



SD1457

RF POWER BIPOLAR TRANSISTORS FM BROADCAST APPLICATIONS

FEATURES SUMMARY

- 108 MHz
- 28 VOLTS
- EFFICIENCY 75%
- COMMON EMITTER
- GOLD METALLIZATION
- $P_{OUT} = 75 \text{ W MIN. WITH } 10.0 \text{ dB GAIN}$

DESCRIPTION

The SD1457 is a 28 V gold metallized epitaxial silicon NPN planar transistor designed for FM VHF broadcast transmitters.

This device utilizes diffused emitter resistors to achieve infinite VSWR at rated operating conditions.

Figure 1. Package

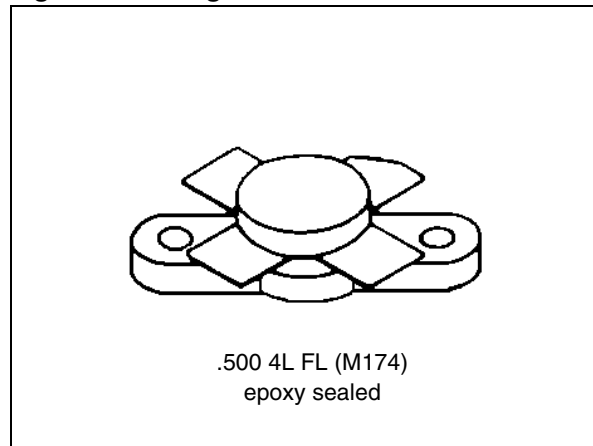


Figure 2. Pin Connection

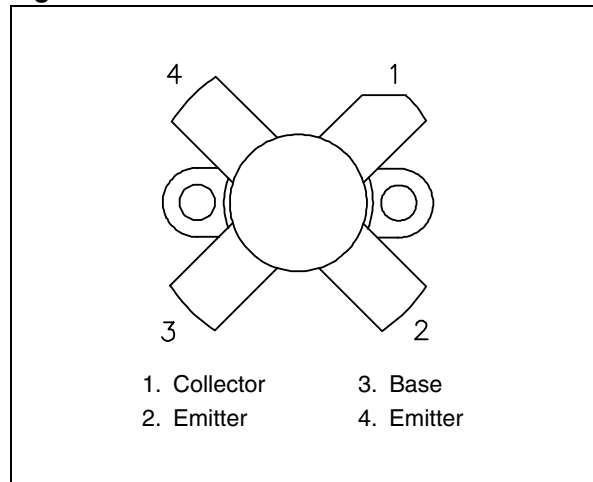


Table 1. Order Codes

Order Codes	Marking	Package	Packaging
SD1457	SD1457	M174	PLASTIC TRAYS

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

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	65	V
V_{CEO}	Collector-Emitter Voltage	30	V
V_{CES}	Collector-Emitter Voltage	60	V
V_{EBO}	Emitter-Base Voltage	4.0	V
I_{C}	Device Current	10	A
P_{DISS}	Power Dissipation	100	W
T_{J}	Junction Temperature	+200	$^{\circ}\text{C}$
T_{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	1.5	$^{\circ}\text{C}/\text{W}$

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

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BV_{CBO}	$I_{\text{C}} = 50 \text{ mA}; I_{\text{E}} = 0 \text{ mA}$	65	—	—	V
BV_{CER}	$I_{\text{C}} = 50 \text{ mA}; R_{\text{BE}} = 10 \Omega$	60	—	—	V
BV_{CEO}	$I_{\text{C}} = 50 \text{ mA}; I_{\text{B}} = 0 \text{ mA}$	30	—	—	V
BV_{EBO}	$I_{\text{E}} = 10 \text{ mA}; I_{\text{C}} = 0 \text{ mA}$	4.0	—	—	V
h_{FE}	$V_{\text{CE}} = 5 \text{ V}; I_{\text{C}} = 1 \text{ A}$	20	—	150	—

Table 5. Dynamic

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_{OUT}	$f = 108 \text{ MHz}; P_{\text{IN}} = 7.5 \text{ W}; V_{\text{CE}} = 28 \text{ V}$	75	—	—	W
G_{P}	$f = 108 \text{ MHz}; P_{\text{IN}} = 7.5 \text{ W}; V_{\text{CE}} = 28 \text{ V}$	10	—	—	dB
η_{c}	$f = 108 \text{ MHz}; P_{\text{IN}} = 7.5 \text{ W}; V_{\text{CE}} = 28 \text{ V}$	70	—	—	%
C_{OB}	$f = 1 \text{ MHz}; V_{\text{CB}} = 30 \text{ V}$	—	—	85	pF

TYPICAL PERFORMANCE

Figure 3. Power Output vs Power Input

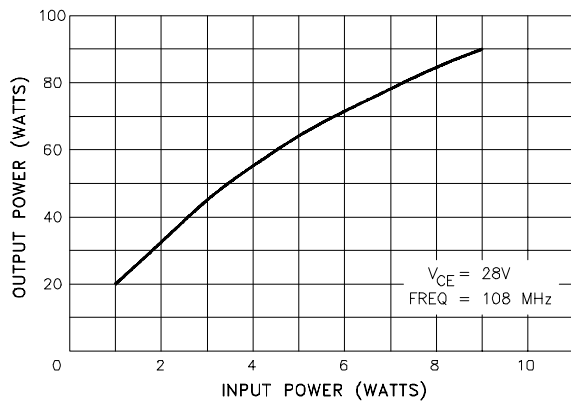
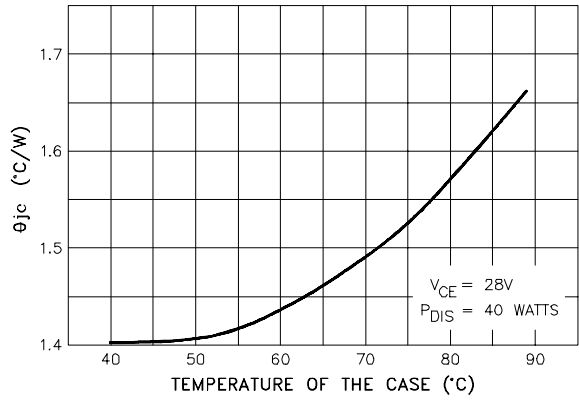


Figure 4. Thermal Resistance vs Case Temperature



IMPEDANCE DATA

Figure 5. Impedance Data

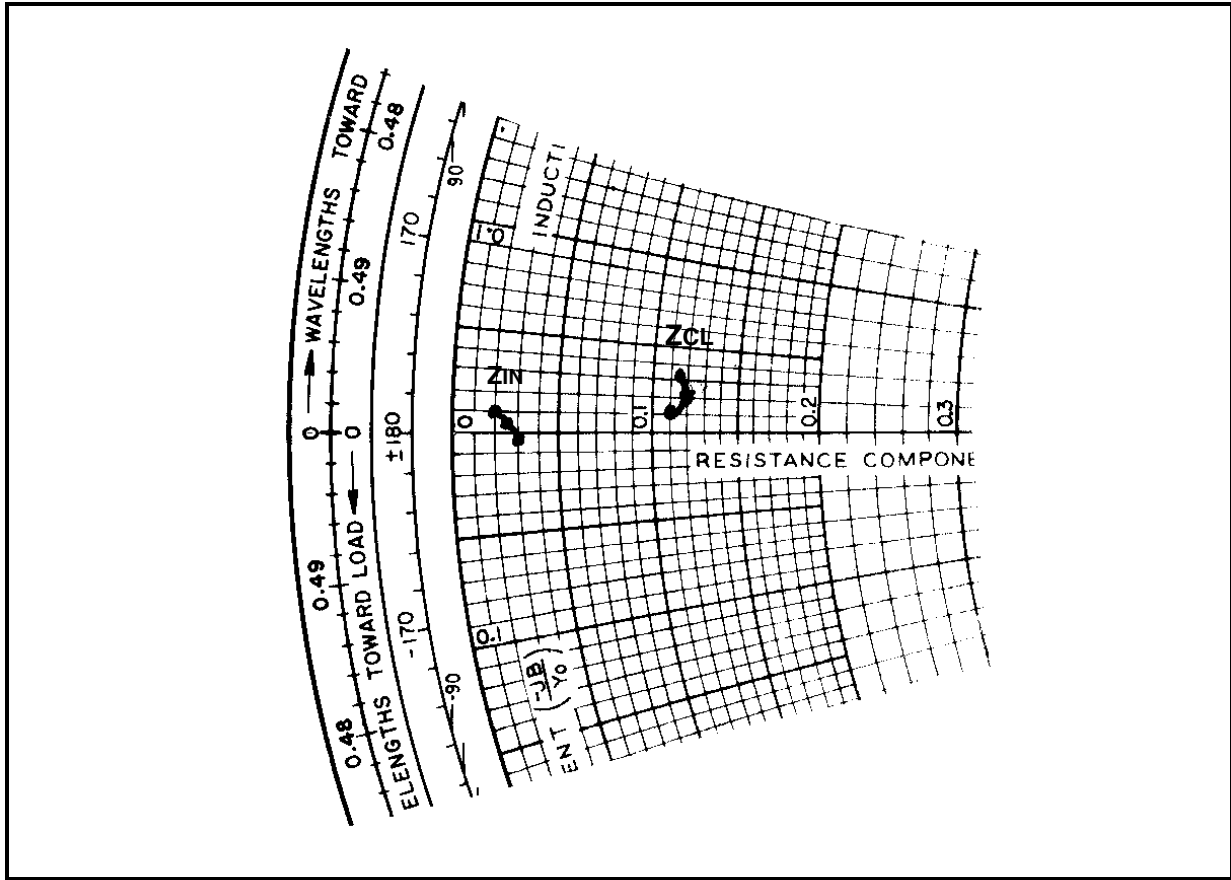


Table 6. Impedance Data

FREQ.	$Z_{IN} (\Omega)$	$Z_{CL} (\Omega)$
88 MHz	$1.4 + j0.1$	$5.5 + j0.7$
98 MHz	$1.2 + j0.3$	$6.1 + j1.1$
100 MHz	$1.0 + j0.5$	$5.7 + j1.6$

TEST CIRCUIT

Figure 6. Test Circuit

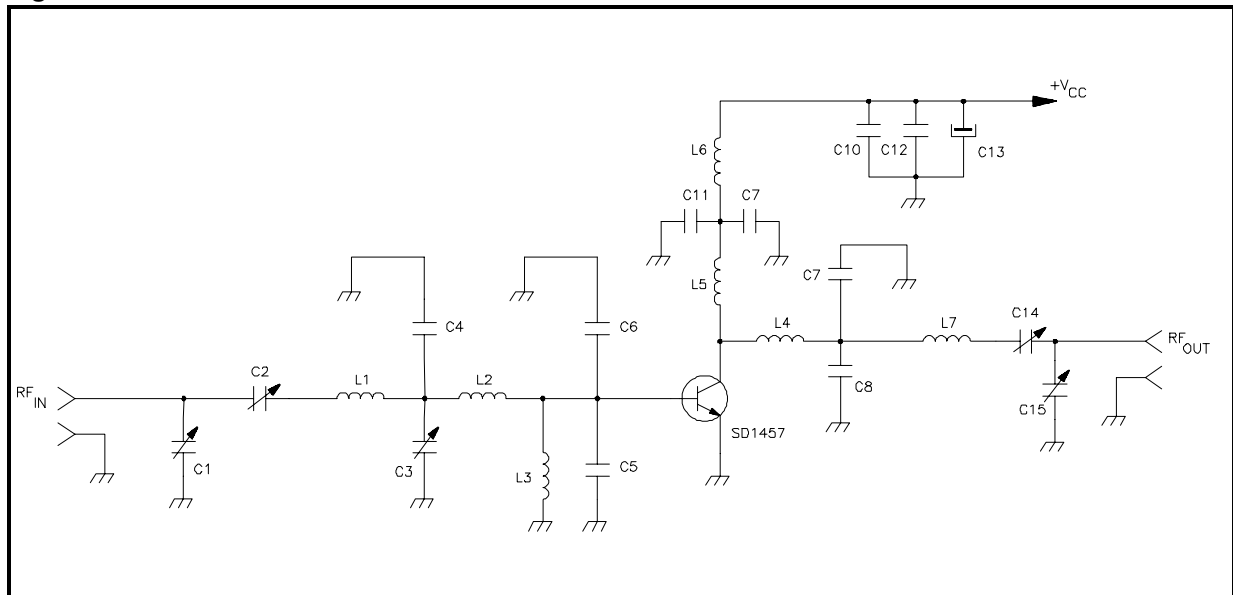


Table 7. Test Circuit

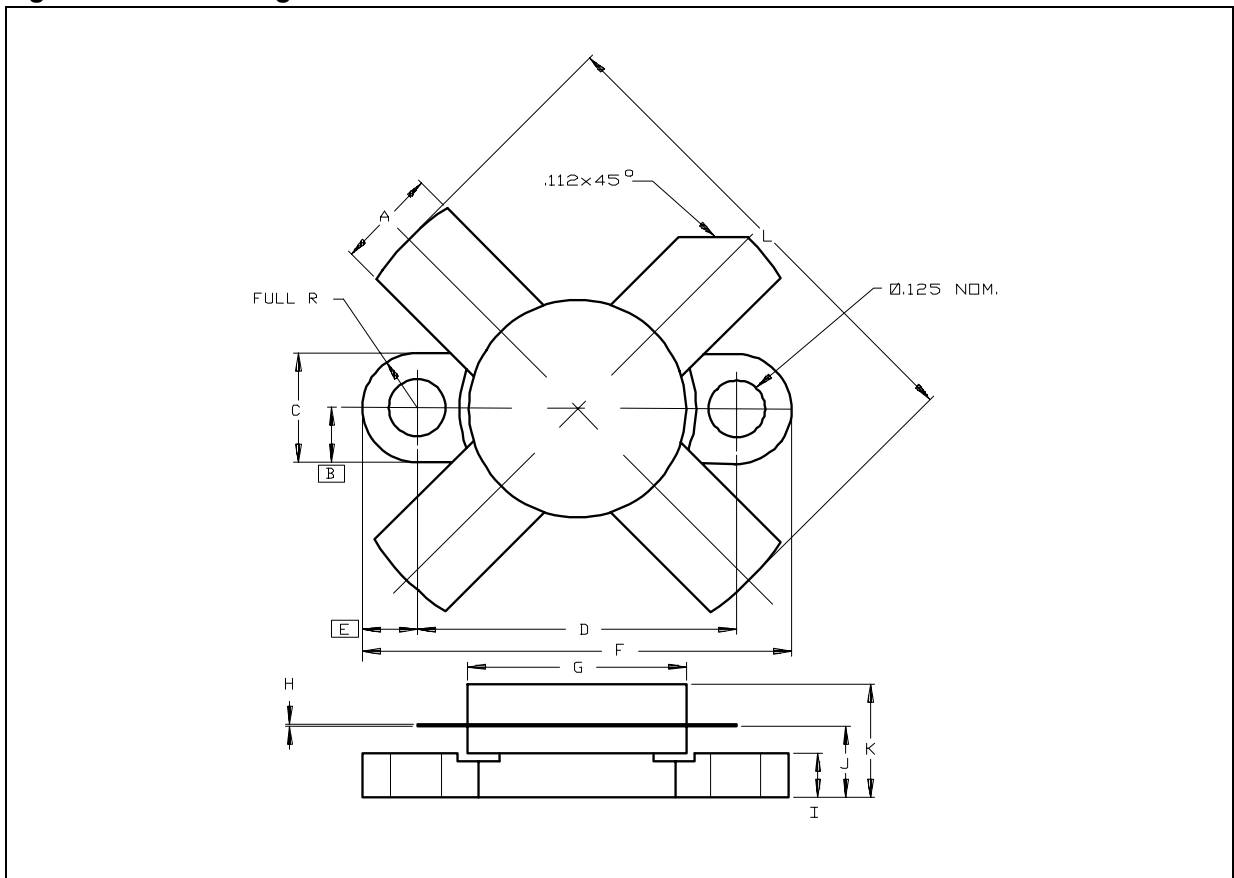
C1, C2, C14	24 - 200pF, Arco 425
C3	16 - 100pF, Arco 423
C4	62pF, Unelco Capacitor
C5, C6	330pF, Unelco Capacitor
C7, C10	1000pF, Unelco Capacitor
C8, C9	36pF, Unelco Capacitor
C11, C12	0.1 μ F, Disc Capacitor
C13	100 μ F, 63V, Electrolytic Capacitor
C15	25 - 150pF, Arco 424
L1	3 Turns, 1mm Wire, 6mm I.D.
L2	1/2 Turn, 1.4mm Wire, 15mm Length
L3	0.7 μ H, Molded Choke
L4	1/2 Turn, 2mm Wire, 20mm Length
L5	4 Turns, 1mm Wire, 6mm I.D.
L6	4 Turns, 1.2mm Wire on Ferrite Core
L7	3 Turns, 1.4mm Wire, 8mm I.D.
Board Material	Epoxy Glass

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
3-June-2004	2	Stylesheet update. No content change.

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