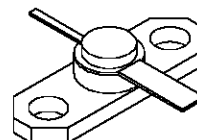


RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

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



.250 2LFL (S010)
hermetically sealed

ORDER CODE

MSC83303

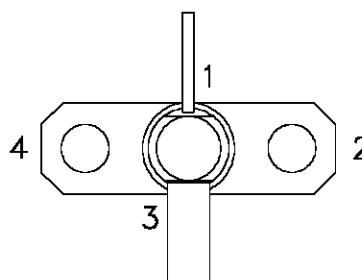
BRANDING

83303

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.

PIN CONNECTION



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

ABSOLUTE MAXIMUM RATINGS ($T_{case} = 25^{\circ}\text{C}$)

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

THERMAL DATA

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

MSC83303

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

STATIC

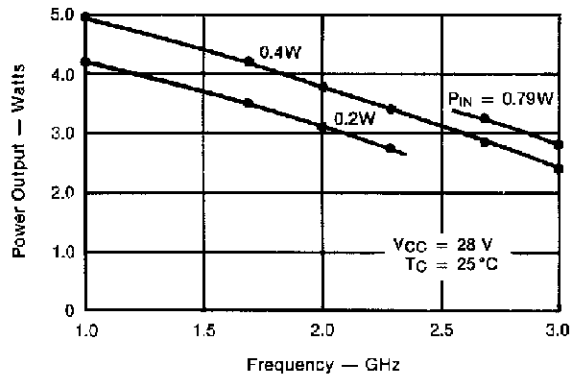
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BV_{CBO}	$I_{\text{C}} = 1 \text{ mA}$ $I_{\text{E}} = 0 \text{ mA}$	45	—	—	V
BV_{EBO}	$I_{\text{E}} = 1 \text{ mA}$ $I_{\text{C}} = 0 \text{ mA}$	3.5	—	—	V
BV_{CER}	$I_{\text{C}} = 5 \text{ mA}$ $R_{\text{BE}} = 10 \ \Omega$	45	—	—	V
I_{CBO}	$V_{\text{CB}}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

DYNAMIC

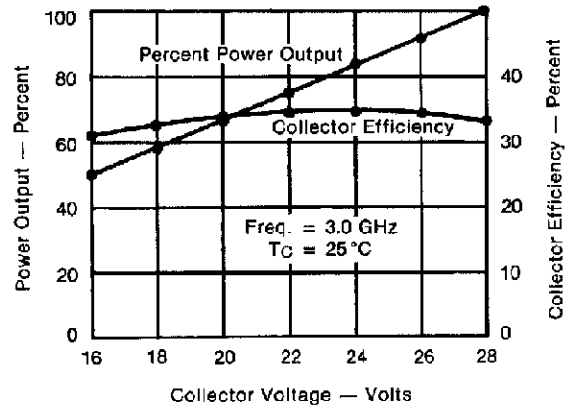
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_{OUT}	$f = 3.0 \text{ GHz}$ $P_{\text{IN}} = 0.79 \text{ W}$ $V_{\text{CC}} = 28 \text{ V}$	2.5	2.8	—	W
η_{C}	$f = 3.0 \text{ GHz}$ $P_{\text{IN}} = 0.79 \text{ W}$ $V_{\text{CC}} = 28 \text{ V}$	30	33	—	%
P_{G}	$f = 3.0 \text{ GHz}$ $P_{\text{IN}}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

TYPICAL PERFORMANCE

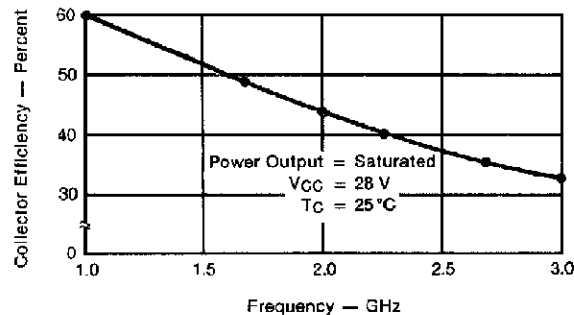
**TYPICAL POWER OUTPUT
vs FREQUENCY**



**PERCENT POWER OUTPUT & COLLECTOR
EFFICIENCY vs COLLECTOR VOLTAGE**

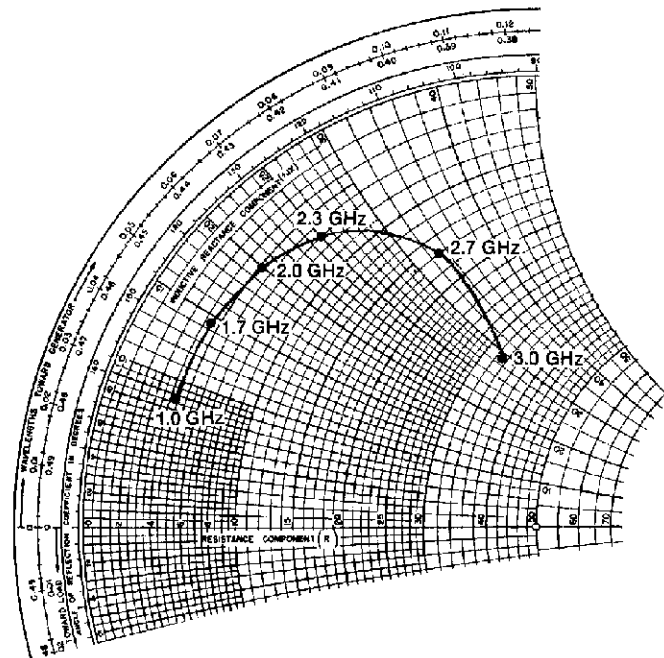
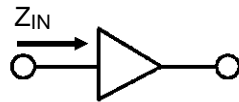


**TYPICAL COLLECTOR EFFICIENCY
vs FREQUENCY**



IMPEDANCE DATA

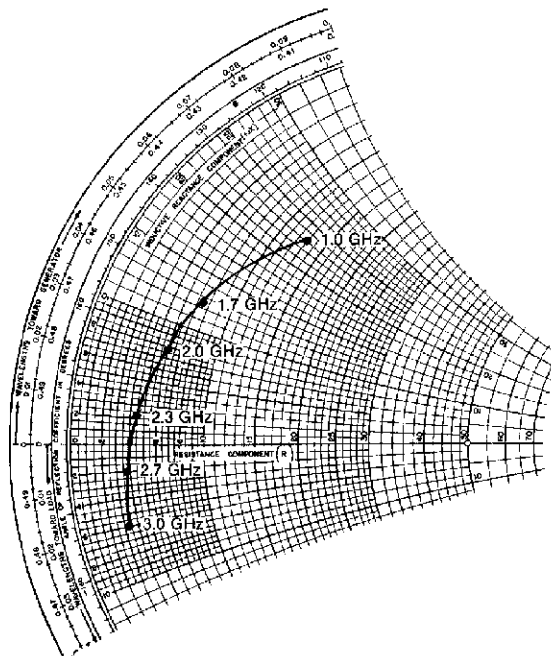
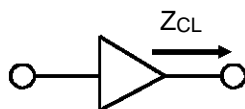
TYPICAL INPUT
IMPEDANCE



FREQ.	$Z_{IN} (\Omega)$	$Z_{CL} (\Omega)$
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	$33.0 + j 29.0$	$3.3 - j 6.0$

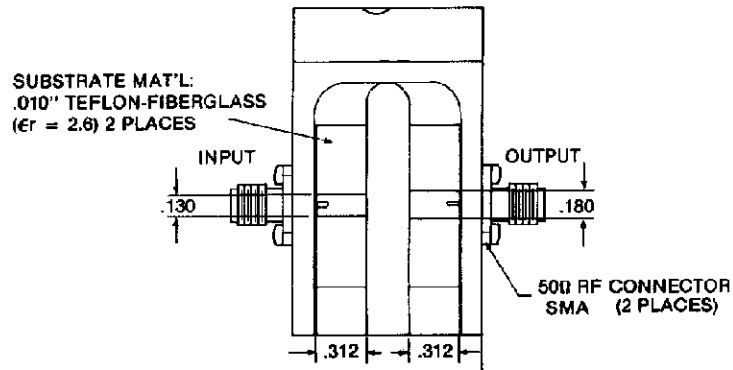
P_{OUT} = Saturated
 $V_{CC} = 28 \text{ V}$
 Normalized to 50 ohms

TYPICAL COLLECTOR
LOAD IMPEDANCE

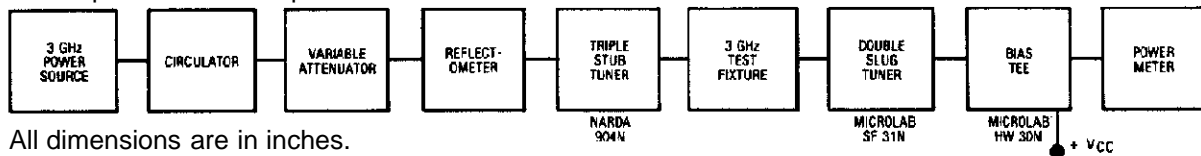


TEST CIRCUIT

Ref.: Dwg. No. C125562



RF Amplifier Power Output Test

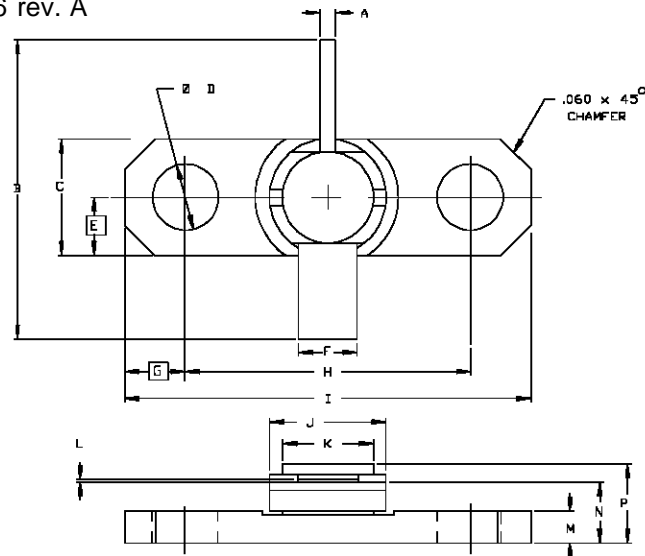


All dimensions are in inches.

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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