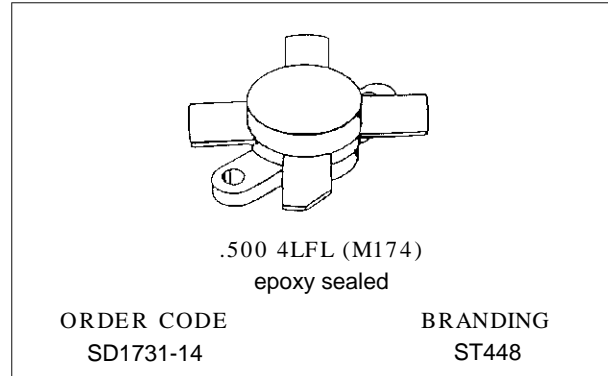


## RF & MICROWAVE TRANSISTORS HF SSB APPLICATIONS

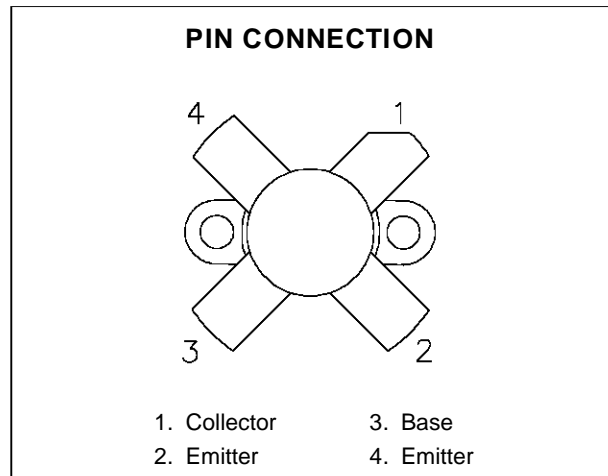
PRELIMINARY DATA

- OPTIMIZED FOR SSB
- 30 MHz
- 50 VOLTS
- EFFICIENCY 40%
- COMMON EMITTER
- GOLD METALLIZATION
- P<sub>OUT</sub> = 250 W PEP WITH 12 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<sub>case</sub> = 25°C)

Symbol	Parameter	Value	Unit
V <sub>CBO</sub>	Collector-Base Voltage	110	V
V <sub>CEO</sub>	Collector-Emitter Voltage	55	V
V <sub>EBO</sub>	Emitter-Base Voltage	4.0	V
I <sub>C</sub>	Device Current	20	A
P <sub>DISS</sub>	Power Dissipation (T <sub>heatsink</sub> ≤ 25°C)	257	W
T <sub>J</sub>	Junction Temperature	+200	°C
T <sub>STG</sub>	Storage Temperature	- 65 to +150	°C

### THERMAL DATA

R <sub>TH(j-c)</sub>	Junction-Case Thermal Resistance	0.48	°C/W
R <sub>TH(c-s)</sub>	Case-Heatsink Thermal Resistance	0.2	°C/W

## ELECTRICAL SPECIFICATIONS

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

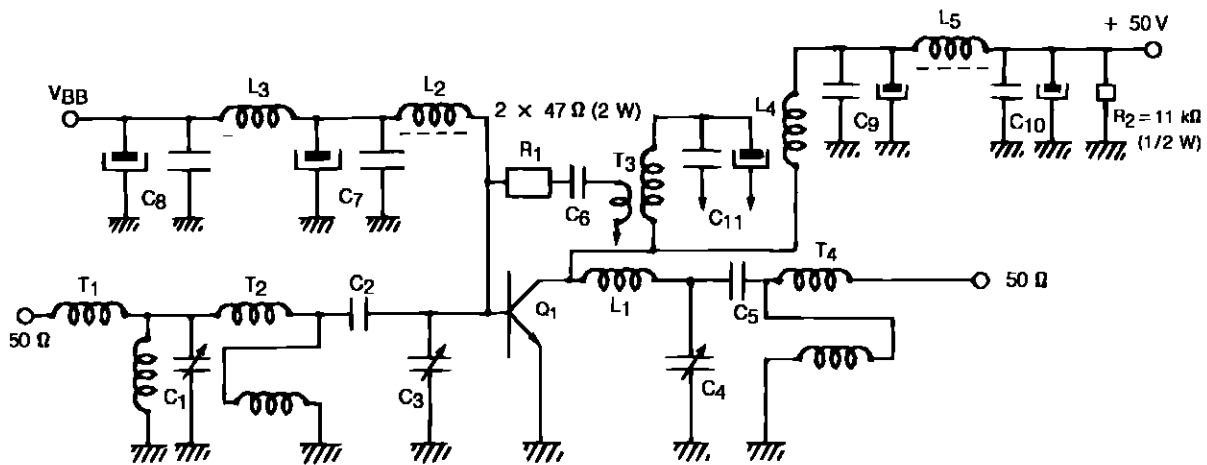
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
$BV_{CBO}$	$I_C = 200 \text{ mA}$	$I_E = 0 \text{ mA}$	110	—	—	V
$BV_{CEO}$	$I_C = 200 \text{ mA}$	$I_B = 0 \text{ mA}$	55	—	—	V
$BV_{EBO}$	$I_E = 20 \text{ mA}$	$I_C = 0 \text{ mA}$	4.0	—	—	V
$I_{CEO}$	$V_{CE} = 30 \text{ V}$	$I_B = 0 \text{ mA}$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

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

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
$P_{OUT}$	$f = 30 \text{ MHz}$	$V_{CC} = 50 \text{ V}$	$I_{CQ} = 150 \text{ mA}$	250	—	—	W
$G_P^*$	$P_{OUT} = 250 \text{ W PEP}$	$V_{CC} = 50 \text{ V}$	$I_{CQ} = 150 \text{ mA}$	12	—	—	dB
$IMD^*$	$P_{OUT} = 250 \text{ W PEP}$	$V_{CC} = 50 \text{ V}$	$I_{CQ} = 150 \text{ mA}$	—	—	-30	dBc
$\eta_C^*$	$P_{OUT} = 250 \text{ W PEP}$	$V_{CC} = 50 \text{ V}$	$I_{CQ} = 150 \text{ mA}$	40	45	—	%
$COB$	$f = 1 \text{ MHz}$	$V_{CB} = 50 \text{ V}$		—	270	—	pf

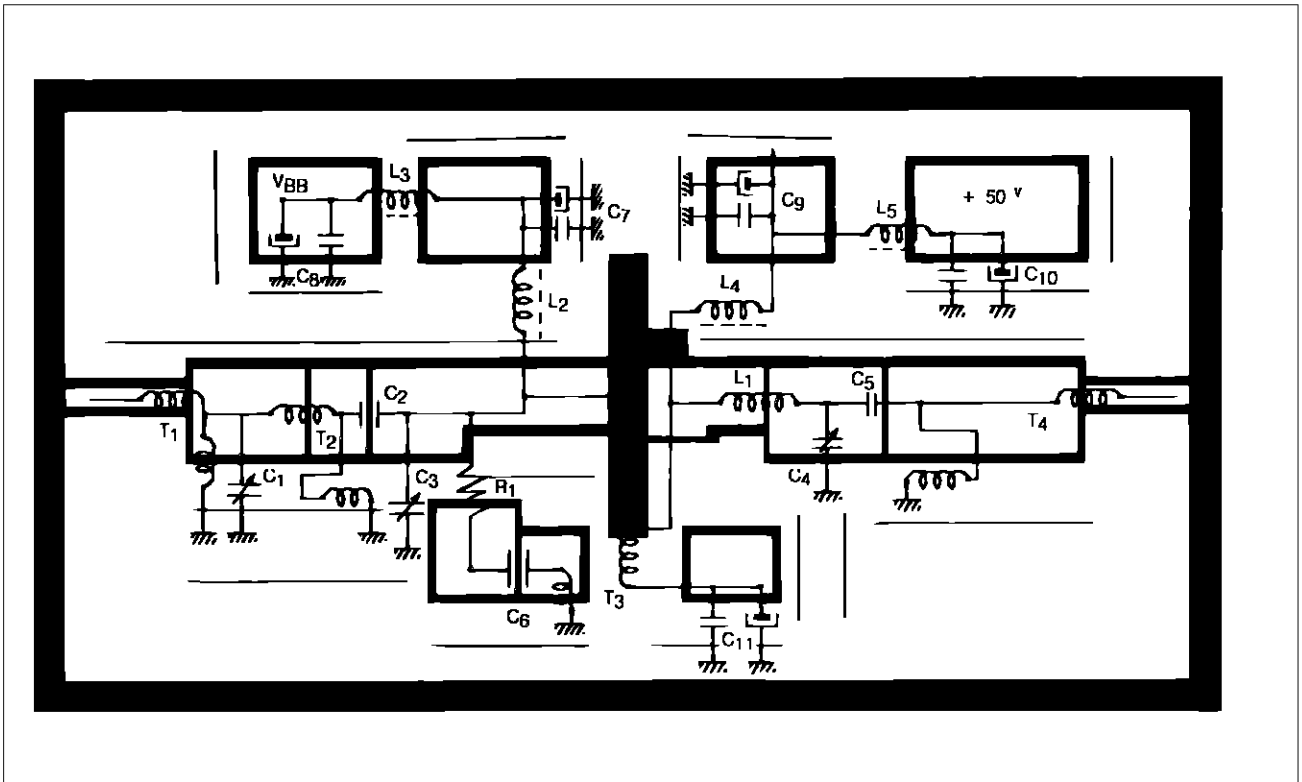
Note:  $*f_1 = 30.00 \text{ MHz}$ ,  $f_2 = 30.001 \text{ MHz}$

## TEST CIRCUIT

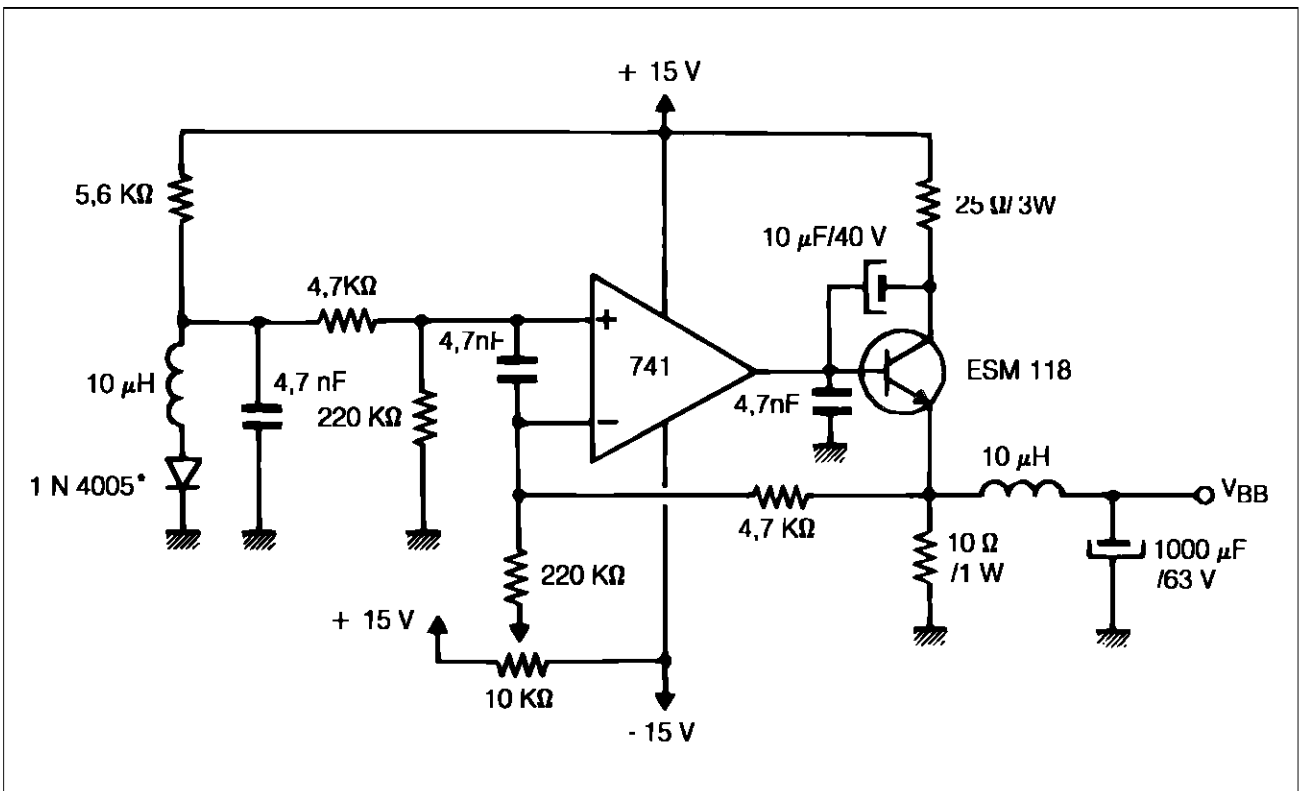


- |                        |   |      |  |
|------------------------|---|------|--|
| C1 :                   | Arco 426 + 220pF + 330pF Chips  | L4 : | 10 Turns of 1.2mm Enameled Wire, Diameter 8.1mm, Length 20mm   |
| C2 :                   | 2 x 10nF Chips  | L5 : | 7 Turns of 1.2mm Enameled Wire on Ferrite Core Phillips 4C6 97180  |
| C3 :                   | Arco 4615 + 2.2nF + 2 x 1nF LCC + 4.7nF + 560pf Chps                            | T1 : | 6:3.5 Impedance Transformer on toriod Phillips 4C6 97180   |
| C4 :                   | Arco 4213 + 330pF Chip  | T2 : | Twisted Pair 4:1 Transformer, 4 Turns Made with 1.0mm Enameled on toriod 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

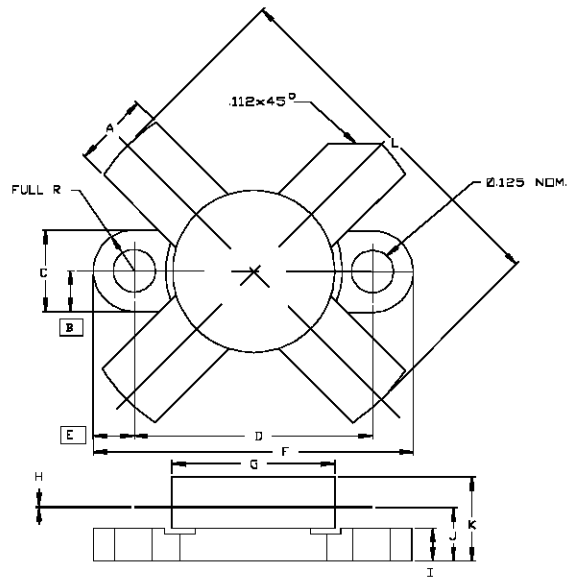


BIAS CIRCUIT



## PACKAGE MECHANICAL DATA

Ref.: Dwg. No.12-0174  
UDCS No. 1011000 rev. C



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	.980/24,89
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	.150/3,81	.175/4,45		

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