



# SD1460

## RF POWER BIPOLAR TRANSISTORS FM BROADCAST APPLICATIONS

### FEATURES SUMMARY

- 108 MHz
- 28 VOLTS
- EFFICIENCY 75%
- COMMON EMITTER
- GOLD METALLIZATION
- $P_{OUT} = 150 \text{ W MIN. WITH } 9.2 \text{ dB GAIN}$

### DESCRIPTION

The SD1460 is a 28 V gold metallized epitaxial silicon NPN planar transistor designed for VHF FM broadcast transmitters. This device utilizes diffused emitter resistors to achieve infinite VSWR at rated operating conditions.

Figure 1. Package

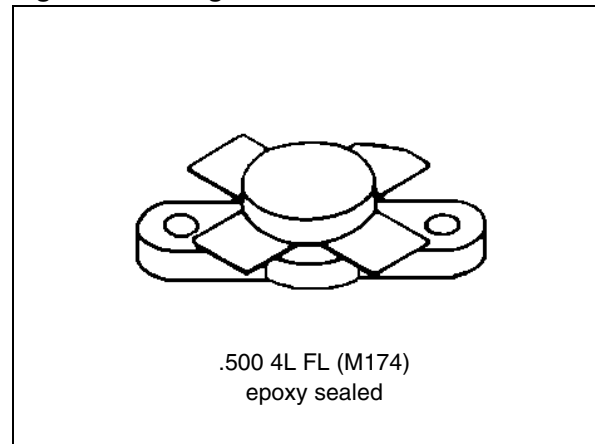


Figure 2. Pin Connection

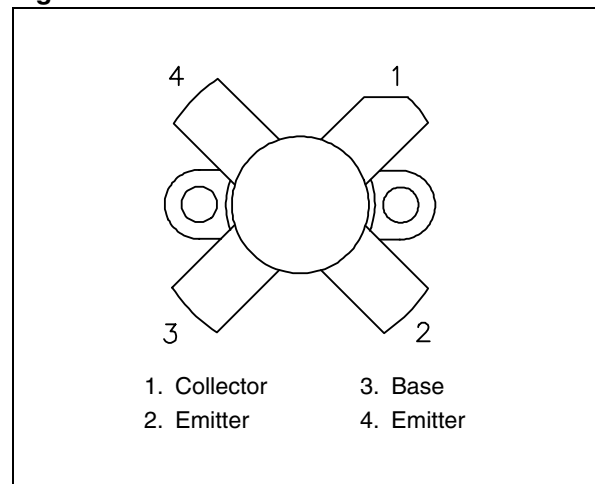


Table 1. Order Codes

Order Codes	Marking	Package	Packaging
SD1460	SD1460	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	60	V
$V_{\text{CEO}}$	Collector-Emitter Voltage	25	V
$V_{\text{CES}}$	Collector-Emitter Voltage	60	V
$V_{\text{EBO}}$	Emitter-Base Voltage	4.0	V
$I_{\text{C}}$	Device Current	16	A
$P_{\text{DISS}}$	Power Dissipation	230	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	0.75	$^{\circ}\text{C/W}$

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

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$BV_{\text{CBO}}$	$I_{\text{C}} = 100 \text{ mA}; I_{\text{E}} = 0 \text{ mA}$	60	—	—	V
$BV_{\text{CER}}$	$I_{\text{C}} = 100 \text{ mA}; R_{\text{BE}} = 10 \Omega$	55	—	—	V
$BV_{\text{CEO}}$	$I_{\text{C}} = 100 \text{ mA}; I_{\text{B}} = 0 \text{ mA}$	25	—	—	V
$BV_{\text{EBO}}$	$I_{\text{E}} = 20 \text{ mA}; I_{\text{C}} = 0 \text{ mA}$	4.0	—	—	V
$h_{\text{FE}}$	$V_{\text{CE}} = 5 \text{ V}; I_{\text{C}} = 1 \text{ A}$	20	—	150	—

**Table 5. Dynamic**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$P_{\text{OUT}}$	$f = 108 \text{ MHz}; P_{\text{IN}} = 18 \text{ W}; V_{\text{CE}} = 28 \text{ V}$	150	—	—	W
$G_{\text{P}}$	$f = 108 \text{ MHz}; P_{\text{IN}} = 18 \text{ W}; V_{\text{CE}} = 28 \text{ V}$	9.2	—	—	dB
$\eta_{\text{c}}$	$f = 108 \text{ MHz}; P_{\text{IN}} = 18 \text{ W}; V_{\text{CE}} = 28 \text{ V}$	70	—	—	%
$C_{\text{OB}}$	$f = 1 \text{ MHz}; V_{\text{CB}} = 28 \text{ V}$	—	—	150	pF

TYPICAL PERFORMANCE

Figure 3. Power Output vs Power Input

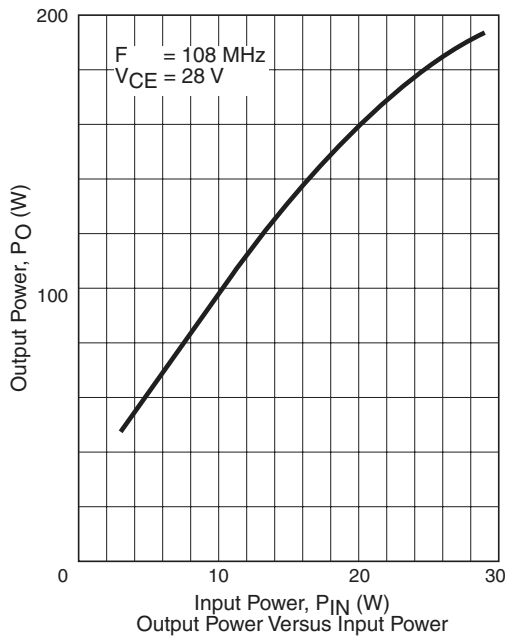
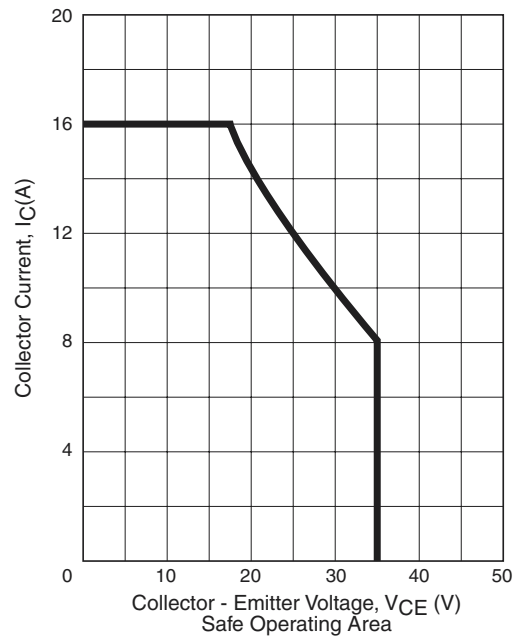


Figure 4. Safe Operating Area



IMPEDANCE DATA

Figure 5. Typical Input Impedance

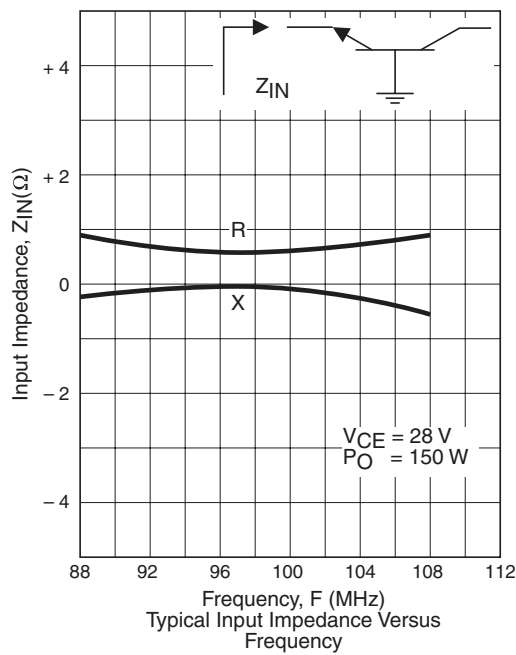
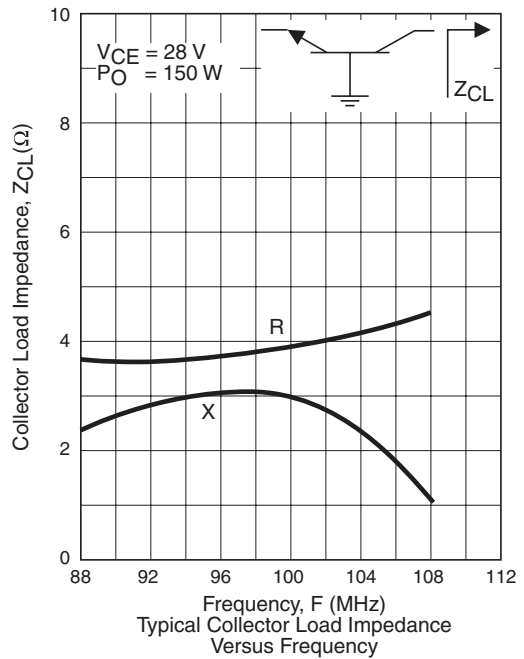


Figure 6. Typical Collector Load Impedance



TEST CIRCUIT

Figure 7. Test Circuit

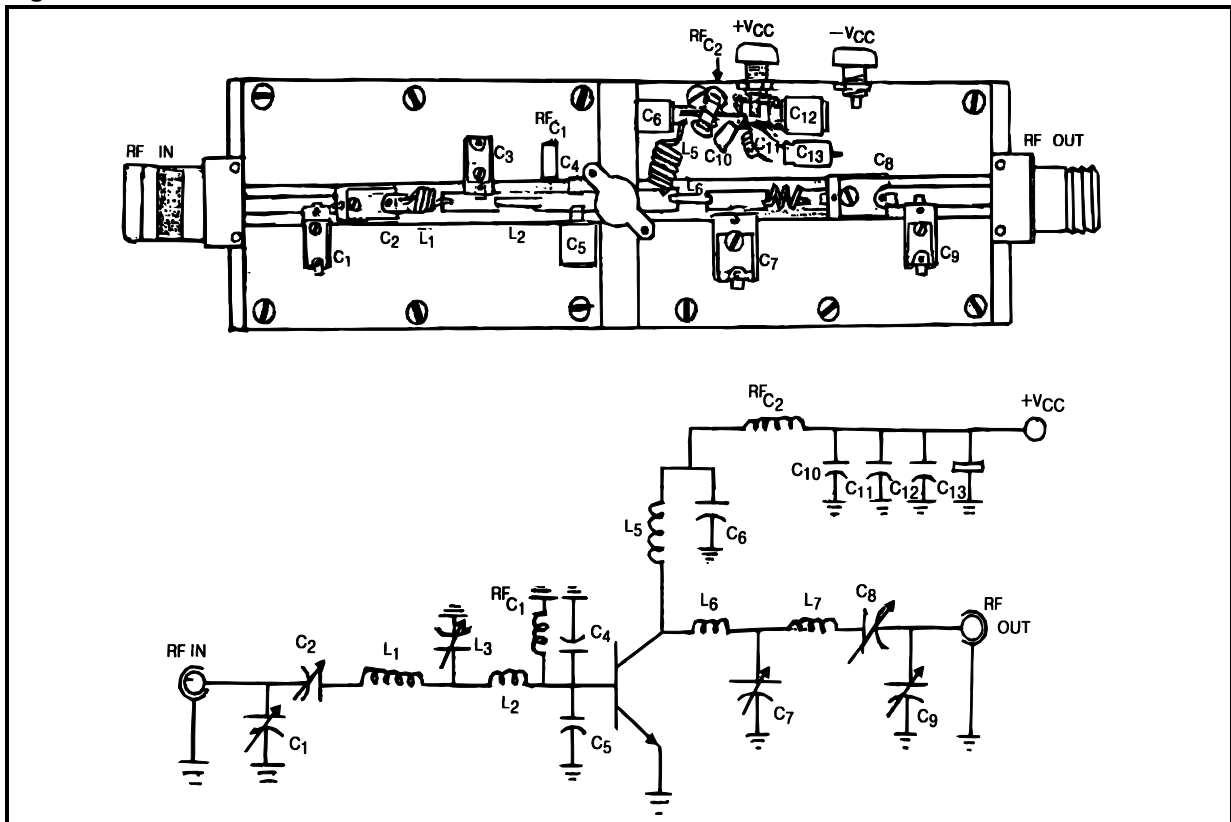


Table 6. Test Circuit

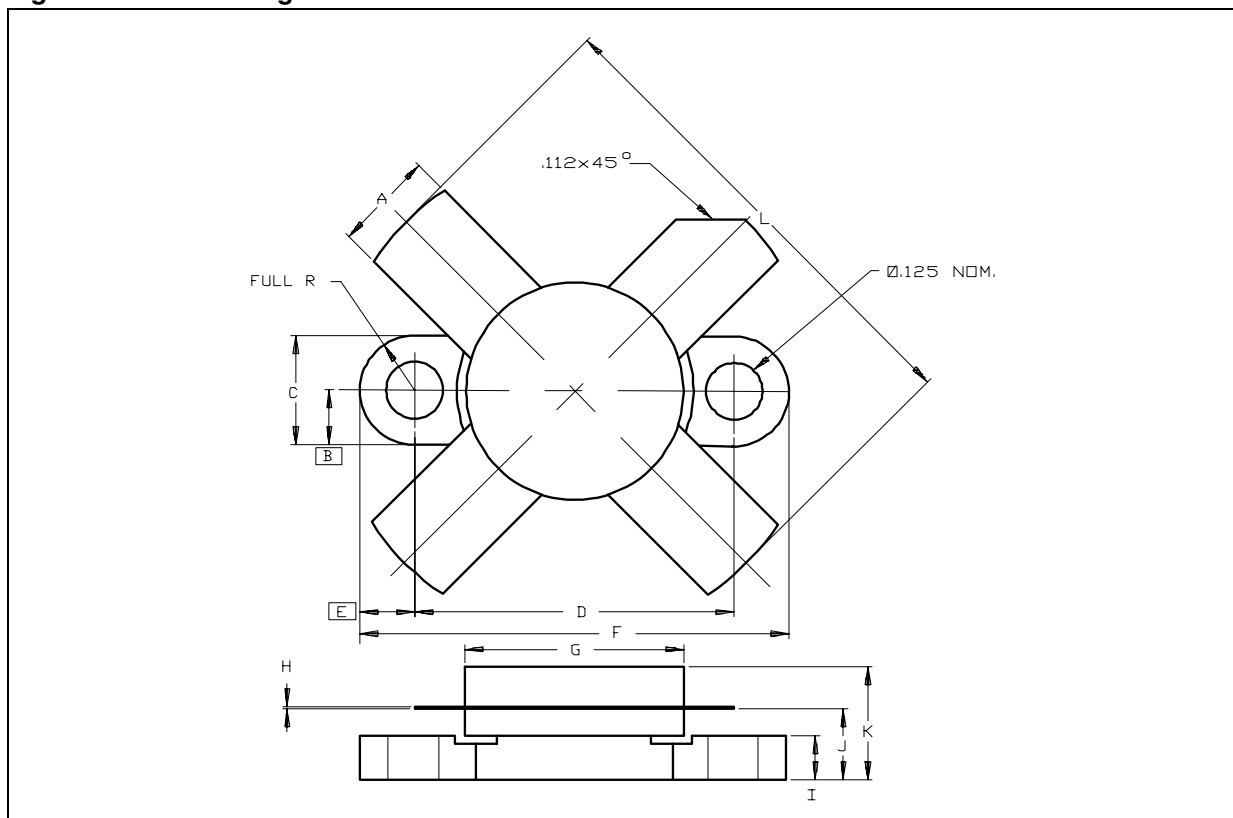
C1, C2, C3, C9	24 - 200pF Variable, Arco 425
C4	470pF ATC 125 mil. Sq. Chip
C5	470pF Unelco, 400 mil. Sq.
C6	1000pF Unelco, 400 mil Sq.
C7	50 - 380pF Variable, Arco 465
C8	25 - 280pF Variable, Arco 464
C10	.1μF 50V, Erie Disc
C11	.01μF 50V, Erie Disc
C12	1000pF Unelco, 400 mil Sq.
C13	100μF 35V, Sprague Electrolytic
L1	3 Turns, #16 AWG, .225" I.D.
L2	#14 AWG, Length .335", Height .400"
L5	5 1/2 Turns, #16 AWG Enameled .270" I.D.
L6	#14 AWG, Length .300", Height .335"
L7	3 Turns, #16 AWG, Length .300", Height .335"
RFC 1	VK200 19/4B (1 winding) Ferroxcube Choke
RFC 2	6 Turns, #16 AWG Enamel on T50-2 Torroid
Board Material	3-M-K-6098 1/16" Thick

## PACKAGE MECHANICAL

Table 7. 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 8. M174 Package Dimensions



Note: Drawing is not to scale.

**REVISION HISTORY**

**Table 8. Revision History**

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

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