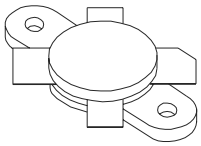
SD1728 (TH430)

RF & MICROWAVE TRANSISTORS
HF SSB APPLICATION

- OPTIMIZED FOR SSB
- 30 MHz
- 50 V
- IMD = -30 dB
- GOLD METALLIZATION
- COMMON EMITTER
- P_{OUT} = 250 W PEP WITH 14.5 dB GAIN



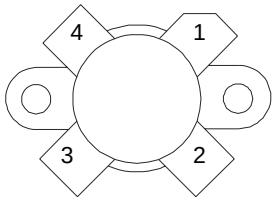
M177
epoxy sealed

ORDER CODE	BRANDING
SD1728	TH430

DESCRIPTION

The SD1728 is a 50 V epitaxial silicon NPN planar transistor designed primarily for SSB and VHF communications. This device utilizes emitter ballasting for improved ruggedness and reliability.

PIN CONNECTION



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

ABSOLUTE MAXIMUM RATINGS (T_{CASE} = 25 °C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	110	V
V_{CEO}	Collector-Emitter Voltage	55	V
V_{EBO}	Emitter-Base Voltage	4.0	V
I_C	Device Current	40	A
P_{DISS}	Power Dissipation	330	W
T_j	Max. Operating Junction Temperature	200	°C
T_{STG}	Storage Temperature	-65 to +150	°C

THERMAL DATA

$R_{th(j-c)}$	Junction -Case Thermal Resistance	0.4	°C/W

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

STATIC

Symbol	Test Conditions	Min.	Typ.	Max.	Unit
BV_{CES}	I_C = 200 mA V_{BE} = 0 V	110			V
BV_{CEO}	I_C = 200 mA I_B = 0 mA	55			V
BV_{EBO}	I_E = 20 mA I_C = 0 mA	4.0			V
I_{CEO}	V_{CE} = 30 V I_E = 0 mA	1.5		10	mA
I_{CES}	V_{CE} = 60 V I_E = 0 mA			10	mA
h_{FE}	V_{CE} = 6 V I_C = 10 A	15		45	

DYNAMIC

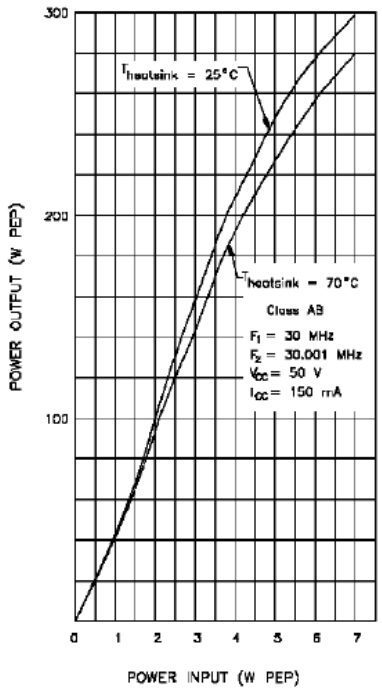
Symbol	Test Conditions	Min.	Typ.	Max.	Unit
P_{OUT}	V_{CC} = 50 V I_{CQ} = 150 mA f = 30 MHz	250			W
G_P*	V_{CC} = 50 V I_{CQ} = 150 mA P_{OUT} = 250 W PEP	14.5			dB
IMD*	V_{CC} = 50 V I_{CQ} = 150 mA P_{OUT} = 250 W PEP			-30	dBc
η_C*	V_{CC} = 50 V I_{CQ} = 150 mA P_{OUT} = 250 W PEP	37			%
C_{OB}	V_{CB} = 50 V f = 1 MHz			360	pF

* Two Tone Method; f1 = 30.00 MHz; f2 = 30.001 MHz
In Class C: GP Mi n. 13.5 dB, Efficiency 65%@ 30 MHz
GP Mi n. 10 dB, Efficiency 57%@ 70 MHz

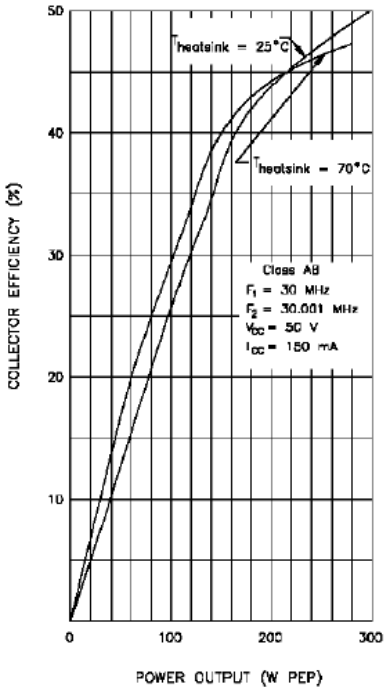
TYPICAL PERFORMANCE

CLASS AB

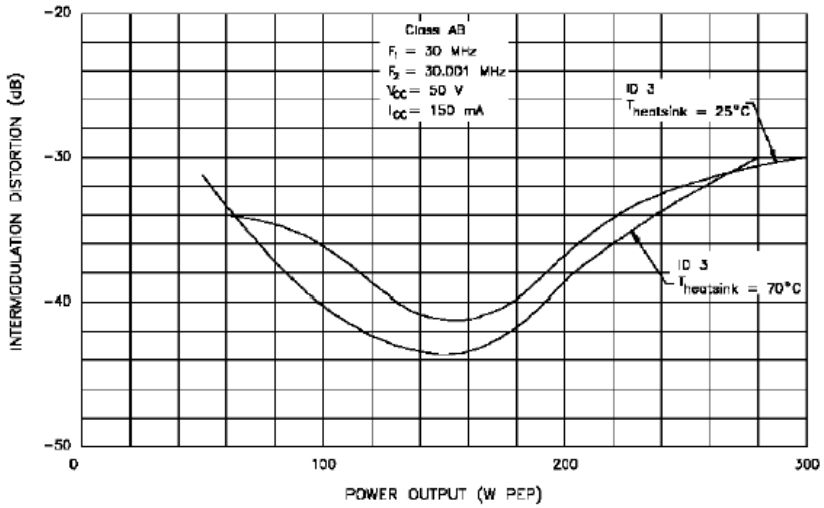
POWER OUTPUT PEP vs POWER INPUT



COLLECTOR EFFICIENCY vs POWER OUTPUT PEP

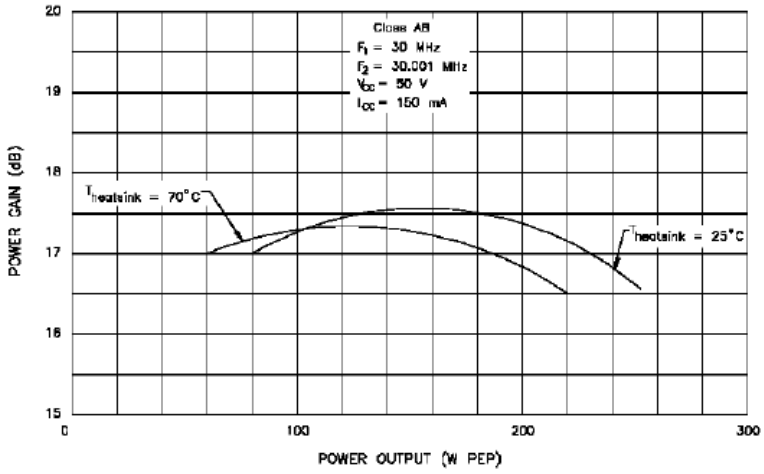


INTERMODULATION DISTORTION vs POWER OUTPUT PEP

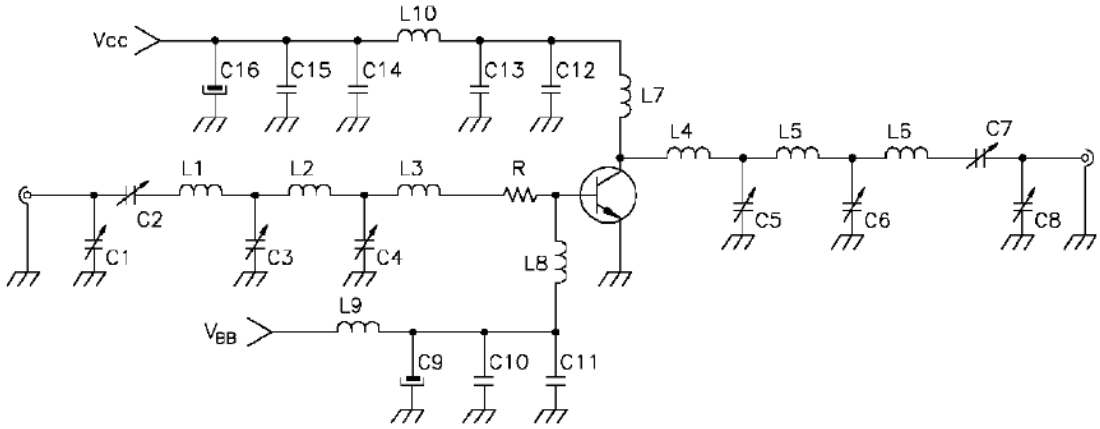


TYPICAL PERFORMANCE (cont'd)

POWER GAIN vs POWER OUTPUT PEP



TEST CIRCUIT SSB - CLASS AB - 30 MHz



C1	:	Arco 429
C2	:	Arco 4615
C3, C6	:	Arco 4213
C4, C5, C7	:	Arco 4611
C8	:	Arco 427
C9	:	470µF, 40V
C10, C14	:	100nF, 63V
C11, C13, C15	:	1nF
C12	:	10nF
C16	:	220µF, 63V

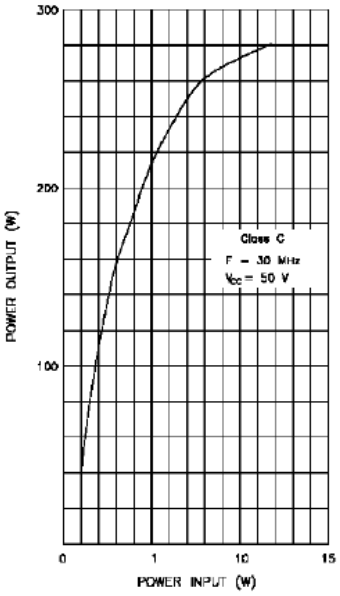
L1	:	5 Turns, Diameter 10mm, 1.3mm Wire, Length 15mm
L2	:	2 Turns, Diameter 12mm, 2mm Wire, Length 8mm
L3	:	1 Turn, Diameter 12mm, 2mm Wire, Length 5mm
L4	:	Hair Pin Copper Foil 20 x 5mm
L5	:	1 Turn, Diameter 12mm, 2mm Wire, Length 8mm
L6	:	5 Turns, Diameter 8mm, 1.3mm Wire, Length 18mm
L7	:	3 Turns, Diameter 8mm, 1.3mm Wire, Length 15mm
R	:	0.25Ω*

* 4 Resistors 1Ω 0.5W in parallel

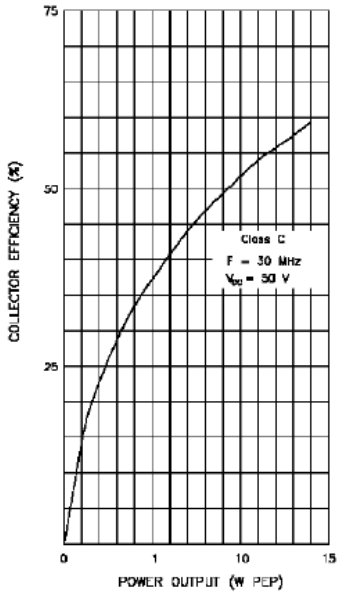
TYPICAL PERFORMANCE

CLASS C F = 30 MHz

POWER OUTPUT vs POWER INPUT

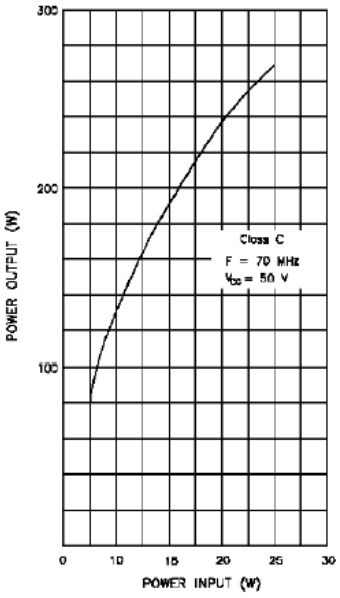


COLLECTOR EFFICIENCY vs POWER OUTPUT

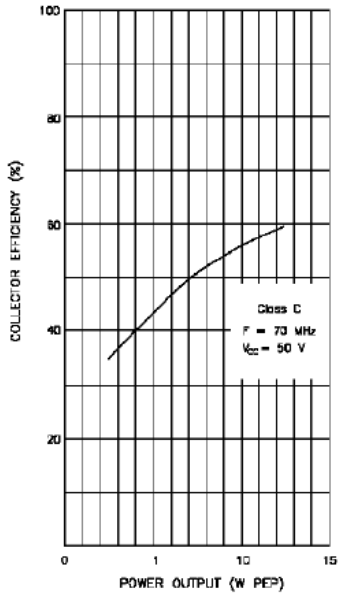


CLASS C F = 70 MHz

POWER OUTPUT vs POWER INPUT

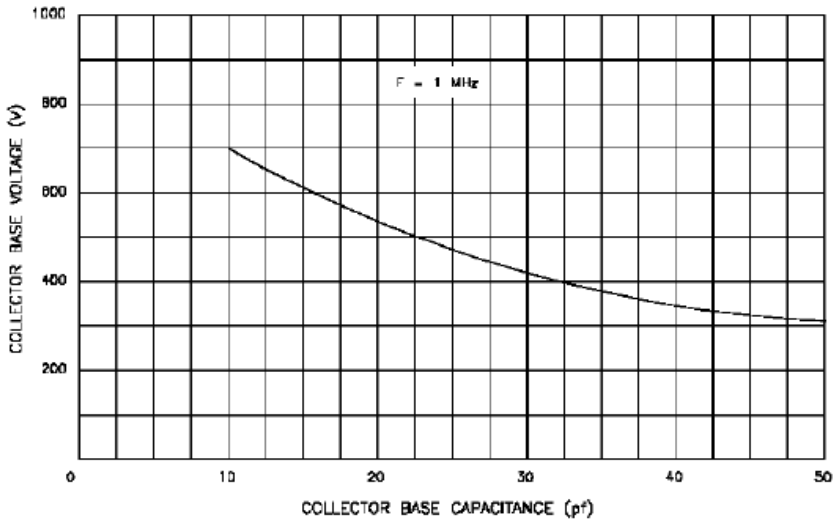


COLLECTOR EFFICIENCY vs POWER OUTPUT

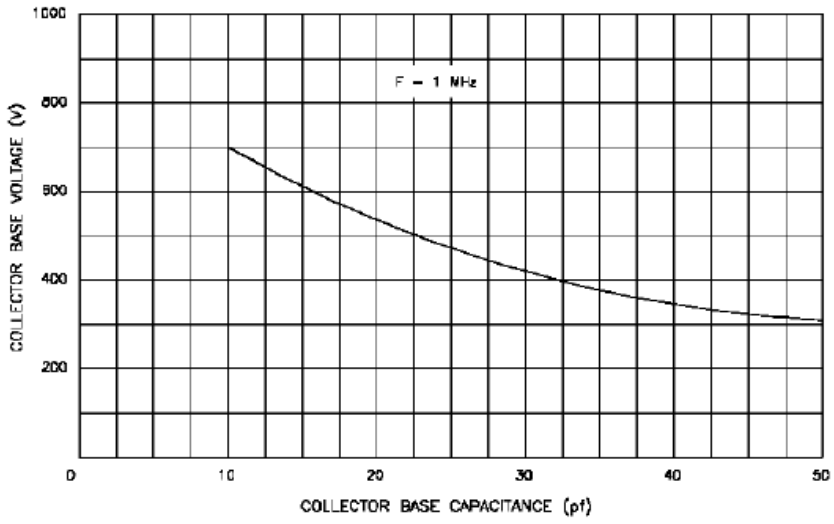


TYPICAL PERFORMANCE (cont'd)

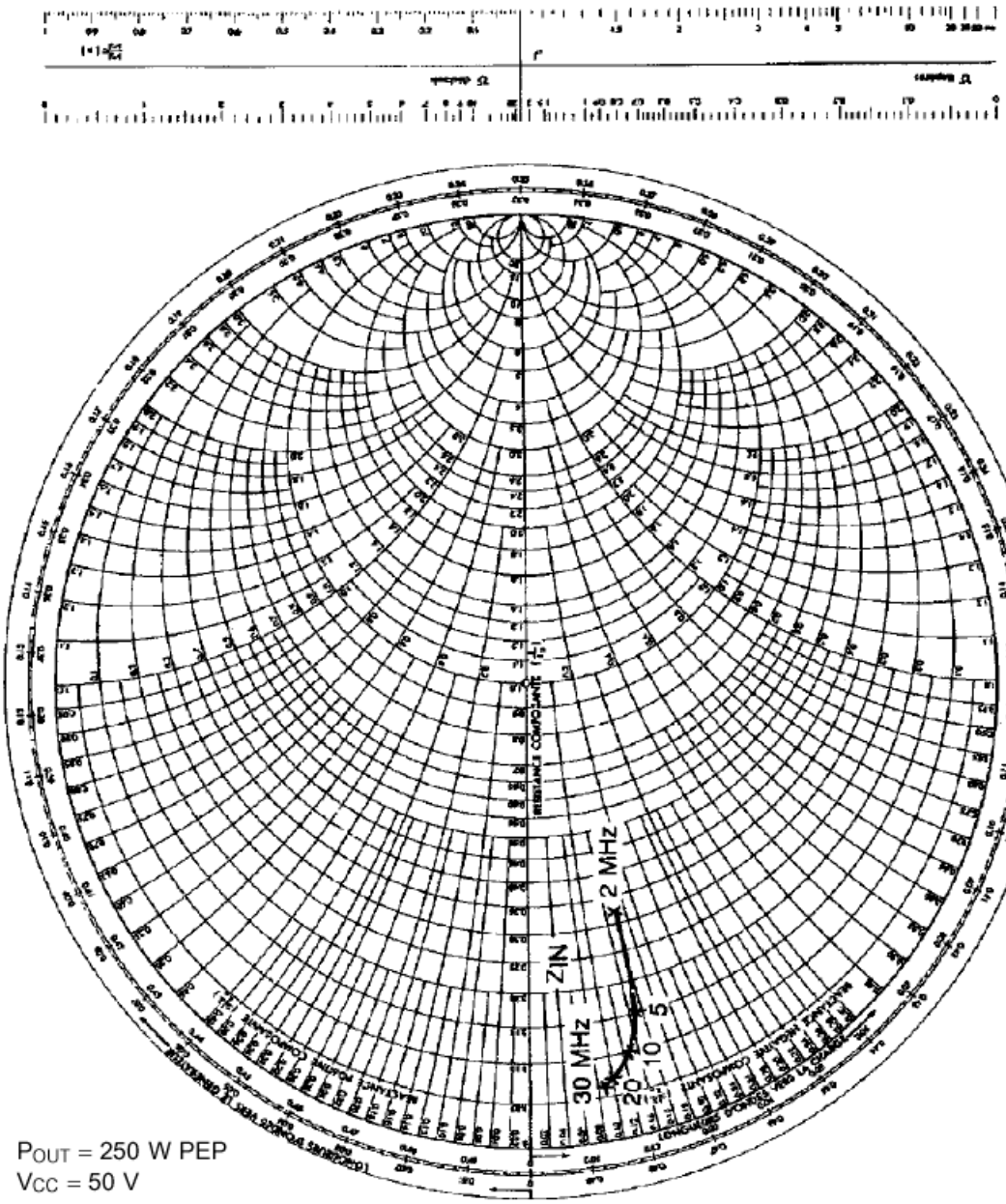
COLLECTOR BASE CAPACITANCE vs COLLECTOR BASE VOLTAGE



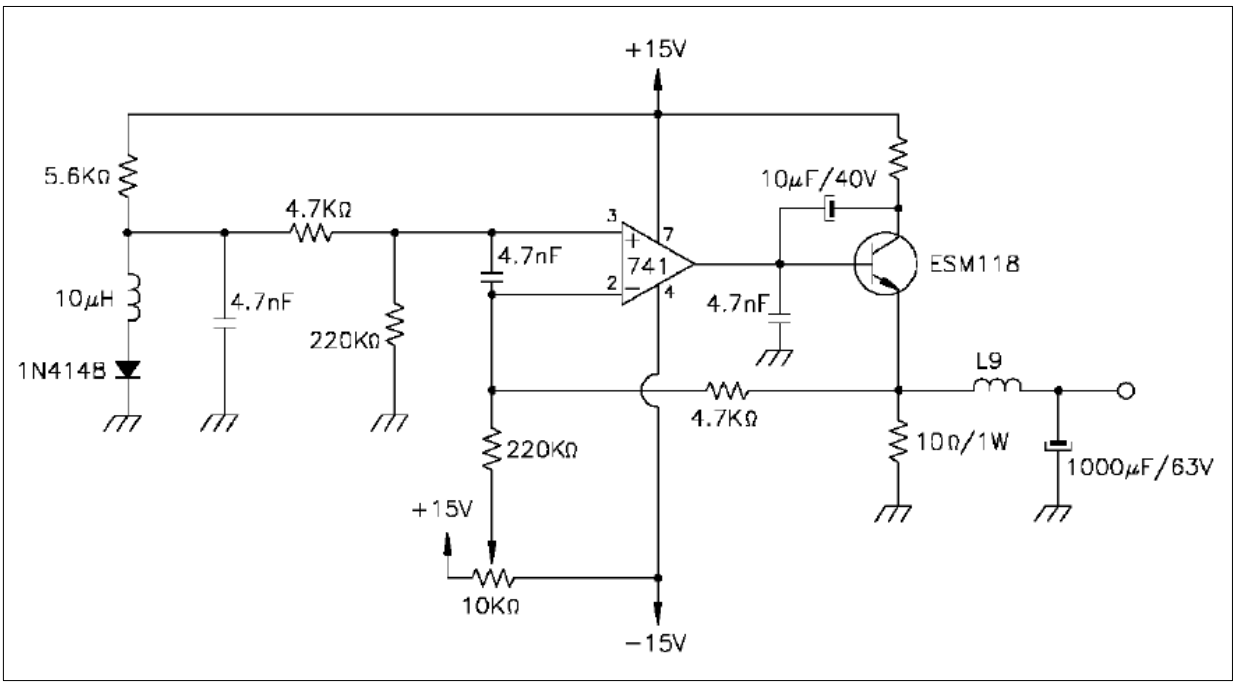
DC SAFE OPERATING AREA



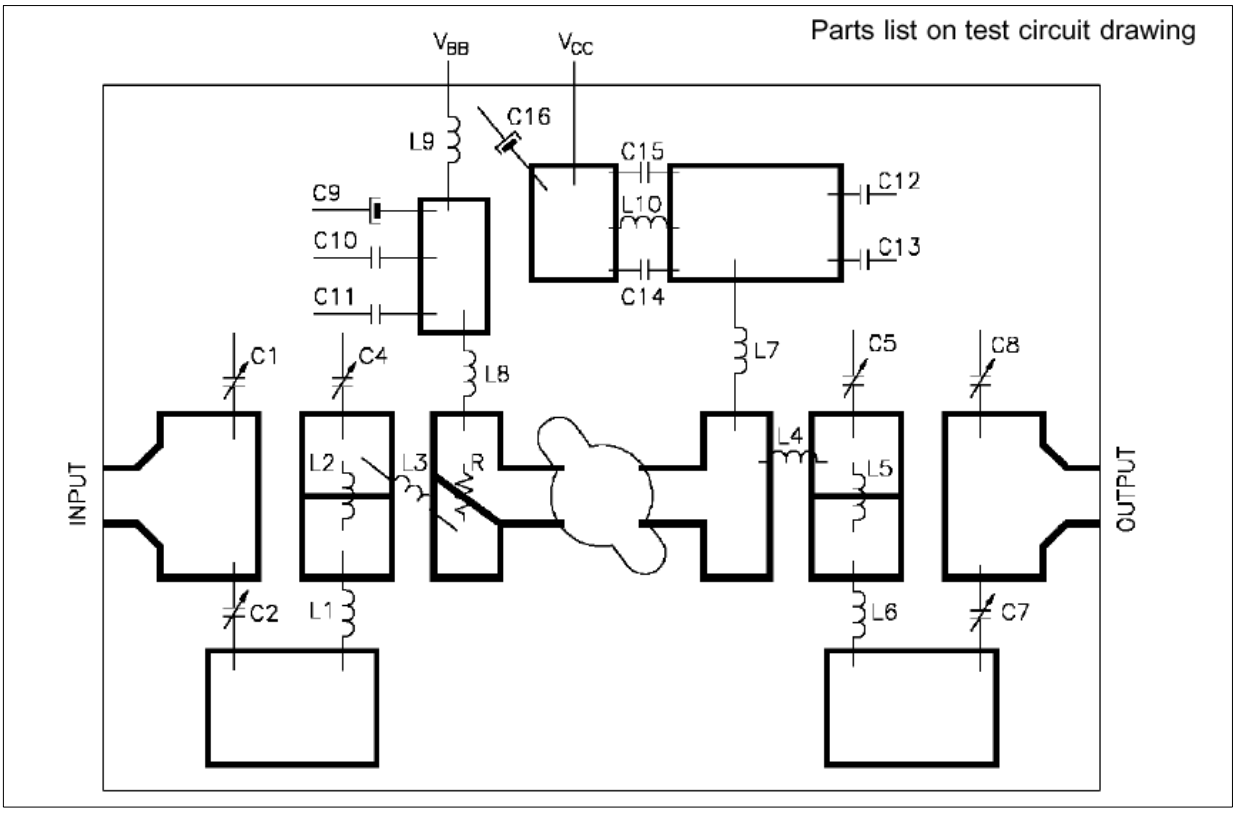
IMPEDANCE DATA (TYPICAL)



BIAS CIRCUIT

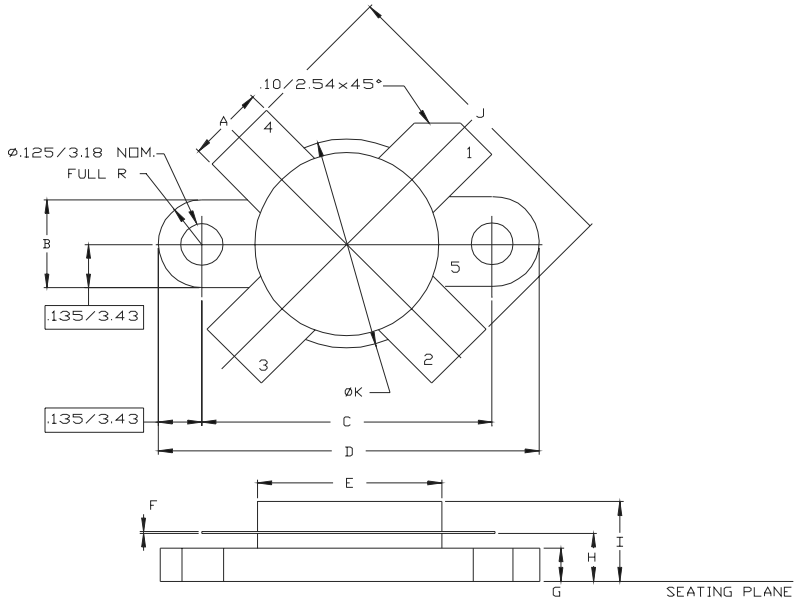


MOUNTING CIRCUIT



M177 (.550 DIA 4/L N/HERM W/FLG) MECHANICAL DATA

DIM.	mm			Inch		
	MIN.	TYP.	MAX	MIN.	TYP.	MAX
A	5.72		5.97	0.225		0.235
B	6.73		6.96	0.265		0.275
C	21.84		22.10	0.860		0.870
D	28.70		28.96	1.130		1.140
E	13.84		14.10	0.545		0.555
F	0.08		0.18	0.003		0.007
G	2.49		2.74	0.098		0.108
H	3.81		4.32	0.150		0.170
I			7.11			0.280
J	27.43		28.45	1.080		1.120
K	15.88		16.13	0.625		0.635



Controlling Dimension: Inches

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