# PH2731-75L

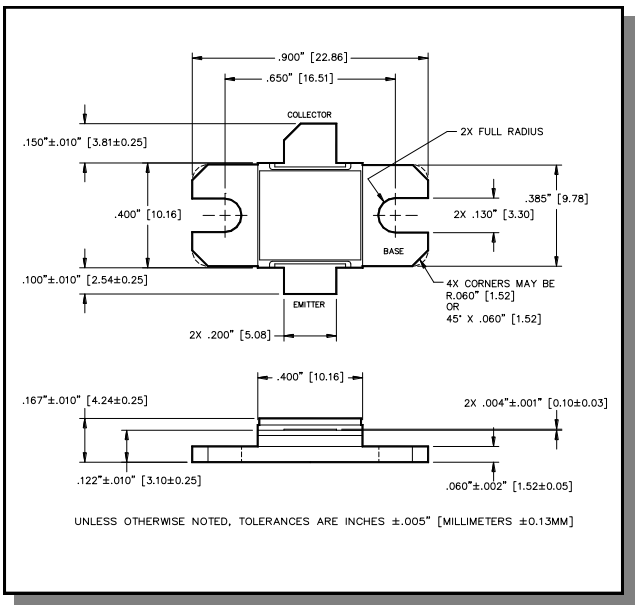
## Radar Pulsed Power Transistor
## 75 W, 2.7 - 3.1 GHz, 300 µs Pulse, 10% Duty

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 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) | $I_C$ | 7.0 | A |
| Power Dissipation @ +25°C | $P_{TOT}$ | 220 | W |
| Storage Temperature | $T_{STG}$ | -65 to +200 | °C |
| Junction Temperature | $T_J$ | 200 | °C |

### Electrical Specifications: $T_C$ = 25 ± 5°C (Room Ambient )

| Parameter | Test Conditions | Frequency | Symbol | Min | Max | Units |
|---|---|---|---|---|---|---|
| Collector-Emitter Breakdown Voltage | $I_C$ = 50mA | | $BV_{CES}$ | 65 | - | V |
| Collector-Emitter Leakage Current | $V_{CE}$ = 36V | | $I_{CES}$ | - | 7.5 | mA |
| Thermal Resistance | Vcc = 36V, Pout =75W | F = 2.7, 2.9, 3.1 GHz | $R_{TH(JC)}$ | - | 0.8 | °C/W |
| Output Power | Vcc = 36V, Pout =75W | F = 2.7, 2.9, 3.1 GHz | $P_{IN}$ | - | 13.5 | W |
| Power Gain | Vcc = 36V, Pout =75W | F = 2.7, 2.9, 3.1 GHz | $G_P$ | 7.45 | - | dB |
| Collector Efficiency | Vcc = 36V, Pout =75W | F = 2.7, 2.9, 3.1 GHz | $\eta_C$ | 38 | - | % |
| Input Return Loss | Vcc = 36V, Pout =75W | F = 2.7, 2.9, 3.1 GHz | RL | - | -6 | dB |
| Load Mismatch Tolerance | Vcc = 36V, Pout =75W | F = 2.7, 2.9, 3.1 GHz | VSWR-T | - | 3:1 | - |
| Load Mismatch Stability | Vcc = 36V, Pout =75W | F = 2.7, 2.9, 3.1 GHz | VSWR-S | - | 1.5:1 | - |

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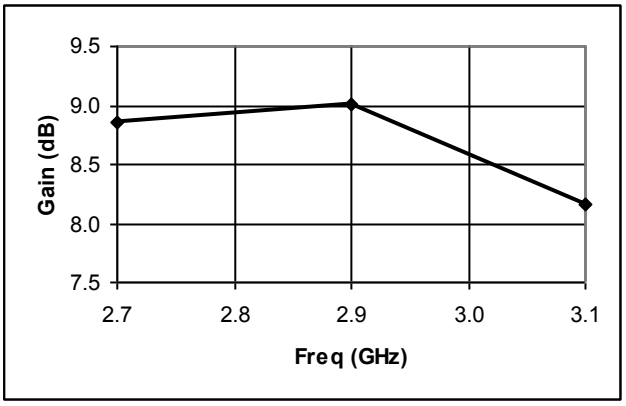
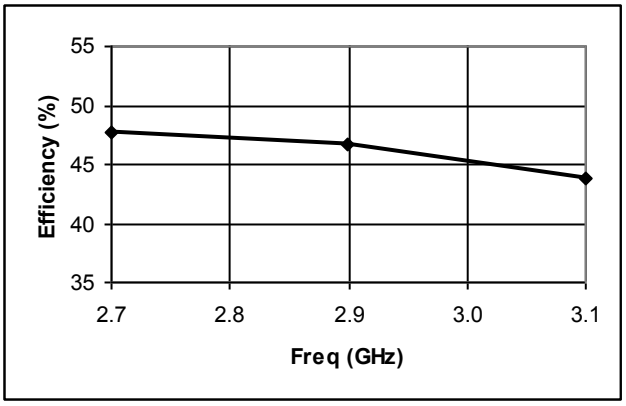
### Typical RF Performance

| Freq. (GHz) | Pin (W) | Pout (W) | Gain (dB) | Ic (A) | Eff (%) | RL (dB) | VSWR-S (1.5:1) | VSWR-T (3:1) |
|---|---|---|---|---|---|---|---|---|
| 2.7 | 9.8 | 75 | 8.86 | 4.40 | 47.8 | -11.0 | S | P |
| 2.9 | 9.4 | 75 | 9.01 | 4.50 | 46.7 | -18.5 | S | P |
| 3.1 | 11.5 | 75 | 8.16 | 4.80 | 43.8 | -17.7 | S | P |

### Gain vs. Frequency

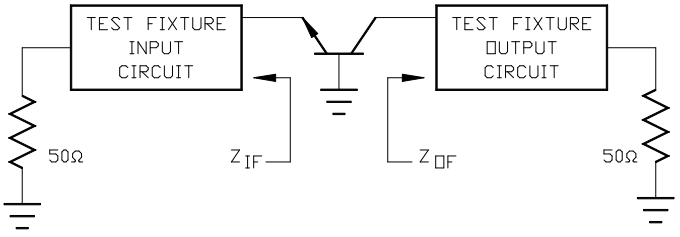



### Collector Efficiency vs. Frequency




### RF Test Fixture Impedance

| F (GHz) | $Z_{IF}$ (Ω) | $Z_{OF}$ (Ω) |
|---|---|---|
| 2.7 | 6.9 - j12.2 | 4.5 - j6.8 |
| 2.9 | 6.0 - j11.7 | 3.9 - j6.1 |
| 3.1 | 5.2 - j10.0 | 3.4 - j4.8 |



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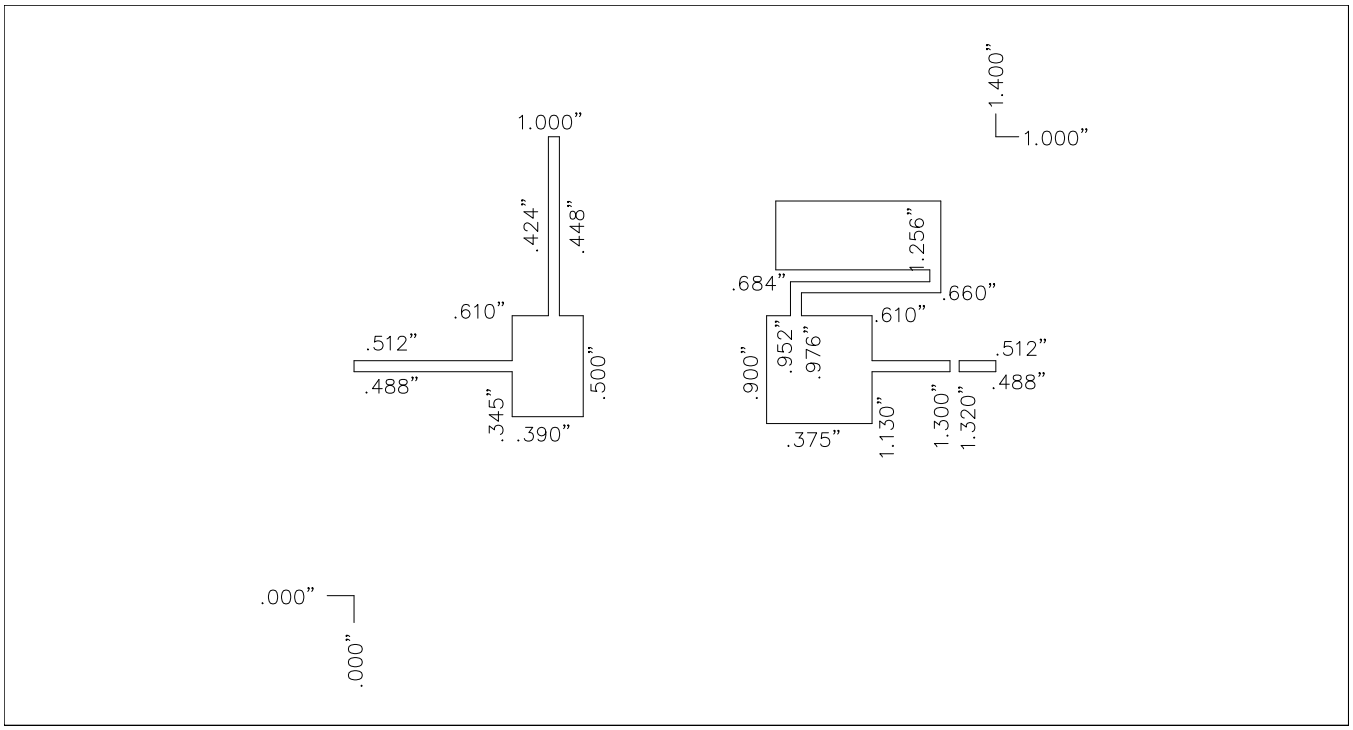
### Test Fixture Circuit Dimensions




### Test Fixture Assembly