

MAPR-001214-380M00



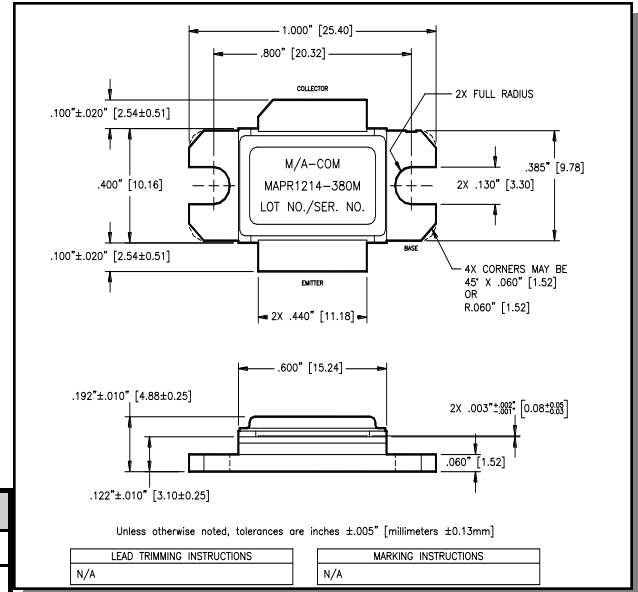
Radar Pulsed Power Transistor
380 WATTS, 1.2-1.4 GHz, 150us Pulse, 10% DUTY

Production
02 Feb 2012

Features

- NPN Silicon Microwave Power Transistors
- Common Base Configuration
- Broadband Class C Operation
- High Efficiency Interdigitated 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} | 88 | V |
| Emitter-Base Voltage | V_{EBO} | 3.0 | V |
| Collector Current (Peak) | I_C | 23.9 | A |
| Power Dissipation @ +25°C | P_{TOT} | 700 | 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} | 90 | - | V |
| Collector-Emitter Leakage Current | $V_{CE} = 44\text{V}$ | | I_{CES} | - | 10 | mA |
| Thermal Resistance | $V_{CC} = 44\text{V}$, $P_{in} = 50\text{W}$ | $F = 1.2, 1.3, 1.4\text{ GHz}$ | $R_{TH(JC)}$ | - | 0.25 | °C/W |
| Output Power | $V_{CC} = 44\text{V}$, $P_{in} = 50\text{W}$ | $F = 1.2, 1.3, 1.4\text{ GHz}$ | P_O | 380 | - | W |
| Power Gain | $V_{CC} = 44\text{V}$, $P_{in} = 50\text{W}$ | $F = 1.2, 1.3, 1.4\text{ GHz}$ | G_P | 8.8 | - | dB |
| Gain Flatness | $V_{CC} = 44\text{V}$, $P_{in} = 50\text{W}$ | $F = 1.2, 1.3, 1.4\text{ GHz}$ | ΔG_P | | 1 | dB |
| Droop | $V_{CC} = 44\text{V}$, $P_{in} = 50\text{W}$ | $F = 1.2, 1.3, 1.4\text{ GHz}$ | Droop | - | 0.6 | dB |
| Collector Efficiency | $V_{CC} = 44\text{V}$, $P_{in} = 50\text{W}$ | $F = 1.2, 1.3, 1.4\text{ GHz}$ | η_C | 45 | - | % |
| Input Return Loss | $V_{CC} = 44\text{V}$, $P_{in} = 50\text{W}$ | $F = 1.2, 1.3, 1.4\text{ GHz}$ | RL | - | -9 | dB |
| Load Mismatch Tolerance | $V_{CC} = 44\text{V}$, $P_{in} = 50\text{W}$ | $F = 1.2, 1.3, 1.4\text{ GHz}$ | VSWR-T | - | 2:1 | - |
| Load Mismatch Stability | $V_{CC} = 44\text{V}$, $P_{in} = 50\text{W}$ | $F = 1.2, 1.3, 1.4\text{ GHz}$ | VSWR-S | - | 1.5:1 | - |

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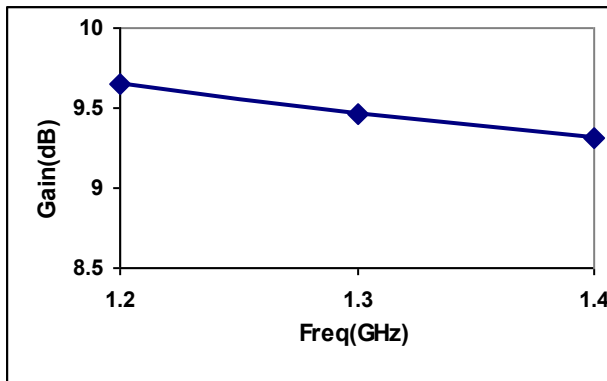
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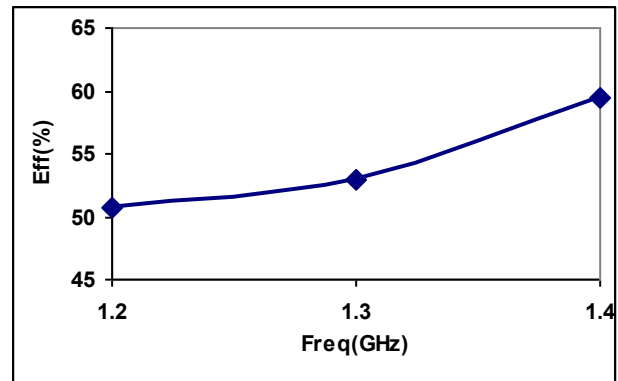
Typical RF Performance

| Freq. (GHz) | Pin (W) | Pout (W) | Gain (dB) | ΔGain (dB) | Eff (%) | RL (dB) | Droop (dB) | VSWR-S 1.5:1 | VSWR-T 2:01 |
|-------------|---------|----------|-----------|------------|---------|---------|------------|--------------|-------------|
| 1.2 | 50 | 458.5 | 9.65 | | 50.75 | -23.6 | 0.15 | S | P |
| 1.3 | 50 | 436.8 | 9.46 | | 52.88 | -16.8 | -0.02 | S | P |
| 1.4 | 50 | 421.3 | 9.31 | 0.34 | 59.52 | -15.2 | -0.01 | S | P |

Gain vs. Frequency



Collector Efficiency vs. Frequency

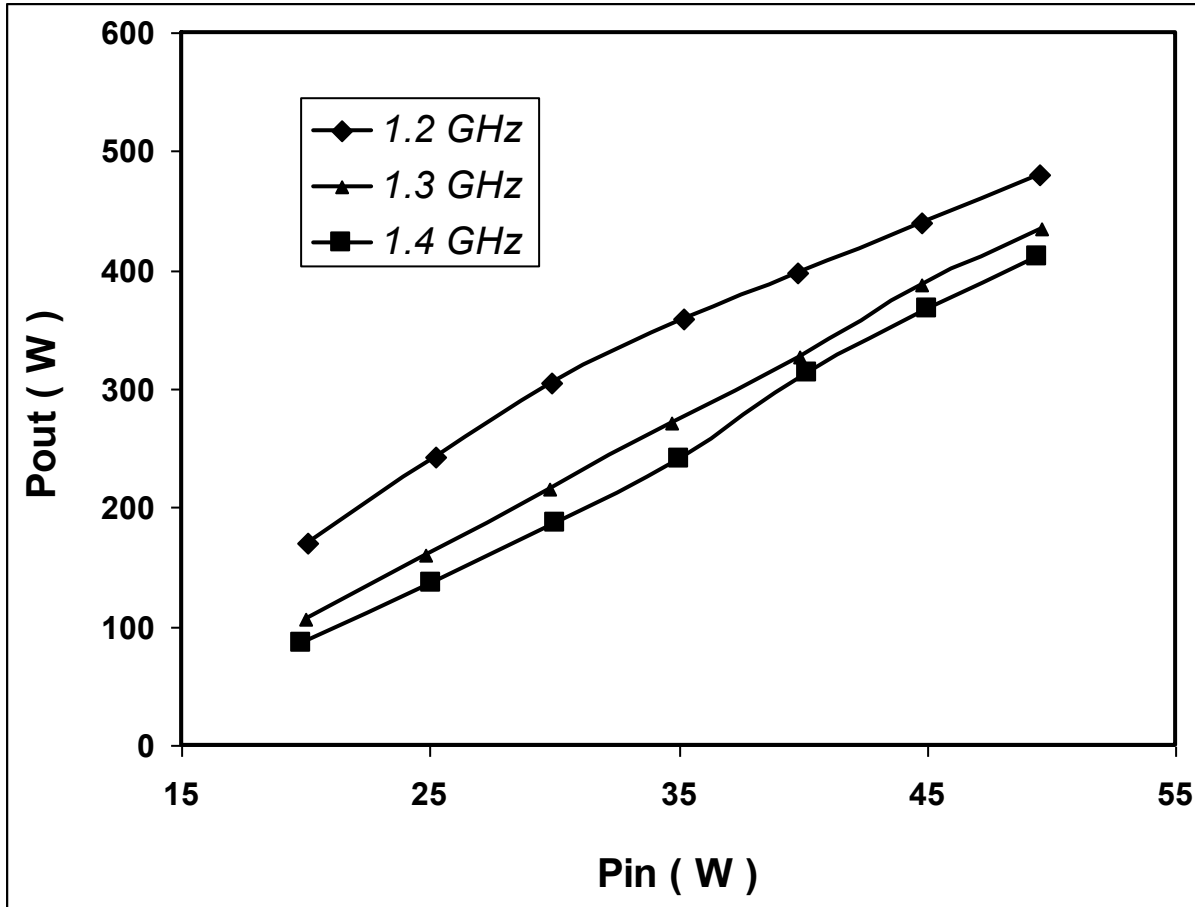


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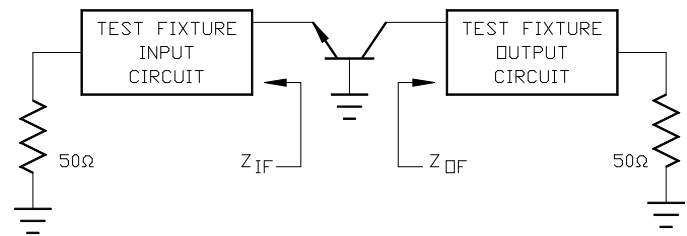
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RF Power Transfer Curve
(Output Power Vs. Input Power)



Broadband Test Fixture Impedance

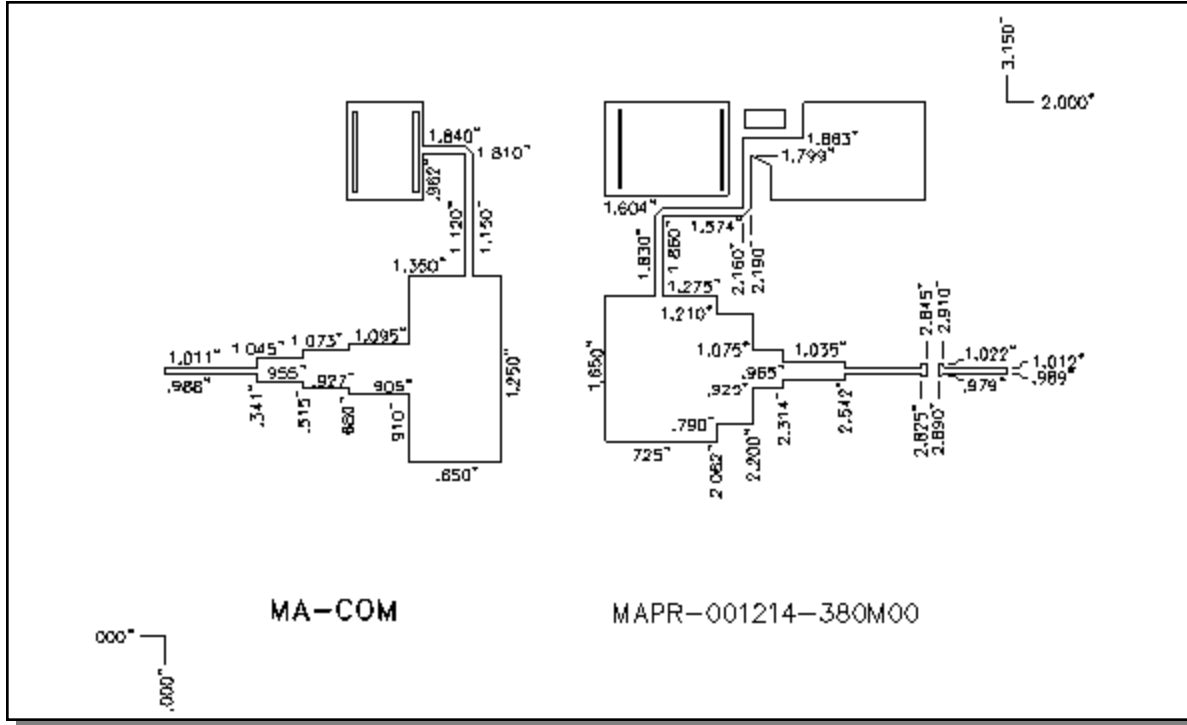
| F (MHz) | Z _{IF} (Ω) | Z _{OF} (Ω) |
|---------|---------------------|---------------------|
| 1200 | 1.3 - j1.89 | 1.08 - j1.83 |
| 1300 | 1.43 - j1.28 | 1.08 - j1.24 |
| 1400 | 1.51 - j0.73 | 1.1 - j0.75 |



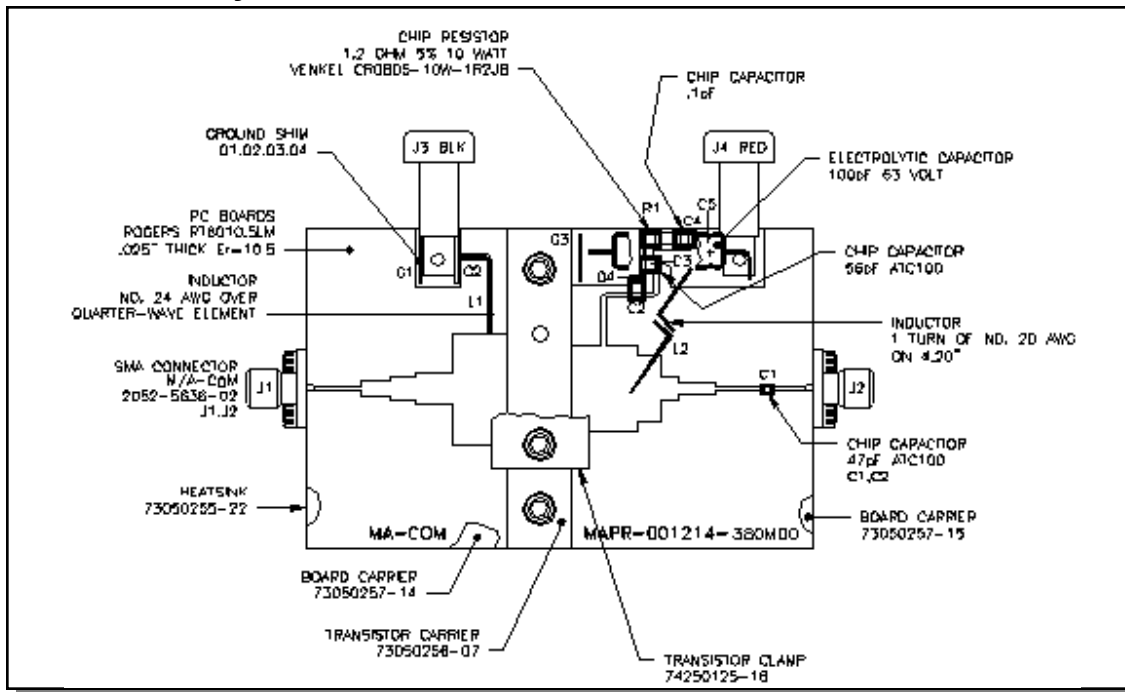
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Test Fixture Circuit Dimensions



Test Fixture Assembly



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