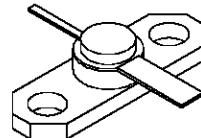




**MSC81058**

# RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

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



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

**ORDER CODE**  
**MSC81058**

# BRANDING

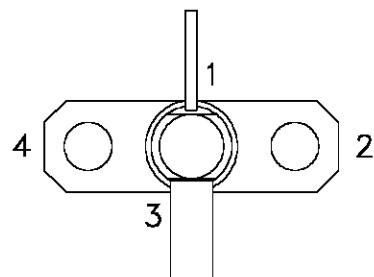
## 81058

## DESCRIPTION

The MSC81058 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 infinite load VSWR at any phase angle under rated conditions.

The MSC81058 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<sub>case</sub> = 25°C)

Symbol	Parameter	Value	Unit
P <sub>DISS</sub>	Power Dissipation*	29	W
I <sub>c</sub>	Device Current*	1.0	A
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*	6.0	°C/W
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\*Applies only to rated RF amplifier operation

## MSC81058

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

#### STATIC

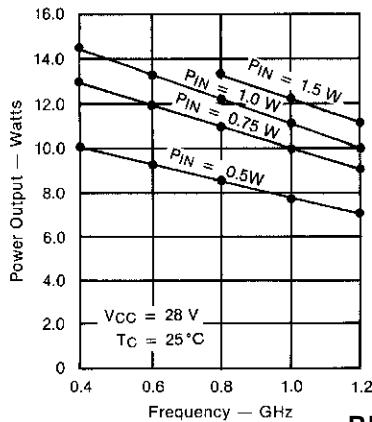
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$BV_{CBO}$	$I_C = 1\text{mA}$ $I_E = 0\text{mA}$	45	—	—	V
$BV_{EBO}$	$I_E = 1\text{mA}$ $I_C = 0\text{mA}$	3.5	—	—	V
$BV_{CER}$	$I_C = 10\text{mA}$ $R_{BE} = 10\Omega$	45	—	—	V
$I_{CBO}$	$V_{CB} = 28\text{V}$	—	—	2.5	mA
$h_{FE}$	$V_{CE} = 5\text{V}$ $I_C = 500\text{mA}$	15	—	120	—

#### DYNAMIC

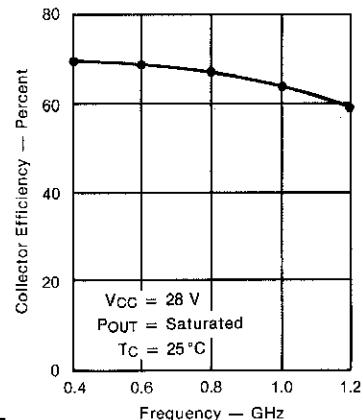
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$P_{OUT}$	$f = 1.0\text{ GHz}$ $P_{IN} = 1.0\text{ W}$ $V_{CC} = 28\text{ V}$	10	11	—	W
$\eta_C$	$f = 1.0\text{ GHz}$ $P_{IN} = 1.0\text{ W}$ $V_{CC} = 28\text{ V}$	60	64	—	%
$G_P$	$f = 1.0\text{ GHz}$ $P_{IN} = 1.0\text{ W}$ $V_{CC} = 28\text{ V}$	10	10.4	—	dB
$C_{OB}$	$f = 1\text{ MHz}$ $V_{CB} = 28\text{ V}$	—	—	10	pF

#### TYPICAL PERFORMANCE

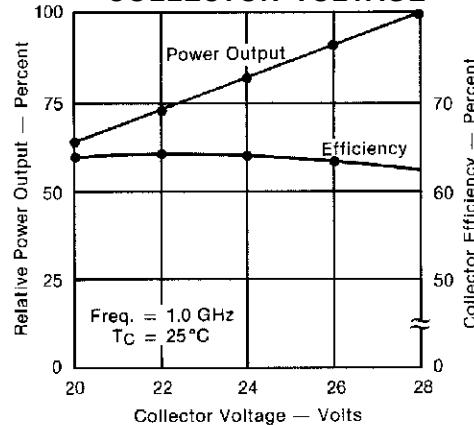
##### POWER OUTPUT vs FREQUENCY



##### FREQUENCY vs COLLECTOR EFFICIENCY

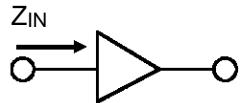


##### RELATIVE POWER OUTPUT vs COLLECTOR VOLTAGE

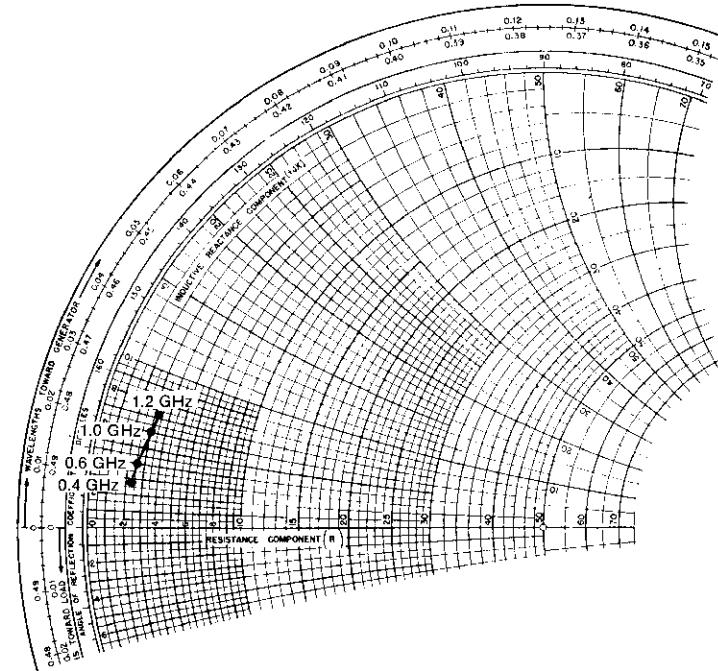


## IMPEDANCE DATA

## TYPICAL INPUT IMPEDANCE

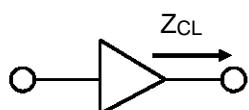


$P_{IN} = 1.0 \text{ W}$   
 $V_{CC} = 28 \text{ V}$   
 Normalized to 50 ohms

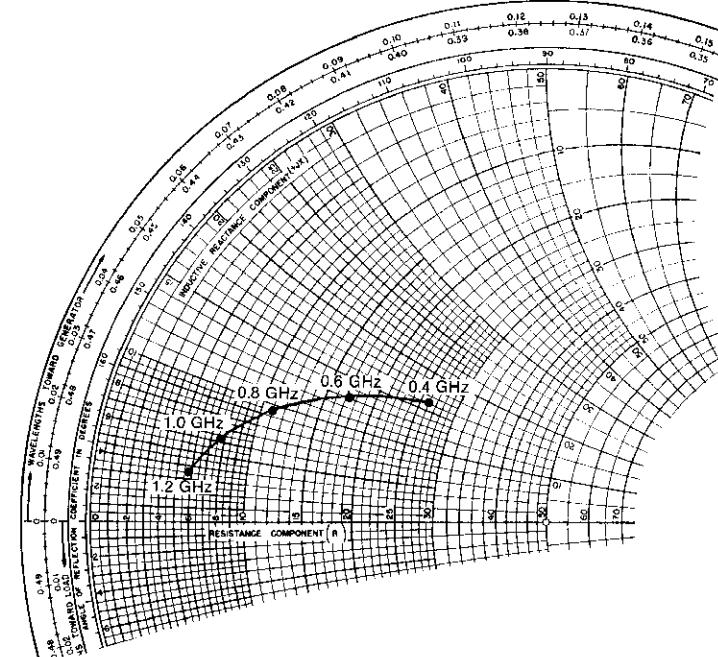


FREQ.	$Z_{IN} (\Omega)$	$Z_{CL} (\Omega)$
0.4 GHz	$2.3 + j 2.7$	$26.0 + j 16.0$
0.6 GHz	$2.5 + j 4.0$	$17.2 + j 13.0$
0.8 GHz	$2.8 + j 5.0$	$11.0 + j 9.5$
1.0 GHz	$3.0 + j 6.0$	$7.7 + j 6.3$
1.2 GHz	$3.3 + j 7.2$	$5.8 + j 3.5$

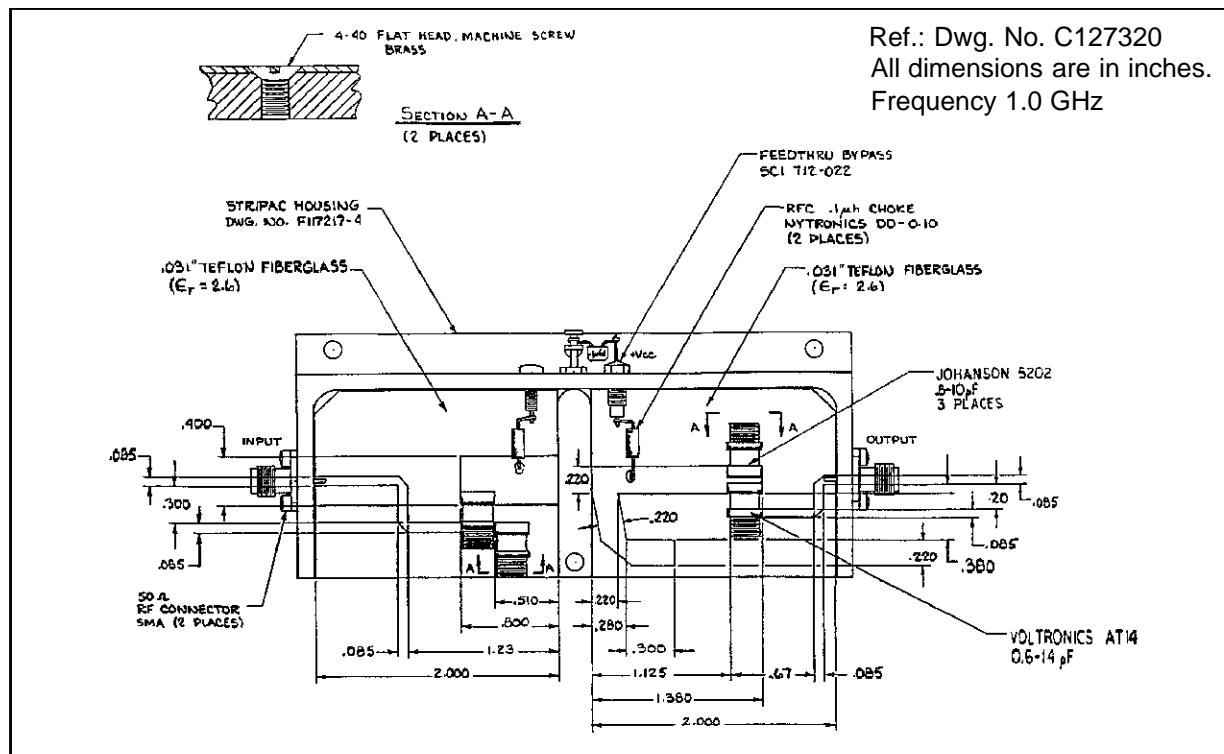
## TYPICAL COLLECTOR LOAD IMPEDANCE



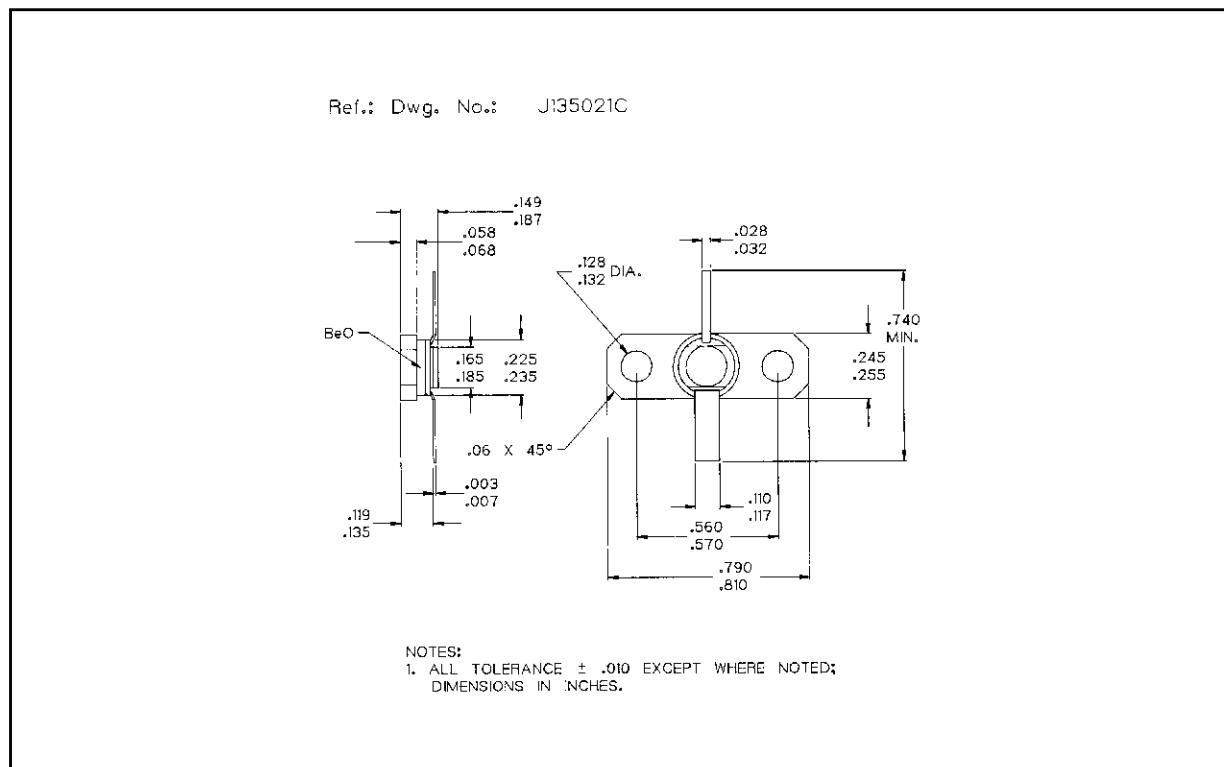
$P_{OUT} = \text{Saturated}$   
 $V_{CC} = 28 \text{ V}$   
 Normalized to 50 ohms



TEST CIRCUIT



PACKAGE MECHANICAL DATA



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