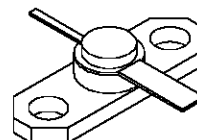


## RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

- EMITTER BALLASTED
- VSWR CAPABILITY  $\infty:1$  @ RATED CONDITIONS
- HERMETIC STRIPAC® PACKAGE
- $P_{OUT} = 10$  W MIN. WITH 5.2 dB GAIN @ 2.0 GHz



**.250 2LFL (S010)**  
hermetically sealed

**ORDER CODE**

MSC82010

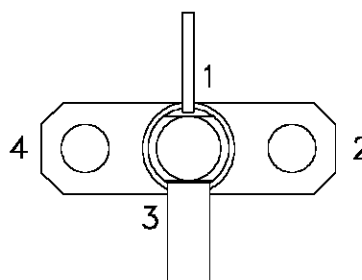
**BRANDING**

82010

### DESCRIPTION

The MSC82010 is a common base hermetically sealed silicon NPN microwave transistor utilizing a fishbone emitter ballasted geometry with a refractory/gold metallization system. This device is capable of withstanding an infinite load VSWR at any phase angle under rated conditions. The MSC82010 was designed for Class C amplifier applications in the 1.0 - 2.0 GHz frequency range.

### PIN CONNECTION



1. Collector

2. Base

3. Emitter

4. Base

### ABSOLUTE MAXIMUM RATINGS ( $T_{case} = 25^{\circ}\text{C}$ )

Symbol	Parameter	Value	Unit
$P_{DISS}$	Power Dissipation*	35	W
$I_C$	Device Current*	1.5	A
$V_{CC}$	Collector-Supply Voltage*	35	V
$T_J$	Junction Temperature	200	$^{\circ}\text{C}$
$T_{STG}$	Storage Temperature	- 65 to +200	$^{\circ}\text{C}$

### THERMAL DATA

$R_{TH(j-c)}$	Junction-Case Thermal Resistance*	5.0	$^{\circ}\text{C/W}$
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\*Applies only to rated RF amplifier operation

## MSC82010

### ELECTRICAL SPECIFICATIONS ( $T_{\text{case}} = 25^{\circ}\text{C}$ )

#### STATIC

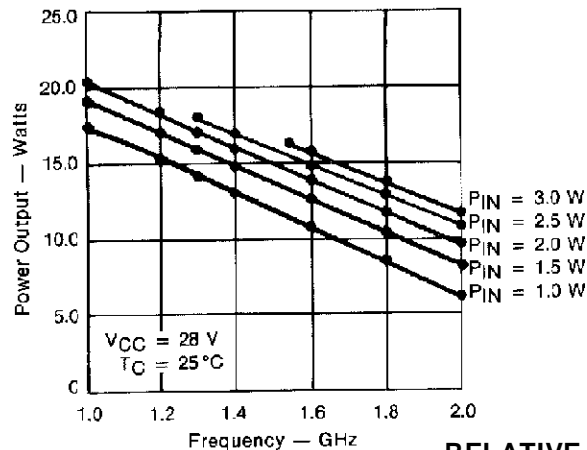
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$BV_{CBO}$	$I_C = 5\text{mA}$ $I_E = 0\text{mA}$	45	—	—	V
$BV_{EBO}$	$I_E = 1\text{mA}$ $I_C = 0\text{mA}$	3.5	—	—	V
$BV_{CER}$	$I_C = 15\text{mA}$ $R_{BE} = 10\Omega$	45	—	—	V
$I_{CBO}$	$V_{CB} = 28\text{V}$	—	—	5.0	mA
$h_{FE}$	$V_{CE} = 5\text{V}$ $I_C = 1000\text{mA}$	15	—	120	—

#### DYNAMIC

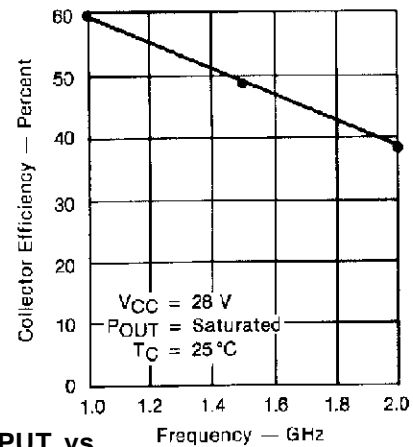
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$P_{OUT}$	$f = 2.0\text{ GHz}$ $P_{IN} = 3.0\text{ W}$ $V_{CC} = 28\text{ V}$	10	11.5	—	W
$\eta_c$	$f = 2.0\text{ GHz}$ $P_{IN} = 3.0\text{ W}$ $V_{CC} = 28\text{ V}$	35	38	—	%
$G_P$	$f = 2.0\text{ GHz}$ $P_{IN} = 3.0\text{ W}$ $V_{CC} = 28\text{ V}$	5.2	5.8	—	dB
$C_{OB}$	$f = 1\text{ MHz}$ $V_{CB} = 28\text{ V}$	—	—	19	pF

#### TYPICAL PERFORMANCE

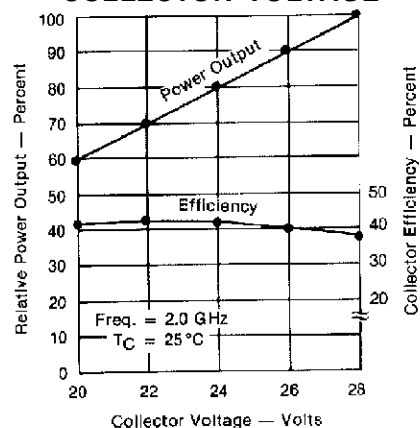
##### POWER OUTPUT vs FREQUENCY



##### COLLECTOR EFFICIENCY vs FREQUENCY

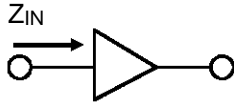


##### RELATIVE POWER OUTPUT vs COLLECTOR VOLTAGE

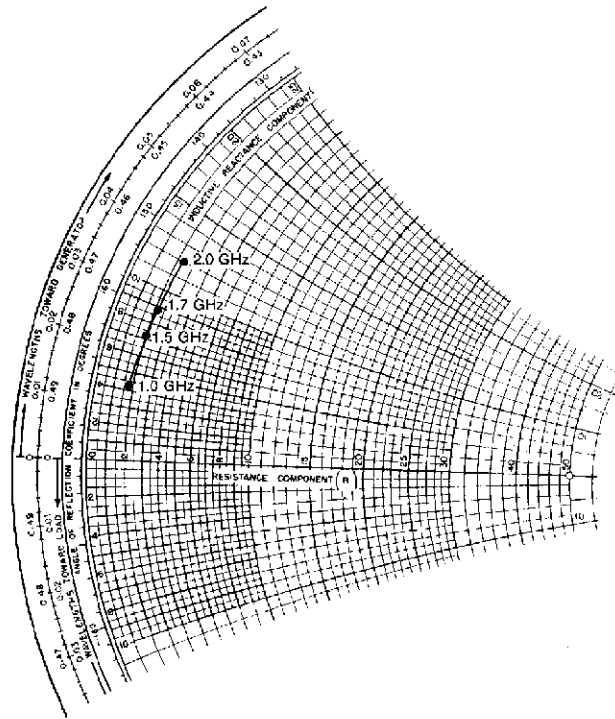


# IMPEDANCE DATA

## TYPICAL INPUT IMPEDANCE

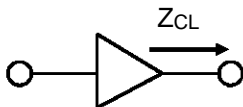


$P_{IN} = 3.0\text{ W}$   
 $V_{CC} = 28\text{ V}$   
 Normalized to 50 ohms

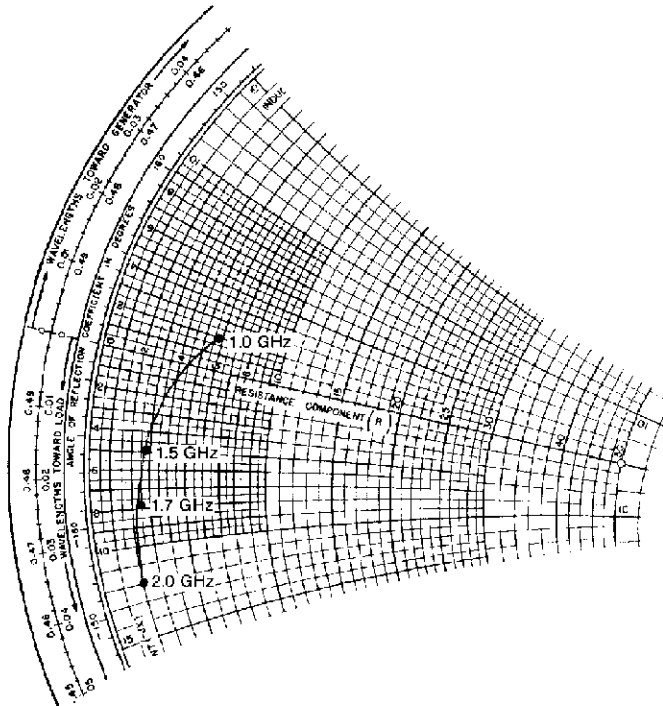


FREQ.	$Z_{IN} (\Omega)$	$Z_{CL} (\Omega)$
1.0 GHz	$1.7 + j\ 4.2$	$5.7 + j\ 1.9$
1.5 GHz	$2.0 + j\ 7.2$	$2.8 - j\ 5.0$
1.7 GHz	$2.2 + j\ 8.8$	$2.5 - j\ 7.8$
2.0 GHz	$2.4 + j\ 12.0$	$2.0 - j\ 12.0$

## TYPICAL COLLECTOR LOAD IMPEDANCE



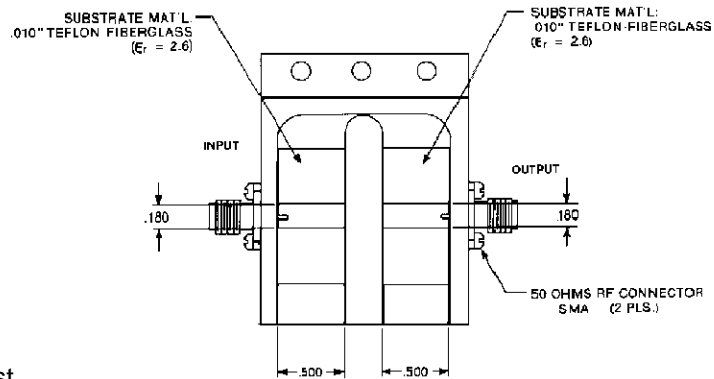
$P_{OUT} = \text{Saturated}$   
 $V_{CC} = 28\text{ V}$   
 Normalized to 50 ohms



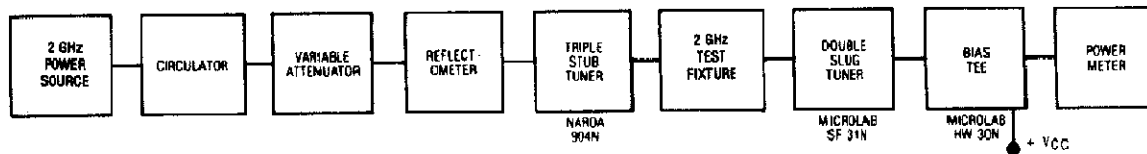
## TEST CIRCUIT

Ref.: Dwg. No. C125518

All dimensions are in inches.  
Frequency 2.0 GHz

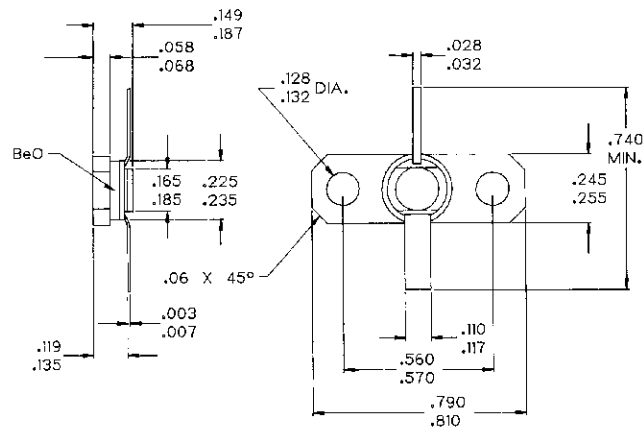


### RF Amplifier Power Output Test



## PACKAGE MECHANICAL DATA

Ref.: Dwg. No.: J135021C



#### NOTES:

1. ALL TOLERANCE  $\pm .010$  EXCEPT WHERE NOTED;  
DIMENSIONS IN INCHES.

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