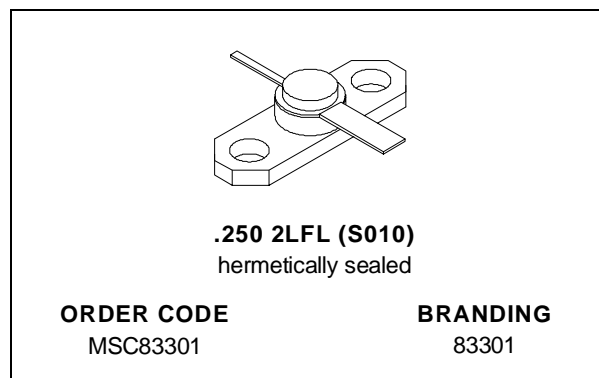


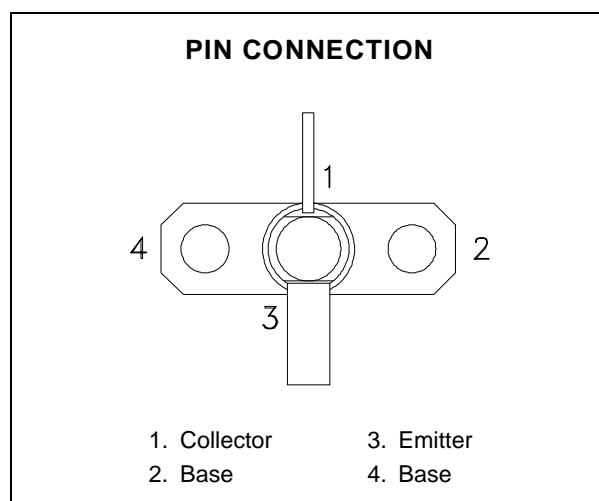
## RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

- REFRACTORY/GOLD METALLIZATION
- EMITTER SITE BALLASTED
- VSWR CAPABILITY  $\infty:1$  @ RATED CONDITIONS
- HERMETIC STRIPAC<sup>®</sup> PACKAGE
- $P_{OUT} = 1.0$  W MIN. WITH 7.0 dB GAIN @ 3.0 GHz



### DESCRIPTION

The MSC83301 is a common base hermetically sealed silicon NPN microwave power transistor utilizing an overlay, 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 MSC83301 is 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* ( $T_C \leq 50^{\circ}C$ )	6.0	W
$I_C$	Device Current*	200	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*	25	$^{\circ}C/W$
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\*Applies only to rated RF amplifier operation

# MSC83301

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

### STATIC

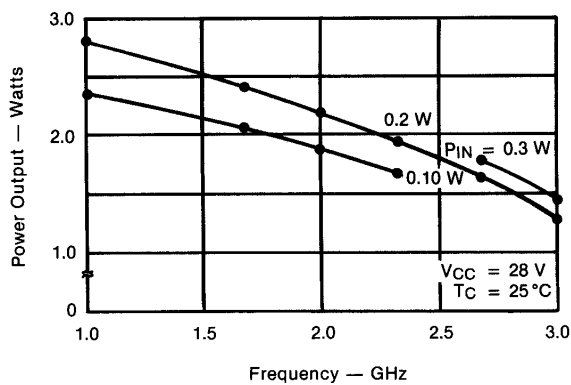
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV <sub>CBO</sub>	I <sub>C</sub> = 1 mA	I <sub>E</sub> = 0 mA	45	—	—	V
BV <sub>EBO</sub>	I <sub>E</sub> = 1 mA	I <sub>C</sub> = 0 mA	3.5	—	—	V
BV <sub>CER</sub>	I <sub>C</sub> = 5 mA	R <sub>BE</sub> = 10 Ω	45	—	—	V
I <sub>CBO</sub>	V <sub>CB</sub> = 28V		—	—	0.5	mA
h <sub>FE</sub>	V <sub>CE</sub> = 5 V	I <sub>C</sub> = 100 mA	30	—	300	—

### DYNAMIC

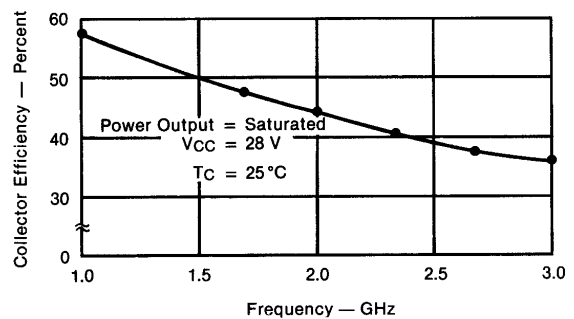
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P <sub>OUT</sub>	f = 3.0 GHz	P <sub>IN</sub> = 0.20 W	V <sub>CC</sub> = 28 V	1.0	1.3	—	W
η <sub>C</sub>	f = 3.0 GHz	P <sub>IN</sub> = 0.20 W	V <sub>CC</sub> = 28 V	33	36	—	%
P <sub>G</sub>	f = 3.0 GHz	P <sub>IN</sub> = 0.20 W	V <sub>CC</sub> = 28 V	7.0	8.1	—	dB
C <sub>OB</sub>	f = 1 MHz	V <sub>CB</sub> = 28 V		—	—	3.5	pF

### TYPICAL PERFORMANCE

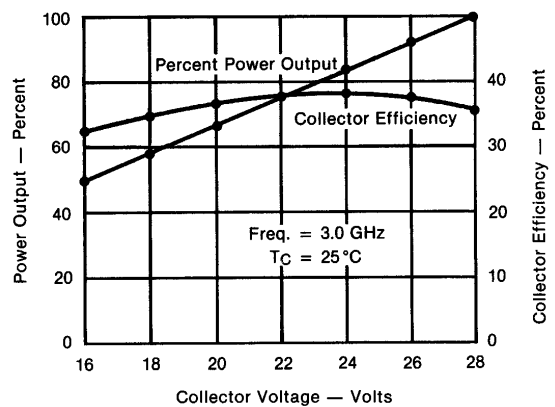
TYPICAL POWER OUTPUT vs FREQUENCY



TYPICAL COLLECTOR EFFICIENCY vs FREQUENCY

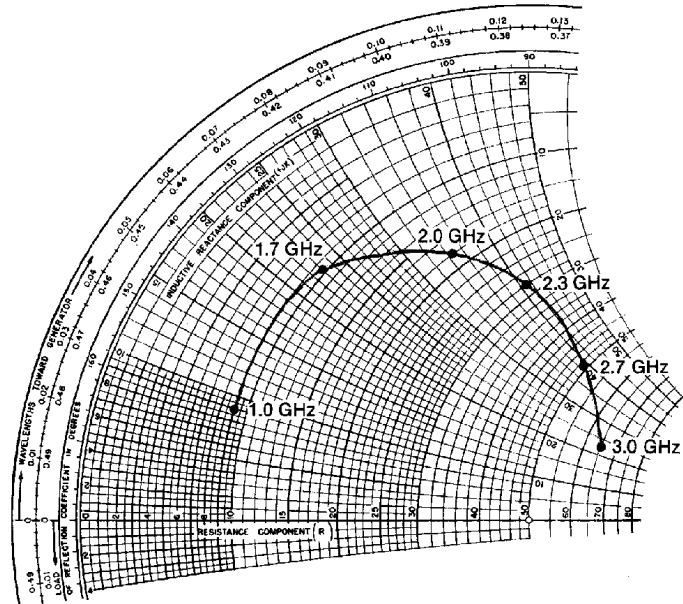
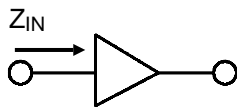


PERCENT POWER OUTPUT & COLLECTOR EFFICIENCY vs COLLECTOR VOLTAGE



IMPEDANCE DATA

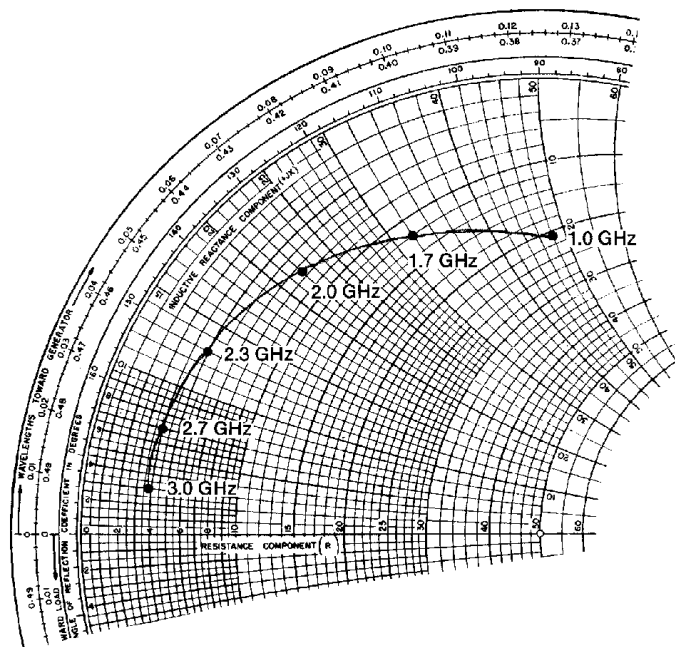
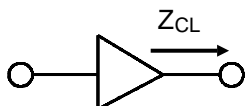
TYPICAL INPUT IMPEDANCE



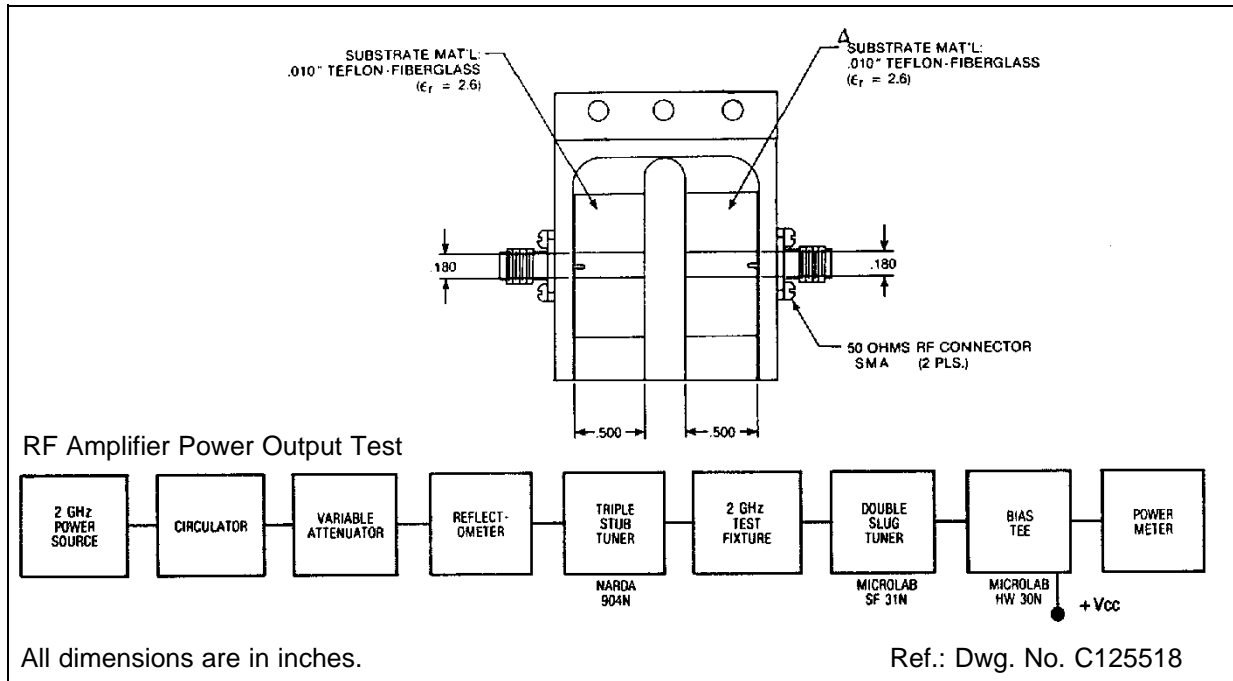
FREQ.	Z <sub>IN</sub> (Ω)	Z <sub>CL</sub> (Ω)
1.0 GHz	9.0 + j 9.0	21.0 + j 48.0
1.7 GHz	9.5 + j 23.0	12.0 + j 32.0
2.0 GHz	18.0 + j 34.5	7.5 + j 22.0
2.3 GHz	28.0 + j 41.0	5.0 + j 13.0
2.7 GHz	49.0 + j 39.0	4.0 + j 7.0
3.0 GHz	65.0 + j 22.0	3.8 + j 3.0

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

TYPICAL COLLECTOR LOAD IMPEDANCE

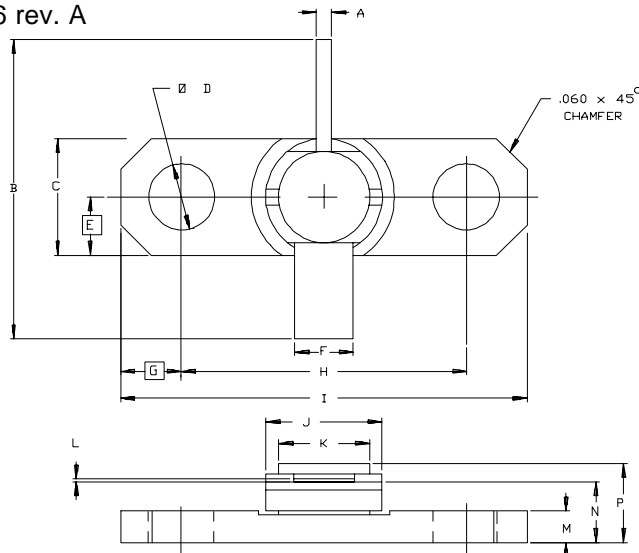


TEST CIRCUIT



PACKAGE MECHANICAL DATA

Ref.: Dwg. No. 12-0216 rev. A



SGS-THOMSON MICROELECTRONICS		CONT'D			
	MINIMUM Inches/mm	MAXIMUM Inches/mm		MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.028/0,71	.032/0,81	K	.165/4,19	.185/4,70
B	.740/18,80		L	.003/0,08	.007/0,18
C	.245/6,22	.255/6,48	M	.058/1,47	.068/1,73
D	.128/3,25	.132/3,35	N	.119/3,02	.135/3,43
E	.125/3,18		P	.149/3,78	.187/4,75
F	.110/2,79	.117/2,97			
G	.117/2,97				
H	.560/14,22	.570/14,48			
I	.795/20,19	.805/20,45			
J	.225/5,72	.235/5,97			

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