PH2931-20M

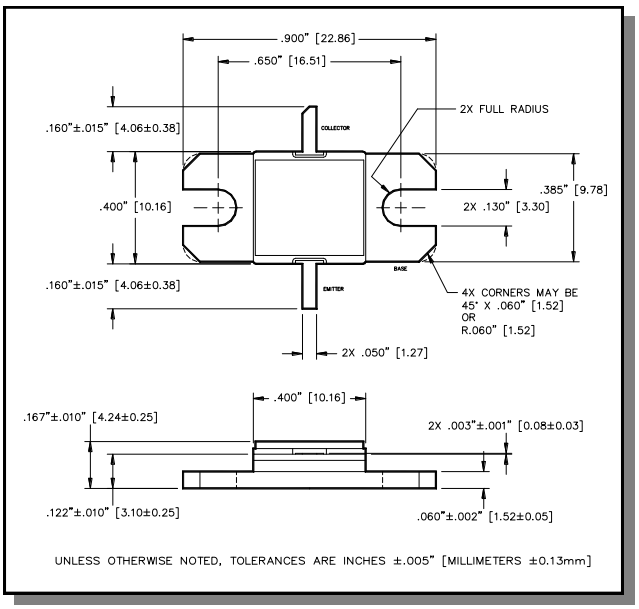
Radar Pulsed Power Transistor
20W, 2.9-3.1 GHz, 100µs Pulse, 10% Duty

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	1.85	A
Power Dissipation @ +25°C	P_{TOT}	115	W
Storage Temperature	T_{STG}	-65 to +200	°C
Junction Temperature	T_J	200	°C

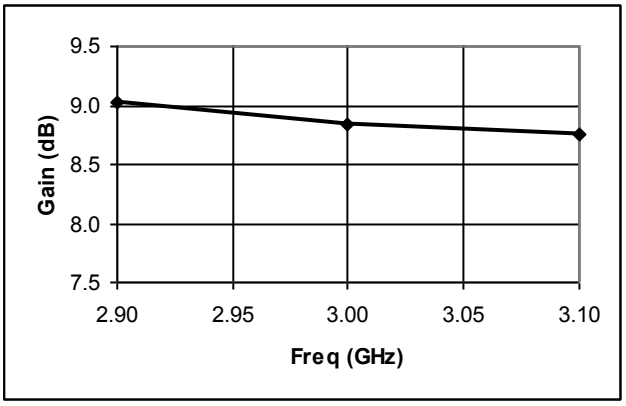
Electrical Specifications: T_C = 25 ± 5°C (Room Ambient)

Parameter	Test Conditions	Frequency	Symbol	Min	Max	Units
Collector-Emitter Breakdown Voltage	I_C = 10mA		BV_{CES}	65	-	V
Collector-Emitter Leakage Current	V_{CE} = 40V		I_{CES}	-	1.5	mA
Thermal Resistance	Vcc = 36V, Pin = 3.0W	F = 2.9, 3.0, 3.1 GHz	$R_{TH(JC)}$	-	1.5	°C/W
Output Power	Vcc = 36V, Pin = 3.0W	F = 2.9, 3.0, 3.1 GHz	P_{OUT}	20	-	W
Power Gain	Vcc = 36V, Pin = 3.0W	F = 2.9, 3.0, 3.1 GHz	G_P	8.2	-	dB
Collector Efficiency	Vcc = 36V, Pin = 3.0W	F = 2.9, 3.0, 3.1 GHz	η_C	45	-	%
Input Return Loss	Vcc = 36V, Pin = 3.0W	F = 2.9, 3.0, 3.1 GHz	RL	-	-6	dB
Load Mismatch Tolerance	Vcc = 36V, Pin = 3.0W	F = 2.9, 3.0, 3.1 GHz	VSWR-T	-	3:1	-
Load Mismatch Stability	Vcc = 36V, Pin = 3.0W	F = 2.9, 3.0, 3.1 GHz	VSWR-S	-	1.5:1	-

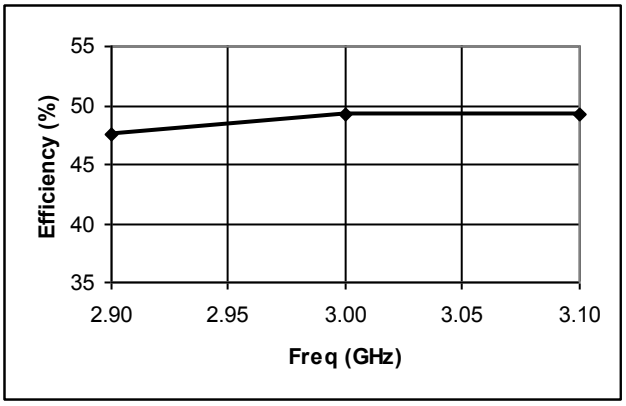
Typical RF Performance

Freq. (GHz)	Pin (W)	Pout (W)	Gain (dB)	Ic (A)	Eff (%)	RL (dB)	VSWR-S (1.5:1)	VSWR-T (3:1)
2.9	3.0	24.0	9.03	1.41	47.5	-19.1	S	P
3.0	3.0	23.0	8.85	1.30	49.2	-16.9	S	P
3.1	3.0	22.5	8.75	1.27	49.3	-19.4	S	P

Gain vs. Frequency

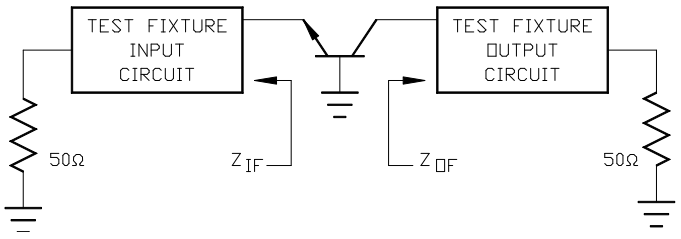


Collector Efficiency vs. Frequency



RF Test Fixture Impedance

F (GHz)	Z_{IF} (Ω)	Z_{OF} (Ω)
2.9	33.0 - j17.8	13.3 - j8.3
3.0	30.0 - j19.0	12.0 - j7.9
3.1	27.0 - j19.4	10.9 - j7.4



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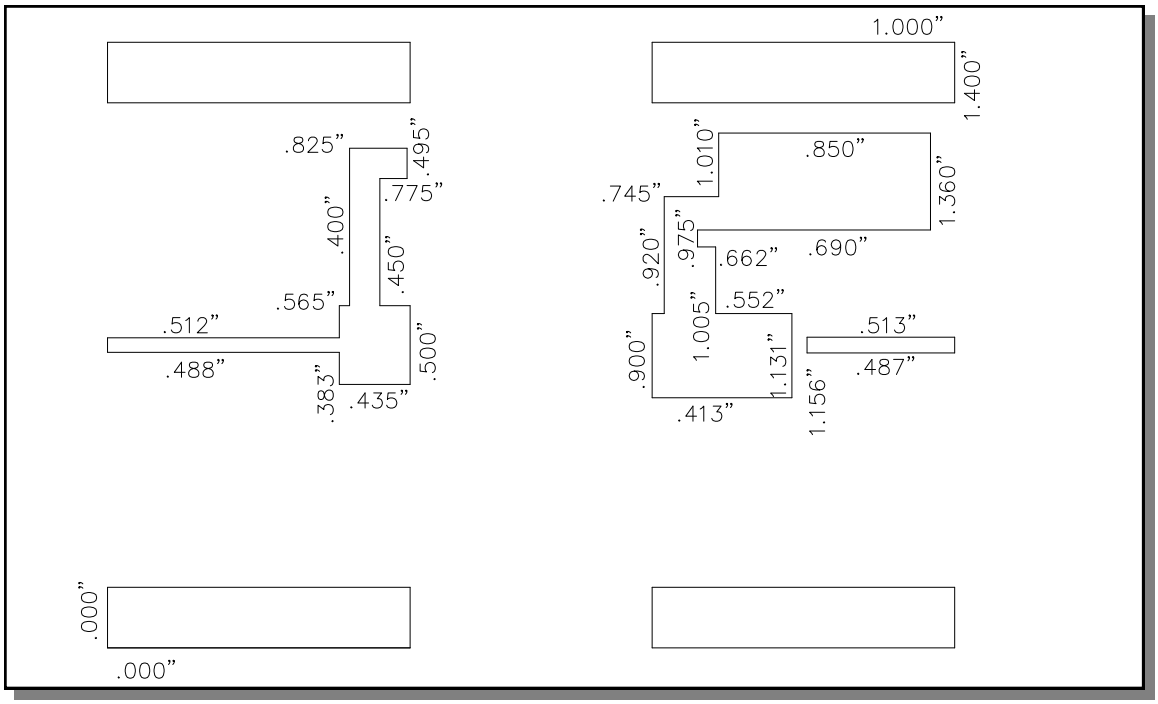
Test Fixture Circuit Dimensions



Test Fixture Assembly