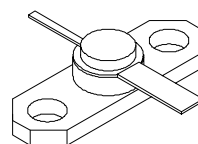


RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

- 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



.250 2LFL (S010)
hermetically sealed

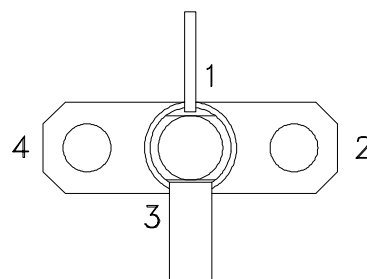
ORDER CODE
MSC83305

BRANDING
83305

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.

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* ($T_C \leq 50^{\circ}\text{C}$)	17.6	W
I_C	Device Current*	700	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*	8.5	$^{\circ}\text{C/W}$
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*Applies only to rated RF amplifier operation

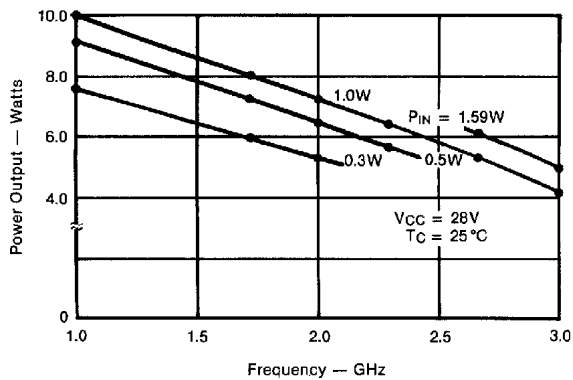
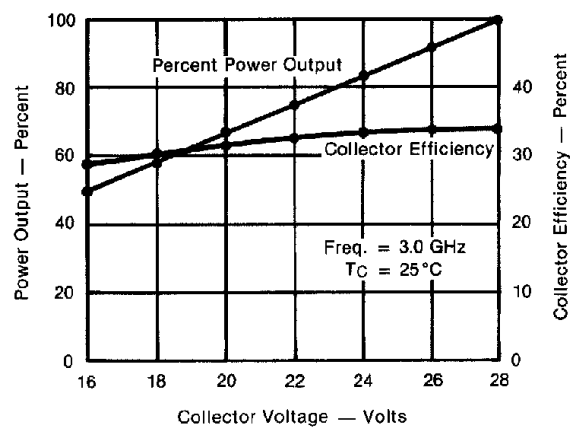
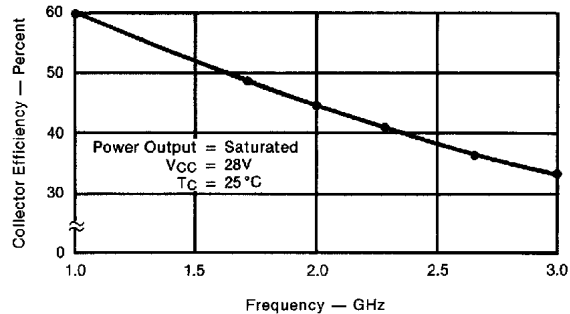
ELECTRICAL SPECIFICATIONS ($T_{\text{case}} = 25^{\circ}\text{C}$)

STATIC

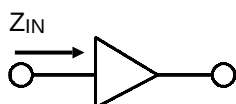
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BV_{CBO}	$I_{\text{C}} = 1\text{mA}$ $I_{\text{E}} = 0\text{mA}$	45	—	—	V
BV_{EBO}	$I_{\text{E}} = 1\text{mA}$ $I_{\text{C}} = 0\text{mA}$	3.5	—	—	V
BV_{CER}	$I_{\text{C}} = 5\text{mA}$ $R_{\text{BE}} = 10\Omega$	45	—	—	V
I_{CBO}	$V_{\text{CB}} =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

DYNAMIC

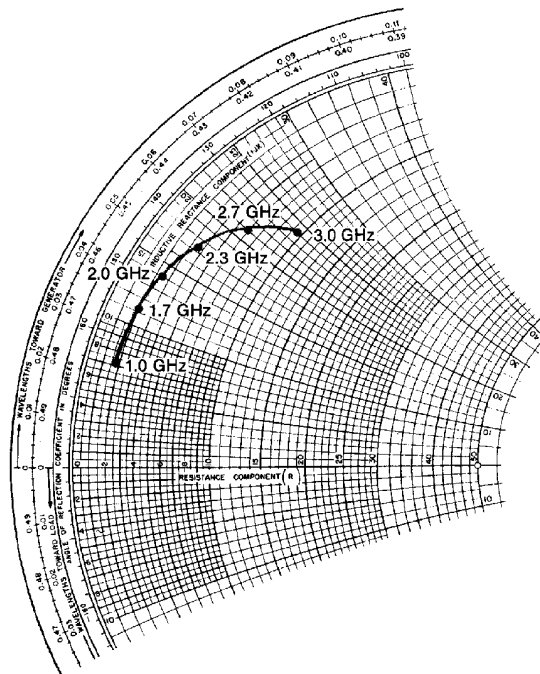
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_{OUT}	$f = 3.0\text{ GHz}$ $P_{\text{IN}} = 1.59\text{ W}$ $V_{\text{CC}} = 28\text{ V}$	4.5	5.0	—	W
η_{C}	$f = 3.0\text{ GHz}$ $P_{\text{IN}} = 1.59\text{ W}$ $V_{\text{CC}} = 28\text{ V}$	30	33	—	%
G_{P}	$f = 3.0\text{ GHz}$ $P_{\text{IN}} = 1.59\text{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

TYPICAL PERFORMANCE
POWER OUTPUT vs FREQUENCY

PERCENT POWER OUTPUT & COLLECTOR EFFICIENCY vs COLLECTOR VOLTAGE

COLLECTOR EFFICIENCY vs FREQUENCY


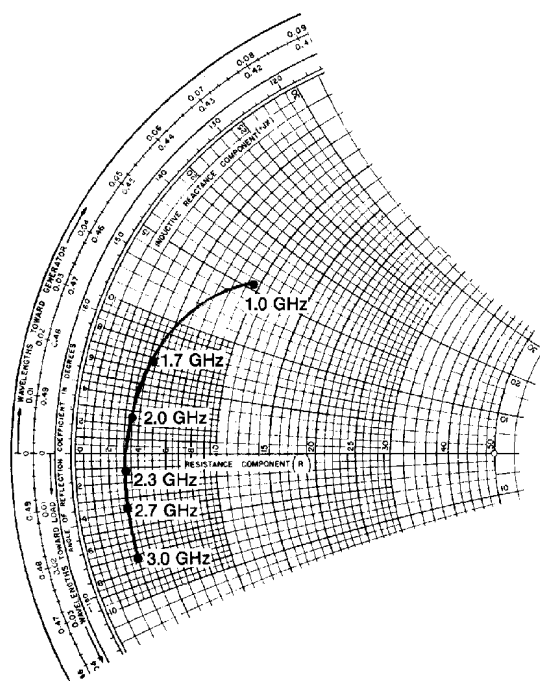
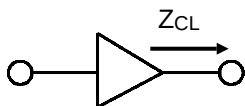
IMPEDANCE DATA

TYPICAL INPUT
IMPEDANCE

FREQ.	$Z_{IN} (\Omega)$	$Z_{CL} (\Omega)$
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	$9.5 + j 24.0$	$3.0 - j 7.2$



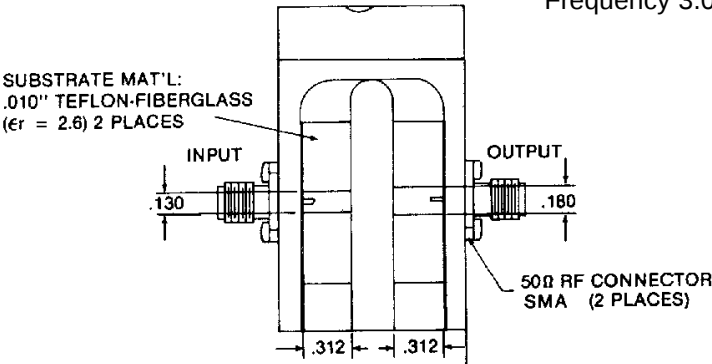
P_{OUT} = Saturated
 V_{CC} = 28V
 Normalized to 50 ohms

TYPICAL COLLECTOR
LOAD IMPEDANCE

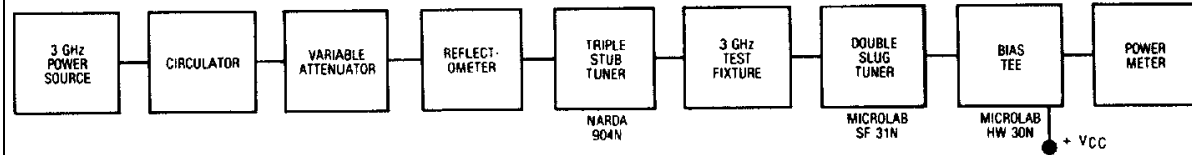
TEST CIRCUIT

Ref.: Dwg. No. C125562

All dimensions are in inches.
Frequency 3.0 GHz

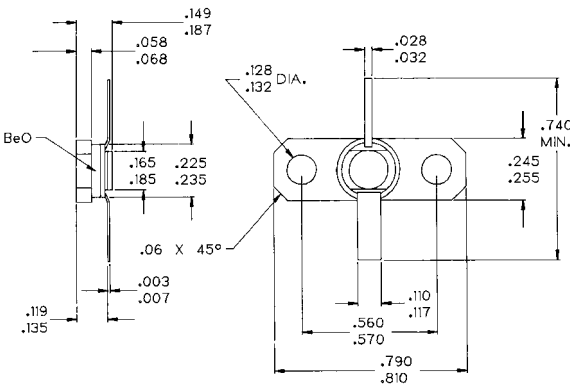


RF Amplifier Power Output Test



PACKAGE MECHANICAL DATA

Ref.: Dwg. No.: JI35021C



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

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