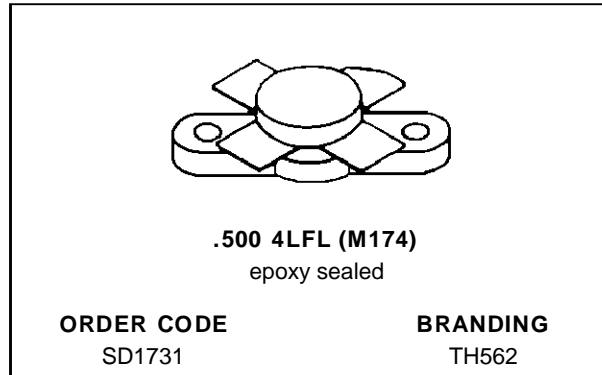


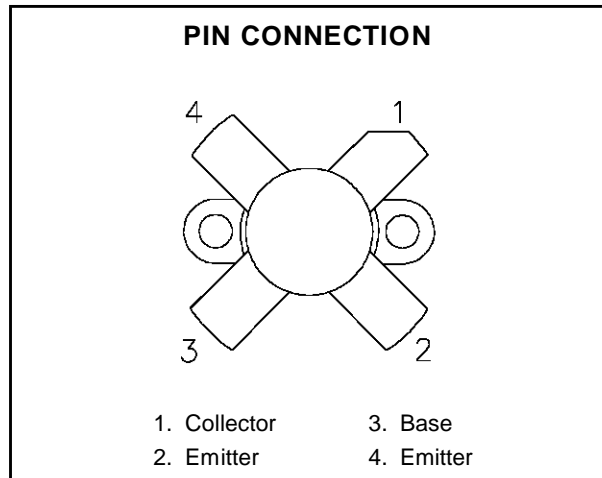
## RF & MICROWAVE TRANSISTORS HF SSB APPLICATIONS

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



### 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 ( $T_{case} = 25^{\circ}C$ )

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 ( $T_{heatsink} \leq 25^{\circ}C$ )	233	W
$T_J$	Junction Temperature	+200	$^{\circ}C$
$T_{STG}$	Storage Temperature	- 65 to +150	$^{\circ}C$

### THERMAL DATA

$R_{TH(j-c)}$	Junction-Case Thermal Resistance	0.55	$^{\circ}C/W$
$R_{TH(c-s)}$	Case-Heatsink Thermal Resistance	0.2	$^{\circ}C/W$

## ELECTRICAL SPECIFICATIONS

STATIC ( $T_{\text{case}} = 25^{\circ}\text{C}$ )

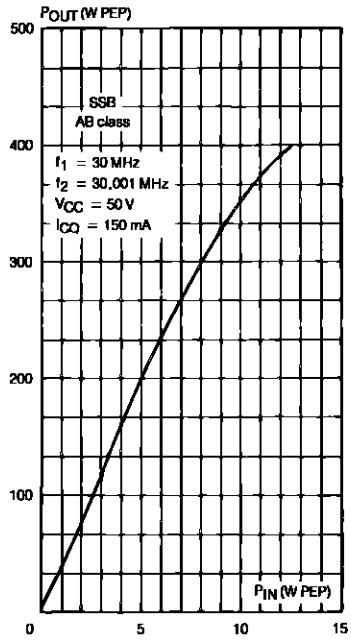
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
$BV_{CBO}$	$I_C = 200 \text{ mA}$	$I_E = 0 \text{ mA}$	110	—	—	V
$BV_{CEO}$	$I_C = 200 \text{ mA}$	$I_B = 0 \text{ mA}$	55	—	—	V
$BV_{EBO}$	$I_E = 20 \text{ mA}$	$I_C = 0 \text{ mA}$	4.0	—	—	V
$I_{CEO}$	$V_{CE} = 30 \text{ V}$	$I_E = 0 \text{ mA}$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

DYNAMIC ( $T_{\text{heatsink}} = 25^{\circ}\text{C}$ )

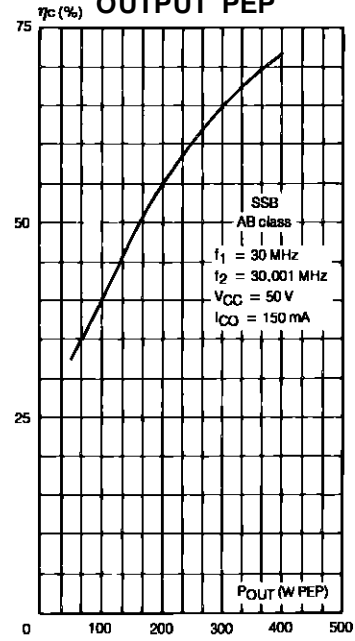
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
$P_{OUT}$	$f = 30 \text{ MHz}$	$V_{CE} = 50 \text{ V}$	$I_{CQ} = 150 \text{ mA}$	220	—	—	W
$G_P^*$	$P_{OUT} = 220 \text{ W PEP}$	$V_{CE} = 50 \text{ V}$	$I_{CQ} = 150 \text{ mA}$	13	—	—	dB
$IMD^*$	$P_{OUT} = 220 \text{ W PEP}$	$V_{CE} = 50 \text{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

## TYPICAL PERFORMANCE

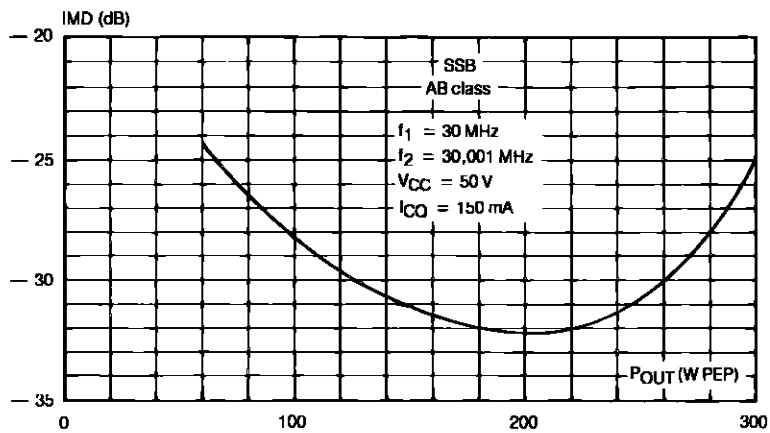
POWER OUTPUT PEP vs POWER INPUT



COLLECTOR EFFICIENCY vs POWER OUTPUT PEP

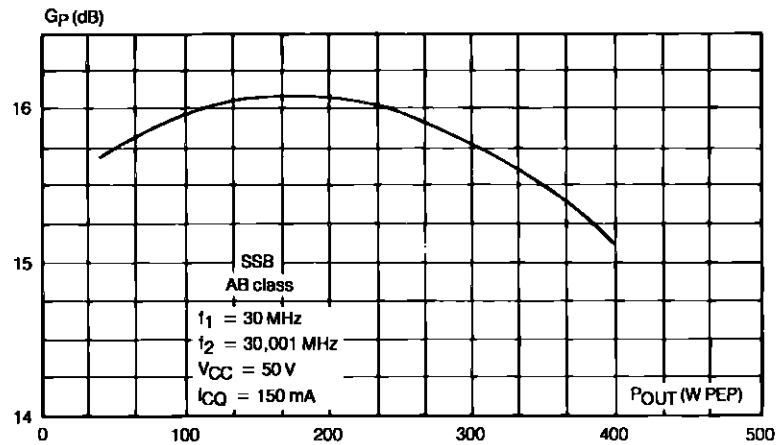


INTERMODULATION DISTORTION vs POWER OUTPUT PEP

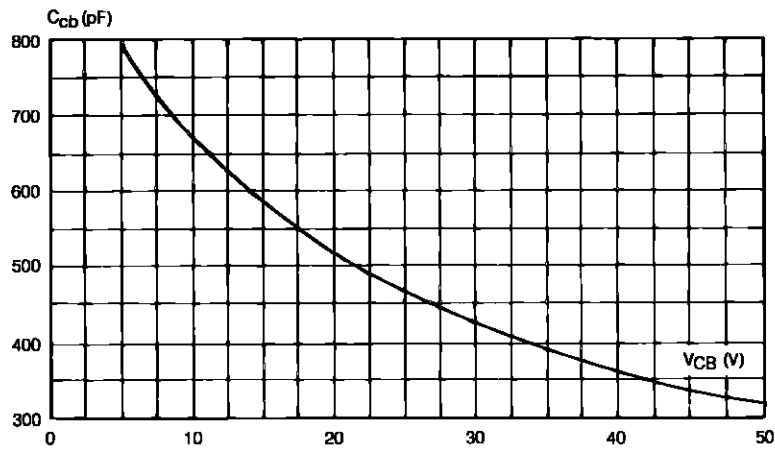


## TYPICAL PERFORMANCE

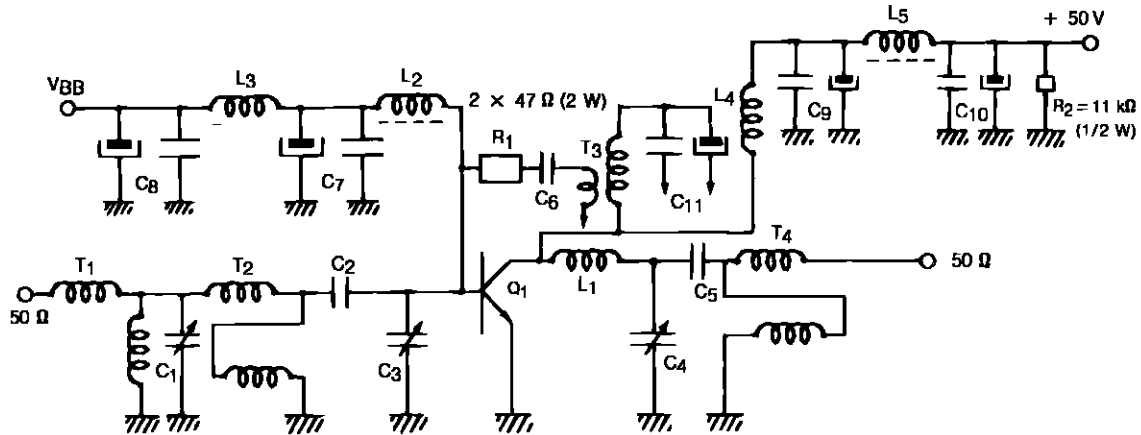
POWER GAIN vs POWER OUTPUT PEP



COLLECTOR BASE CAPACITANCE vs COLLECTOR EMITTER VOLTAGE

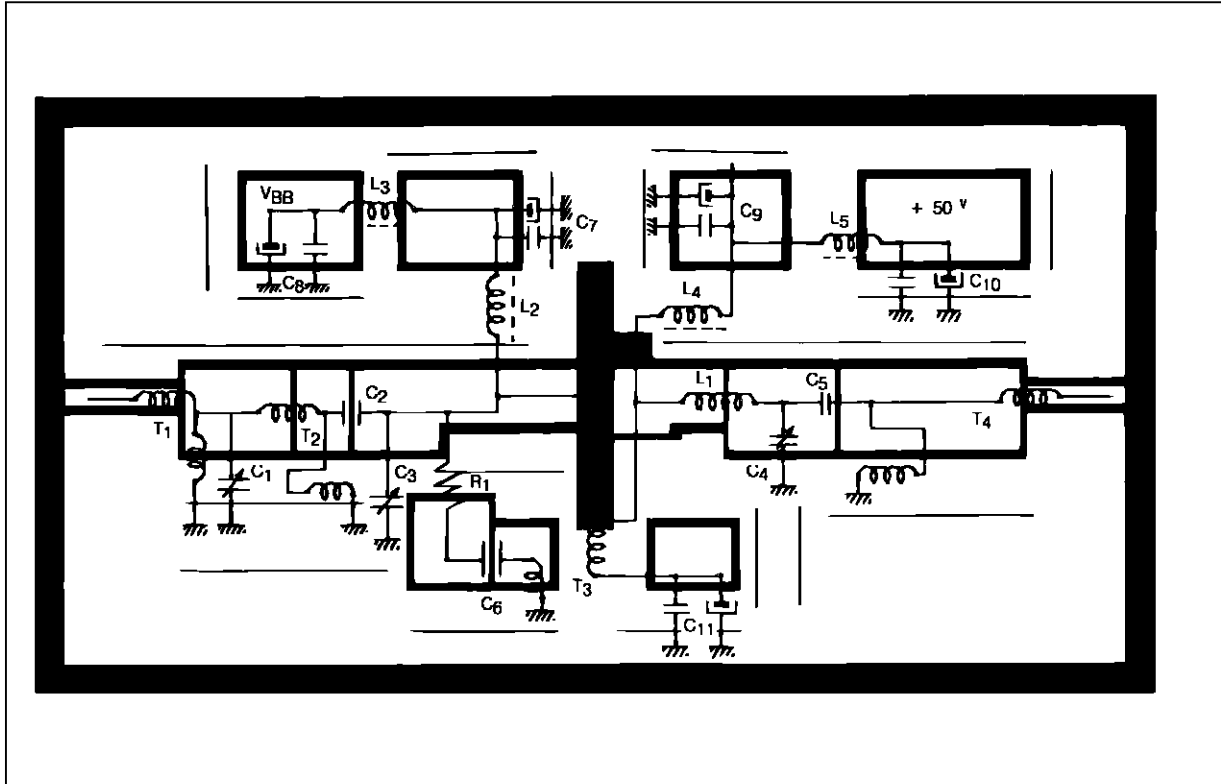


## TEST CIRCUIT

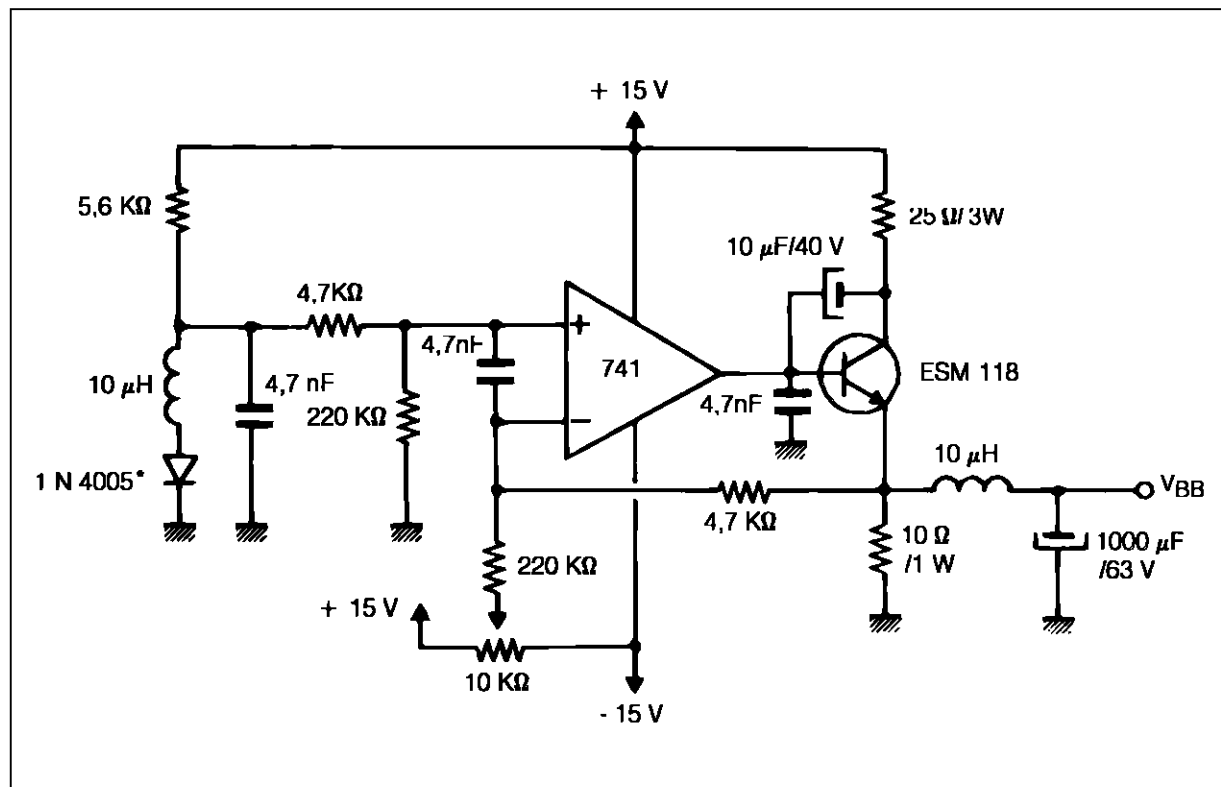


- |                      |  |    |  |
|----------------------|--|----|--|
| C1                   | : Arco 426 + 220pF + 330pF Chips   | L4 | : 10 Turns of 1.2mm Enameled Wire, Diameter 8.1mm, Length 20mm   |
| C2                   | : 2 x 10nF Chips   | L5 | : 7 Turns of 1.2mm Enameled Wire on Ferrite Core Phillips 4C6 97180  |
| C3                   | : Arco 4615 + 2.2nF + 2 x 1nF LCC + 4.7nF + 560pF Chips                          | T1 | : 6:3.5 Impedance Transformer on toroid Phillips 4C6 97180   |
| C4                   | : Arco 4213 + 330pF Chip   | T2 | : Twisted Pair 4:1 Transformer, 4 Turns Made with 1.0mm Enameled on toroid Phillips 4C6 97180              |
| C5                   | : 10nF Chip  | T3 | : Feedback Transformer<br>Primary: 2 Turns of 1mm Enameled Wire<br>Secondary: 8 Turns of 1mm Enameled Wire |
| C6                   | : 3 x 10nF Chips   | T4 | : Twisted Pair 4:1 Transformer, 4 Turns of bifilar Twisted 1.2mm Wires on Ferrite Core Phillips 4C6 97200  |
| 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) |    |  |

## MOUNTING CIRCUIT

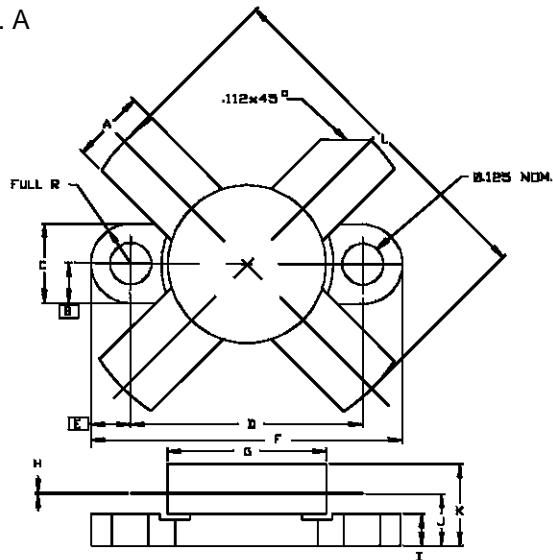


## BIAS CIRCUIT



## PACKAGE MECHANICAL DATA

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



SGS-THOMSON MICROELECTRONICS		CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm		
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		

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