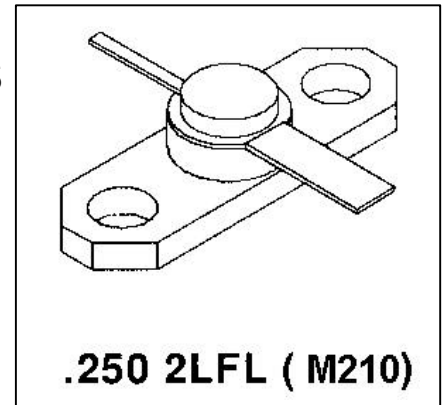


## MSC4001

### RF AND MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

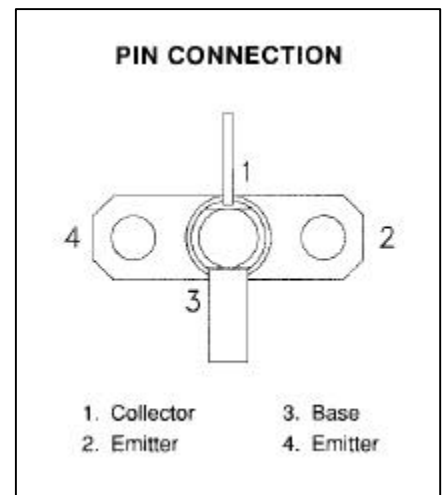
#### Features

- 3:1 VSWR AT RATED CONDITIONS
- HERMETIC STRIPAC® PACKAGE
- $P_{OUT} = 1.0 \text{ W MIN. WITH } 5.0 \text{ dB GAIN AT } 4.0 \text{ GHz}$



#### DESCRIPTION:

The MSC4001 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 ( $T_{CASE} = 25^{\circ}\text{C}$ )

Symbol	Parameter	Value	Unit
$P_{DISS}$	Power Dissipation*	7.0	W
$I_C$	Device Current*	0.25	A
$V_{CC}$	Collector Supply Voltage*	30	V
$T_J$	Junction Temperature (Pulsed RF Operation)	+200	$^{\circ}\text{C}$
$T_{STG}$	Storage Temperature	-65 to +200	$^{\circ}\text{C}$

#### THERMAL DATA

$R_{TH(j-c)}$	Junction-Case Thermal Resistance*	25	$^{\circ}\text{C/W}$
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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.	
$BV_{CBO}$	$I_C = 1\text{ mA}$	$I_E = 0\text{ mA}$		45	---	---	V
$BV_{EBO}$	$I_E = 1\text{ mA}$	$I_C = 0\text{ mA}$		3.5	---	---	V
$BV_{CER}$	$I_C = 5\text{ mA}$	$R_{BE} = 10\ \Omega$		45	---	---	V
$I_{CBO}$	$V_{BE} = 28\text{ V}$			---	---	0.5	mA
$h_{FE}$	$V_{CE} = 5\text{ V}$	$I_C = 100\text{ mA}$		15	---	120	---

**DYNAMIC**

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
$P_{OUT}$	$f = 4.0\text{ GHz}$	$P_{IN} = 0.32\text{ W}$	$V_{CC} = 28\text{ V}$	1.0	1.2	---	W
$\eta_C$	$f = 4.0\text{ GHz}$	$P_{IN} = 0.32\text{ W}$	$V_{CC} = 28\text{ V}$	25	27	---	%
$G_P$	$f = 4.0\text{ GHz}$	$P_{IN} = 0.32\text{ W}$	$V_{CC} = 28\text{ V}$	5.0	5.8	---	dB
$C_{OB}$	$f = 1\text{ MHz}$	$V_{CB} = 28\text{ V}$		---	---	3.6	pF

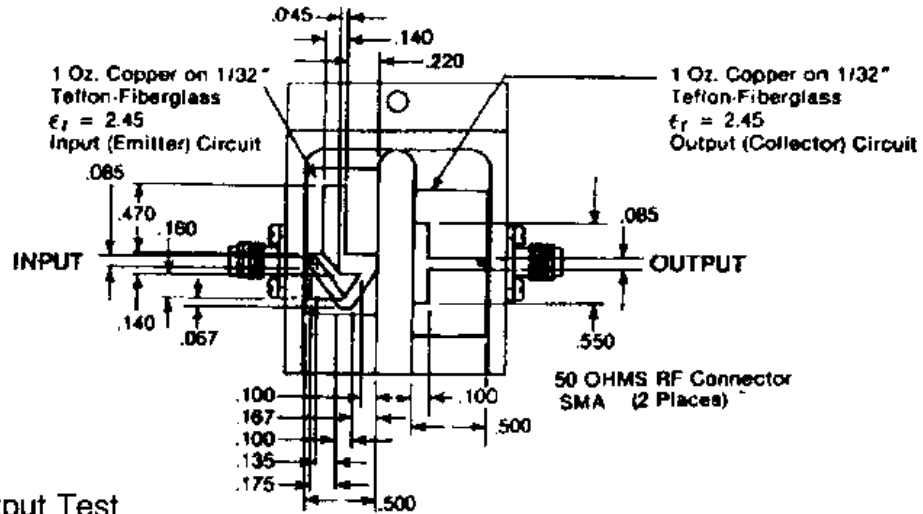
**MSC4001**

**IMPEDANCE DATA**

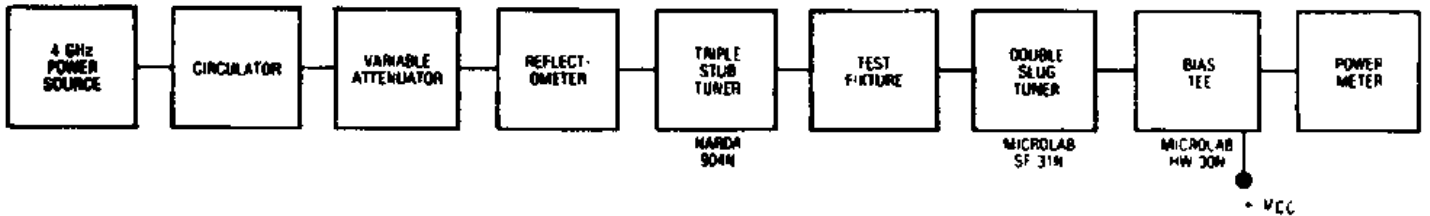
Freq.	Z <sub>IN</sub> (Ω)	Z <sub>CL</sub> (Ω)
2.0 GHz	7.5 + j 15.0	10.0 + j 18.0
2.3 GHz	11.0 + j 29.0	8.5 + j 13.0
3.0 GHz	65.0 + j 42.5	6.0 + j 0.0
3.5 GHz	65.0 - j 27.5	5.0 - j 8.5
4.0 GHz	53.0 - j 42.5	5.0 - j 10.0
4.4 GHz	33.0 - j 48.0	9.0 - j 22.0

**TEST CIRCUIT**

Ref.: Dwg. No. C125505B



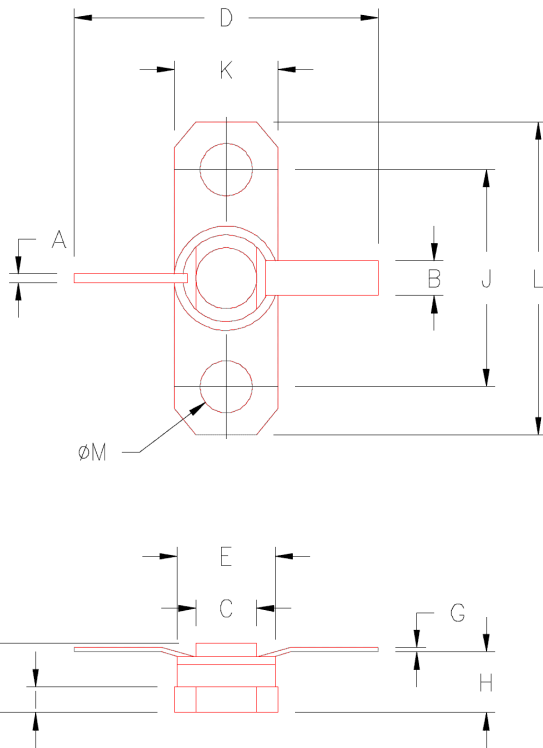
**RF Amplifier Power Output Test**



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			