

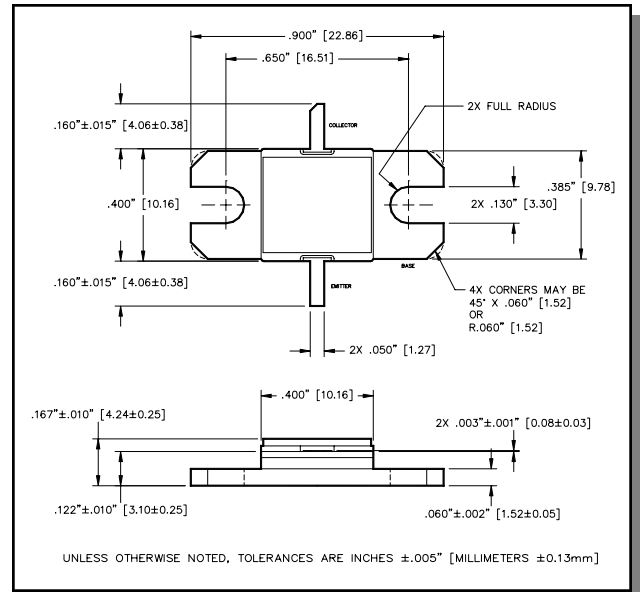
Radar Pulsed Power Transistor  
20W, 2.7-3.1 GHz, 100µs Pulse, 10% Duty

M/A-COM Products  
Released, 29 Jun 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	$V_{CES}$	65	V
Emitter-Base Voltage	$V_{EBO}$	3.0	V
Collector Current (Peak)	$I_C$	1.85	A
Power Dissipation @ +25°C	$P_{TOT}$	70	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	$I_C = 10\text{mA}$		$BV_{CES}$	65	-	V
Collector-Emitter Leakage Current	$V_{CE} = 40\text{V}$		$I_{CES}$	-	1.5	mA
Thermal Resistance	$V_{CC} = 36\text{V}$ , $P_{in} = 3.0\text{W}$	$F = 2.7, 2.9, 3.1\text{ GHz}$	$R_{TH(JC)}$	-	2.5	°C/W
Output Power	$V_{CC} = 36\text{V}$ , $P_{in} = 3.0\text{W}$	$F = 2.7, 2.9, 3.1\text{ GHz}$	$P_{OUT}$	20	-	W
Power Gain	$V_{CC} = 36\text{V}$ , $P_{in} = 3.0\text{W}$	$F = 2.7, 2.9, 3.1\text{ GHz}$	$G_P$	8.2	-	dB
Collector Efficiency	$V_{CC} = 36\text{V}$ , $P_{in} = 3.0\text{W}$	$F = 2.7, 2.9, 3.1\text{ GHz}$	$\eta_C$	45	-	%
Input Return Loss	$V_{CC} = 36\text{V}$ , $P_{in} = 3.0\text{W}$	$F = 2.7, 2.9, 3.1\text{ GHz}$	RL	-	-6	dB
Load Mismatch Tolerance	$V_{CC} = 36\text{V}$ , $P_{in} = 3.0\text{W}$	$F = 2.7, 2.9, 3.1\text{ GHz}$	VSWR-T	-	3:1	-
Load Mismatch Stability	$V_{CC} = 36\text{V}$ , $P_{in} = 3.0\text{W}$	$F = 2.7, 2.9, 3.1\text{ GHz}$	VSWR-S	-	1.5:1	-

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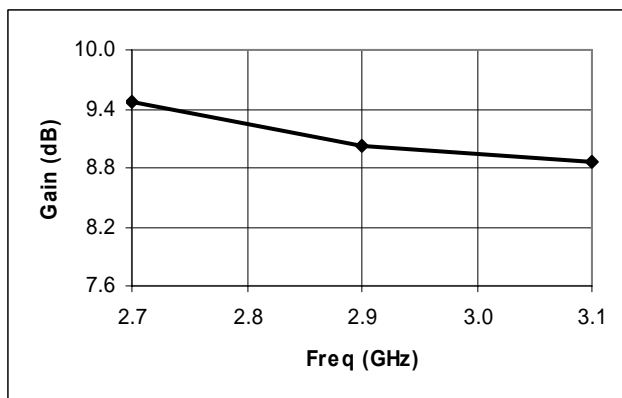
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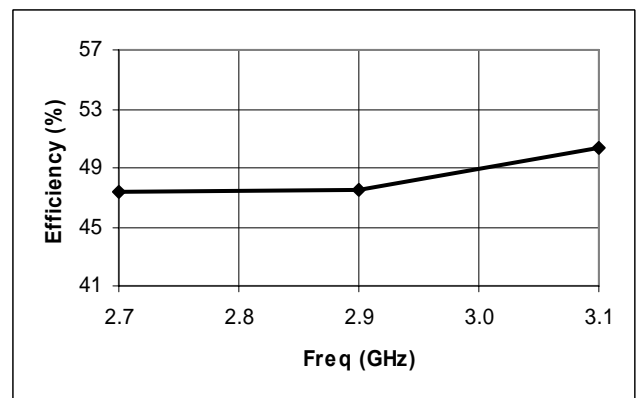
## Typical RF Performance

Freq. (GHz)	Pin (W)	P <sub>out</sub> (W)	Gain (dB)	I <sub>c</sub> (A)	Eff (%)	RL (dB)	VSWR-S (1.5:1)	VSWR-T (3:1)
2.7	3.0	26.6	9.48	1.56	47.4	-12.3	S	P
2.9	3.0	24.0	9.03	1.40	47.5	-16.6	S	P
3.1	3.0	23.1	8.87	1.28	50.3	-21.0	S	P

## Gain vs. Frequency

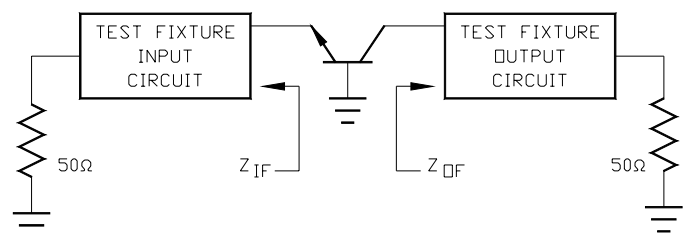


## Collector Efficiency vs. Frequency



## RF Test Fixture Impedance

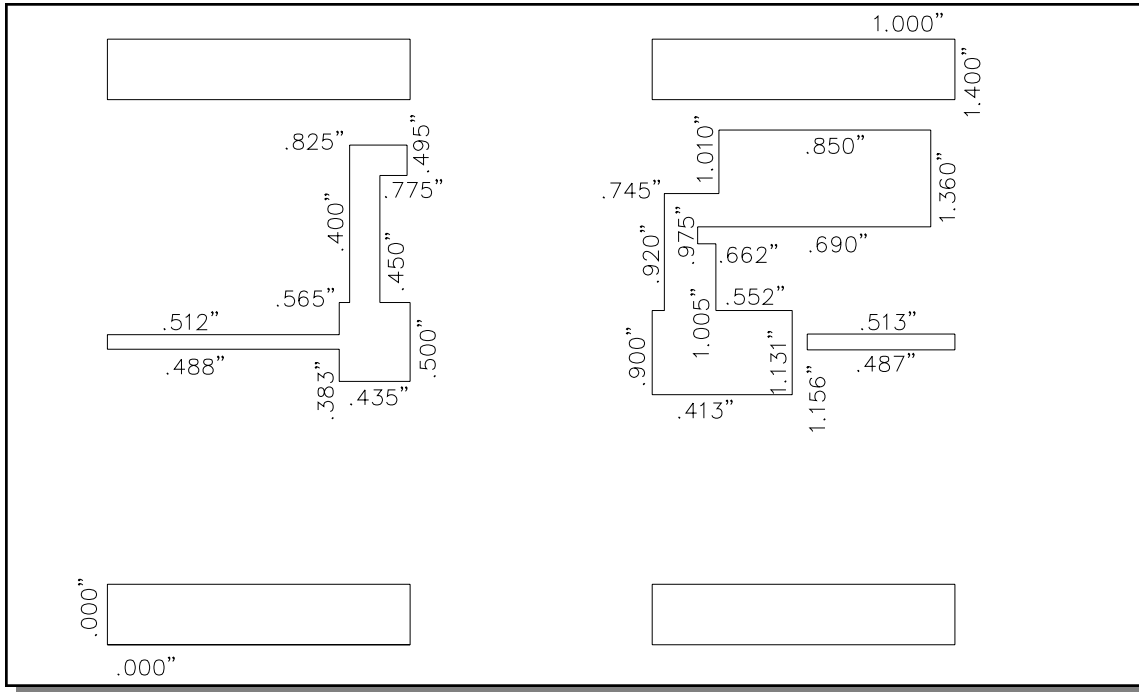
F (GHz)	Z <sub>IF</sub> (Ω)	Z <sub>OF</sub> (Ω)
2.7	38.0 - j14.4	17.1 - j8.7
2.9	33.0 - j17.8	13.3 - j8.3
3.1	27.0 - j19.4	10.9 - j7.4



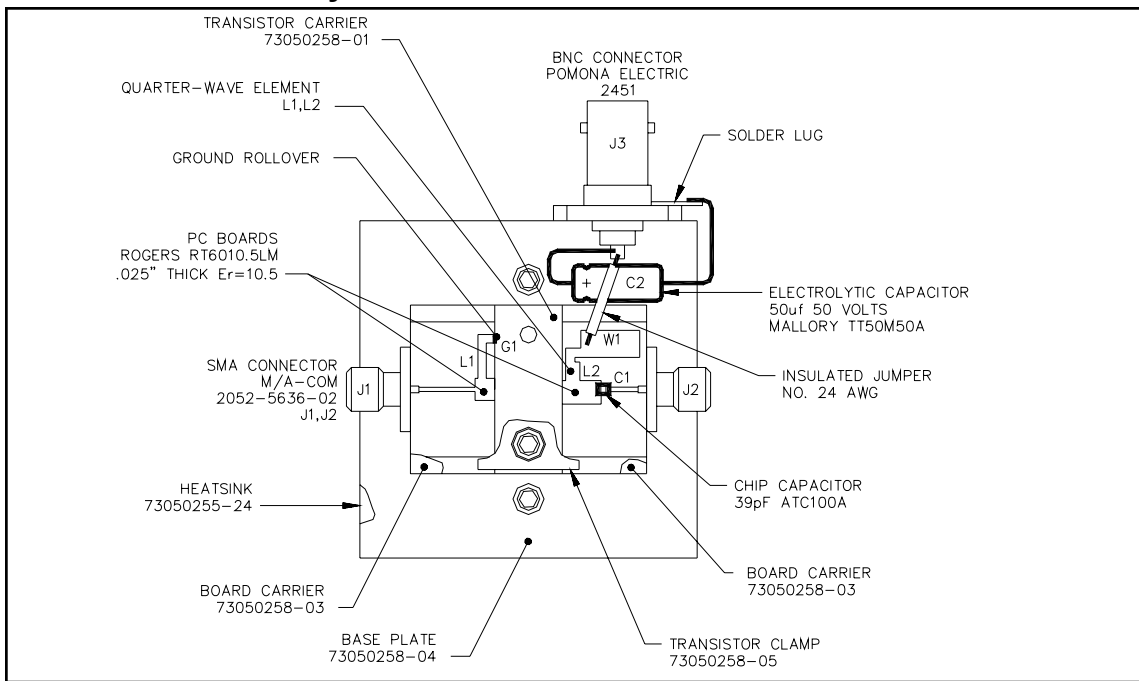
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## Test Fixture Circuit Dimensions



## Test Fixture Assembly



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