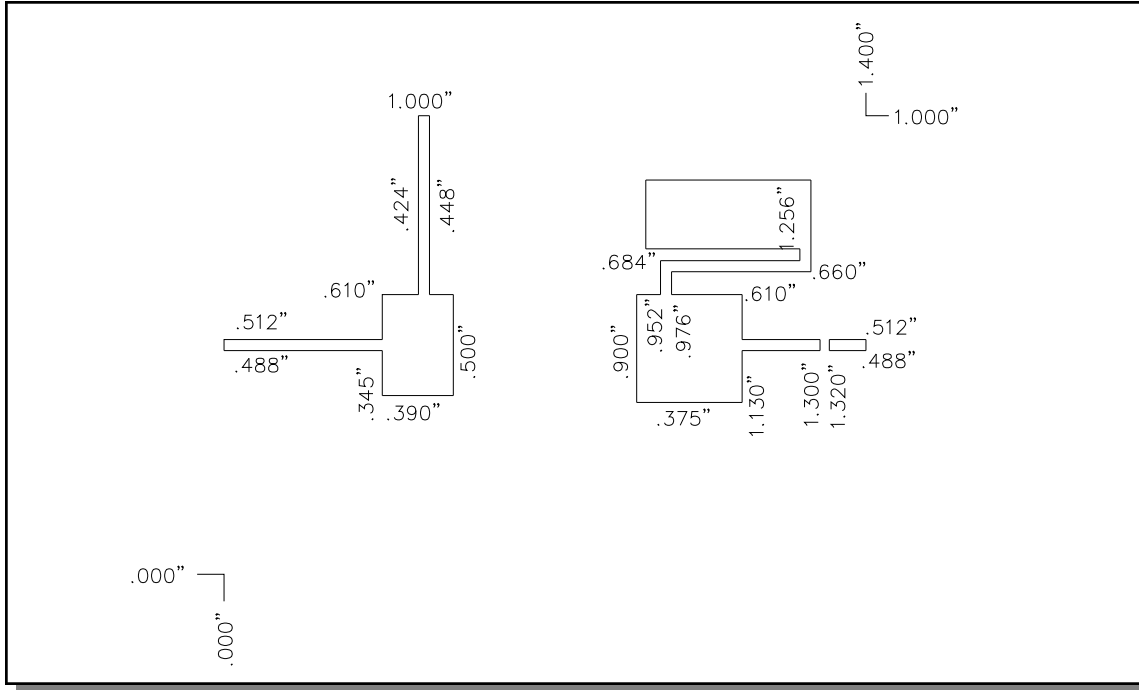
| F (GHz) | Z _{IF} (Ω) | Z _{OF} (Ω) |
|---------|---------------------|---------------------|
| 2.7 | 6.9 - j12.2 | 4.5 - j6.8 |
| 2.9 | 6.0 - j11.7 | 3.9 - j6.1 |
| 3.1 | 5.2 - j10.0 | 3.4 - j4.8 |



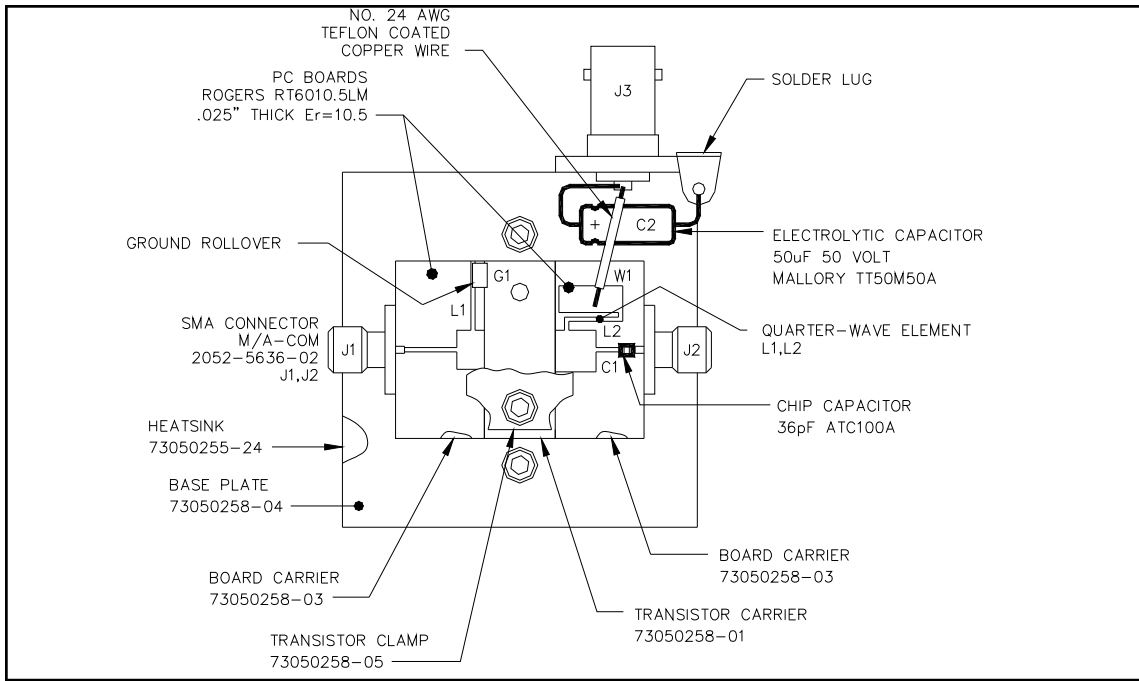
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Test Fixture Circuit Dimensions



Test Fixture Assembly



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