

MAPRST1214-6UF



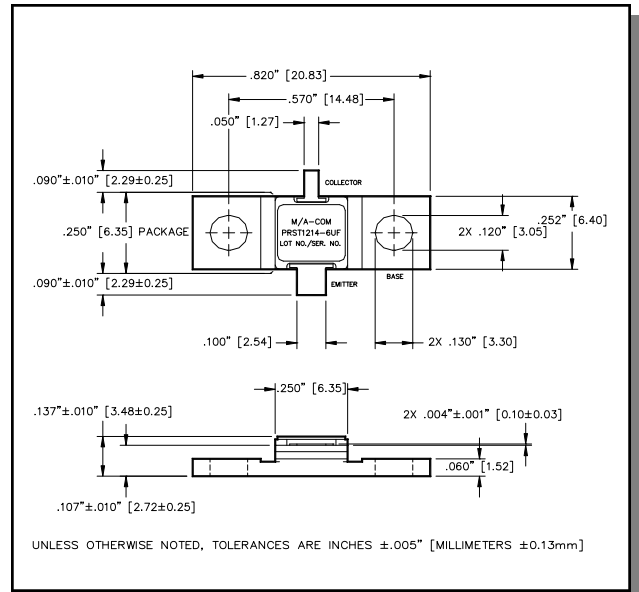
Radar Pulsed Power Transistor
6W, 1.2-1.4 GHz, 6ms Pulse, 25% Duty

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} | 65 | V |
| Emitter-Base Voltage | V_{EBO} | 3.0 | V |
| Collector Current (Peak) | I_C | 1.9 | A |
| Power Dissipation @ +25°C | P_{TOT} | 100 | 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} | - | 3.0 | mA |
| Thermal Resistance | $V_{CC} = 36\text{V}$, $P_{in} = 0.8\text{W}$ | F = 1.2, 1.3, 1.4 GHz | $R_{TH(JC)}$ | - | 1.8 | °C/W |
| Output Power | $V_{CC} = 36\text{V}$, $P_{in} = 0.8\text{W}$ | F = 1.2, 1.3, 1.4 GHz | P_{OUT} | 6 | - | W |
| Power Gain | $V_{CC} = 36\text{V}$, $P_{in} = 0.8\text{W}$ | F = 1.2, 1.3, 1.4 GHz | G_P | 8.75 | - | dB |
| Gain Flatness | $V_{CC} = 36\text{V}$, $P_{in} = 0.8\text{W}$ | F = 1.2, 1.3, 1.4 GHz | ΔG | - | 0.75 | dB |
| Collector Efficiency | $V_{CC} = 36\text{V}$, $P_{in} = 0.8\text{W}$ | F = 1.2, 1.3, 1.4 GHz | η_C | 40 | - | % |
| Input Return Loss | $V_{CC} = 36\text{V}$, $P_{in} = 0.8\text{W}$ | F = 1.2, 1.3, 1.4 GHz | RL | - | -10 | dB |
| Pulse Droop | $V_{CC} = 36\text{V}$, $P_{in} = 0.8\text{W}$ | F = 1.2, 1.3, 1.4 GHz | Droop | - | 0.3 | dB |
| Load Mismatch Tolerance | $V_{CC} = 36\text{V}$, $P_{in} = 0.8\text{W}$ | F = 1.2, 1.3, 1.4 GHz | VSWR-T | - | 3:1 | - |
| Load Mismatch Stability | $V_{CC} = 36\text{V}$, $P_{in} = 0.8\text{W}$ | F = 1.2, 1.3, 1.4 GHz | VSWR-S | - | 1.5:1 | - |

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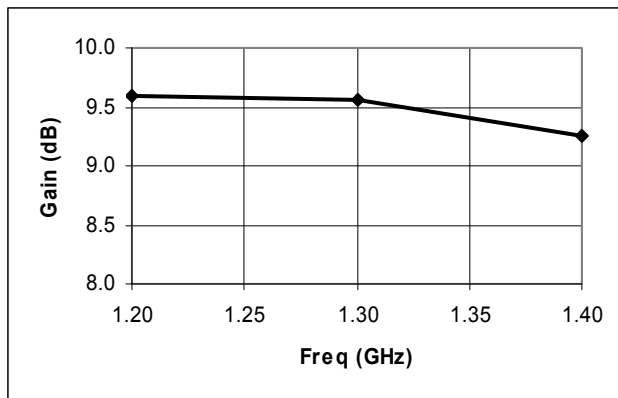
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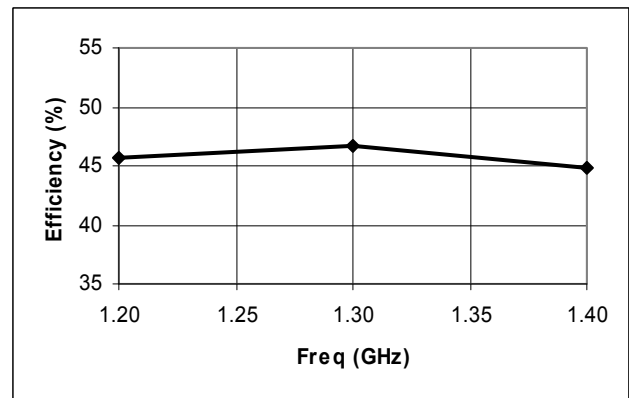
Typical RF Performance

| Freq. (GHz) | Pin (W) | Pout (W) | Gain (dB) | Ic (A) | Eff (%) | Droop (dB) | RL (dB) | VSWR-S (1.5:1) | VSWR-T (3:1) |
|-------------|---------|----------|-----------|--------|---------|------------|---------|----------------|--------------|
| 1.2 | 0.8 | 7.3 | 9.59 | 0.44 | 45.7 | 0.10 | -14.1 | S | P |
| 1.3 | 0.8 | 7.2 | 9.56 | 0.43 | 46.6 | 0.09 | -15.2 | S | P |
| 1.4 | 0.8 | 6.7 | 9.26 | 0.42 | 44.8 | 0.08 | -16.1 | S | P |

Gain vs. Frequency

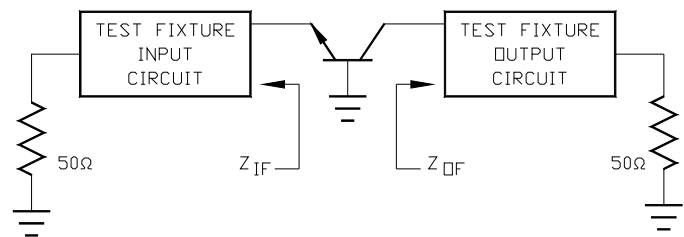


Collector Efficiency vs. Frequency



RF Test Fixture Impedance

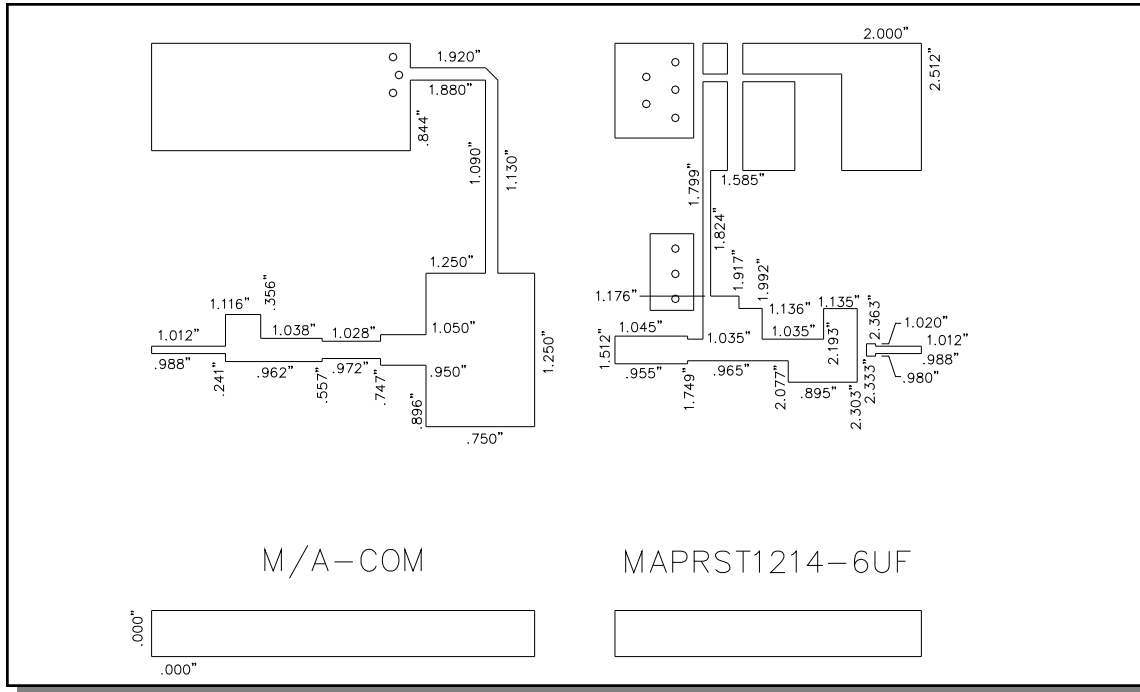
| F (GHz) | Z _{IF} (Ω) | Z _{OF} (Ω) |
|---------|---------------------|---------------------|
| 1.2 | 3.7 - j 3.2 | 16.9 + j18.0 |
| 1.3 | 3.8 - j 3.4 | 14.2 + j16.4 |
| 1.4 | 3.4 - j 3.7 | 11.7 + j18.2 |



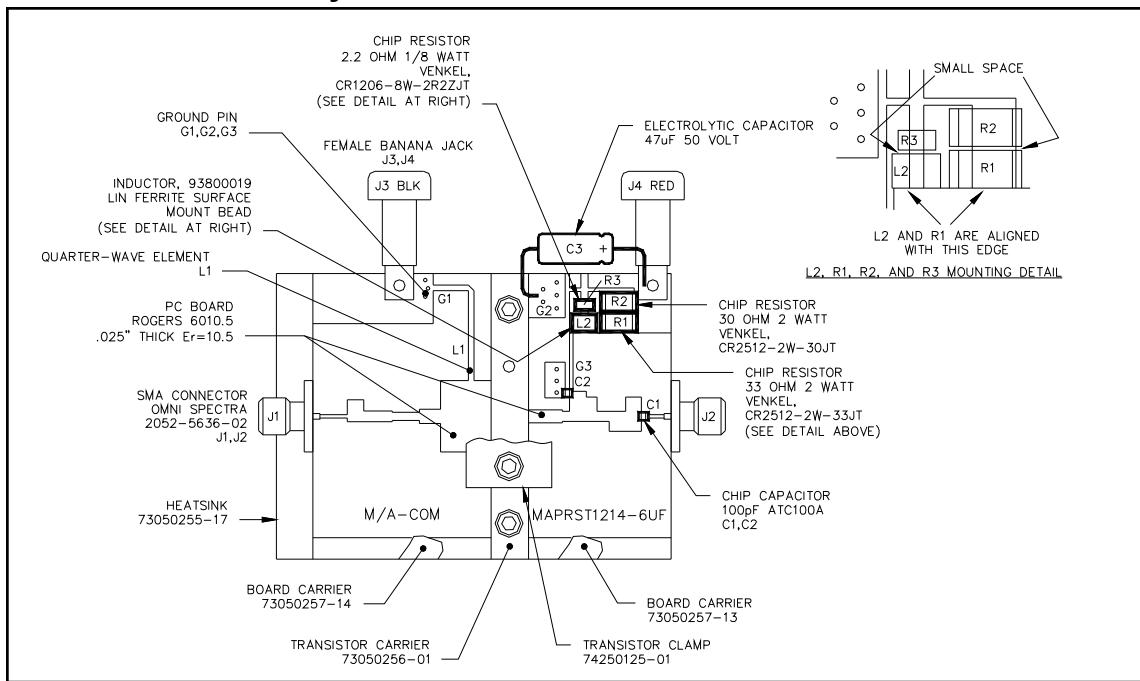
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Test Fixture Circuit Dimensions



Test Fixture Assembly



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