

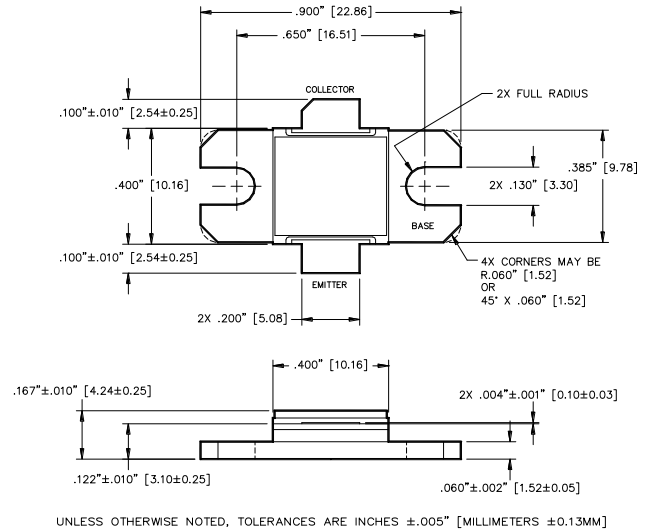
Radar Pulsed Power Transistor 130 W, 2.7—2.9 GHz, 100 μ s Pulse, 10% Duty

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} | 63 | V |
| Emitter-Base Voltage | V_{EBO} | 3.0 | V |
| Collector Current (Peak) | I_C | 12.5 | A |
| Power Dissipation @ +25°C | P_{TOT} | 575 | W |
| Storage Temperature | T_{STG} | -65 to +200 | °C |
| Junction Temperature | T_J | 200 | °C |

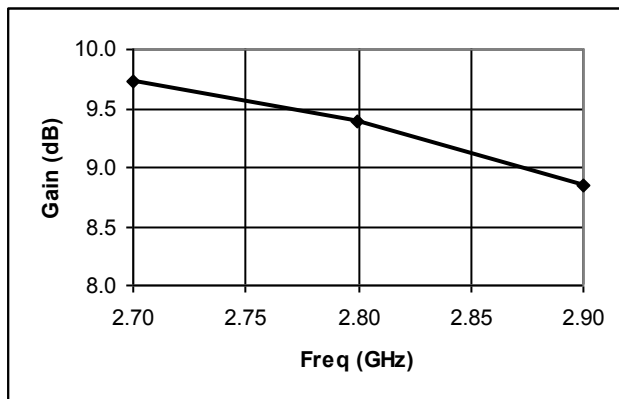
Electrical Specifications: $T_C = 25 \pm 5^\circ\text{C}$ (Room Ambient)

| Parameter | Test Conditions | Frequency | Symbol | Min | Max | Units |
|-------------------------------------|---|--------------------------------|--------------|-----|-------|-------|
| Collector-Emitter Breakdown Voltage | $I_C = 40\text{mA}$ | | BV_{CES} | 63 | - | V |
| Collector-Emitter Leakage Current | $V_{CE} = 36\text{V}$ | | I_{CES} | - | 7.5 | mA |
| Thermal Resistance | $V_{CC} = 36\text{V}$, $P_{out} = 130\text{W}$ | $F = 2.7, 2.8, 2.9\text{ GHz}$ | $R_{TH(JC)}$ | - | 0.3 | °C/W |
| Input Power | $V_{CC} = 36\text{V}$, $P_{out} = 130\text{W}$ | $F = 2.7, 2.8, 2.9\text{ GHz}$ | P_{IN} | - | 23 | W |
| Power Gain | $V_{CC} = 36\text{V}$, $P_{out} = 130\text{W}$ | $F = 2.7, 2.8, 2.9\text{ GHz}$ | G_P | 7.0 | - | dB |
| Collector Efficiency | $V_{CC} = 36\text{V}$, $P_{out} = 130\text{W}$ | $F = 2.7, 2.8, 2.9\text{ GHz}$ | η_C | 40 | - | % |
| Input Return Loss | $V_{CC} = 36\text{V}$, $P_{out} = 130\text{W}$ | $F = 2.7, 2.8, 2.9\text{ GHz}$ | RL | - | -10 | dB |
| Pulse Droop | $V_{CC} = 36\text{V}$, $P_{out} = 130\text{W}$ | $F = 2.7, 2.8, 2.9\text{ GHz}$ | Droop | - | 0.5 | dB |
| Load Mismatch Tolerance | $V_{CC} = 36\text{V}$, $P_{out} = 130\text{W}$ | $F = 2.7, 2.8, 2.9\text{ GHz}$ | VSWR-T | - | 2:1 | - |
| Load Mismatch Stability | $V_{CC} = 36\text{V}$, $P_{out} = 130\text{W}$ | $F = 2.7, 2.8, 2.9\text{ GHz}$ | VSWR-S | - | 1.5:1 | - |

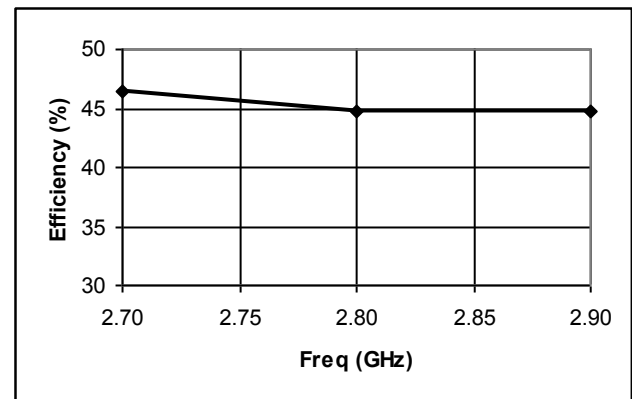
Typical RF Performance

| Freq. (GHz) | Pin (W) | Pout (W) | Gain (dB) | Ic (A) | Eff (%) | RL (dB) | VSWR-S (1.5:1) | VSWR-T (2:1) |
|-------------|---------|----------|-----------|--------|---------|---------|----------------|--------------|
| 2.7 | 13.9 | 130 | 9.73 | 7.78 | 46.4 | -11.4 | S | P |
| 2.8 | 15.0 | 130 | 9.38 | 8.07 | 44.8 | -13.6 | S | P |
| 2.9 | 17.0 | 130 | 8.85 | 8.07 | 44.8 | -13.8 | S | P |

Gain vs. Frequency

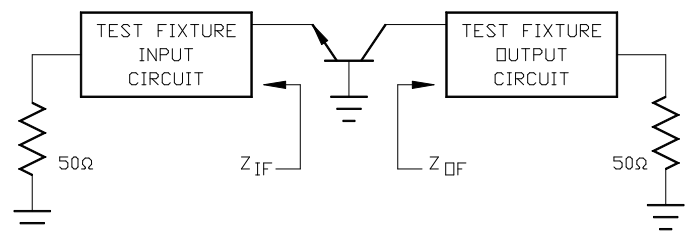


Collector Efficiency vs. Frequency

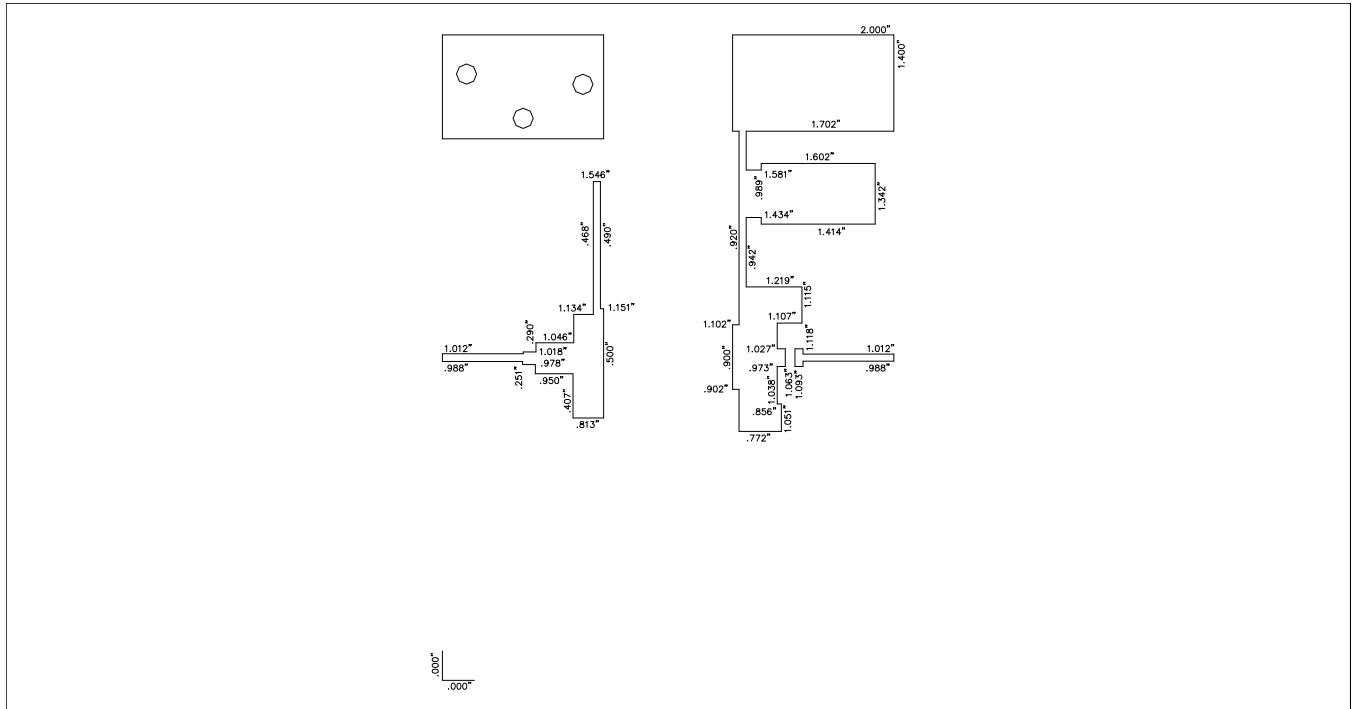


RF Test Fixture Impedance

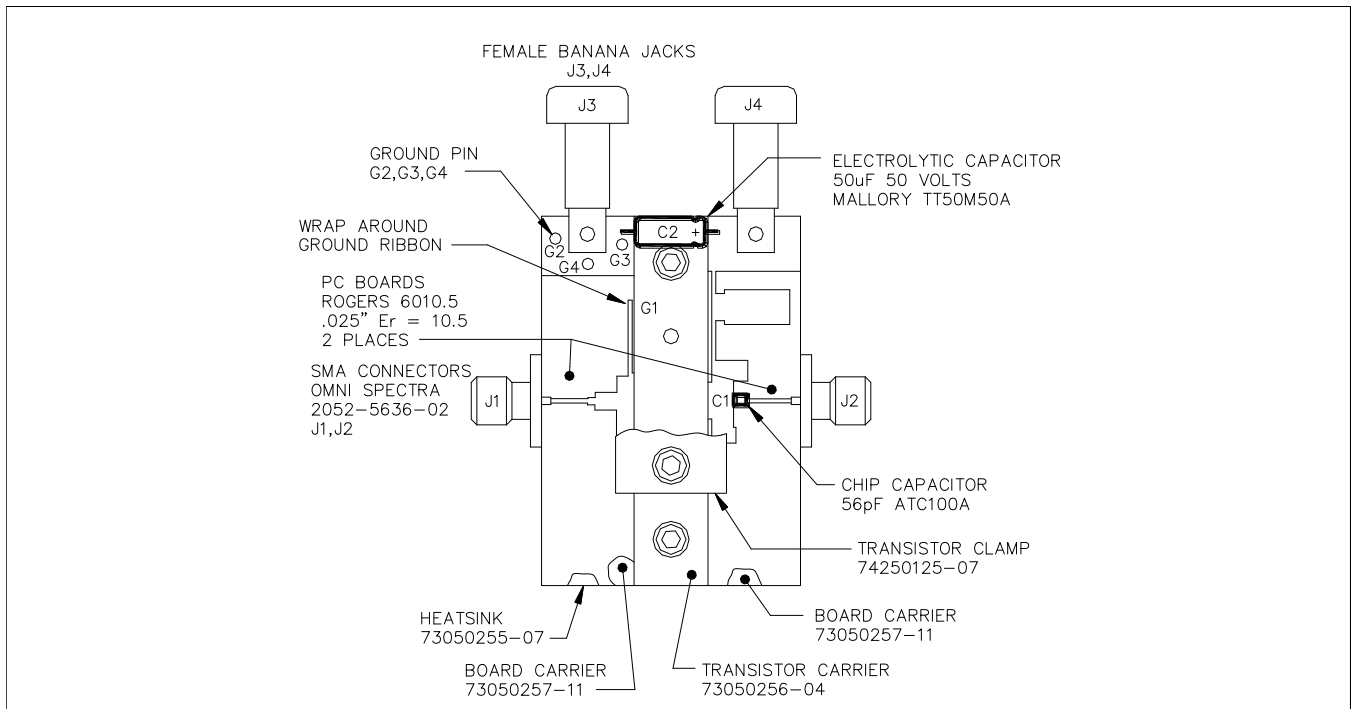
| F (GHz) | Z _{IF} (Ω) | Z _{OF} (Ω) |
|---------|------------------------------|------------------------------|
| 2.7 | 5.5 - j9.1 | 1.9 - j5.6 |
| 2.8 | 5.25 - j8.8 | 1.75 - j5.2 |
| 2.9 | 5.05 - j8.3 | 1.6 - j4.8 |



Test Fixture Circuit Dimensions



Test Fixture Assembly



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