SD1487

RF POWER BIPOLAR TRANSISTORS
HF SSB APPLICATIONS

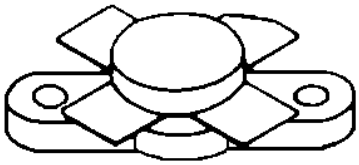
FEATURES SUMMARY

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

DESCRIPTION

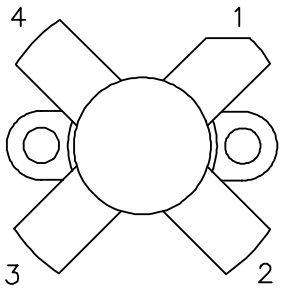
The SD1487 is a 12.5 V Class C epitaxial silicon NPN planar transistor designed primarily for HF communications. This device utilizes state-of-the-art diffused emitter ballasting to achieve extreme ruggedness under severe operating conditions.

Figure 1. Package



.500 4L FL (M174)
epoxy sealed

Figure 2. Pin Connection



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

Table 1. Order Codes

Order Codes	Marking	Package	Packaging
SD1487	SD1487	M174	PLASTIC TRAYS

Table 2. Absolute Maximum Ratings (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	36	V
V_{CEO}	Collector-Emitter Voltage	18	V
V_{EBO}	Emitter-Base Voltage	4.0	V
I_C	Device Current	20	A
P_{DISS}	Power Dissipation	290	W
T_J	Junction Temperature	+200	°C
T_{STG}	Storage Temperature	– 65 to +150	°C

Table 3. Thermal Data

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

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

Table 4. Static

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

Table 5. Dynamic

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_{OUT}	f = 30 MHz; V_{CE} = 12.5 V; I_{CQ} = 150 mA	100	—	—	W
G_P	f = 30 MHz; V_{CE} = 12.5 V; I_{CQ} = 150 mA	11	13	—	dB
IMD_3(1)	P_{OUT} = 100WPEP; V_{CE} = 12.5 V; I_{CQ} = 150 mA	—	—	–30	dBc
C_{OB}	f = 1 MHz; V_{CB} = 12.5 V	—	400	—	pF

Note: 1. f = 30 + 30.001MHz

TYPICAL PERFORMANCE

Figure 3. Power Gain & Collector Efficiency vs Power Input

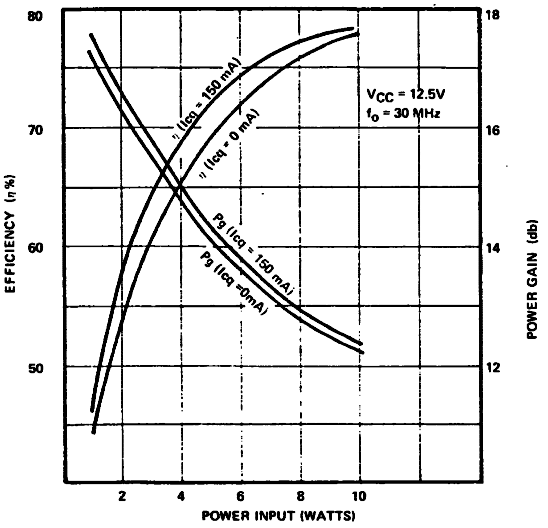


Figure 4. IMD vs Power Output, Pep

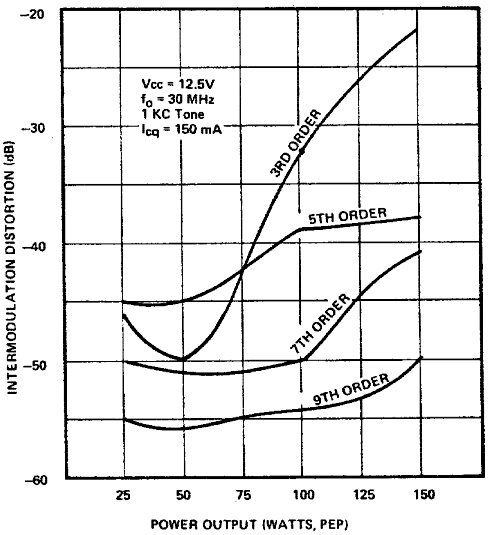


Figure 5. Power Output vs Power Input

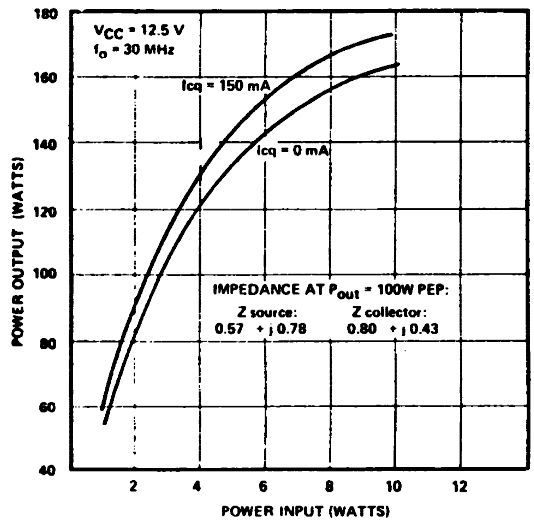


Table 6. Impedance Data (1)

FREQ.	Z_{IN} (Ω)	Z_{CL} (Ω)
30 MHz	0.57 + j 0.78	0.80 + j 0.43

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

TEST CIRCUIT

Figure 6. Test Circuit

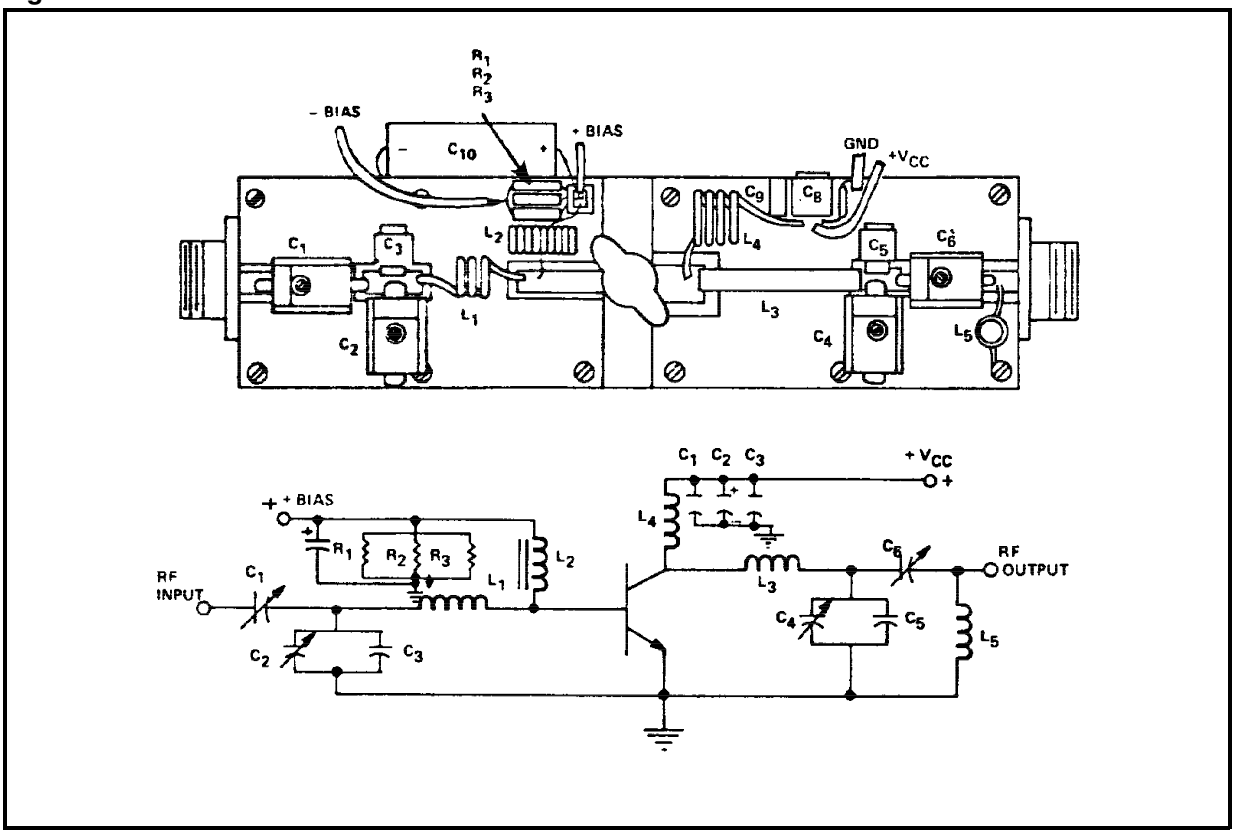


Table 7. Test Circuit

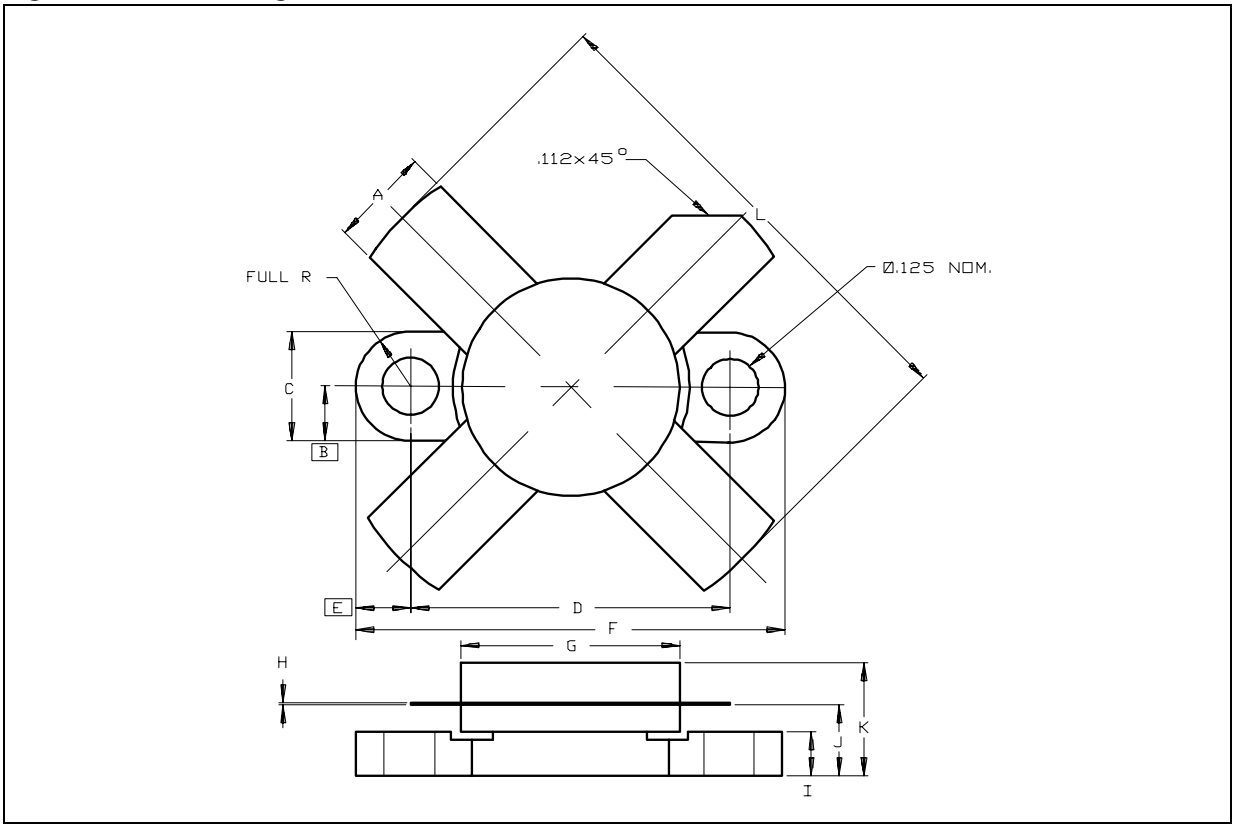
C1	9 - 180pF Arco 463
C2	5 - 380pF Arco 465
C3	200pF Arco 465
C4, C6	170pF Arco 469
C7	0.1µF Ceramic Disc
C5, C8	1000pF Unelco
C9	10µF Electrolytic, 35Vdc
C10	1000µF Electrolytic, 35Vdc
L1	2 1/2 Turns, #14 AWG, I.D. Loose Wound
L2	16 Turns, #16 AWG, Enameled Wire on Micrometals Torroid #T-94
L3	Copper 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

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