2STA1695

High power PNP epitaxial planar bipolar transistor

Features

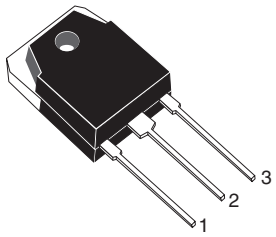
- High breakdown voltage V_{CEO} = -140 V
- Complementary to 2STC4468
- Typical f_t = 20 MHz
- Fully characterized at 125 °C

Applications

- Audio power amplifier

Description

This device is an PNP transistor manufactured using BiT-LA (Bipolar transistor for linear amplifier) technology. The resulting transistor exhibits good gain linearity behavior. Recommended for 70 W to 100 W high fidelity audio frequency amplifier output stages.



TO-3P

Figure 1. Internal schematic diagram

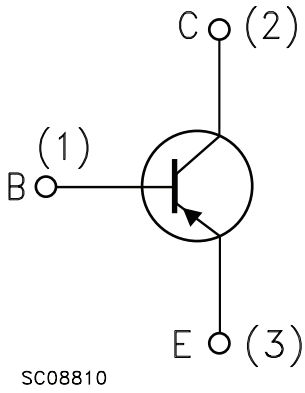


Table 1. Device summary

Order code	Marking	Package	Packaging
2STA1695	2STA1695	TO-3P	Tube

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage (I_E = 0)	-140	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	-140	V
V_{EBO}	Emitter-base voltage (I_C = 0)	-6	V
I_C	Collector current	-10	A
I_{CM}	Collector peak current (t_P < 5 ms)	-20	A
P_{tot}	Total dissipation at T_c = 25 °C	100	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	1.25	°C/W
$R_{thj\text{-}amb}$	Thermal resistance junction-ambient max	35.7	°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} = -140 V			-0.1	µA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = -6 V			-0.1	µA
$V_{(BR)CEO}$	Collector-emitter breakdown voltage (I_B = 0)	I_C = -50 mA	-140			V
$V_{(BR)CBO}$	Collector-base breakdown voltage (I_E = 0)	I_C = -100 µA	-140			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 = -5 A I_B = -500 mA I_C = -7 A I_B = -700 mA			-0.5 -0.7	V V
V_{BE} (1)	Base-emitter voltage	V_{CE} = -5 V I_C = -5 A			-1.3	V
h_{FE}	DC current gain	I_C = -3 A V_{CE} = -4 V I_C = -5 A V_{CE} = -4 V	70 50		140	
f_T	Transition frequency	I_C = -0.5 A V_{CE} = -12 V		20		MHz
C_{CBO}	Collector-base capacitance (I_E = 0)	V_{CB} = -10 V f = 1 MHz		225		pF
	Resistive load					
t_{on}	Turn-on time	I_C = -5 A V_{CC} = -60 V		0.24		µs
t_{stg}	Storage time	I_{B1} = -I_{B2} = -0.5 A		1.2		µs
t_f	Fall time			0.24		µs

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

2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

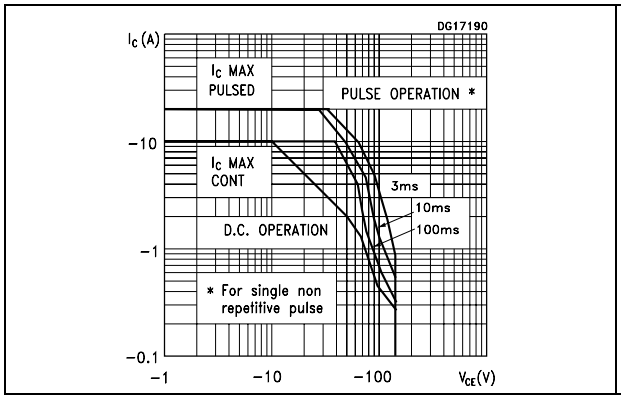


Figure 3. Power derating versus temperature

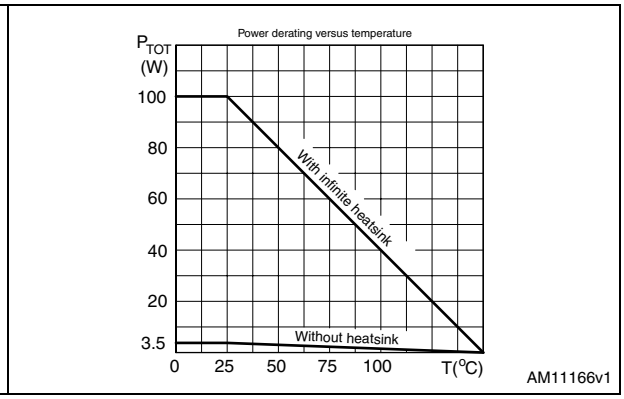


Figure 4. Output characteristics

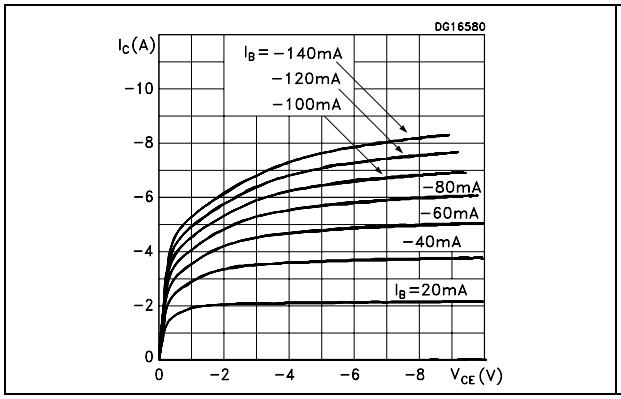


Figure 5. DC current gain

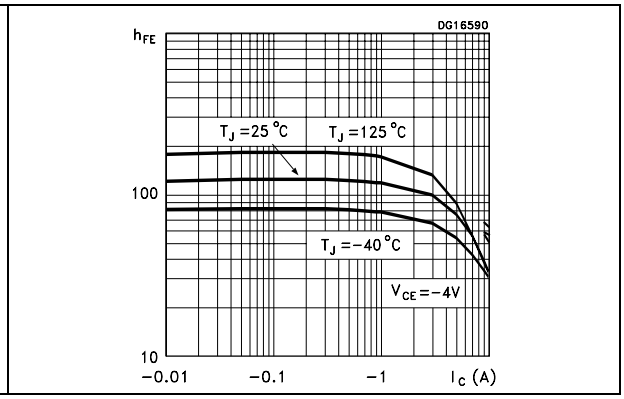


Figure 6. Collector-emitter saturation voltage

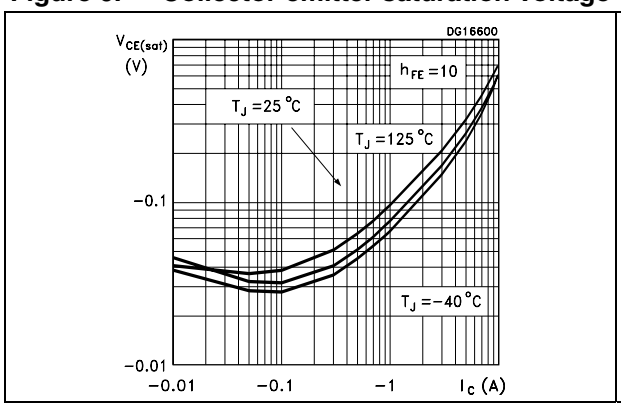


Figure 7. Base-emitter voltage

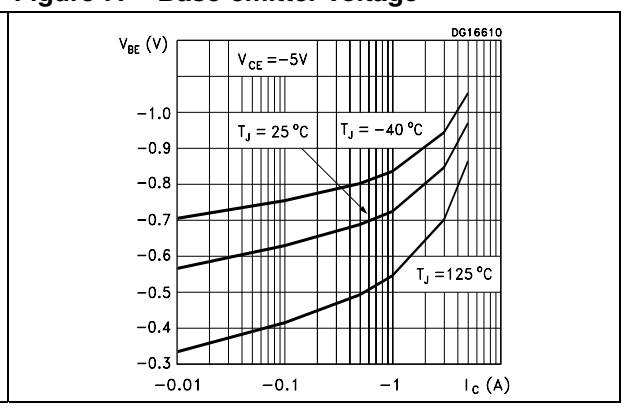
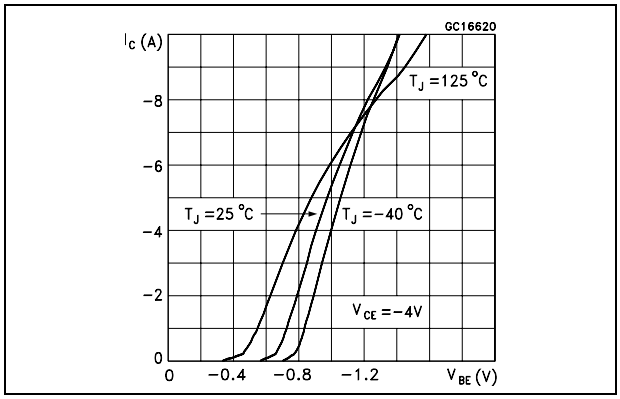
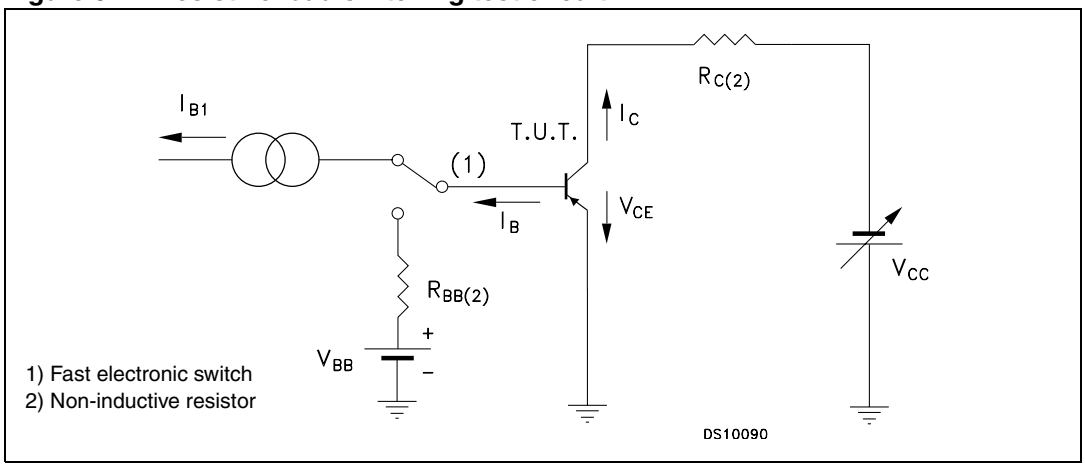


Figure 8. Base-emitter voltage



2.2 Test circuit

Figure 9. Resistive load switching test circuit



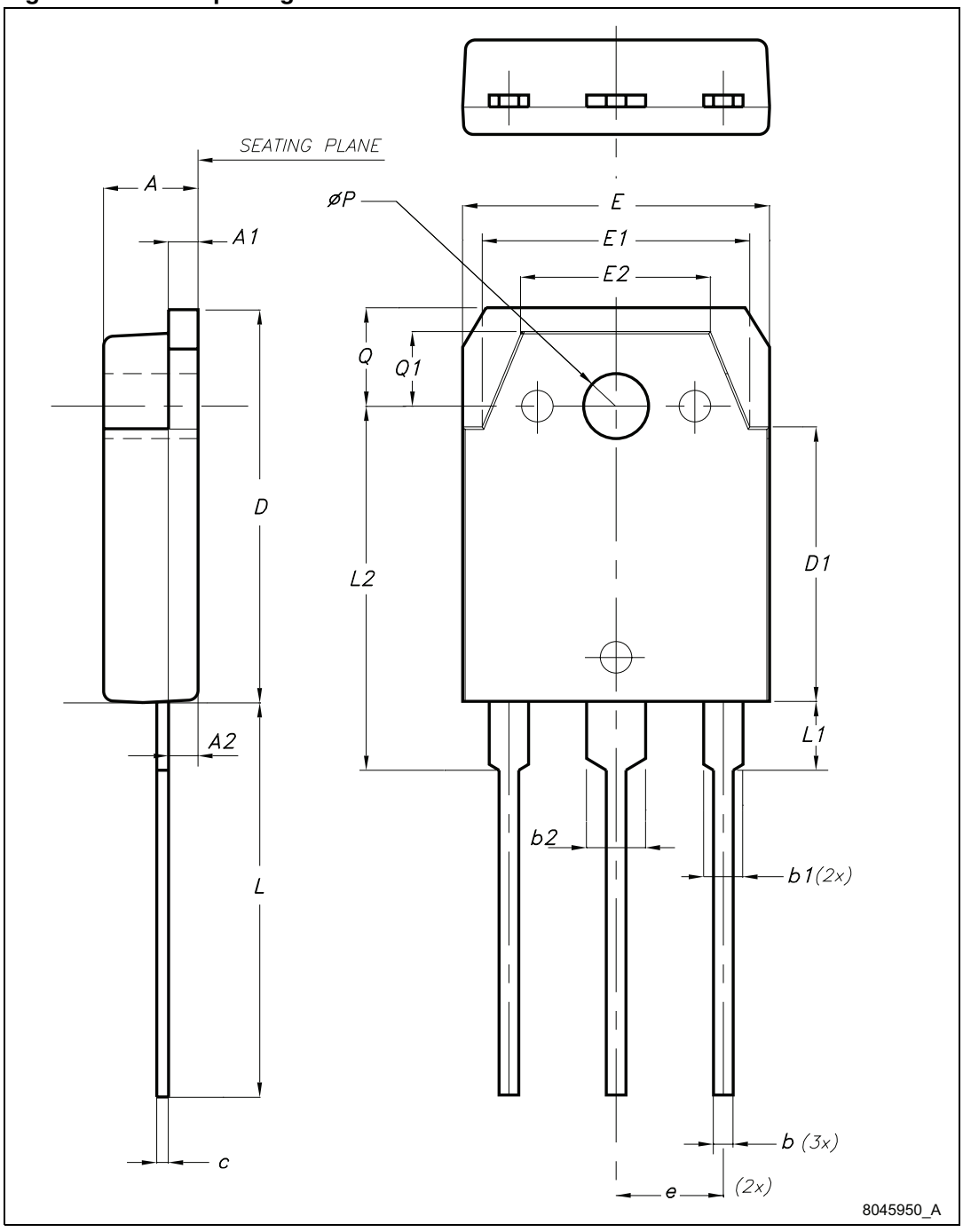
3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: *www.st.com*.
ECOPACK® is an ST trademark.

Table 5. TO-3P mechanical data

Dim.	mm		
	Min.	Typ.	Max
A	4.60		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
øP	3.10		3.30
Q		5	
Q1		3.80	

Figure 10. TO-3P package dimensions



4 Revision history

Table 6. Document revision history

Date	Revision	Changes
18-May-2007	1	Initial release
06-Nov-2008	2	Document status promoted from preliminary data to datasheet.
07-Feb-2012	3	– *Figure 3* inserted – Mechanical data updated