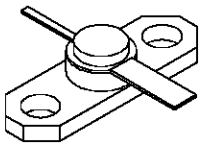
SGS-THOMSON MICROELECTRONICS

MSC83303

RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

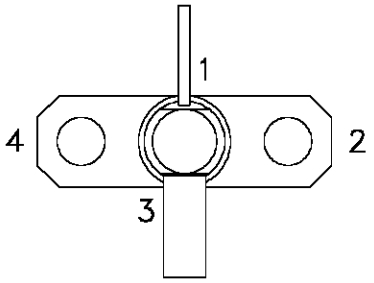
- REFRACTORY/GOLD METALLIZATION
- EMITTER BALLASTED
- VSWR CAPABILITY ∞:1 @ RATED CONDITIONS
- HERMETIC STRIPAC® PACKAGE
- P_{OUT} = 3.0 W MIN. WITH 7.0 dB GAIN @ 3.0 GHz



.250 2LFL (S010)
hermetically sealed

ORDER CODE	BRANDING
MSC83303	83303

PIN CONNECTION



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

DESCRIPTION

The MSC83303 is a common base hermetically sealed silicon NPN microwave power transistor utilizing an overlay, emitter site 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 MSC83303 is designed for Class C amplifier/oscillator applications in the 1.0 - 3.0 GHz frequency range.

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

Symbol	Parameter	Value	Unit
P_{DISS}	Power Dissipation* ($T_C \leq 50°C$)	10.0	W
I_C	Device Current*	540	mA
V_{CC}	Collector-Supply Voltage*	30	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*	12	°C/W

*Applies only to rated RF amplifier operation

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

STATIC

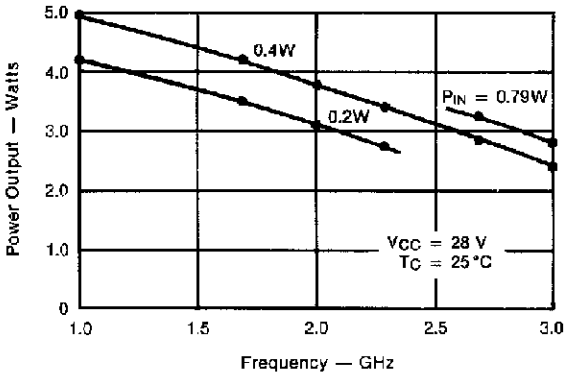
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 1 mA	I_E = 0 mA	45	—	—	V
BV_{EBO}	I_E = 1 mA	I_C = 0 mA	3.5	—	—	V
BV_{CER}	I_C = 5 mA	R_{BE} = 10 Ω	45	—	—	V
I_{CBO}	V_{CB} = 28 V		—	—	0.5	mA
h_{FE}	V_{CE} = 5 V	I_C = 200 mA	30	—	300	—

DYNAMIC

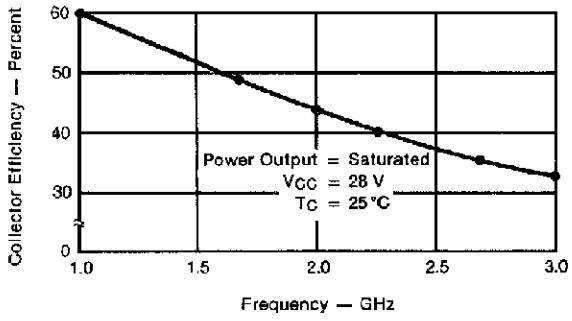
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 3.0 GHz	P_{IN} = 0.79 W	V_{CC} = 28 V	2.5	2.8	—	W
ηc	f = 3.0 GHz	P_{IN} = 0.79 W	V_{CC} = 28 V	30	33	—	%
P_G	f = 3.0 GHz	P_{IN} = 0.79 W	V_{CC} = 28 V	5.0	5.5	—	dB
C_{OB}	f = 1 MHz	V_{CB} = 28 V		—	—	5	pF

TYPICAL PERFORMANCE

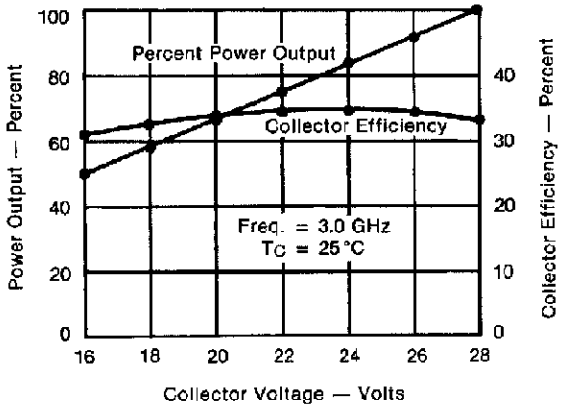
TYPICAL POWER OUTPUT vs FREQUENCY



TYPICAL COLLECTOR EFFICIENCY vs FREQUENCY

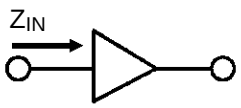


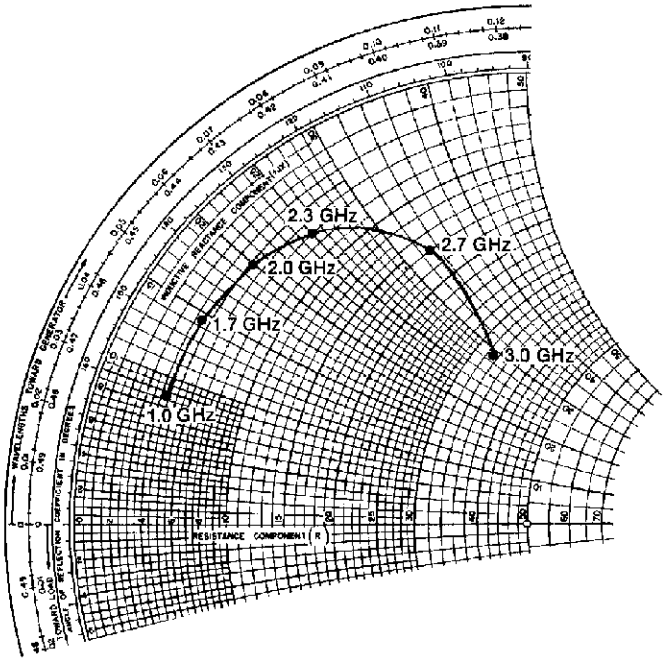
PERCENT POWER OUTPUT & COLLECTOR EFFICIENCY vs COLLECTOR VOLTAGE



IMPEDANCE DATA

TYPICAL INPUT IMPEDANCE

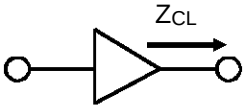


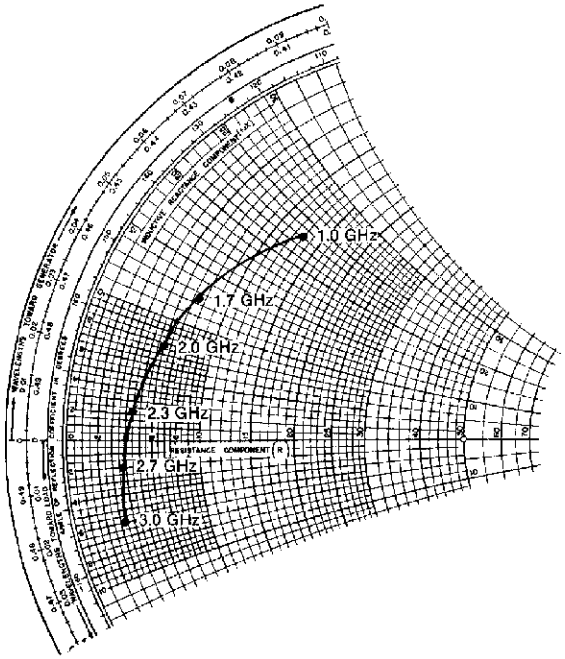


FREQ.	Z_{IN} (Ω)	Z_{CL} (Ω)
1.0 GHz	4.4 + j 8.7	13.0 + j 23.0
1.7 GHz	4.5 + j 14.5	7.5 + j 12.5
2.0 GHz	5.1 + j 20.0	6.0 + j 7.8
2.3 GHz	7.0 + j 25.0	4.5 + j 2.2
2.7 GHz	16.0 + j 33.0	3.8 – j 2.0
3.0 GHz	33.0 + j 29.0	3.3 – j 6.0

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

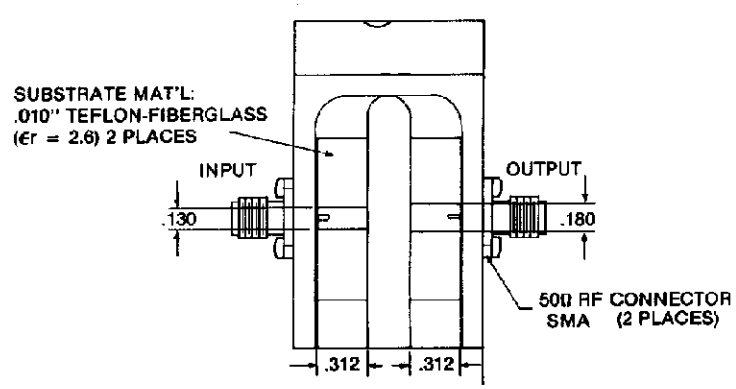
TYPICAL COLLECTOR LOAD IMPEDANCE



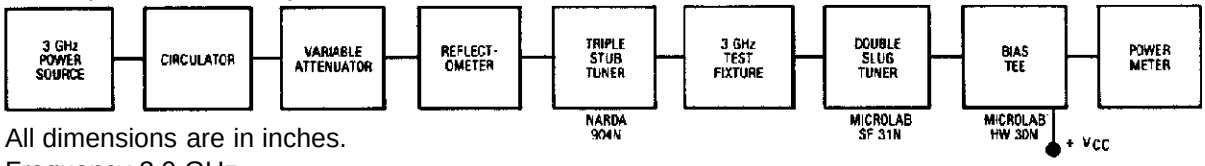


TEST CIRCUIT

Ref.: Dwg. No. C125562



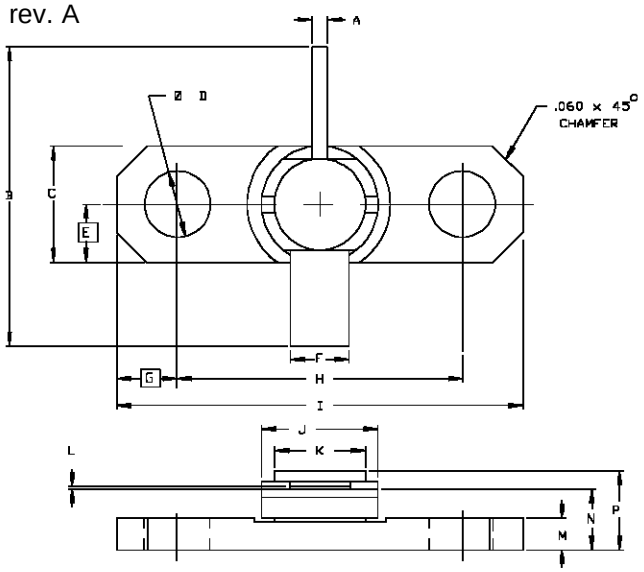
RF Amplifier Power Output Test



All dimensions are in inches.
Frequency 3.0 GHz

PACKAGE MECHANICAL DATA

Ref. Dwg. No. 12-0216 rev. A



SGS-THOMSON MICROELECTRONICS		
	MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.028/0,71	.032/0,81
B	.740/18,80	
C	.245/6,22	.255/6,48
D	.128/3,25	.132/3,35
E	.125/3,18	
F	.110/2,79	.117/2,97
G	.117/2,97	
H	.560/14,22	.570/14,48
I	.795/20,19	.805/20,45
J	.225/5,72	.235/5,97

CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm
K	.165/4,19	.185/4,70
L	.003/0,08	.007/0,18
M	.058/1,47	.068/1,73
N	.119/3,02	.135/3,43
P	.149/3,78	.187/4,75