

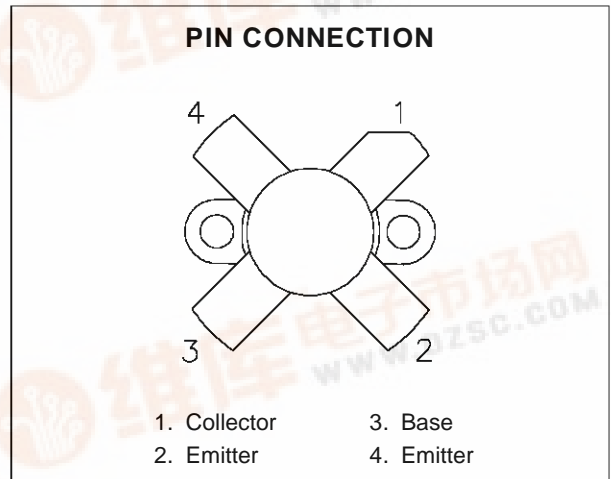
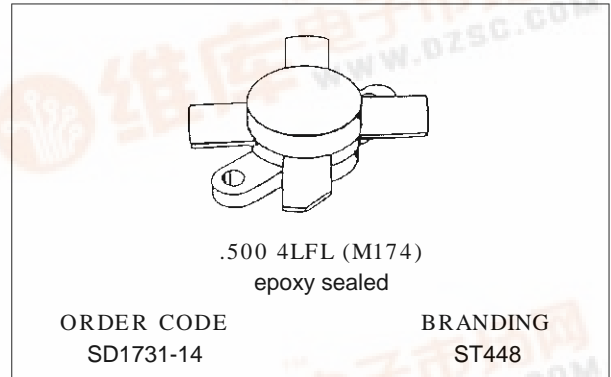


SD1731-14 (ST448)

RF & MICROWAVE TRANSISTORS HF SSB APPLICATIONS

PRELIMINARY DATA

- OPTIMIZED FOR SSB
- 30 MHz
- 50 VOLTS
- EFFICIENCY 40%
- COMMON EMITTER
- GOLD METALLIZATION
- P_{OUT} = 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_{case} = 25°C)

Symbol	Parameter	Value	Unit
V _{CB0}	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)	257	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	0.48	°C/W
R _{TH(c-s)}	Case-Heatsink Thermal Resistance	0.2	°C/W

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ELECTRICAL SPECIFICATIONS

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

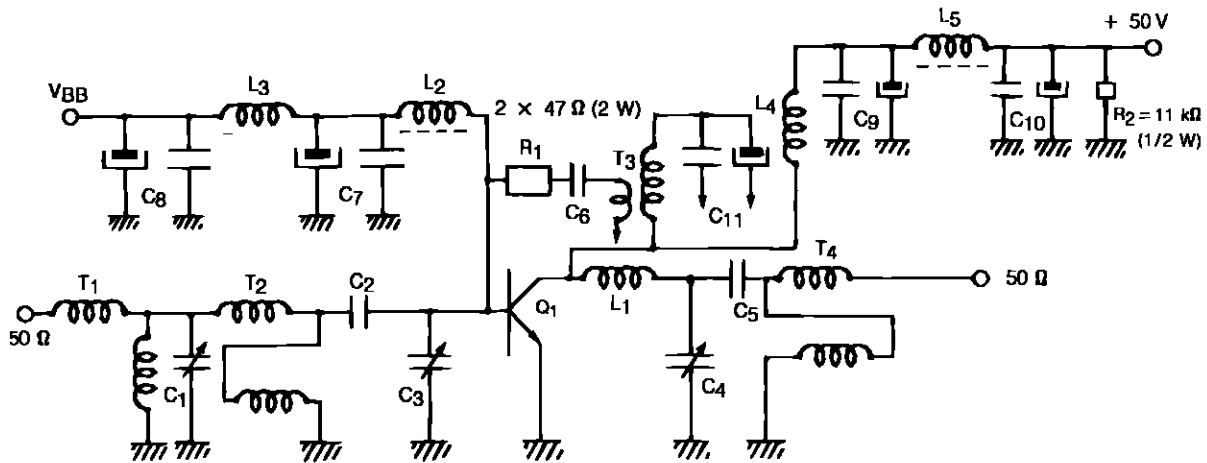
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	$I_C = 200 \text{ mA}$	$I_E = 0 \text{ mA}$	110	—	—	V
BV_{CEO}	$I_C = 200 \text{ mA}$	$I_B = 0 \text{ mA}$	55	—	—	V
BV_{EBO}	$I_E = 20 \text{ mA}$	$I_C = 0 \text{ mA}$	4.0	—	—	V
I_{CEO}	$V_{CE} = 30 \text{ V}$	$I_B = 0 \text{ mA}$	—	—	5	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
η_C^*	$P_{OUT} = 250 \text{ W PEP}$	$V_{CC} = 50 \text{ V}$	$I_{CQ} = 150 \text{ mA}$	40	45	—	%
C_{OB}	$f = 1 \text{ MHz}$	$V_{CB} = 50 \text{ V}$		—	270	—	pf

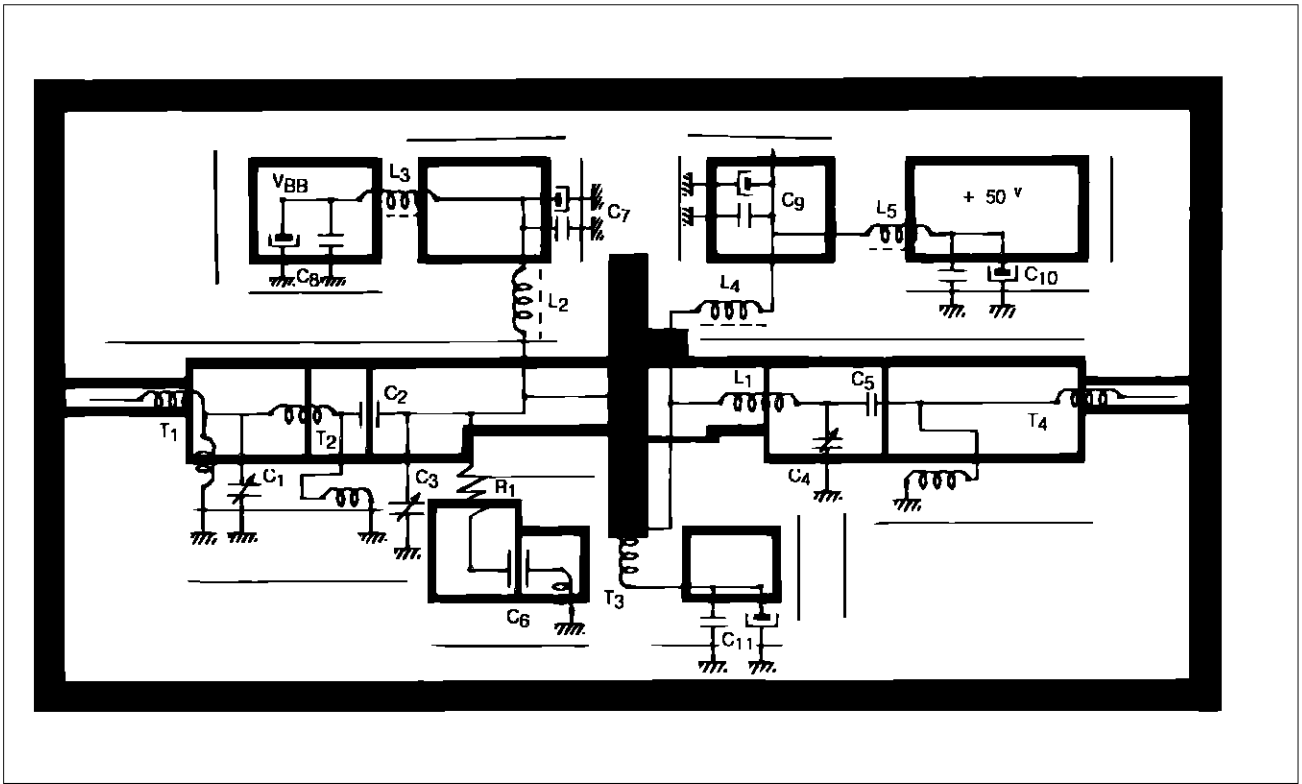
Note: $*f_1 = 30.00 \text{ MHz}$, $f_2 = 30.001 \text{ MHz}$

TEST CIRCUIT

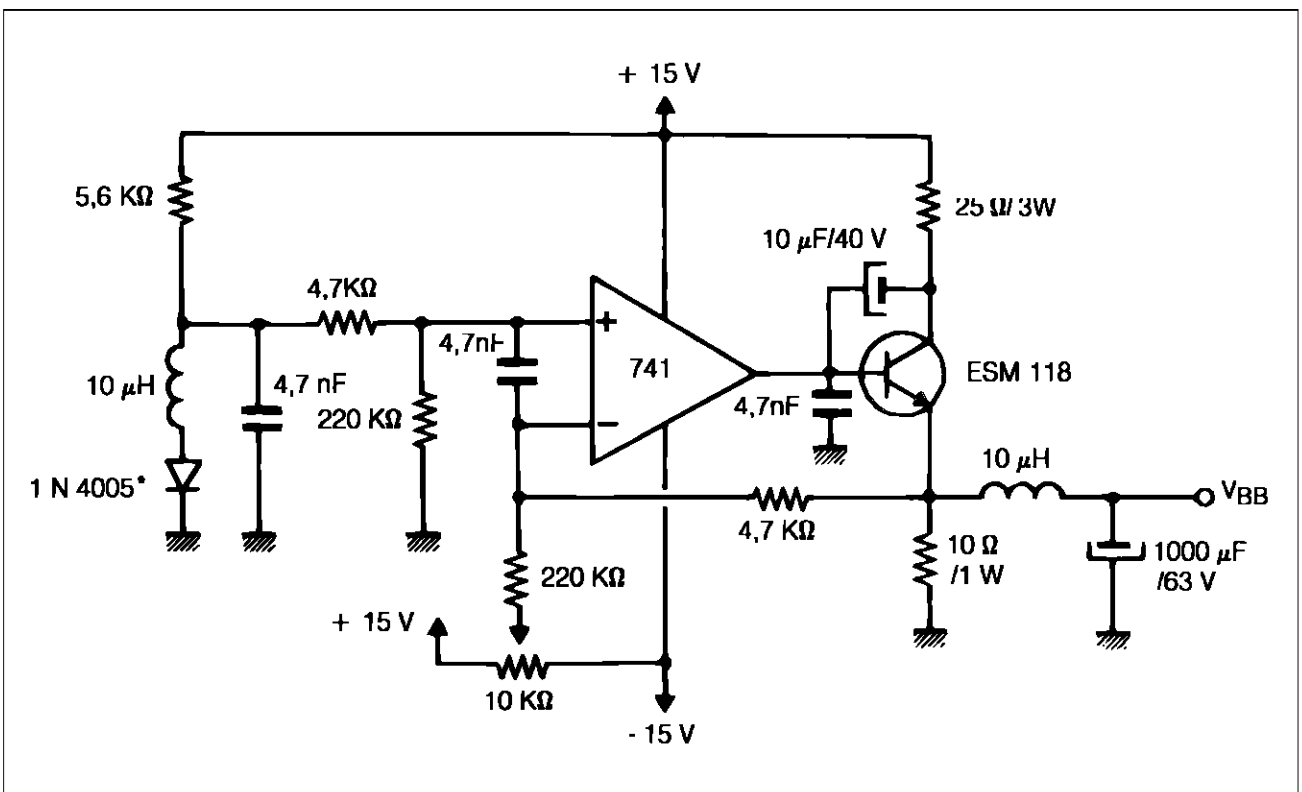


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|---------------------------|--|------|--|
| C1 : | Arco 426 + 220pF + 330pF Chips | L4 : | 10 Turns of 1.2mm Enameled Wire, Diameter 8.1mm, Length 20mm |
| C2 : | 2 x 10nF Chips | L5 : | 7 Turns of 1.2mm Enameled Wire on Ferrite Core Phillips 4C6 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
Primary: 2 Turns of 1mm Enameled Wire
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

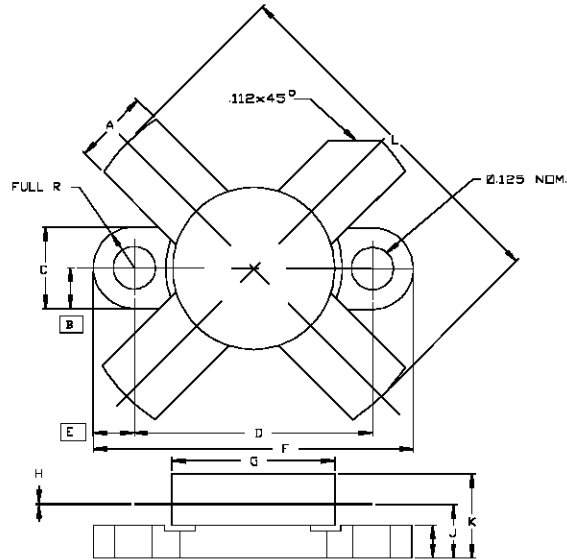


BIAS CIRCUIT



PACKAGE MECHANICAL DATA

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



SGS-THOMSON MICROELECTRONICS			CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm		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	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	.150/3,81	.175/4,45			

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