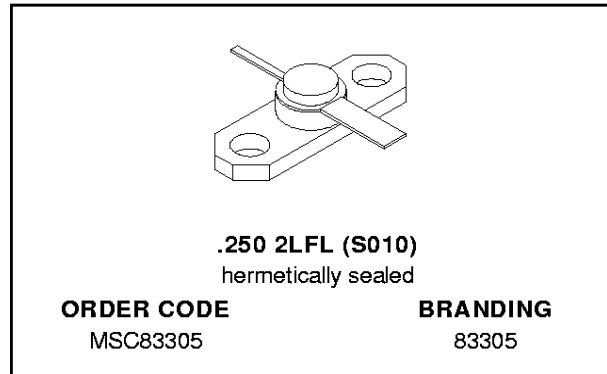


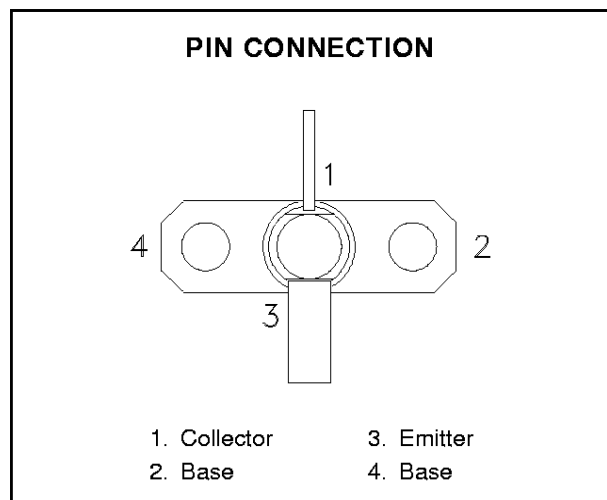
**RF & MICROWAVE TRANSISTORS  
GENERAL PURPOSE AMPLIFIER APPLICATIONS**

- REFRACTORY/GOLD METALLIZATION
- EMITTER BALLASTED
- VSWR CAPABILITY  $\infty:1$  @ RATED CONDITIONS
- HERMETIC STRIPAC<sup>®</sup> PACKAGE
- P<sub>OUT</sub> = 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<sub>case</sub> = 25°C)

Symbol	Parameter	Value	Unit
P <sub>DISS</sub>	Power Dissipation* (T <sub>C</sub> ≤ 50°C)	17.6	W
I <sub>C</sub>	Device Current*	700	mA
V <sub>CC</sub>	Collector-Supply Voltage*	30	V
T <sub>J</sub>	Junction Temperature	200	°C
T <sub>STG</sub>	Storage Temperature	- 65 to +200	°C

**THERMAL DATA**

R <sub>TH(j-c)</sub>	Junction-Case Thermal Resistance*	8.5	°C/W
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\*Applies only to rated RF amplifier operation

# MSC83305

## ELECTRICAL SPECIFICATIONS (T<sub>case</sub> = 25°C)

### STATIC

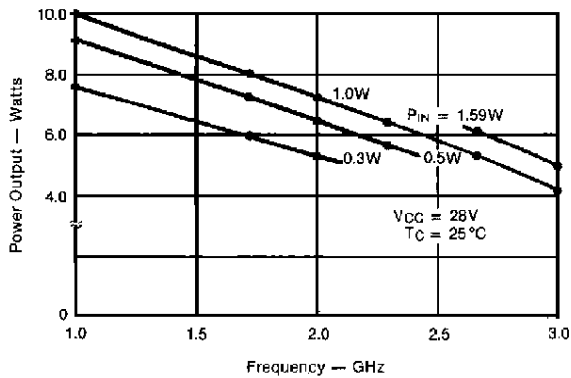
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV <sub>CB0</sub>	I <sub>C</sub> = 1mA	I <sub>E</sub> = 0mA	45	—	—	V
BV <sub>EB0</sub>	I <sub>E</sub> = 1mA	I <sub>C</sub> = 0mA	3.5	—	—	V
BV <sub>CER</sub>	I <sub>C</sub> = 5mA	R <sub>BE</sub> = 10Ω	45	—	—	V
I <sub>CB0</sub>	V <sub>CB</sub> = 28V		—	—	0.5	mA
h <sub>FE</sub>	V <sub>CE</sub> = 5V	I <sub>C</sub> = 500mA	30	—	300	—

### DYNAMIC

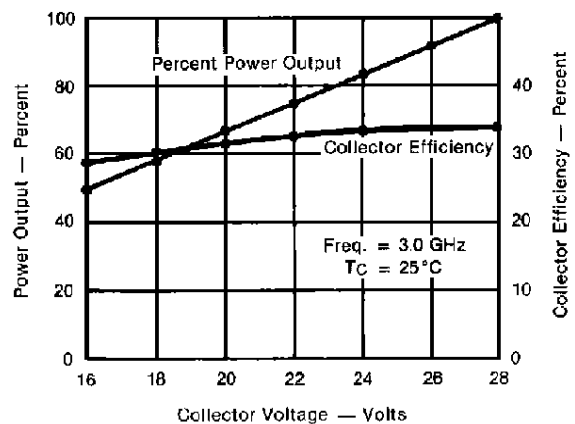
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P <sub>OUT</sub>	f = 3.0 GHz	P <sub>IN</sub> = 1.59 W	V <sub>CC</sub> = 28 V	4.5	5.0	—	W
η <sub>c</sub>	f = 3.0 GHz	P <sub>IN</sub> = 1.59 W	V <sub>CC</sub> = 28 V	30	33	—	%
G <sub>P</sub>	f = 3.0 GHz	P <sub>IN</sub> = 1.59 W	V <sub>CC</sub> = 28 V	4.5	5.0	—	dB
C <sub>OB</sub>	f = 1 MHz	V <sub>CB</sub> = 28 V		—	—	7.5	pF

### TYPICAL PERFORMANCE

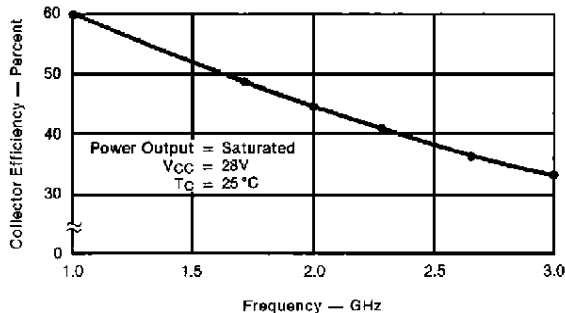
**POWER OUTPUT vs FREQUENCY**



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

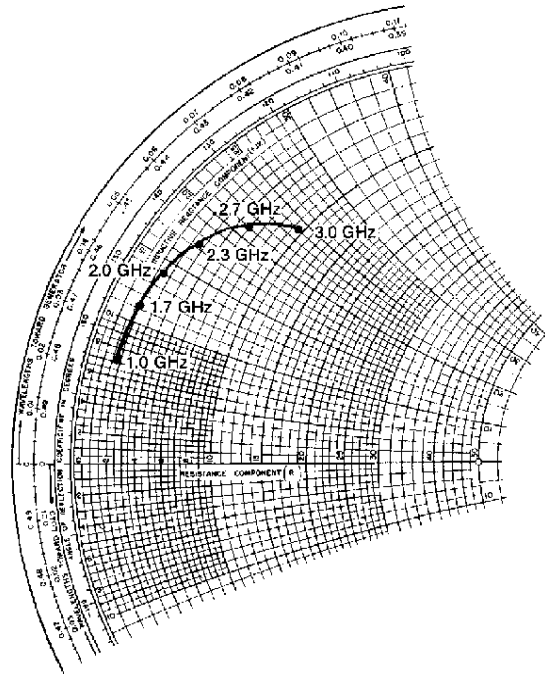
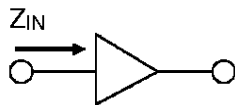


**COLLECTOR EFFICIENCY vs FREQUENCY**



IMPEDANCE DATA

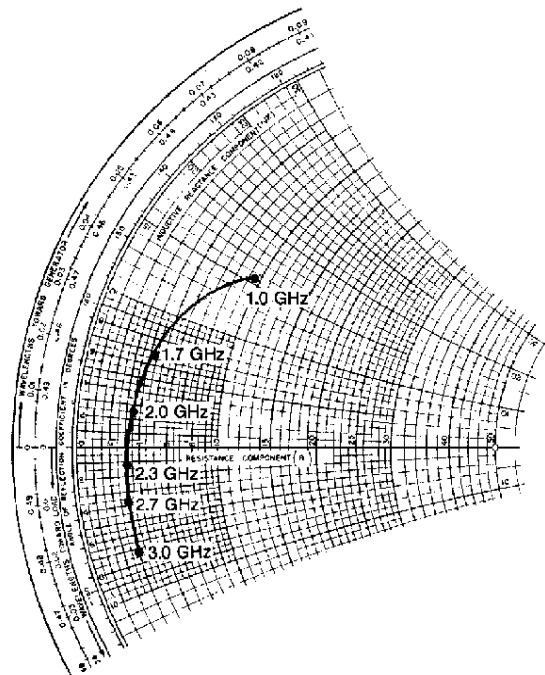
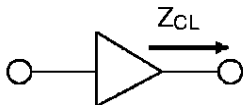
TYPICAL INPUT IMPEDANCE



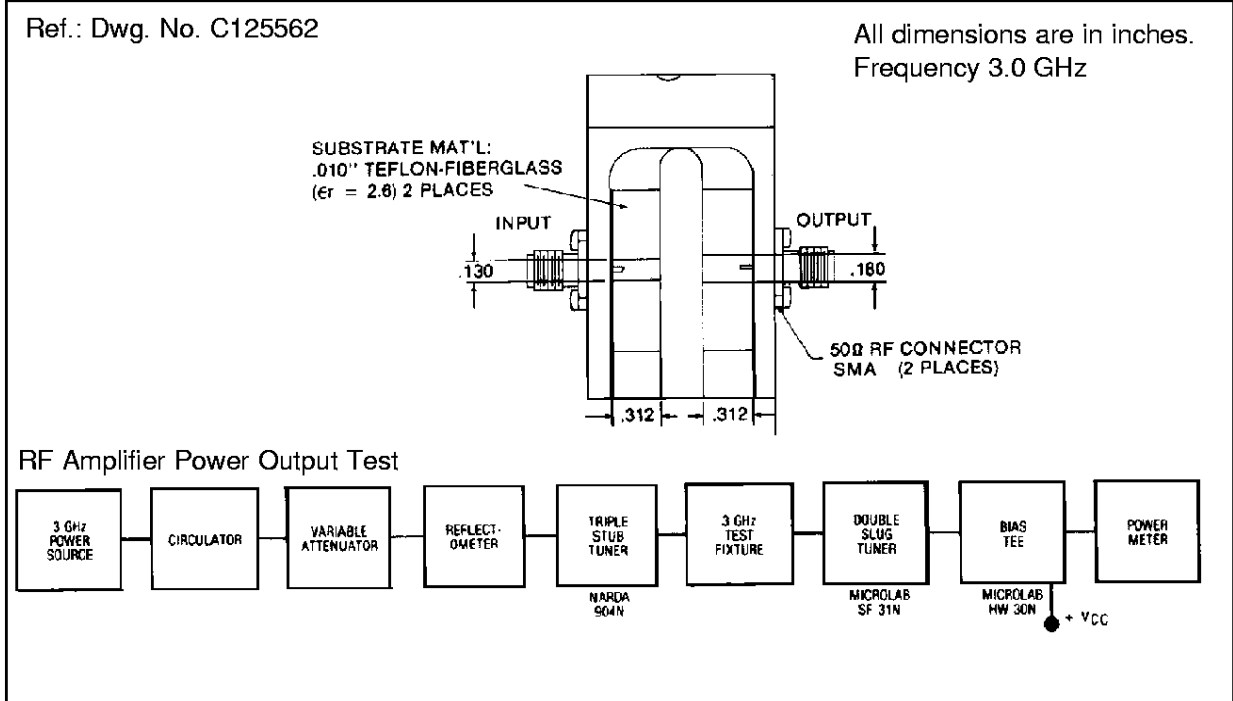
FREQ.	Z <sub>IN</sub> (Ω)	Z <sub>CL</sub> (Ω)
1.0 GHz	1.7 + j 7.2	9.5 + j 15.5
1.7 GHz	2.0 + j 11.2	4.2 + j 6.7
2.0 GHz	2.4 + j 14.0	3.5 + j 2.5
2.3 GHz	3.6 + j 17.4	3.1 - j 1.2
2.7 GHz	6.0 + j 21.0	3.0 - j 3.8
3.0 GHz	9.5 + j 24.0	3.0 - j 7.2

P<sub>OUT</sub> = Saturated  
 V<sub>CC</sub> = 28V  
 Normalized to 50 ohms

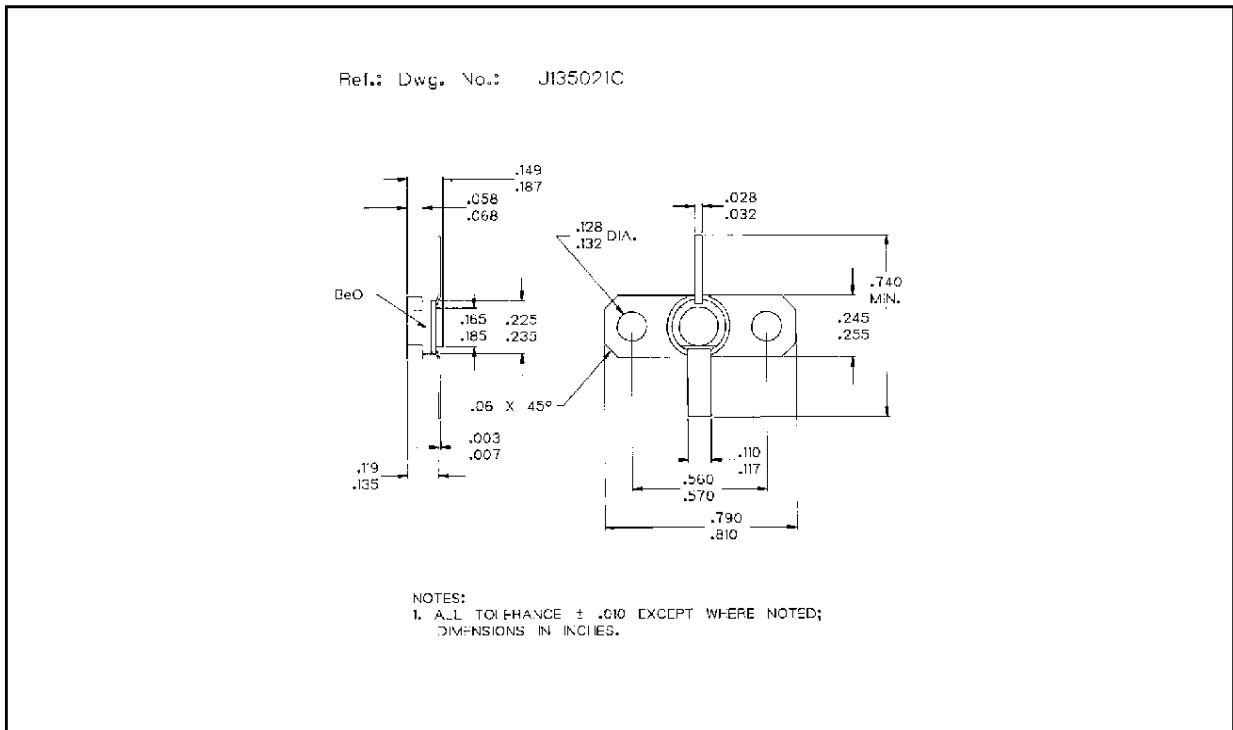
TYPICAL COLLECTOR LOAD IMPEDANCE



TEST CIRCUIT



PACKAGE MECHANICAL DATA



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