MAPR-000912-500S00

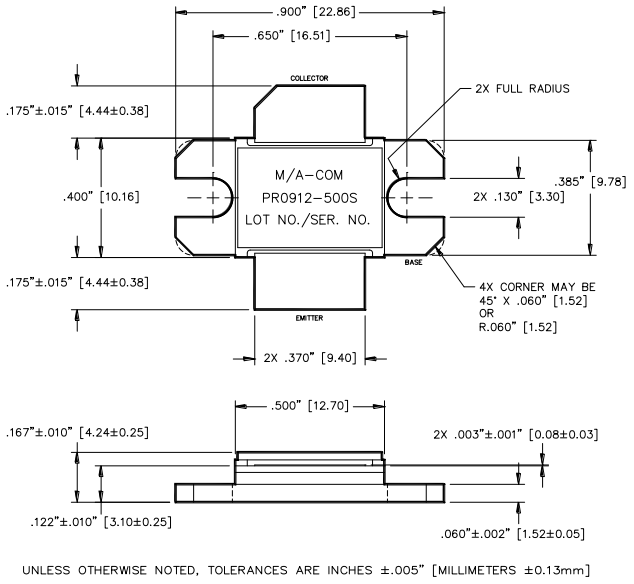
Avionics Pulsed Power Transistor
500 W, 960 - 1215 MHz, 10 µs Pulse, 10 % Duty

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



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

Absolute Maximum Ratings @ +25°C

Parameter	Symbol	Rating
Collector-Emitter Voltage	V_{CES}	80 V
Emitter-Base Voltage	V_{EBO}	3 V
Collector Current (Peak)	I_C	52.5 A
Power Dissipation	P_{TOT}	2.2 kW
Storage Temperature	T_{STG}	-65°C to +200°C
Junction Temperature	T_J	+200°C

Electrical Specifications: V_{CC} = 50 V, P_{IN} = 63 W, T_A = 25 ± 5°C (unless otherwise noted)

Parameter	Symbol	Test Conditions	Units	Min.	Max.
Collector-Emitter Breakdown Voltage	BV_{CES}	I_C = 80 mA	V	80	-
Collector-Emitter Leakage Current	I_{CES}	V_{CE} = 40 V	mA	-	15
Thermal Resistance	$R_{TH(JC)}$	F = 960, 1090, 1215 MHz	°C/W	-	0.08
Output Power	P_O	F = 960, 1090, 1215 MHz	W	500	-
Power Gain	G_P	F = 960, 1090, 1215 MHz	dB	9	-
Collector Efficiency	h_C	F = 960, 1090, 1215 MHz	%	45	-
Input Return Loss	RL	F = 960, 1090, 1215 MHz	dB	-	-9
Load Mismatch Stability	VSWR-T	F = 960 MHz	-	-	3:1
Load Mismatch Tolerance	VSWR-S	F = 960, 1090, 1215 MHz	-	-	1.5:1

* Restrictions on Hazardous Substances, European Union Directive 2011/65/EU.

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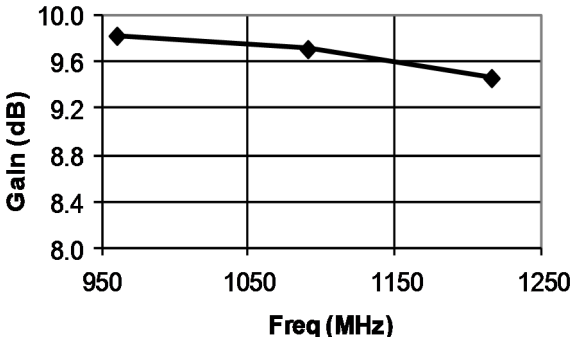
Typical RF Performance

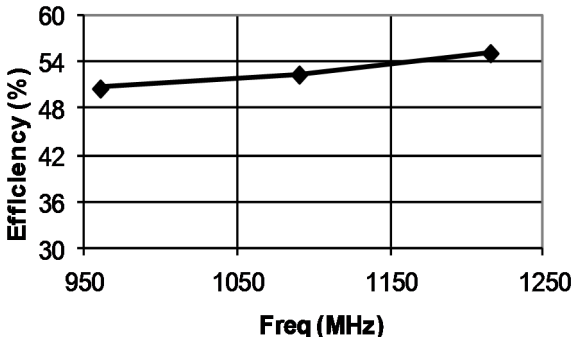
Freq. (MHz)	P_{IN} (W)	P_{OUT} (W)	Gain (dB)	ΔGain (dB)	I_C (A)	Eff (%)	RL (dB)	VSWR-S (1.5:1)	VSWR-T (10:1)	P1dB Overdrive	
										P_{OUT} (W)	Δ P_O (dB)
960	63	598	9.77	—	23.5	50.9	-17.1	S	P	675	0.52
1090	63	582	9.65	—	21.9	53.1	-21.8	S	—	677	0.66
1215	63	554	9.44	033	19.7	56.1	-16.8	S	—	619	0.48

Note: ΔPo(dB) is the difference between P_{OUT} at 1dB overdrive and P_{OUT} at P_{IN} = 63 W.

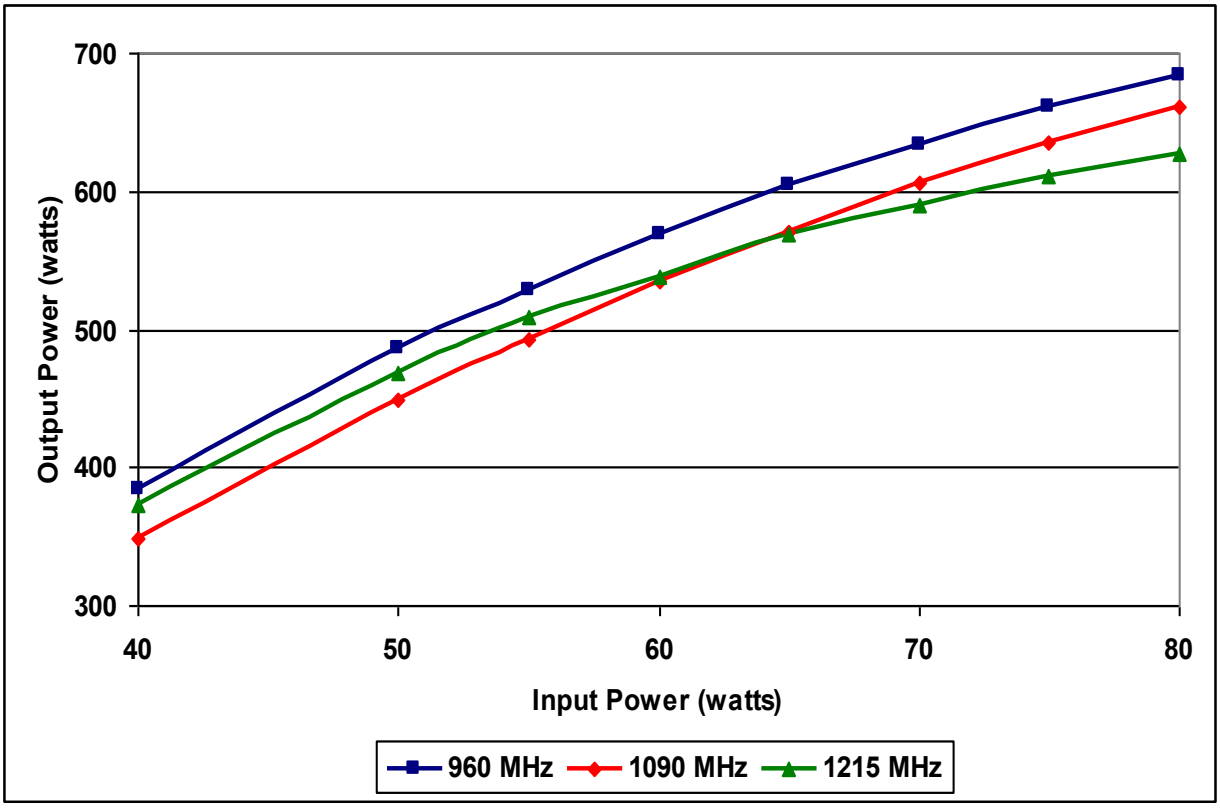
Gain vs. Frequency



Collector Efficiency vs. Frequency

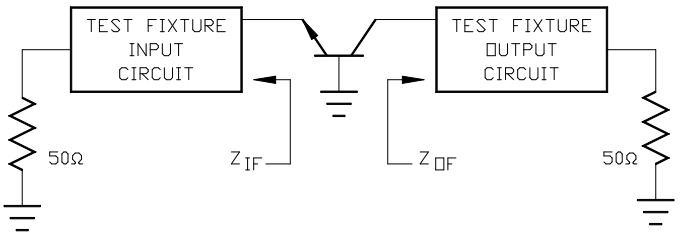


RF Power Transfer Curve
(Output Power Vs. Input Power)

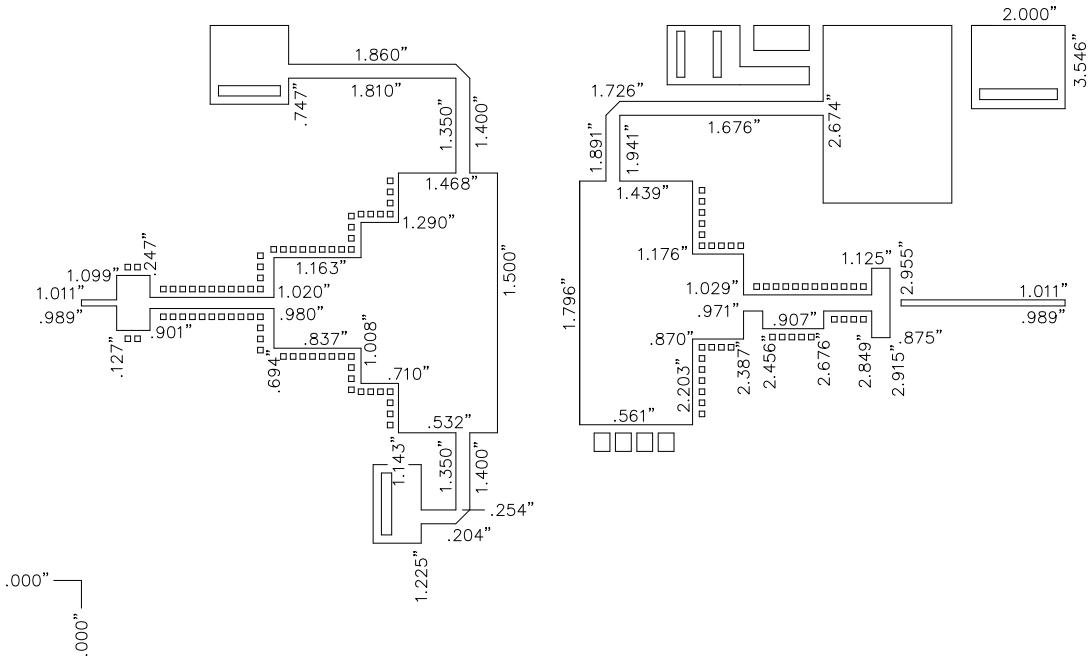


Broadband Test Fixture Impedance

F (MHz)	Z_{IF} (Ω)	Z_{OF} (Ω)
960	1.3 - j1.4	1.27 - j1.4
1025	1.3 - j1.1	1.2 - j1.1
1090	1.2 - j0.9	1.3 - j0.9
1150	1.2 - j0.8	1.4 - j0.7
1215	1.0 - j0.8	1.3 - j0.6



Test Fixture Circuit Dimensions



Test Fixture Assembly