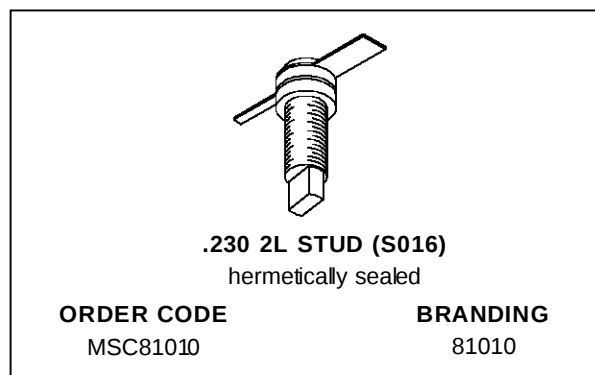


RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

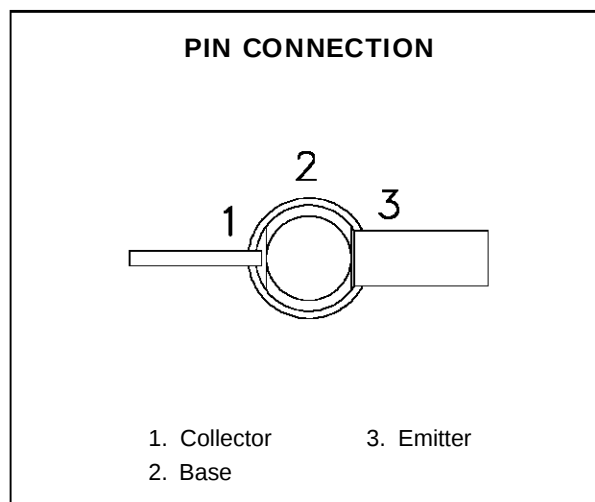
- EMITTER BALLASTED
- VSWR CAPABILITY $\infty:1$ @ RATED CONDITIONS
- HERMETIC STRIPAC® PACKAGE
- $P_{OUT} = 10$ W MIN. WITH 10 dB GAIN @ 1 GHz



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

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	$^{\circ}\text{C}$
T_{STG}	Storage Temperature	- 65 to +200	$^{\circ}\text{C}$

THERMAL DATA

$R_{TH(j-c)}$	Junction-Case Thermal Resistance*	6.0	$^{\circ}\text{C/W}$
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*Applies only to rated RF amplifier operation

MSC81010

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

STATIC

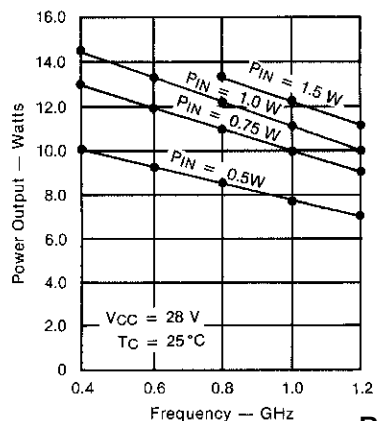
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BV_{CBO}	$I_{\text{C}} = 1\text{mA}$ $I_{\text{E}} = 0\text{mA}$	45	—	—	V
BV_{EBO}	$I_{\text{E}} = 1\text{mA}$ $I_{\text{C}} = 0\text{mA}$	3.5	—	—	V
BV_{CER}	$I_{\text{C}} = 10\text{mA}$ $R_{\text{BE}} = 10\Omega$	45	—	—	V
I_{CBO}	$V_{\text{CB}} =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

DYNAMIC

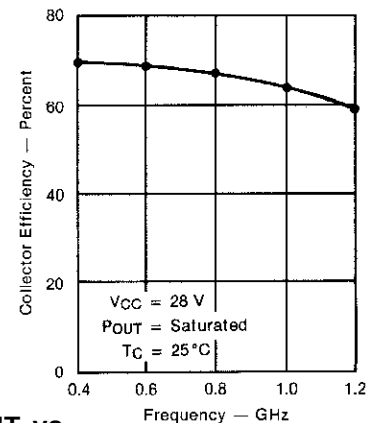
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_{OUT}	$f = 1.0\text{ GHz}$ $P_{\text{IN}} = 1.0\text{ W}$ $V_{\text{CC}} = 28\text{ V}$	10	11	—	W
η_{C}	$f = 1.0\text{ GHz}$ $P_{\text{IN}} = 1.0\text{ W}$ $V_{\text{CC}} = 28\text{ V}$	60	64	—	%
G_{P}	$f = 1.0\text{ GHz}$ $P_{\text{IN}} = 1.0\text{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

TYPICAL PERFORMANCE

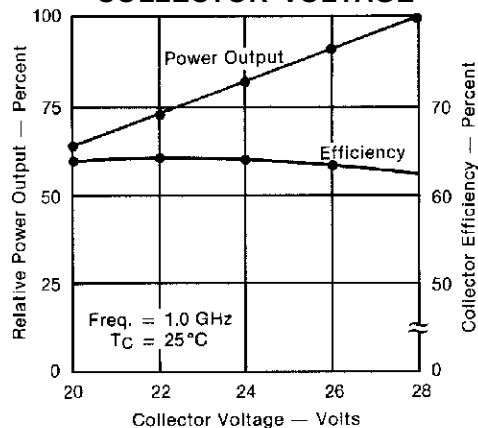
POWER OUTPUT vs FREQUENCY



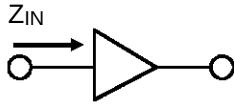
FREQUENCY vs COLLECTOR EFFICIENCY



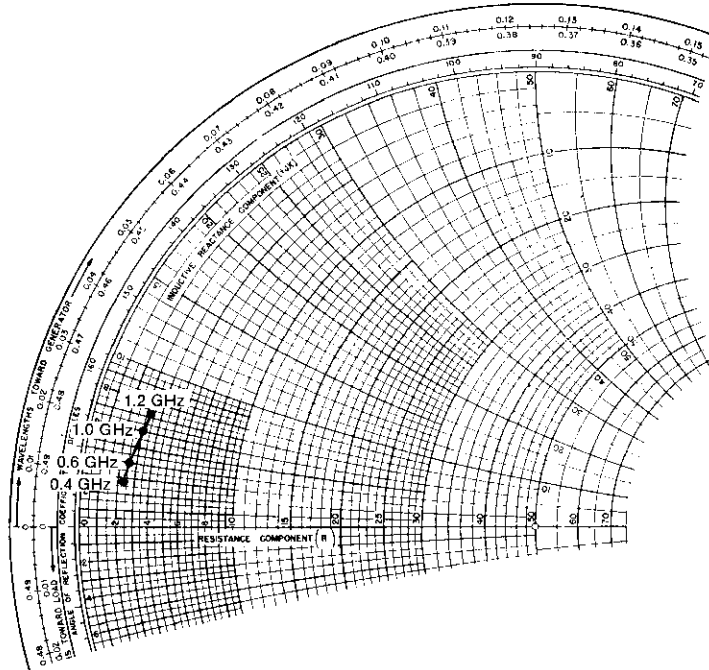
RELATIVE POWER OUTPUT vs COLLECTOR VOLTAGE



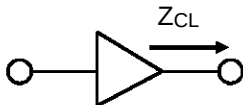
IMPEDANCE DATA

TYPICAL INPUT
IMPEDANCE

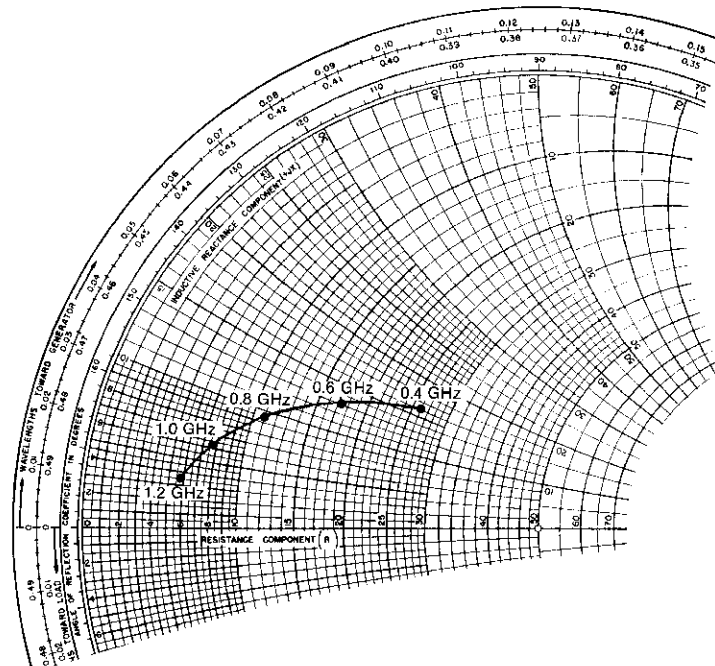
$P_{IN} = 1.0 \text{ W}$
 $V_{CC} = 28 \text{ V}$
 Normalized to 50 ohms



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	$3.3 + j 7.2$	$5.8 + j 3.5$

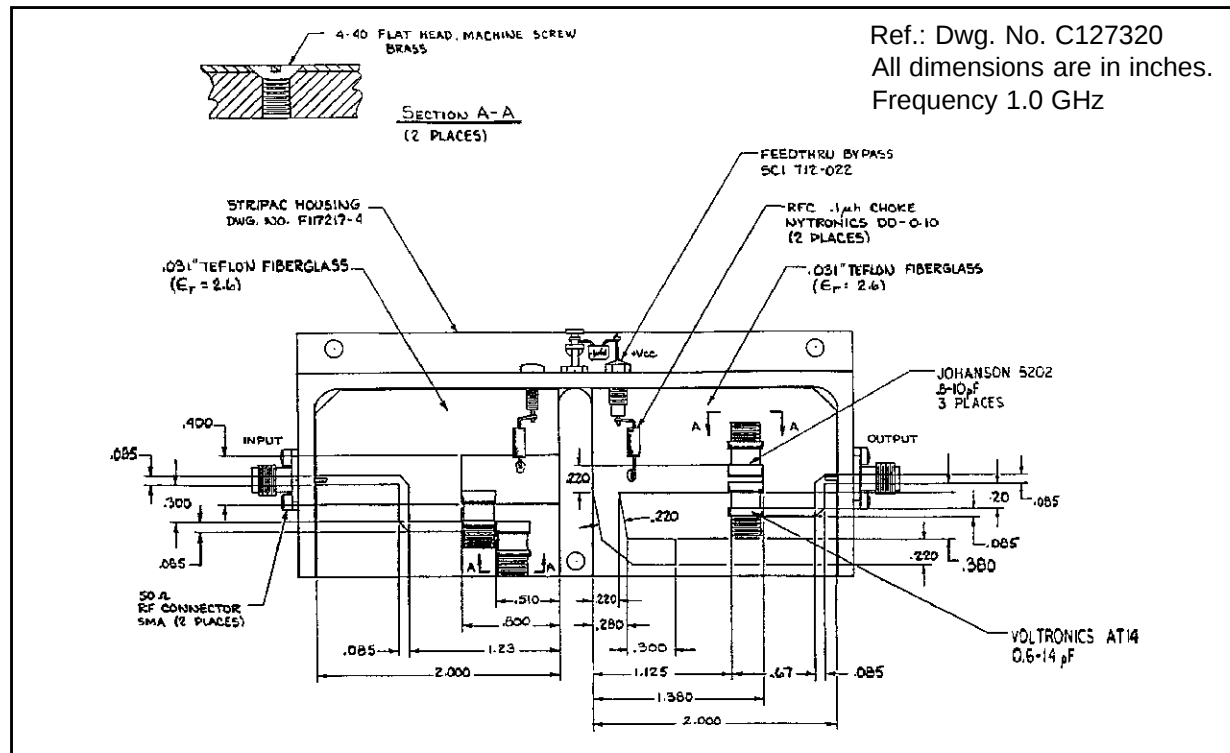
TYPICAL COLLECTOR
LOAD IMPEDANCE

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

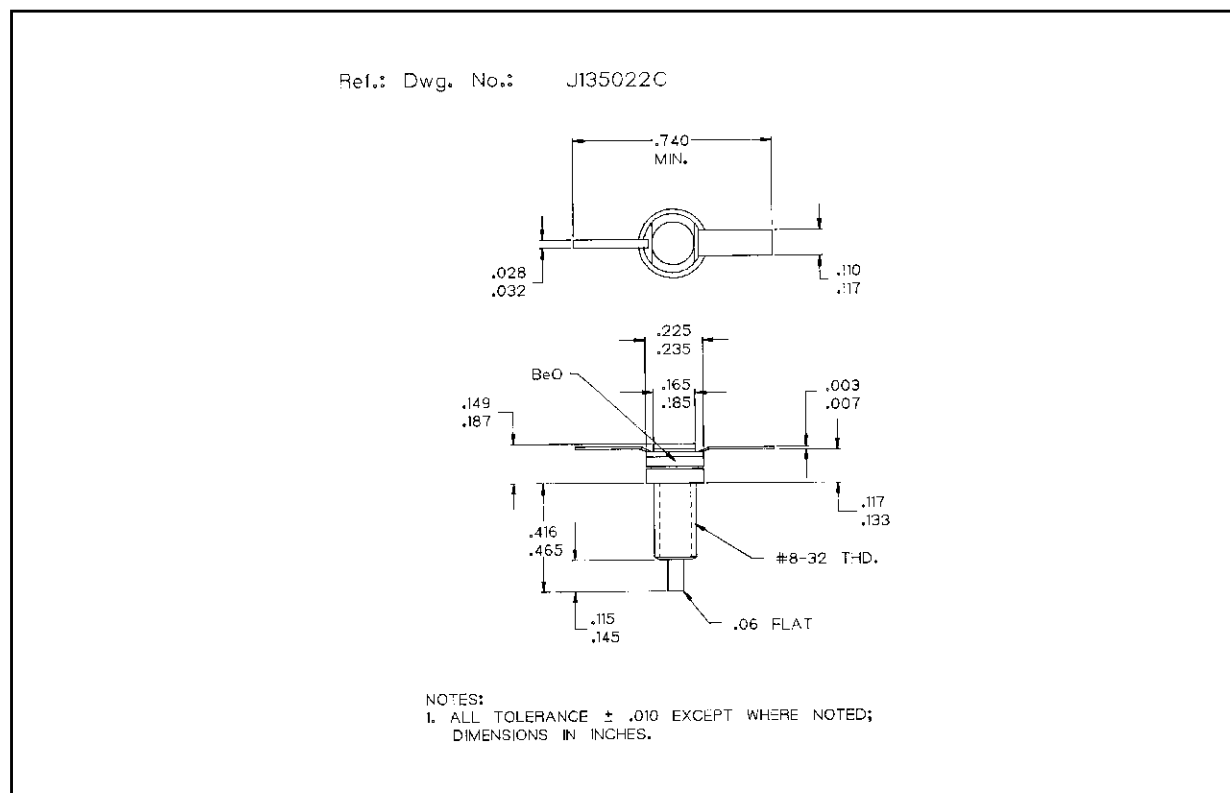


MSC81010

TEST CIRCUIT



PACKAGE MECHANICAL DATA



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