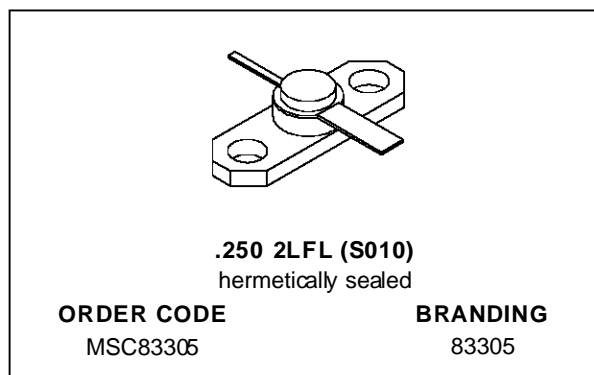


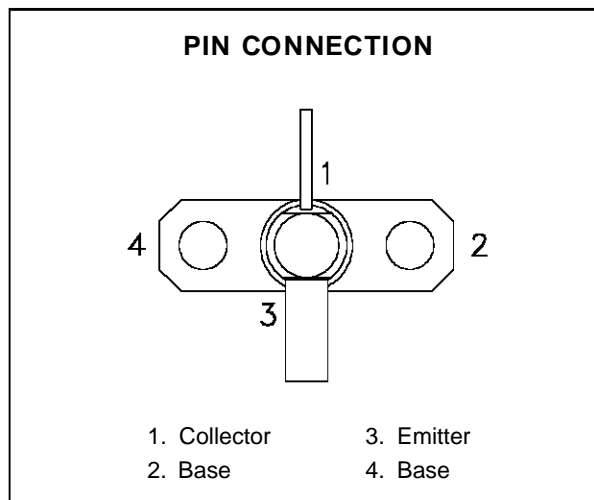
## RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

- REFRACTORY/GOLD METALLIZATION
- EMITTER BALLASTED
- VSWR CAPABILITY  $\infty:1$  @ RATED CONDITIONS
- HERMETIC STRIPAC<sup>®</sup> 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

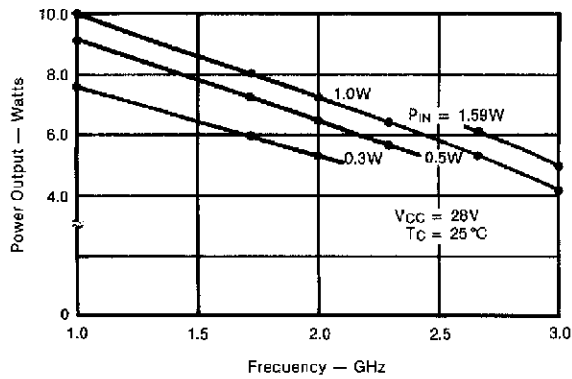
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
$BV_{CBO}$	$I_C = 1mA$	$I_E = 0mA$	45	—	—	V
$BV_{EBO}$	$I_E = 1mA$	$I_C = 0mA$	3.5	—	—	V
$BV_{CER}$	$I_C = 5mA$	$R_{BE} = 10\Omega$	45	—	—	V
$I_{CBO}$	$V_{CB} = 28V$		—	—	0.5	mA
$h_{FE}$	$V_{CE} = 5V$	$I_C = 500mA$	30	—	300	—

### DYNAMIC

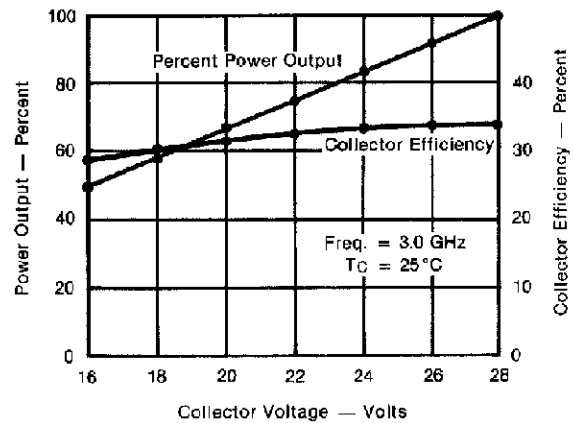
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
$P_{OUT}$	$f = 3.0\text{ GHz}$	$P_{IN} = 1.59\text{ W}$	$V_{CC} = 28\text{ V}$	4.5	5.0	—	W
$\eta_C$	$f = 3.0\text{ GHz}$	$P_{IN} = 1.59\text{ W}$	$V_{CC} = 28\text{ V}$	30	33	—	%
$G_P$	$f = 3.0\text{ GHz}$	$P_{IN} = 1.59\text{ W}$	$V_{CC} = 28\text{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

### TYPICAL PERFORMANCE

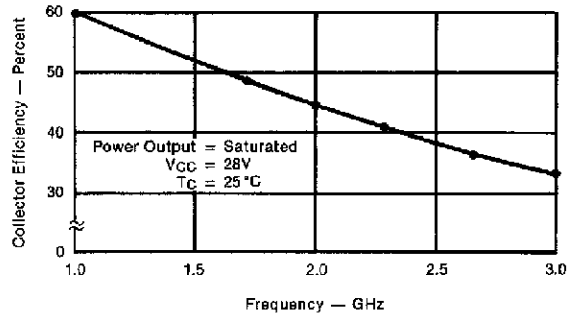
#### POWER OUTPUT vs FREQUENCY



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

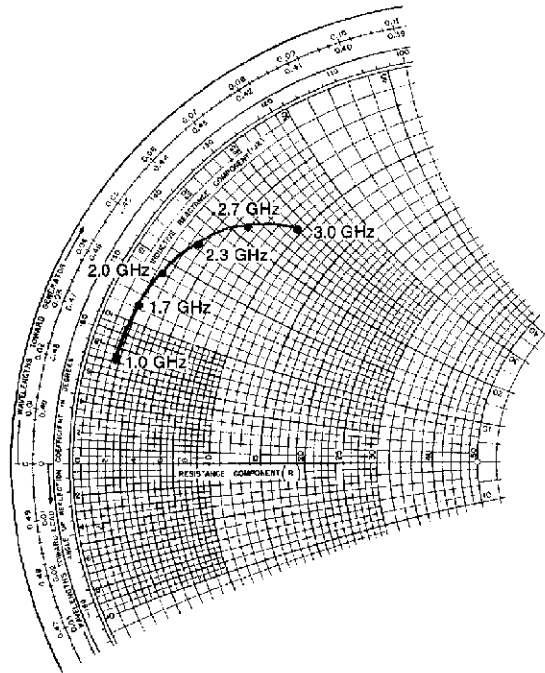
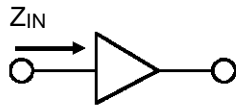


#### COLLECTOR EFFICIENCY vs FREQUENCY



IMPEDANCE DATA

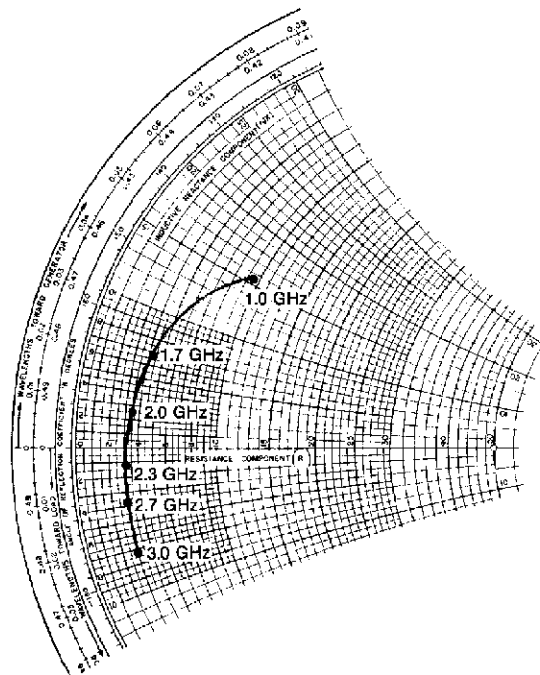
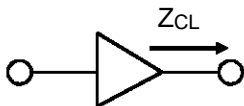
TYPICAL INPUT IMPEDANCE



FREQ.	Z <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

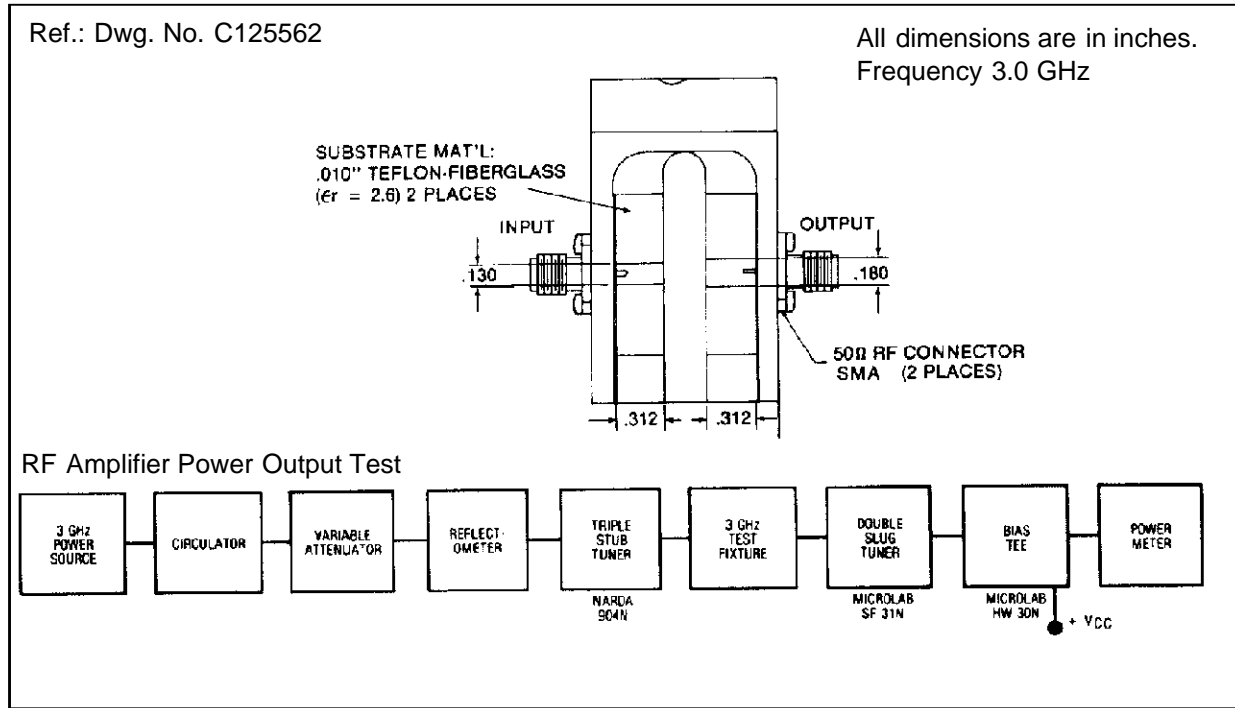
P<sub>OUT</sub> = Saturated  
 V<sub>CC</sub> = 28V  
 Normalized to 50 ohms

TYPICAL COLLECTOR LOAD IMPEDANCE

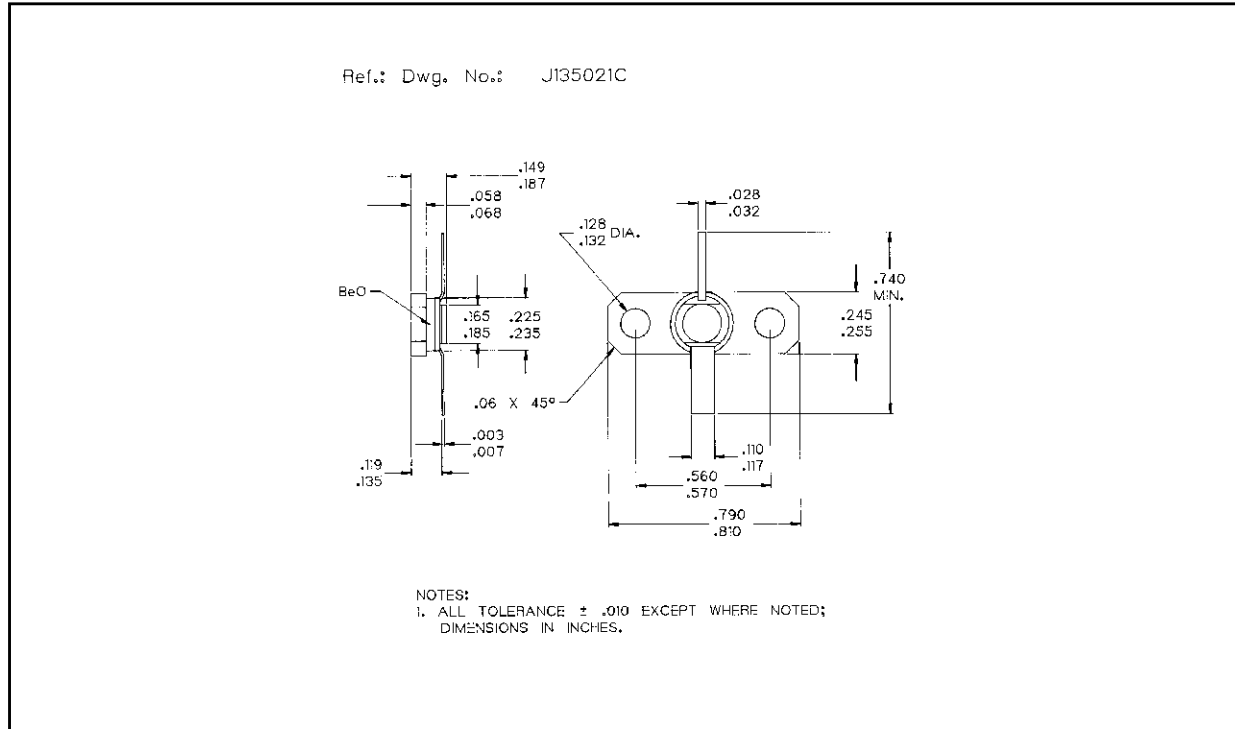


# MSC83305

## TEST CIRCUIT



## PACKAGE MECHANICAL DATA



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