

High power NPN epitaxial planar bipolar transistor

Features

- High breakdown voltage $V_{CE0} = 250\text{ V}$
- Complementary to 2STA2120
- Fast-switching speed
- Typical $f_t = 25\text{ MHz}$
- Fully characterized at $125\text{ }^\circ\text{C}$

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.

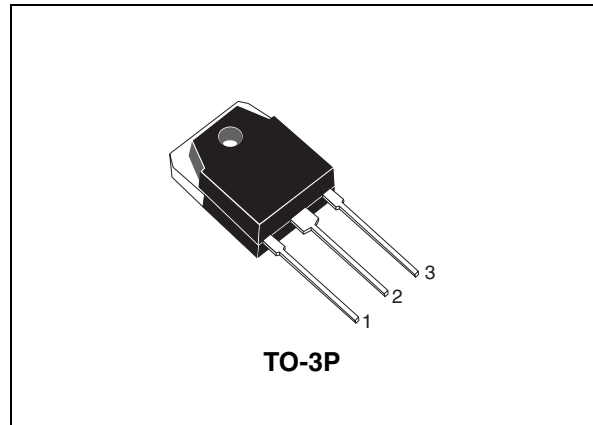


Figure 1. Internal schematic diagram

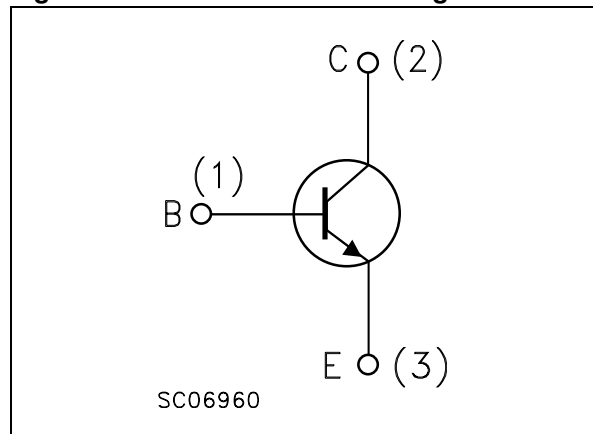


Table 1. Device summary

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 ($t_P < 5\text{ms}$)	34	A
P_{TOT}	Total dissipation at $T_C = 25\text{ }^\circ\text{C}$	200	W
T_{stg}	Storage temperature	-65 to 150	$^\circ\text{C}$
T_J	Max. operating junction temperature	150	$^\circ\text{C}$

Table 3. Thermal data

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

2 Electrical characteristics

www.datasheet4u.com (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 V _{CE} = 5 V I _C = 7 A 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

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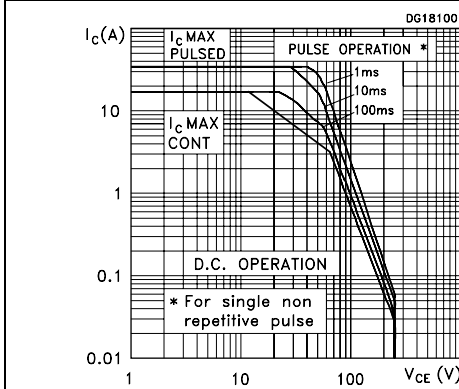


Figure 3. Derating curve

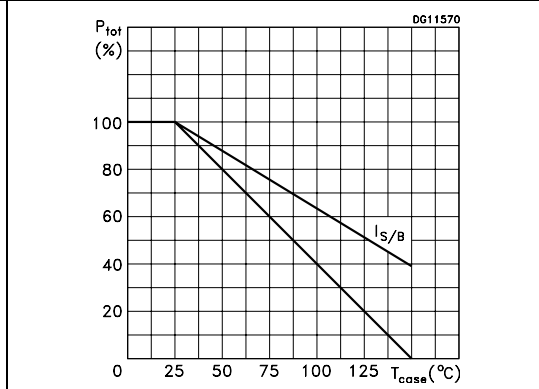


Figure 4. Output characteristics

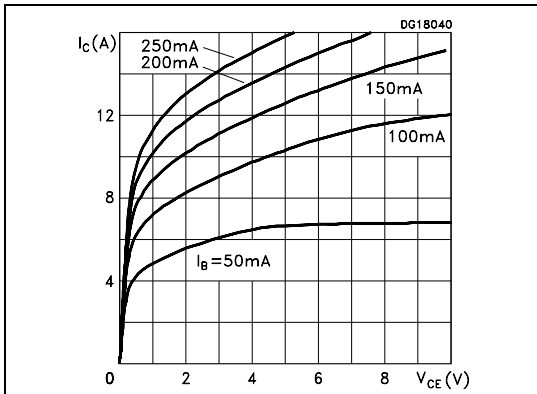


Figure 5. DC current gain

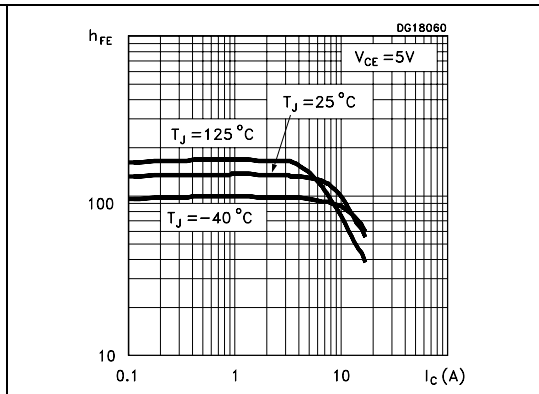


Figure 6. Collector-emitter saturation voltage

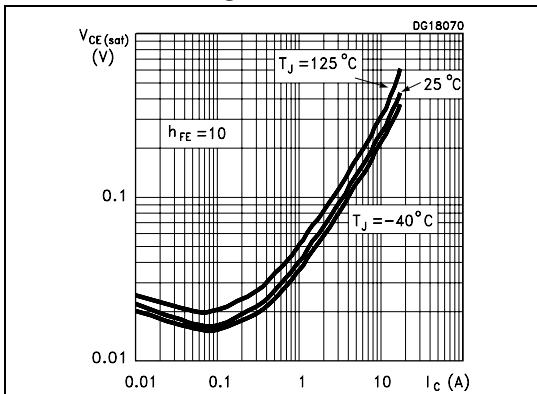
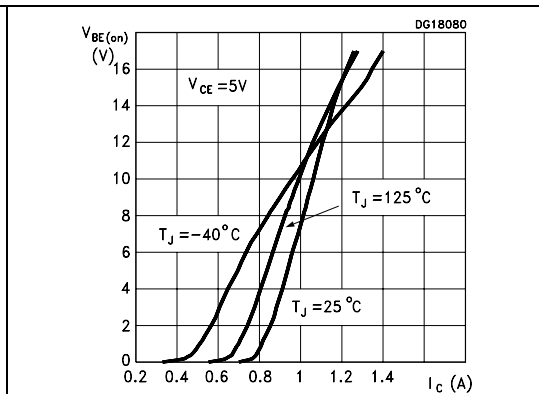


Figure 7. Base-emitter on voltage



3 Package mechanical data

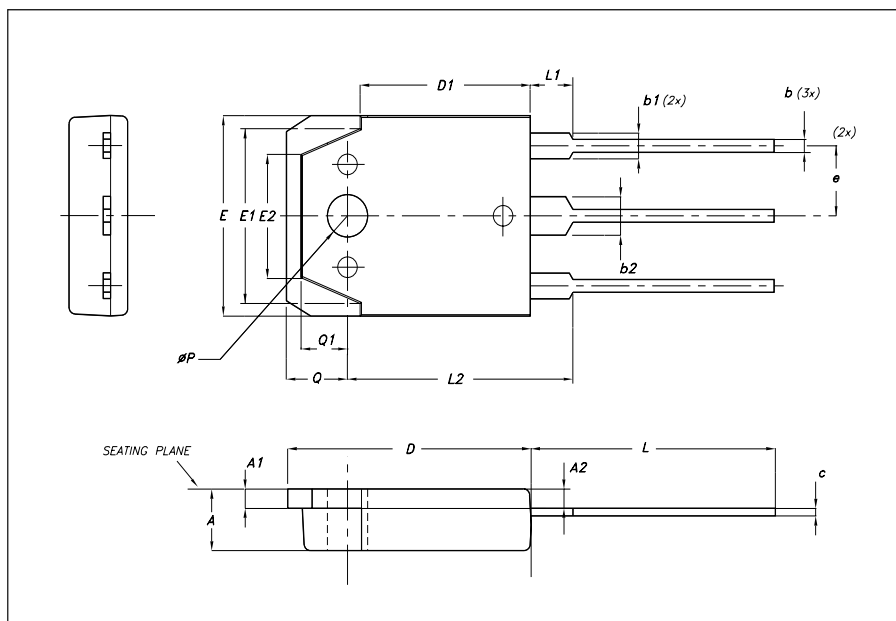
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TO-3P Mechanical data

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.

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