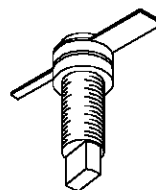


RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

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



.230 2L STUD (S016)

hermetically sealed

ORDER CODE

MSC81020

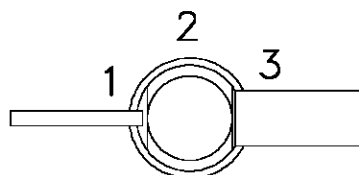
BRANDING

81020

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.

PIN CONNECTION



1. Collector

2. Base

3. Emitter

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

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

THERMAL DATA

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

MSC81020

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

STATIC

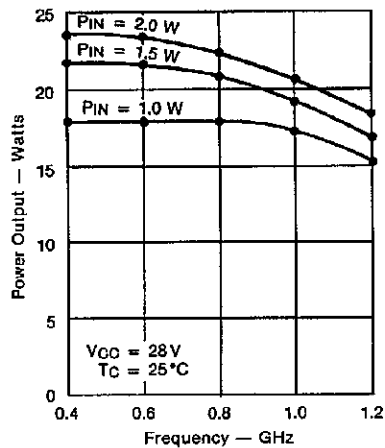
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BV_{CBO}	$I_{\text{C}} = 5\text{mA}$ $I_{\text{E}} = 0\text{mA}$	45	—	—	V
BV_{EBO}	$I_{\text{E}} = 1\text{mA}$ $I_{\text{C}} = 0\text{mA}$	3.5	—	—	V
BV_{CER}	$I_{\text{C}} = 15\text{mA}$ $R_{\text{BE}} = 10\Omega$	45	—	—	V
I_{CBO}	$V_{\text{CB}} =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

DYNAMIC

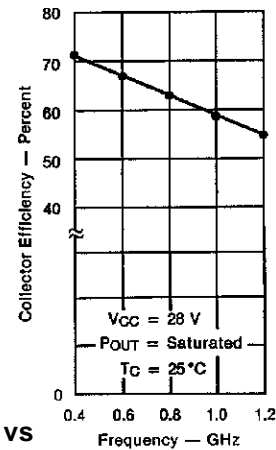
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_{OUT}	$f = 1.0\text{ GHz}$ $P_{\text{IN}} = 2.0\text{ W}$ $V_{\text{CC}} = 28\text{ V}$	20	21	—	W
η_{C}	$f = 1.0\text{ GHz}$ $P_{\text{IN}} = 2.0\text{ W}$ $V_{\text{CC}} = 28\text{ V}$	55	58	—	%
G_{P}	$f = 1.0\text{ GHz}$ $P_{\text{IN}} = 2.0\text{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

TYPICAL PERFORMANCE

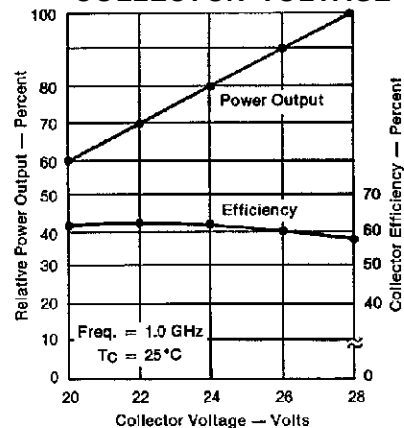
POWER OUTPUT vs FREQUENCY



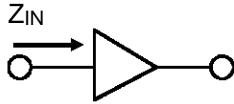
COLLECTOR EFFICIENCY vs FREQUENCY



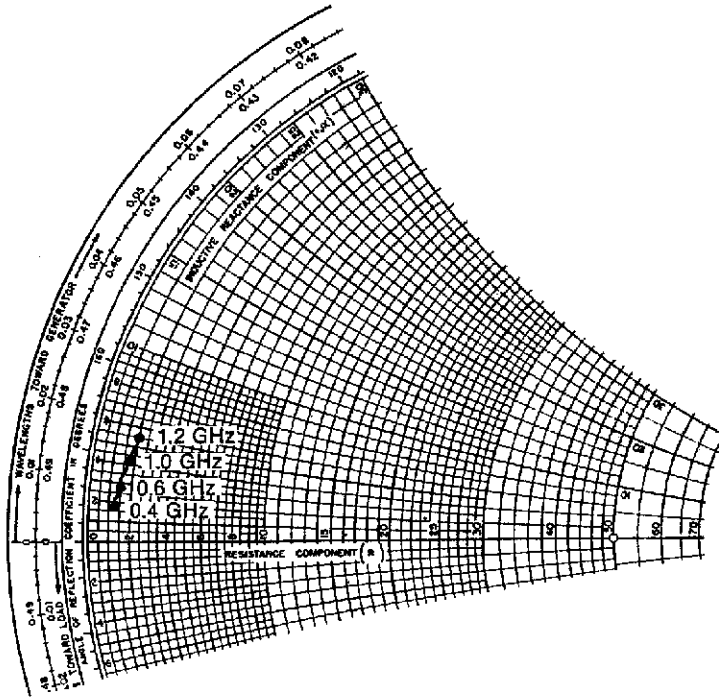
RELATIVE POWER OUTPUT vs COLLECTOR VOLTAGE



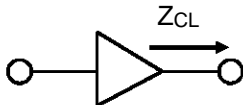
IMPEDANCE DATA

TYPICAL INPUT
IMPEDANCE

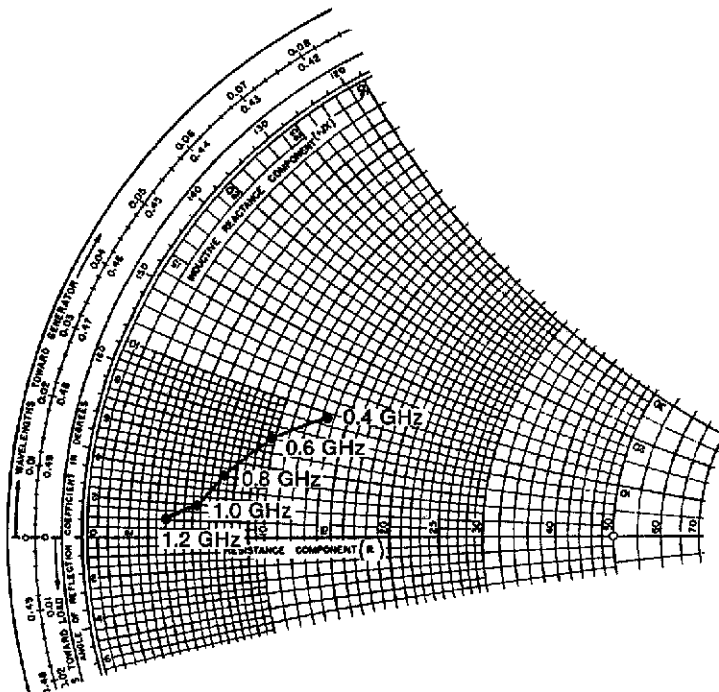
$P_{IN} = 3.0\text{ W}$
 $V_{CC} = 28\text{ V}$
 Normalized to 50 ohms



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



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