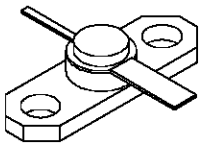
SGS-THOMSON MICROELECTRONICS

MSC82003

RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

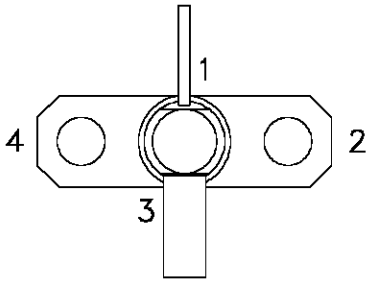
- EMITTER BALLASTED
- VSWR CAPABILITY ∞:1 @ RATED CONDITIONS
- REFRACTORY/GOLD METALLIZATION
- HERMETIC STRIPAC® PACKAGE
- P_{OUT} = 3.0 W MIN. WITH 7.8 dB GAIN @ 2.0 GHz



.250 2LFL (S010)
hermetically sealed

ORDER CODE	BRANDING
MSC82003	82003

PIN CONNECTION



1. Collector
2. Base
3. Emitter
4. Base

DESCRIPTION

The MSC82003 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 rated conditions. The MSC82003 was designed for Class C amplifier applications in the 1.0 - 2.0 GHz frequency range.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
P_{DISS}	Power Dissipation*	21.8	W
I_C	Device Current*	600	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*	8.0	°C/W

*Applies only to rated RF amplifier operation

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

STATIC

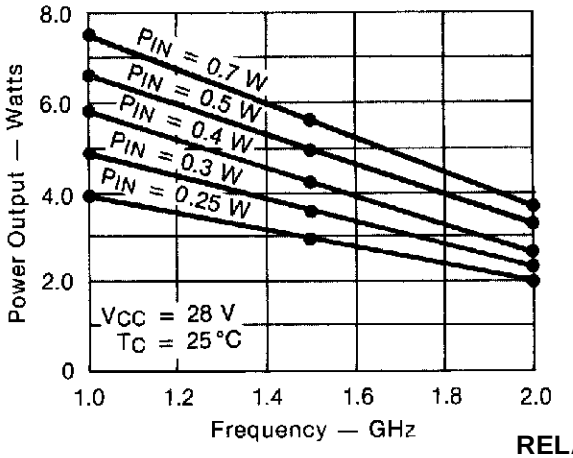
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 1mA	I_E = 0mA	45	—	—	V
BV_{EBO}	I_E = 1mA	I_C = 0mA	3.5	—	—	V
BV_{CER}	IC = 5mA	R_{BE} = 10Ω	45	—	—	V
I_{CBO}	V_{CB} = 28V		—	—	1.0	mA
h_{FE}	V_{CE} = 5V	I_C = 200mA	15	—	120	—

DYNAMIC

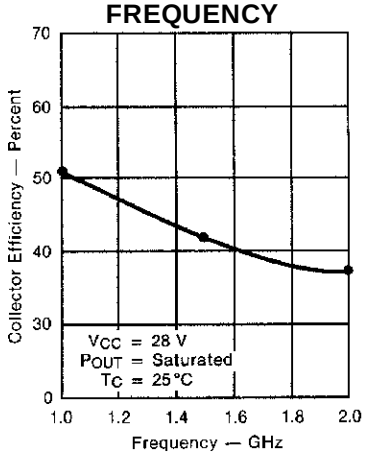
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 2.0 GHz	P_{IN} = 0.5 W	V_{CC} = 28 V	3.0	3.3	—	W
ηc	f = 2.0 GHz	P_{IN} = 0.5 W	V_{CC} = 28 V	35	37	—	%
G_P	f = 2.0 GHz	P_{IN} = 0.5 W	V_{CC} = 28 V	7.8	8.2	—	dB
C_{OB}	f = 1 MHz	V_{CB} = 28 V		—	—	6.5	pF

TYPICAL PERFORMANCE

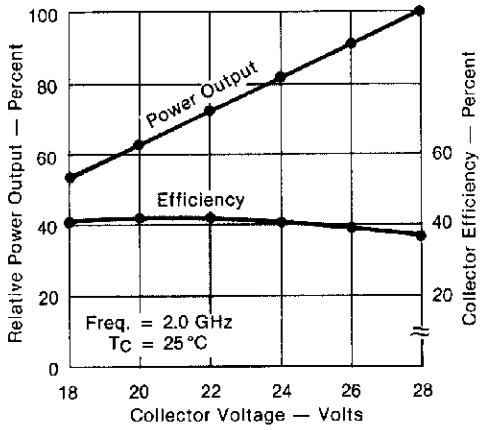
POWER OUTPUT vs FREQUENCY



COLLECTOR EFFICIENCY vs FREQUENCY

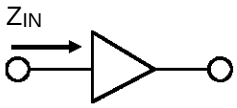


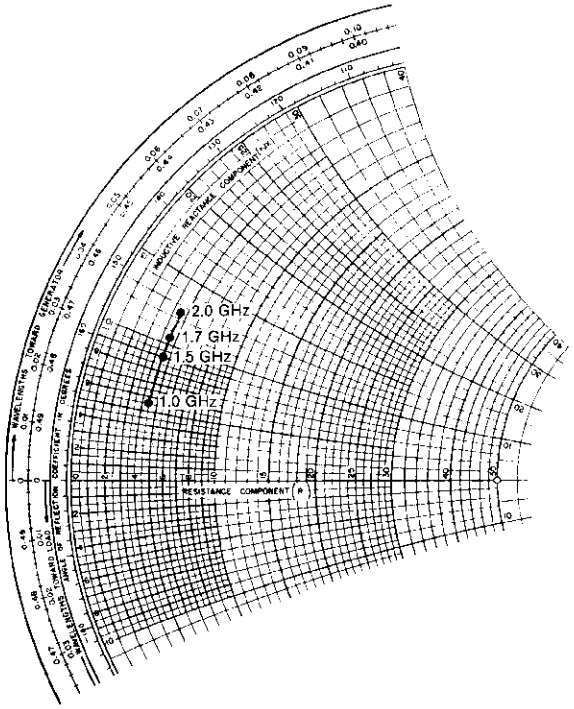
RELATIVE POWER OUTPUT vs COLLECTOR VOLTAGE



IMPEDANCE DATA

TYPICAL INPUT IMPEDANCE

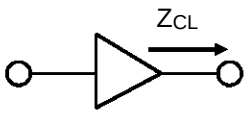


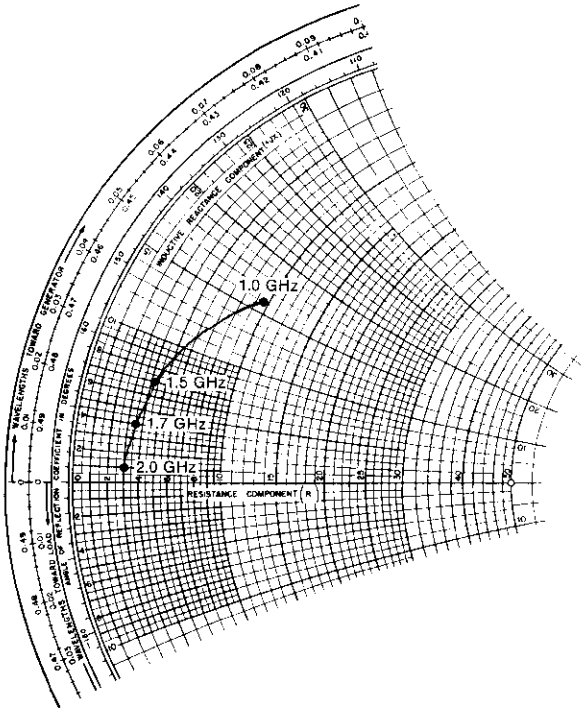


P_{IN} = 0.5 W
V_{CC} = 28 V
Normalized to 50 ohms

FREQ.	Z_{IN} (Ω)	Z_{CL} (Ω)
1.0 GHz	4.4 + j 5.5	9.6 + j 16.0
1.5 GHz	4.5 + j 9.0	4.3 + j 7.0
1.7 GHz	4.5 + j 10.5	3.5 + j 4.0
2.0 GHz	4.6 + j 12.5	3.0 + j 1.0

TYPICAL COLLECTOR LOAD IMPEDANCE



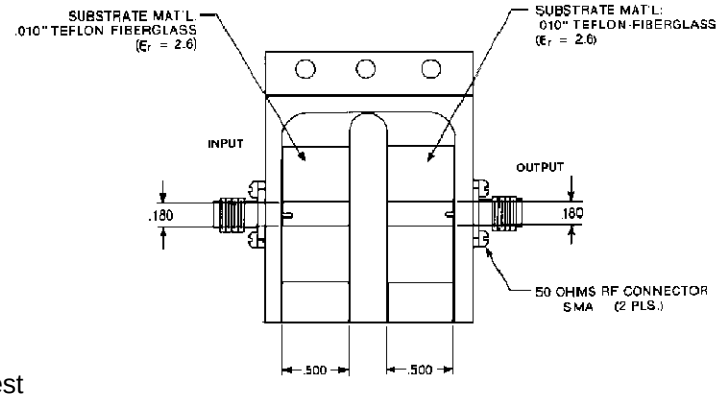


P_{OUT} = Saturated
V_{CC} = 28 V
Normalized to 50 ohms

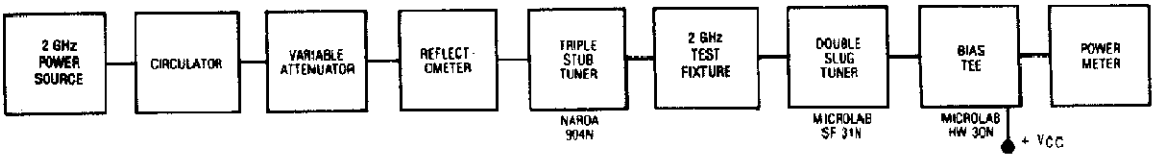
TEST CIRCUIT

Ref.: Dwg. No. C125518

All dimensions are in inches.
Frequency 2.0 GHz

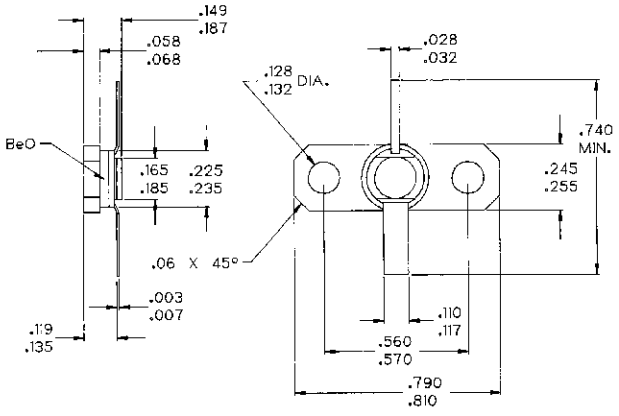


RF Amplifier Power Output Test



PACKAGE MECHANICAL DATA

Ref.: Dwg. No.: J135021C



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