

# PH1214-220M



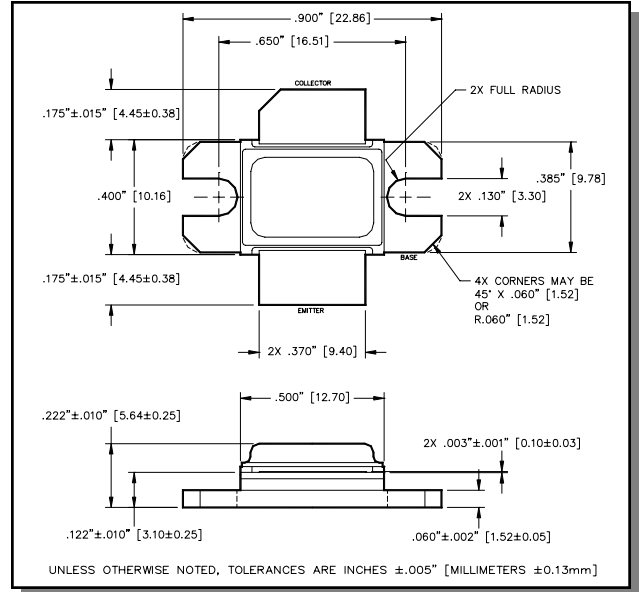
Radar Pulsed Power Transistor  
220W, 1.2-1.4 GHz, 150µs Pulse, 10% Duty

M/A-COM Products  
Released, 30 May 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	$V_{CES}$	70	V
Emitter-Base Voltage	$V_{EBO}$	3.0	V
Collector Current (Peak)	$I_C$	21	A
Power Dissipation @ +25°C	$P_{TOT}$	700	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	$I_C = 100\text{mA}$		$BV_{CES}$	70	-	V
Collector-Emitter Leakage Current	$V_{CE} = 40\text{V}$		$I_{CES}$	-	10	mA
Thermal Resistance	$V_{CC} = 40\text{V}$ , $P_{in} = 40\text{W}$	$F = 1.2, 1.3, 1.4 \text{ GHz}$	$R_{TH(JC)}$	-	0.25	°C/W
Output Power	$V_{CC} = 40\text{V}$ , $P_{in} = 40\text{W}$	$F = 1.2, 1.3, 1.4 \text{ GHz}$	$P_{OUT}$	220	-	W
Power Gain	$V_{CC} = 40\text{V}$ , $P_{in} = 40\text{W}$	$F = 1.2, 1.3, 1.4 \text{ GHz}$	$G_P$	7.4	-	dB
Collector Efficiency	$V_{CC} = 40\text{V}$ , $P_{in} = 40\text{W}$	$F = 1.2, 1.3, 1.4 \text{ GHz}$	$\eta_C$	50	-	%
Input Return Loss	$V_{CC} = 40\text{V}$ , $P_{in} = 40\text{W}$	$F = 1.2, 1.3, 1.4 \text{ GHz}$	RL	-	-9	dB
Pulse Droop	$V_{CC} = 40\text{V}$ , $P_{in} = 40\text{W}$	$F = 1.2, 1.3, 1.4 \text{ GHz}$	Droop	-	0.8	dB
Load Mismatch Tolerance	$V_{CC} = 40\text{V}$ , $P_{in} = 40\text{W}$	$F = 1.2, 1.3, 1.4 \text{ GHz}$	VSWR-T	-	3:1	-
Load Mismatch Stability	$V_{CC} = 40\text{V}$ , $P_{in} = 40\text{W}$	$F = 1.2, 1.3, 1.4 \text{ GHz}$	VSWR-S	-	1.5:1	-

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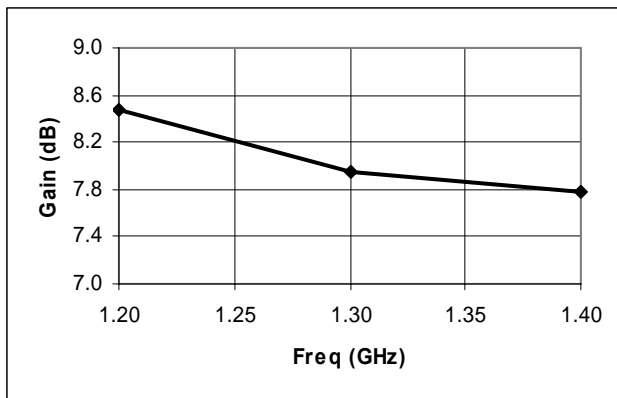
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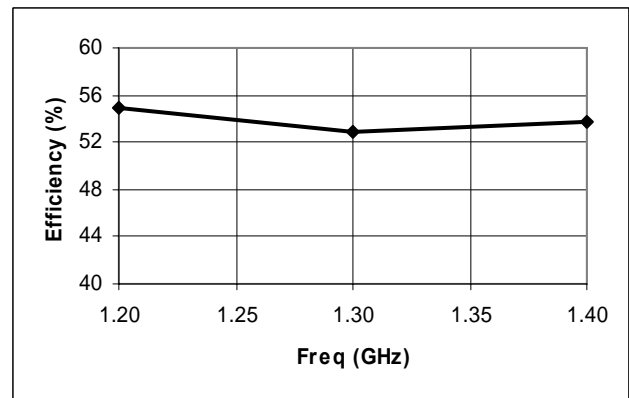
## Typical RF Performance

Freq. (GHz)	Pin (W)	Pout (W)	Gain (dB)	Ic (A)	Eff (%)	Droop (dB)	RL (dB)	VSWR-S (1.5:1)	VSWR-T (3:1)
1.2	40	281	8.47	12.8	54.8	0.34	-16.7	S	P
1.3	40	250	7.95	11.8	53.0	0.22	-16.8	S	P
1.4	40	240	7.78	11.2	53.7	0.24	-15.4	S	P

## Gain vs. Frequency

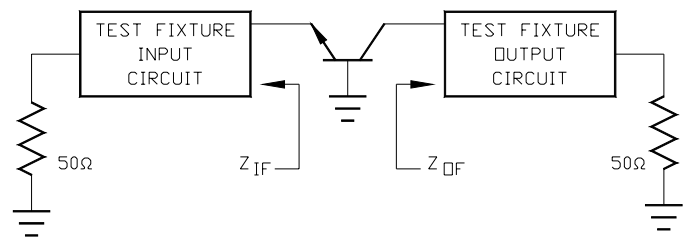


## Collector Efficiency vs. Frequency



## RF Test Fixture Impedance

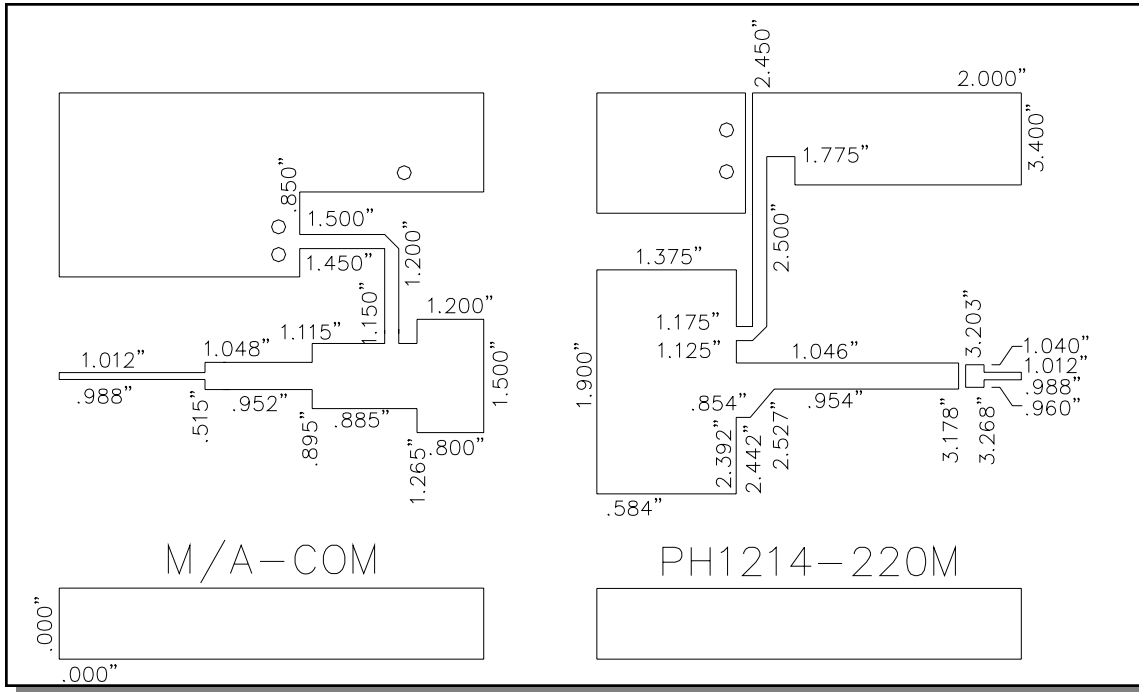
F (GHz)	Z <sub>IF</sub> (Ω)	Z <sub>OF</sub> (Ω)
1.2	3.3 - j2.7	2.0 - j1.5
1.3	3.4 - j2.1	1.9 - j1.6
1.4	3.6 - j1.3	1.7 - j1.4



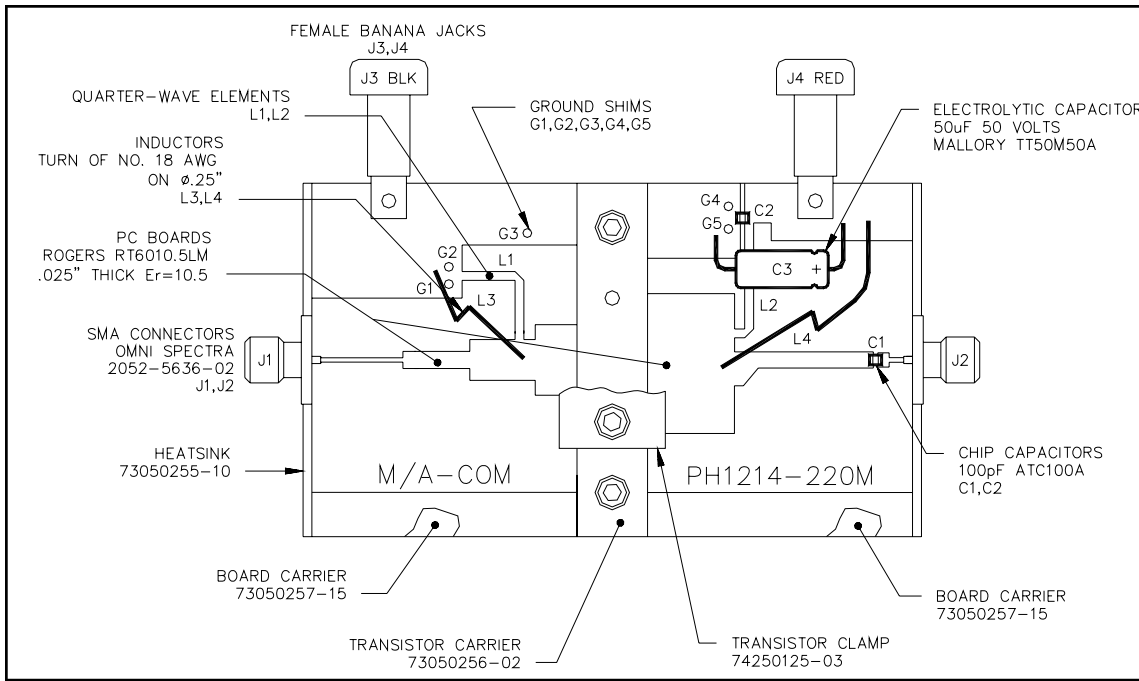
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## Test Fixture Circuit Dimensions



## Test Fixture Assembly



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