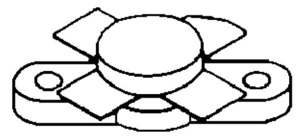
SGS-THOMSON MICROELECTRONICS

SD1731 (TH562)

RF & MICROWAVE TRANSISTORS HF SSB APPLICATIONS

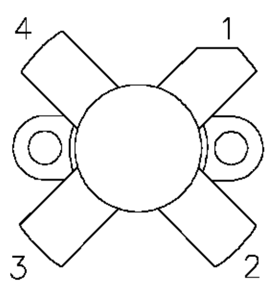
- OPTIMIZED FOR SSB
- 30 MHz
- 50 VOLTS
- EFFICIENCY 40%
- COMMON EMITTER
- GOLD METALLIZATION
- P_{OUT} = 220 W PEP WITH 13 dB GAIN



.500 4LFL (M174)
epoxy sealed

ORDER CODE	BRANDING
SD1731	TH562

PIN CONNECTION



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

DESCRIPTION

The SD1731 is a 50 V epitaxial silicon NPN planar transistor designed primarily for SSB 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	20	A
P_{DISS}	Power Dissipation ($T_{heatsink}$ ≤ 25°C)	233	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	0.55	°C/W
$R_{TH(c-s)}$	Case-Heatsink Thermal Resistance	0.2	°C/W

ELECTRICAL SPECIFICATIONS

STATIC (T_{case} = 25°C)

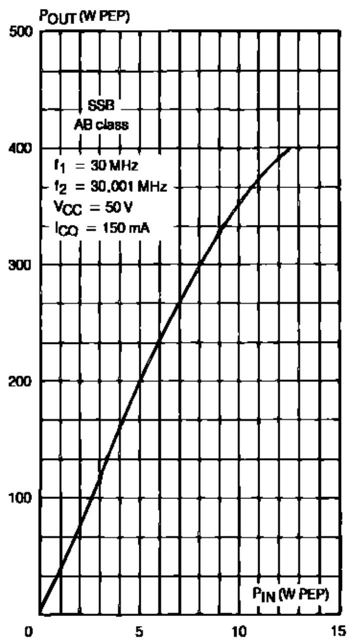
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 200 mA	I_E = 0 mA	110	—	—	V
BV_{CEO}	I_C = 200 mA	I_B = 0 mA	55	—	—	V
BV_{EBO}	I_E = 20 mA	I_C = 0 mA	4.0	—	—	V
I_{CEO}	V_{CE} = 30 V	I_E = 0 mA	—	—	5	mA
I_{CES}	V_{CE} = 55 V	I_E = 0 mA	—	—	10	mA
h_{FE}	V_{CE} = 6 V	I_C = 10 A	15	—	80	—

DYNAMIC ($T_{heatsink}$ = 25°C)

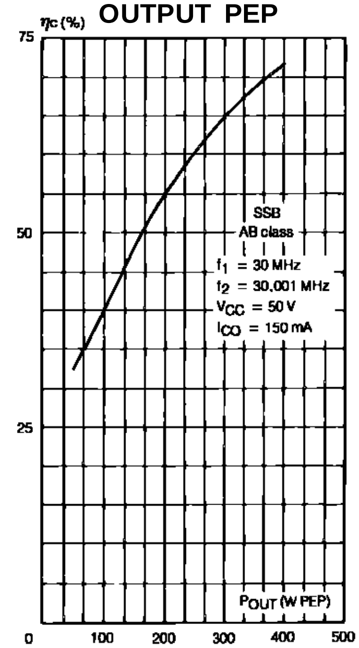
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 30 MHz	V_{CE} = 50 V	I_{CQ} = 150 mA	220	—	—	W
G_P*	P_{OUT} = 220 W PEP	V_{CE} = 50 V	I_{CQ} = 150 mA	13	—	—	dB
IMD*	P_{OUT} = 220 W PEP	V_{CE} = 50 V	I_{CQ} = 150 mA	—	—	–30	dBc
η_C*	P_{OUT} = 220 W PEP	V_{CE} = 50 V	I_{CQ} = 150 mA	40	—	—	%
C_{OB}	f = 1 MHz	V_{CB} = 50 V		—	330	—	pf

TYPICAL PERFORMANCE

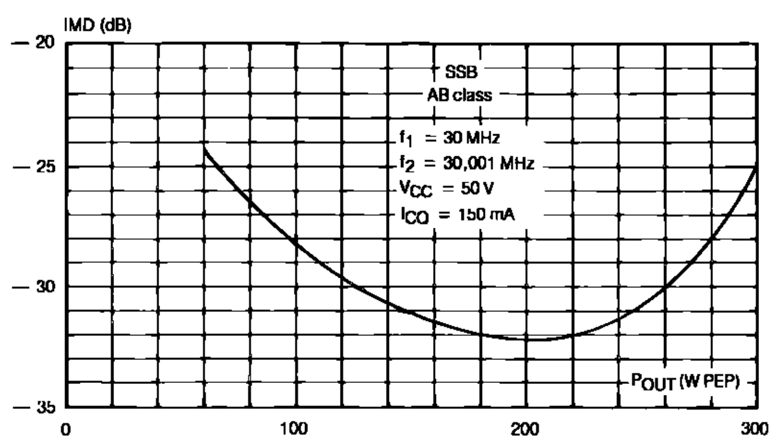
POWER OUTPUT PEP vs POWER INPUT



COLLECTOR EFFICIENCY vs POWER OUTPUT PEP

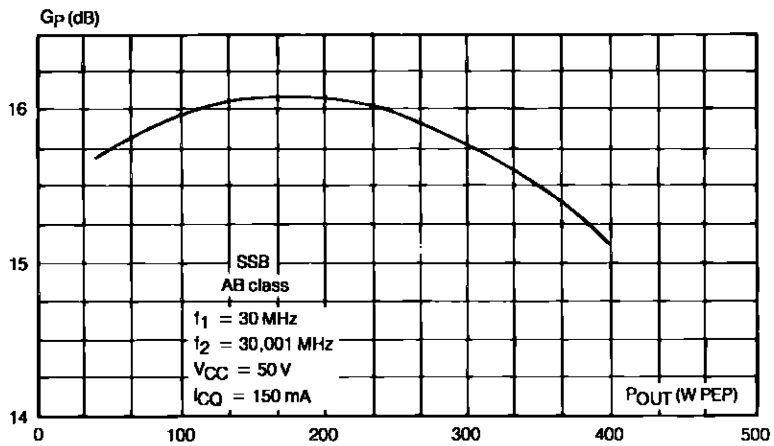


INTERMODULATION DISTORTION vs POWER OUTPUT PEP

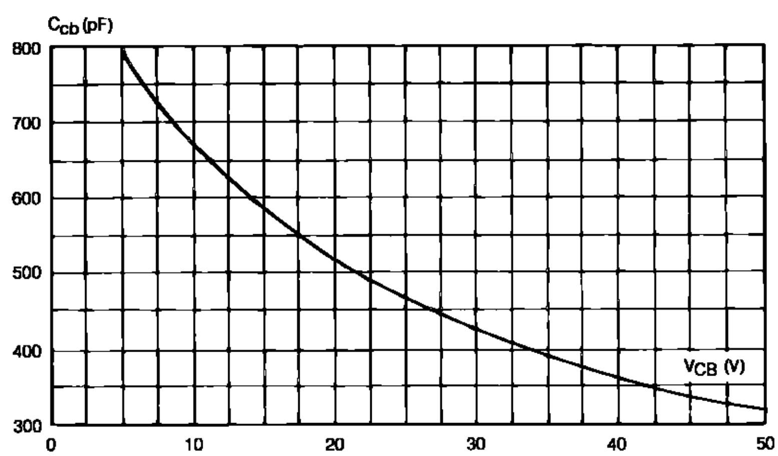


TYPICAL PERFORMANCE

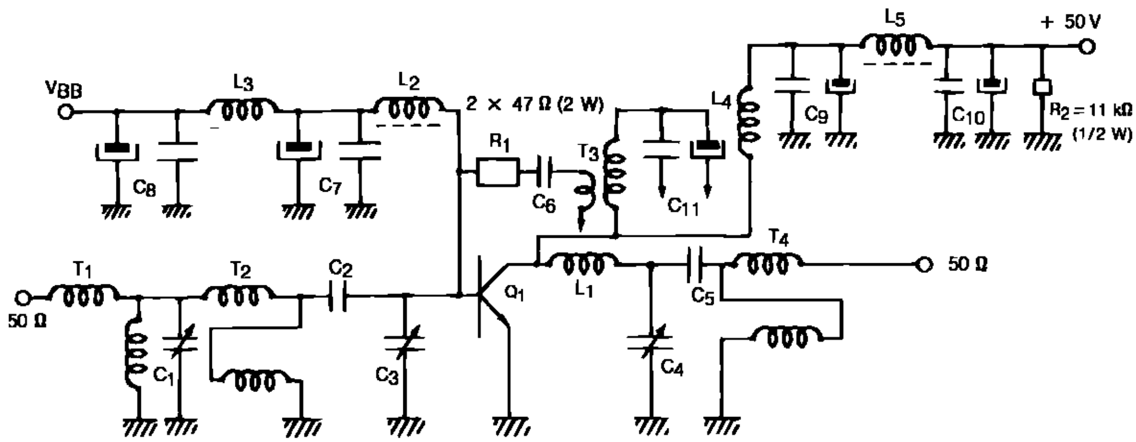
POWER GAIN vs POWER OUTPUT PEP



COLLECTOR BASE CAPACITANCE vs COLLECTOR EMITTER VOLTAGE

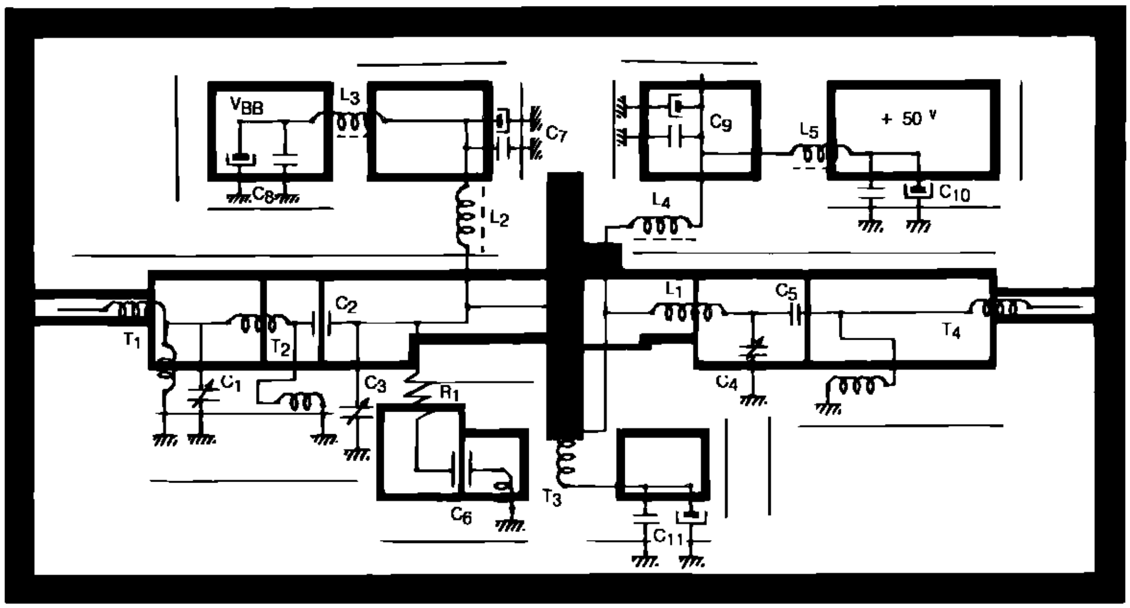


TEST CIRCUIT

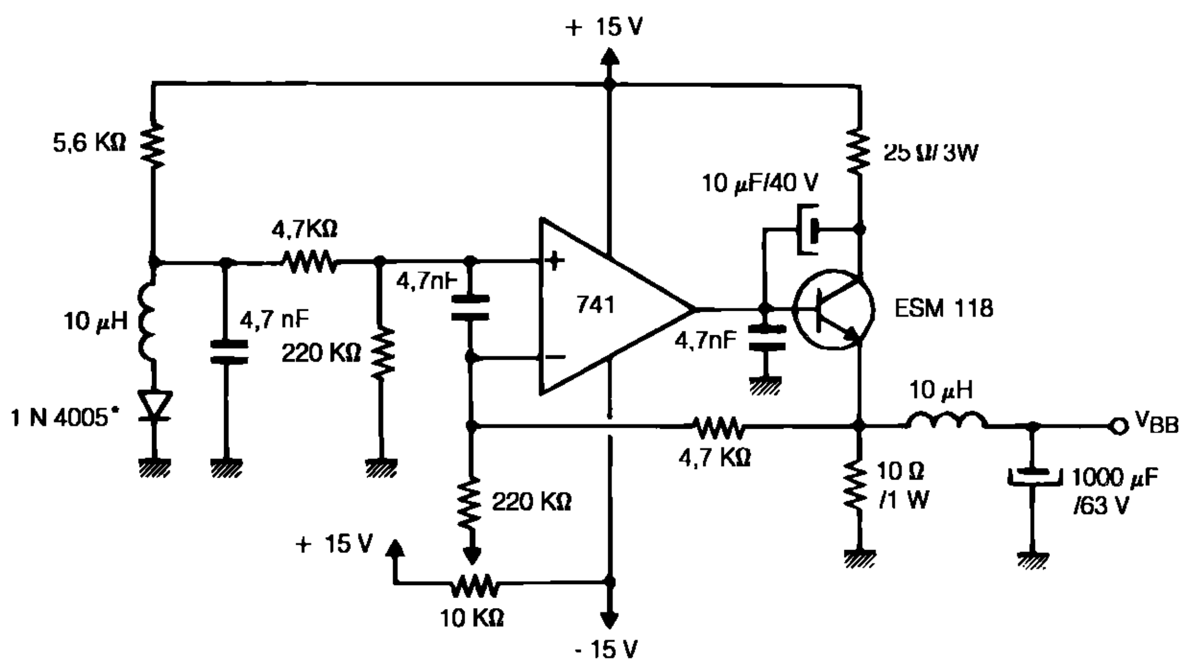


C1	:	Arco 426 + 220pF + 330pF Chips
C2	:	2 x 10nF Chips
C3	:	Arco 4615 + 2.2nF + 2 x 1nF LCC + 4.7nF + 560pf Chps
C4	:	Arco 4213 + 330pF Chip
C5	:	10nF Chip
C6	:	3 x 10nF Chips
C7, C8, C9, C10, C11	:	1nF + 10nF + 100nF + 4.7μF, 63V + 100μF, 63V
L1	:	3 Turns of 1.2mm Unenameled Wire Diameter, 7.1mm, Length 13mm
L2, L3	:	8 Turns of 0.55mm Enameled Wire on Ferrite Core Phillips 4C6 97170 (9 x 6 x 3)
L4	:	10 Turns of 1.2mm Enameled Wire, Diameter 8.1mm, Length 20mm
L5	:	7 Turns of 1.2mm Enameled Wire on Ferrite Core Phillips 4C6 97180
T1	:	6:3.5 Impedance Transformer on toriod Phillips 4C6 97180
T2	:	Twisted Pair 4:1 Transformer, 4 Turns Made with 1.0mm Enameled on toriod Phillips 4C6 97180
T3	:	Feedback Transformer Primary: 2 Turns of 1mm Enameled Wire Secondary: 8 Turns of 1mm Enameled Wire
T4	:	Twisted Pair 4:1 Transformer, 4 Turns of bifilar Twisted 1.2mm Wires on Ferrite Core Phillips 4C6 97200

MOUNTING CIRCUIT

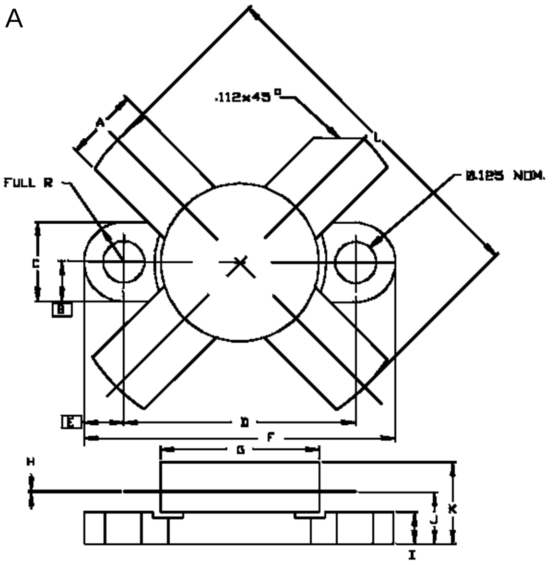


BIAS CIRCUIT



PACKAGE MECHANICAL DATA

Ref.: Dwg. No.12-0174 rev. A



SGS-THOMSON MICROELECTRONICS			CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm		MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.220/5,59	.230/5,84	K		.280/7,11
B	.125/3,18		L		1.050/26,67
C	.245/6,22	.255/6,48			
D	.720/18,28	.730/18,54			
E	.125/3,18				
F	.970/24,64	.980/24,89			
G	.495/12,57	.505/12,83			
H	.003/0,08	.007/0,18			
I	.090/2,29	.110/2,79			
J	.160/4,06	.175/4,45			