

## Rev. V1

- 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

Technical drawing of a 100W 6X4 vacuum tube pinout. The drawing shows two views: a top view and a side view.

**Top View Dimensions:**

- Overall width: .900" [22.86]
- Pin spacing (center-to-center): .650" [16.51]
- Pin diameter: .175" ± .015" [4.45 ± 0.38]
- Pin height: .400" [10.16]
- Pin width: .385" [9.78]
- Pin spacing (edge-to-edge): .130" [3.30]
- Base width: .370" [9.40]
- Base height: .500" [12.70]
- Base pin spacing: .222" ± .010" [5.64 ± 0.25]
- Base pin diameter: .122" ± .010" [3.10 ± 0.25]
- Base pin height: .060" ± .002" [1.52 ± 0.05]
- Base pin width: .003" ± .001" [0.10 ± 0.03]

**Side View Dimensions:**

- Overall height: .900" [22.86]
- Pin spacing (center-to-center): .650" [16.51]
- Pin diameter: .175" ± .015" [4.45 ± 0.38]
- Pin height: .400" [10.16]
- Pin width: .385" [9.78]
- Pin spacing (edge-to-edge): .130" [3.30]
- Base width: .370" [9.40]
- Base height: .500" [12.70]
- Base pin spacing: .222" ± .010" [5.64 ± 0.25]
- Base pin diameter: .122" ± .010" [3.10 ± 0.25]
- Base pin height: .060" ± .002" [1.52 ± 0.05]
- Base pin width: .003" ± .001" [0.10 ± 0.03]

**Notes:**

- COLLECTOR
- EMITTER
- 2X FULL RADIUS
- 4X CORNERS MAY BE 45° X .060" [1.52] OR R.060" [1.52]

UNLESS OTHERWISE NOTED, TOLERANCES ARE INCHES ±.005" [MILLIMETERS ±0.13mm]

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

Parameter	Test Conditions	Frequency	Symbol	Min	Max	Units
Collector-Emitter Breakdown Voltage	I <sub>C</sub> = 100mA		BV <sub>CES</sub>	70	-	V
Collector-Emitter Leakage Current	V <sub>CE</sub> = 40V		I <sub>CES</sub>	-	10	mA
Thermal Resistance	V <sub>CC</sub> = 40V, P <sub>in</sub> = 40W	F = 1.2, 1.3, 1.4 GHz	R <sub>TH(JC)</sub>	-	0.25	°C/W
Output Power	V <sub>CC</sub> = 40V, P <sub>in</sub> = 40W	F = 1.2, 1.3, 1.4 GHz	P <sub>OUT</sub>	220	-	W
Power Gain	V <sub>CC</sub> = 40V, P <sub>in</sub> = 40W	F = 1.2, 1.3, 1.4 GHz	G <sub>P</sub>	7.4	-	dB
Collector Efficiency	V <sub>CC</sub> = 40V, P <sub>in</sub> = 40W	F = 1.2, 1.3, 1.4 GHz	η <sub>C</sub>	50	-	%
Input Return Loss	V <sub>CC</sub> = 40V, P <sub>in</sub> = 40W	F = 1.2, 1.3, 1.4 GHz	RL	-	-9	dB
Pulse Droop	V <sub>CC</sub> = 40V, P <sub>in</sub> = 40W	F = 1.2, 1.3, 1.4 GHz	Droop	-	0.8	dB
Load Mismatch Tolerance	V <sub>CC</sub> = 40V, P <sub>in</sub> = 40W	F = 1.2, 1.3, 1.4 GHz	VSWR-T	-	3:1	-
Load Mismatch Stability	V <sub>CC</sub> = 40V, P <sub>in</sub> = 40W	F = 1.2, 1.3, 1.4 GHz	VSWR-S	-	1.5:1	-

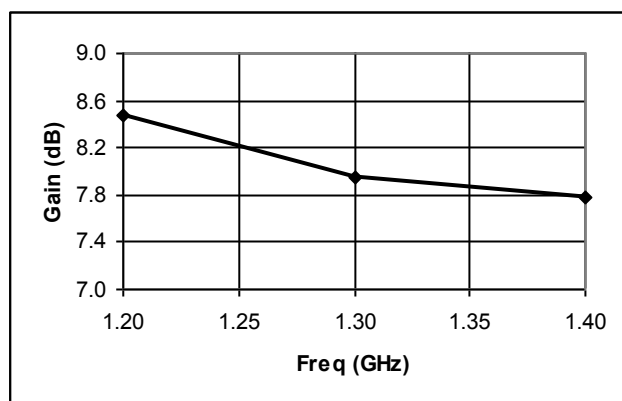
## Radar Pulsed Power Transistor 220W, 1.2-1.4 GHz, 150μs Pulse, 10% Duty

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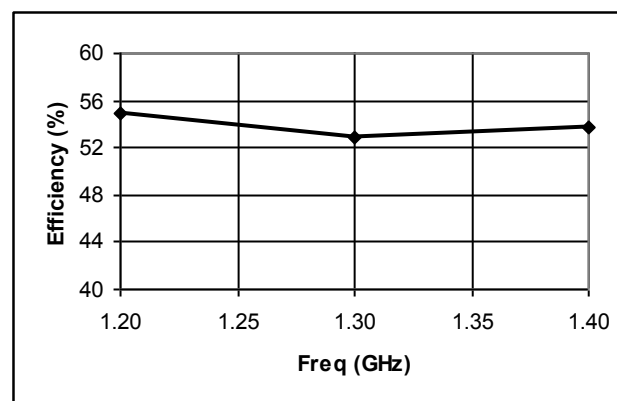
### Typical RF Performance

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

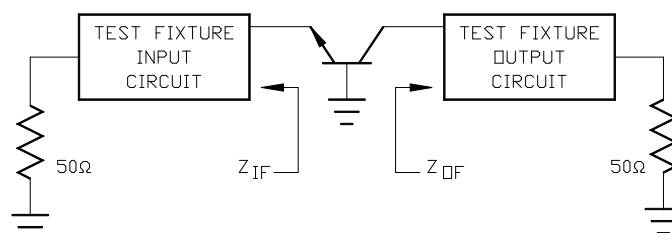


### Collector Efficiency vs. Frequency



### RF Test Fixture Impedance

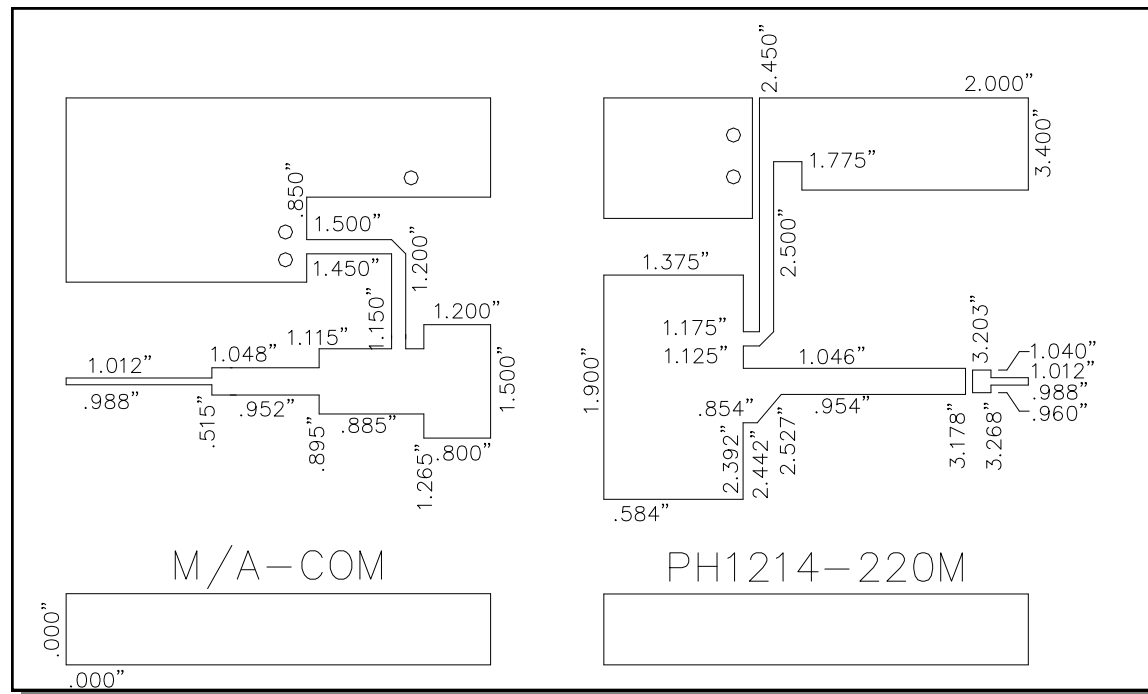
F (GHz)	Z <sub>IF</sub> (Ω)	Z <sub>OF</sub> (Ω)
1.2	3.3 - j2.7	2.0 - j1.5
1.3	3.4 - j2.1	1.9 - j1.6
1.4	3.6 - j1.3	1.7 - j1.4



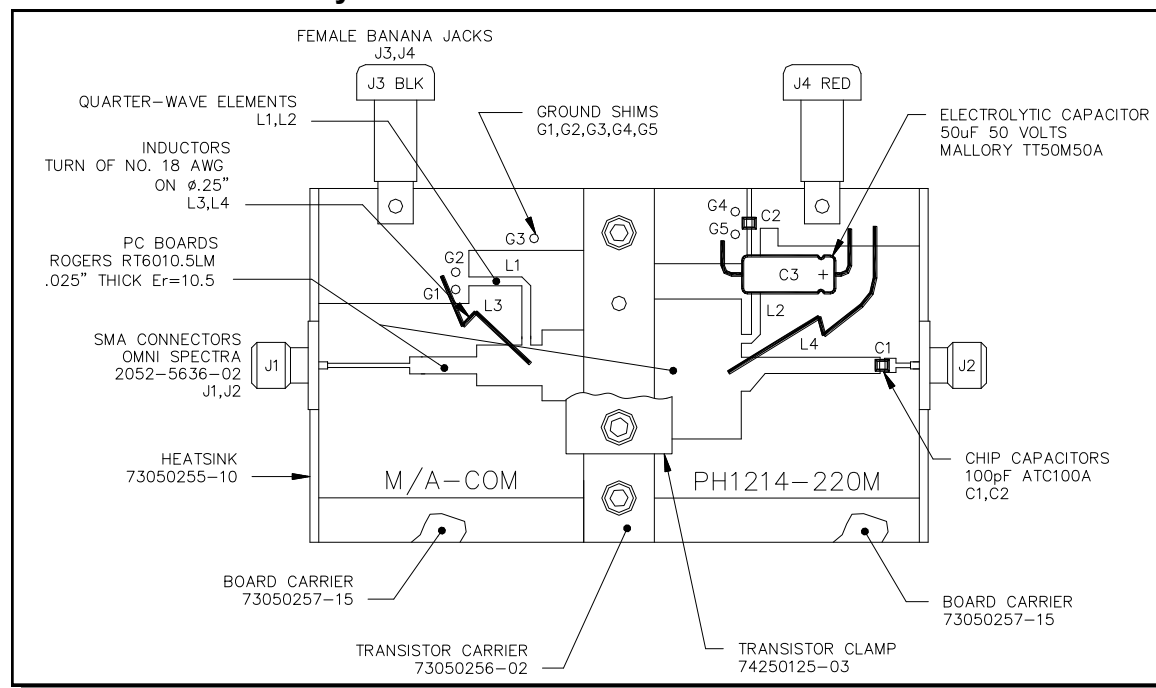
## Radar Pulsed Power Transistor 220W, 1.2-1.4 GHz, 150 $\mu$ s Pulse, 10% Duty

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### Test Fixture Circuit Dimensions



### Test Fixture Assembly



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

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