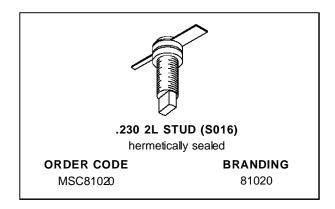
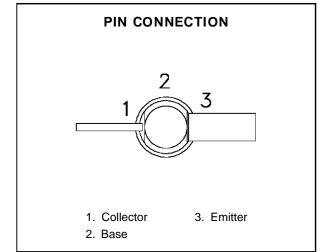


# MSC81020

# RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

- EMITTER BALLASTED
- REFRACTORY/GOLD METALLIZATION
- LOW THERMAL RESISTANCE
- HERMETIC STRIPAC® PACKAGE
- P<sub>OUT</sub> = 20 W MIN. WITH 10 dB GAIN @ 1 GHz





#### **DESCRIPTION**

The MSC81020 is a common base hermetically sealed silicon NPN microwave transitor 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<sub>case</sub> = 25°C)

Symbol	Parameter	Value	Unit
Poiss	Power Dissipation*	35	W
Ic	Device Current*	1.50	А
V <sub>CC</sub>	Collector-Supply Voltage*	35	V
TJ	Junction Temperature	200	°C
T <sub>STG</sub>	T <sub>STG</sub> Storage Temperature		°C

#### THERMAL DATA

R <sub>TH(j-c)</sub>	Junction-Case Thermal Resistance*	5.0	°C/W

<sup>\*</sup>Applies only to rated RF amplifier operation

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# **ELECTRICAL SPECIFICATIONS** (T<sub>case</sub> = 25°C)

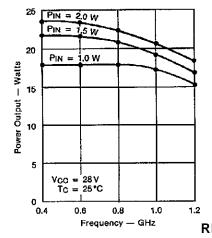
### **STATIC**

Symbol	Test Conditions		Value			llm:4	
		rest Conditions		Min. Typ. Max.		Unit	
ВУсво	I <sub>C</sub> = 5mA	$I_E = 0mA$		45	_	-	V
BV <sub>EBO</sub>	I <sub>E</sub> = 1mA	$I_C = 0mA$		3.5	_	_	V
BV <sub>CER</sub>	IC = 15mA	$R_{BE} = 10\Omega$		45	_	_	V
I <sub>CBO</sub>	$V_{CB} = 28V$			_	_	5.0	mA
hFE	V <sub>CE</sub> = 5V	$I_C = 1000 \text{mA}$		15	_	120	_

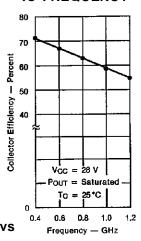
#### **DYNAMIC**

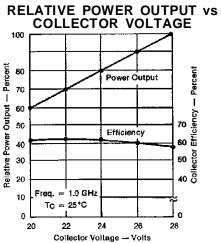
Symbol		Test Conditions		Value		IImi4	
Symbol	rest Conditions			Min.	Тур.	Max.	Unit
Роит	f = 1.0 GHz	$P_{IN} = 2.0 W$	$V_{CC} = 28 \text{ V}$	20	21	_	W
ης	f = 1.0 GHz	$P_{IN} = 2.0 W$	$V_{CC} = 28 \text{ V}$	55	58	_	%
G <sub>P</sub>	f = 1.0 GHz	P <sub>IN</sub> = 2.0 W	V <sub>C</sub> C = 28 V	10	10.2	_	dB
СОВ	f = 1 MHz	V <sub>CB</sub> = 28 V		_	_	19	pF

# TYPICAL PERFORMANCE POWER OUTPUT vs FREQUENCY



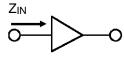
# COLLECTOR EFFICIENCY vs FREQUENCY



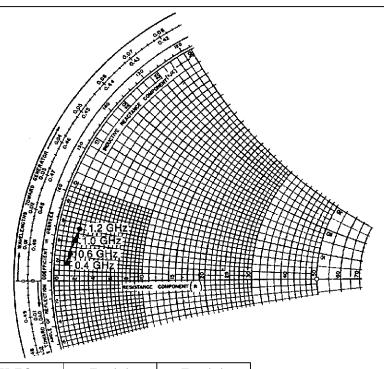


# **IMPEDANCE DATA**

# TYPICAL INPUT IMPEDANCE

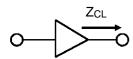


 $P_{IN} = 3.0 \text{ W}$   $V_{CC} = 28 \text{ V}$  Normalized to 50 ohms

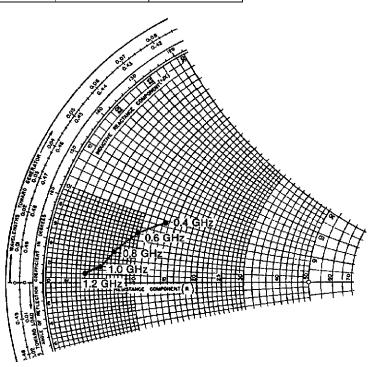


FREQ.	Z <sub>IN</sub> (Ω)	Z <sub>CL</sub> (Ω)
0.4 GHz	1.3 + j 1.7	13.3 + j 9.8
0.6 GHz	1.5 + j 2.8	9.7 + j 7.0
0.8 GHz	1.6 + j 3.4	7.2 + j 4.0
1.0 GHz	1.8 + j 4.2	5.8 + j 2.0
1.2 GHz	2.0 + j 5.5	4.0 + j 1.0

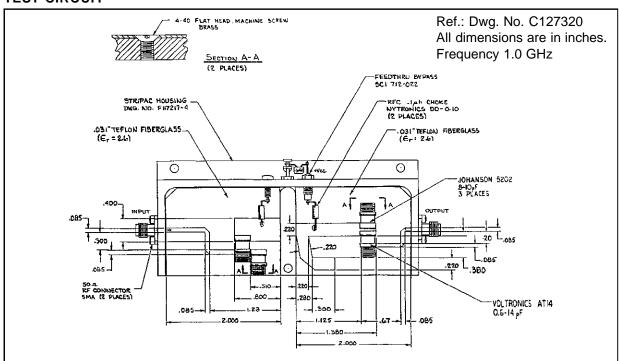
# TYPICAL COLLECTOR LOAD IMPEDANCE



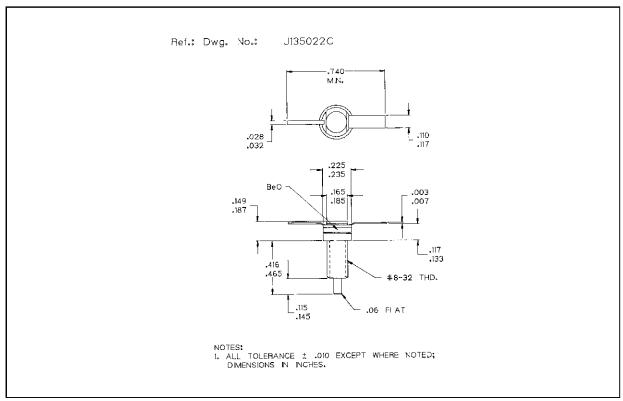
 $P_{OUT} = Saturated$   $V_{CC} = 28 \text{ V}$ Normalized to 50 ohms



### **TEST CIRCUIT**



## PACKAGE MECHANICAL DATA





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