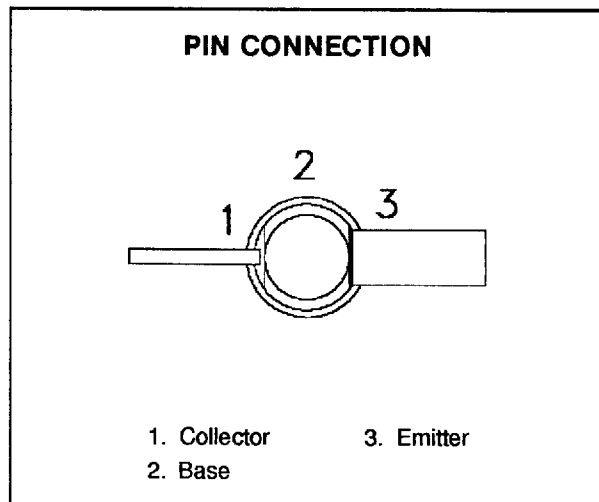
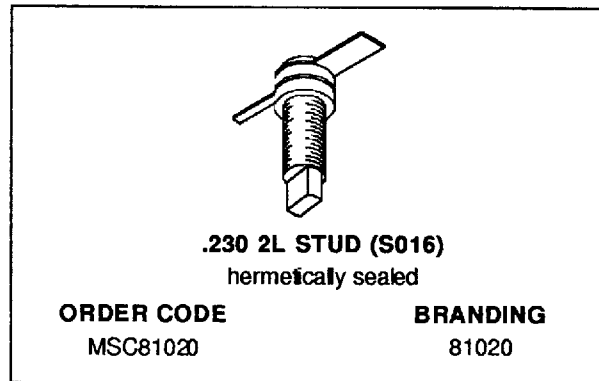


**RF & MICROWAVE TRANSISTORS
GENERAL PURPOSE AMPLIFIER APPLICATIONS**

- EMITTER BALLASTED
- REFRACTORY/GOLD METALLIZATION
- LOW THERMAL RESISTANCE
- HERMETIC STRIPAC® PACKAGE
- $P_{OUT} = 20$ W MIN. WITH 10 dB GAIN @ 1 GHz



DESCRIPTION

The MSC81020 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 designed for Class C amplifier applications in the 0.4 - 1.2 GHz frequency range.

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

Symbol	Parameter	Value	Unit
P_{DISS}	Power Dissipation*	35	W
I_c	Device Current*	1.50	A
V_{CC}	Collector-Supply Voltage*	35	V
T_J	Junction Temperature	200	$^{\circ}C$
T_{STG}	Storage Temperature	- 65 to +200	$^{\circ}C$

THERMAL DATA

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

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

STATIC

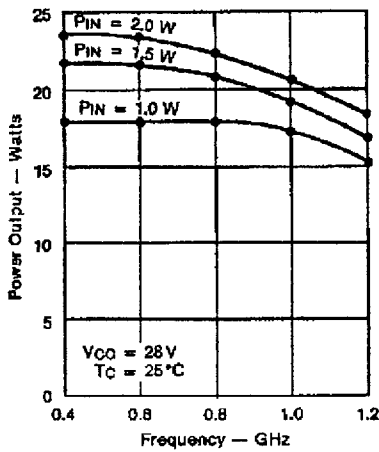
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	$I_C = 5mA$	$I_E = 0mA$	45	—	—	V
BV_{EBO}	$I_E = 1mA$	$I_C = 0mA$	3.5	—	—	V
BV_{CER}	$I_C = 15mA$	$R_{BE} = 10\Omega$	45	—	—	V
I_{CBO}	$V_{CB} = 28V$		—	—	5.0	mA
h_{FE}	$V_{CE} = 5V$	$I_C = 1000mA$	15	—	120	—

DYNAMIC

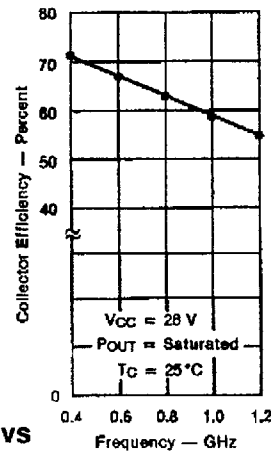
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	$f = 1.0 GHz$	$P_{IN} = 2.0 W$	$V_{CC} = 28 V$	20	21	—	W
η_c	$f = 1.0 GHz$	$P_{IN} = 2.0 W$	$V_{CC} = 28 V$	55	58	—	%
G_P	$f = 1.0 GHz$	$P_{IN} = 2.0 W$	$V_{CC} = 28 V$	10	10.2	—	dB
C_{OB}	$f = 1 MHz$	$V_{CB} = 28 V$		—	—	19	pF

TYPICAL PERFORMANCE

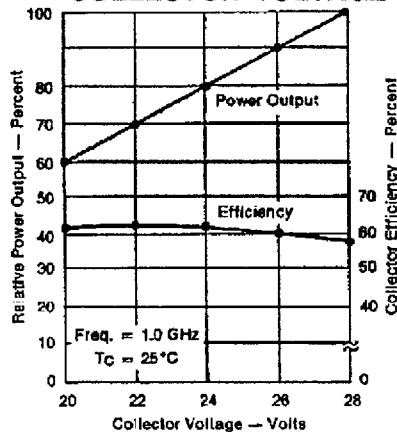
POWER OUTPUT vs FREQUENCY



COLLECTOR EFFICIENCY vs FREQUENCY

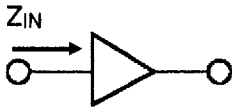


RELATIVE POWER OUTPUT vs COLLECTOR VOLTAGE

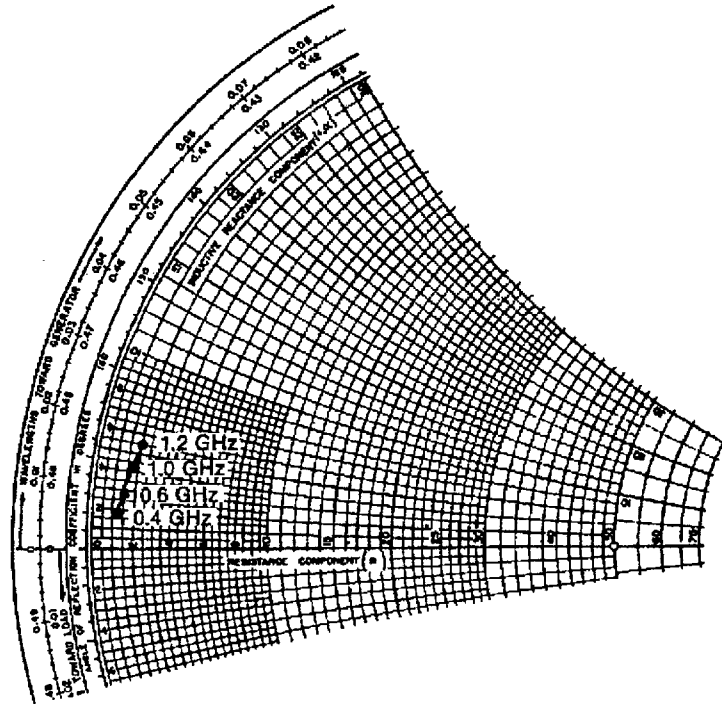


IMPEDANCE DATA

TYPICAL INPUT IMPEDANCE

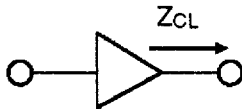


$P_{IN} = 3.0 \text{ W}$
 $V_{CC} = 28 \text{ V}$
 Normalized to 50 ohms

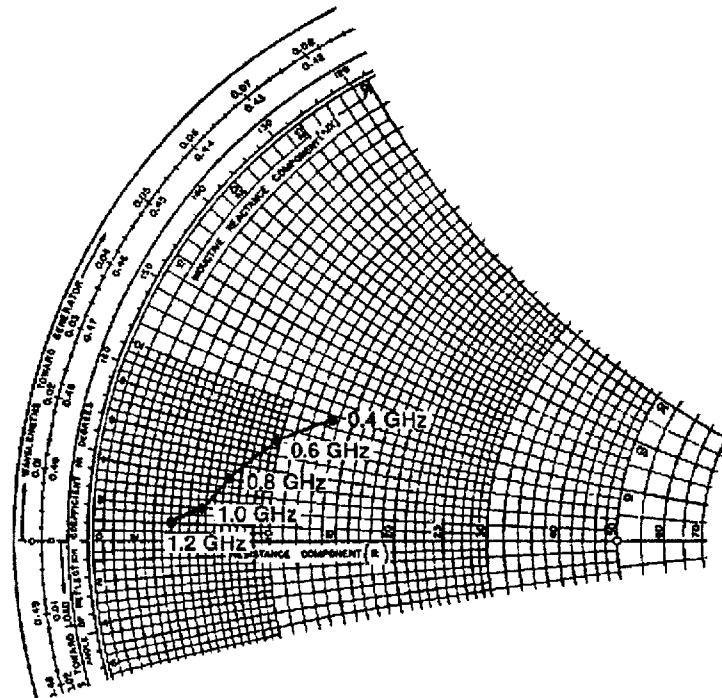


FREQ.	$Z_{IN} (\Omega)$	$Z_{CL} (\Omega)$
0.4 GHz	$1.3 + j 1.7$	$13.3 + j 9.8$
0.6 GHz	$1.5 + j 2.8$	$9.7 + j 7.0$
0.8 GHz	$1.6 + j 3.4$	$7.2 + j 4.0$
1.0 GHz	$1.8 + j 4.2$	$5.8 + j 2.0$
1.2 GHz	$2.0 + j 5.5$	$4.0 + j 1.0$

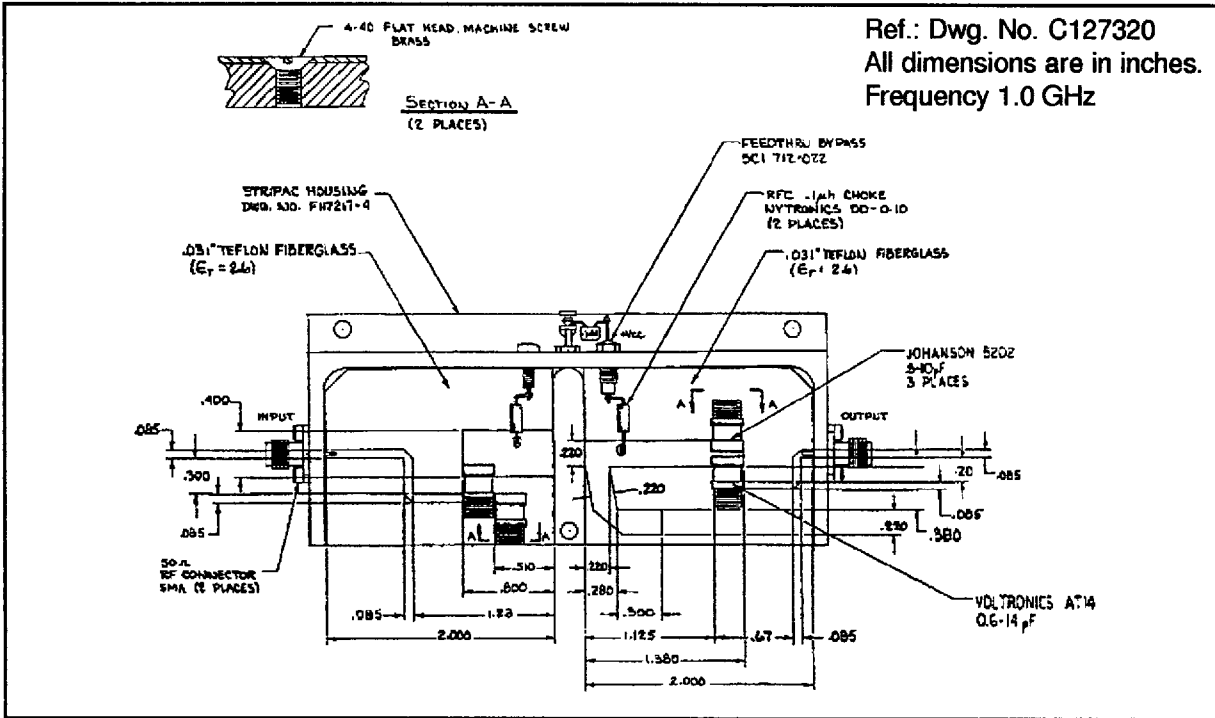
TYPICAL COLLECTOR LOAD IMPEDANCE



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



TEST CIRCUIT



PACKAGE MECHANICAL DATA

