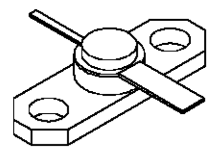
SGS-THOMSON MICROELECTRONICS

MSC83301

RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

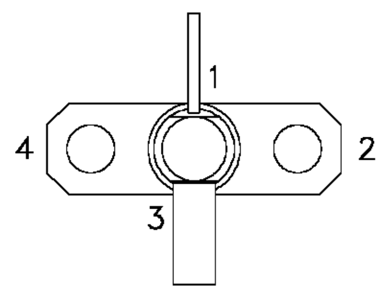
- REFRACTORY/GOLD METALLIZATION
- EMITTER SITE BALLASTED
- VSWR CAPABILITY ∞:1 @ RATED CONDITIONS
- HERMETIC STRIPAC® PACKAGE
- P_{OUT} = 1.0 W MIN. WITH 7.0 dB GAIN @ 3.0 GHz



.250 2LFL (S010)
hermetically sealed

ORDER CODE	BRANDING
MSC83301	83301

PIN CONNECTION



1. Collector
2. Base
3. Emitter
4. Base

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°C)

Symbol	Parameter	Value	Unit
P_{DISS}	Power Dissipation* ($T_C \leq 50$°C)	6.0	W
I_C	Device Current*	200	mA
V_{CC}	Collector-Supply Voltage*	30	V
T_J	Junction Temperature	200	°C
T_{STG}	Storage Temperature	– 65 to +200	°C

THERMAL DATA

$R_{TH(j-c)}$	Junction-Case Thermal Resistance*	25	°C/W

*Applies only to rated RF amplifier operation

ELECTRICAL SPECIFICATIONS (T_{case} = 25°C)

STATIC

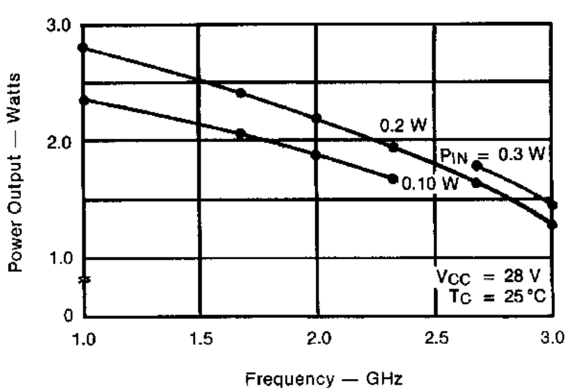
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 1 mA	I_E = 0 mA	45	—	—	V
BV_{EBO}	I_E = 1 mA	I_C = 0 mA	3.5	—	—	V
BV_{CER}	I_C = 5 mA	R_{BE} = 10 Ω	45	—	—	V
I_{CBO}	V_{CB} = 28V		—	—	0.5	mA
h_{FE}	V_{CE} = 5 V	I_C = 100 mA	30	—	300	—

DYNAMIC

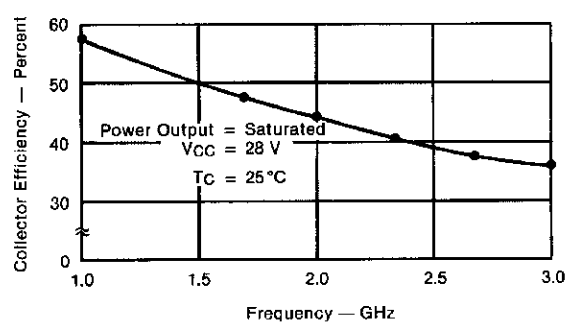
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 3.0 GHz	P_{IN} = 0.20 W	V_{CC} = 28 V	1.0	1.3	—	W
η_C	f = 3.0 GHz	P_{IN} = 0.20 W	V_{CC} = 28 V	33	36	—	%
P_G	f = 3.0 GHz	P_{IN} = 0.20 W	V_{CC} = 28 V	7.0	8.1	—	dB
C_{OB}	f = 1 MHz	V_{CB} = 28 V		—	—	3.5	pF

TYPICAL PERFORMANCE

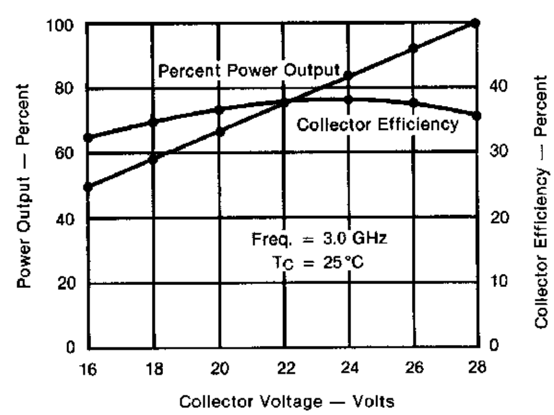
TYPICAL POWER OUTPUT vs FREQUENCY



TYPICAL COLLECTOR EFFICIENCY vs FREQUENCY

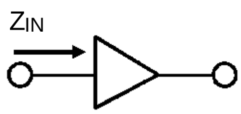


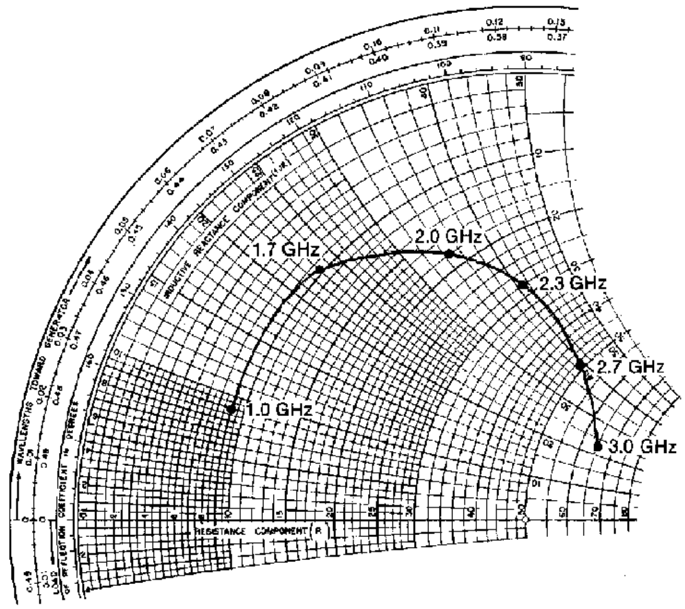
PERCENT POWER OUTPUT & COLLECTOR EFFICIENCY vs COLLECTOR VOLTAGE



IMPEDANCE DATA

TYPICAL INPUT IMPEDANCE

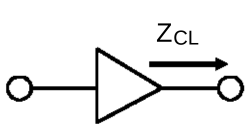


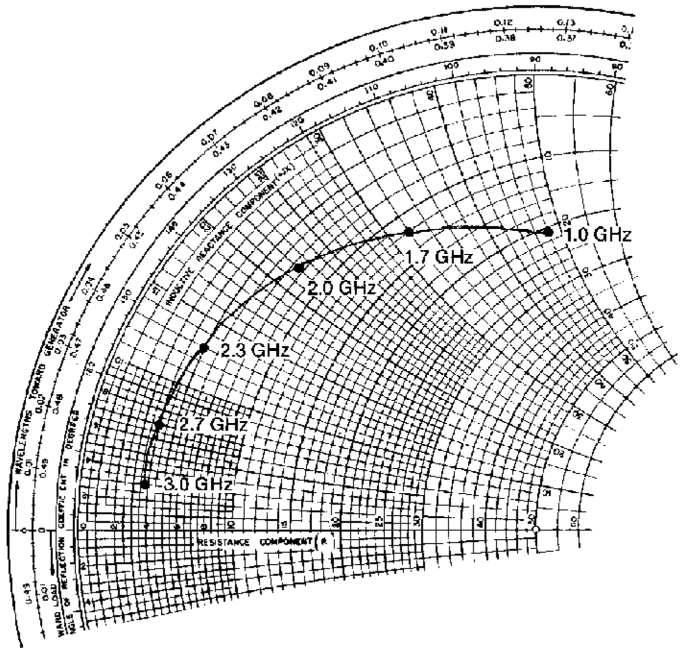


FREQ.	Z_{IN} (Ω)	Z_{CL} (Ω)
1.0 GHz	9.0 + j 9.0	21.0 + j 48.0
1.7 GHz	9.5 + j 23.0	12.0 + j 32.0
2.0 GHz	18.0 + j 34.5	7.5 + j 22.0
2.3 GHz	28.0 + j 41.0	5.0 + j 13.0
2.7 GHz	49.0 + j 39.0	4.0 + j 7.0
3.0 GHz	65.0 + j 22.0	3.8 + j 3.0

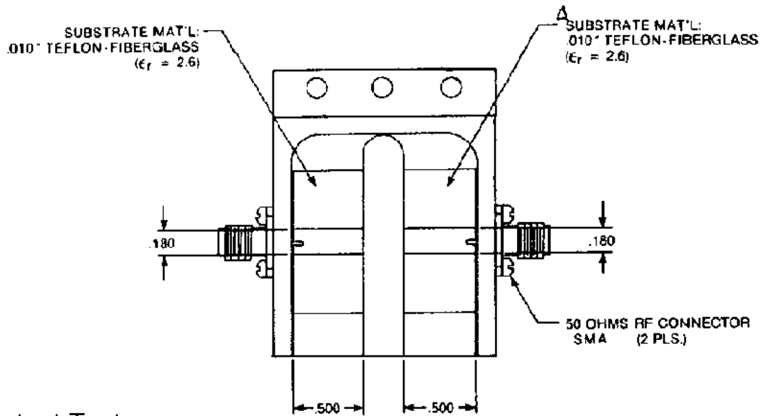
P_{OUT} = Saturated
V_{CC} = 28 V
Normalized to 50 ohms

TYPICAL COLLECTOR LOAD IMPEDANCE

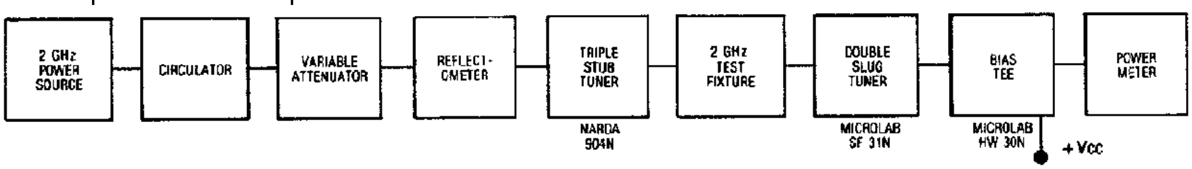




TEST CIRCUIT



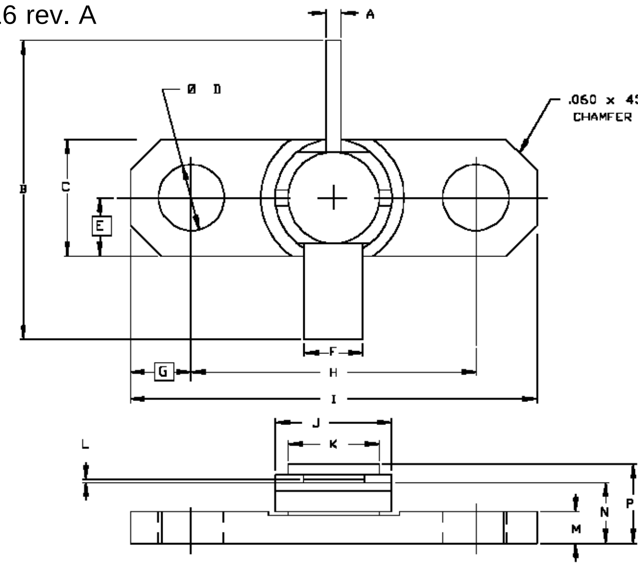
RF Amplifier Power Output Test



All dimensions are in inches. Ref.: Dwg. No. C125518

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			