

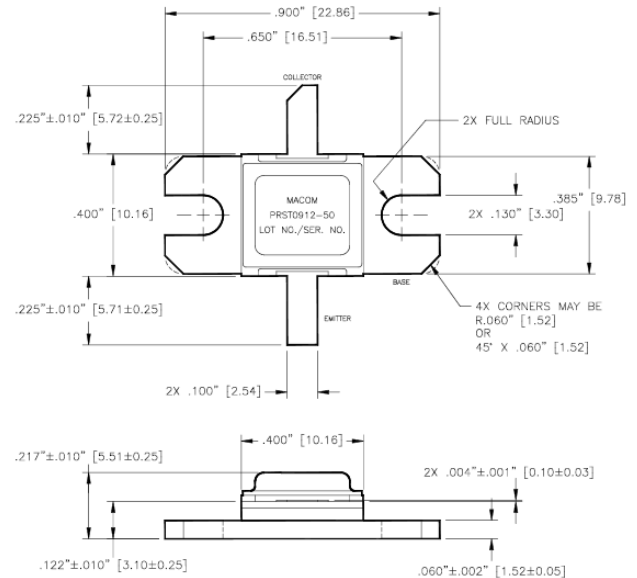
## Features

- 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

## Description

The MAPRST0912-50 is a RF power transistor. These high power transistors are ideal for avionics, communications, radar, and industrial, scientific, and medical applications.

## Outline Drawing



Unless otherwise noted, tolerances are inches  $\pm .005$ " [millimeters  $\pm 0.13$ mm]

## Electrical Specifications: $T_A = +25^\circ\text{C} \pm 5^\circ\text{C}$ , $V_{CC} = 50\text{ V}$ , $P_{IN} = 6.2\text{ W}$ (unless otherwise noted)

Parameter	Test Conditions	Symbol	Min.	Max.	Units
Collector-Emitter Breakdown Voltage	$I_C = 15\text{ mA}$	$BV_{CES}$	65	-	V
Collector-Emitter Leakage Current	$V_{CE} = 40\text{ V}$	$I_{CES}$	-	2.0	mA
Thermal Resistance	F = 960, 1090, 1215 MHz	$R_{TH(JC)}$	-	0.80	$^\circ\text{C/W}$
Output Power	F = 960, 1090, 1215 MHz	$P_O$	50	-	W
Power Gain	F = 960, 1090, 1215 MHz	$G_P$	9.1	-	dB
Input Return Loss	F = 960, 1090, 1215 MHz	RL	40	-	dB
Collector Efficiency	F = 960, 1090, 1215 MHz	$\eta_C$	-	-9	%
Load Mismatch Stability	F = 960 MHz	VSWR-S	-	10:1	-
Load Mismatch Tolerance	F = 960, 1090, 1215 MHz	VSWR-T	-	1.5:1	-

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

## Avionics Pulsed Power Transistor 50 W, 960 - 1215 MHz, 10 $\mu$ s Pulse, 10% Duty

Rev. V2

### Typical RF Performance

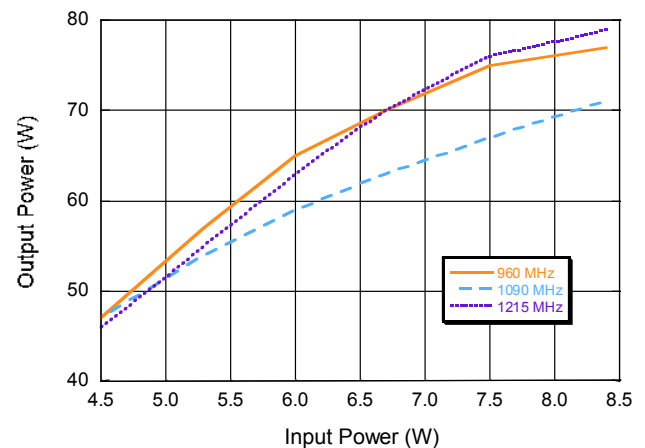
Freq. (MHz)	Pin (W)	Pout (W)	Gain (dB)	$\Delta$ Gain (dB)	Ic (A)	Eff (%)	RL (dB)	VSWR-S (1.5:1)	VSWR-T (10:1)	P1dB Overdrive	
										Pout (W)	$\Delta$ Po
960	6.2	65.9	10.25	-	2.66	49.6	-22.2	S	P	73.4	0.48
1090	6.2	61.9	9.98	-	2.58	48.0	-15.2	S	-	68.7	0.45
1215	6.2	64.6	10.16	0.35	2.50	51.6	-15.9	S	-	74.8	0.63

Note:  $\Delta$ Po(dB) is the difference between Pout at 1dB overdrive and Pout at Pin = 6.2 W.

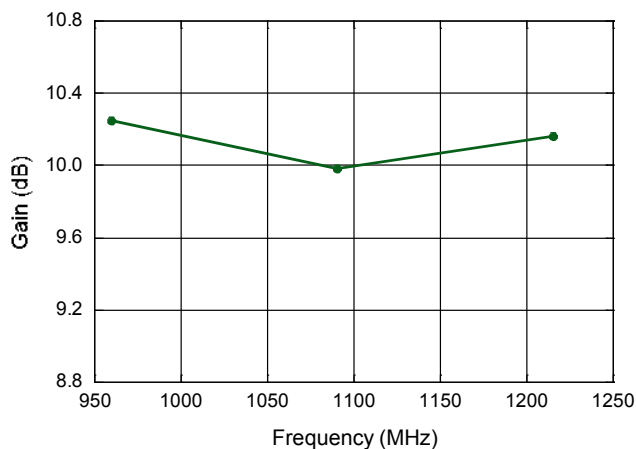
### Absolute Maximum Ratings @ +25°C

Parameter	Rating
Collector-Emitter Voltage ( $V_{CES}$ )	65 V
Emitter-Base Voltage ( $V_{EBO}$ )	3.0 V
Collector Current (Peak) ( $I_C$ )	5.3 A
Power Dissipation @ +25°C ( $P_{TOT}$ )	220 kW
Storage Temperature ( $T_{STG}$ )	-65°C to +200°C
Junction Temperature ( $T_J$ )	200°C

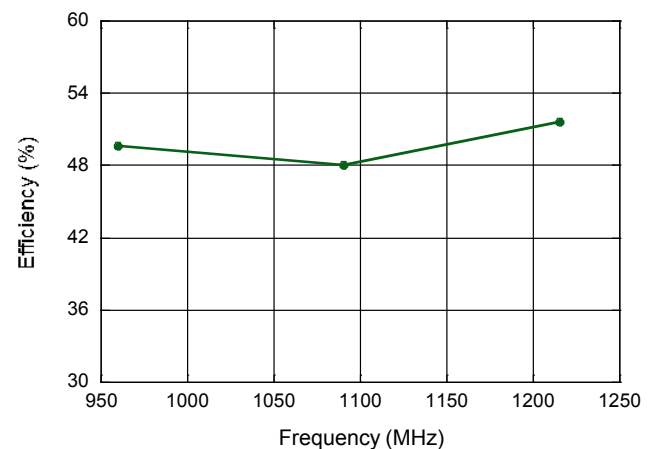
Output Power vs. Input Power



Gain vs. Frequency



Collector Efficiency vs. Frequency

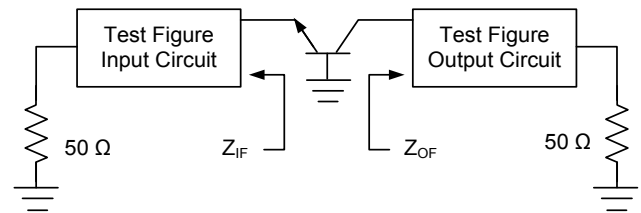


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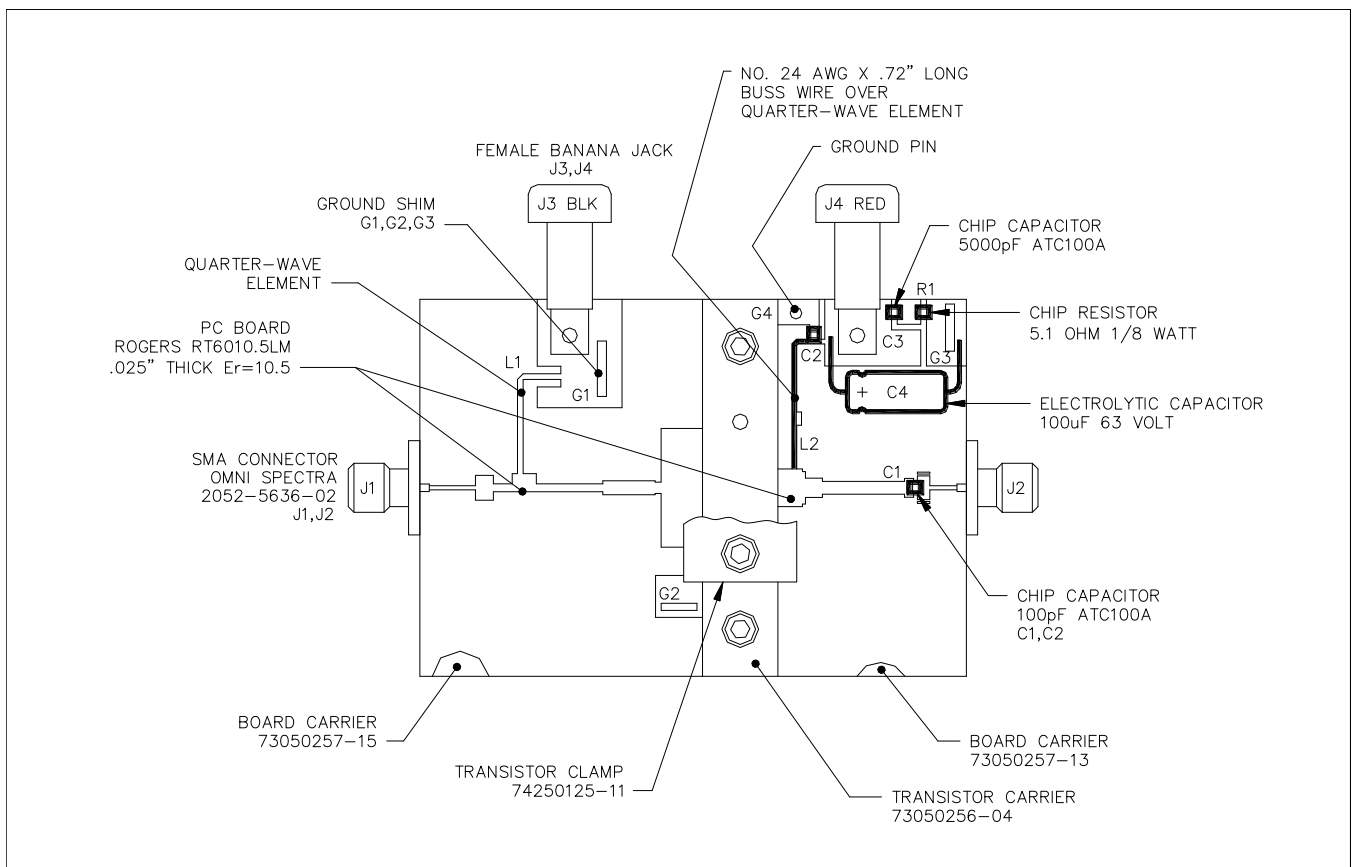
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### Broadband Test Fixture Impedance

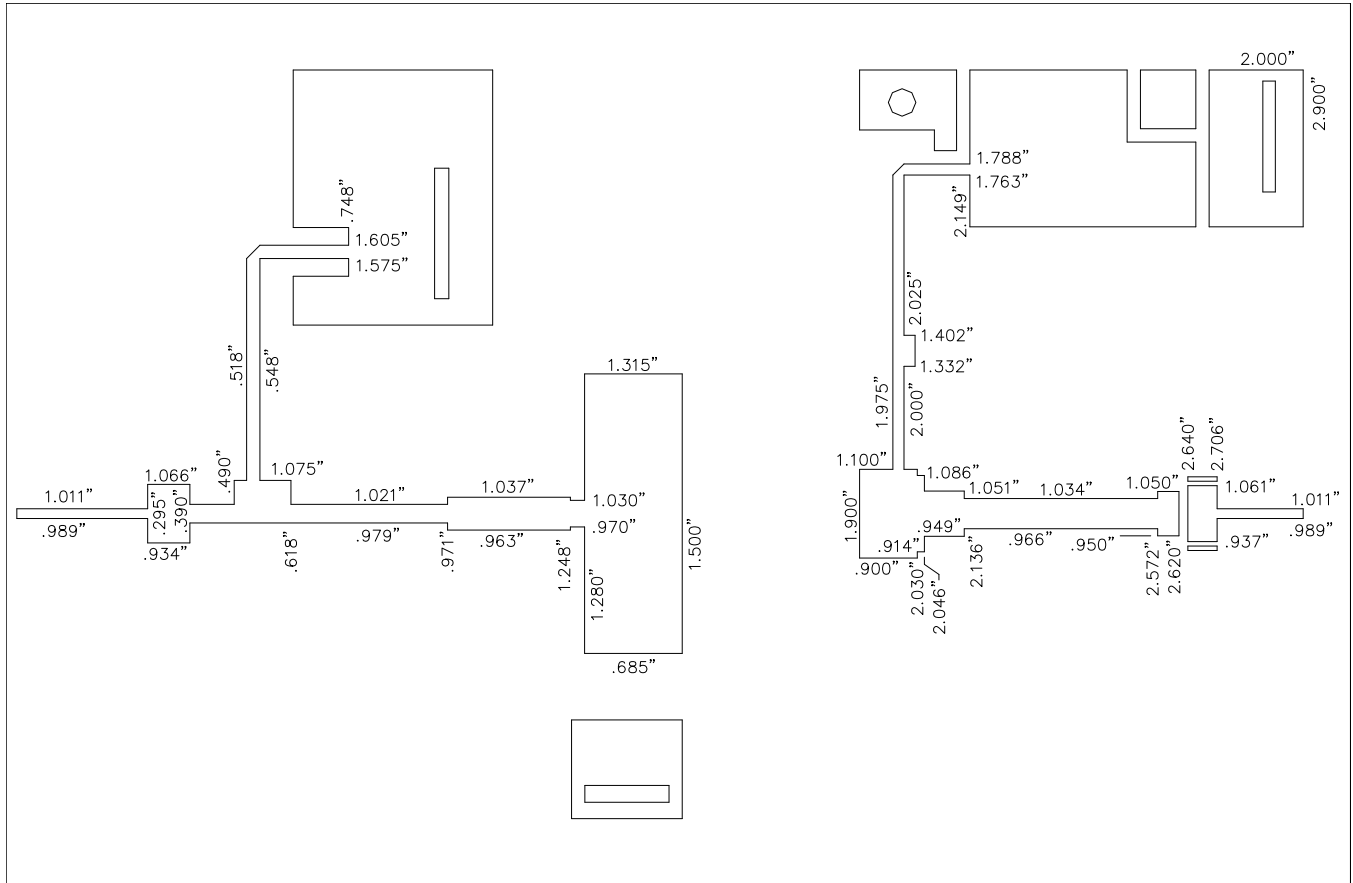
Frequency (MHz)	$Z_{IF}$ ( $\Omega$ )	$Z_{OF}$ ( $\Omega$ )
960	3.5 - j7.5	12.0 - j7.8
1030	3.8 - j7.0	11.1 - j6.4
1090	3.9 - j6.8	10.6 - j5.1
1150	3.9 - j6.8	10.8 - j3.8
1215	3.6 - j7.0	11.1 - j3.2



### Test Fixture Assembly



## Test Fixture Circuit Dimensions



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