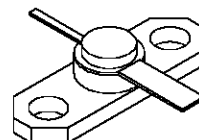


## RF & MICROWAVE TRANSISTORS GENERAL PURPOSE AMPLIFIER APPLICATIONS

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



**.250 2LFL (S010)**  
hermetically sealed

**ORDER CODE**

MSC83301

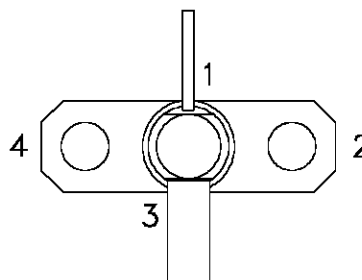
**BRANDING**

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 | 3. Emitter |
| 2. Base      | 4. Base    |

### ABSOLUTE MAXIMUM RATINGS ( $T_{case} = 25^{\circ}\text{C}$ )

Symbol	Parameter	Value	Unit
$P_{DISS}$	Power Dissipation* ( $T_c \leq 50^{\circ}\text{C}$ )	6.0	W
$I_c$	Device Current*	200	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*	25	$^{\circ}\text{C/W}$
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\*Applies only to rated RF amplifier operation

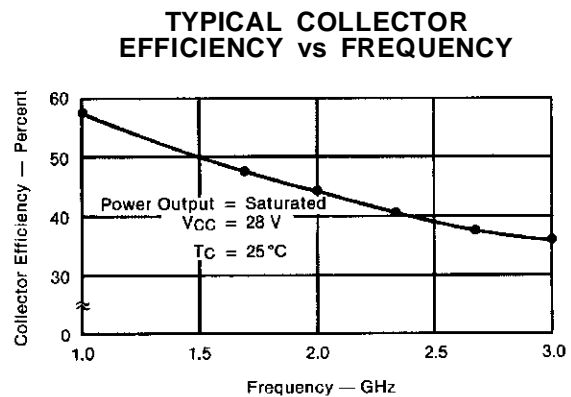
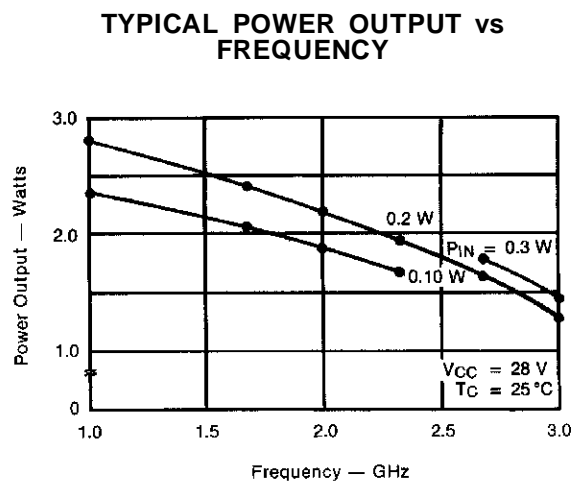
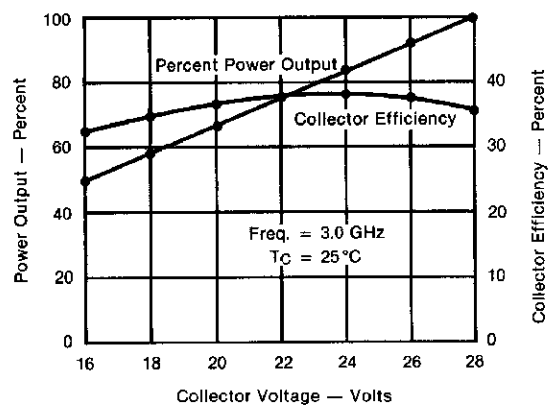
**ELECTRICAL SPECIFICATIONS** ( $T_{\text{case}} = 25^{\circ}\text{C}$ )

**STATIC**

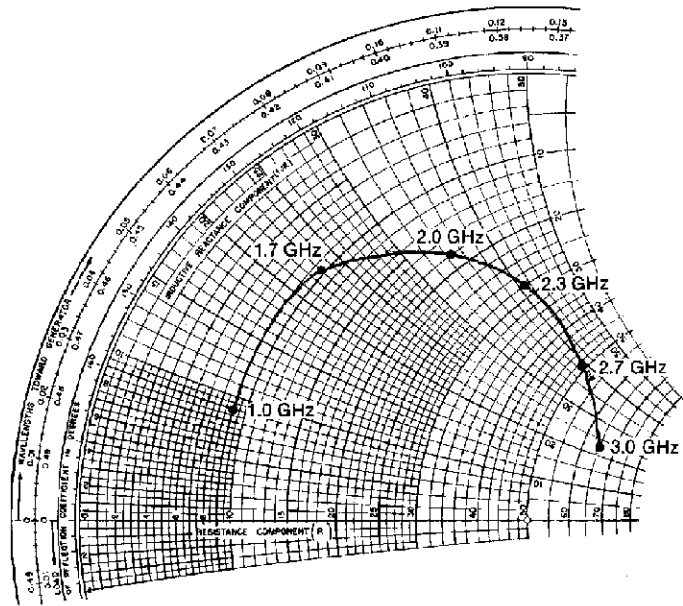
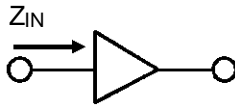
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$BV_{\text{CBO}}$	$I_{\text{C}} = 1 \text{ mA}$ $I_{\text{E}} = 0 \text{ mA}$	45	—	—	V
$BV_{\text{EBO}}$	$I_{\text{E}} = 1 \text{ mA}$ $I_{\text{C}} = 0 \text{ mA}$	3.5	—	—	V
$BV_{\text{CER}}$	$I_{\text{C}} = 5 \text{ mA}$ $R_{\text{BE}} = 10 \Omega$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

**DYNAMIC**

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

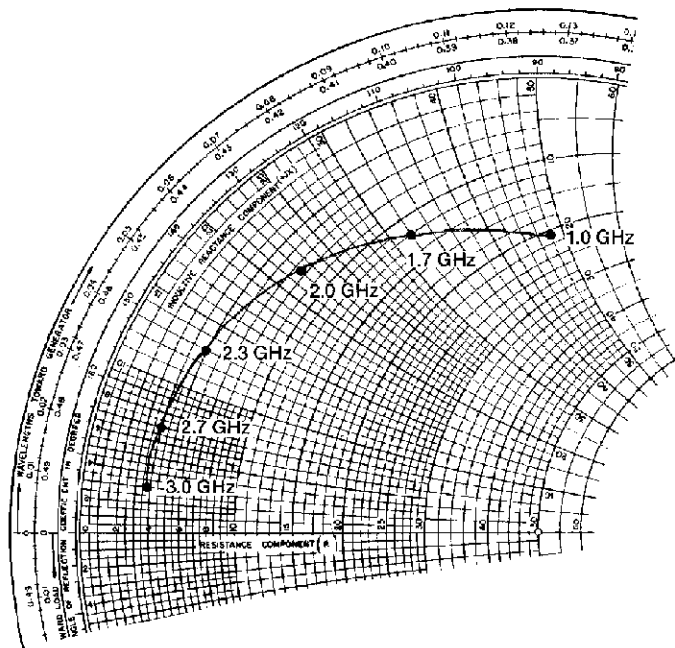
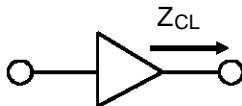
**TYPICAL PERFORMANCE**

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


## IMPEDANCE DATA

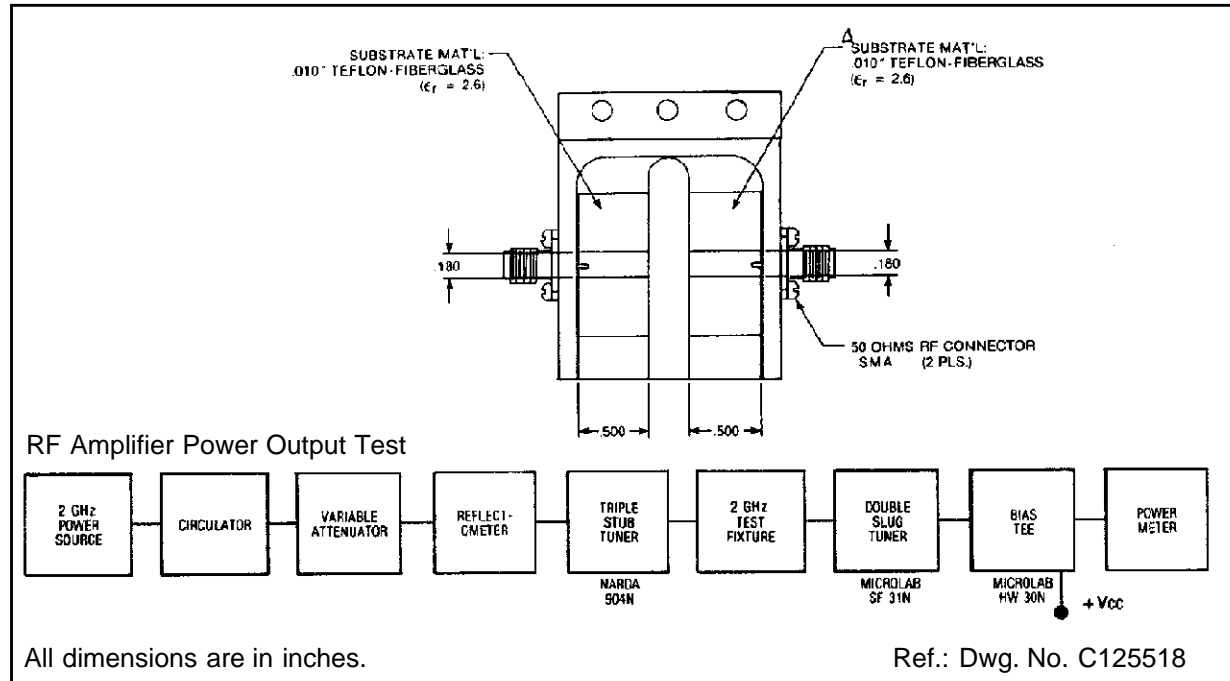
TYPICAL INPUT  
IMPEDANCE

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

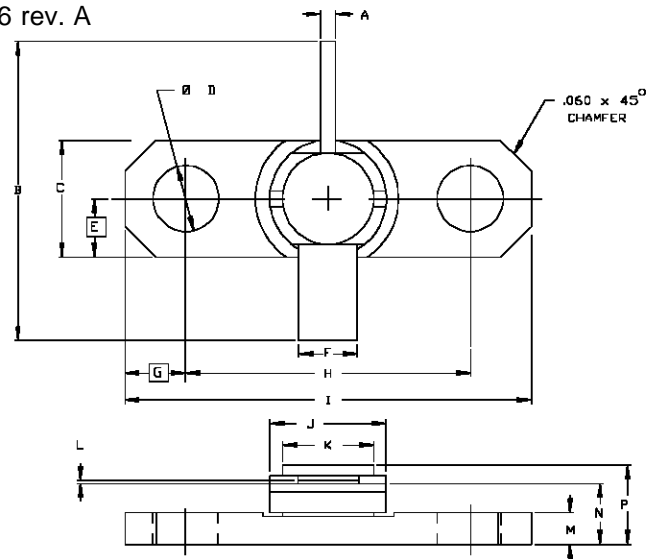
TYPICAL COLLECTOR  
LOAD IMPEDANCE

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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