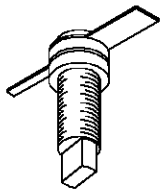
SGS-THOMSON MICROELECTRONICS

MSC81020

RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

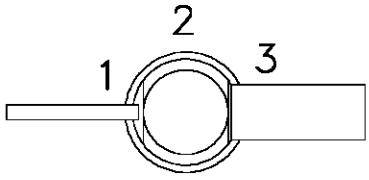
- EMITTER BALLASTED
- REFRACTORY/GOLD METALLIZATION
- LOW THERMAL RESISTANCE
- HERMETIC STRIPAC® PACKAGE
- P_{OUT} = 20 W MIN. WITH 10 dB GAIN @ 1 GHz



.230 2L STUD (S016)
hermetically sealed

ORDER CODE	BRANDING
MSC81020	81020

PIN CONNECTION



1. Collector
2. Base
3. Emitter

DESCRIPTION

The MSC81020 is a common base hermetically sealed silicon NPN microwave tranisitor 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°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	°C
T_{STG}	Storage Temperature	– 65 to +200	°C

THERMAL DATA

$R_{TH(j-c)}$	Junction-Case Thermal Resistance*	5.0	°C/W

*Applies only to rated RF amplifier operation

ELECTRICAL SPECIFICATIONS (T_{case} = 25°C)

STATIC

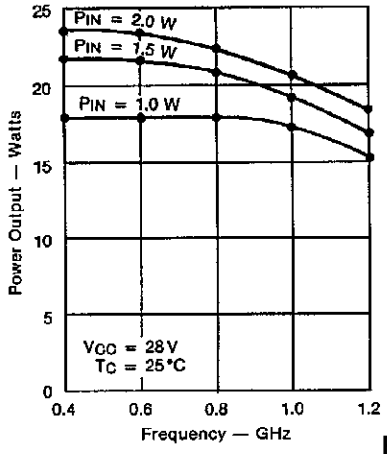
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 5mA	I_E = 0mA	45	—	—	V
BV_{EBO}	I_E = 1mA	I_C = 0mA	3.5	—	—	V
BV_{CER}	IC = 15mA	R_{BE} = 10Ω	45	—	—	V
I_{CBO}	V_{CB} = 28V		—	—	5.0	mA
h_{FE}	V_{CE} = 5V	I_C = 1000mA	15	—	120	—

DYNAMIC

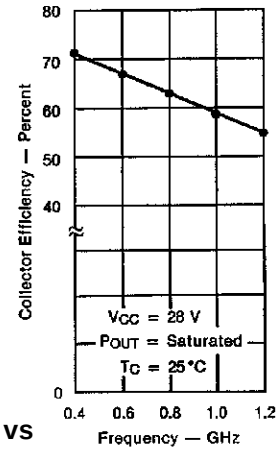
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 1.0 GHz	P_{IN} = 2.0 W	V_{CC} = 28 V	20	21	—	W
ηc	f = 1.0 GHz	P_{IN} = 2.0 W	V_{CC} = 28 V	55	58	—	%
G_P	f = 1.0 GHz	P_{IN} = 2.0 W	V_{CC} = 28 V	10	10.2	—	dB
C_{OB}	f = 1 MHz	V_{CB} = 28 V		—	—	19	pF

TYPICAL PERFORMANCE

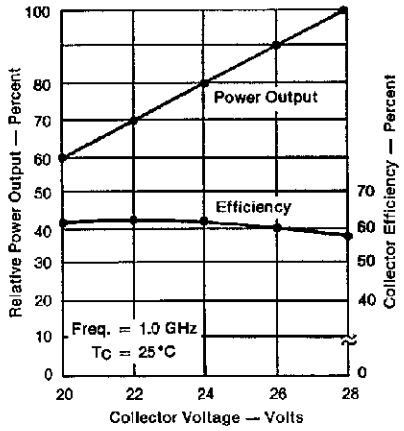
POWER OUTPUT vs FREQUENCY



COLLECTOR EFFICIENCY vs FREQUENCY

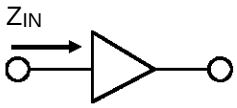


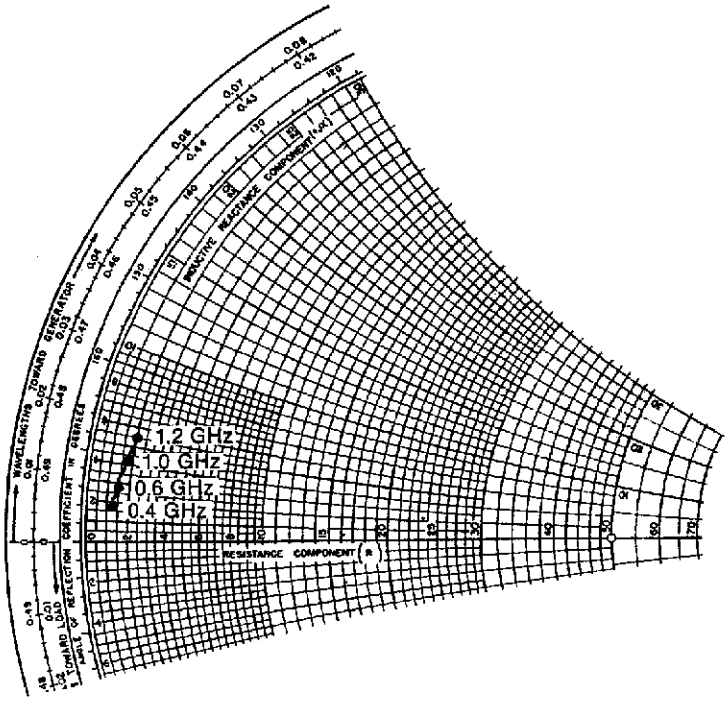
RELATIVE POWER OUTPUT vs COLLECTOR VOLTAGE



IMPEDANCE DATA

TYPICAL INPUT IMPEDANCE

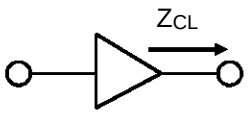


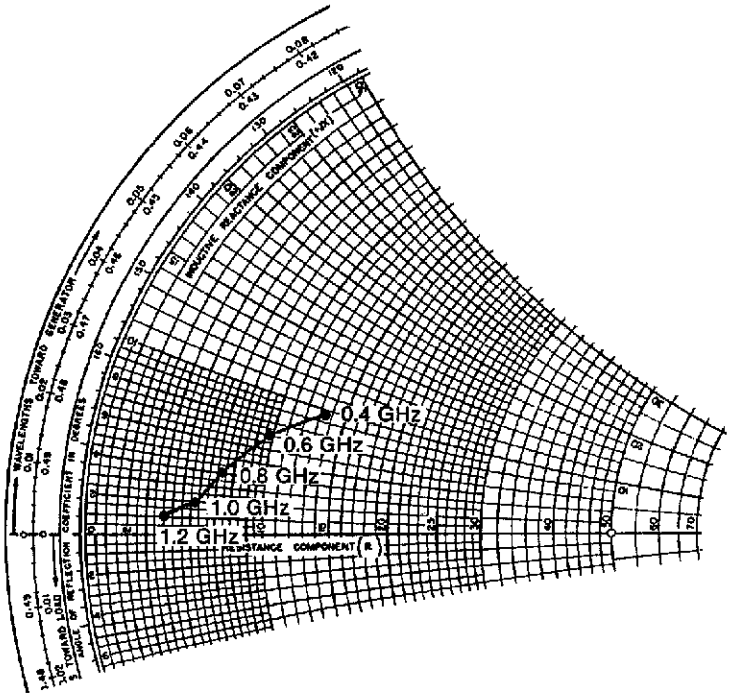


P_{IN} = 3.0 W
V_{CC} = 28 V
Normalized to 50 ohms

FREQ.	Z_{IN} (Ω)	Z_{CL} (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

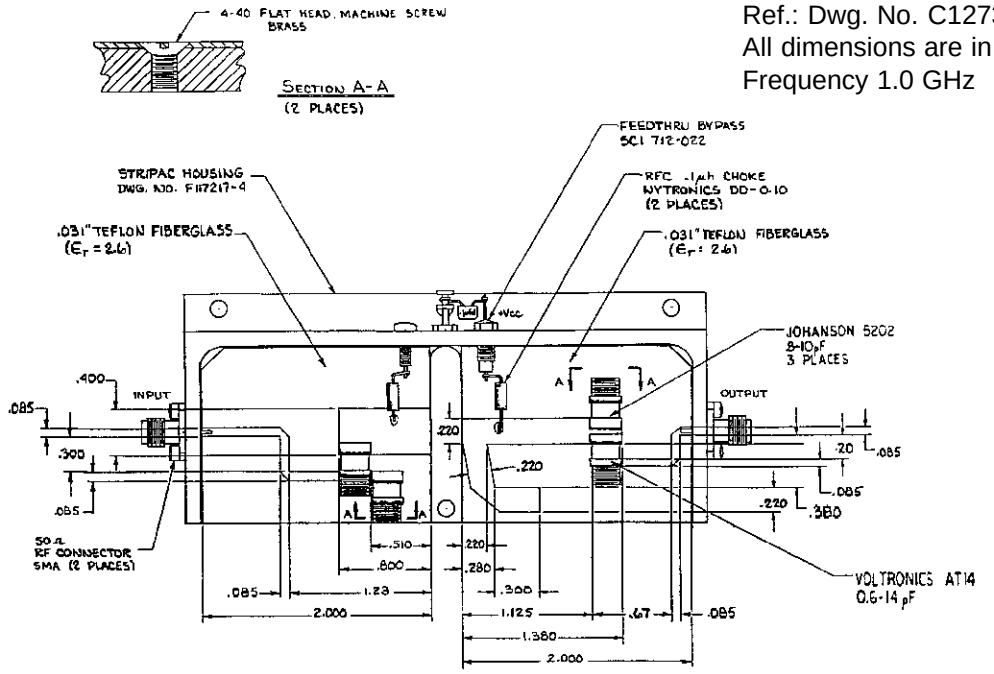
TYPICAL COLLECTOR LOAD IMPEDANCE





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

TEST CIRCUIT



PACKAGE MECHANICAL DATA