



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



# MS2209

## RF & MICROWAVE TRANSISTORS AVIONICS APPLICATIONS

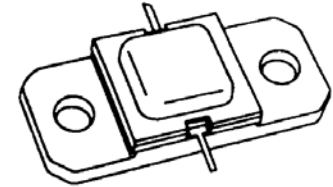
### Features

- 225 MHz BANDWIDTH
- COMMON BASE
- GOLD METALLIZATION
- CLASS C OPERATION
- POUT = 90 W MIN. WITH 8.4 dB GAIN

### DESCRIPTION:

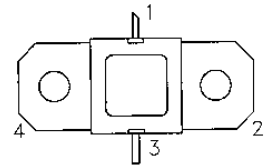
The MS2209 is a broadband, high peak pulse power silicon NPN bipolar device specifically designed for avionics applications requiring broad bandwidth with moderate duty cycles and pulse width constraints such as ground/ship based DME/TACAN.

This device is also designed for specialized applications including JTIDS applications when duty cycle is moderately higher. Gold metallization and emitter ballasting assure high reliability under Class C amplifier operation.



.400 x .400 2NLFL (M218)  
hermetically sealed

### PIN CONNECTION



1. Collector      3. Emitter  
2. Base          4. Base

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

Symbol	Parameter	Value	Unit
V <sub>CC</sub>	Collector Supply Voltage	50	V
I <sub>C</sub>	Device Current	7.0	A
P <sub>DISS</sub>	Power Dissipation	220	W
T <sub>J</sub>	Junction Temperature (RF Pulsed Operation)	+200	°C
T <sub>STG</sub>	Storage Temperature	-65 to +200	°C

### Thermal Data

R <sub>TH(J-C)</sub>	Junction-case Thermal Resistance	0.80	°C/W
----------------------	----------------------------------	------	------

Rev B- September 2008

**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> = 40mA</b>	<b>I<sub>E</sub> = 0mA</b>	<b>65</b>	<b>---</b>	<b>---</b>	<b>V</b>
<b>BV<sub>EBO</sub></b>	<b>I<sub>E</sub> = 10mA</b>	<b>I<sub>C</sub> = 0mA</b>	<b>3.0</b>	<b>---</b>	<b>---</b>	<b>V</b>
<b>BV<sub>CER</sub></b>	<b>I<sub>C</sub> = 40mA</b>	<b>R<sub>BE</sub> = 10Ω</b>	<b>65</b>	<b>---</b>	<b>---</b>	<b>V</b>
<b>I<sub>CBO</sub></b>	<b>V<sub>CB</sub> = 35 V</b>		<b>-----</b>	<b>---</b>	<b>12</b>	<b>mA</b>
<b>h<sub>FE</sub></b>	<b>V<sub>CE</sub> = 5 V</b>	<b>I<sub>C</sub> = 2A</b>	<b>20</b>	<b>---</b>	<b>120</b>	<b>---</b>

**DYNAMIC**

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
<b>P<sub>OUT</sub></b>	<b>f = 960-1215MHz</b>	<b>V<sub>CC</sub> = 50V</b>	<b>P<sub>IN</sub> = 13W</b>	<b>90</b>	<b>100</b>	<b>---</b>	<b>W</b>
<b>G<sub>p</sub></b>	<b>f = 960-1215MHz</b>	<b>V<sub>CC</sub> = 50V</b>	<b>P<sub>IN</sub> = 13W</b>	<b>8.4</b>	<b>---</b>	<b>---</b>	<b>dB</b>
<b>η<sub>c</sub></b>	<b>f = 960-1215MHz</b>	<b>V<sub>CC</sub> = 50V</b>	<b>P<sub>IN</sub> = 13W</b>	<b>38</b>	<b>44</b>	<b>---</b>	<b>%</b>
<b>VSWR</b>	<b>f = 960MHz</b>	<b>V<sub>CC</sub> = 50V</b>	<b>P<sub>IN</sub> = 13W</b>			<b>10:1</b>	

Pulse Width = 10 μs

Duty Cycle = 10%

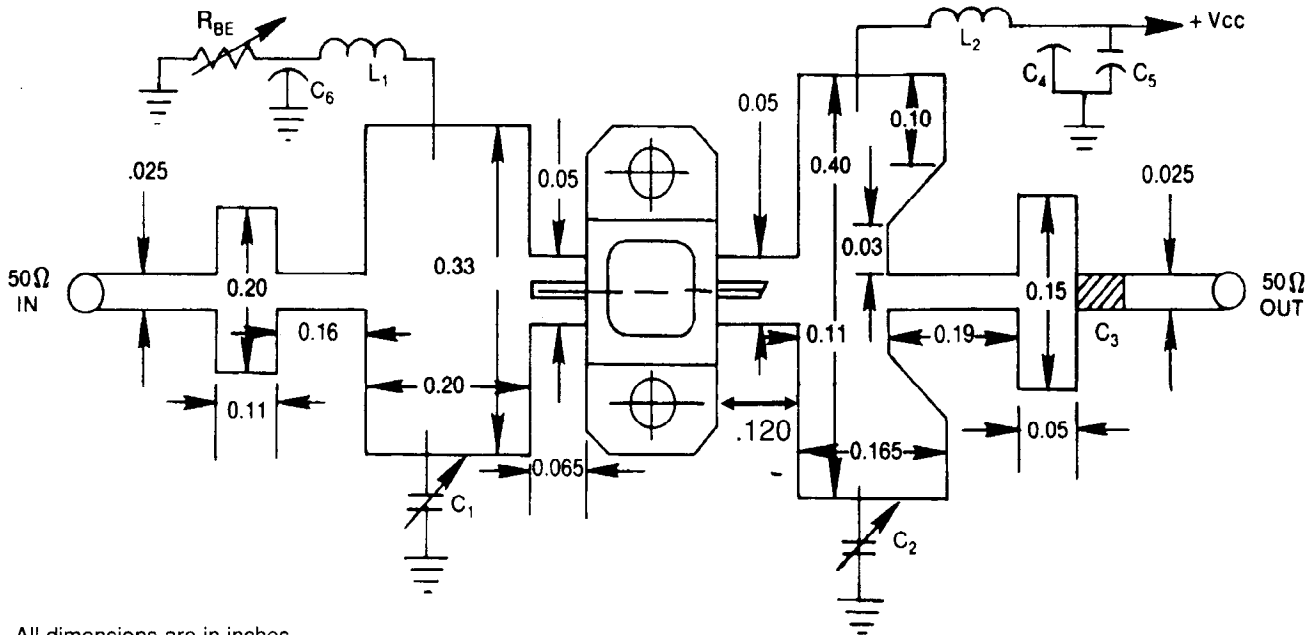
**IMPEDANCE DATA**

Freq	Z <sub>in</sub> (Ω)	Z <sub>cl</sub> (Ω)
960	5+j9.0	10.2-j8.8
1025	6+j8.0	9.5-j7.6
1090	6.8+j7.2	9.0-j6.2
1150	6.3+j7.0	8.4-j5.0
1215	5.8+j7.8	7.0-j3.7

 V<sub>cc</sub>=50v  
 P<sub>out</sub>=90w

**TEST CIRCUIT**

Ref. Dwg. No. J-313120



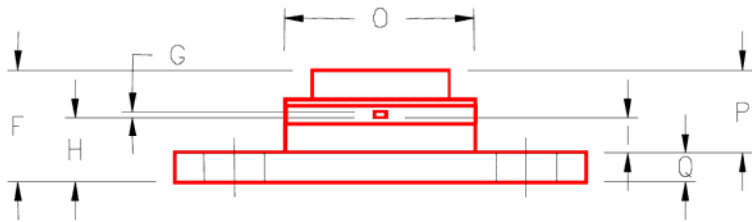
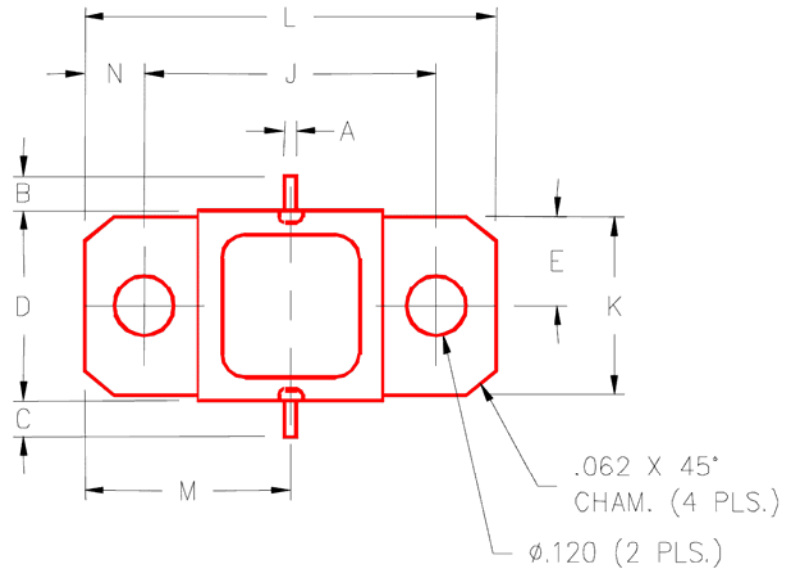
All dimensions are in inches.  
Substrate material: .025 thick Al<sub>2</sub>O<sub>3</sub>

C1,C2 : 0.3 - 3.5 pF Johanson Capacitors, or Equiv.  
C3 : 100 pF Chip Capacitor  
C4,C6 : 1500 pF RF Feedthru

C5 : 100 MF, Electrolytic 50V  
L1,L2 : No. 32 Wire, 4 Turn .062 I.D.  
RBE : 0 - 1.0 Ohm

**MS2209**
**PACKAGE MECHANICAL DATA**

## PACKAGE STYLE M218



	MINIMUM INCHES/MM	MAXIMUM INCHES/MM		MINIMUM INCHES/MM	MAXIMUM INCHES/MM
A	.025/0,64		J	.650/16,51	
B	.100/2,54		K	.386/9,80	
C	.100/2,54		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	.405/10,29	
G	.004/0,10	.007/0,18	P	.170/4,32	
H	.118/3,00	.131/3,33	Q	.062/1,58	
I	.063/1,60				