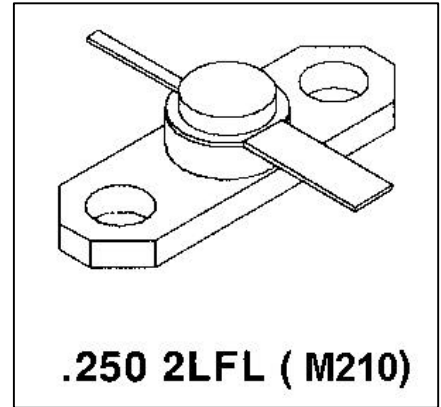


**MSC4003**

**RF AND MICROWAVE TRANSISTORS  
GENERAL PURPOSE AMPLIFIER APPLICATIONS**

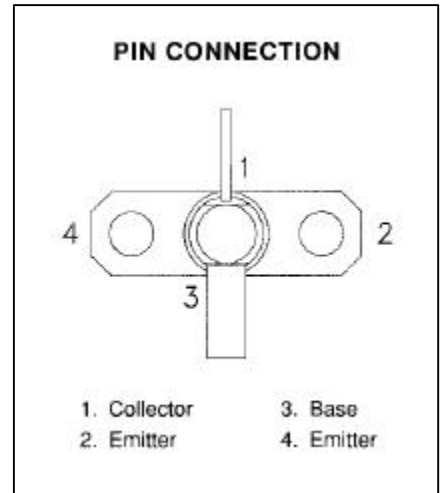
**Features**

- 3:1 VSWR AT RATED CONDITIONS
- HERMETIC STRIPAC® PACKAGE
- P<sub>OUT</sub> = 2.5 W MIN. WITH 5.0 dB GAIN AT 4.0 GHz



**DESCRIPTION:**

The MSC4003 common-base, hermetically sealed silicon NPN microwave power transistor features a unique Microgrid™ structure and can withstand 3:1 VSWR at any phase angle under rated conditions. It is designed for Class C amplifier applications in the 2.0 – 4.4 GHz frequency range.



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

Symbol	Parameter	Value	Unit
P <sub>DISS</sub>	Power Dissipation*	14.0	W
I <sub>C</sub>	Device Current*	0.5	A
V <sub>CC</sub>	Collector Supply Voltage*	30	V
T <sub>J</sub>	Junction Temperature (Pulsed RF 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*	12.5	°C/W
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\*Applies only to rated RF amplifier operation

**ELECTRICAL SPECIFICATIONS ( $T_{CASE} = 25^{\circ}C$ )**
**STATIC**

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
$BV_{CBO}$	$I_C = 2.5 \text{ mA}$	$I_E = 0 \text{ mA}$	<b>45</b>	---	---	<b>V</b>	
$BV_{EBO}$	$I_E = 1 \text{ mA}$	$I_C = 0 \text{ mA}$	<b>3.5</b>	---	---	<b>V</b>	
$BV_{CER}$	$I_C = 5 \text{ mA}$	$R_{BE} = 10 \Omega$	<b>45</b>	---	---	<b>V</b>	
$I_{CBO}$	$V_{BE} = 28 \text{ V}$		---	---	<b>0.5</b>	<b>mA</b>	
$h_{FE}$	$V_{CE} = 5 \text{ V}$	$I_C = 250 \text{ mA}$	<b>15</b>	---	<b>120</b>	---	

**DYNAMIC**

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
$P_{OUT}$	$f = 4.0 \text{ GHz}$	$P_{IN} = 0.79 \text{ W}$	$V_{CC} = 28 \text{ V}$	<b>2.5</b>	<b>2.7</b>	---	<b>W</b>
$\eta_C$	$f = 4.0 \text{ GHz}$	$P_{IN} = 0.79 \text{ W}$	$V_{CC} = 28 \text{ V}$	<b>25</b>	<b>27</b>	---	<b>%</b>
$G_P$	$f = 4.0 \text{ GHz}$	$P_{IN} = 0.79 \text{ W}$	$V_{CC} = 28 \text{ V}$	<b>5.0</b>	<b>5.3</b>	---	<b>dB</b>
$C_{OB}$	$f = 1 \text{ MHz}$	$V_{CB} = 28 \text{ V}$		---	---	<b>5.0</b>	<b>pF</b>

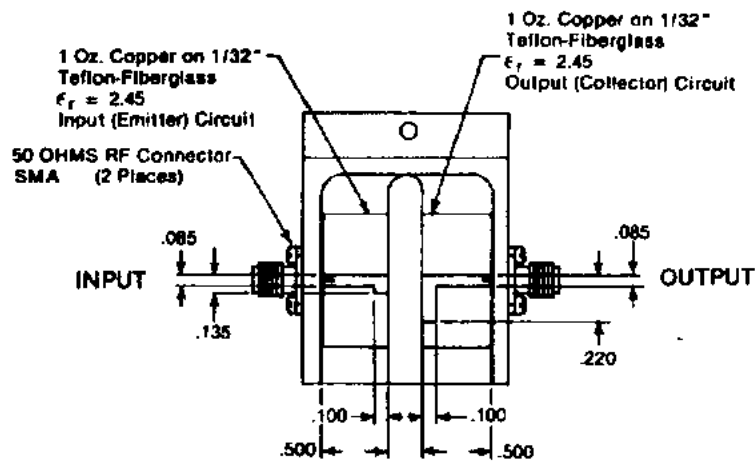
**IMPEDANCE DATA**

Freq.	Z <sub>IN</sub> (Ω)	Z <sub>CL</sub> (Ω)
2.3 GHz	.30 + j 14.0	6.5 + j 5.5
2.5 GHz	4.0 + j 20.0	5.3 + j 2.5
3.0 GHz	8.0 + j 32.0	4.5 - j 4.0
3.5 GHz	20.0 + j 47.0	4.5 - j 10.0
4.0 GHz	27.0 + j 57.0	4.5 - j 20.0
4.4 GHz	50.0 + j 75.0	7.0 - j 26.0

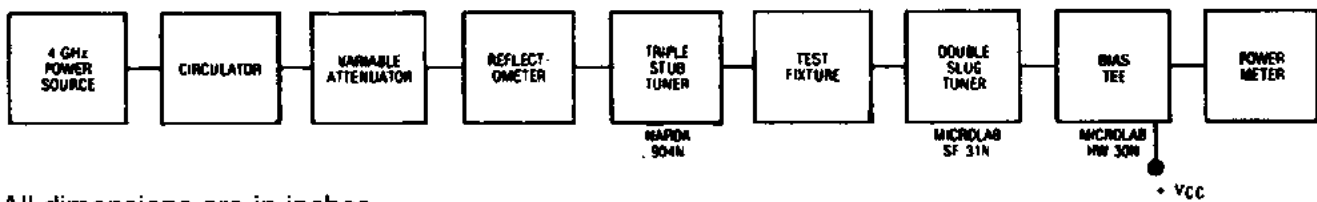
Normalized to 50 Ω

**TEST CIRCUIT**

Ref.: Dwg. No. C125506B



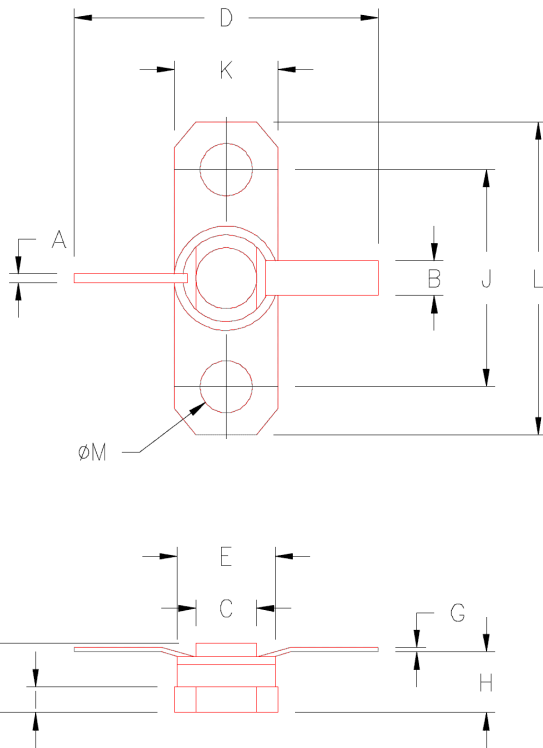
**RF Amplifier Power Output Test**



All dimensions are in inches.

**PACKAGE MECHANICAL DATA**

**PACKAGE STYLE M210**



INCHES/MM			
.028/0,71			
.110/2,80	K	.245/6,22	.255/6,48
.165/4,19	L	.790/20,07	.810/20,57
.740/18,80	M	.128/3,25	.132/3,35
.225/5,72			
.149/2,30			
.003/0,08			
.117/2,97			
.058/1,47			