



# SD1487

## RF POWER BIPOLAR TRANSISTORS HF SSB APPLICATIONS

### FEATURES SUMMARY

- 30 MHz
- 12.5 VOLTS
- IMD -30 dB
- COMMON EMITTER
- GOLD METALLIZATION
- $P_{OUT} = 100 \text{ W MIN. WITH } 12.0 \text{ dB GAIN}$

### DESCRIPTION

The SD1487 is a 12.5 V Class C epitaxial silicon NPN planar transistor designed primarily for HF communications. This device utilizes state-of-the-art diffused emitter ballasting to achieve extreme ruggedness under severe operating conditions.

Figure 1. Package

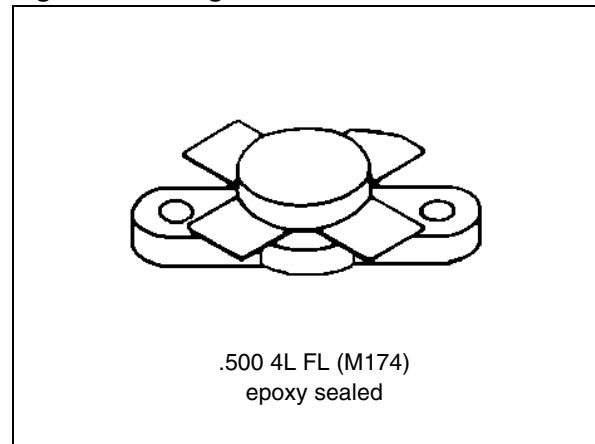


Figure 2. Pin Connection

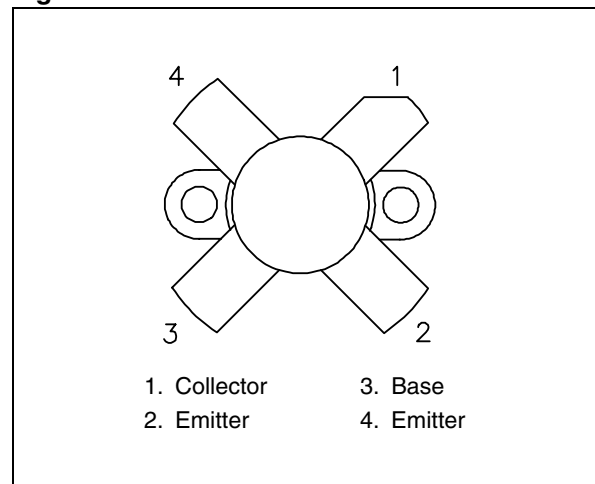


Table 1. Order Codes

Order Codes	Marking	Package	Packaging
SD1487	SD1487	M174	PLASTIC TRAYS

**Table 2. Absolute Maximum Ratings ( $T_{\text{case}} = 25^{\circ}\text{C}$ )**

Symbol	Parameter	Value	Unit
$V_{\text{CBO}}$	Collector-Base Voltage	36	V
$V_{\text{CEO}}$	Collector-Emitter Voltage	18	V
$V_{\text{EBO}}$	Emitter-Base Voltage	4.0	V
$I_{\text{C}}$	Device Current	20	A
$P_{\text{DISS}}$	Power Dissipation	290	W
$T_{\text{J}}$	Junction Temperature	+200	$^{\circ}\text{C}$
$T_{\text{STG}}$	Storage Temperature	- 65 to +150	$^{\circ}\text{C}$

**Table 3. Thermal Data**

Symbol	Parameter	Value	Unit
$R_{\text{TH(j-c)}}$	Junction-Case Thermal Resistance	0.6	$^{\circ}\text{C/W}$

**ELECTRICAL SPECIFICATIONS ( $T_{\text{case}} = 25^{\circ}\text{C}$ )****Table 4. Static**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$BV_{\text{CBO}}$	$I_{\text{C}} = 100 \text{ mA}; I_{\text{E}} = 0 \text{ mA}$	36	—	—	V
$BV_{\text{CES}}$	$I_{\text{C}} = 100 \text{ mA}; V_{\text{BE}} = 0 \text{ V}$	36	—	—	V
$BV_{\text{CEO}}$	$I_{\text{C}} = 100 \text{ mA}; I_{\text{B}} = 0 \text{ mA}$	18	—	—	V
$BV_{\text{EBO}}$	$I_{\text{E}} = 20 \text{ mA}; I_{\text{C}} = 0 \text{ mA}$	4.0	—	—	V
$I_{\text{CES}}$	$V_{\text{CE}} = 15 \text{ V}; I_{\text{E}} = 0 \text{ mA}$	—	—	20	mA
$h_{\text{FE}}$	$V_{\text{CE}} = 5 \text{ V}; I_{\text{C}} = 5 \text{ A}$	10	—	200	—

**Table 5. Dynamic**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$P_{\text{OUT}}$	$f = 30 \text{ MHz}; V_{\text{CE}} = 12.5 \text{ V}; I_{\text{CQ}} = 150 \text{ mA}$	100	—	—	W
$G_{\text{P}}$	$f = 30 \text{ MHz}; V_{\text{CE}} = 12.5 \text{ V}; I_{\text{CQ}} = 150 \text{ mA}$	11	13	—	dB
$\text{IMD}_3^{(1)}$	$P_{\text{OUT}} = 100\text{WPEP}; V_{\text{CE}} = 12.5 \text{ V}; I_{\text{CQ}} = 150 \text{ mA}$	—	—	-30	dBc
$C_{\text{OB}}$	$f = 1 \text{ MHz}; V_{\text{CB}} = 12.5 \text{ V}$	—	400	—	pF

Note: 1.  $f = 30 + 30.001\text{MHz}$

TYPICAL PERFORMANCE

Figure 3. Power Gain & Collector Efficiency vs Power Input

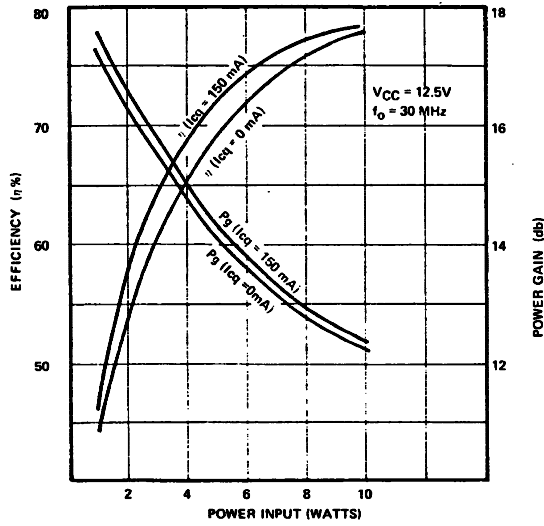


Figure 4. IMD vs Power Output, Pep

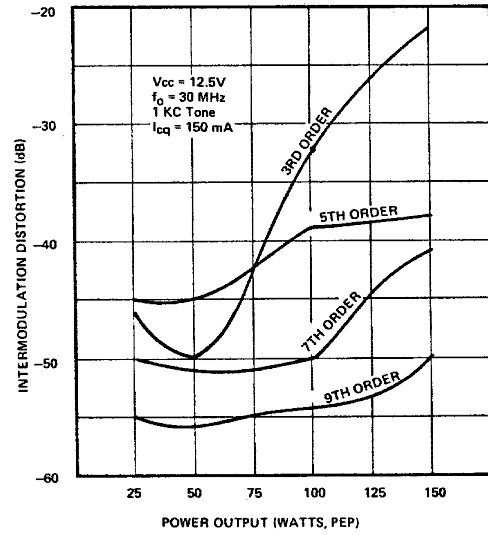


Figure 5. Power Output vs Power Input

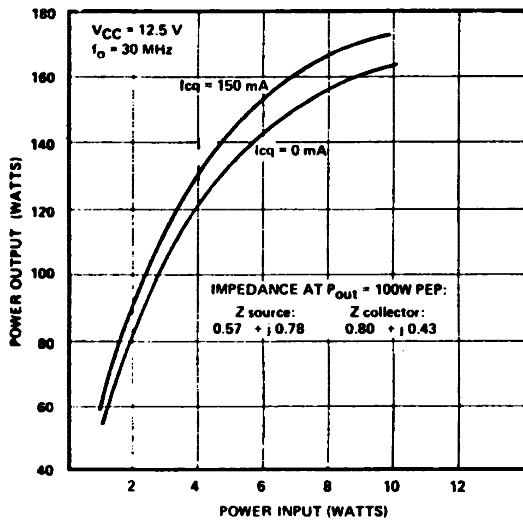


Table 6. Impedance Data (1)

FREQ.	$Z_{IN} (\Omega)$	$Z_{CL} (\Omega)$
30 MHz	$0.57 + j0.78$	$0.80 + j0.43$

Note: 1.  $P_{OUT} = 100 \text{ W PEP}$ ;  $V_{CE} = 12.5 \text{ V}$

## TEST CIRCUIT

Figure 6. Test Circuit

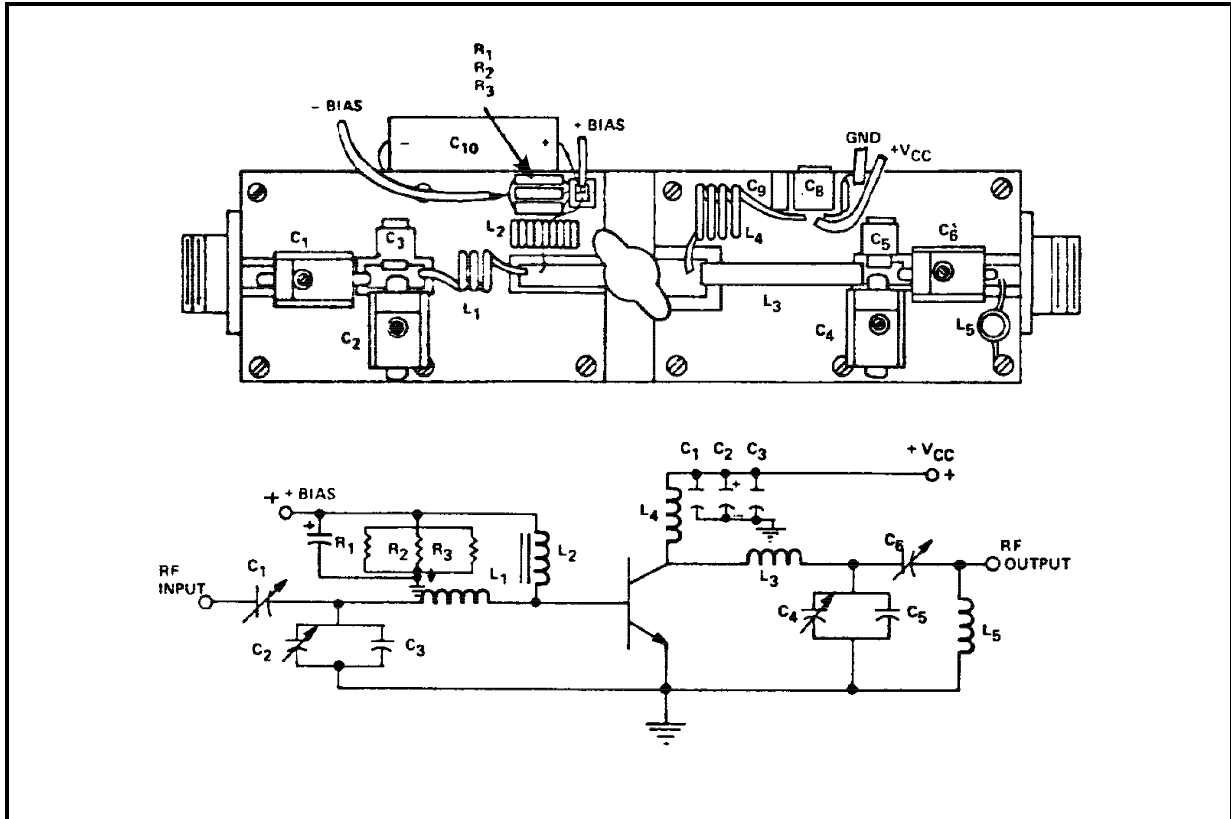


Table 7. Test Circuit

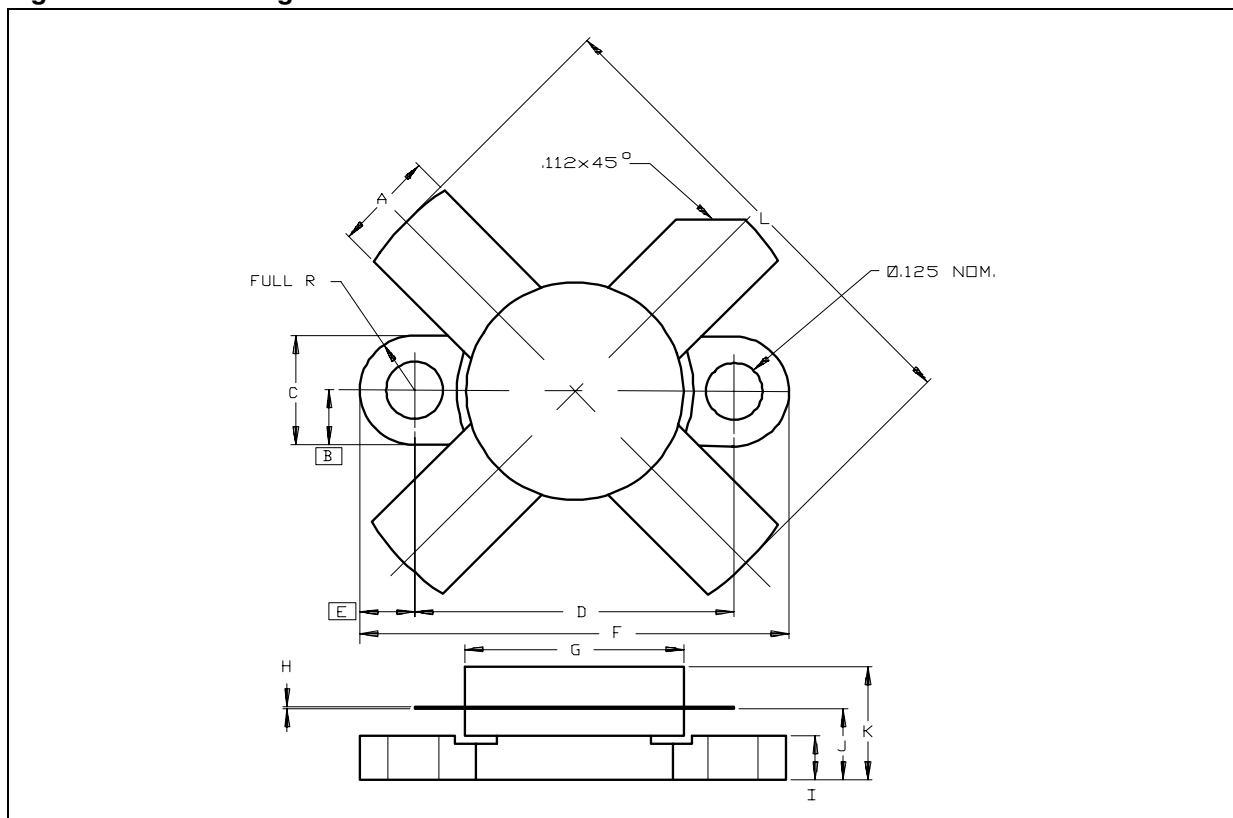
C1	9 - 180pF Arco 463
C2	5 - 380pF Arco 465
C3	200pF Arco 465
C4, C6	170pF Arco 469
C7	0.1 $\mu$ F Ceramic Disc
C5, C8	1000pF Unelco
C9	10 $\mu$ F Electrolytic, 35Vdc
C10	1000 $\mu$ F Electrolytic, 35Vdc
L1	2 1/2 Turns, #14 AWG, I.D. Loose Wound
L2	16 Turns, #16 AWG, Enameled Wire on Micrometals Torroid #T-94
L3	Copper Strap 1/4" Widht, Length 1 1/2, Height 1/2"
L4	4 Turns, #16 AWG, Enameled Wire 3/8" I.D.
L5	5 Turns, #18 AWG on 1/4" I.D. Coil Form Length 1/2", Ferrite Slug
R1, R2, R3	1.5 Ohm, 1 Watt Carbon

## PACKAGE MECHANICAL

Table 8. M174 Mechanical Data

Symbol	millimeters			inches		
	Min	Typ	Max	Min	Typ	Max
A	5.59		5.84	0.220		0.230
B		3.18			0.125	
C	6.22		6.48	0.245		0.255
D	18.28		18.54	0.720		0.730
E		3.18			0.125	
F	24.64		24.89	0.970		0.980
G	12.57		12.83	0.495		0.505
H	0.08		0.18	0.003		0.007
I	2.29		2.79	0.090		0.110
J	4.06		4.45	0.160		0.175
K			7.11			0.280
L			26.67			1.050

Figure 7. M174 Package Dimensions



Note: Drawing is not to scale.

**REVISION HISTORY**

**Table 9. Revision History**

<b>Date</b>	<b>Revision</b>	<b>Description of Changes</b>
November-1992	1	First Issue
7-June-2004	2	Stylesheet update. No content change.

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