2STC5948

High power NPN epitaxial planar bipolar transistor

Features

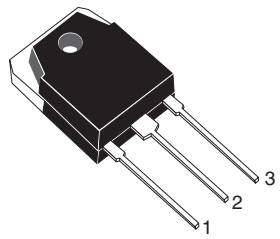
- High breakdown voltage V_{CEO} = 250 V
- Complementary to 2STA2120
- Fast-switching speed
- Typical f_t = 25 MHz
- Fully characterized at 125 °C

Applications

- Audio power amplifier

Description

The device is a NPN transistor manufactured using new BiT-LA (Bipolar transistor for linear amplifier) technology. The resulting transistor shows good gain linearity behaviour.



TO-3P

Figure 1. Internal schematic diagram

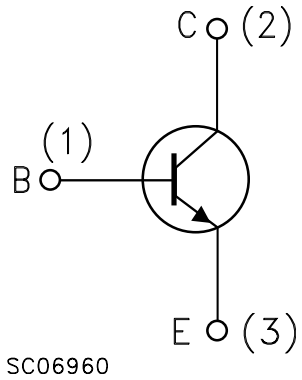


Table 1. Device summary

Order code	Marking	Package	Packaging
2STC5948	2STC5948	TO-3P	Tube

1 Electrical ratings

Table 2. Absolute maximum rating

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage (I_E = 0)	250	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	250	V
V_{EBO}	Emitter-base voltage (I_C = 0)	6	V
I_C	Collector current	17	A
I_{CM}	Collector peak current (t_P < 5ms)	34	A
P_{TOT}	Total dissipation at T_c = 25 °C	200	W
T_{stg}	Storage temperature	-65 to 150	°C
T_J	Max. operating junction temperature	150	°C

Table 3. Thermal data

Symbol	Parameter	Value	Unit
$R_{thj\text{-}case}$	Thermal resistance junction-case max	0.625	°C/W

2 Electrical characteristics

(T_{case} = 25 °C; unless otherwise specified)

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current (I_E = 0)	V_{CB} = 250 V				5	µA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = 6 V				5	µA
$V_{(BR)CEO}$ (1)	Collector-emitter breakdown voltage (I_B = 0)	I_C = 50 mA		250			V
$V_{(BR)CBO}$	Collector-base breakdown voltage (I_E = 0)	I_C = 100 µA		250			V
$V_{(BR)EBO}$ (1)	Emitter-base breakdown voltage (I_C = 0)	I_E = 1 mA		6			V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = 8 A	I_B = 800 mA			3	V
V_{BE} (1)	Base-emitter on voltage	I_C = 7 A	V_{CE} = 5 V			1.5	V
h_{FE}	DC current gain	I_C = 1 A I_C = 7 A	V_{CE} = 5 V V_{CE} = 5 V	80 35		160	
f_T	Transition frequency	I_C = 1 A	V_{CE} = 5 V		25		MHz

1. Pulsed duration = 300 µs, duty cycle ≤ 1.5%

2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

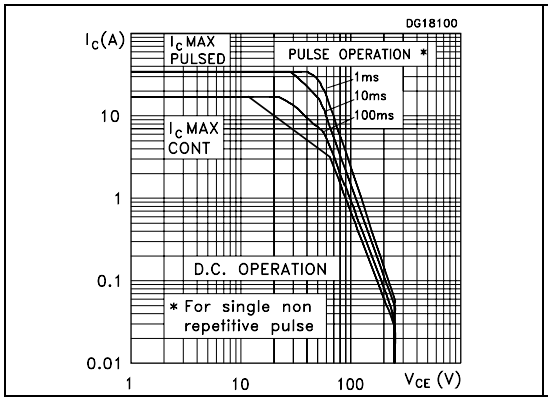


Figure 3. Derating curve

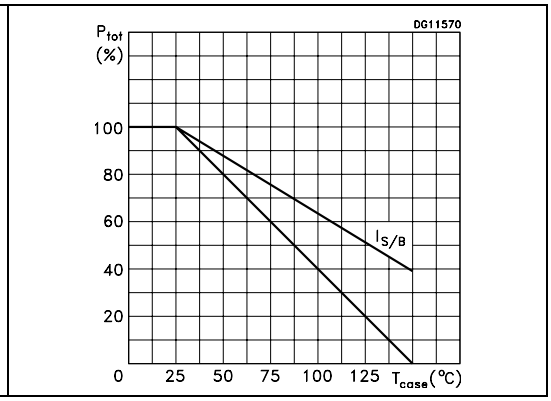


Figure 4. Output characteristics

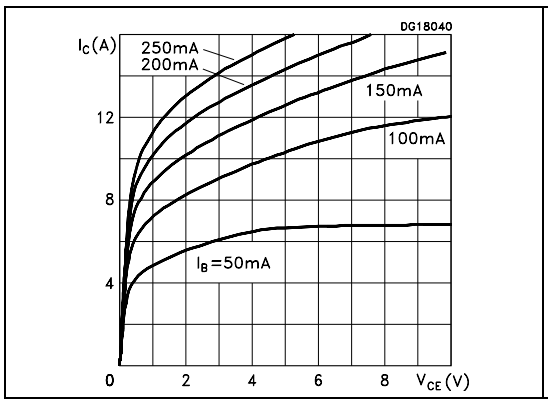


Figure 5. DC current gain

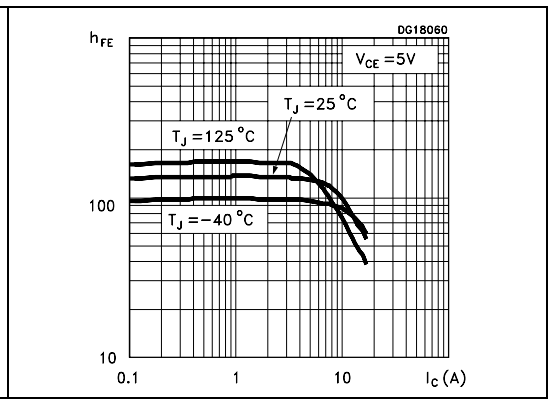


Figure 6. Collector-emitter saturation voltage

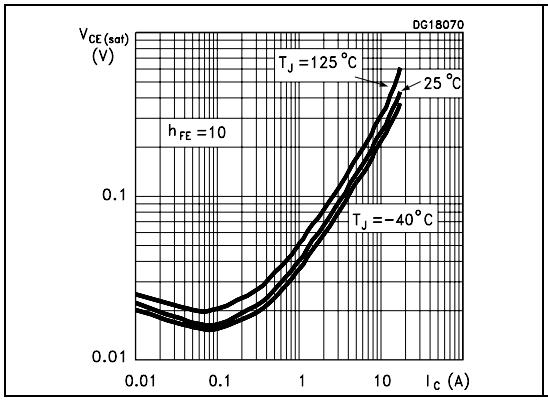
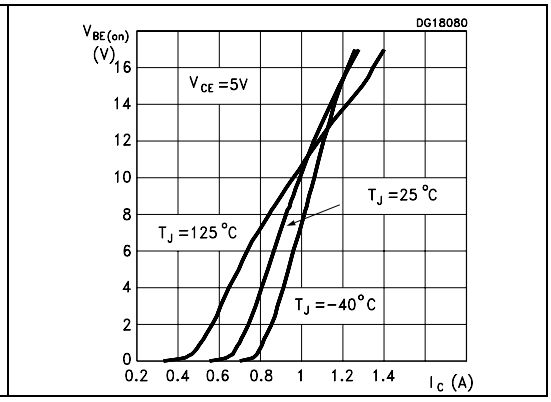


Figure 7. Base-emitter on voltage

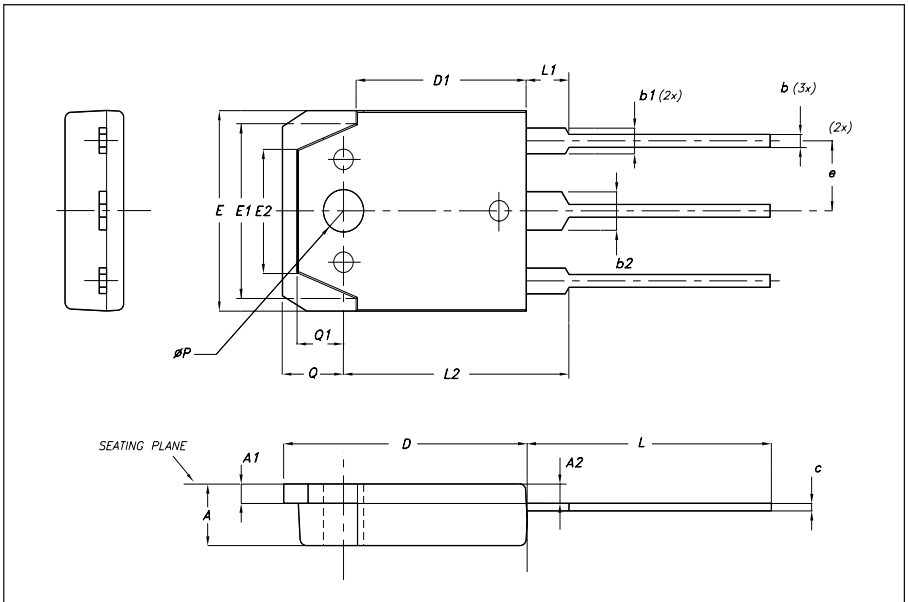


3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

TO-3P Mechanical data

DIM.	mm.		
	MIN.	TYP	MAX.
A	4.6		5
A1	1.45	1.50	1.65
A2	1.20	1.40	1.60
b	0.80	1	1.20
b1	1.80		2.20
b2	2.80		3.20
c	0.55	0.60	0.75
D	19.70	19.90	20.10
D1		13.90	
E	15.40		15.80
E1		13.60	
E2		9.60	
e	5.15	5.45	5.75
L	19.50	20	20.50
L1		3.50	
L2	18.20	18.40	18.60
P	3.10		3.30
Q		5	
Q1		3.80	



4 Revision history

Table 5. Document revision history

Date	Revision	Changes
26-Nov-2007	1	Initial release.
06-May-2008	2	New graphics.
11-Jul-2008	3	Updated figure 7.

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