

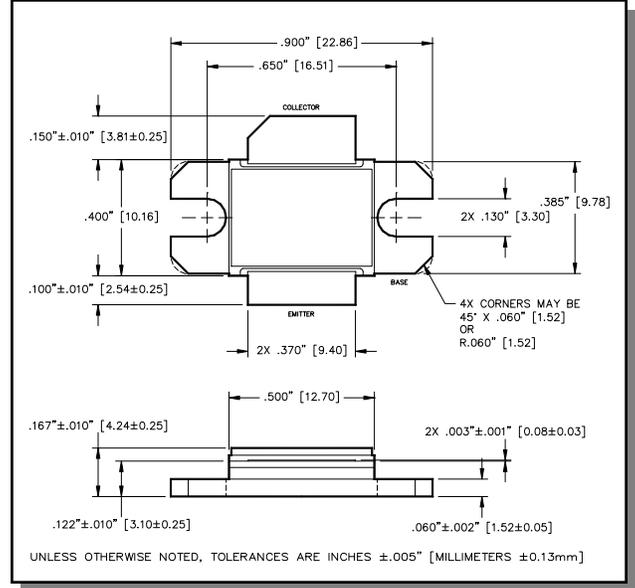
**Radar Pulsed Power Transistor**  
 135W, 2.9-3.1 GHz, 20µs Pulse, 1% Duty

**M/A-COM Products**  
 Released, 10 Aug 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 | $V_{CES}$ | 80          | V     |
| Emitter-Base Voltage      | $V_{EBO}$ | 3.0         | V     |
| Collector Current (Peak)  | $I_C$     | 12          | A     |
| Power Dissipation @ +25°C | $P_{TOT}$ | 580         | 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 | $I_C = 100\text{mA}$                          |                                | $BV_{CES}$   | 80  | -   | V     |
| Collector-Emitter Leakage Current   | $V_{CE} = 40\text{V}$                         |                                | $I_{CES}$    | -   | 7.5 | mA    |
| Thermal Resistance                  | $V_{CC} = 42\text{V}$ , $P_{in} = 24\text{W}$ | $F = 2.9, 3.0, 3.1\text{ GHz}$ | $R_{TH(JC)}$ | -   | 0.3 | °C/W  |
| Output Power                        | $V_{CC} = 42\text{V}$ , $P_{in} = 24\text{W}$ | $F = 2.9, 3.0, 3.1\text{ GHz}$ | $P_{OUT}$    | 135 | -   | W     |
| Power Gain                          | $V_{CC} = 42\text{V}$ , $P_{in} = 24\text{W}$ | $F = 2.9, 3.0, 3.1\text{ GHz}$ | $G_P$        | 7.5 | -   | dB    |
| Collector Efficiency                | $V_{CC} = 42\text{V}$ , $P_{in} = 24\text{W}$ | $F = 2.9, 3.0, 3.1\text{ GHz}$ | $\eta_C$     | 40  | -   | %     |
| Input Return Loss                   | $V_{CC} = 42\text{V}$ , $P_{in} = 24\text{W}$ | $F = 2.9, 3.0, 3.1\text{ GHz}$ | RL           | -   | -9  | dB    |
| Load Mismatch Tolerance             | $V_{CC} = 42\text{V}$ , $P_{in} = 24\text{W}$ | $F = 2.9, 3.0, 3.1\text{ GHz}$ | VSWR-T       | -   | 2:1 | -     |

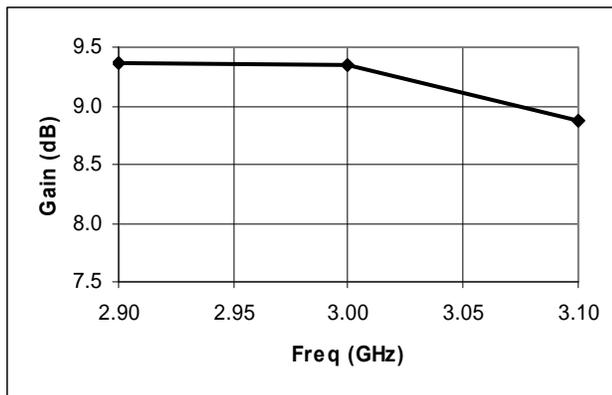
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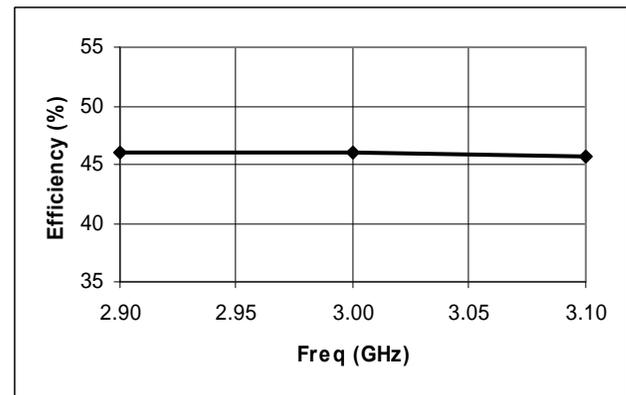
## Typical RF Performance

| Freq. (GHz) | Pin (W) | Pout (W) | Gain (dB) | Ic (A) | Eff (%) | RL (dB) | VSWR-T (2:1) |
|-------------|---------|----------|-----------|--------|---------|---------|--------------|
| 2.9         | 24      | 207      | 9.36      | 10.8   | 46.0    | -18.1   | P            |
| 3.0         | 24      | 207      | 9.35      | 10.7   | 45.9    | -19.6   | P            |
| 3.1         | 24      | 185      | 8.87      | 9.7    | 45.6    | -13.3   | P            |

## Gain vs. Frequency

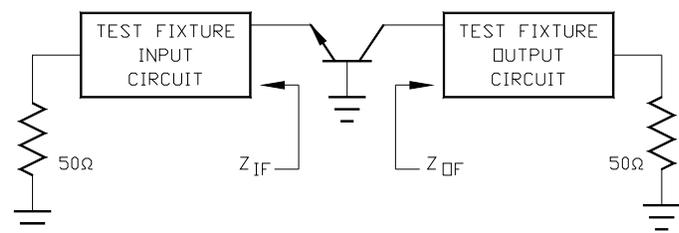


## Collector Efficiency vs. Frequency



## RF Test Fixture Impedance

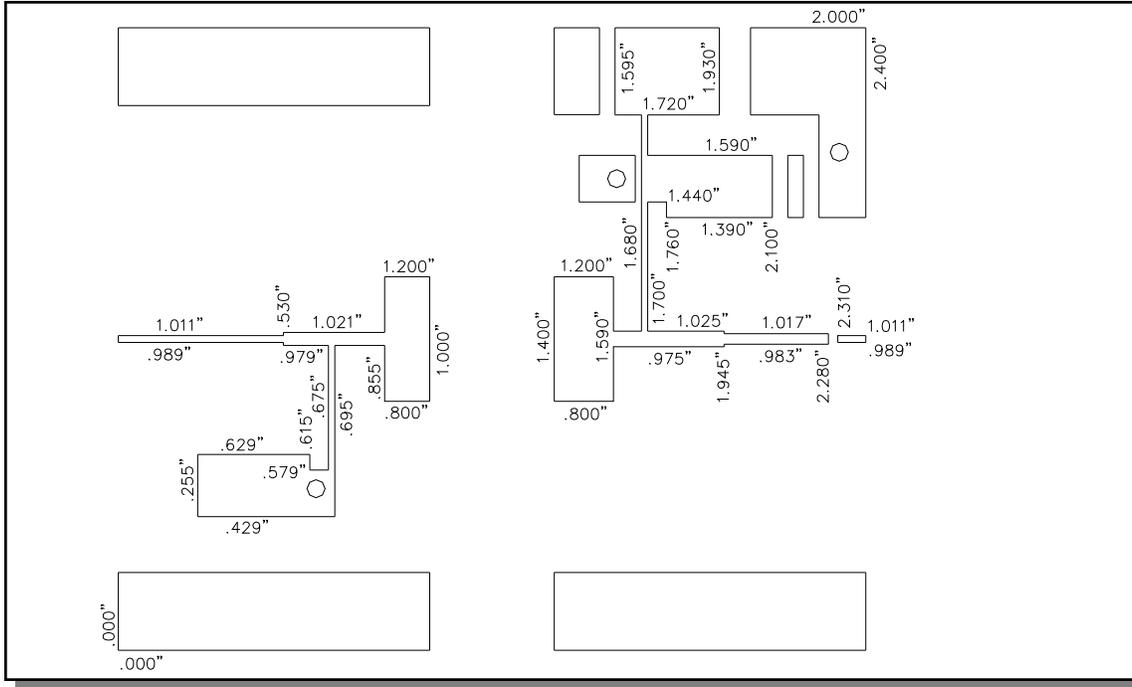
| F (GHz) | Z <sub>IF</sub> (Ω) | Z <sub>OF</sub> (Ω) |
|---------|---------------------|---------------------|
| 2.9     | 4.0 - j6.0          | 2.3 - j4.3          |
| 3.0     | 4.2 - j5.9          | 2.5 - j3.9          |
| 3.1     | 4.1 - j5.9          | 2.4 - j3.8          |



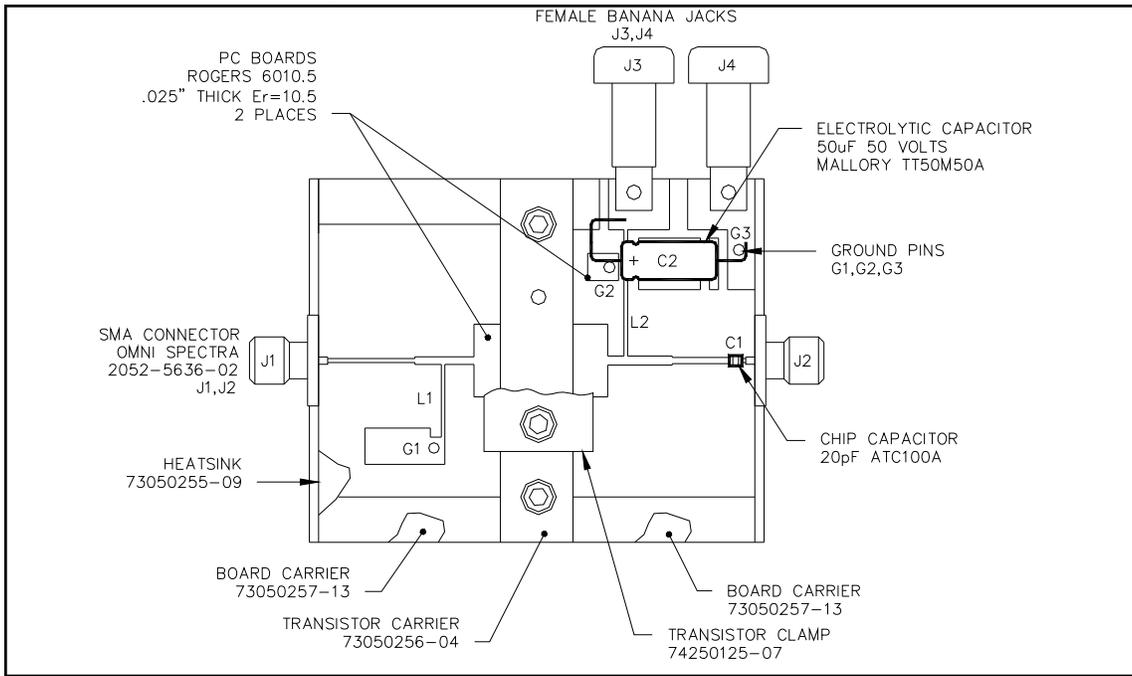
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## Test Fixture Circuit Dimensions



## Test Fixture Assembly



**ADVANCED:** Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.

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