

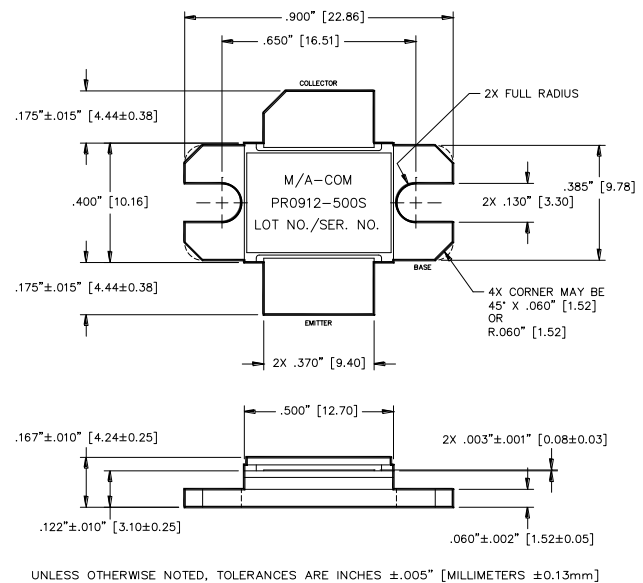
Avionics Pulsed Power Transistor 500 W, 960 - 1215 MHz, 10 μ s Pulse, 10 % Duty

Rev. V1

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 @ +25°C

| Parameter | Symbol | Rating |
|---------------------------|-----------|-----------------|
| Collector-Emitter Voltage | V_{CES} | 80 V |
| Emitter-Base Voltage | V_{EBO} | 3 V |
| Collector Current (Peak) | I_C | 52.5 A |
| Power Dissipation | P_{TOT} | 2.2 kW |
| Storage Temperature | T_{STG} | -65°C to +200°C |
| Junction Temperature | T_J | +200°C |

Electrical Specifications: $V_{CC} = 50$ V, $P_{IN} = 63$ W, $T_A = 25 \pm 5^\circ$ C (unless otherwise noted)

| Parameter | Symbol | Test Conditions | Units | Min. | Max. |
|-------------------------------------|--------------|-------------------------|-------|------|-------|
| Collector-Emitter Breakdown Voltage | BV_{CES} | $I_C = 80$ mA | V | 80 | - |
| Collector-Emitter Leakage Current | I_{CES} | $V_{CE} = 40$ V | mA | - | 15 |
| Thermal Resistance | $R_{TH(JC)}$ | F = 960, 1090, 1215 MHz | °C/W | - | 0.08 |
| Output Power | P_O | F = 960, 1090, 1215 MHz | W | 500 | - |
| Power Gain | G_P | F = 960, 1090, 1215 MHz | dB | 9 | - |
| Collector Efficiency | h_C | F = 960, 1090, 1215 MHz | % | 45 | - |
| Input Return Loss | RL | F = 960, 1090, 1215 MHz | dB | - | -9 |
| Load Mismatch Stability | VSWR-T | F = 960 MHz | - | - | 3:1 |
| Load Mismatch Tolerance | VSWR-S | F = 960, 1090, 1215 MHz | - | - | 1.5:1 |

* Restrictions on Hazardous Substances, European Union Directive 2011/65/EU.

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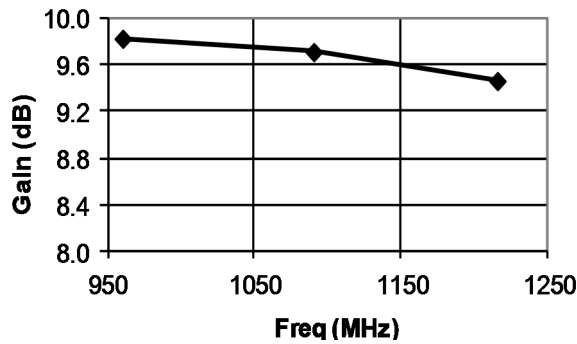
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Typical RF Performance

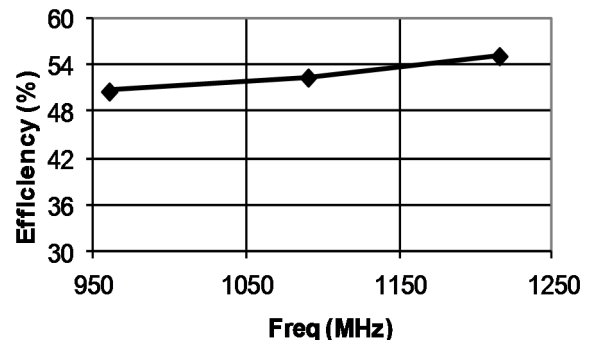
| Freq. (MHz) | P _{IN} (W) | P _{OUT} (W) | Gain (dB) | Δ Gain (dB) | I _c (A) | Eff (%) | RL (dB) | VSWR-S (1.5:1) | VSWR-T (10:1) | P1dB Overdrive | |
|-------------|---------------------|----------------------|-----------|--------------------|--------------------|---------|---------|----------------|---------------|----------------------|------------------------------|
| | | | | | | | | | | P _{OUT} (W) | Δ P _O (dB) |
| 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 | 033 | 19.7 | 56.1 | -16.8 | S | — | 619 | 0.48 |

Note: Δ Po(dB) is the difference between P_{OUT} at 1dB overdrive and P_{OUT} at P_{IN} = 63 W.

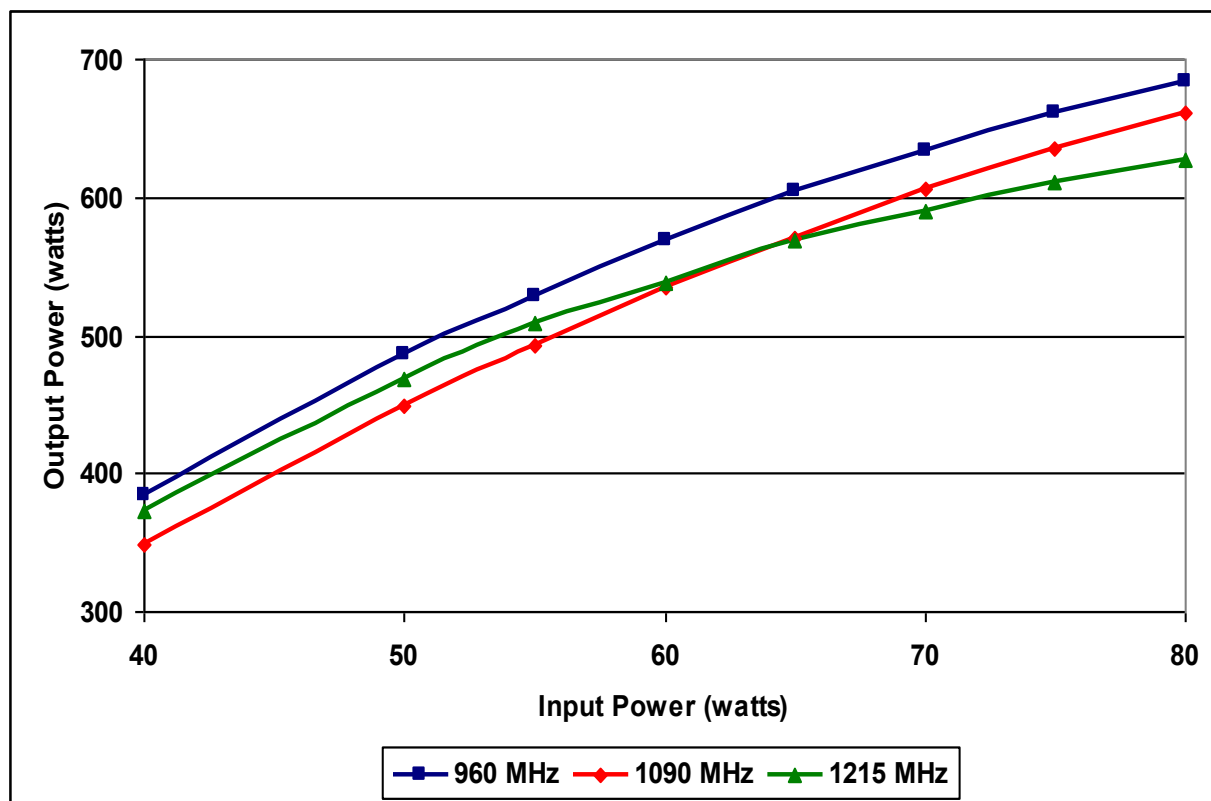
Gain vs. Frequency



Collector Efficiency vs. Frequency

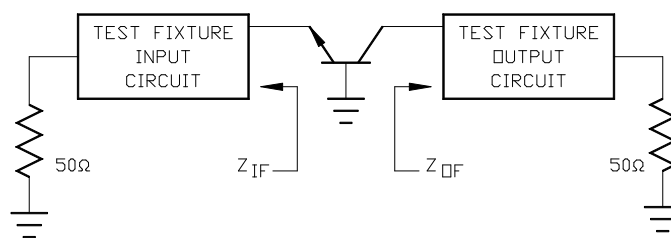


RF Power Transfer Curve (Output Power Vs. Input Power)



Broadband Test Fixture Impedance

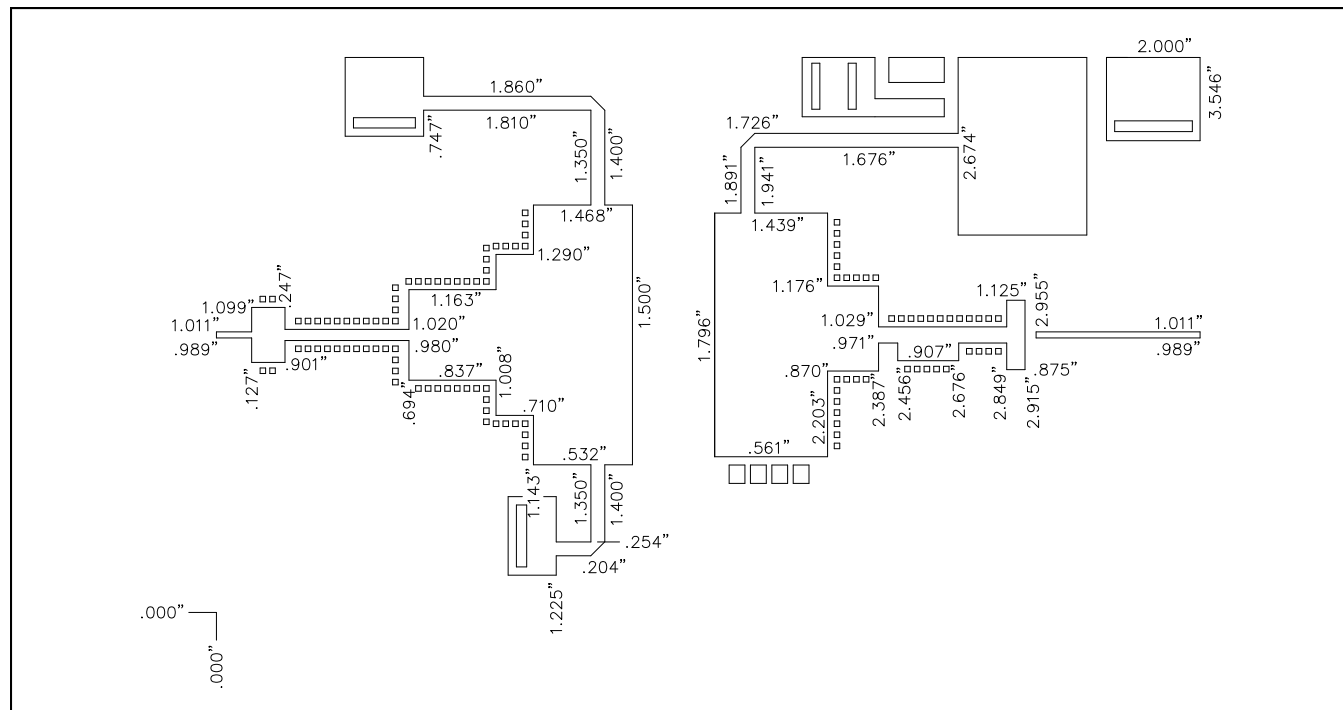
| F (MHz) | Z _{IF} (Ω) | Z _{OF} (Ω) |
|---------|------------------------------|------------------------------|
| 960 | 1.3 - j1.4 | 1.27 - j1.4 |
| 1025 | 1.3 - j1.1 | 1.2 - j1.1 |
| 1090 | 1.2 - j0.9 | 1.3 - j0.9 |
| 1150 | 1.2 - j0.8 | 1.4 - j0.7 |
| 1215 | 1.0 - j0.8 | 1.3 - j0.6 |



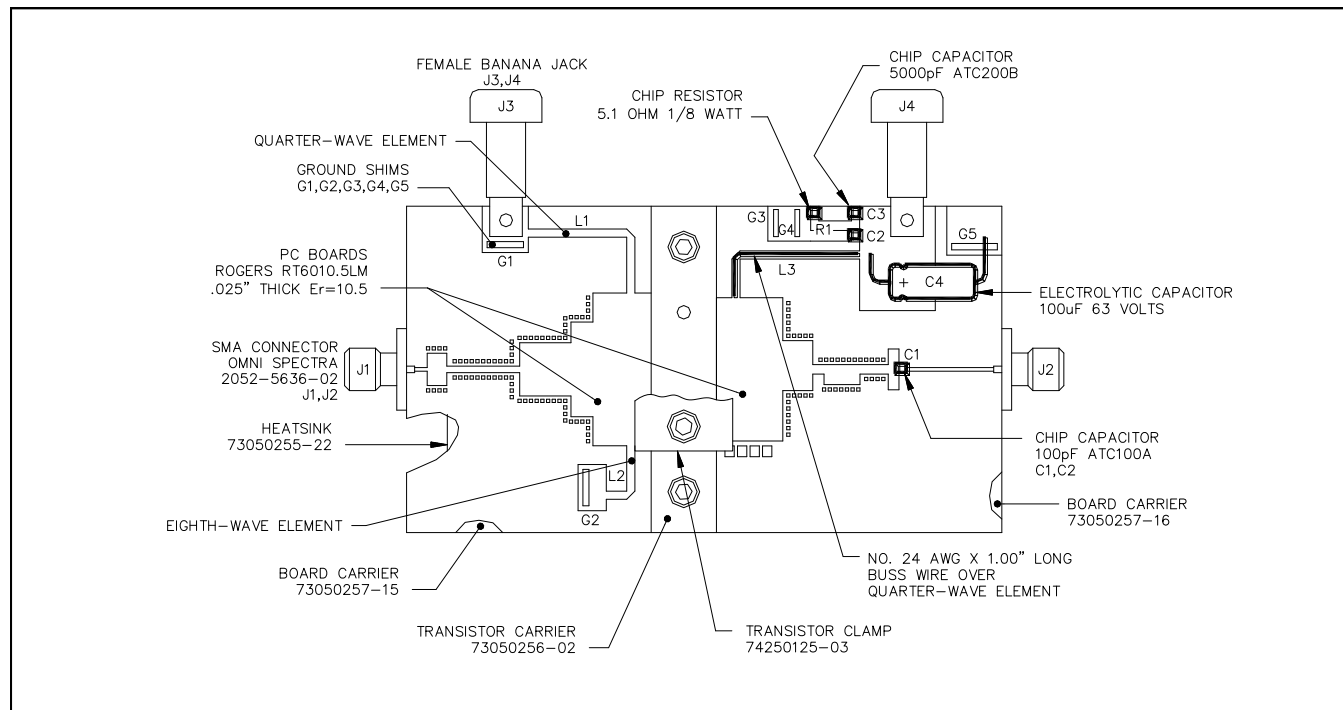
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Test Fixture Circuit Dimensions



Test Fixture Assembly



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