SD1729 (TH416)

RF POWER BIPOLAR TRANSISTORS
HF SSB APPLICATIONS

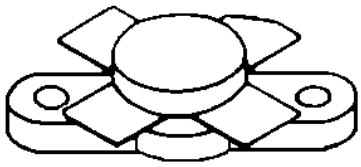
FEATURES SUMMARY

- OPTIMIZED FOR SSB
- 30 MHz
- 28 VOLTS
- IMD –30 dB
- COMMON EMITTER
- GOLD METALLIZATION
- P_{OUT} = 130 W PEP WITH 12 dB GAIN

DESCRIPTION

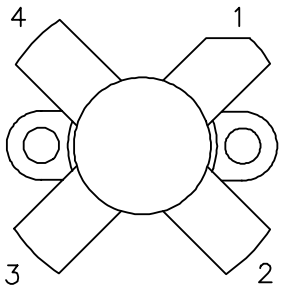
The SD1729 is a Class AB 28 V epitaxial silicon NPN planar transistor designed primarily for SSB communications. This device utilizes emitter ballasting to achieve extreme ruggedness under severe operating conditions.

Figure 1. Package



.500 4L FL (M174)
epoxy sealed

Figure 2. Pin Connection



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

Table 1. Order Codes

Order Codes	Marking	Package	Packaging
SD1729 (TH416)	SD1729	M174	PLASTIC TRAYS

Table 2. Absolute Maximum Ratings (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	70	V
V_{CEO}	Collector-Emitter Voltage	35	V
V_{EBO}	Emitter-Base Voltage	4.0	V
I_C	Device Current	12	A
P_{DISS}	Power Dissipation	175	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	1.0	°C/W

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

Table 4. Static

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BV_{CES}	I_C = 50 mA; V_{BE} = 0 V	70	—	—	V
BV_{CEO}	I_C = 100 mA; I_B = 0 mA	35	—	—	V
BV_{EBO}	I_E = 20 mA; I_C = 0 mA	4.0	—	—	V
I_{CES}	V_{CE} = 35 V; I_E = 0 mA	—	—	20	mA
h_{FE}	V_{CE} = 5 V; I_C = 7 A	18	—	50	—

Table 5. Dynamic

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_{OUT}	f = 30 MHz; V_{CE} = 28 V; I_{CQ} = 150 mA	130	—	—	W
G_P	P_{OUT} = 130 W PEP; V_{CE} = 28 V; I_{CQ} = 150 mA	12	—	—	dB
IMD(1)	P_{OUT} = 130 W PEP; V_{CE} = 28 V; I_{CQ} = 150 mA	—	—	–30	dBc
η_c	P_{OUT} = 130 W PEP; V_{CE} = 28 V; I_{CQ} = 150 mA	37	—	—	%
C_{OB}	f = 1 MHz; V_{CB} = 28 V	—	220	—	pF

Note: 1. f_1 = 30.00 MHz, f_2 = 30.001 MHz

TYPICAL PERFORMANCE

Figure 3. Safe Operating Area

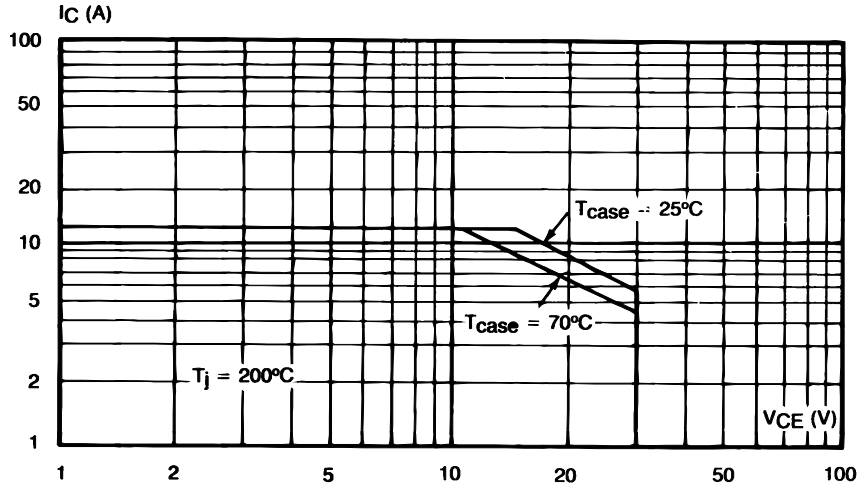
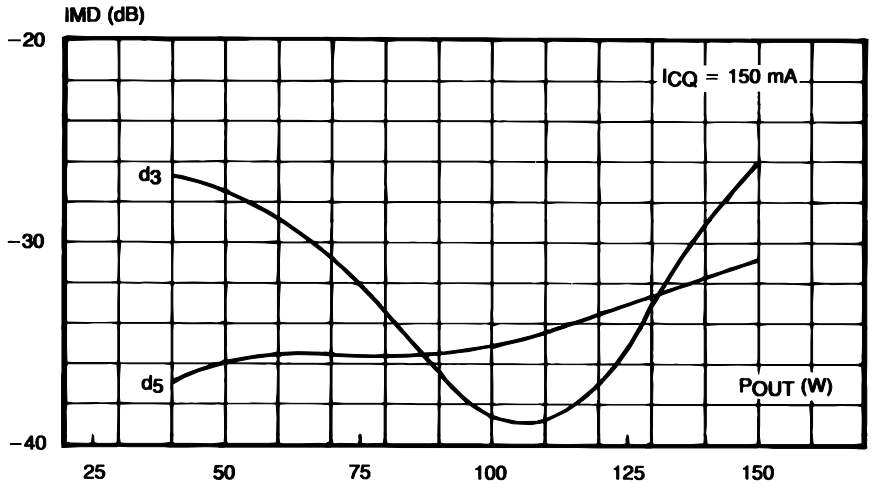


Figure 4. Intermodulation Distortion vs Power Output



TEST CIRCUIT

Figure 5. Test Circuit 3

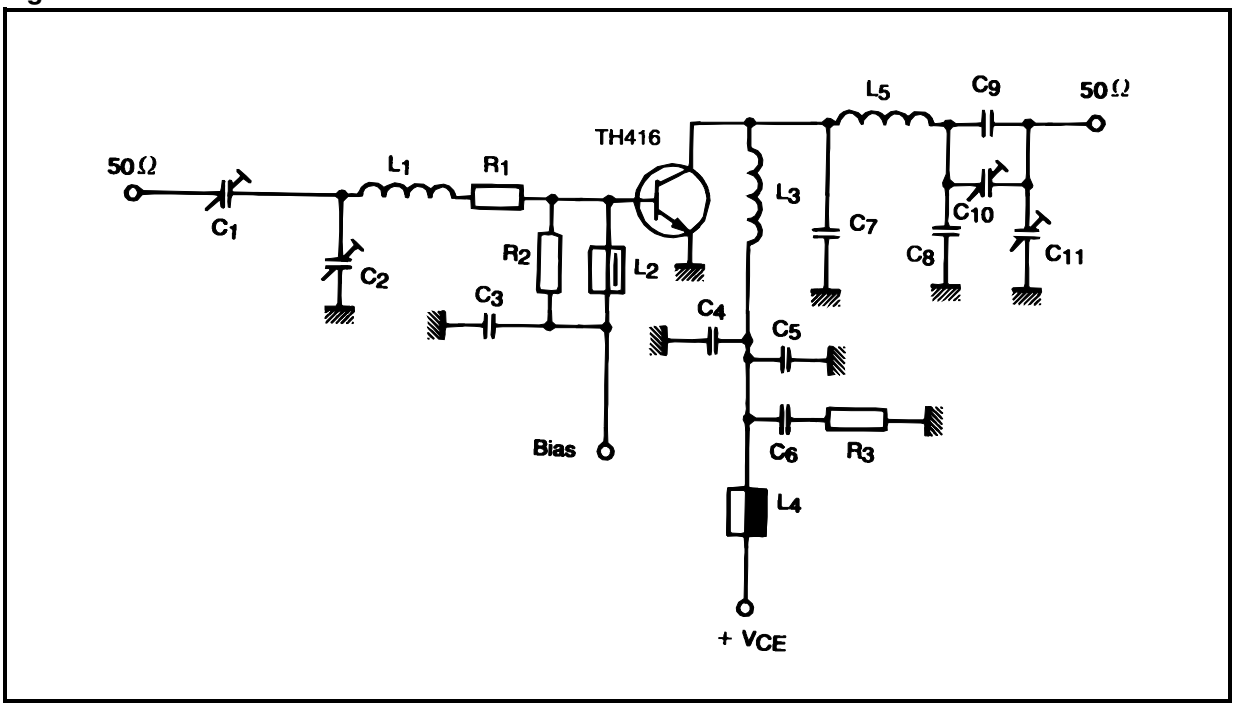


Table 6. Test Circuit

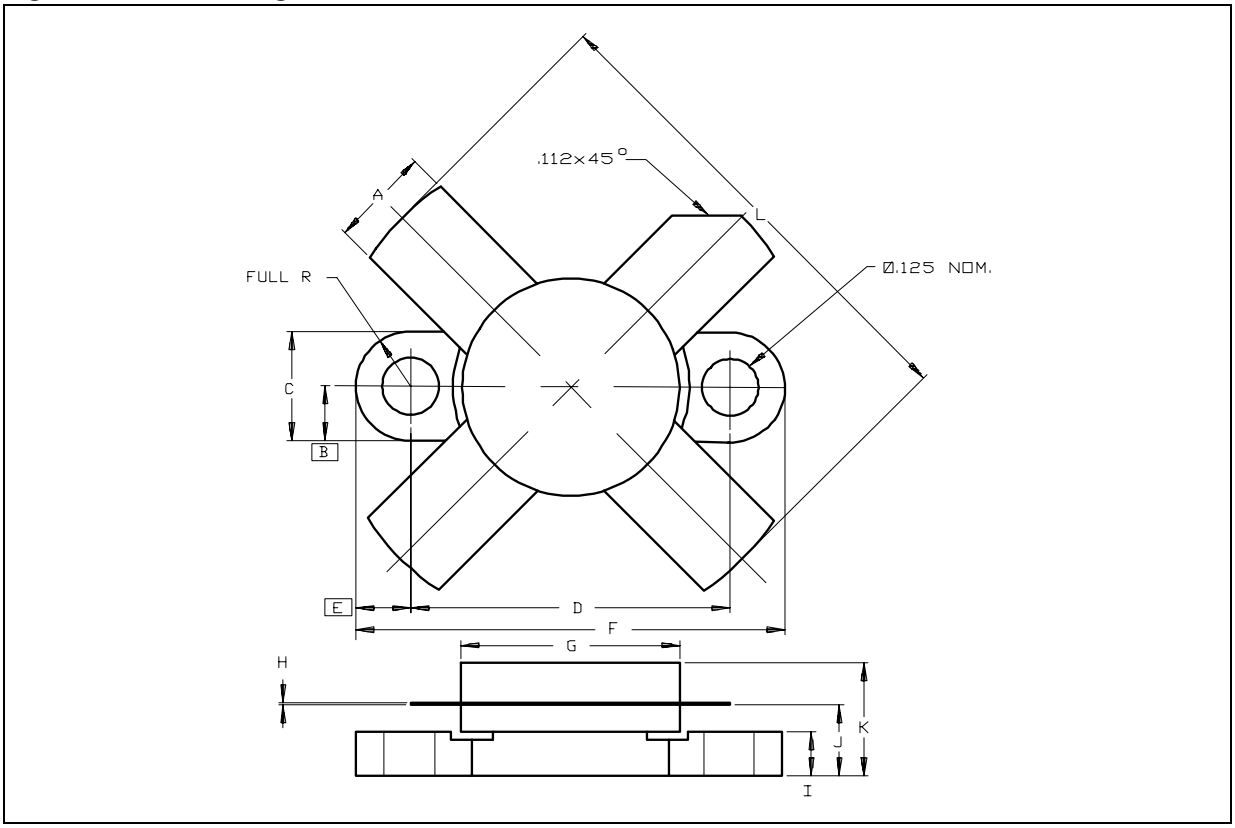
C1	20 – 120pF
C2	50 – 300pF
C3, C4	3.9nF
C5	100nF
C6	2.2µF
C7	2 x 180pF in Parallel
C8	3 x 56pF and 33pF in Parallel
C9	4 x 56pF and 68pF in Parallel
C10, C11	360pF
L1	88nF
L2	22µH Choke Coil
L3, L5	80nF
L4	Ferroxcube Choke Coil
R1	0.55Ω
R2	27Ω
R3	4.7Ω

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 6. M174 Package Dimensions



Note: Drawing is not to scale.

REVISION HISTORY

Table 8. Revision History

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