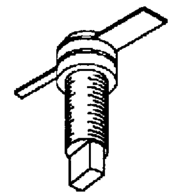
SGS-THOMSON MICROELECTRONICS

MSC81002

RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

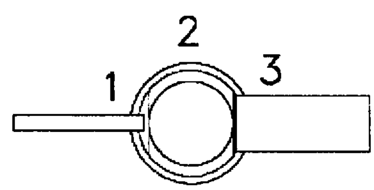
- EMITTER BALLASTED
- VSWR CAPABILITY ∞:1 @ RATED CONDITIONS
- HERMETIC STRIPAC® PACKAGE
- P_{OUT} = 2.0 W MIN. WITH 10 dB GAIN @ 1 GHz



.230 2L STUD (S016)
hermetically sealed

ORDER CODE	BRANDING
MSC81002	81002

PIN CONNECTION



1. Collector
2. Base
3. Emitter

DESCRIPTION

The MSC81002 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 an infinite load VSWR at any phase angle under rated conditions.

The MSC81002 was 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* ($T_C \leq 75$°C)	6.25	W
I_C	Device Current*	200	mA
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*	20	°C/W

*Applies only to rated RF amplifier operation

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

STATIC

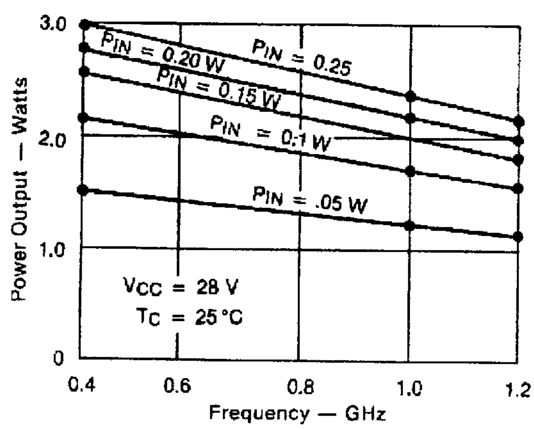
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 1mA	I_E = 0mA	45	—	—	V
BV_{EBO}	I_E = 1mA	I_C = 0mA	3.5	—	—	V
BV_{CER}	IC = 5mA	R_{BE} = 10Ω	45	—	—	V
I_{CBO}	V_{CB} = 28V		—	—	0.5	mA
h_{FE}	V_{CE} = 5V	I_C = 100mA	15	—	120	—

DYNAMIC

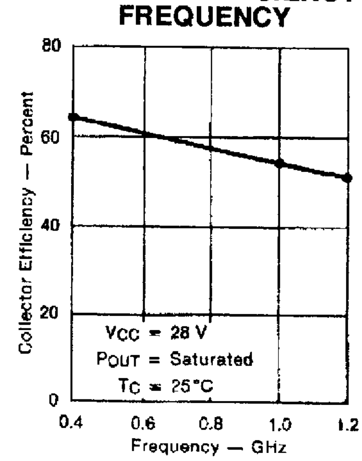
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 1.0 GHz	P_{IN} = 0.2 W	V_{CC} = 28 V	2.0	2.2	—	W
η_C	f = 1.0 GHz	P_{IN} = 0.2 W	V_{CC} = 28 V	50	55	—	%
G_P	f = 1.0 GHz	P_{IN} = 0.2 W	V_{CC} = 28 V	10	10.4	—	dB
C_{OB}	f = 1 MHz	V_{CB} = 28 V		—	—	3.2	pF

TYPICAL PERFORMANCE

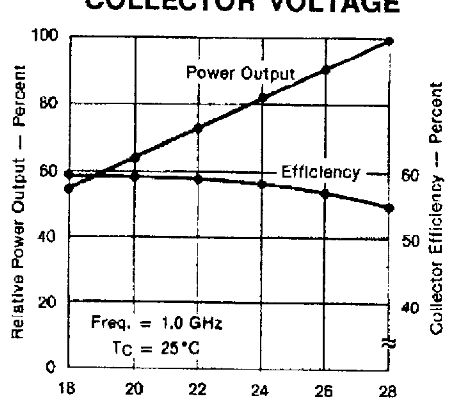
POWER OUTPUT vs FREQUENCY



COLLECTOR EFFICIENCY vs FREQUENCY

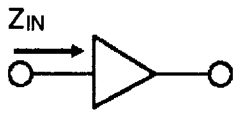


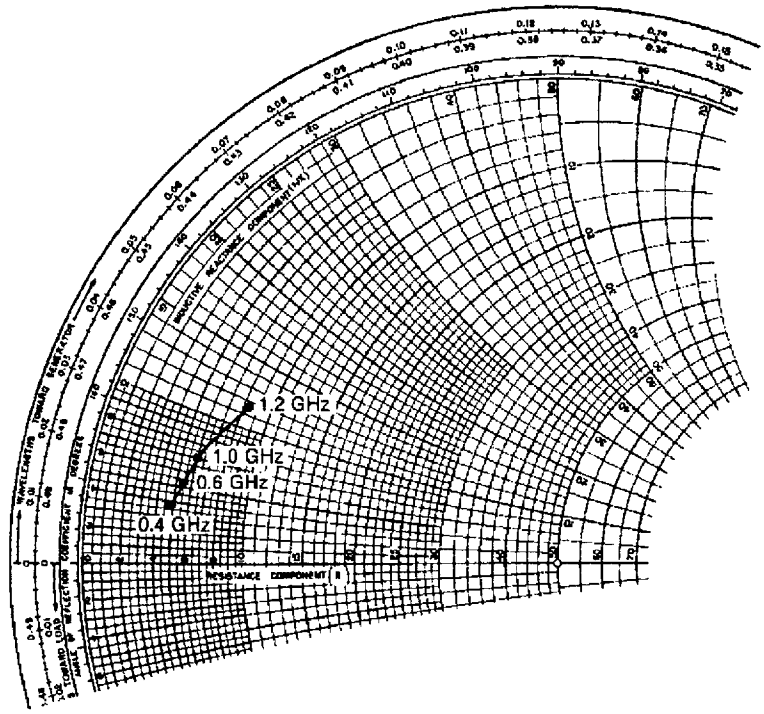
RELATIVE POWER OUTPUT vs COLLECTOR VOLTAGE



IMPEDANCE DATA

TYPICAL INPUT IMPEDANCE

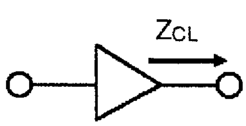


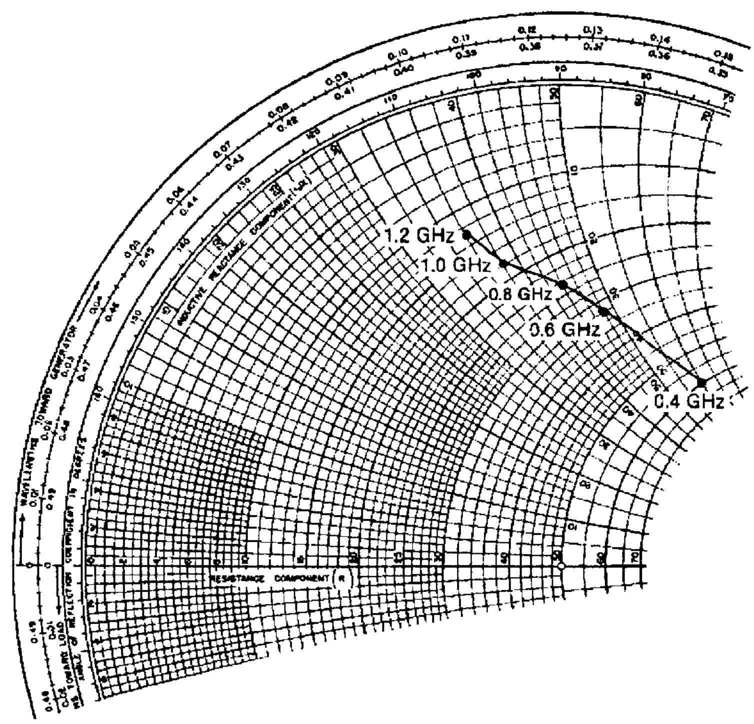


P_{IN} = 0.2 W
V_{CC} = 28 V
Normalized to 50 ohms

FREQ.	Z_{IN} (Ω)	Z_{CL} (Ω)
0.4 GHz	4.8 + j 3.7	60.0 + j 60.0
0.6 GHz	5.4 + j 5.3	32.0 + j 48.0
1.0 GHz	6.0 + j 7.0	18.0 + j 38.0
1.2 GHz	8.2 + j 11.6	12.8 + j 36.0

TYPICAL COLLECTOR LOAD IMPEDANCE

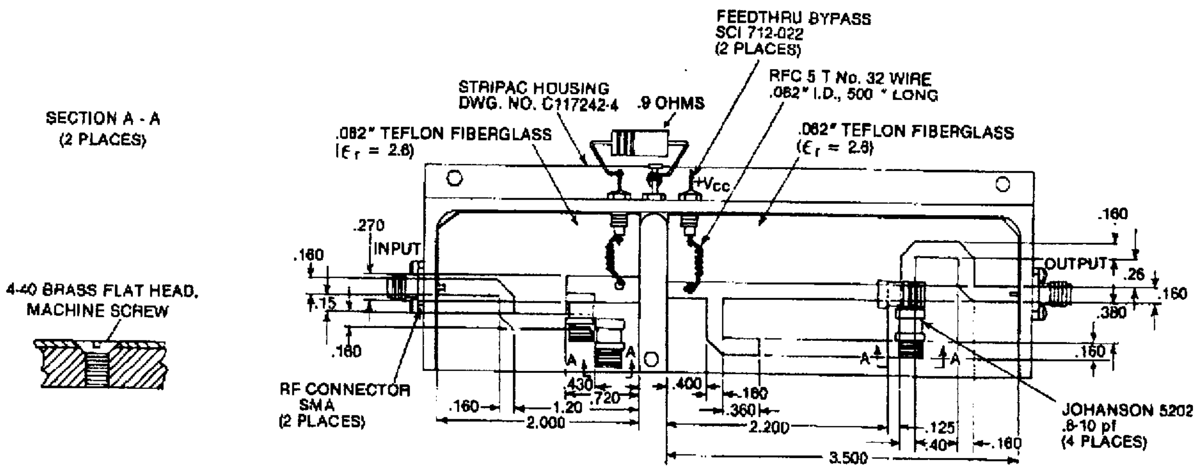




P_{OUT} = Saturated
V_{CC} = 28 V
Normalized to 50 ohms

TEST CIRCUIT

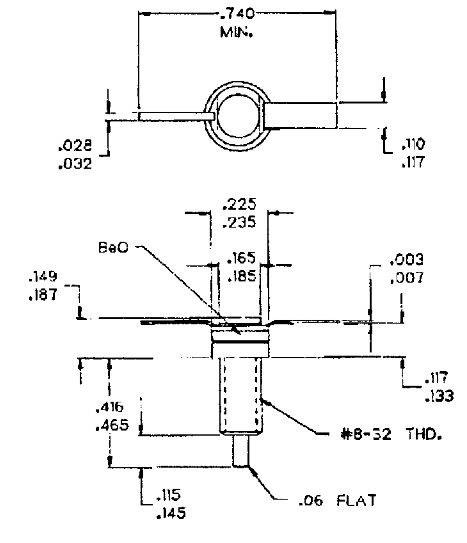
Ref.: Dwg. No. C127317



All dimensions are in inches.
Frequency 1.0 GHz

PACKAGE MECHANICAL DATA

Ref.: Dwg. No.: J135022C



NOTES:
1. ALL TOLERANCE ± .010 EXCEPT WHERE NOTED;
DIMENSIONS IN INCHES.