SD1433

RF POWER BIPOLAR TRANSISTORS
UHF MOBILE APPLICATIONS

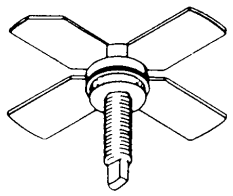
FEATURES SUMMARY

- 470 MHz
- 12.5 VOLTS
- CLASS C
- EFFICIENCY 60%
- COMMON EMITTER
- P_{OUT} = 10 W MIN. WITH 8.0 dB GAIN

DESCRIPTION

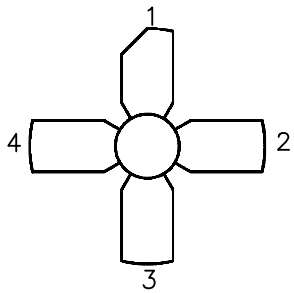
The SD1433 is a Class C epitaxial silicon NPN planar transistor designed for driver applications in the 450 - 512 MHz frequency range. This device uses an emitter ballasted geometry specifically designed for optimum stable power gain, maximum efficiency and infinite VSWR.

Figure 1. Package



.280 4L STUD (M122)
epoxy sealed

Figure 2. Pin Connection



Obsolete Product(s) - Obsolete Product(s)

Table 1. Order Codes

Order Codes	Marking	Package	Packaging
SD1433	SD1433	M122	BLACK CARDBOARDS

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	16	V
V_{CES}	Collector-Emitter Voltage	36	V
V_{EBO}	Emitter-Base Voltage	4.0	V
I_C	Device Current	2.5	A
P_{DISS}	Power Dissipation	58	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	3.0	°C/W

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

Table 4. Static

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BV_{CES}	I_C = 25 mA; V_{BE} = 0 V	36	—	—	V
BV_{CEO}	I_C = 20 mA; I_B = 0 mA	16	—	—	V
BV_{EBO}	I_E = 10 mA; I_C = 0 mA	4.0	—	—	V
I_{CES}	V_{CE} = 10 V; I_E = 0 mA	—	—	3	mA
I_{CBO}	V_{CB} = 15 V; I_E = 0 mA	—	—	2	mA
h_{FE}	V_{CE} = 5 V; I_C = 1 A	10	—	—	—

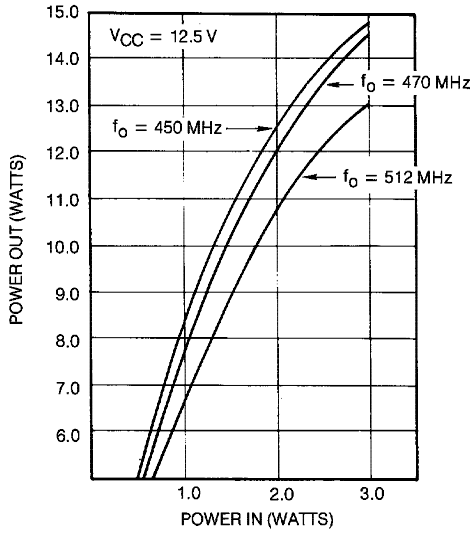
Table 5. Dynamic

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_{OUT}	f = 470 MHz; P_{IN} = 2.0 W; V_{CE} = 12.5 V	10	—	—	W
G_P	f = 470 MHz; P_{OUT} = 10 W; V_{CE} = 12.5 V	7	—	—	dB
C_{OB}	f = 1 MHz; V_{CB} = 12.5 V	—	19	—	pF

Obsolete Product(s) - Obsolete Product(s)

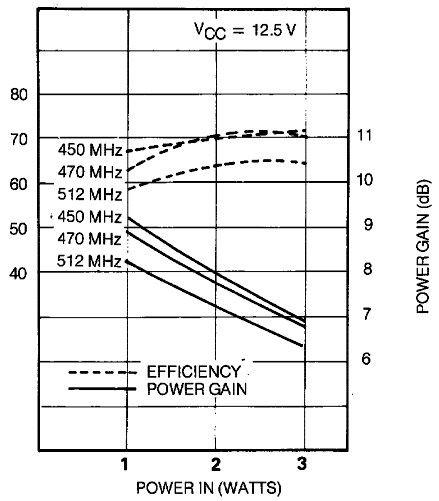
TYPICAL PERFORMANCE

Figure 3. Power Output vs Power Input



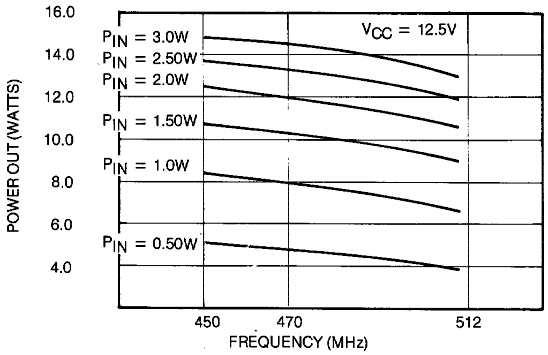
POWER OUT VS POWER IN

Figure 4. Power Gain & Efficiency vs Power Input



POWER GAIN/EFFICIENCY VS POWER IN

Figure 5. Power Output vs Frequency

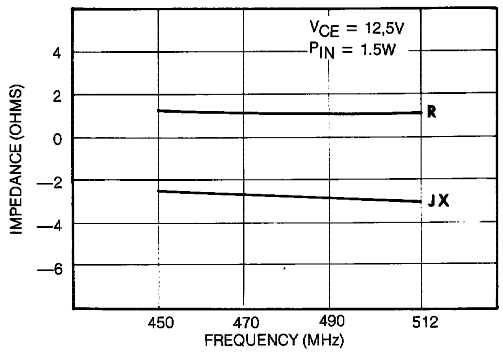


POWER OUT VS FREQUENCY

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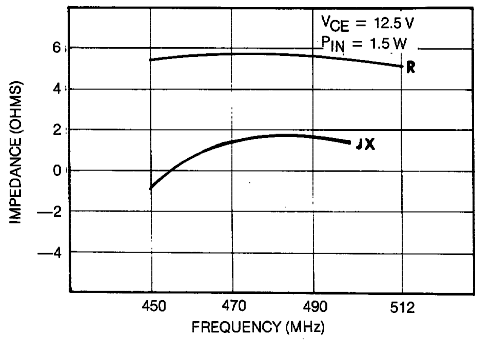
IMPEDANCE DATA

Figure 6. Typical Input Impedance



SERIES SOURCE IMPEDANCE VS FREQUENCY

Figure 7. Typical Collector Load Impedance



SERIES COLLECTOR LOAD IMPEDANCE VS FREQUENCY

Table 6. Impedance Data

FREQ.	Z_{IN} (Ω)	Z_{CL} (Ω)
470 MHz	1.5 – j 2.7	5.7 + j 1.5

Obsolete Product(s) - Obsolete Product(s)

TEST CIRCUIT

Figure 8. Test Circuit

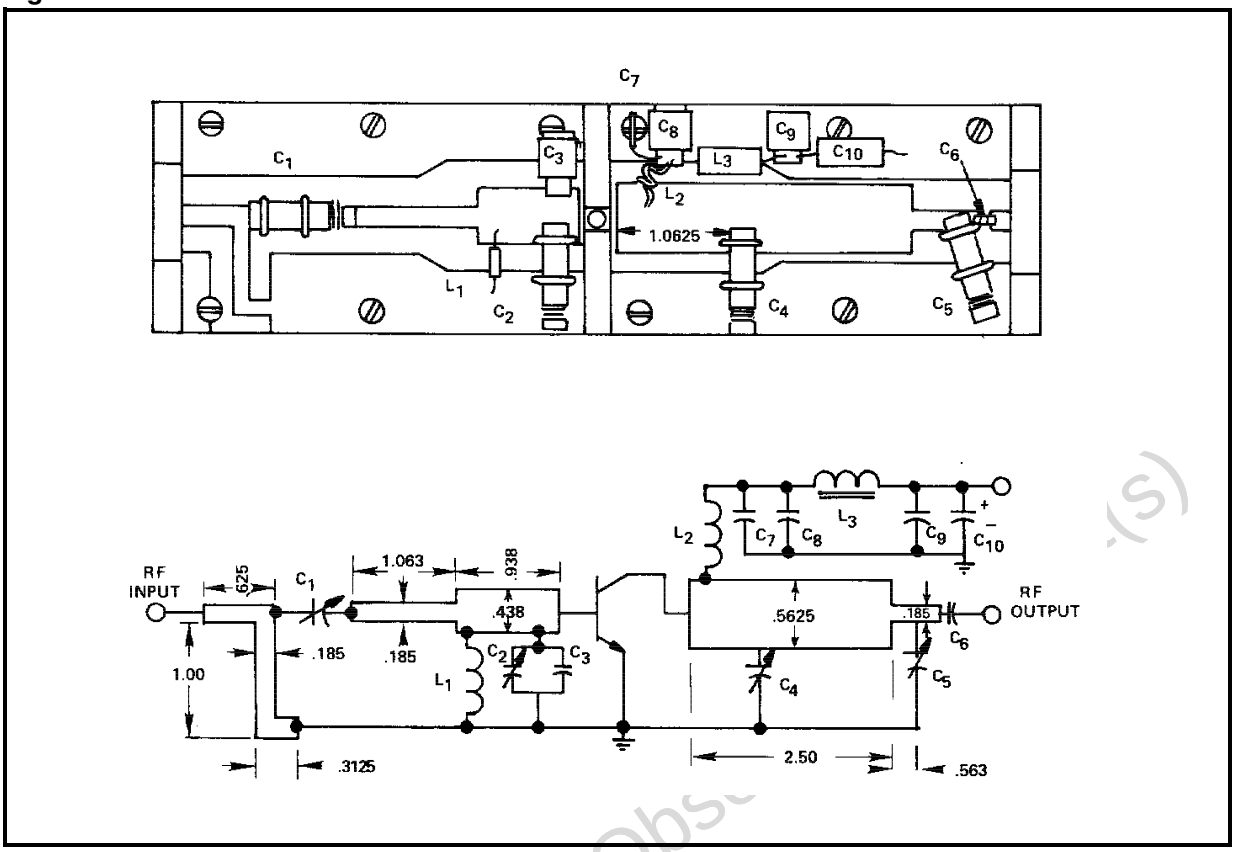


Table 7. Test Circuit

C1, C2:	0.8pF Voltronics
C3:	18pF Chip Capacitor
C4, C5:	AJ810
C6:	1000pF Chip Capacitor
C7:	0.01µF Disc Ceramic
C8, C9:	1000pF Unelco
C10:	10µF, 35V Electrolytic
L1:	0.47µH Molded Choke
L2:	2 Turns, #20 AWG, 1/8" I.D.
L3	2 Turns in Ferroxcube VK200/19-4B
Board Material:	3M-K6098, 1/16" Thick

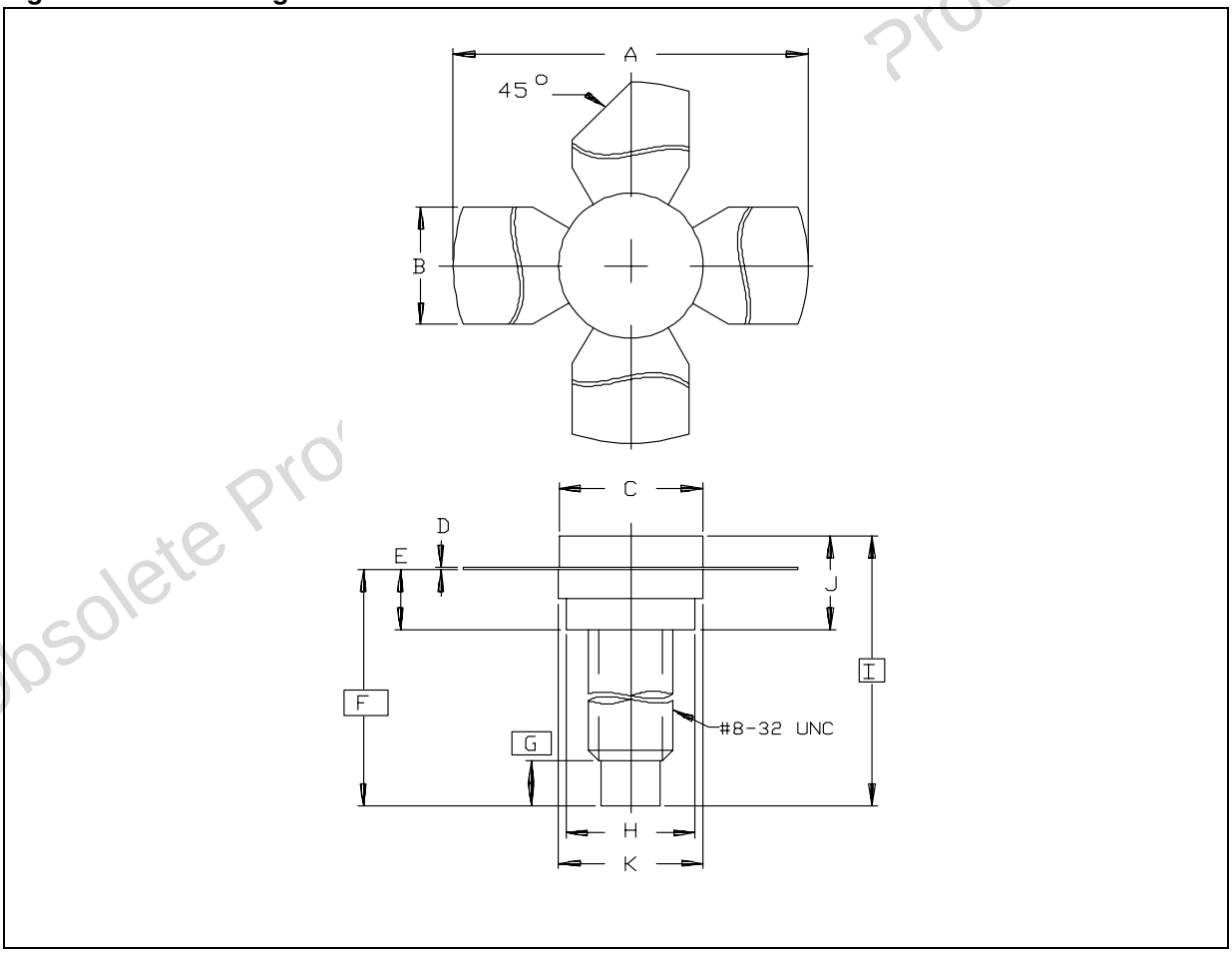
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PACKAGE MECHANICAL

Table 8. M122 Mechanical Data

Symbol	millimeters			inches		
	Min	Typ	Max	Min	Typ	Max
A	25.65		26.80	1.010		1.055
B	5.59		5.84	0.220		0.230
C	6.86		7.24	0.270		0.285
D	0.08		0.18	0.003		0.007
E	2.97		3.48	0.117		0.137
F		14.53			0.572	
G		3.30			0.130	
H	6.22		6.48	0.245		0.255
I		16.26			0.640	
J	4.45		5.51	0.175		0.217
K	6.99		7.24	0.275		0.285

Figure 9. M122 Package Dimensions



Note: Drawing is not to scale.

Obsolete Product(s)

REVISION HISTORY

Table 9. Revision History

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

Obsolete Product(s) - Obsolete Product(s)

Obsolete Product(s) - Obsolete Product(s)

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