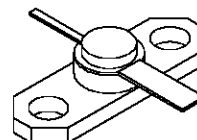


RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

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



.250 2LFL (S010)
hermetically sealed

ORDER CODE

MSC83301

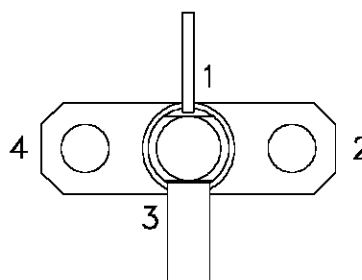
BRANDING

83301

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.

PIN CONNECTION



1. Collector

2. Base

3. Emitter

4. Base

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

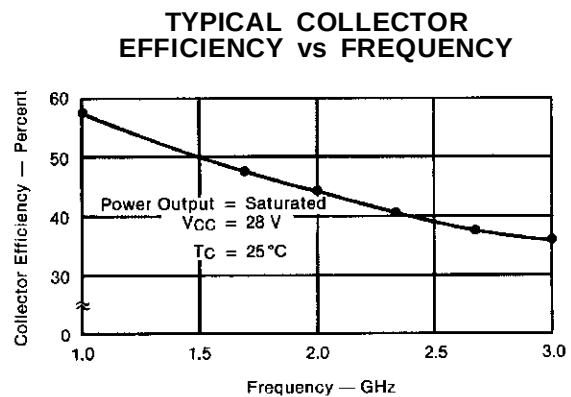
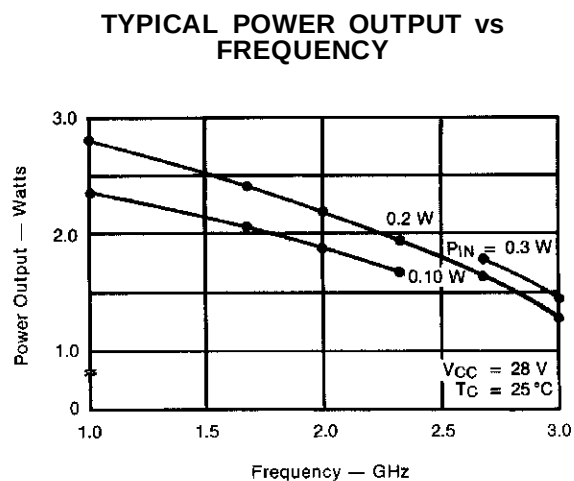
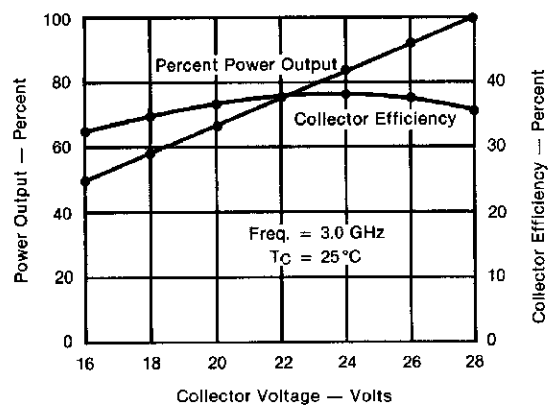
ELECTRICAL SPECIFICATIONS ($T_{\text{case}} = 25^{\circ}\text{C}$)

STATIC

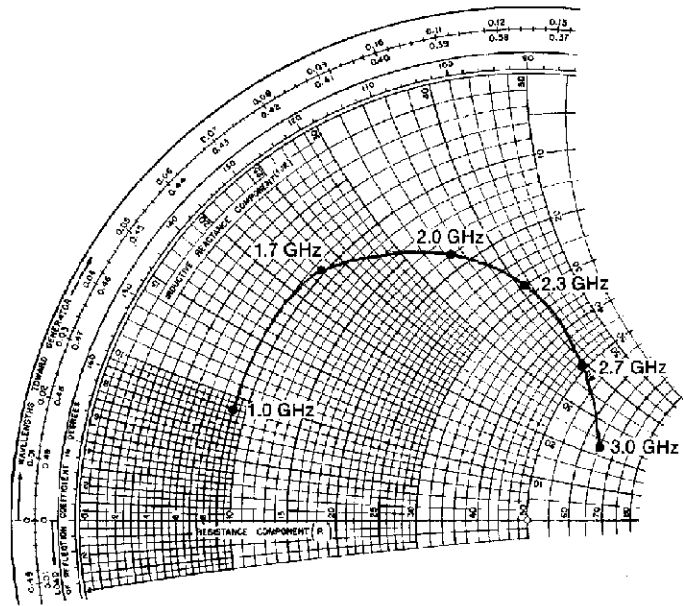
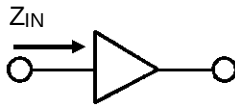
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BV_{CBO}	$I_{\text{C}} = 1 \text{ mA}$ $I_{\text{E}} = 0 \text{ mA}$	45	—	—	V
BV_{EBO}	$I_{\text{E}} = 1 \text{ mA}$ $I_{\text{C}} = 0 \text{ mA}$	3.5	—	—	V
BV_{CER}	$I_{\text{C}} = 5 \text{ mA}$ $R_{\text{BE}} = 10 \ \Omega$	45	—	—	V
I_{CBO}	$V_{\text{CB}} = 28 \text{ V}$	—	—	0.5	mA
h_{FE}	$V_{\text{CE}} = 5 \text{ V}$ $I_{\text{C}} = 100 \text{ mA}$	30	—	300	—

DYNAMIC

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_{OUT}	$f = 3.0 \text{ GHz}$ $P_{\text{IN}} = 0.20 \text{ W}$ $V_{\text{CC}} = 28 \text{ V}$	1.0	1.3	—	W
η_{C}	$f = 3.0 \text{ GHz}$ $P_{\text{IN}} = 0.20 \text{ W}$ $V_{\text{CC}} = 28 \text{ V}$	33	36	—	%
P_{G}	$f = 3.0 \text{ GHz}$ $P_{\text{IN}} = 0.20 \text{ W}$ $V_{\text{CC}} = 28 \text{ V}$	7.0	8.1	—	dB
C_{OB}	$f = 1 \text{ MHz}$ $V_{\text{CB}} = 28 \text{ V}$	—	—	3.5	pF

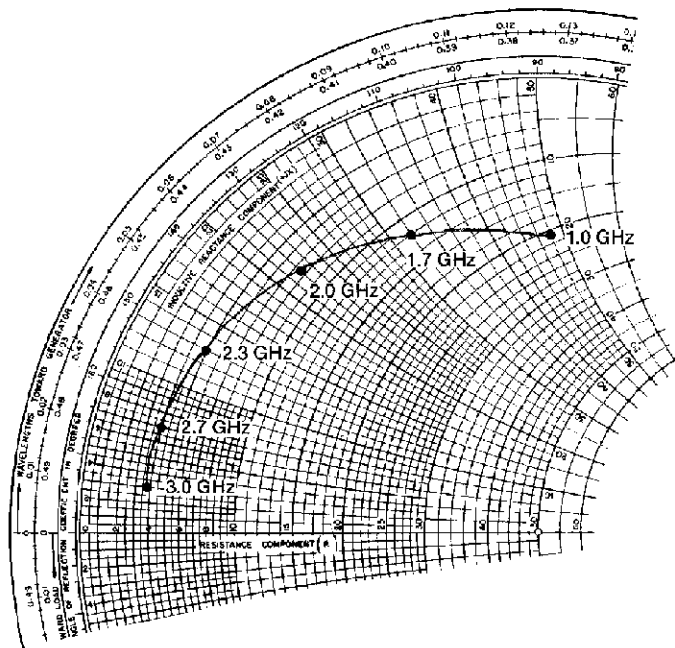
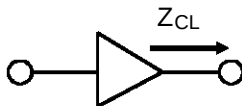
TYPICAL PERFORMANCE

PERCENT POWER OUTPUT & COLLECTOR EFFICIENCY vs COLLECTOR VOLTAGE


IMPEDANCE DATA

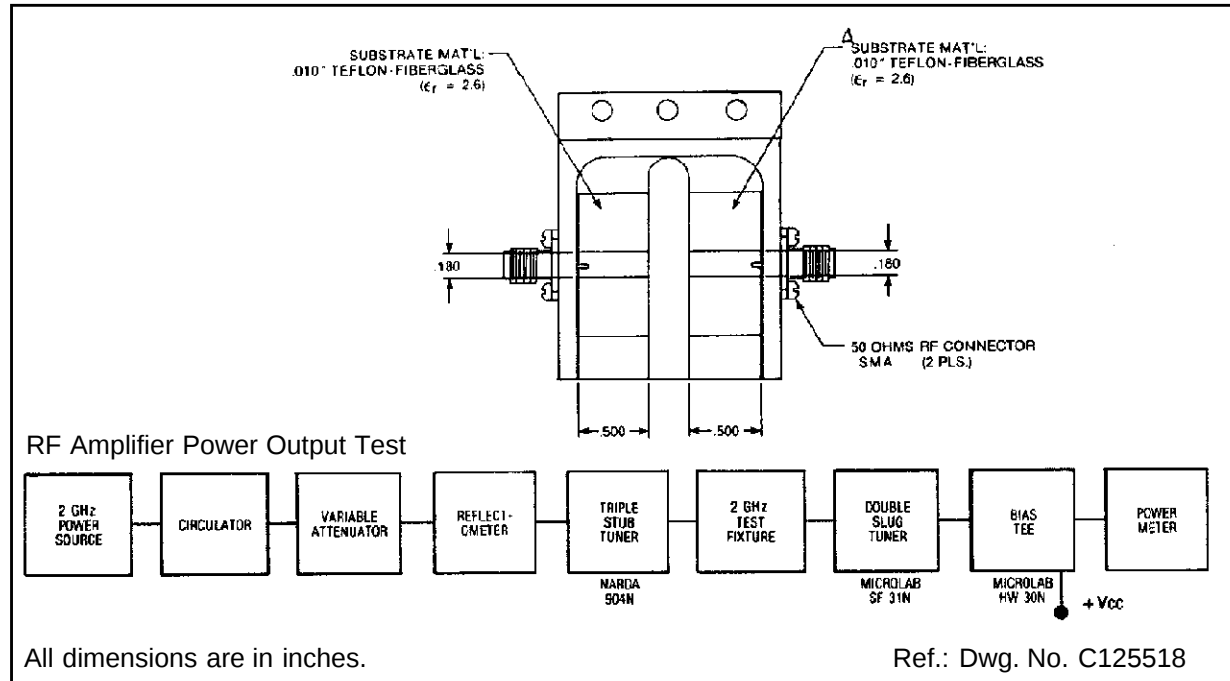
TYPICAL INPUT
IMPEDANCE

FREQ.	$Z_{IN} (\Omega)$	$Z_{CL} (\Omega)$
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_{OUT} = Saturated
 V_{CC} = 28 V
 Normalized to 50 ohms

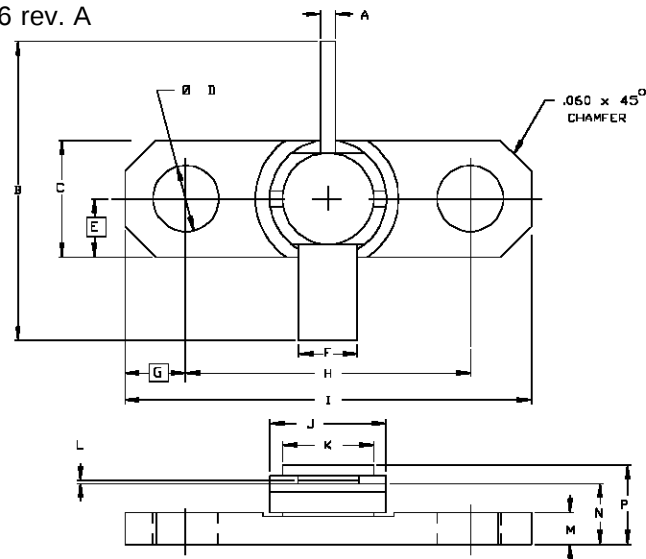
TYPICAL COLLECTOR
LOAD IMPEDANCE

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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