

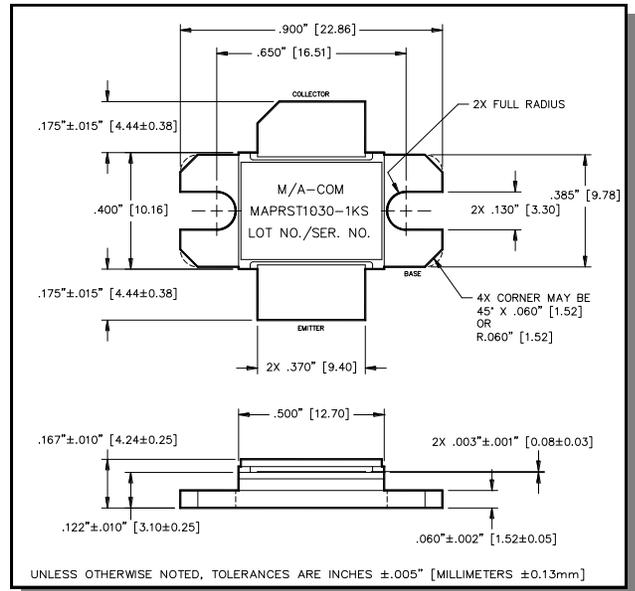
Avionics Pulsed Power Transistor 1000W, 1030 MHz, 10µs Pulse, 1% Duty

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 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 | 250 | A |
| Power Dissipation @ +25°C | P_{TOT} | 11.6 | 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)

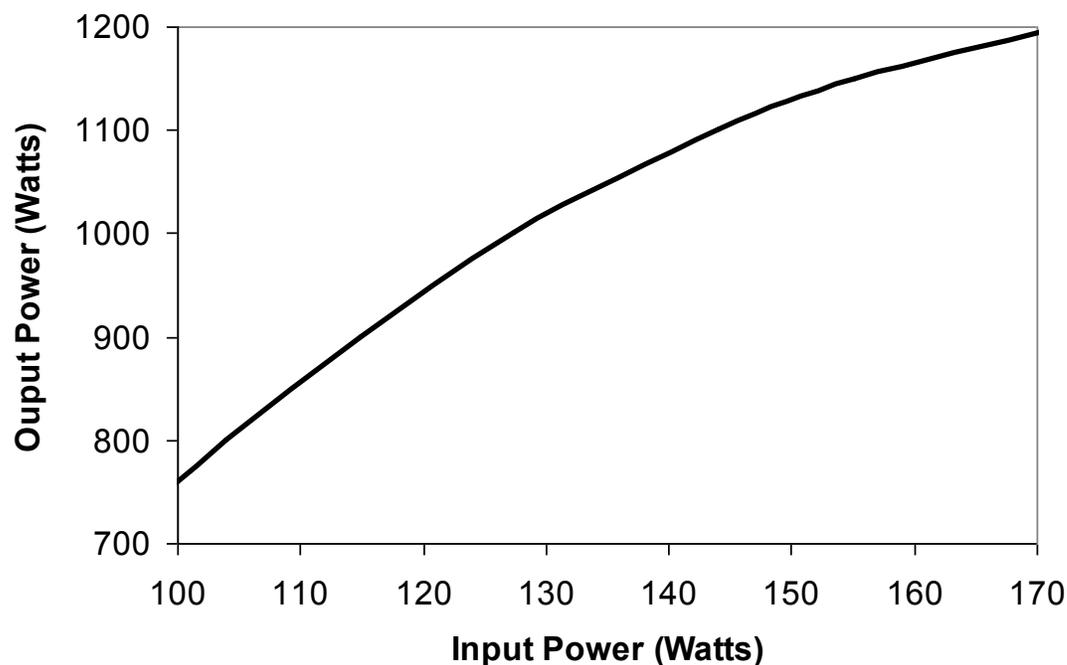
| Parameter | Test Conditions | Frequency | Symbol | Min | Max | Units |
|-------------------------------------|--|-----------------------|--------------|-----|-------|-------|
| Collector-Emitter Breakdown Voltage | $I_C = 250\text{mA}$ | | BV_{CES} | 65 | - | V |
| Collector-Emitter Leakage Current | $V_{CE} = 50\text{V}$ | | I_{CES} | - | 30 | mA |
| Thermal Resistance | $V_{CC} = 50\text{V}$, $P_{out} = 1000\text{W}$ | $F = 1030\text{ MHz}$ | $R_{TH(JC)}$ | - | 0.015 | °C/W |
| Input Power | $V_{CC} = 50\text{V}$, $P_{out} = 1000\text{W}$ | $F = 1030\text{ MHz}$ | P_{IN} | - | 158 | W |
| Power Gain | $V_{CC} = 50\text{V}$, $P_{out} = 1000\text{W}$ | $F = 1030\text{ MHz}$ | G_P | 8.0 | - | dB |
| Collector Efficiency | $V_{CC} = 50\text{V}$, $P_{out} = 1000\text{W}$ | $F = 1030\text{ MHz}$ | η_C | 45 | - | % |
| Input Return Loss | $V_{CC} = 50\text{V}$, $P_{out} = 1000\text{W}$ | $F = 1030\text{ MHz}$ | RL | - | -10 | dB |
| Load Mismatch Tolerance | $V_{CC} = 50\text{V}$, $P_{out} = 1000\text{W}$ | $F = 1030\text{ MHz}$ | VSWR-T | - | 10:1 | - |
| Load Mismatch Stability | $V_{CC} = 50\text{V}$, $P_{out} = 1000\text{W}$ | $F = 1030\text{ MHz}$ | VSWR-S | - | 1.5:1 | - |

Typical RF Performance

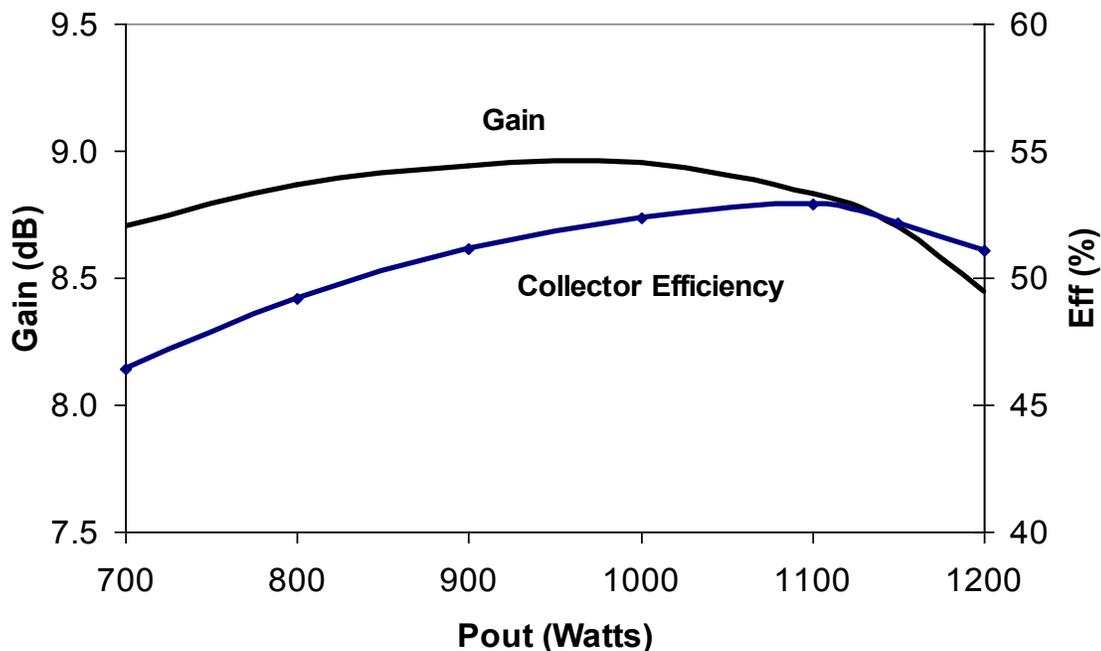
| Freq. (MHz) | Pin (W) | Pout (W) | Gain (dB) | Ic (A) | Eff (%) | RL (dB) | VSWR-S (1.5:1) | VSWR-T (10:1) | P1dB Overdrive | |
|-------------|---------|----------|-----------|--------|---------|---------|----------------|---------------|----------------|-------------|
| | | | | | | | | | Pout | Δ Po |
| 1030 | 134 | 1000 | 8.74 | 39.5 | 50.8 | -21.3 | S | P | 1180 | 0.74 |

Note: Δ Po(dB) is the difference between Pout at 1dB overdrive and Pout at Pout = 1000W.

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

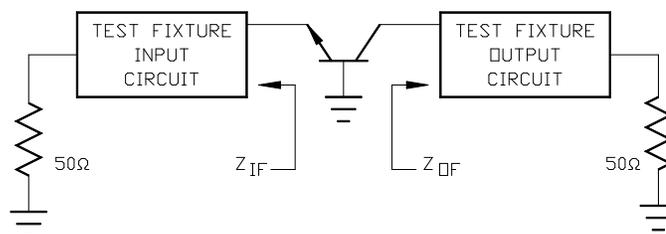


RF Power Transfer Curve (Gain & Collector Efficiency vs. Output Power)

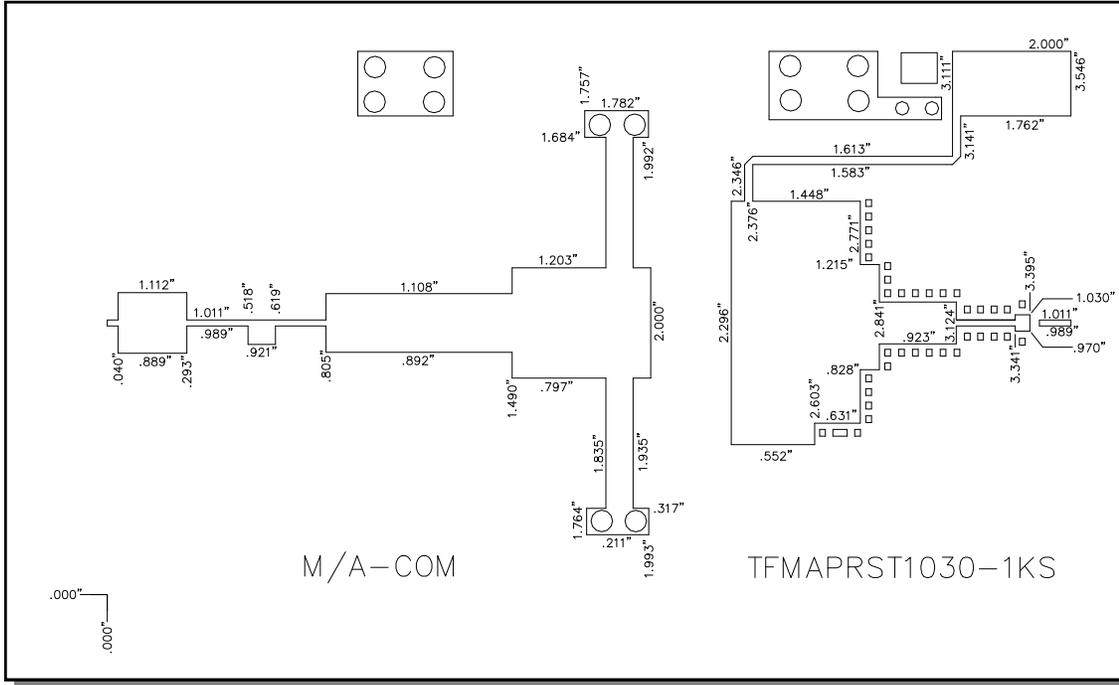


RF Test Fixture Impedance

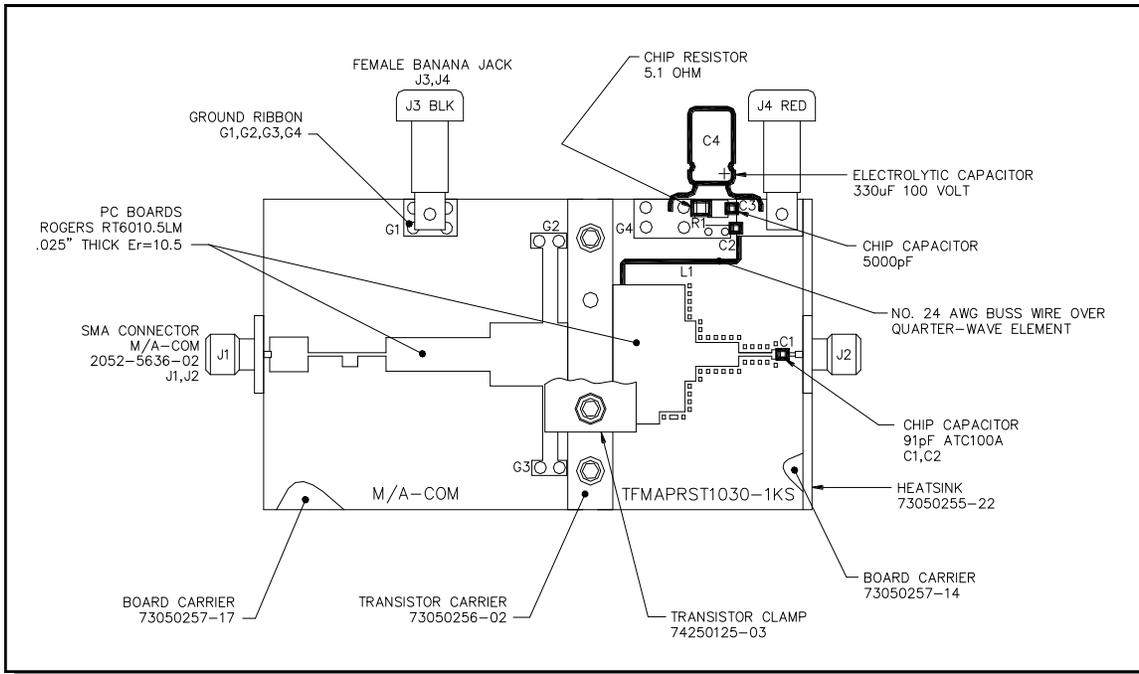
| F (MHz) | Z _{IF} (Ω) | Z _{OF} (Ω) |
|---------|---------------------|---------------------|
| 1030 | 1.8 - j2.2 | 0.5 - j1.0 |



Test Fixture Circuit Dimensions



Test Fixture Assembly



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