

MS2211

**RF & MICROWAVE TRANSISTORS  
AVIONICS APPLICATIONS**

**Features**

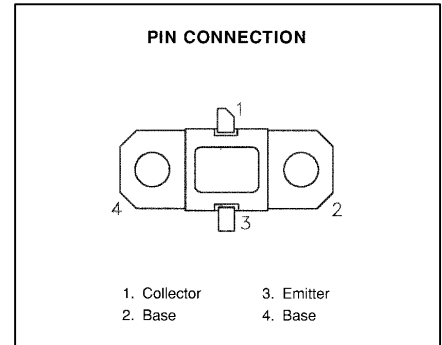
- 960-1215 MHz
- COMMON BASE
- GOLD METALLIZATION
- POUT = 6 W MIN. WITH 9.3 dB GAIN
- 5:1 VSWR CAPABILITY



**DESCRIPTION:**

The MS2211 is a silicon NPN bipolar device designed For specialized avionics applications, including JTIDS, utilizing pulse formats with short pulse widths and high burst rates or overall duty cycles.

The MS2211 is housed in a hermetic package and utilizes internal input impedance matching. Gold metallization and emitter ballasting assures high reliability under operating conditions.



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

Symbol	Parameter	Value	Unit
P <sub>DISS</sub>	Power Dissipation* (T <sub>C</sub> ≤ 75°C)	25	W
I <sub>C</sub>	Device Current*	0.9	A
V <sub>CC</sub>	Collector-Supply Voltage	32	V
T <sub>J</sub>	Junction Temperature (Pulsed RF Operation)	+250	°C
T <sub>STG</sub>	Storage Temperature	-65 to +200	°C

**Thermal Data**

R <sub>TH(J-C)</sub>	Junction-case Thermal Resistance*	7.0	°C/W
----------------------	-----------------------------------	-----	------

\* Applies only to rated RF amplifier operation

**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> = 1mA</b>	<b>I<sub>E</sub> = 0mA</b>	<b>48</b>	<b>---</b>	<b>---</b>	<b>V</b>
<b>BV<sub>CER</sub></b>	<b>I<sub>C</sub> = 5mA</b>	<b>R<sub>BE</sub> = 10 Ω</b>	<b>48</b>	<b>---</b>	<b>---</b>	<b>V</b>
<b>BV<sub>EBO</sub></b>	<b>I<sub>E</sub> = 1mA</b>	<b>I<sub>C</sub> = 0 mA</b>	<b>3.5</b>	<b>---</b>	<b>---</b>	<b>V</b>
<b>I<sub>CES</sub></b>	<b>V<sub>CE</sub> = 28 V</b>	<b>V<sub>BE</sub> = 0 V</b>	<b>-----</b>	<b>---</b>	<b>0.5</b>	<b>mA</b>
<b>h<sub>FE</sub></b>	<b>V<sub>CE</sub> = 5 V</b>	<b>I<sub>C</sub> = 250mA</b>	<b>30</b>	<b>---</b>	<b>300</b>	<b>---</b>

**DYNAMIC**

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
<b>P<sub>OUT</sub></b>	<b>f = 960-1215 MHz</b>	<b>V<sub>CC</sub> = 28V</b>	<b>P<sub>IN</sub> = 0.7W</b>	<b>6.0</b>	<b>---</b>	<b>---</b>	<b>W</b>
<b>G<sub>p</sub></b>	<b>f = 960-1215 MHz</b>	<b>V<sub>CC</sub> = 28V</b>	<b>P<sub>IN</sub> = 0.7W</b>	<b>9.3</b>	<b>---</b>	<b>---</b>	<b>dB</b>
<b>η</b>	<b>f = 960-1215 MHz</b>	<b>V<sub>CC</sub> = 28V</b>	<b>P<sub>IN</sub> = 0.7W</b>	<b>45</b>	<b>---</b>	<b>---</b>	<b>%</b>

Pulse Format: 6.4 μS ON/ 6.6 μS OFF, repeat for 3mS, then OFF for 4.5125mS.

Conditions Duty Cycle: Burst: 49.2%, overall 20.8%

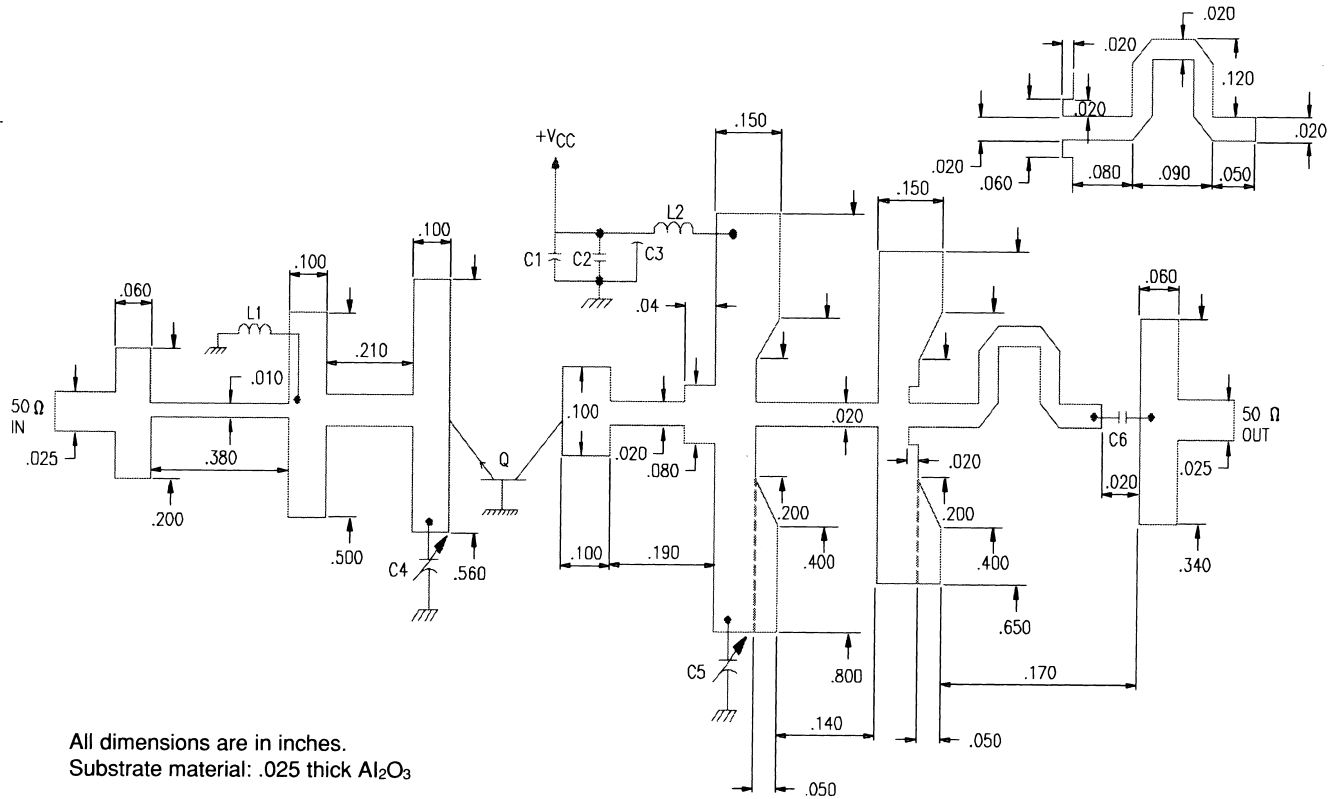
**IMPEDANCE DATA**

FREQ	Z <sub>IN</sub> (Ω)	Z <sub>CL</sub> (Ω)
960 MHz	8.2 + j8.5	10.5 + j12.9
1090 MHz	11.1 + j8.3	9.4 + j11.3
1215 MHz	15.6 + j6.8	9.0 + j8.3

**P<sub>IN</sub> = 0.7W**

**V<sub>CC</sub> = 28V**

**TEST CIRCUIT**

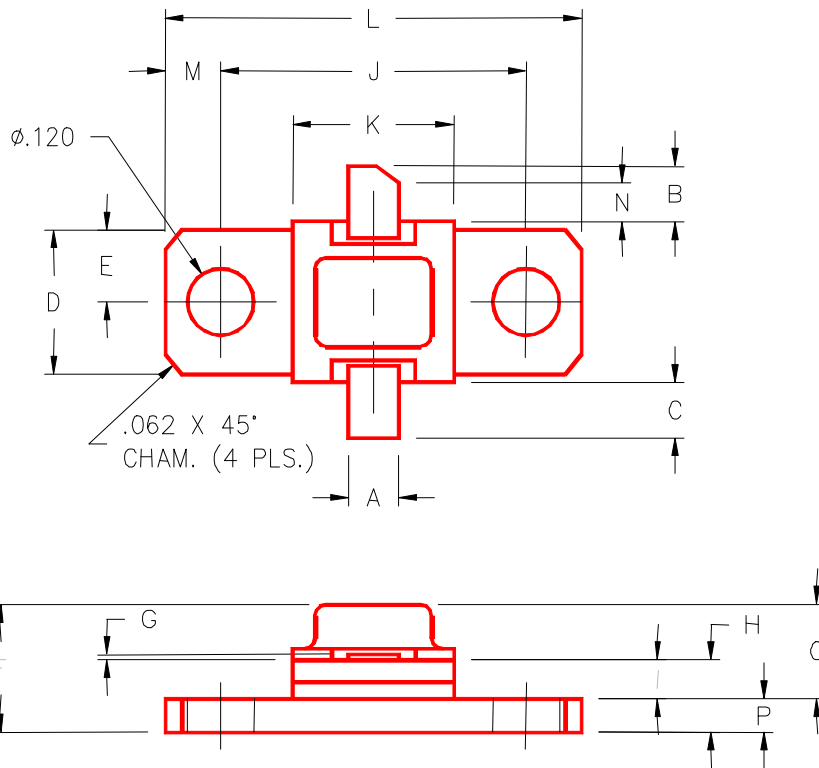


All dimensions are in inches.  
Substrate material: .025 thick Al<sub>2</sub>O<sub>3</sub>

- |    |   |    |   |
|----|---|----|---|
| C1 | : 100 μF Electrolytic Capacitor, 63V              | C5 | : .6 — 4.5 pF, 2 pls, Johanson Gigatrim Capacitor |
| C2 | : .1 μF Ceramic Capacitor                         | C6 | : 100 pF Chip Capacitor                           |
| C3 | : Feedthrough Bypass SCI 712-022                  | L1 | : No. 26 Wire, 4 Turn                             |
| C4 | : .6 — 4.5 pF, 2 pls, Johanson Gigatrim Capacitor | L2 | : No. 26 Wire, 4 Turn                             |

**PACKAGE MECHANICAL DATA**

PACKAGE STYLE M222



	MINIMUM INCHES/MM	MAXIMUM INCHES/MM		MINIMUM INCHES/MM	MAXIMUM INCHES/MM
A	.100/2,54		J	.562/14,28	
B	.110/2,80		K	.310/7,87	
C	.110/2,80		L	.800/20,32	
D	.296/7,52		M	.119/3,02	
E	.148/3,76		N	.050/1,27	
F		.230/5,84	O		.170/4,32
G	.003/0,08	.006/0,15	P	.062/1,58	
H	.118/3,00	.131/3,33			
I	.059/1,50				