

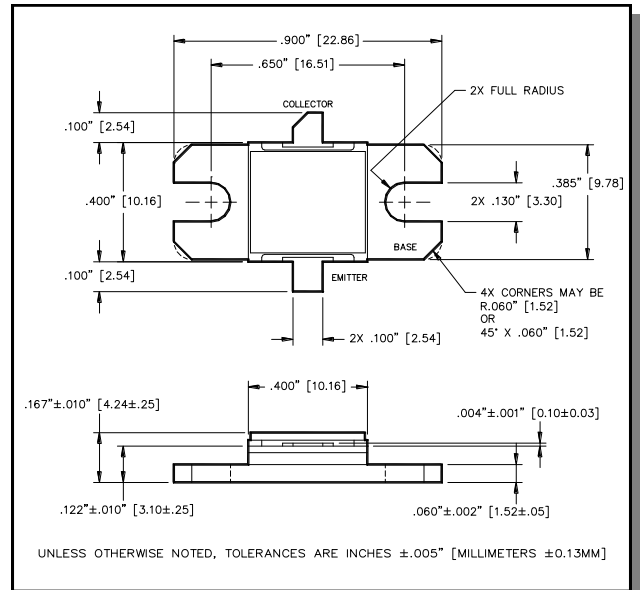
Radar Pulsed Power Transistor 20W, 3.1-3.5 GHz, 100µs Pulse, 10% Duty

Rev. V1

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 | 2.4 | A |
| Power Dissipation @ +25°C | P_{TOT} | 200 | W |
| Storage Temperature | T_{STG} | -65 to +200 | °C |
| Junction Temperature | T_J | 200 | °C |

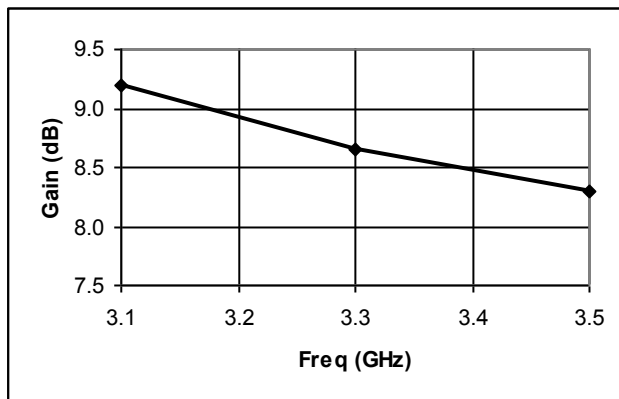
Electrical Specifications: $T_C = 25 \pm 5^\circ\text{C}$ (Room Ambient)

| Parameter | Test Conditions | Frequency | Symbol | Min | Max | Units |
|-------------------------------------|--|--------------------------------|--------------|-----|-----|-------|
| Collector-Emitter Breakdown Voltage | $I_C = 10\text{mA}$ | | BV_{CES} | 65 | - | V |
| Collector-Emitter Leakage Current | $V_{CE} = 40\text{V}$ | | I_{CES} | - | 1.5 | mA |
| Thermal Resistance | $V_{CC} = 36\text{V}$, $P_{out} = 20\text{W}$ | $F = 3.1, 3.3, 3.5\text{ GHz}$ | $R_{TH(JC)}$ | - | 1.1 | °C/W |
| Output Power | $V_{CC} = 36\text{V}$, $P_{out} = 20\text{W}$ | $F = 3.1, 3.3, 3.5\text{ GHz}$ | P_{IN} | - | 3.6 | W |
| Power Gain | $V_{CC} = 36\text{V}$, $P_{out} = 20\text{W}$ | $F = 3.1, 3.3, 3.5\text{ GHz}$ | G_P | 7.5 | - | dB |
| Collector Efficiency | $V_{CC} = 36\text{V}$, $P_{out} = 20\text{W}$ | $F = 3.1, 3.3, 3.5\text{ GHz}$ | η_C | 35 | - | % |
| Input Return Loss | $V_{CC} = 36\text{V}$, $P_{out} = 20\text{W}$ | $F = 3.1, 3.3, 3.5\text{ GHz}$ | RL | - | -6 | dB |
| Load Mismatch Tolerance | $V_{CC} = 36\text{V}$, $P_{out} = 20\text{W}$ | $F = 3.1, 3.3, 3.5\text{ GHz}$ | VSWR-T | - | 2:1 | - |

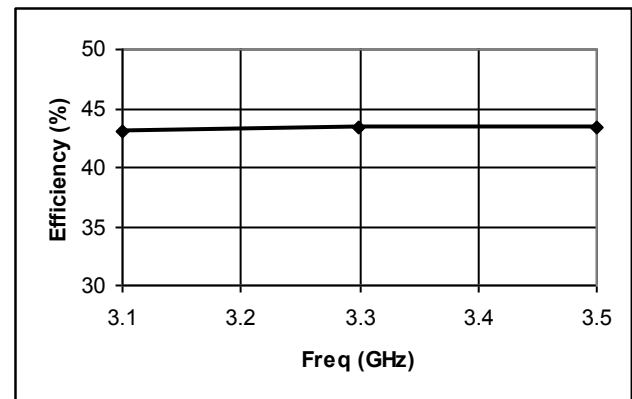
Typical RF Performance

| Freq. (GHz) | Pin (W) | Pout (W) | Gain (dB) | Ic (A) | Eff (%) | RL (dB) | VSWR-T (2:1) |
|-------------|---------|----------|-----------|--------|---------|---------|--------------|
| 3.1 | 2.4 | 20 | 9.19 | 1.29 | 43.1 | -10.2 | P |
| 3.3 | 2.7 | 20 | 8.65 | 1.28 | 43.4 | -10.9 | P |
| 3.5 | 3.0 | 20 | 8.30 | 1.28 | 43.4 | -13.0 | P |

Gain vs. Frequency

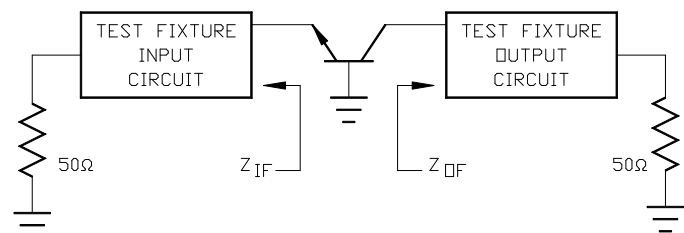


Collector Efficiency vs. Frequency

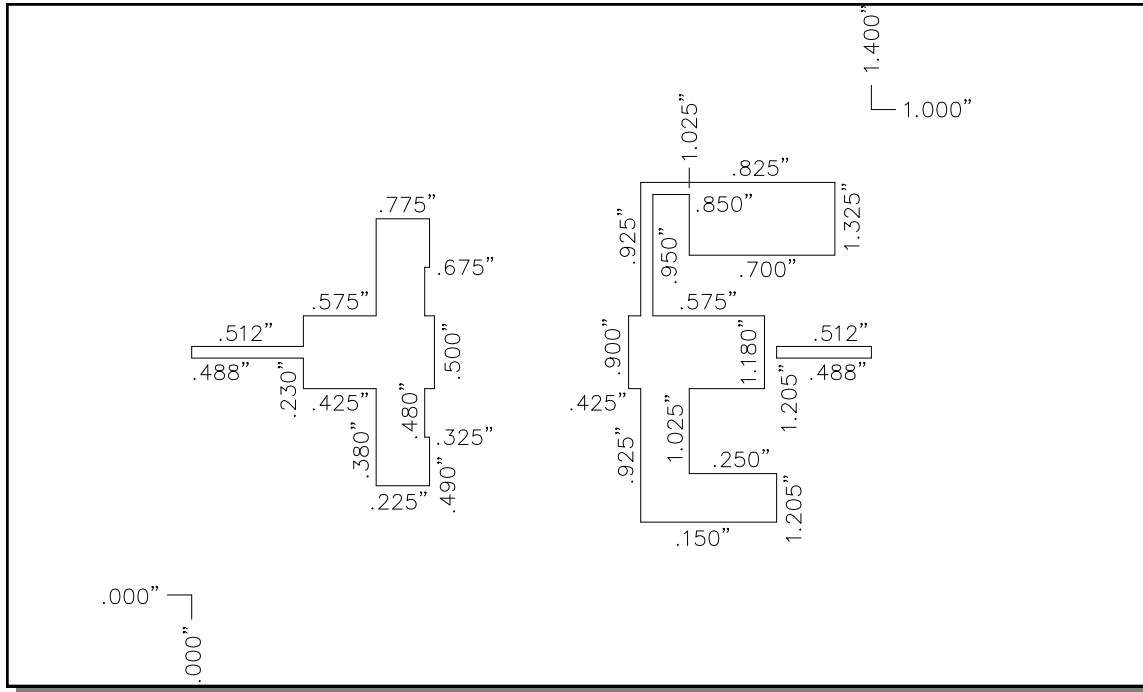


RF Test Fixture Impedance

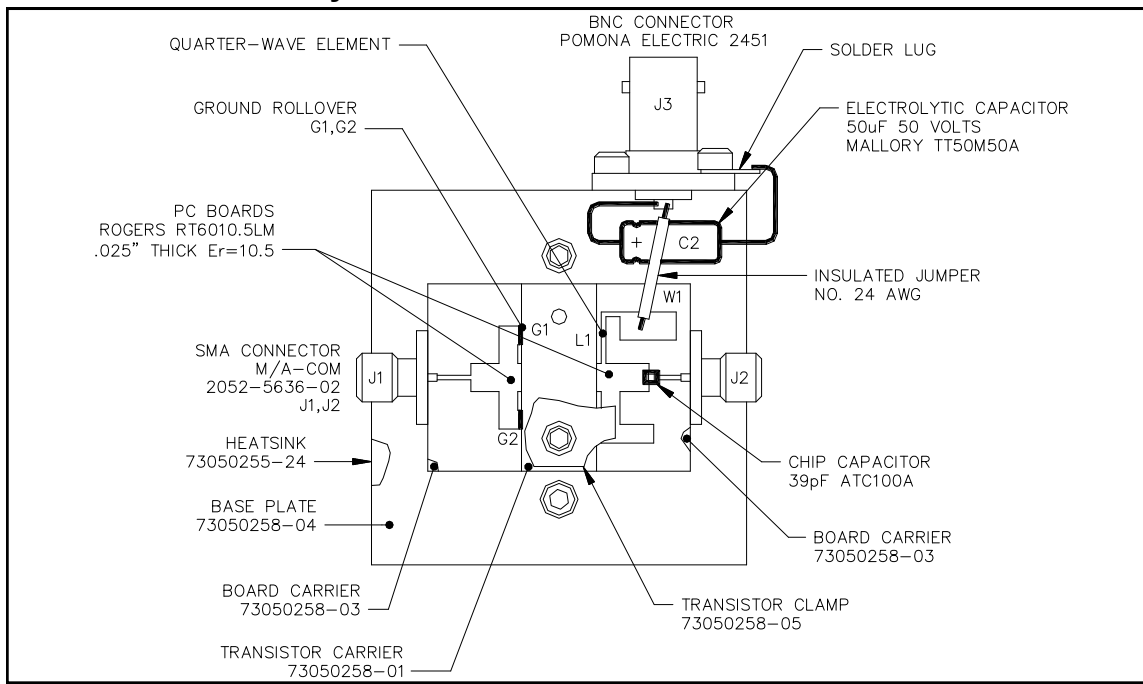
| F (GHz) | Z _{IF} (Ω) | Z _{OF} (Ω) |
|---------|---------------------|---------------------|
| 3.1 | 16.0 + j5.5 | 19.0 + j3.4 |
| 3.3 | 14.5 + j1.6 | 14.2 - j2.8 |
| 3.5 | 11.3 + j0.0 | 10.7 - j3.3 |



Test Fixture Circuit Dimensions



Test Fixture Assembly



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