

**AVIONICS PULSED POWER TRANSISTOR**  
500 WATTS, 960-1215 MHz, 10us PULSE, 10% DUTY

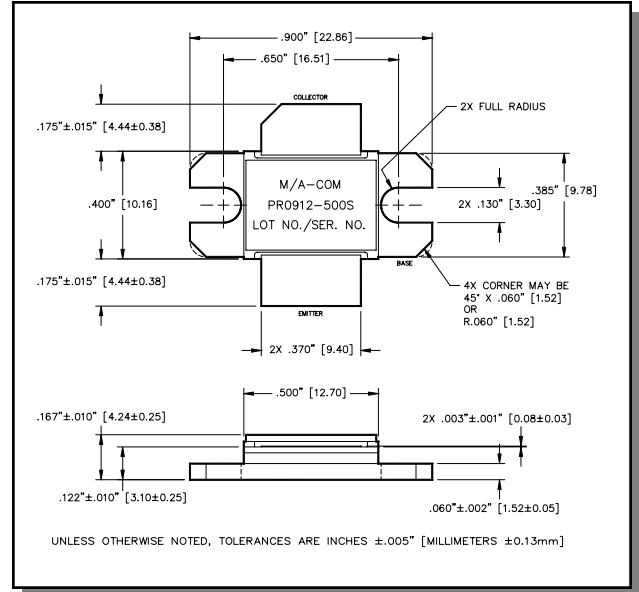
MAPR-000912-500S00

11 Jan 2007

**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)  | $I_C$     | 52.5        | A     |
| Power Dissipation @ +25°C | $P_{TOT}$ | 2.2         | kW    |
| 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 | $I_C = 80\text{mA}$                           |                         | $BV_{CES}$   | 80  | -     | V     |
| Collector-Emitter Leakage Current   | $V_{CE} = 40\text{V}$                         |                         | $I_{CES}$    | -   | 15    | mA    |
| Thermal Resistance                  | $V_{CC} = 50\text{V}$ , $P_{in} = 63\text{W}$ | F = 960, 1090, 1215 MHz | $R_{TH(JC)}$ | -   | 0.08  | °C/W  |
| Output Power                        | $V_{CC} = 50\text{V}$ , $P_{in} = 63\text{W}$ | F = 960, 1090, 1215 MHz | $P_O$        | 500 | -     | W     |
| Power Gain                          | $V_{CC} = 50\text{V}$ , $P_{in} = 63\text{W}$ | F = 960, 1090, 1215 MHz | $G_P$        | 9.0 | -     | dB    |
| Collector Efficiency                | $V_{CC} = 50\text{V}$ , $P_{in} = 63\text{W}$ | F = 960, 1090, 1215 MHz | $\eta_C$     | 45  | -     | %     |
| Input Return Loss                   | $V_{CC} = 50\text{V}$ , $P_{in} = 63\text{W}$ | F = 960, 1090, 1215 MHz | RL           | -   | -9    | dB    |
| Load Mismatch Tolerance             | $V_{CC} = 50\text{V}$ , $P_{in} = 63\text{W}$ | F = 960 MHz             | VSWR-T       | -   | 3:1   | -     |
| Load Mismatch Stability             | $V_{CC} = 50\text{V}$ , $P_{in} = 63\text{W}$ | F = 960, 1090, 1215 MHz | VSWR-S       | -   | 1.5:1 | -     |

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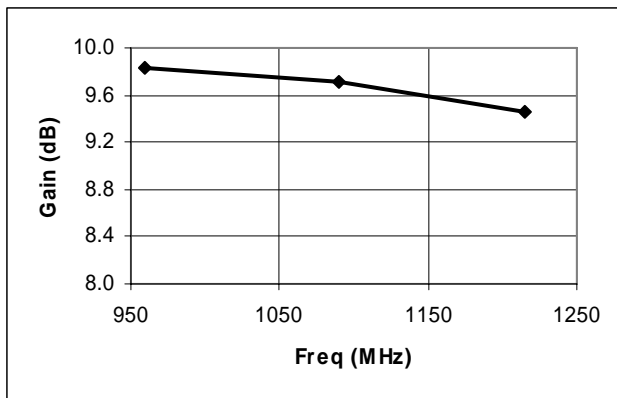
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**Typical RF Performance**

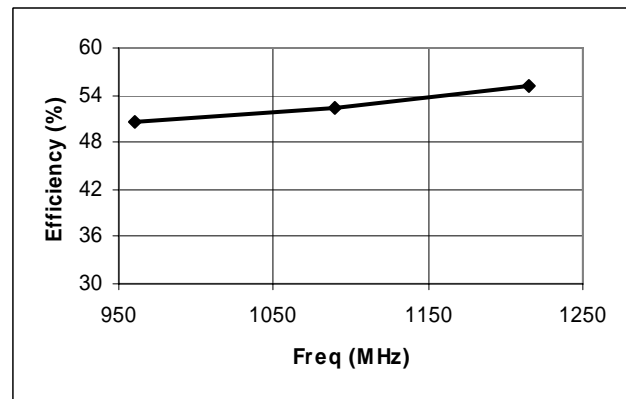
| Freq. (MHz) | Pin (W) | Pout (W) | Gain (dB) | $\Delta$ Gain (dB) | Ic (A) | Eff (%) | RL (dB) | VSWR-S (1.5:1) | VSWR-T (3:1) | P1dB Overdrive |             |
|-------------|---------|----------|-----------|--------------------|--------|---------|---------|----------------|--------------|----------------|-------------|
|             |         |          |           |                    |        |         |         |                |              | Pout           | $\Delta$ Po |
| 960         | 63      | 598      | 9.77      | -                  | 23.5   | 50.9    | -17.1   | S              | P            | 675            | 0.52        |
| 1090        | 63      | 582      | 9.65      | -                  | 21.9   | 53.1    | -21.8   | S              | -            | 677            | 0.66        |
| 1215        | 63      | 554      | 9.44      | 0.33               | 19.7   | 56.1    | -16.8   | S              | -            | 619            | 0.48        |

Note:  $\Delta$ Po(dB) is the difference between Pout at 1dB overdrive and Pout at Pin = 63W.

**Gain vs. Frequency**



**Collector Efficiency vs. Frequency**

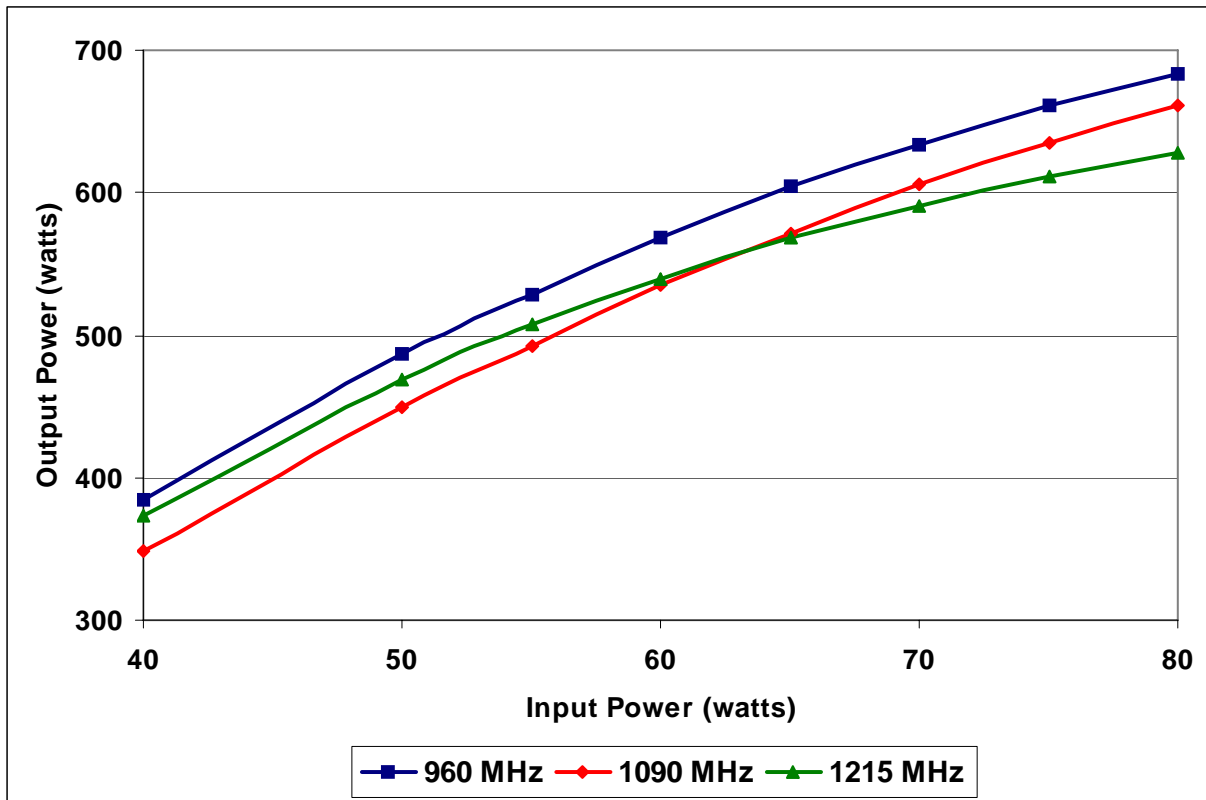


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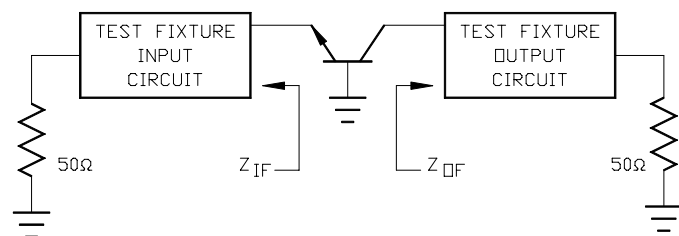
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**RF Power Transfer Curve**  
(Output Power Vs. Input Power)



**Broadband Test Fixture Impedance**

| F (MHz) | Z <sub>IF</sub> (Ω) | Z <sub>OF</sub> (Ω) |
|---------|---------------------|---------------------|
| 960     | 1.3 - j1.4          | 1.2 - j1.4          |
| 1025    | 1.3 - j1.1          | 1.2 - j1.1          |
| 1090    | 1.2 - j0.9          | 1.3 - j0.9          |
| 1150    | 1.2 - j0.8          | 1.4 - j0.7          |
| 1215    | 1.0 - j0.8          | 1.3 - j0.6          |

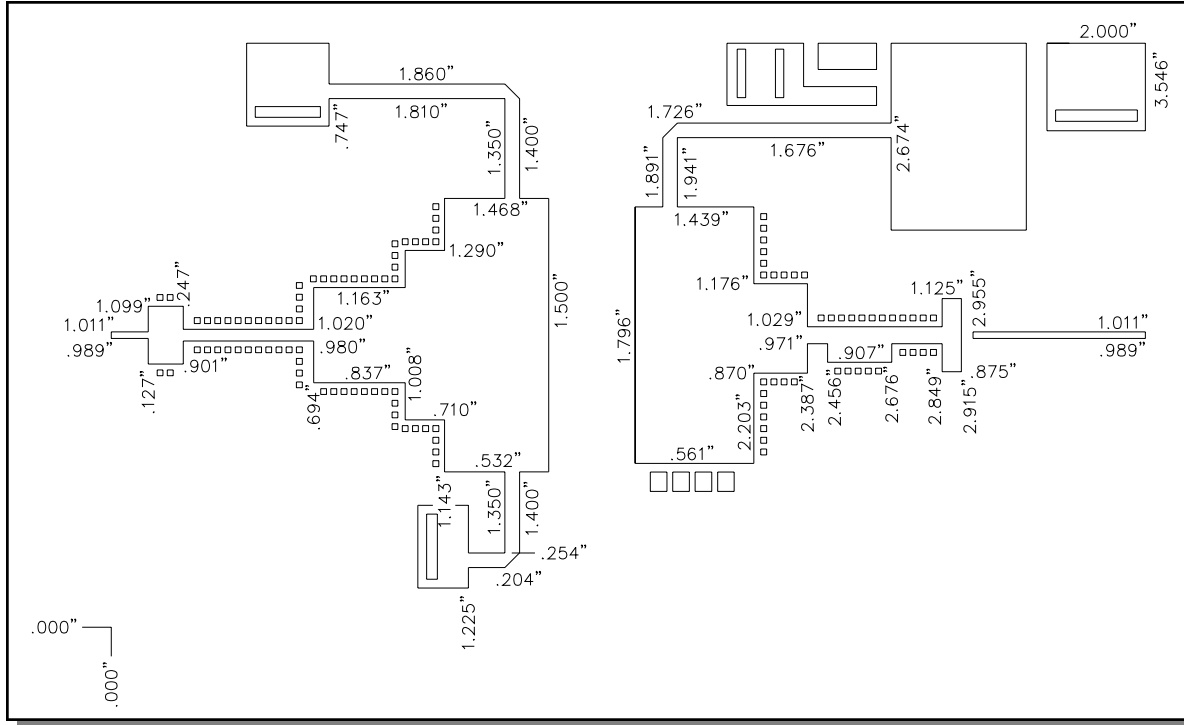


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**Test Fixture Circuit Dimensions**



**Test Fixture Assembly**

