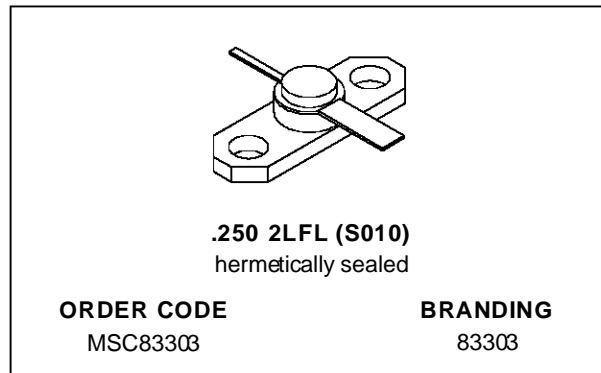


RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

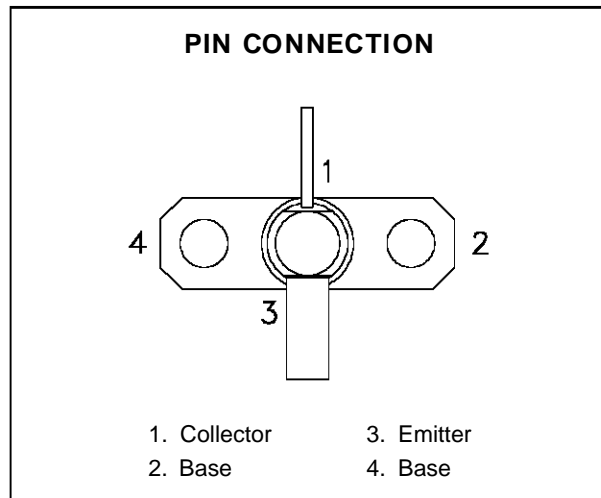
- REFRACTORY/GOLD METALLIZATION
- EMITTER BALLASTED
- VSWR CAPABILITY $\infty:1$ @ RATED CONDITIONS
- HERMETIC STRIPAC® PACKAGE
- $P_{OUT} = 3.0$ W MIN. WITH 7.0 dB GAIN @ 3.0 GHz



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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 ($T_{case} = 25^{\circ}C$)

Symbol	Parameter	Value	Unit
P_{DISS}	Power Dissipation* ($T_c \leq 50^{\circ}C$)	10.0	W
I_c	Device Current*	540	mA
V_{CC}	Collector-Supply Voltage*	30	V
T_J	Junction Temperature	200	$^{\circ}C$
T_{STG}	Storage Temperature	- 65 to +200	$^{\circ}C$

THERMAL DATA

$R_{TH(j-c)}$	Junction-Case Thermal Resistance*	12	$^{\circ}C/W$
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*Applies only to rated RF amplifier operation

MSC83303

ELECTRICAL SPECIFICATIONS ($T_{case} = 25^{\circ}C$)

STATIC

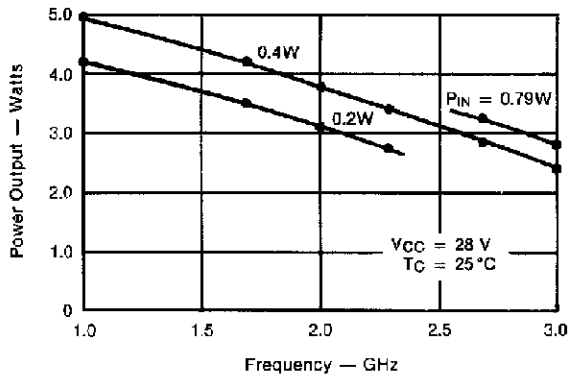
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	$I_C = 1\text{ mA}$	$I_E = 0\text{ mA}$	45	—	—	V
BV_{EBO}	$I_E = 1\text{ mA}$	$I_C = 0\text{ mA}$	3.5	—	—	V
BV_{CER}	$I_C = 5\text{ mA}$	$R_{BE} = 10\ \Omega$	45	—	—	V
I_{CBO}	$V_{CB} = 28\text{ V}$		—	—	0.5	mA
h_{FE}	$V_{CE} = 5\text{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

DYNAMIC

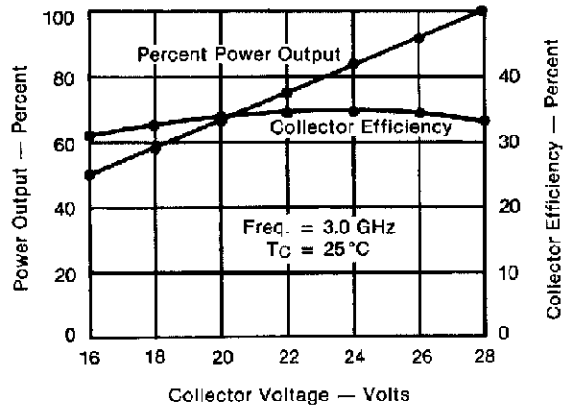
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	$f = 3.0\text{ GHz}$	$P_{IN} = 0.79\text{ W}$	$V_{CC} = 28\text{ V}$	2.5	2.8	—	W
η_C	$f = 3.0\text{ GHz}$	$P_{IN} = 0.79\text{ W}$	$V_{CC} = 28\text{ V}$	30	33	—	%
P_G	$f = 3.0\text{ GHz}$	$P_{IN} = 0.79\text{ W}$	$V_{CC} = 28\text{ V}$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

TYPICAL PERFORMANCE

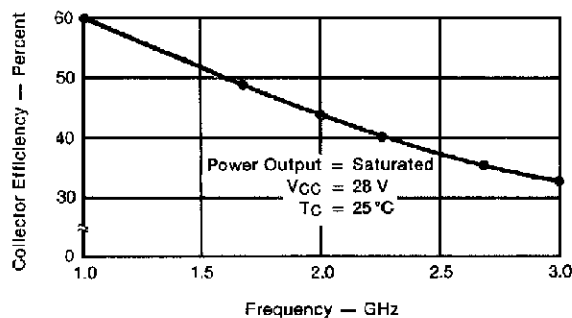
TYPICAL POWER OUTPUT vs FREQUENCY



PERCENT POWER OUTPUT & COLLECTOR EFFICIENCY vs COLLECTOR VOLTAGE

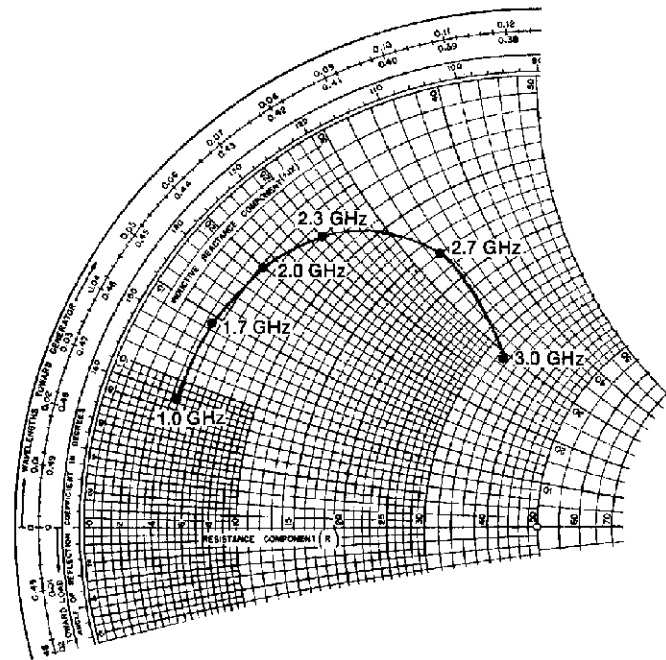
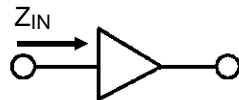


TYPICAL COLLECTOR EFFICIENCY vs FREQUENCY



IMPEDANCE DATA

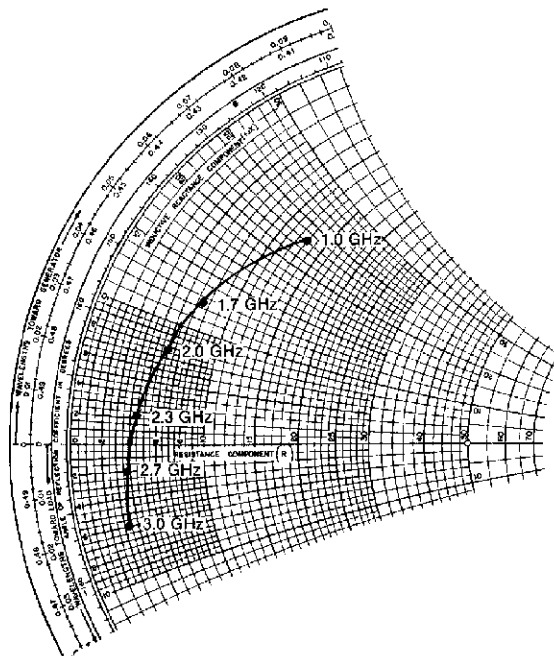
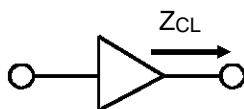
TYPICAL INPUT IMPEDANCE



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

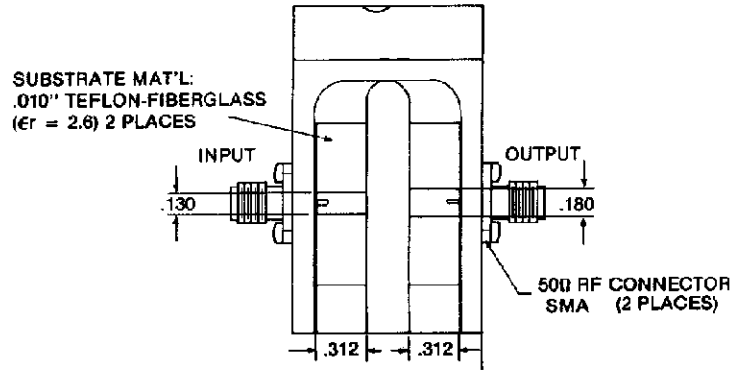
P_{OUT} = Saturated
 V_{CC} = 28 V
 Normalized to 50 ohms

TYPICAL COLLECTOR LOAD IMPEDANCE

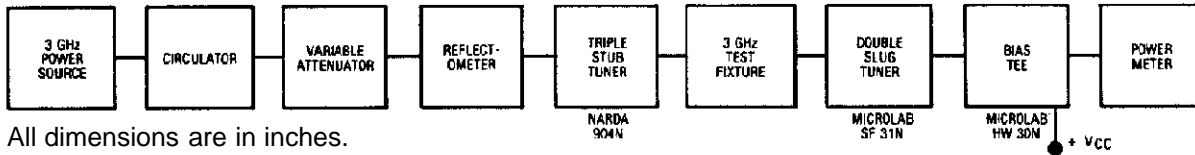


TEST CIRCUIT

Ref.: Dwg. No. C125562



RF Amplifier Power Output Test

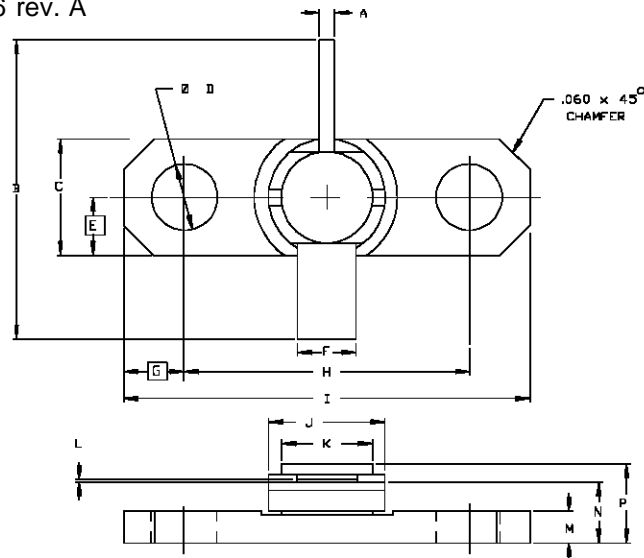


All dimensions are in inches.

Frequency 3.0 GHz

PACKAGE MECHANICAL DATA

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



SGS-THOMSON MICROELECTRONICS		CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm	MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.028/0,71	.032/0,81	K	.165/4,19
B	.740/18,80		L	.003/0,08
C	.245/6,22	.255/6,48	M	.058/1,47
D	.128/3,25	.132/3,35	N	.119/3,02
E	.125/3,18		P	.149/3,78
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		

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