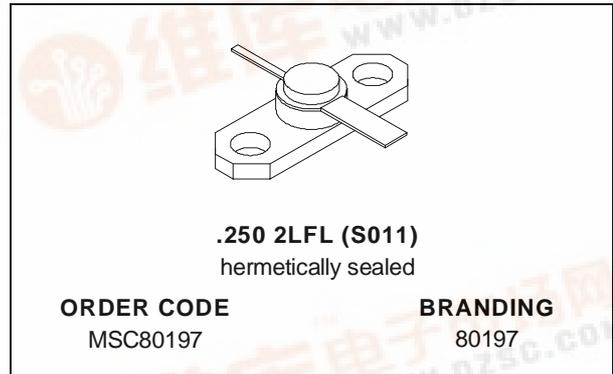




MSC80197

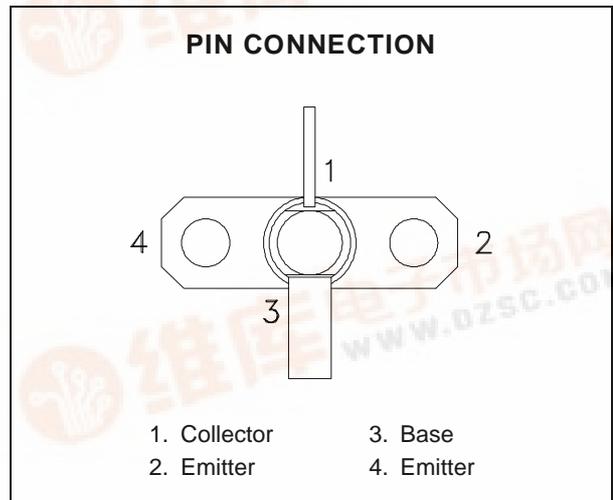
RF & MICROWAVE TRANSISTORS GENERAL PURPOSE LINEAR APPLICATIONS

- EMITTER BALLASTED
- CLASS A LINEAR OPERATION
- COMMON EMITTER
- VSWR CAPABILITY 15:1 @ RATED CONDITIONS
- ft 3.2 GHz TYPICAL
- NOISE FIGURE 12.5 dB @ 2 GHz
- P_{OUT} = 31.7 dBm MIN. @ 2.0 GHz



DESCRIPTION

The MSC80197 is a hermetically sealed NPN power transistor featuring a unique matrix structure. This device is specifically designed for Class A linear applications to provide high gain and high output power at the 1.0 dB compression point.



ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
P _{DISS}	Power Dissipation (see Safe Area)	—	W
I _C	Device Bias Current	700	mA
V _{CE}	Collector-Emitter Bias Voltage*	20	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*	8.5	°C/W
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*Applies only to rated RF amplifier operation

MSC80197

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

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	$I_{\text{C}} = 1\text{mA}$	$I_{\text{E}} = 0\text{mA}$	50	—	—	V
BV_{EBO}	$I_{\text{E}} = 1\text{mA}$	$I_{\text{C}} = 0\text{mA}$	3.5	—	—	V
BV_{CEO}	$I_{\text{C}} = 5\text{mA}$	$I_{\text{B}} = 0\text{mA}$	20	—	—	V
I_{CEO}	$V_{\text{CE}} = 18\text{V}$		—	—	1.0	mA
h_{FE}	$V_{\text{CE}} = 5\text{V}$	$I_{\text{C}} = 500\text{mA}$	15	—	120	—

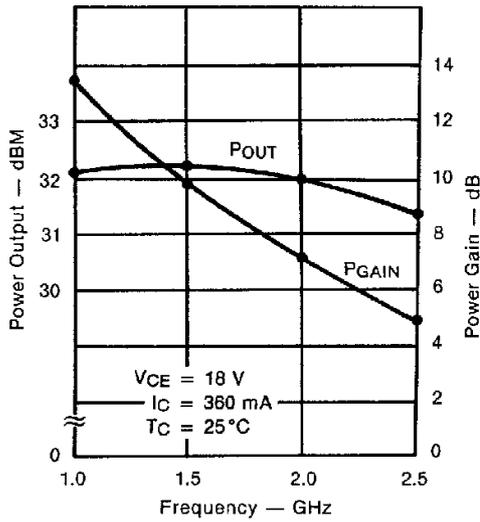
DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
G_{P}^*	$f = 2.0\text{ GHz}$	$P_{\text{OUT}} = 31.7\text{ dBm}$	6.0	7.0	—	dB
ΔG_{P}^*	$f = 2.0\text{ GHz}$	$P_{\text{OUT}} = 31.7\text{ dBm}$ $\Delta P_{\text{OUT}} = 10\text{ dB}$	—	—	1	dB
C_{OB}	$f = 1\text{ MHz}$	$V_{\text{CB}} = 28\text{ V}$	—	—	7.0	pF

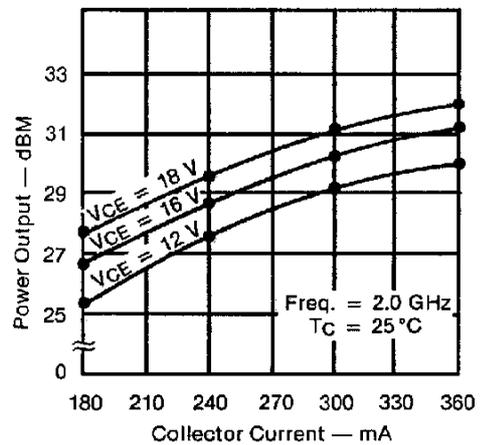
* Note: $V_{\text{CE}} = 18\text{ V}$
 $I_{\text{C}} = 360\text{ mA}$

TYPICAL PERFORMANCE

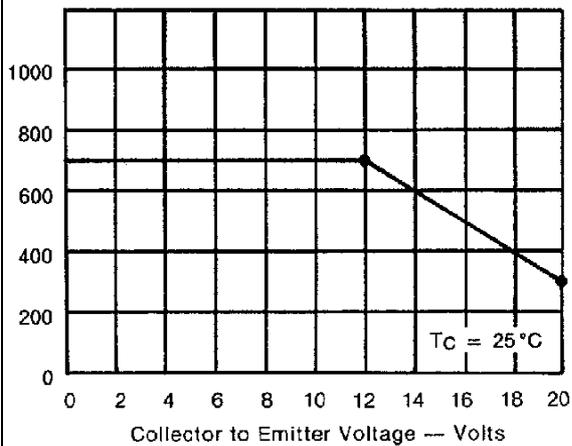
TYPICAL POWER OUTPUT & GAIN @ 1dB COMPRESSION POINT vs FREQUENCY



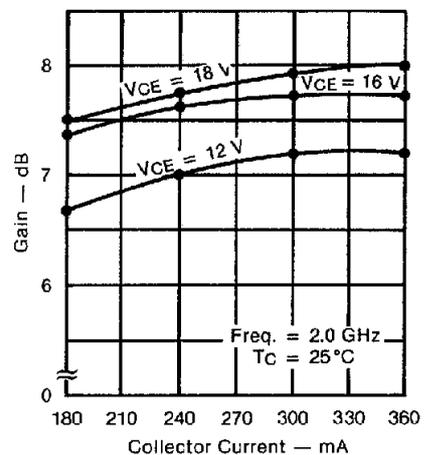
TYPICAL POWER OUTPUT & GAIN @ 1dB COMPRESSION POINT vs COLLECTOR CURRENT



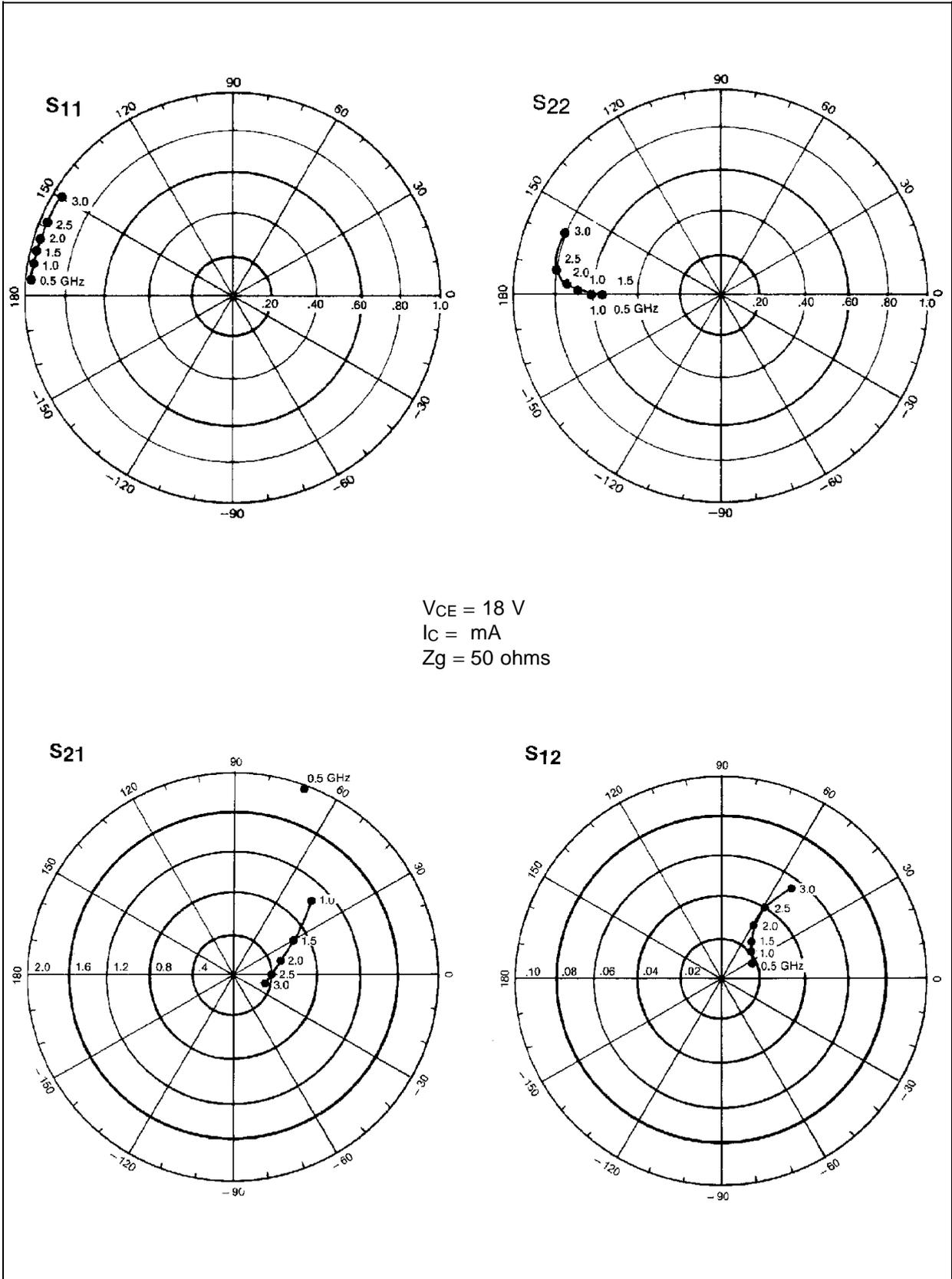
MAXIMUM OPERATING AREA FOR FORWARD BIAS OPERATION



TYPICAL LINEAR GAIN vs COLLECTOR CURRENT



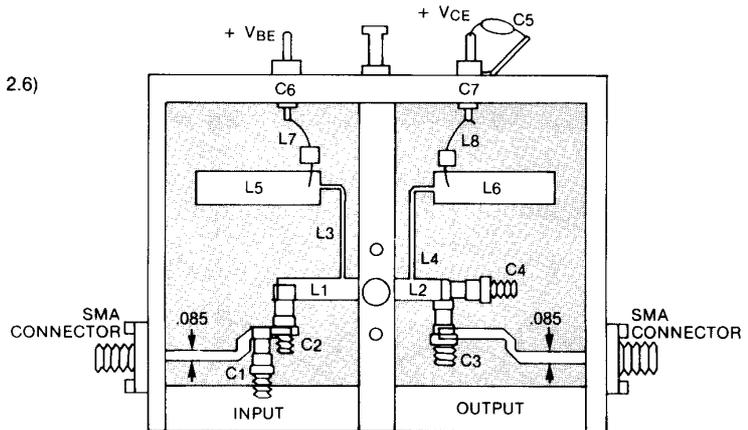
TYPICAL S-PARAMETERS



TEST CIRCUIT

Ref.: Dwg. No. C127271

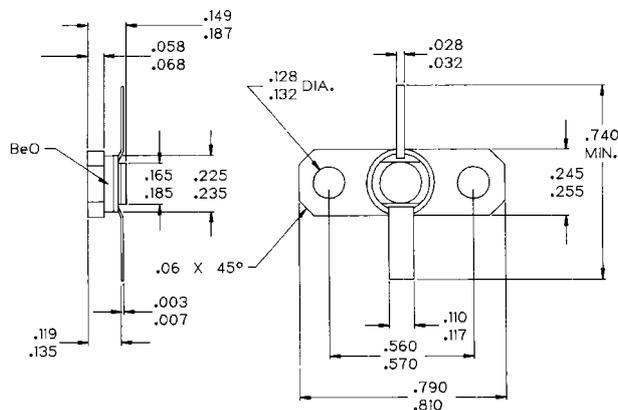
- Board Material 1/32" Teflon — Fiberglass ($\epsilon_r = 2.6$)
- C1, C2, C3, C4, 0.35 to 3.5 pf Johanson #5800
- C5, 0.1 *uf* Disk Capacitor
- C6, C7, Feadthru Filter SCI 712 — 022 (1500 pf)
or AMP P/N 8596184
- L1, .160 Wide, 590 Long
- L2, .160 Wide, 425 Long
- L3, L4, .020 Wide, .825 Long
- L5, L6, .250 Wide, .900 Long
- L7, L8, #20 A.W.G. Tinned Copper, .600 Long,
Ferronics Chokebead #21 - 030 - J



Frequency 2.0 GHz
All dimensions are in inches.

PACKAGE MECHANICAL DATA

Ref.: Dwg. No.: J135021C



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

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