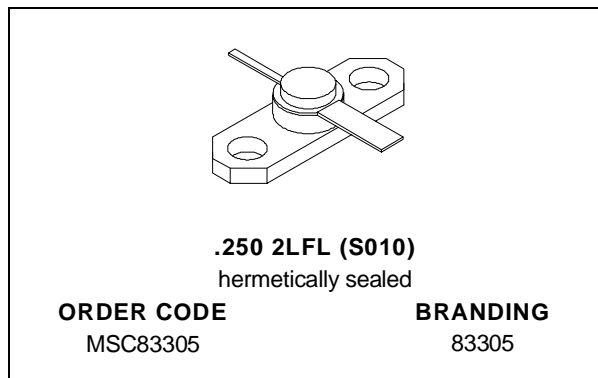


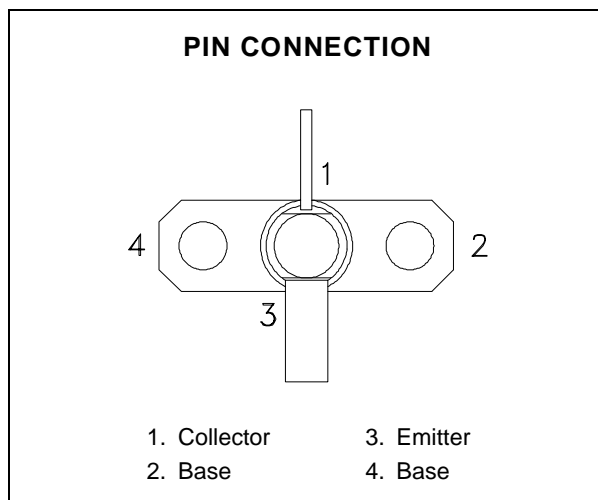
**RF & MICROWAVE TRANSISTORS
GENERAL PURPOSE AMPLIFIER APPLICATIONS**

- REFRACTORY/GOLD METALLIZATION
- EMITTER BALLASTED
- VSWR CAPABILITY $\infty:1$ @ RATED CONDITIONS
- HERMETIC STRIPAC[®] PACKAGE
- $P_{OUT} = 4.5$ W MIN. WITH 4.5 dB GAIN @ 3.0 GHz



DESCRIPTION

The MSC83305 is a common base hermetically sealed silicon NPN microwave power transistor utilizing an 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 MSC83305 was 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* ($T_C \leq 50^{\circ}C$)	17.6	W
I_C	Device Current*	700	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*	8.5	$^{\circ}C/W$
---------------	-----------------------------------	-----	---------------

*Applies only to rated RF amplifier operation

MSC83305

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

STATIC

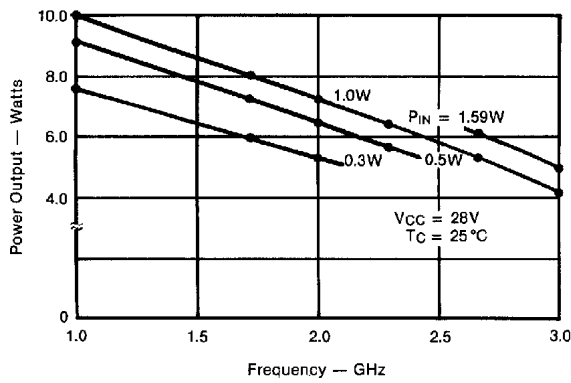
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	$I_C = 1mA$	$I_E = 0mA$	45	—	—	V
BV_{EBO}	$I_E = 1mA$	$I_C = 0mA$	3.5	—	—	V
BV_{CER}	$I_C = 5mA$	$R_{BE} = 10\Omega$	45	—	—	V
I_{CBO}	$V_{CB} = 28V$		—	—	0.5	mA
h_{FE}	$V_{CE} = 5V$	$I_C = 500mA$	30	—	300	—

DYNAMIC

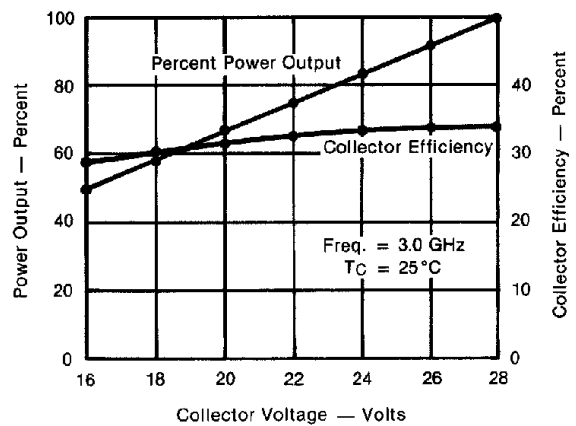
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	$f = 3.0 GHz$	$P_{IN} = 1.59 W$	$V_{CC} = 28 V$	4.5	5.0	—	W
η_C	$f = 3.0 GHz$	$P_{IN} = 1.59 W$	$V_{CC} = 28 V$	30	33	—	%
G_P	$f = 3.0 GHz$	$P_{IN} = 1.59 W$	$V_{CC} = 28 V$	4.5	5.0	—	dB
C_{OB}	$f = 1 MHz$	$V_{CB} = 28 V$		—	—	7.5	pF

TYPICAL PERFORMANCE

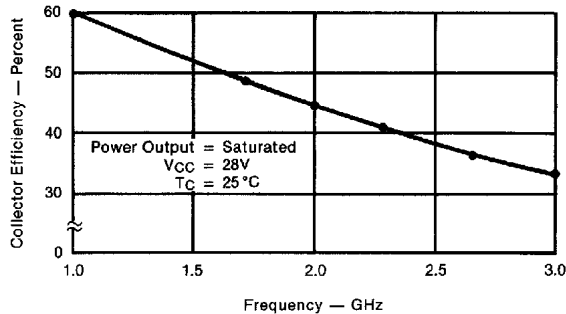
POWER OUTPUT vs FREQUENCY



PERCENT POWER OUTPUT & COLLECTOR EFFICIENCY vs COLLECTOR VOLTAGE

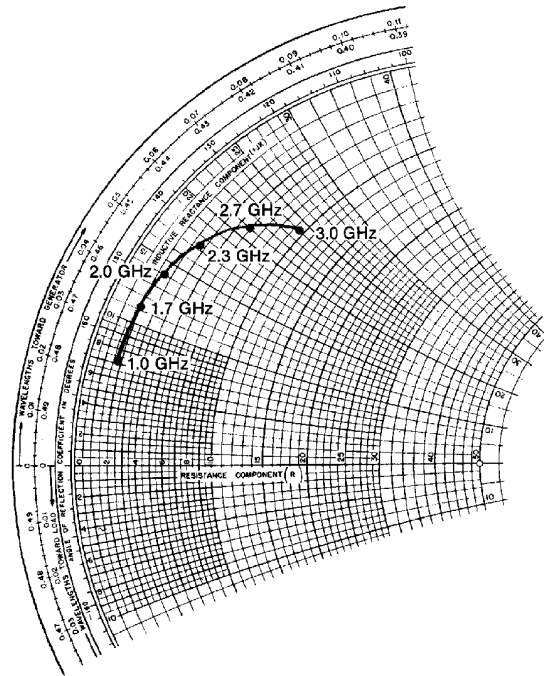
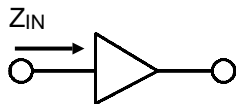


COLLECTOR EFFICIENCY vs FREQUENCY



IMPEDANCE DATA

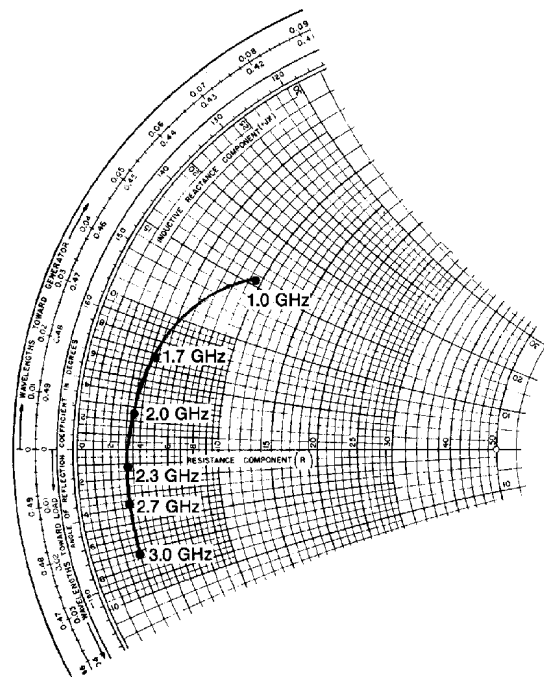
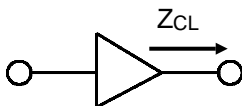
TYPICAL INPUT IMPEDANCE



FREQ.	Z _{IN} (Ω)	Z _{CL} (Ω)
1.0 GHz	1.7 + j 7.2	9.5 + j 15.5
1.7 GHz	2.0 + j 11.2	4.2 + j 6.7
2.0 GHz	2.4 + j 14.0	3.5 + j 2.5
2.3 GHz	3.6 + j 17.4	3.1 - j 1.2
2.7 GHz	6.0 + j 21.0	3.0 - j 3.8
3.0 GHz	9.5 + j 24.0	3.0 - j 7.2

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

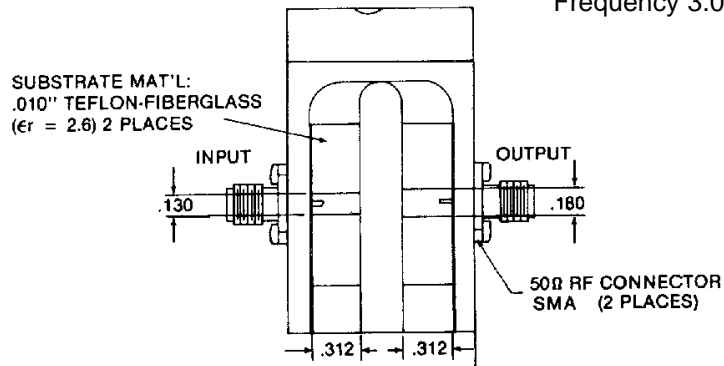
TYPICAL COLLECTOR LOAD IMPEDANCE



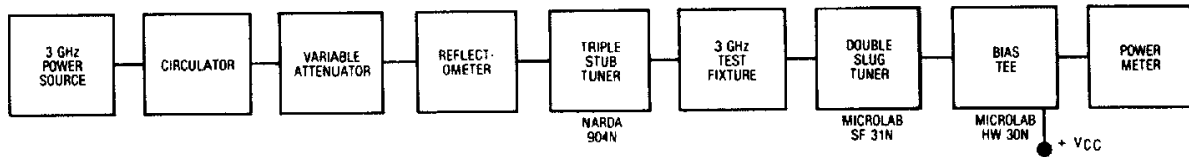
TEST CIRCUIT

Ref.: Dwg. No. C125562

All dimensions are in inches.
Frequency 3.0 GHz

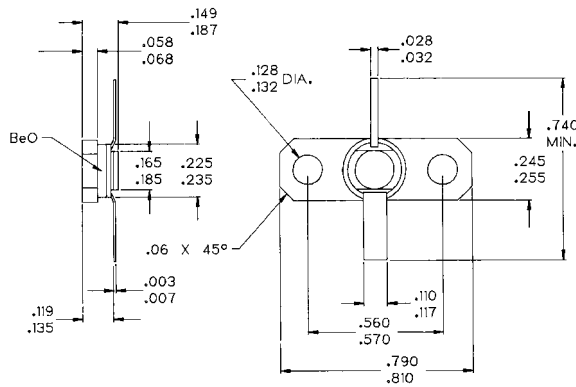


RF Amplifier Power Output Test



PACKAGE MECHANICAL DATA

Ref.: Dwg. No.: J135021C



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

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics - All Rights Reserved

SGS-THOMSON Microelectronics GROUP OF COMPANIES
Australia - Brazil - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands -
Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A