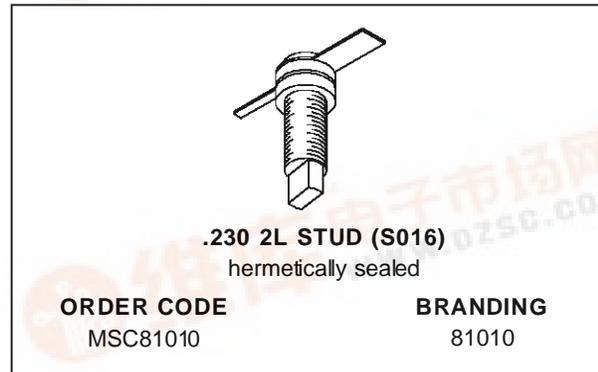




MSC81010

RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

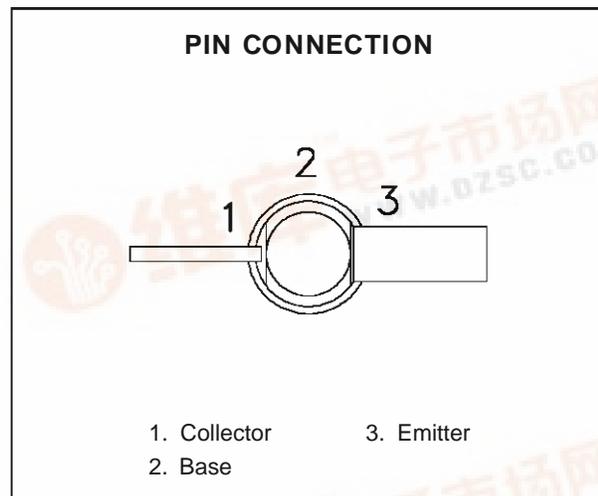
- EMITTER BALLASTED
- VSWR CAPABILITY $\infty:1$ @ RATED CONDITIONS
- HERMETIC STRIPAC® PACKAGE
- $P_{OUT} = 10$ W MIN. WITH 10 dB GAIN @ 1 GHz



DESCRIPTION

The MSC81010 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 MSC81010 is designed for Class C amplifier applications in the 0.4 - 1.2 GHz frequency range.



ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
P _{DISS}	Power Dissipation*	29	W
I _c	Device Current*	1.0	A
V _{CC}	Collector-Supply Voltage*	35	V
T _J	Junction Temperature	200	°C
T _{STG}	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



MSC81010

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

STATIC

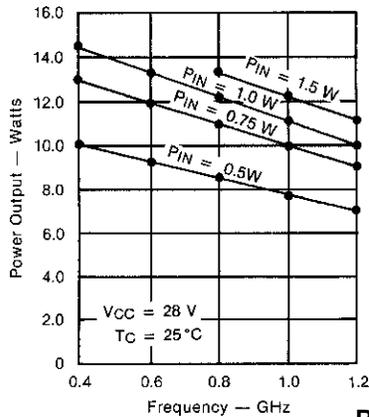
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	$I_C = 1mA$	$I_E = 0mA$	45	—	—	V
BV_{EBO}	$I_E = 1mA$	$I_C = 0mA$	3.5	—	—	V
BV_{CER}	$I_C = 10mA$	$R_{BE} = 10\Omega$	45	—	—	V
I_{CBO}	$V_{CB} = 28V$		—	—	2.5	mA
h_{FE}	$V_{CE} = 5V$	$I_C = 500mA$	15	—	120	—

DYNAMIC

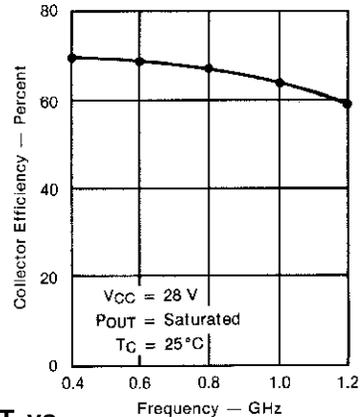
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	$f = 1.0\text{ GHz}$	$P_{IN} = 1.0\text{ W}$	$V_{CC} = 28\text{ V}$	10	11	—	W
η_c	$f = 1.0\text{ GHz}$	$P_{IN} = 1.0\text{ W}$	$V_{CC} = 28\text{ V}$	60	64	—	%
G_P	$f = 1.0\text{ GHz}$	$P_{IN} = 1.0\text{ W}$	$V_{CC} = 28\text{ V}$	10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

TYPICAL PERFORMANCE

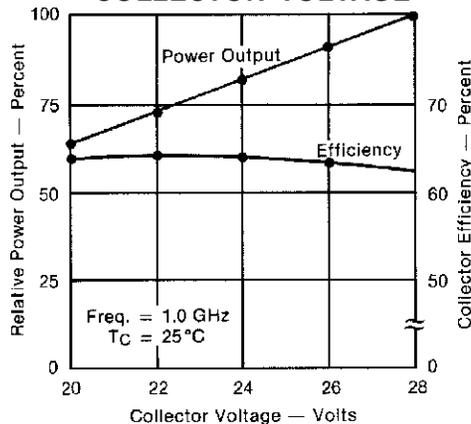
POWER OUTPUT vs FREQUENCY



FREQUENCY vs COLLECTOR EFFICIENCY

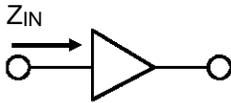


RELATIVE POWER OUTPUT vs COLLECTOR VOLTAGE

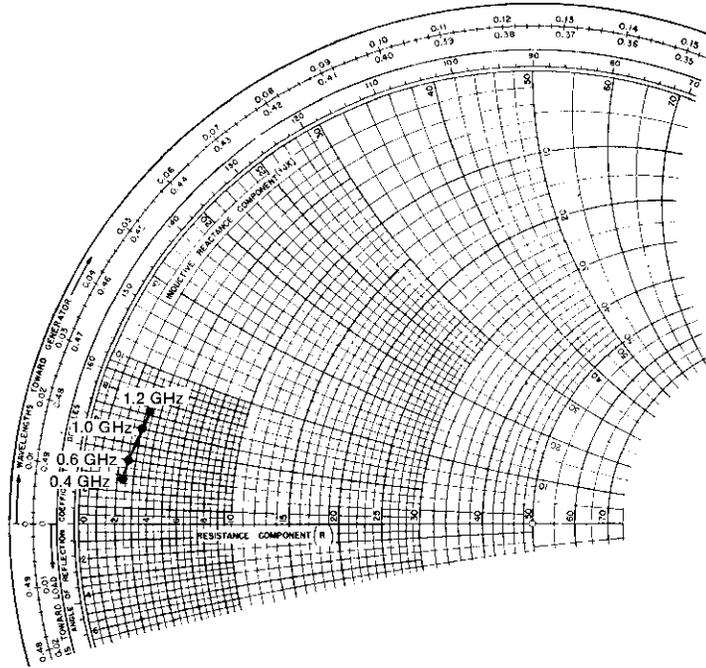


IMPEDANCE DATA

TYPICAL INPUT IMPEDANCE

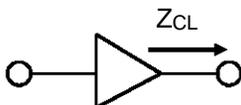


$P_{IN} = 1.0\text{ W}$
 $V_{CC} = 28\text{ V}$
 Normalized to 50 ohms

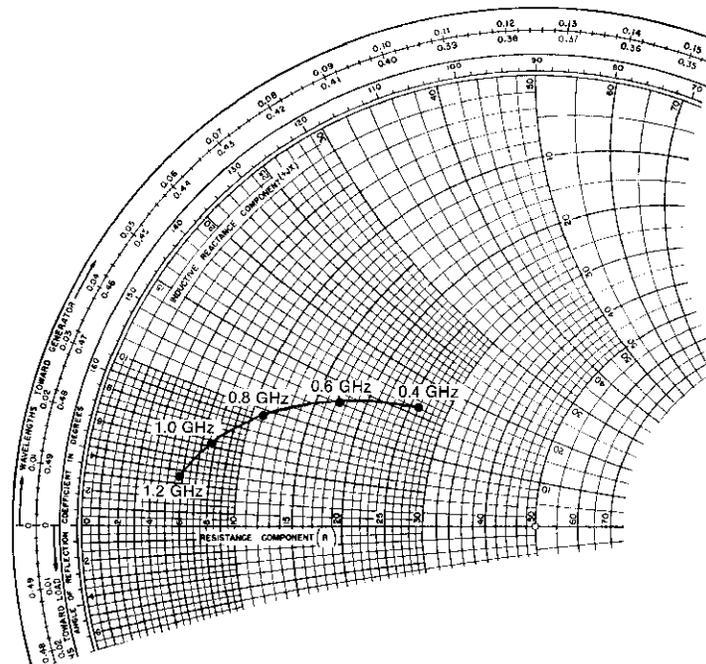


FREQ.	$Z_{IN} (\Omega)$	$Z_{CL} (\Omega)$
0.4 GHz	$2.3 + j 2.7$	$26.0 + j 16.0$
0.6 GHz	$2.5 + j 4.0$	$17.2 + j 13.0$
0.8 GHz	$2.8 + j 5.0$	$11.0 + j 9.5$
1.0 GHz	$3.0 + j 6.0$	$7.7 + j 6.3$
1.2 GHz	$3.3 + j 7.2$	$5.8 + j 3.5$

TYPICAL COLLECTOR LOAD IMPEDANCE

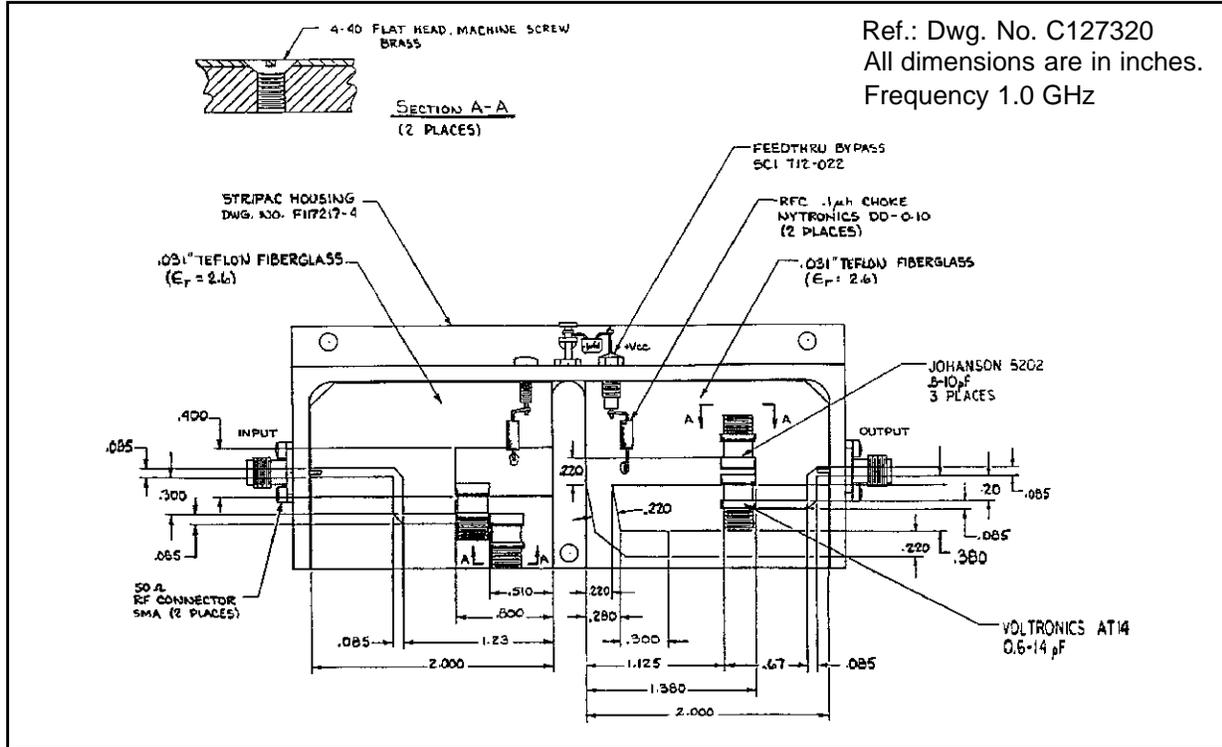


$P_{OUT} = \text{Saturated}$
 $V_{CC} = 28\text{ V}$
 Normalized to 50 ohms

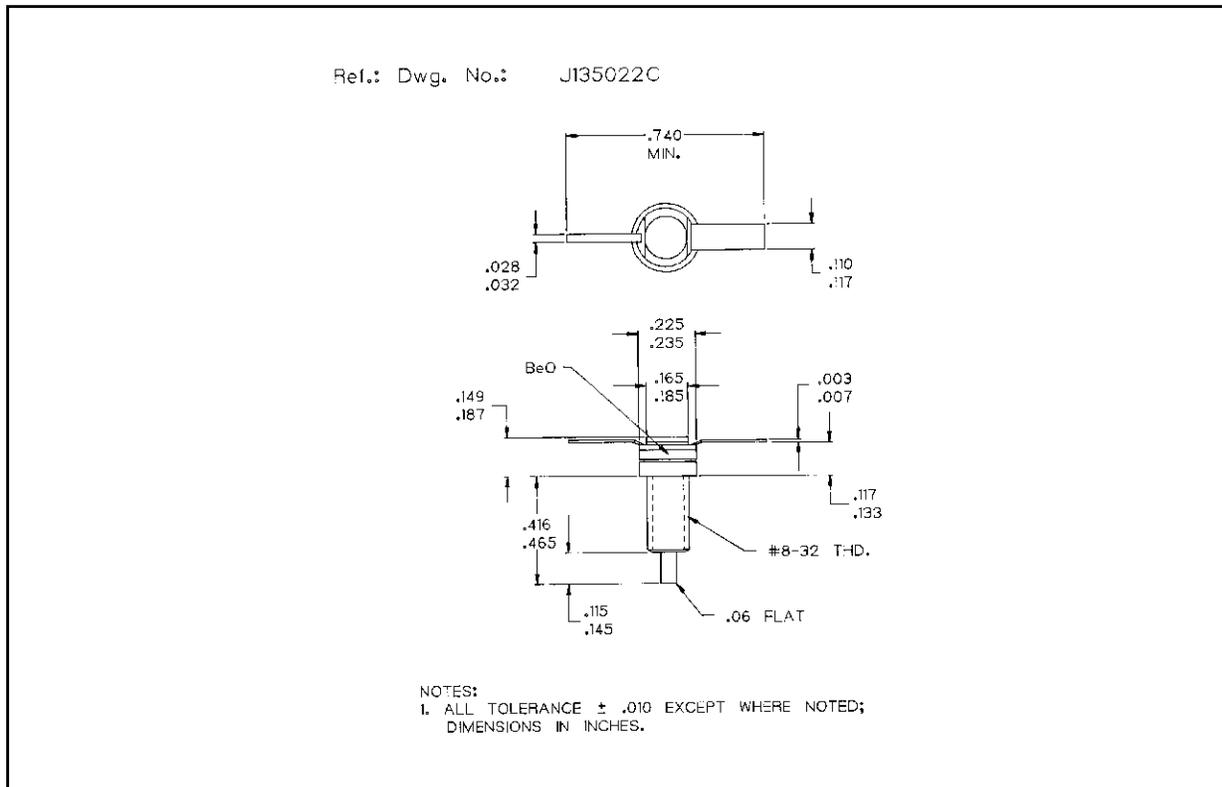


MSC81010

TEST CIRCUIT



PACKAGE MECHANICAL DATA



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