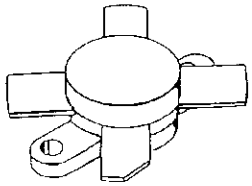
SGS-THOMSON MICROELECTRONICS

SD1728 (TH430)

RF & MICROWAVE TRANSISTORS HF SSB APPLICATIONS

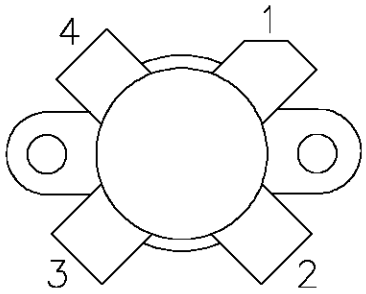
- OPTIMIZED FOR SSB
- 30 MHz
- 50 VOLTS
- IMD – 30 dB
- GOLD METALLIZATION
- COMMON EMITTER
- P_{OUT} = 250 W PEP WITH 14.5 dB GAIN



.550 4LFL (M177)
epoxy sealed

ORDER CODE	BRANDING
SD1728	TH430

PIN CONNECTION



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

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.

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	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 SPECIFICATIONS (T_{case} = 25°C)

STATIC

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

DYNAMIC

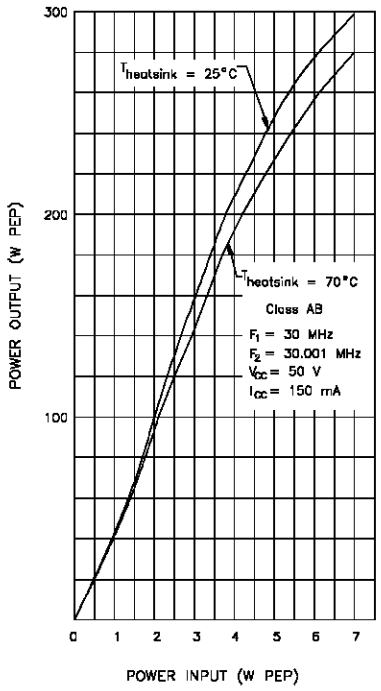
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 30 MHz	V_{CC} = 50 V	I_{CQ} = 150 mA	250	—	—	W
G_P*	P_{OUT} = 250 W PEP	V_{CC} = 50 V	I_{CQ} = 150 mA	14.5	—	—	dB
IMD*	P_{OUT} = 250 W PEP	V_{CC} = 50 V	I_{CQ} = 150 mA	—	—	–30	dBc
ηc*	P_{OUT} = 250 W PEP	V_{CC} = 50 V	I_{CQ} = 150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

Note: * Two Tone Method; f_1 = 30.00 MHz; f_2 = 30.001 MHz
In Class C: G_P Min. 13.5 dB, Efficiency 65%@ 30MHz
G_P Min. 10 dB, Efficiency 57%@ 70MHz

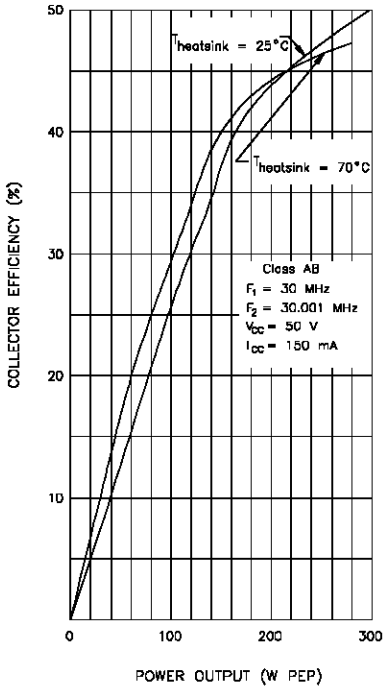
TYPICAL PERFORMANCE

CLASS AB

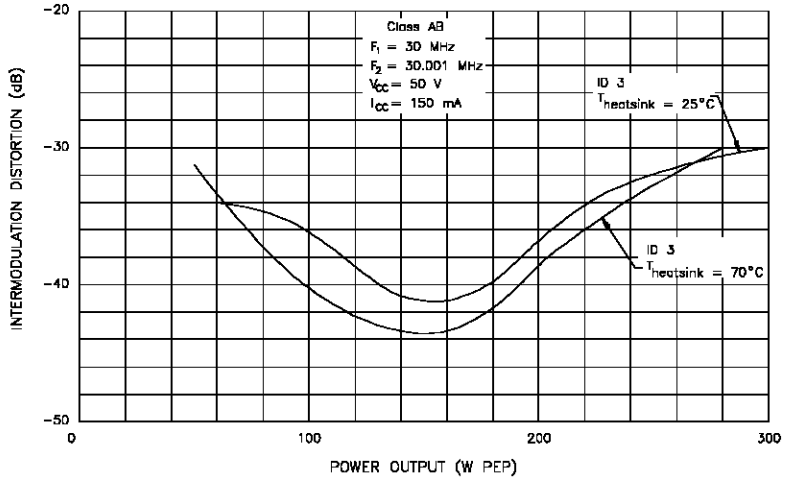
POWER OUTPUT PEP vs POWER INPUT



COLLECTOR EFFICIENCY vs POWER OUTPUT PEP

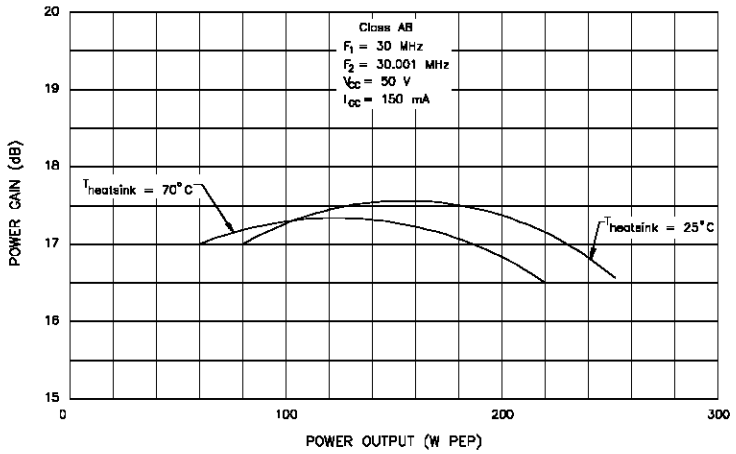


INTERMODULATION DISTORTION vs POWER OUTPUT PEP

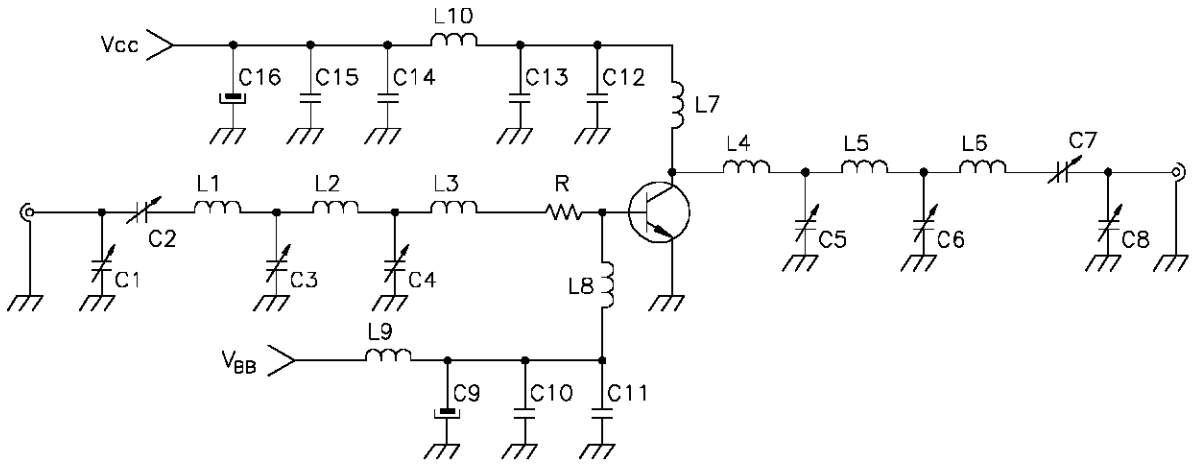


TYPICAL PERFORMANCE (cont'd)

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

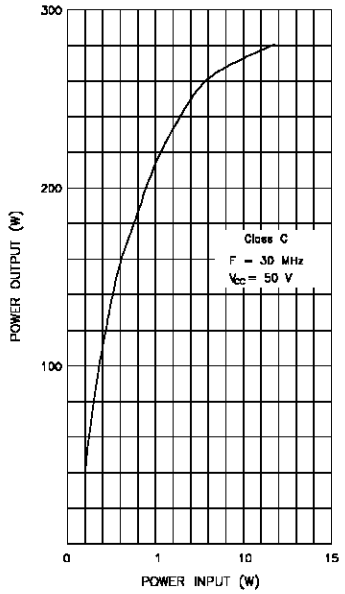
L1	:	5 Turns, Diameter 10mm, 1.3mm Wire, Length 15mm
L2	:	2 Turns, Diameter 12mm, 2mm Wire, Length 8mm
L3	:	1 Turn, Diameter 12mm, 2mm Wire, Length 5mm
L4	:	Hair Pin Copper Foil 20 x 5mm
L5	:	1 Turn, Diameter 12mm, 2mm Wire, Length 8mm
L6	:	5 Turns, Diameter 8mm, 1.3mm Wire, Length 18mm
L7	:	3 Turns,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

* 4 Resistors 1Ω 0.5W in parallel

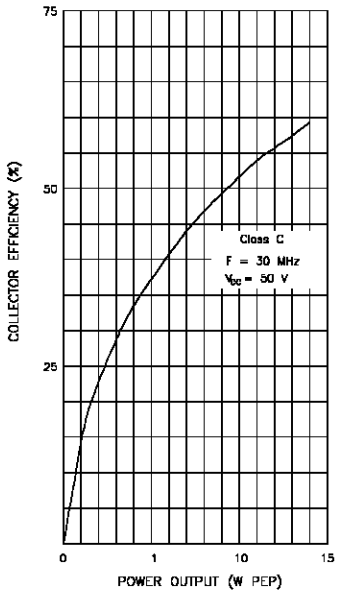
TYPICAL PERFORMANCE

CLASS C F = 30 MHz

POWER OUTPUT vs POWER INPUT

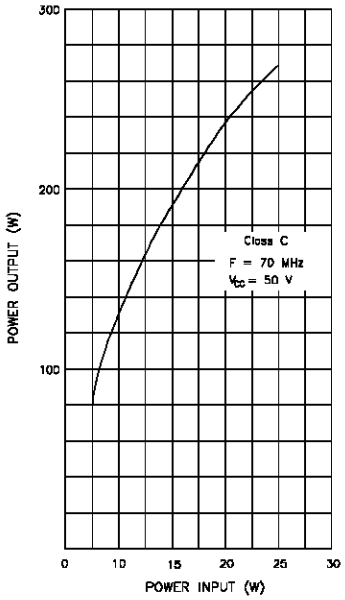


COLLECTOR EFFICIENCY vs POWER OUTPUT

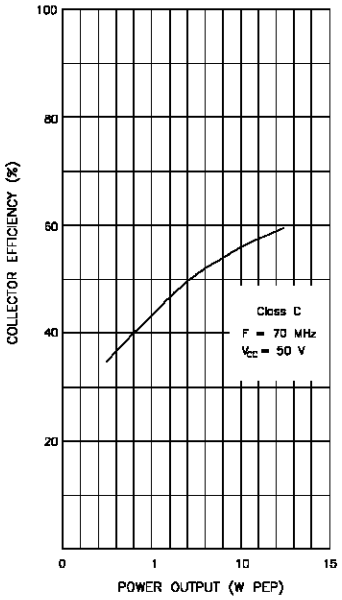


CLASS C F = 70 MHz

POWER OUTPUT vs POWER INPUT

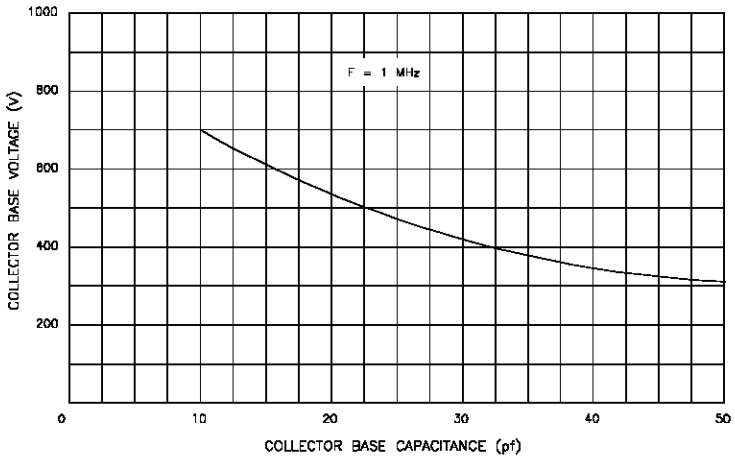


COLLECTOR EFFICIENCY vs POWER OUTPUT

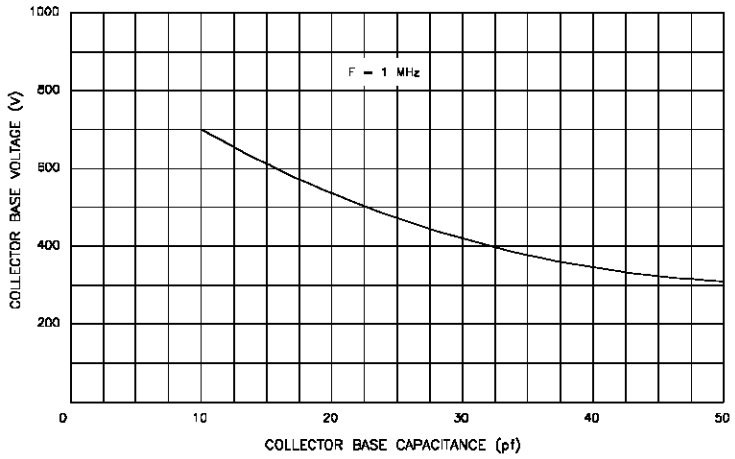


TYPICAL PERFORMANCE (cont'd)

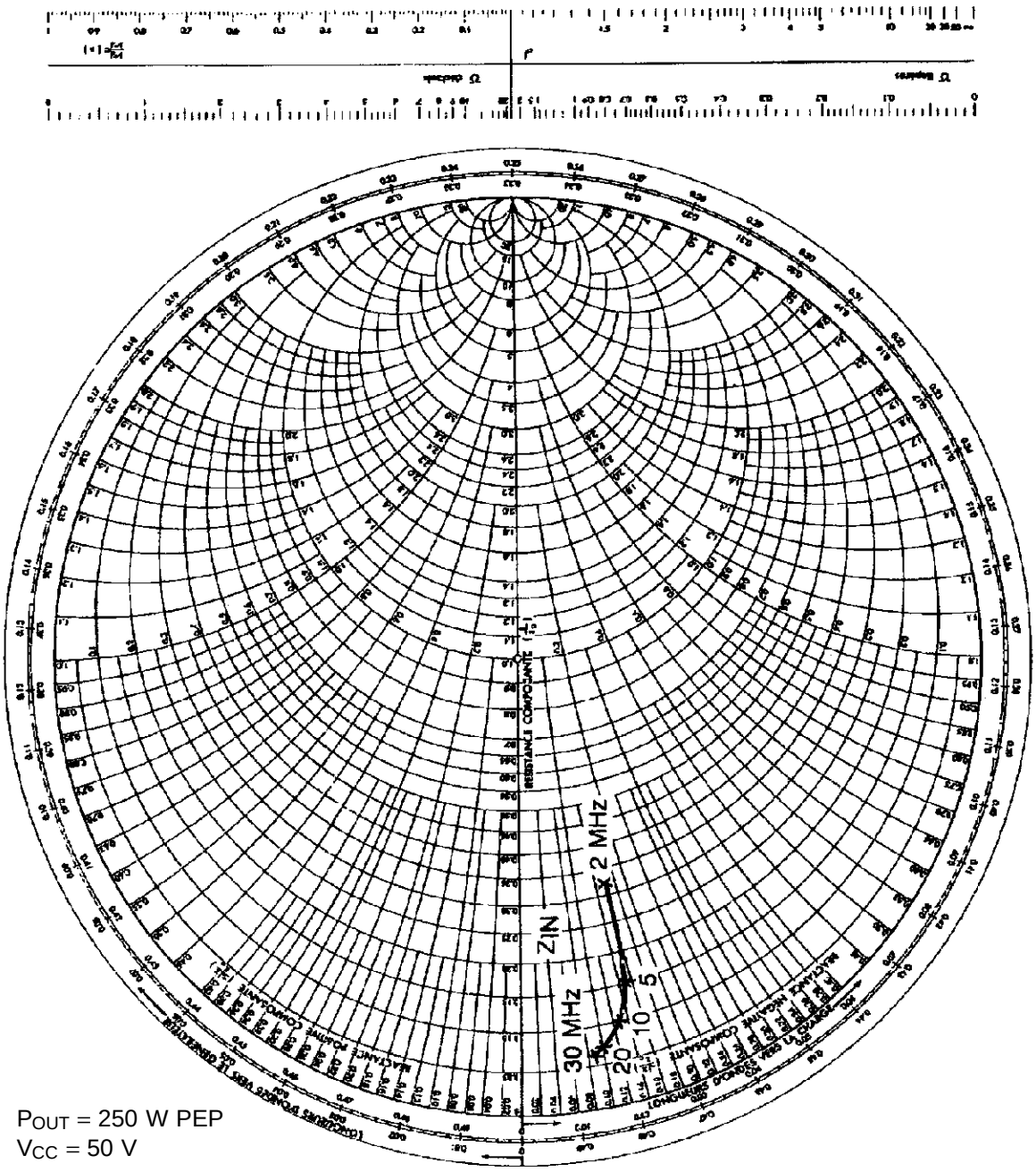
COLLECTOR BASE CAPACITANCE vs COLLECTOR BASE VOLTAGE



DC SAFE OPERATING AREA

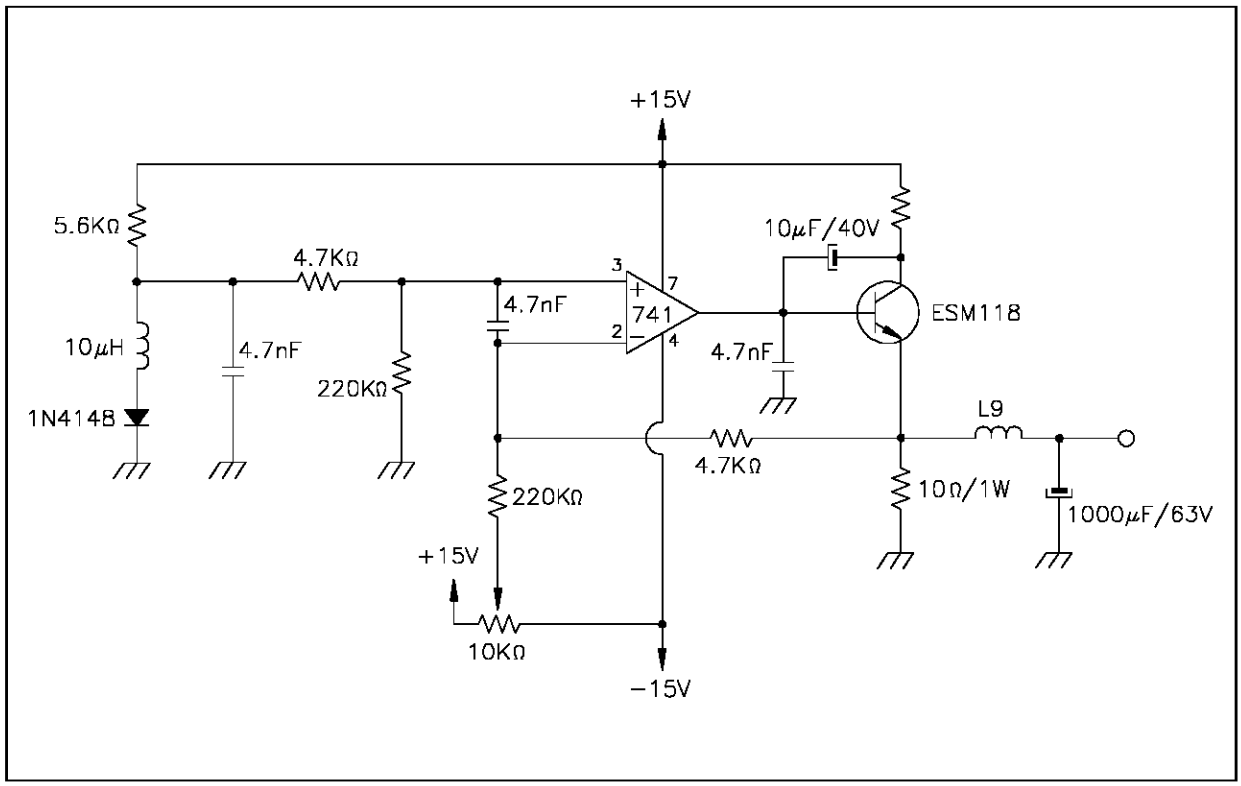


IMPEDANCE DATA (TYPICAL)

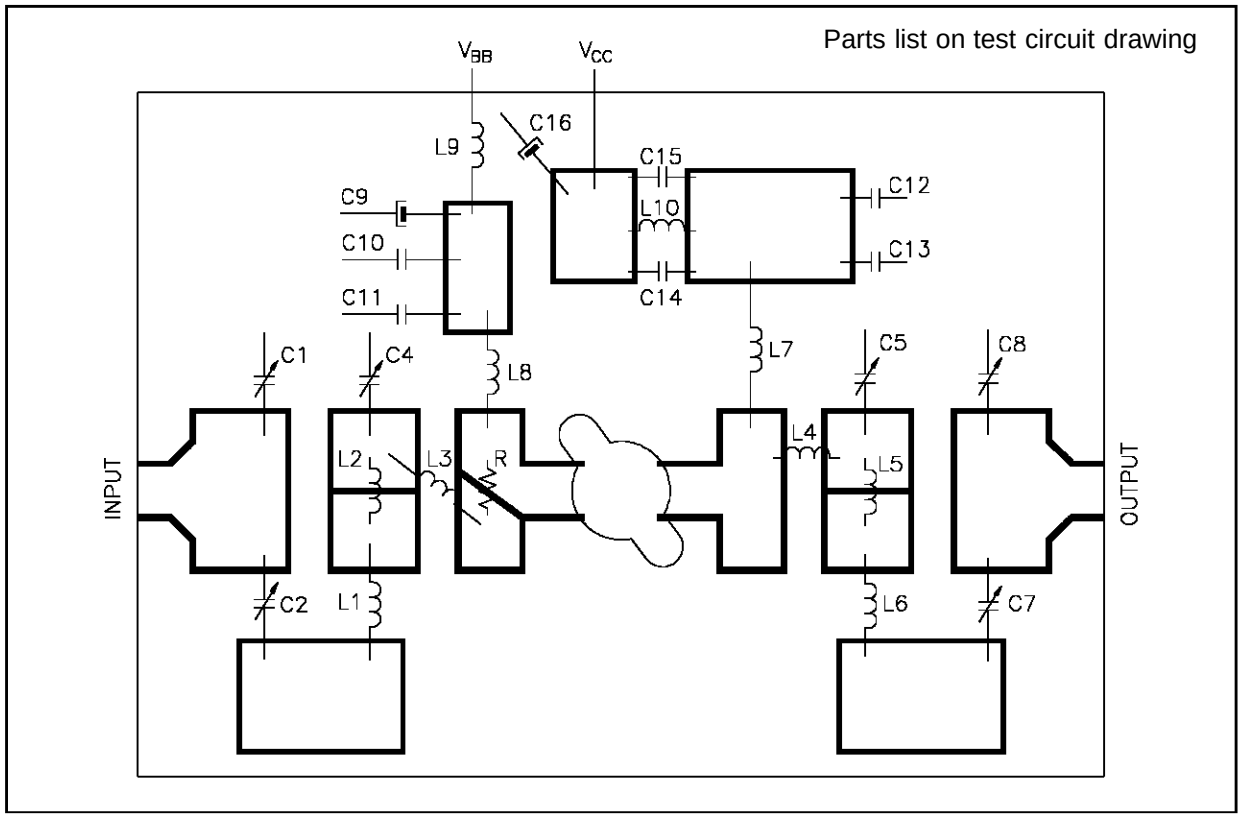


P_{OUT} = 250 W PEP
V_{CC} = 50 V

BIAS CIRCUIT

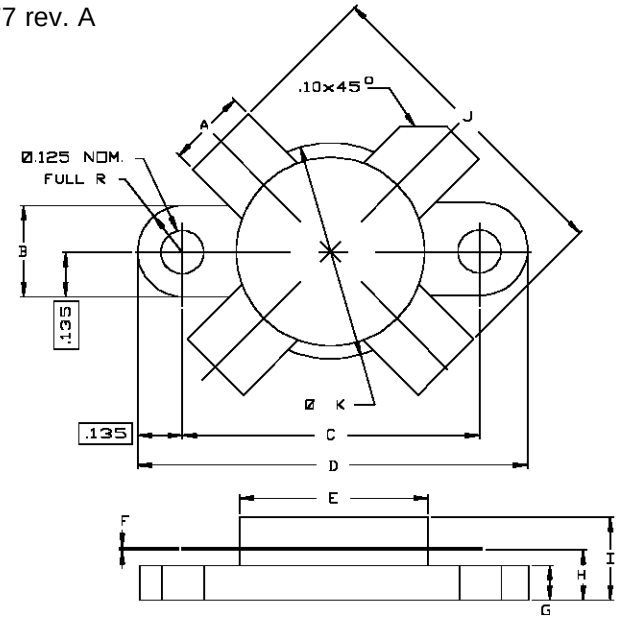


MOUNTING CIRCUIT



PACKAGE MECHANICAL DATA

Ref.: Dwg. No.12-0177 rev. A



SGS-THOMSON MICROELECTRONICS		
	MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.225/5,72	.235/5,97
B	.265/6,73	.275/6,96
C	.860/21,84	.870/22,10
D	1.130/28,70	1.140/28,96
E	.545/13,84	.555/14,10
F	.003/0,08	.007/0,18
G	.100/2,54	.118/3,00
H	.150/3,81	.170/4,32
I		.280/7,11
J	1.080/27,43	1.120/28,45

CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm
K	.625/15,88	.635/16,13