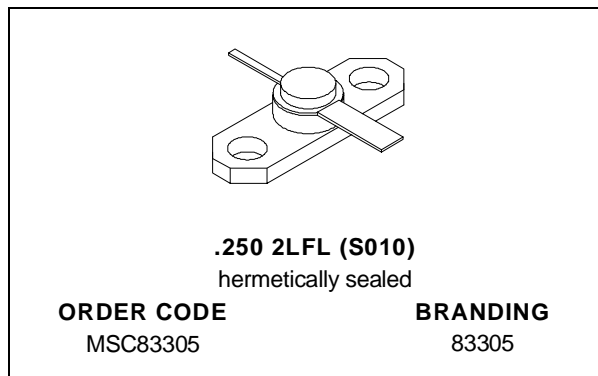


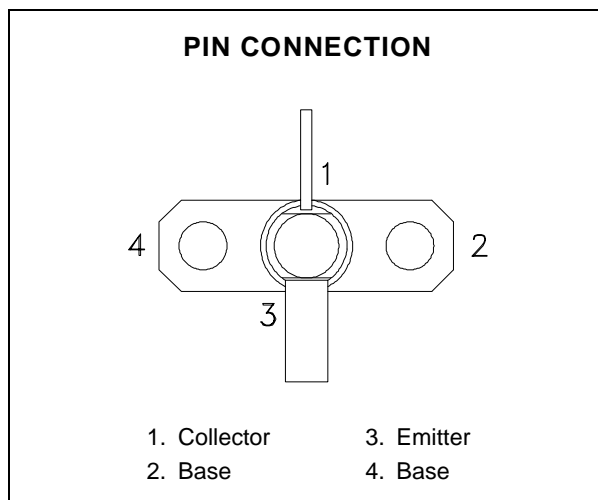
**RF & MICROWAVE TRANSISTORS
GENERAL PURPOSE AMPLIFIER APPLICATIONS**

- 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	$^{\circ}C/W$
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*Applies only to rated RF amplifier operation

MSC83305

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

STATIC

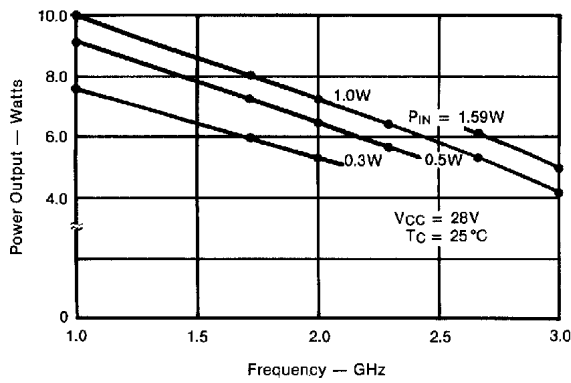
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	$I_C = 1mA$	$I_E = 0mA$	45	—	—	V
BV_{EBO}	$I_E = 1mA$	$I_C = 0mA$	3.5	—	—	V
BV_{CER}	$I_C = 5mA$	$R_{BE} = 10\Omega$	45	—	—	V
I_{CBO}	$V_{CB} = 28V$		—	—	0.5	mA
h_{FE}	$V_{CE} = 5V$	$I_C = 500mA$	30	—	300	—

DYNAMIC

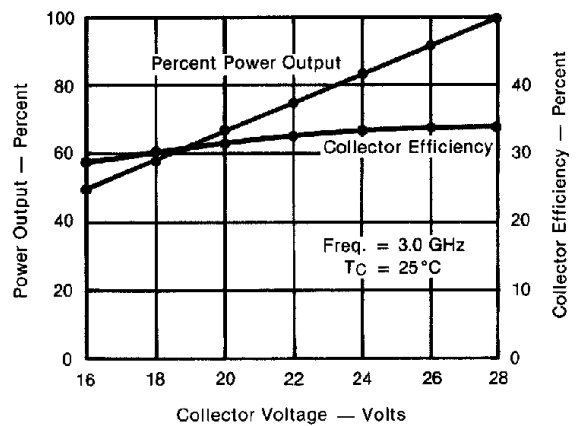
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	$f = 3.0\text{ GHz}$	$P_{IN} = 1.59\text{ W}$	$V_{CC} = 28\text{ V}$	4.5	5.0	—	W
η_C	$f = 3.0\text{ GHz}$	$P_{IN} = 1.59\text{ W}$	$V_{CC} = 28\text{ V}$	30	33	—	%
G_P	$f = 3.0\text{ GHz}$	$P_{IN} = 1.59\text{ W}$	$V_{CC} = 28\text{ V}$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

TYPICAL PERFORMANCE

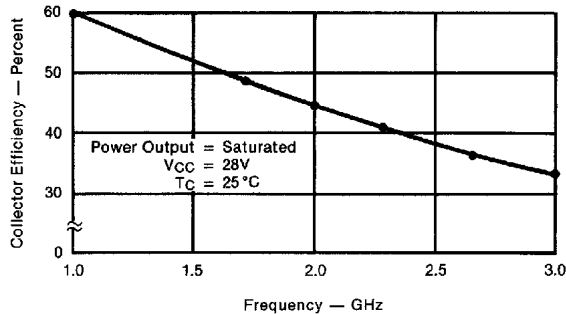
POWER OUTPUT vs FREQUENCY



PERCENT POWER OUTPUT & COLLECTOR EFFICIENCY vs COLLECTOR VOLTAGE

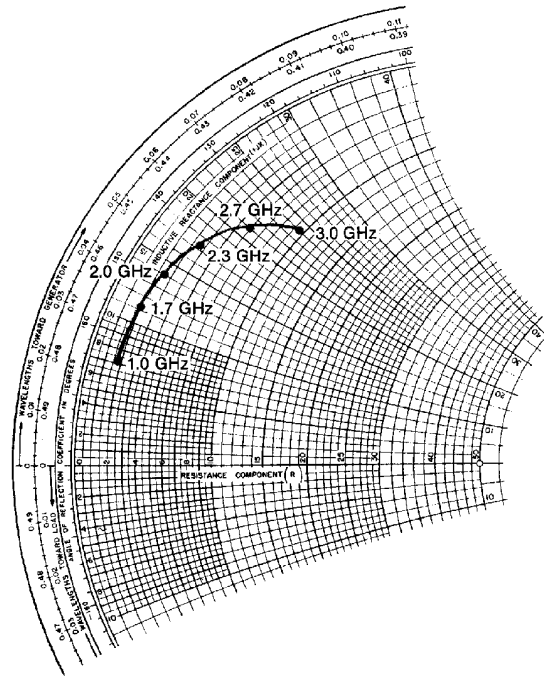
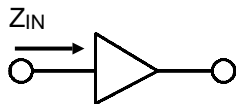


COLLECTOR EFFICIENCY vs FREQUENCY



IMPEDANCE DATA

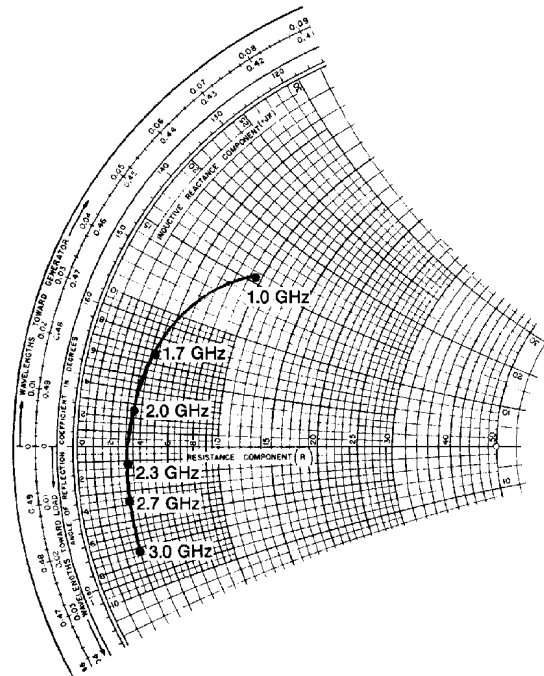
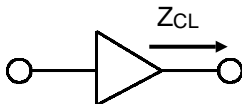
TYPICAL INPUT IMPEDANCE



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

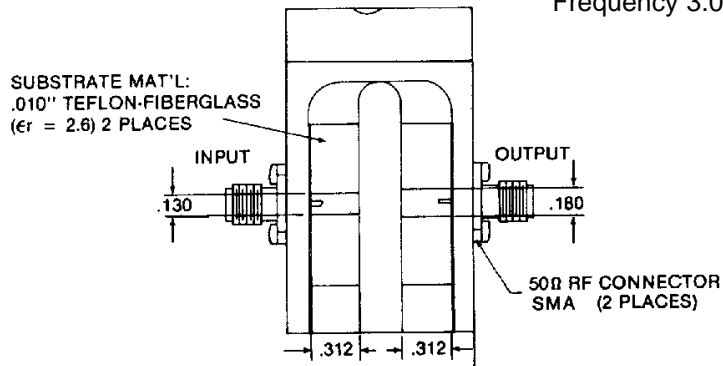
TYPICAL COLLECTOR LOAD IMPEDANCE



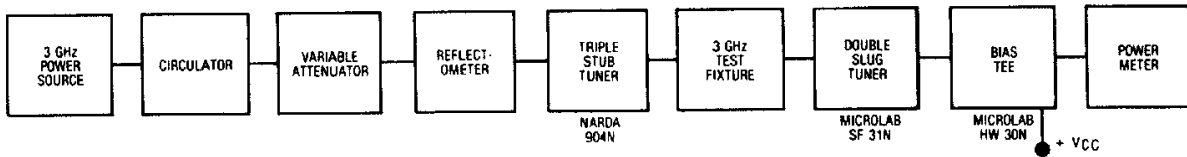
TEST CIRCUIT

Ref.: Dwg. No. C125562

All dimensions are in inches.
Frequency 3.0 GHz

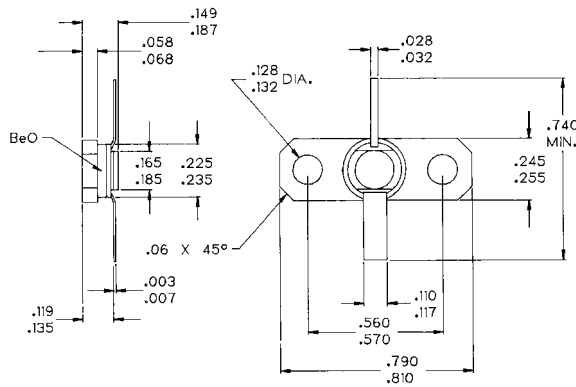


RF Amplifier Power Output Test



PACKAGE MECHANICAL DATA

Ref.: Dwg. No.: J135021C



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

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