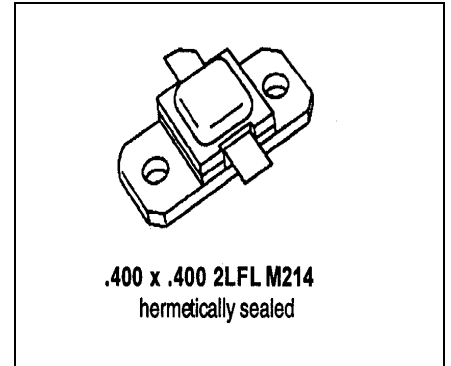


**MS2228**

## RF & MICROWAVE TRANSISTORS L-BAND RADAR APPLICATIONS

### Features

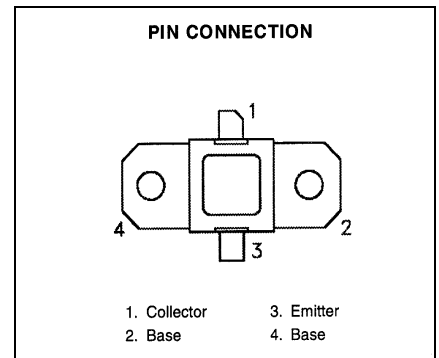
- 1090 MHz
- 50 VOLTS
- $P_{OUT} = 75$  WATTS
- $G_P = 9.2$  dB MINIMUM
- 10:1 VSWR CAPABILITY
- COMMON BASE CONFIGURATION



### DESCRIPTION:

The MS2228 device is a high power Class C transistor specifically designed for L-Band Avionics transponder/interrogator pulsed output and driver applications.

This device is capable of operation over a wide range of pulse widths, duty cycles, and is capable of withstanding 10:1 output VSWR at rated RF conditions. Internal input and output matching provide optimum performance and product consistency.



### ABSOLUTE MAXIMUM RATINGS (T<sub>case</sub> = 25°C)

Symbol	Parameter	Value	Unit
$P_{DISS}$	Power Dissipation	175	W
$I_C$	Device Current	5.4	A
$V_{CC}$	Collector-Supply Voltage	55	V
$T_J$	Junction Temperature	200	°C
$T_{STG}$	Storage Temperature	-65 to +200	°C

### Thermal Data

$R_{TH(J-C)}$	Thermal Resistance Junction-case*	0.86	°C/W
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MS2228

## ELECTRICAL SPECIFICATIONS (T<sub>case</sub> = 25°C)

### STATIC

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
<b>BV<sub>CBO</sub></b>	<b>I<sub>C</sub> = 10 mA</b> <b>I<sub>E</sub> = 0 mA</b>	<b>65</b>	---	---	<b>V</b>
<b>BV<sub>EBO</sub></b>	<b>I<sub>E</sub> = 4 mA</b> <b>I<sub>C</sub> = 0 mA</b>	<b>3.5</b>	---	---	<b>V</b>
<b>BV<sub>CER</sub></b>	<b>I<sub>C</sub> = 20 mA</b> <b>R<sub>BE</sub> = 10Ω</b>	<b>65</b>	---	---	<b>V</b>
<b>I<sub>CES</sub></b>	<b>V<sub>CE</sub> = 50 V</b>	---	---	<b>6</b>	<b>mA</b>
<b>HFE</b>	<b>V<sub>CE</sub> = 5 V</b> <b>I<sub>C</sub> = 1 A</b>	<b>10</b>	---	<b>100</b>	---

### DYNAMIC

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
<b>P<sub>OUT</sub></b>	<b>f = 1090 MHz</b> <b>P<sub>IN</sub> = 9.4W</b> <b>V<sub>CC</sub> = 50V</b>	<b>75</b>	---	---	<b>W</b>
<b>G<sub>p</sub></b>	<b>f = 1090 MHz</b> <b>P<sub>IN</sub> = 9.4W</b> <b>V<sub>CC</sub> = 50V</b>	<b>9.0</b>	---	---	<b>dB</b>
<b>η<sub>c</sub></b>	<b>f = 1090 MHz</b> <b>P<sub>IN</sub> = 9.4W</b> <b>V<sub>CC</sub> = 50V</b>	<b>48</b>	---	---	<b>%</b>

Conditions:      Pulse Width = 32 μsec    Duty Cycle = 2%

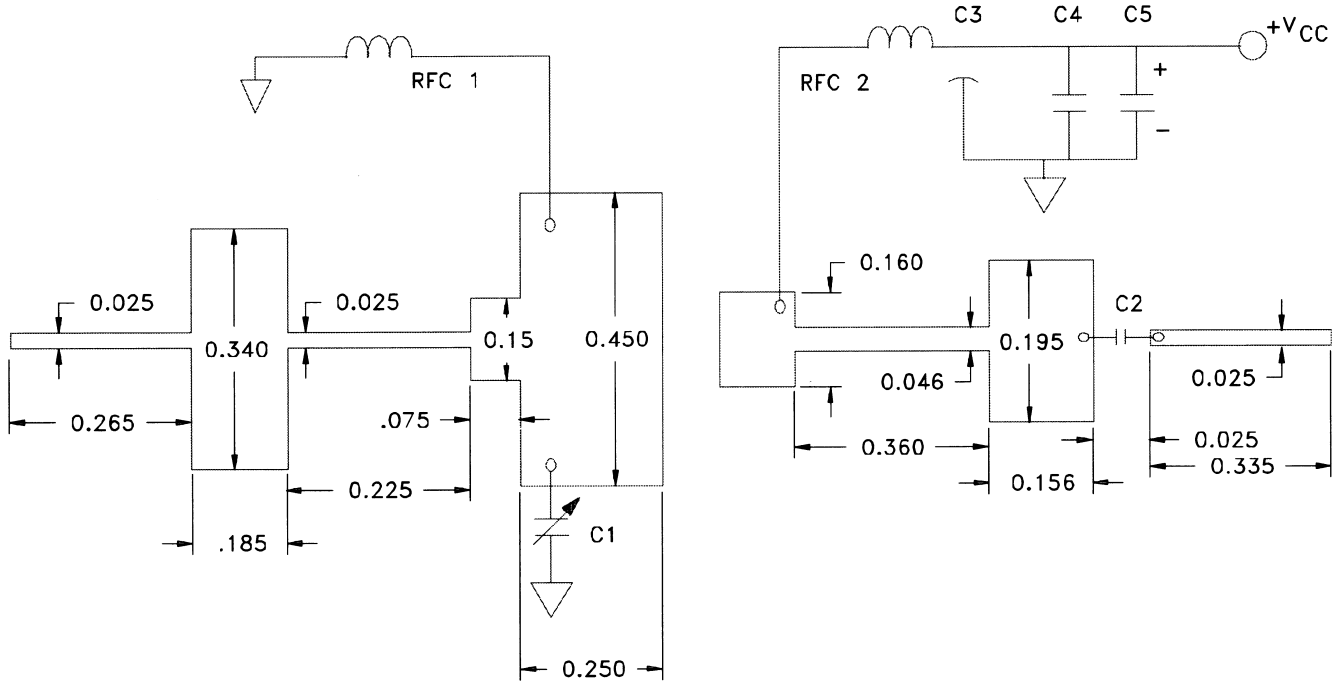
**MS2228**

**IMPEDANCE DATA**

FREQ	Z <sub>IN</sub> (Ω)	Z <sub>CC</sub> (Ω)
1030 MHz	7.0 + j3.0	12.5 - j4.5
1090 MHz	11.0 + j1.5	13.0 - j3.0

P<sub>IN</sub> = 9.0W  
 V<sub>CC</sub> = 50V

**TEST CIRCUIT**



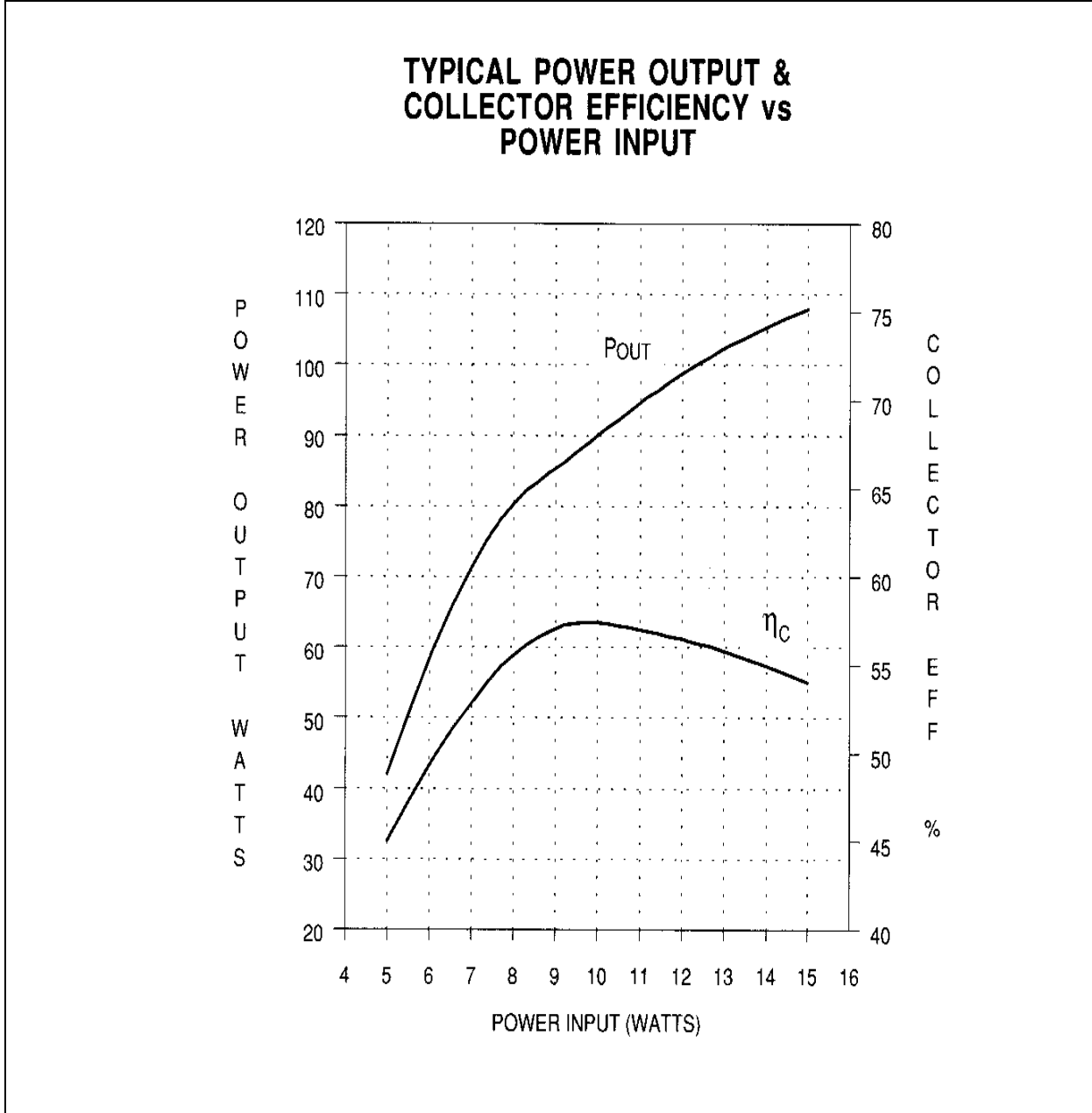
All dimensions are in inches.

Substrate material: .025 thick Al<sub>2</sub>O<sub>3</sub>

- C1 : 0.8—8.0 pF Johanson Gigatrim Capacitor
- C2 : 100 pF Chip Capacitor
- C3 : 1500 pF Filtercon Feedthru

- C4 : 1 μF, Ceramic Capacitor
- C5 : 100 μF, Electrolytic Capacitor
- RFC 1: Au Plated Ni Strap  
0.280 Long x 0.035 Wide x 0.005 Thick
- RFC 2: #26 Wire, 4 Turn 1/16 I.D.

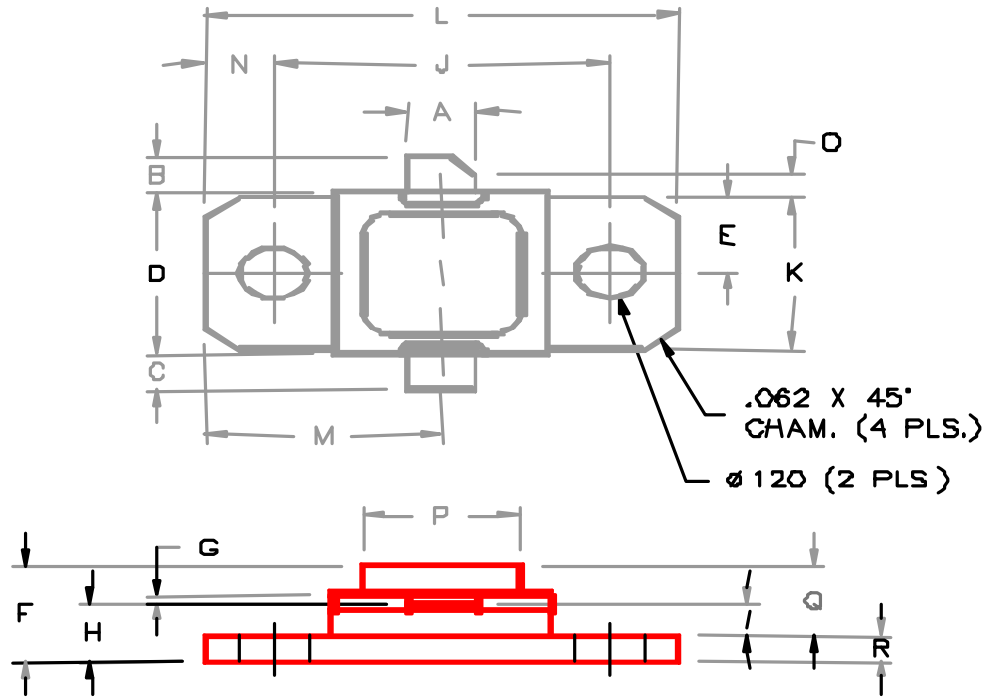
**TYPICAL PERFORMANCE**



**MS2228**

**PACKAGE MECHANICAL DATA**

**PACKAGE STYLE M214**



	MINIMUM INCHES/MM	MAXIMUM INCHES/MM		MIN/MUM INCHES/MM	MAXIMUM INCHES/MM
A	.140/3,56		J	.650/16,51	
B	.110/2,80		K	.386/9,80	
C	.110/2,80		L	.900/22,86	
D	.395/10,03	407/10,34	M	.450/11,43	
E	.193/4,90		N	.125/3,18	
F		.230/5,84	O	.050/1,27	
G	.003/0,08	.006/0,15	P	.405/10,29	
H	.118/3,00	.131/3,33	Q	.170/4,32	
I	.063/1,60		R	.062/1,58	