



SD1477

RF POWER BIPOLAR TRANSISTORS VHF MOBILE APPLICATIONS

FEATURES SUMMARY

- 175 MHz
- 12.5 VOLTS
- COMMON EMITTER
- $P_{OUT} = 100 \text{ W MIN. WITH } 6.0 \text{ dB GAIN}$

DESCRIPTION

The SD1477 is a 12.5 V Class C epitaxial silicon NPN planar transistor designed primarily for VHF FM communications. This device utilizes diffused emitter resistors to withstand extremely high VSWR under rated operating conditions, and is internally input matched to optimize power gain and efficiency over the 136 - 175 MHz band.

Figure 1. Package

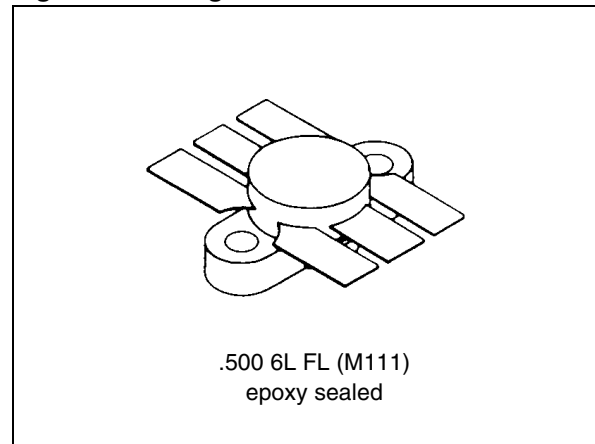


Figure 2. Pin Connection

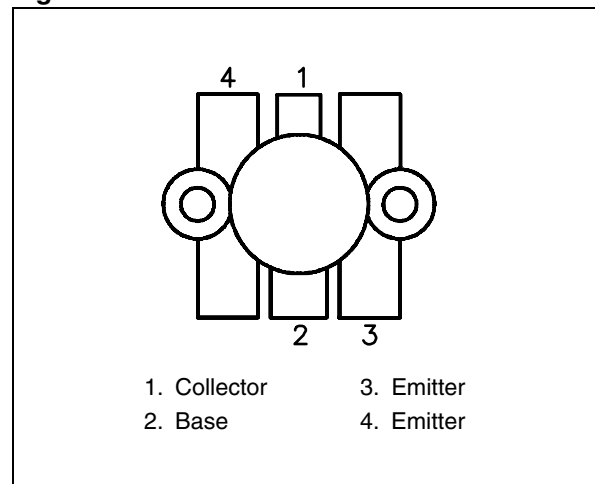


Table 1. Order Codes

Order Codes	Marking	Package	Packaging
SD1477	SD1477	M111	PLASTIC TRAYS

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

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	36	V
V_{CEO}	Collector-Emitter Voltage	18	V
V_{CES}	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}	$I_{\text{C}} = 50 \text{ mA}; I_{\text{E}} = 0 \text{ mA}$	36	—	—	V
BV_{CES}	$I_{\text{C}} = 100 \text{ mA}; V_{\text{BE}} = 0 \text{ V}$	36	—	—	V
BV_{CEO}	$I_{\text{C}} = 100 \text{ mA}; I_{\text{B}} = 0 \text{ mA}$	18	—	—	V
BV_{EBO}	$I_{\text{E}} = 10 \text{ mA}; I_{\text{C}} = 0 \text{ mA}$	4.0	—	—	V
I_{CES}	$V_{\text{CE}} = 15 \text{ V}; I_{\text{E}} = 0 \text{ mA}$	—	—	15	mA
h_{FE}	$V_{\text{CE}} = 5 \text{ V}; I_{\text{C}} = 5 \text{ A}$	10	—	—	—

Table 5. Dynamic

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_{OUT}	$f = 175 \text{ MHz}; P_{\text{IN}} = 25 \text{ W}; V_{\text{CC}} = 12.5 \text{ V}$	100	—	—	W
G_{P}	$f = 175 \text{ MHz}; P_{\text{IN}} = 25 \text{ W}; V_{\text{CC}} = 12.5 \text{ V}$	6.0	—	—	dB
C_{OB}	$f = 1 \text{ MHz}; V_{\text{CB}} = 12.5 \text{ V}$	—	350	—	pF

TYPICAL PERFORMANCE

Figure 3. Power Output vs Frequency

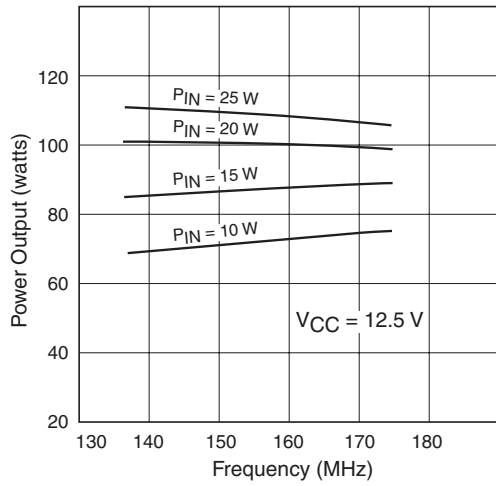
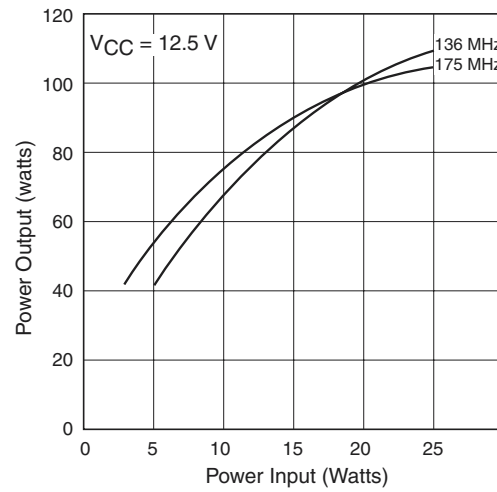


Figure 4. Power Output vs Power Input



IMPEDANCE DATA

Figure 5. Typical Input Impedance

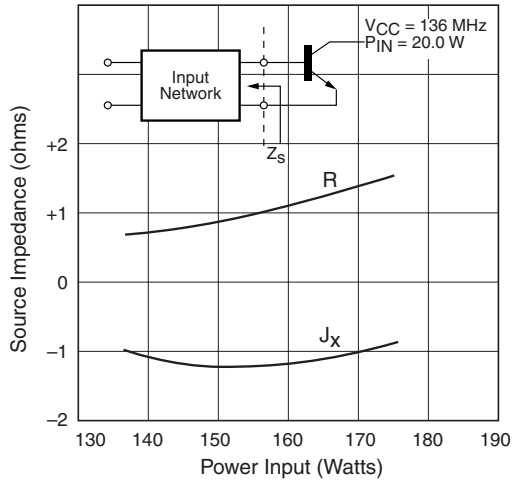


Figure 6. Typical Collector Load Impedance

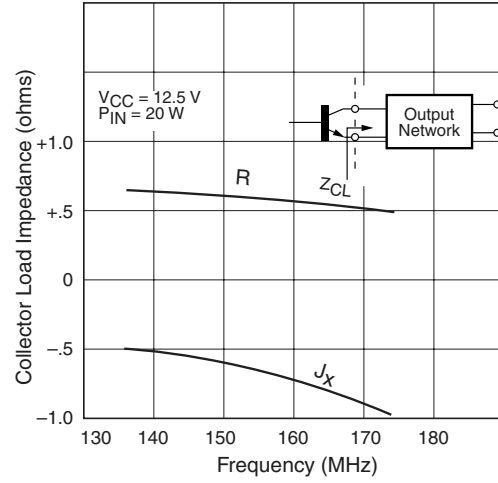


Table 6. Impedance Data

FREQ.	Z _{IN} (Ω)	Z _{CL} (Ω)
175 MHz	1.5 - j 0.9	0.5 - j 1.0

TEST CIRCUIT

Figure 7. Test Circuit

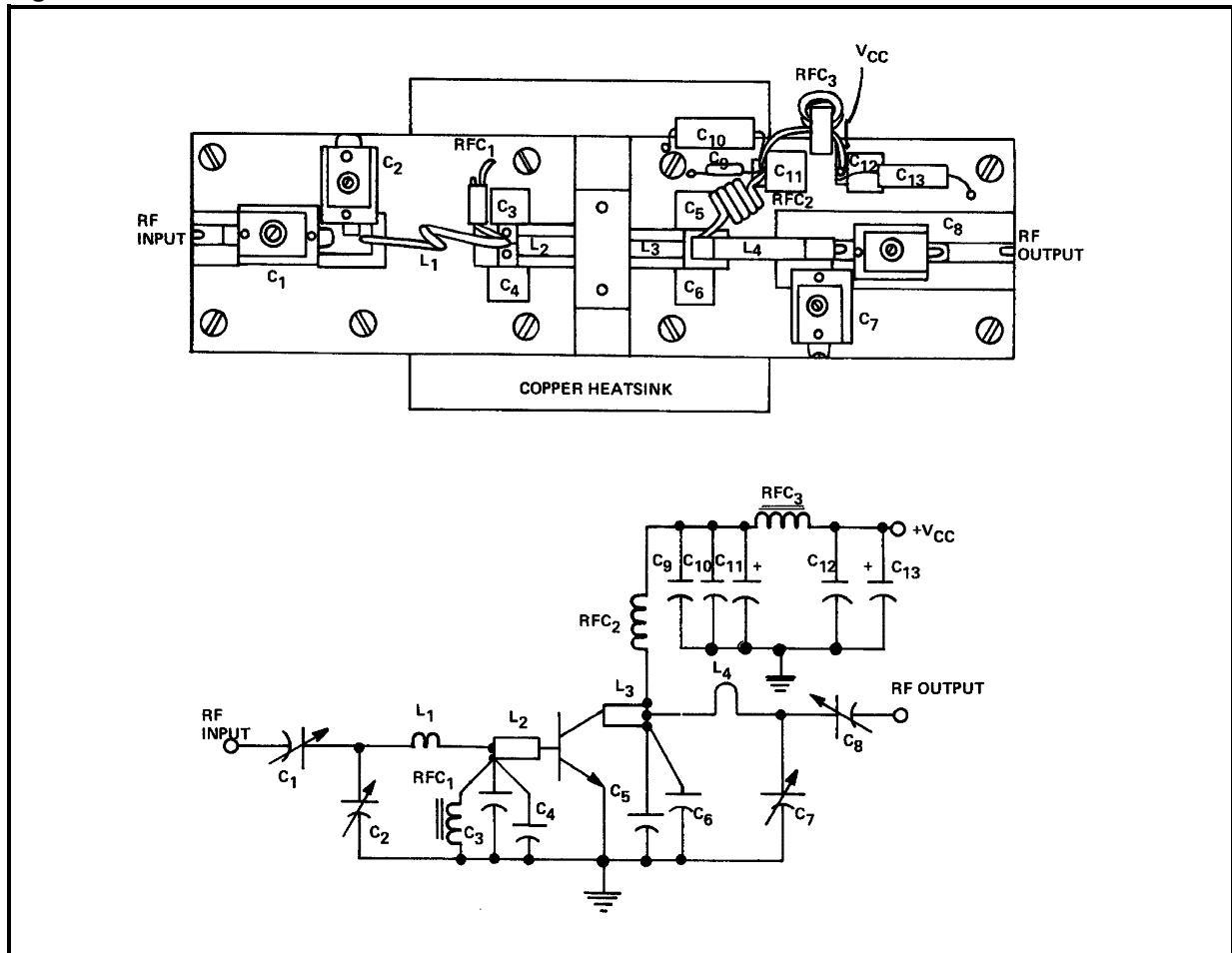
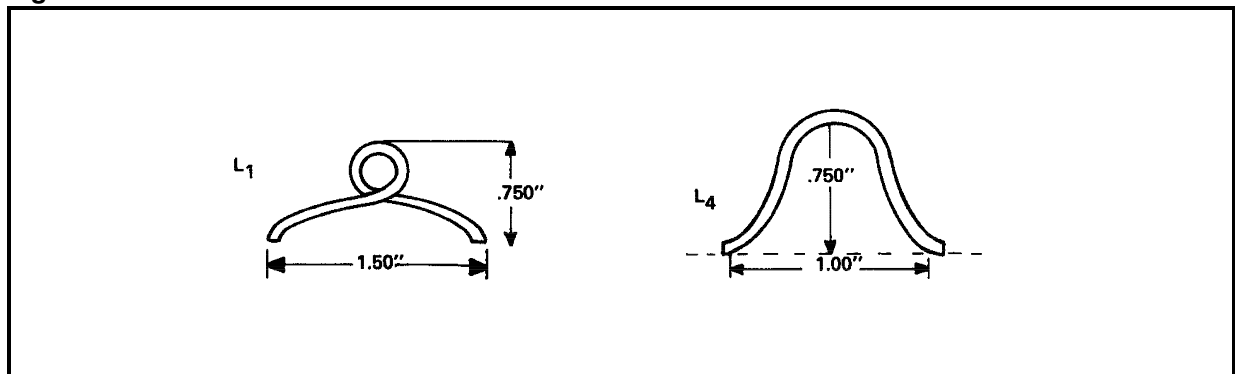


Table 7. Test Circuit

C1, C2	Arco 462 5 - 80pF
C3, C4	Unelco 100pF, 350V
C5, C6	Unelco 120pF, 350V
C7, C8	Arco 463 9 - 180pF
C9, C12	Unelco 1000pF, 350V
C10	Erie .15 μ F, 200V Red Cap
C11	25 μ F, 25V Electrolytic
C13	10 μ F, 25V Electrolytic
L1	1 Turn, #12, 1/4" I.D.
L2, L3	1/2" 50 Ω Stripline (.180" Wide)
L4	1/8" Thick Copper Strap 1/4" Wide
RCF1	1 1/2 Turns on Ferroxcube VK200/19-B
RCF2	4 Turn #16 Enamel, 3/8" I.D., 3/8" Long
RCF3	4 Turns #16 Enamel on T50-2 Torroid
Board Material	3M-K6098, 1/16" Thick

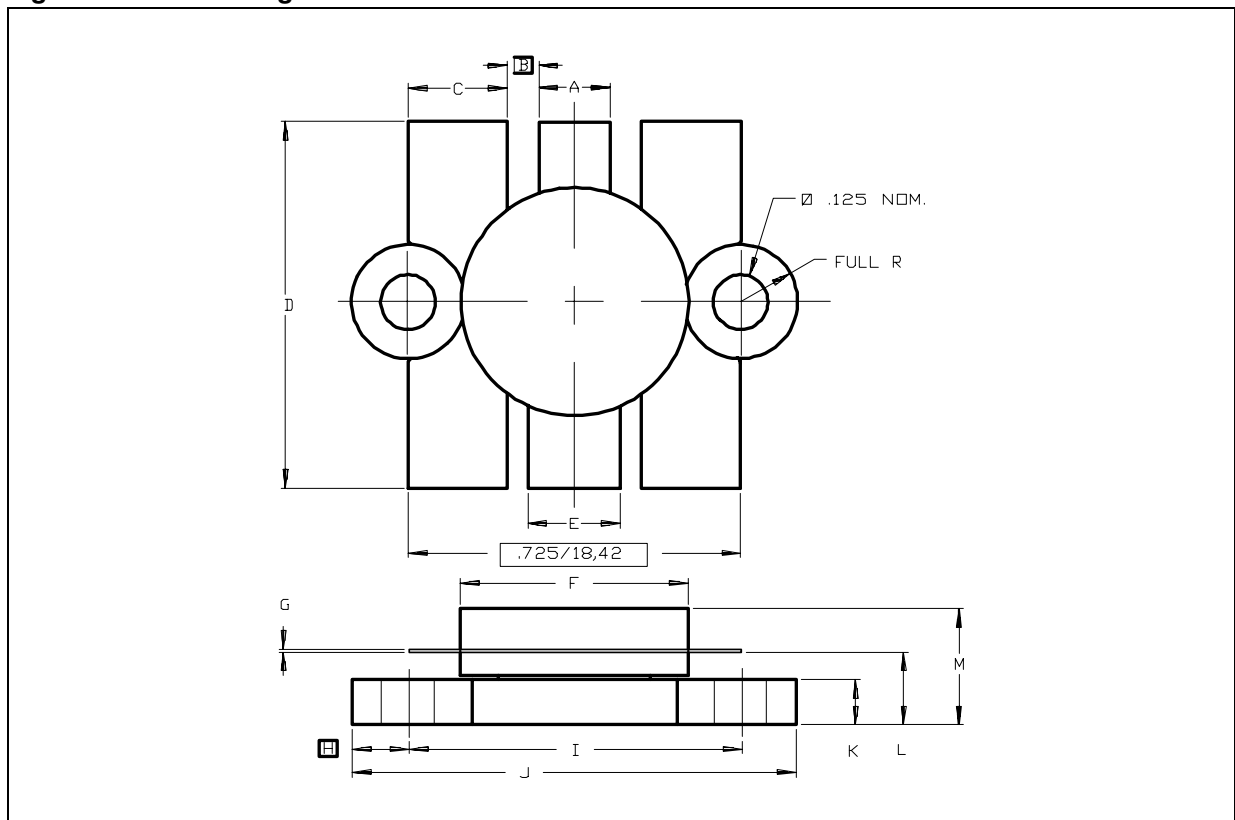
Figure 8. Test Circuit

PACKAGE MECHANICAL

Table 8. M111 Mechanical Data

Symbol	millimeters			inches		
	Min	Typ	Max	Min	Typ	Max
A	3.43		4.06	0.150		0.160
B		1.14			0.045	
C	5.33		5.59	0.210		0.220
D	21.21		21.97	0.835		0.865
E	5.08		5.33	0.200		0.210
F	12.45		12.95	0.490		0.510
G	0.08		0.18	0.003		0.007
H		3.18			0.125	
I	18.29		18.54	0.720		0.730
J	24.64		24.89	0.970		0.980
K	2.41		2.67	0.095		0.105
L	3.81		4.32	0.150		0.170
M			7.11			0.280

Figure 9. M111 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.

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