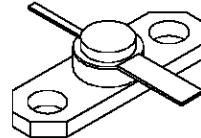


# RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

- Emitter ballasted
- Refractory/gold metallization
- VSWR capability  $\infty:1$  @ rated conditions
- Hermetic Stripac® package
- $P_{out} = 5.0$  W min. with 10 dB gain @ 1 GHz



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

**ORDER CODE**  
**MSC81111**

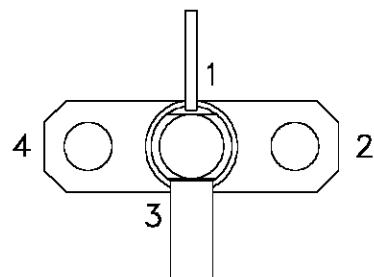
# BRANDING

81111

## DESCRIPTION

The MSC81111 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 MSC81111 is designed for Class C amplifier applications in the 0.4 - 1.2 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
PDISS	Power Dissipation* (T <sub>c</sub> ≤ 50°C)	18.75	W
I <sub>c</sub>	Device Current*	600	mA
V <sub>cc</sub>	Collector-Supply Voltage*	35	V
T <sub>J</sub>	Junction Temperature	200	°C
T <sub>STG</sub>	Storage Temperature	- 65 to +200	°C

## Thermal Data

$R_{TH(j-c)}$	Junction-Case Thermal Resistance*	8.0	°C/W
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\*Applies only to rated RF amplifier operation

# MSC81111

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

### STATIC

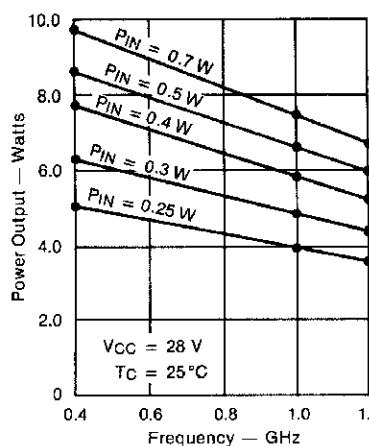
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$BV_{CBO}$	$I_C = 1\text{mA}$ $I_E = 0\text{mA}$	45	—	—	V
$BV_{EBO}$	$I_E = 1\text{mA}$ $I_C = 0\text{mA}$	3.5	—	—	V
$BV_{CER}$	$I_C = 5\text{mA}$ $R_{BE} = 10\Omega$	45	—	—	V
$I_{CBO}$	$V_{CB} = 28\text{V}$	—	—	1.0	mA
$h_{FE}$	$V_{CE} = 5\text{V}$ $I_C = 200\text{mA}$	15	—	120	—

### DYNAMIC

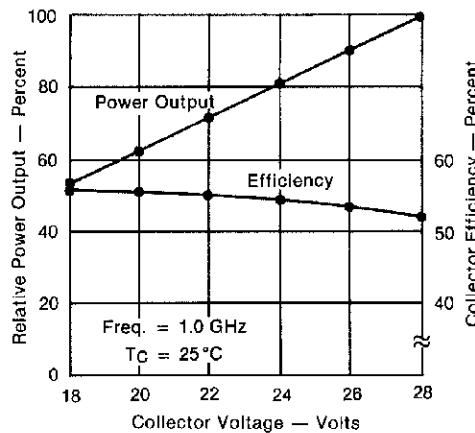
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$P_{OUT}$	$f = 1.0\text{ GHz}$ $P_{IN} = 0.5\text{ W}$ $V_{CC} = 28\text{ V}$	5.0	6.6	—	W
$\eta_C$	$f = 1.0\text{ GHz}$ $P_{IN} = 0.5\text{ W}$ $V_{CC} = 28\text{ V}$	50	52	—	%
$G_P$	$f = 1.0\text{ GHz}$ $P_{IN} = 0.5\text{ W}$ $V_{CC} = 28\text{ V}$	10	11.2	—	dB
$C_{OB}$	$f = 1\text{ MHz}$ $V_{CB} = 28\text{ V}$	—	—	6.5	pF

### TYPICAL PERFORMANCE

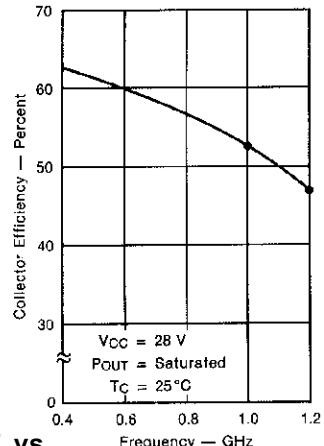
#### POWER OUTPUT vs FREQUENCY



#### RELATIVE POWER OUTPUT vs COLLECTOR VOLTAGE

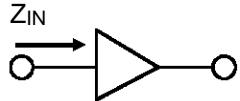


#### COLLECTOR EFFICIENCY vs FREQUENCY

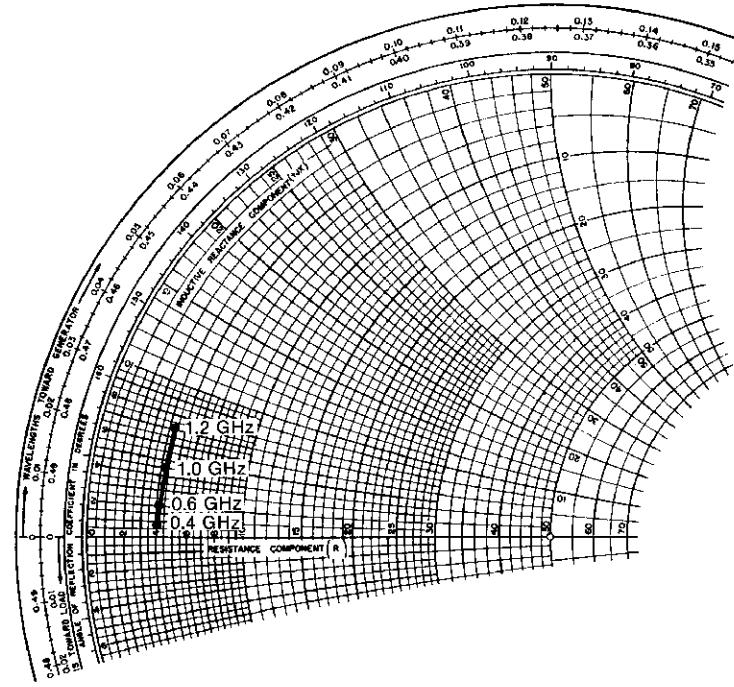


## IMPEDANCE DATA

## TYPICAL INPUT IMPEDANCE

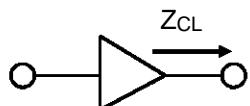


$P_{IN} = 0.5 \text{ W}$   
 $V_{CC} = 35 \text{ V}$   
 Normalized to 50 ohms

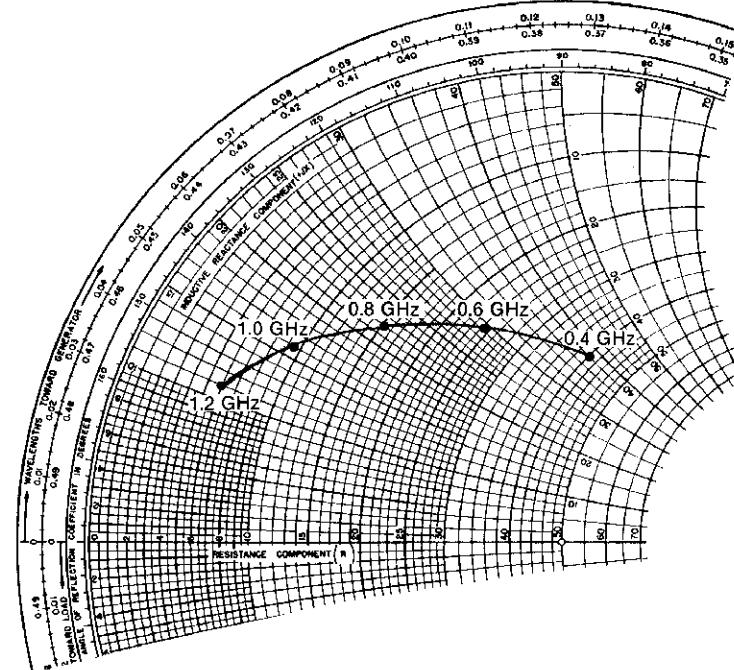


FREQ.	$Z_{IN} (\Omega)$	$Z_{CL} (\Omega)$
0.4 GHz	$4.0 + j 0.8$	$40.0 + j 38.0$
0.6 GHz	$4.1 + j 2.0$	$24.0 + j 29.5$
0.8 GHz	$4.2 + j 3.2$	$15.0 + j 22.0$
1.0 GHz	$4.3 + j 4.5$	$9.4 + j 16.0$
1.2 GHz	$4.4 + j 7.1$	$6.0 + j 11.0$

## TYPICAL COLLECTOR LOAD IMPEDANCE

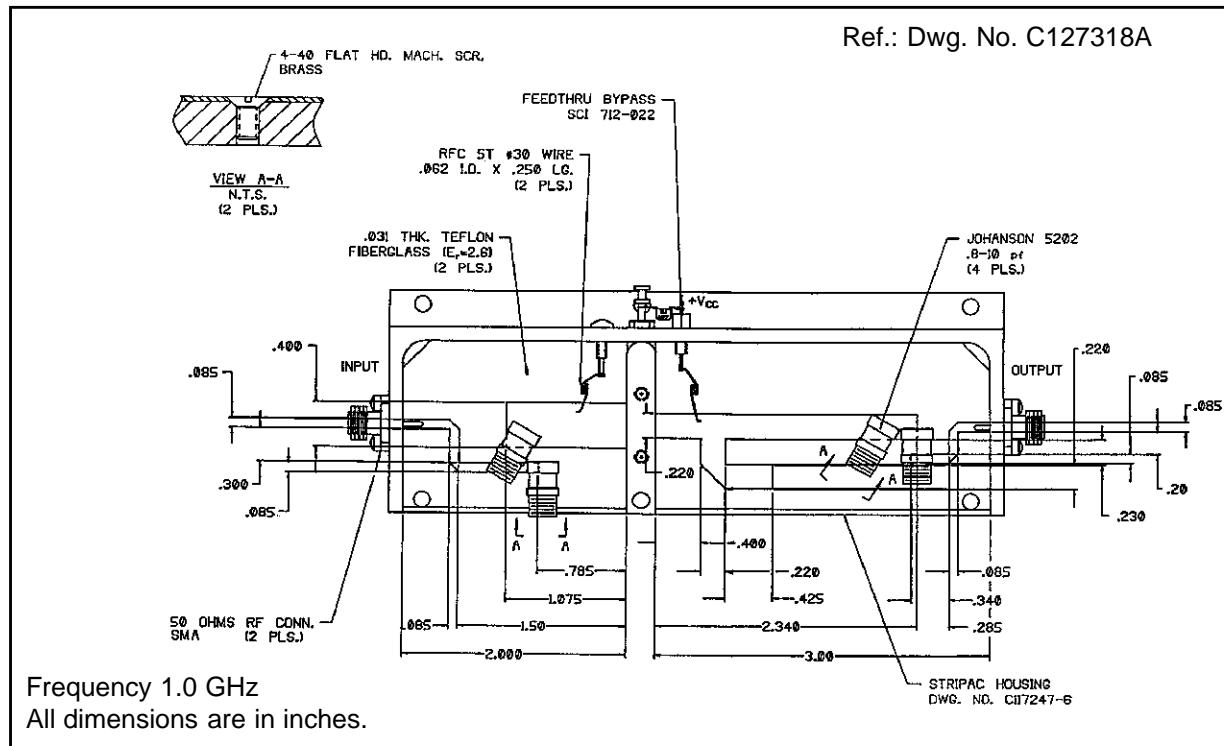


$P_{OUT} = \text{Saturated}$   
 $V_{CC} = 35 \text{ V}$   
 Normalized to 50 ohms

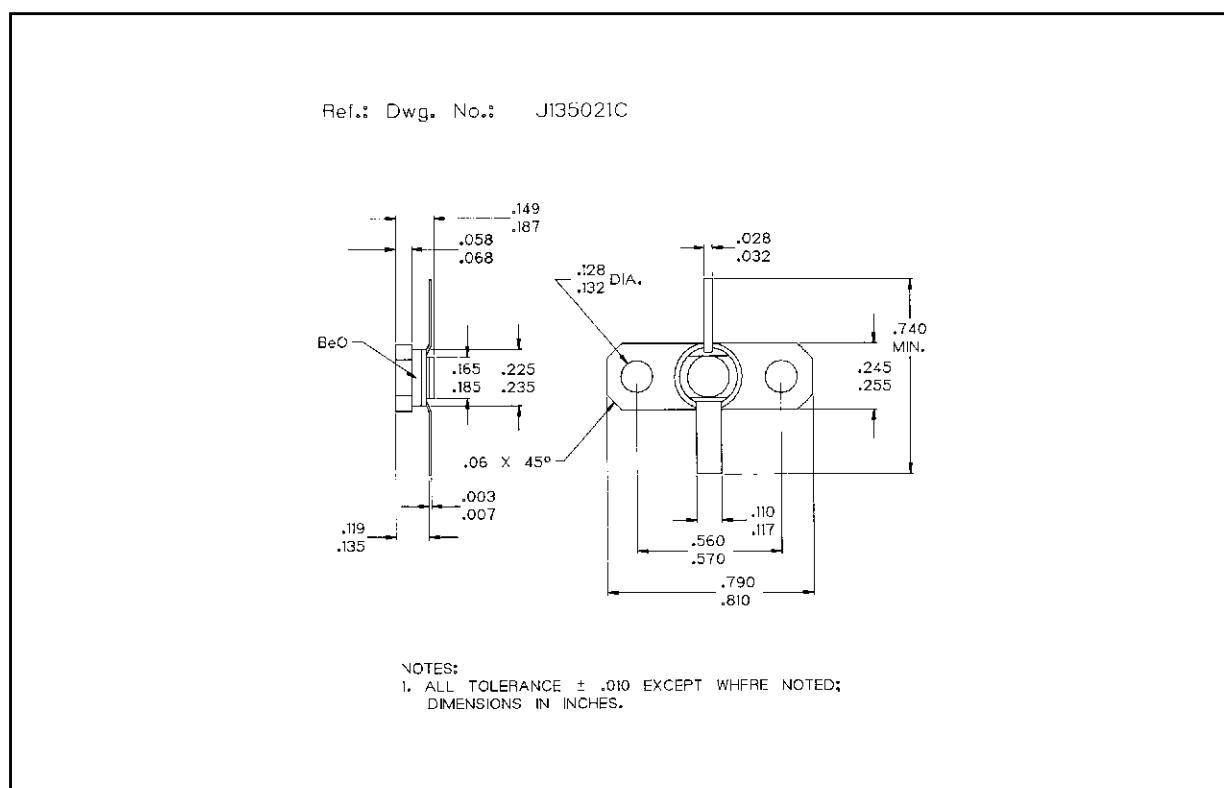


MSC8111

## TEST CIRCUIT



## PACKAGE MECHANICAL DATA



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