SD1446

RF POWER BIPOLAR TRANSISTORS
UHF MOBILE APPLICATIONS

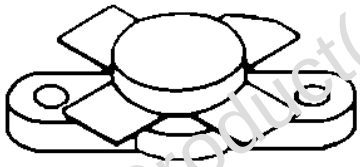
FEATURES SUMMARY

- 50 MHz
- 12.5 VOLTS
- EFFICIENCY 55%
- COMMON EMITTER
- GOLD METALLIZATION
- P_{OUT} = 70 W MIN. WITH 10 dB GAIN

DESCRIPTION

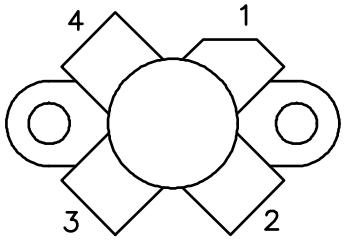
The SD1446 is a 12.5 V Class C epitaxial silicon NPN planar transistor designed primarily for land mobile transmitter applications. This device utilizes emitter ballasting and is extremely stable and capable of withstanding high VSWR under operating conditions.

Figure 1. Package



.380 4L FL (M113)
epoxy sealed

Figure 2. Pin Connection



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

Table 1. Order Codes

Order Codes	Marking	Package	Packaging
SD1446	SD1446	M113	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	3.5	V
I_C	Device Current	12.0	A
P_{DISS}	Power Dissipation	183	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	1.05	°C/W

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

Table 4. Static

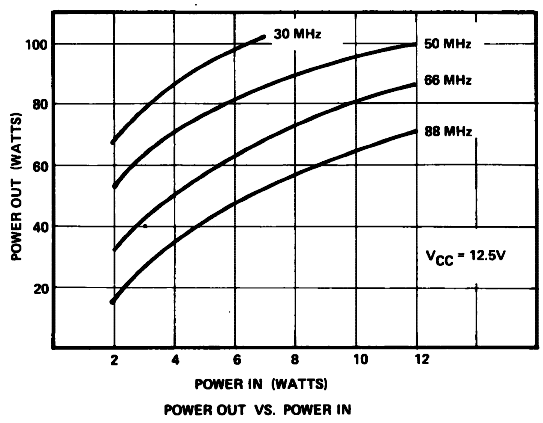
Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BV_{CBO}	I_C = 50 mA; I_E = 0 mA	36	—	—	V
BV_{CES}	I_C = 100 mA; V_{BE} = 0 V	36	—	—	V
BV_{CEO}	I_C = 50 mA; I_B = 0 mA	18	—	—	V
BV_{EBO}	I_E = 10 mA; I_C = 0 mA	3.5	—	—	V
I_{CES}	V_{CE} = 15 V; I_E = 0 mA	—	—	10	mA
h_{FE}	V_{CE} = 5 V; I_C = 5 A	10	—	—	—

Table 5. Dynamic

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_{OUT}	f = 50 MHz; P_{IN} = 7 W; V_{CE} = 12.5 V	70	—	—	W
G_P	f = 50 MHz; P_{IN} = 7 W; V_{CE} = 12.5 V	10	—	—	dB
η_c	f = 50 MHz; P_{IN} = 7 W; V_{CE} = 12.5 V	—	55	—	%
C_{OB}	f = 1 MHz; V_{CB} = 12.5 V	—	—	300	pF

TYPICAL PERFORMANCE

Figure 3. Power Output vs Power Input



IMPEDANCE DATA

Figure 4. Typical Input Impedance

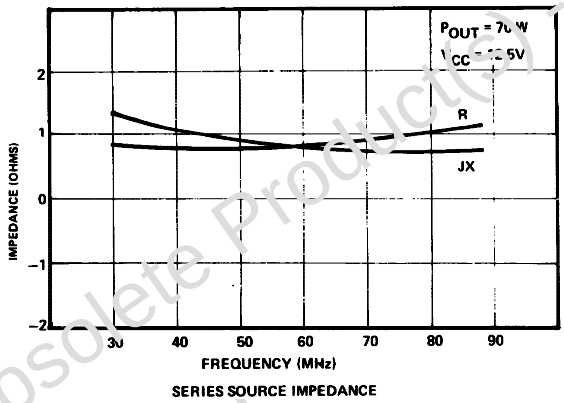


Figure 5. Typical Collector Load Impedance

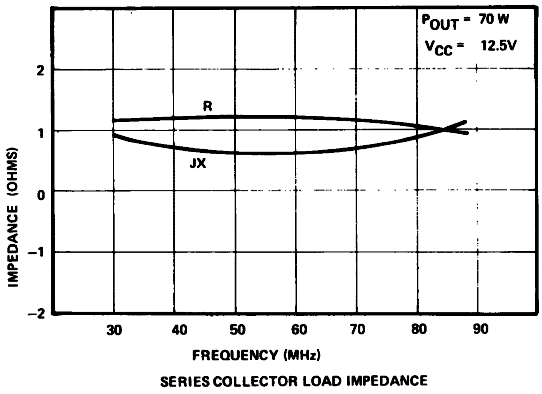


Table 6. Impedance Data (1)

FREQ.	Z_{IN} (Ω)	Z_{CL} (Ω)
50 MHz	0.8 + j 0.9	1.2 + j 0.6

Note: 1. P_{OUT} = 70W; V_{CE} = 12.5 V

TEST CIRCUIT

Figure 6. Test Circuit

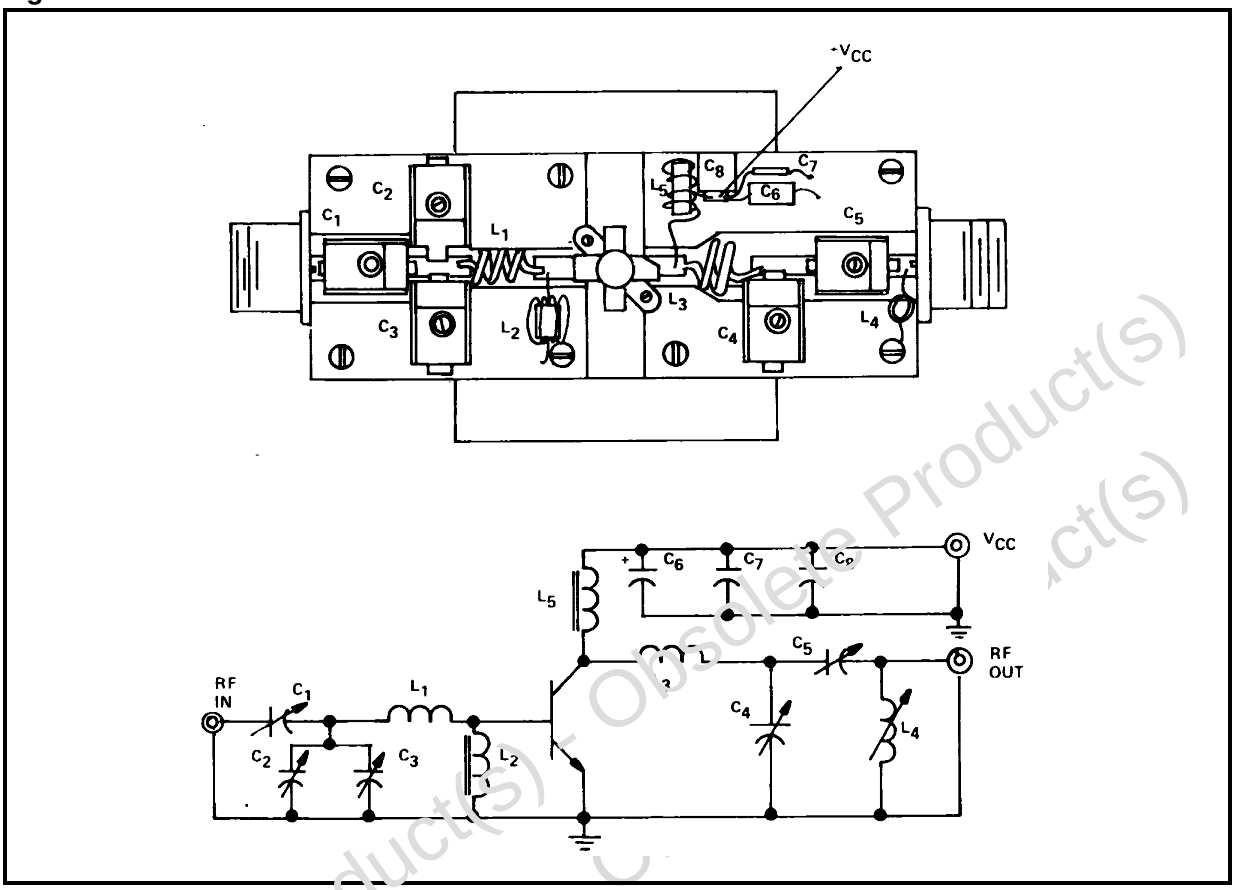


Table 7. Test Circuit

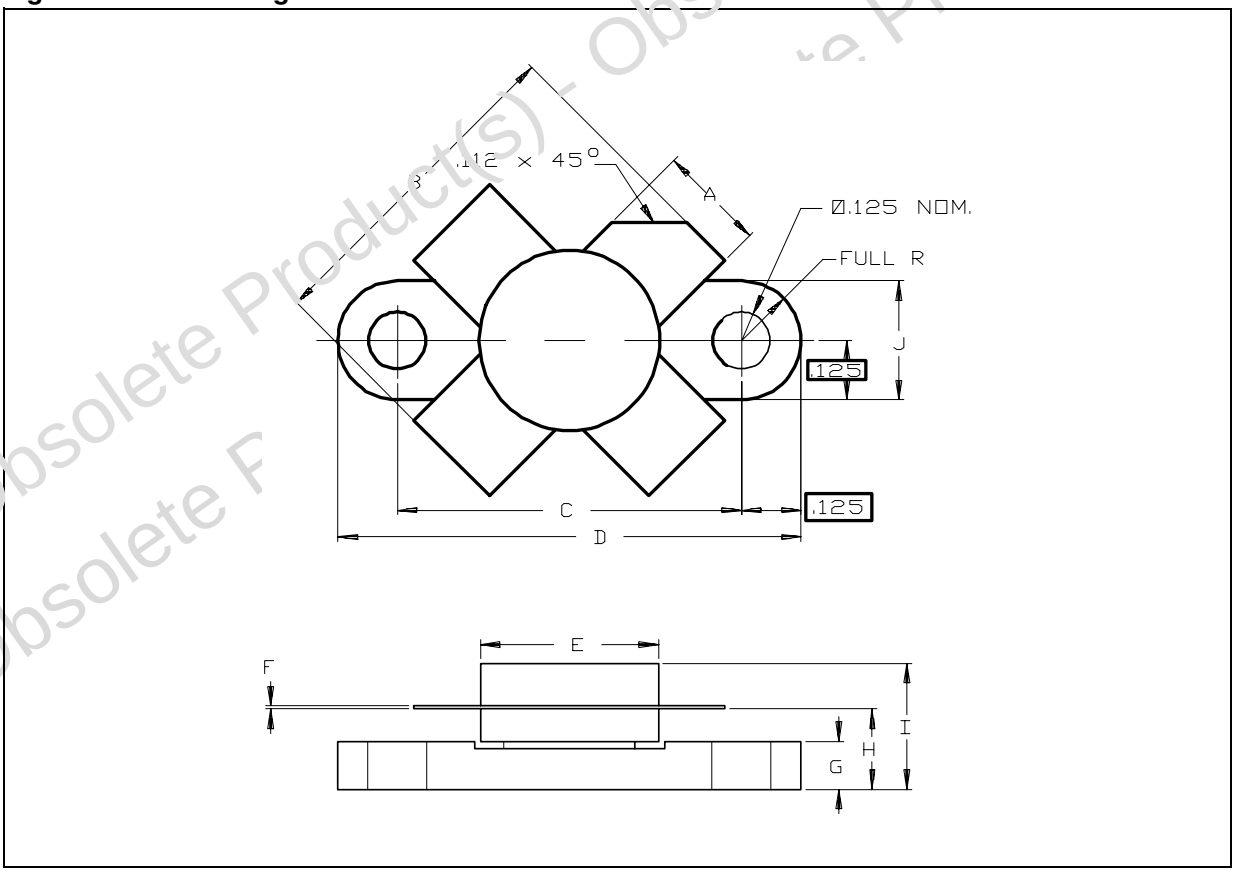
C1, C4	50 - 380pF Arco 465
C2	110 - 580pF Arco 467
C3	140 - 680pF Arco 468
C5	9 - 180pF Arco 463
C6	10µF, 35Vdc, Electrolytic
C7	.01µF Erie
C8	1000pF Unelco
L1	2 1/2 Turns, #14 Awg, Tinned, 1/4" I.D. Loose Wound
L2	10 Turns, #28 AWG, Enameled on Ferroxcube Sleeve #3B
L3	1 1/2 Turns, #12 AWG, Tinned, 3/8" I.D. Loose Wound
L4	8 Turns, #18 AWG on 1/4" I.D. Coil form 1/2" Length with Ferrite Slug
L5	11 Turns, #16 AWG, Enameled on Torroid, Micrometals, T50-2
Board Material	Double Sided Copper 1/16" Thick

PACKAGE MECHANICAL

Table 8. M113 Mechanical Data

Symbol	millimeters			inches		
	Min	Typ	Max	Min	Typ	Max
A	5.59		5.84	0.220		0.230
B	19.94			0.785		
C	18.29		18.54	0.720		0.730
D	24.64		24.89	0.970		0.980
E			9.78			0.385
F	0.10		0.15	0.004		0.006
G	2.16		2.67	0.085		0.105
H	4.06		4.57	0.160		0.180
I			7.11			0.280
J	6.10		6.48	0.240		0.255

Figure 7. M113 Package Dimensions



Note: Drawing is not to scale.

REVISION HISTORY

Table 9. Revision History

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