

# MAPRST1214-6UF



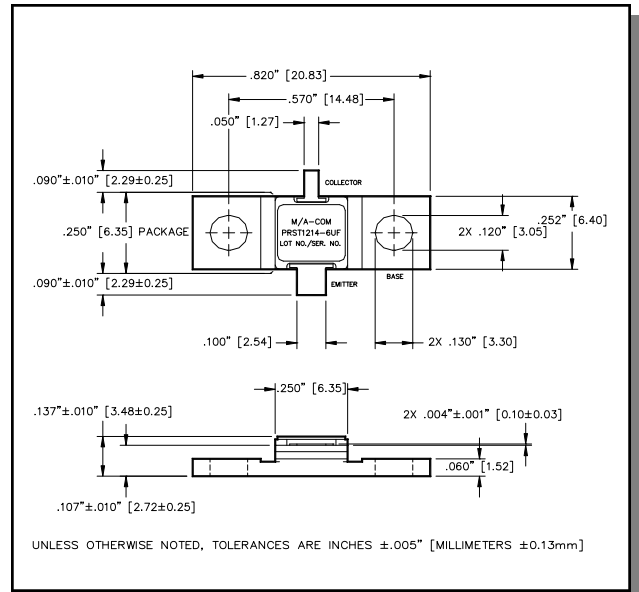
Radar Pulsed Power Transistor  
6W, 1.2-1.4 GHz, 6ms Pulse, 25% Duty

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 | $\Delta G$   | -    | 0.75  | dB    |
| Collector Efficiency                | $V_{CC} = 36\text{V}$ , $P_{in} = 0.8\text{W}$ | F = 1.2, 1.3, 1.4 GHz | $\eta_C$     | 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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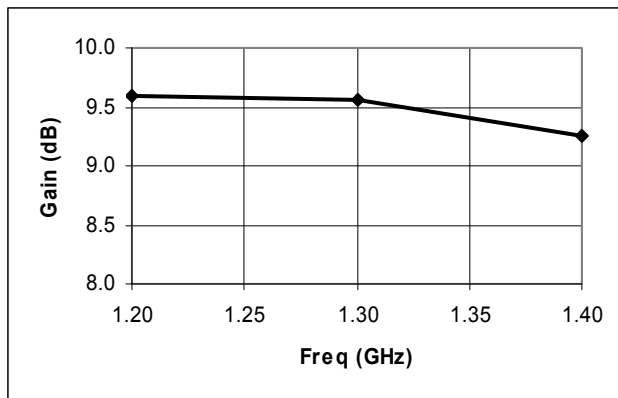
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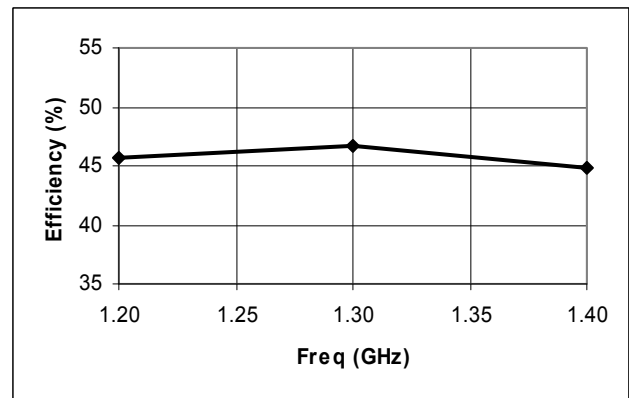
## Typical RF Performance

| 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

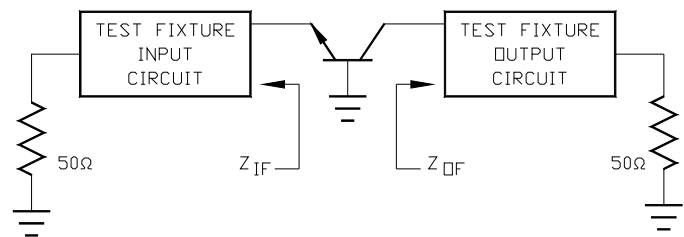


## Collector Efficiency vs. Frequency



## RF Test Fixture Impedance

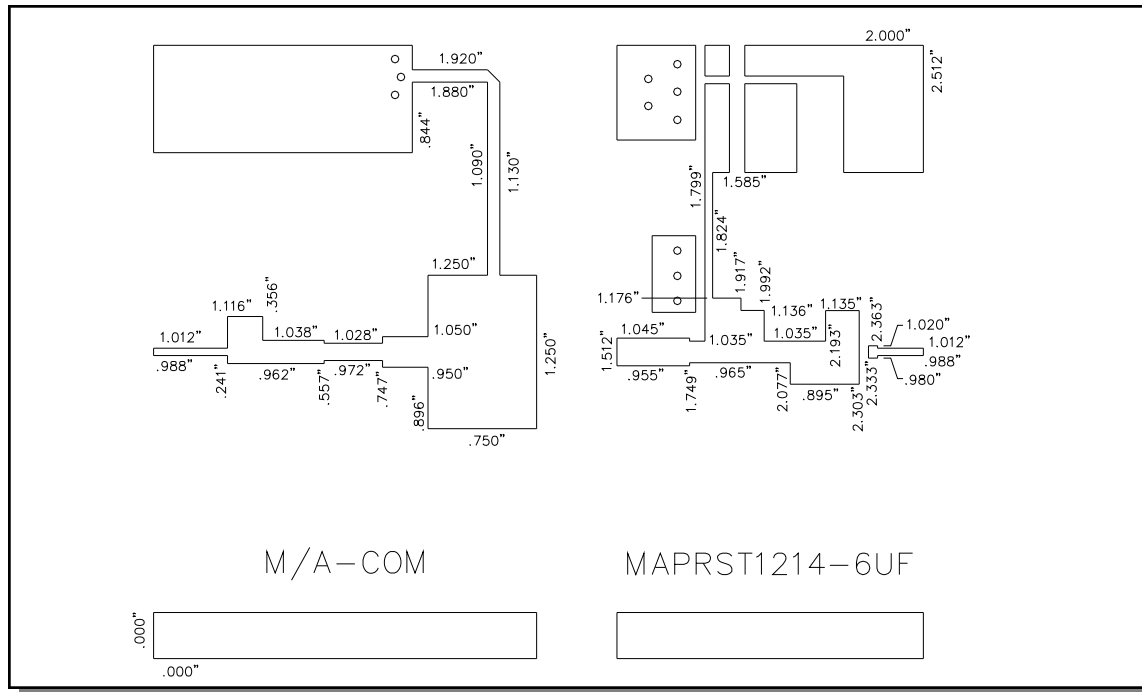
| F (GHz) | Z <sub>IF</sub> (Ω) | Z <sub>OF</sub> (Ω) |
|---------|---------------------|---------------------|
| 1.2     | 3.7 - j 3.2         | 16.9 + j18.0        |
| 1.3     | 3.8 - j 3.4         | 14.2 + j16.4        |
| 1.4     | 3.4 - j 3.7         | 11.7 + j18.2        |



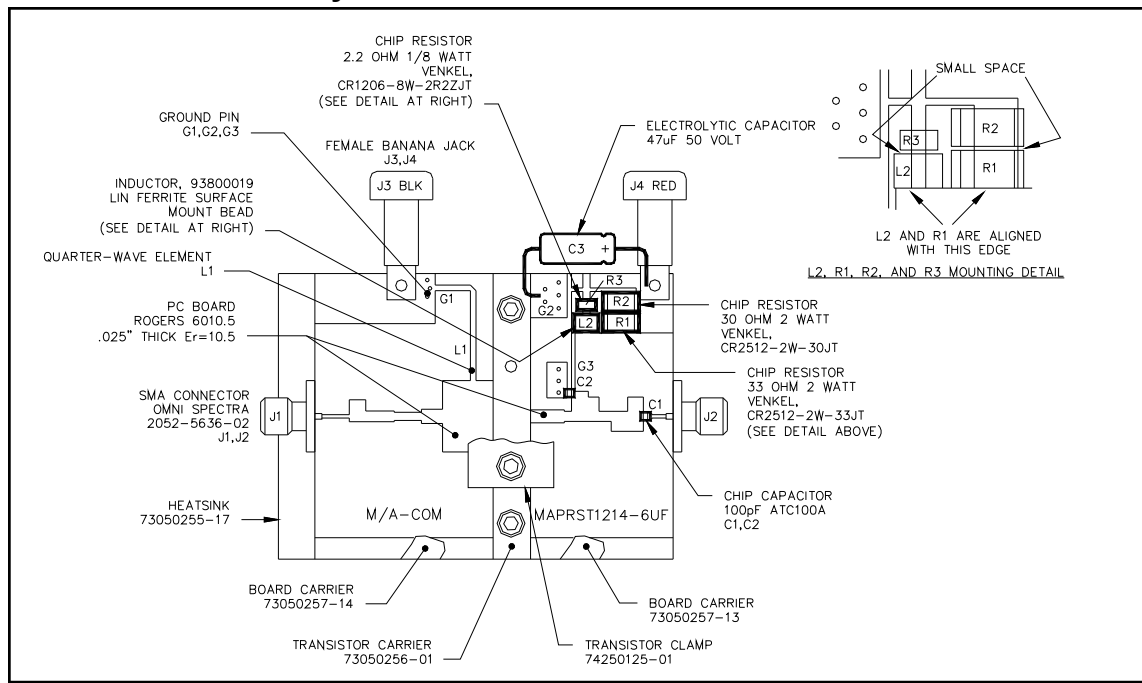
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## Test Fixture Circuit Dimensions



## Test Fixture Assembly



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