



SD1407

RF POWER BIPOLAR TRANSISTORS HF SSB APPLICATIONS

FEATURES SUMMARY

- 30 MHz
- 28 VOLTS
- IMD -30 dB
- COMMON EMITTER
- GOLD METALLIZATION
- $P_{OUT} = 125\text{ W MIN. WITH } 15\text{ dB GAIN}$

DESCRIPTION

The SD1407 is a 28 V epitaxial silicon NPN planar transistor designed primarily for SSB communications. This device utilizes state-of-the-art diffused emitter ballasting for improved ruggedness and reliability.

Figure 1. Package

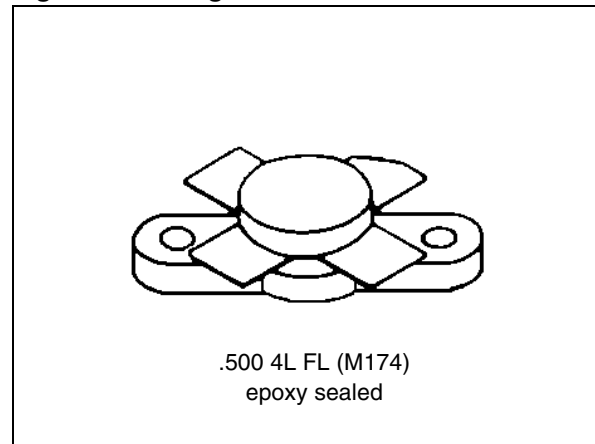


Figure 2. Pin Connection

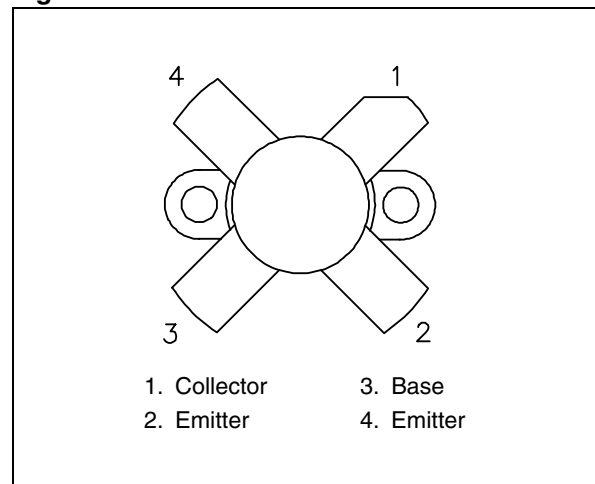


Table 1. Order Codes

Order Codes	Marking	Package	Packaging
SD1407	SD1407	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	36	V
V_{EBO}	Emitter-Base Voltage	4.0	V
I_{C}	Device Current	20	A
P_{DISS}	Power Dissipation	270	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	0.65	$^{\circ}\text{C/W}$

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

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BV_{CBO}	$I_{\text{C}} = 100 \text{ mA}; I_{\text{E}} = 0 \text{ mA}$	65	—	—	V
BV_{CES}	$I_{\text{C}} = 100 \text{ mA}; V_{\text{BE}} = 0 \text{ mA}$	65	—	—	V
BV_{CEO}	$I_{\text{C}} = 100 \text{ mA}; I_{\text{B}} = 0 \text{ mA}$	35	—	—	V
BV_{EBO}	$I_{\text{E}} = 10 \text{ mA}; I_{\text{C}} = 0 \text{ mA}$	4.0	—	—	V
I_{CES}	$V_{\text{CE}} = 30 \text{ mA}; I_{\text{E}} = 0 \text{ mA}$	—	—	15	mA
h_{FE}	$V_{\text{CE}} = 5 \text{ V}; I_{\text{C}} = 5 \text{ A}$	10	—	200	—

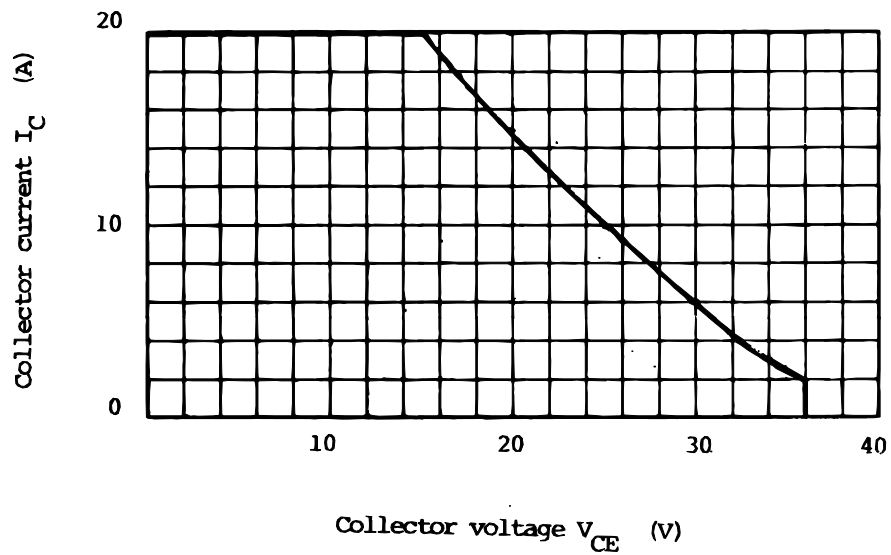
Table 5. Dynamic

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_{OUT}	$f = 30 \text{ MHz}; P_{\text{IN}} = 3.95 \text{ W}; V_{\text{CE}} = 28 \text{ V}$	125	—	—	W
G_{P}	$f = 30 \text{ MHz}; P_{\text{IN}} = 3.95 \text{ W}; V_{\text{CE}} = 28 \text{ V}$	15	16	—	dB
$\text{IMD}^{(1)}$	$f = 30 \text{ MHz}; V_{\text{CE}} = 28 \text{ V}; I_{\text{CQ}} = 100 \text{ mA}$		-34	-30	dB
C_{OB}	$f = 1 \text{ MHz}; V_{\text{CB}} = 30 \text{ V}$	—	250	—	pF

Note: 1. $P_{\text{OUT}} = 100\text{W PEP}$, $f_0 = 30 + 30.001 \text{ MHz}$

TYPICAL PERFORMANCE

Figure 3. Safe Operating Area



TEST CIRCUIT

Figure 4. Test Circuit

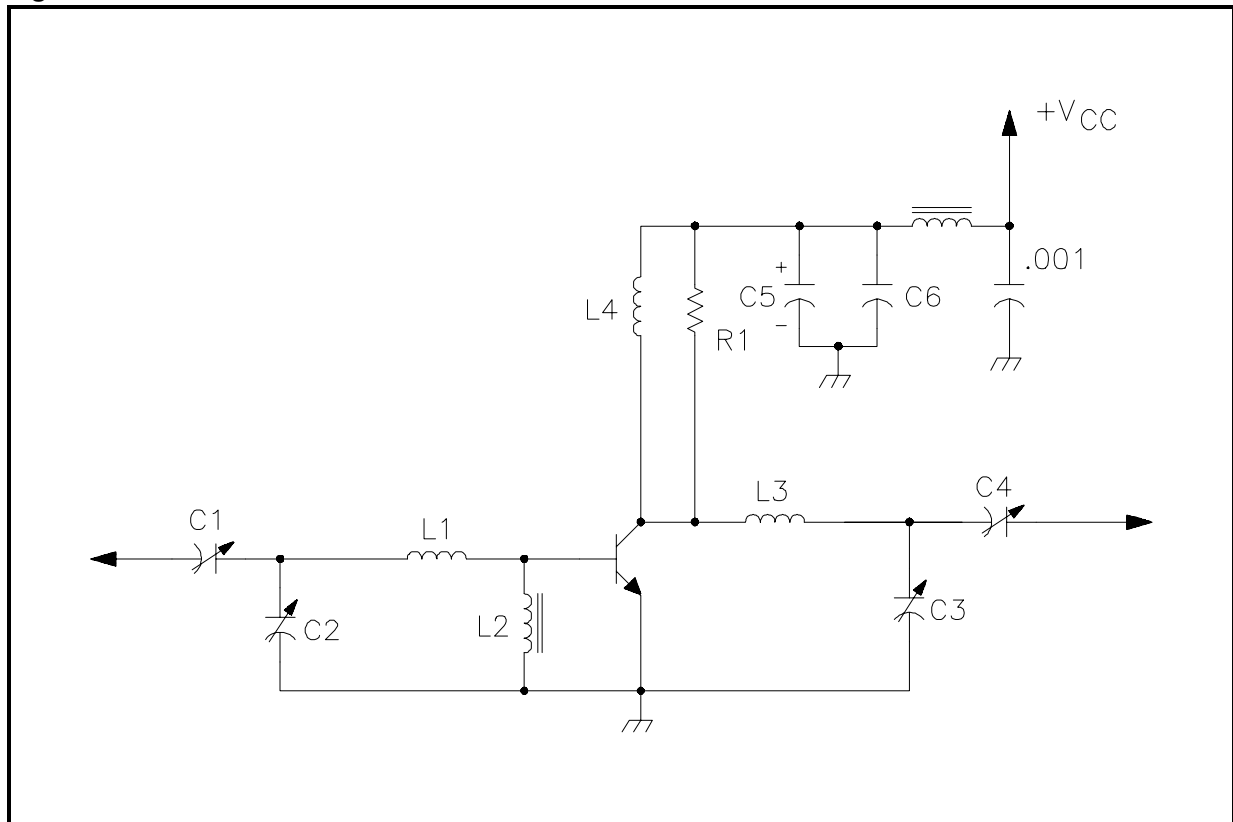


Table 6. Test Circuit

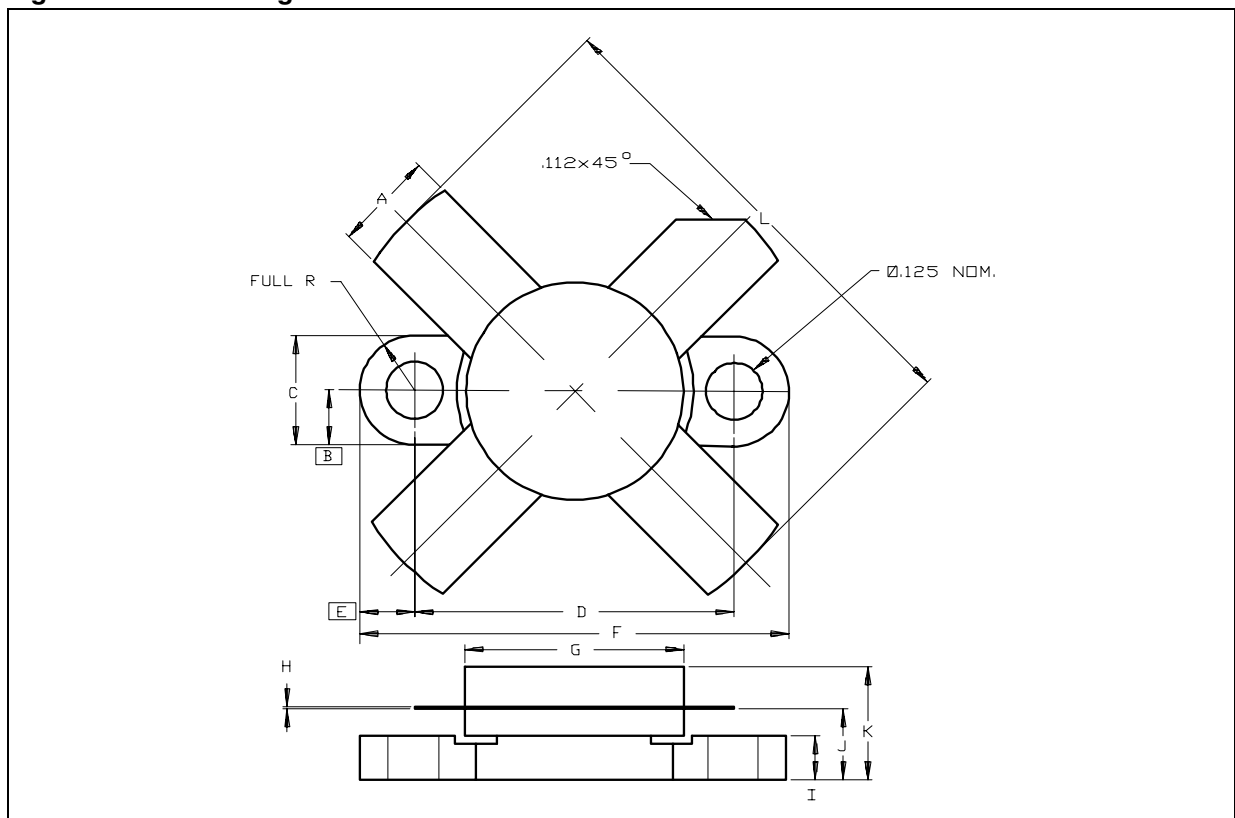
C1,	24 - 200pF Arco 425
C2, C4	50 - 380pF Arco 465
C3	9 - 180pF Arco 463
C5	10 μ F, Electrolytic, 35Vdc
C6	0.01 μ F, 100V, Ceramic
L1	4 Turns, #16 AWG, Tinned, 0.40" I.D.
L2, L5	1 Turn, #22 AWG, Tinned, formed with VK-200 #4B Ferroxcube
L4	17 Turns, #18 Enameled Wire Wrapped Around R1
R1	390 Ω Resistor (2 Watt)

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 5. M174 Package Dimensions



Note: Drawing is not to scale.

REVISION HISTORY

Table 8. Revision History

Date	Revision	Description of Changes
October-1992	1	First Issue
26-May-2004	2	Stylesheet update. No content change.

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics.
All other names are the property of their respective owners

© 2004 STMicroelectronics - All rights reserved

STMicroelectronics GROUP OF COMPANIES

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan -
Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States

www.st.com