

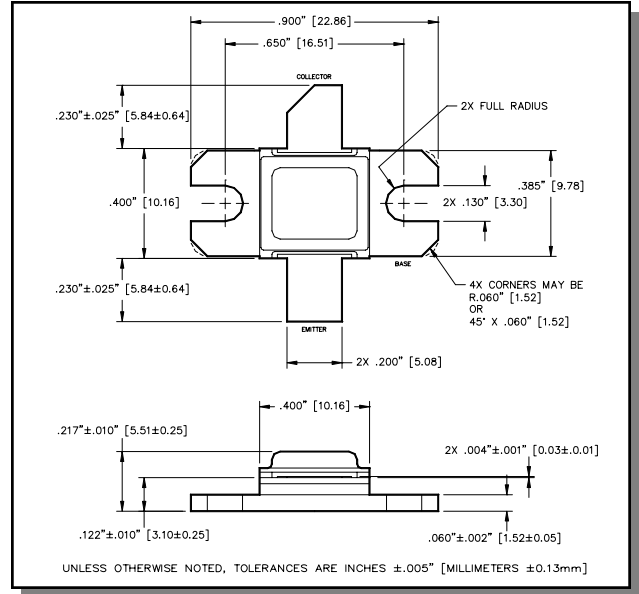
**Radar Pulsed Power Transistor**  
**100W, 1.2-1.4 GHz, 2ms Pulse, 20% Duty**

**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 | $V_{CES}$ | 75          | V     |
| Emitter-Base Voltage      | $V_{EBO}$ | 3.0         | V     |
| Collector Current (Peak)  | $I_C$     | 14.1        | A     |
| Power Dissipation @ +25°C | $P_{TOT}$ | 250         | W     |
| Storage Temperature       | $T_{STG}$ | -65 to +200 | °C    |
| Junction Temperature      | $T_J$     | 200         | °C    |

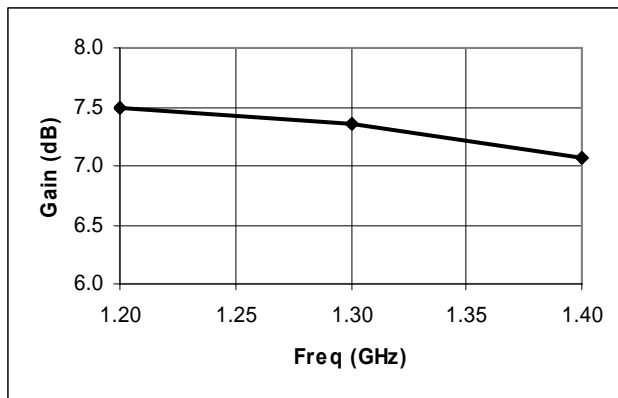
## Electrical Specifications: $T_C = 25 \pm 5^\circ\text{C}$ (Room Ambient)

| Parameter                           | Test Conditions                            | Frequency                       | Symbol       | Min | Max   | Units |
|-------------------------------------|--|---------------------------------|--------------|-----|-------|-------|
| Collector-Emitter Breakdown Voltage | $I_C = 50\text{mA}$                        |                                 | $BV_{CES}$   | 70  | -     | V     |
| Collector-Emitter Leakage Current   | $V_{CE} = 28\text{V}$                      |                                 | $I_{CES}$    | -   | 10    | mA    |
| Thermal Resistance                  | $V_{CC} = 28\text{V}, P_{in} = 25\text{W}$ | $F = 1.2, 1.3, 1.4 \text{ GHz}$ | $R_{TH(JC)}$ | -   | 0.7   | °C/W  |
| Output Power                        | $V_{CC} = 28\text{V}, P_{in} = 25\text{W}$ | $F = 1.2, 1.3, 1.4 \text{ GHz}$ | $P_{OUT}$    | 100 | -     | W     |
| Power Gain                          | $V_{CC} = 28\text{V}, P_{in} = 25\text{W}$ | $F = 1.2, 1.3, 1.4 \text{ GHz}$ | $G_P$        | 6.0 | -     | dB    |
| Collector Efficiency                | $V_{CC} = 28\text{V}, P_{in} = 25\text{W}$ | $F = 1.2, 1.3, 1.4 \text{ GHz}$ | $\eta_C$     | 52  | -     | %     |
| Input Return Loss                   | $V_{CC} = 28\text{V}, P_{in} = 25\text{W}$ | $F = 1.2, 1.3, 1.4 \text{ GHz}$ | RL           | -   | -8    | dB    |
| Load Mismatch Tolerance             | $V_{CC} = 28\text{V}, P_{in} = 25\text{W}$ | $F = 1.2, 1.3, 1.4 \text{ GHz}$ | VSWR-T       | -   | 3:1   | -     |
| Load Mismatch Stability             | $V_{CC} = 28\text{V}, P_{in} = 25\text{W}$ | $F = 1.2, 1.3, 1.4 \text{ GHz}$ | VSWR-S       | -   | 1.5:1 | -     |

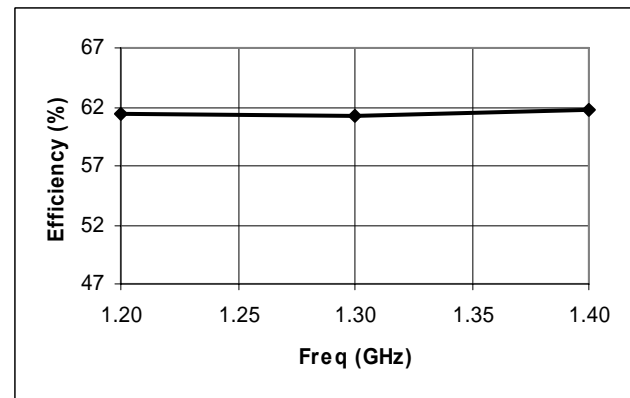
## Typical RF Performance

| Freq. (GHz) | Pin (W) | Pout (W) | Gain (dB) | Ic (A) | Eff (%) | RL (dB) | VSWR-S (1.5:1) | VSWR-T (3:1) |
|-------------|---------|----------|-----------|--------|---------|---------|----------------|--------------|
| 1.2         | 25      | 140      | 7.48      | 16.3   | 61.4    | -14.9   | S              | P            |
| 1.3         | 25      | 136      | 7.35      | 15.8   | 61.3    | -13.5   | S              | P            |
| 1.4         | 25      | 127      | 7.07      | 14.7   | 61.8    | -13.9   | 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     | 2.6 - j3.8          | 3.0 - j2.7          |
| 1.3     | 3.0 - j3.4          | 2.4 - j2.6          |
| 1.4     | 3.4 - j3.1          | 1.9 - j2.5          |

