2STW1693

High power PNP epitaxial planar bipolar transistor

Features

- High breakdown voltage V_{CEO} = -80V
- Complementary to 2STW4466
- Typical f_t = 20MHz
- Fully characterized at 125 °C

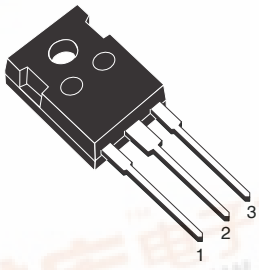
Applications

- Audio power amplifier

Description

The device is a PNP transistor manufactured in low voltage planar technology using base island layout. The resulting transistor shows good gain linearity coupled with low V_{CESAT} behaviour.

Recommended for 40W to 70W high fidelity audio frequency amplifier output stage.



TO-247

Figure 1. Internal schematic diagram

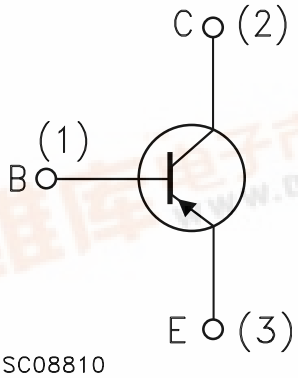


Table 1. Device summary

Order code	Marking	Package	Packaging
2STW1693	2STW1693	TO-247	Tube

Contents

1 Electrical ratings

Table 2. Absolute maximum rating

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-emitter voltage (I_E = 0)	-100	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	-80	V
V_{EBO}	Collector-base voltage (I_C = 0)	-6	V
I_C	Collector current	-6	A
I_{CM}	Collector peak current (t_P < 5ms)	-12	A
P_{TOT}	Total dissipation at T_c = 25°C	60	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
$R_{thj\text{-}amb}$	Thermal resistance junction-amb	max	2.08	°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} = -80V			-0.1	µA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = -6V			-0.1	µA
$V_{(BR)EBO}$	Collector-emitter breakdown voltage (I_C = 0)	I_E = -1mA	-6			V
$V_{(BR)CBO}$	Collector-emitter breakdown voltage (I_E = 0)	I_C = -100µA	-80			V
$V_{(BR)CEO}$	Collector-emitter breakdown voltage (I_B = 0)	I_C = -50mA	-80			V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = -2A I_B = -200mA I_C = -6A I_B = -600mA			-0.6 -1.5	V V
V_{BE} (1)	Base-emitter voltage	V_{CE} = -5V I_C = -5A			-1.5	V
h_{FE}	DC current gain	I_C = -2A V_{CE} = -4V	50		120	
f_T	Transition frequency	I_C = -0.5A V_{CE} = -12V		20		MHz
C_{CBO}	Collector-base capacitance	I_E = 0 V_{CB} = -10V f = 1MHz		80		pF
t_{on} t_{stg} t_{off}	Turn-on time Storage time Fall time	I_C = -3A V_{CC} = -30V I_{B1} = -I_{B2} = -0.3A		0.18 0.6 0.09		ns ns ns

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

2.1 Electrical characteristics (curves)

Figure 2. DC current gain

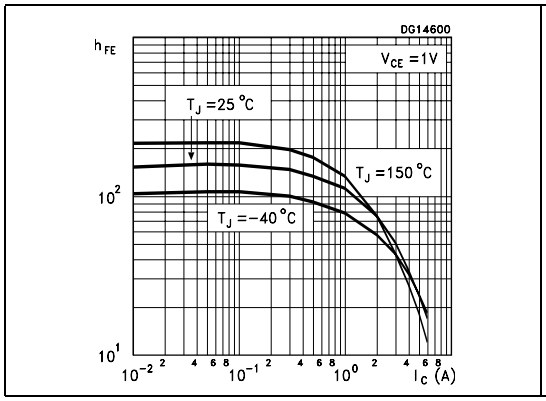


Figure 3. DC current gain

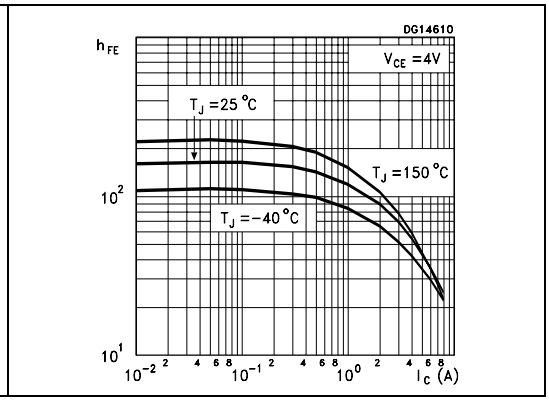


Figure 4. Collector-emitter saturation voltage

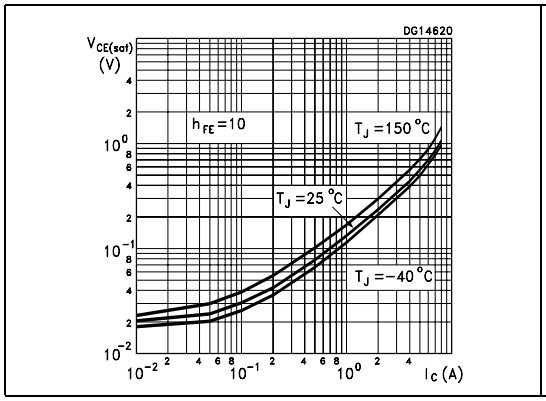


Figure 5. Base-emitter saturation voltage

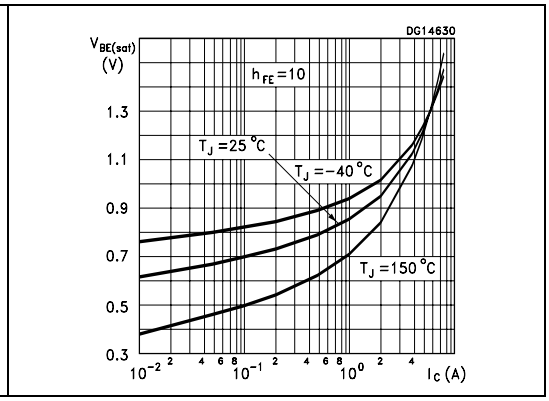


Figure 6. $BT_{(ON)}$ time

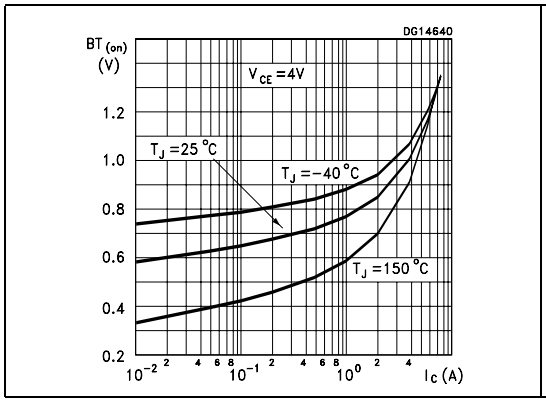


Figure 7. Resistive load switching time

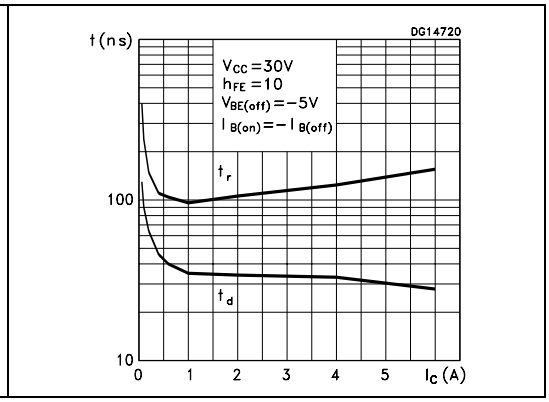


Figure 8. Switching time resistive load

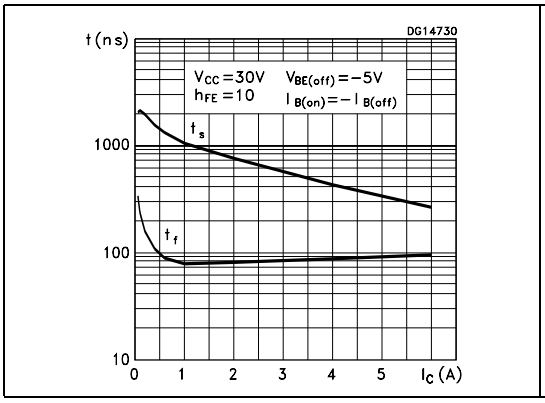
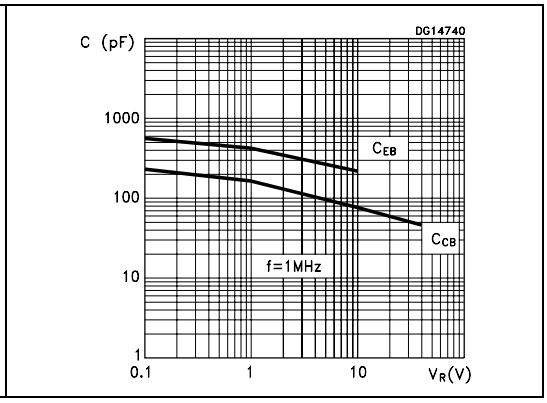


Figure 9. Collector-base and collector-emitter capacitance

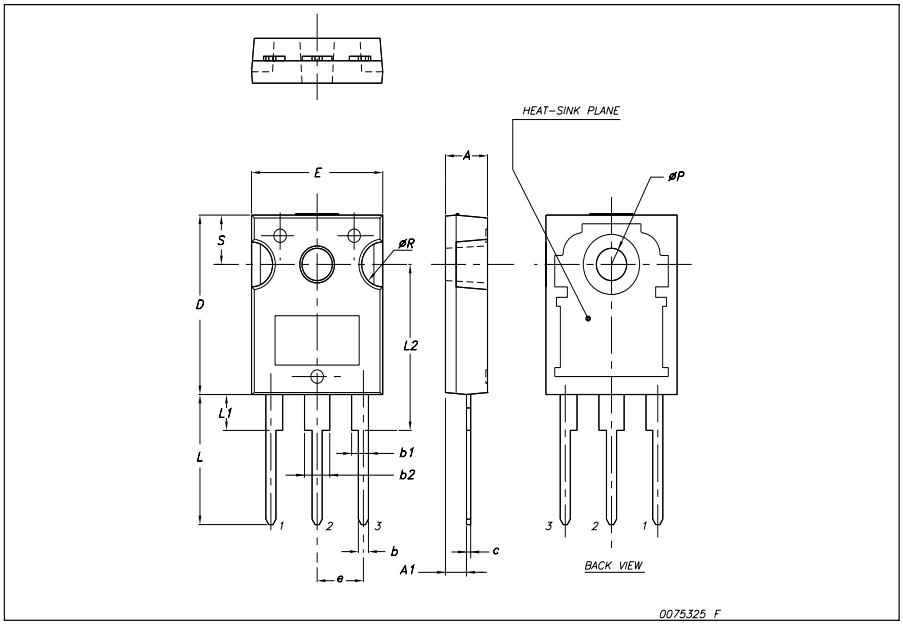


3 Package mechanical data

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-247 Mechanical data

Dim.	mm.		
	Min.	Typ	Max.
A	4.85		5.15
A1	2.20		2.60
b	1.0		1.40
b1	2.0		2.40
b2	3.0		3.40
c	0.40		0.80
D	19.85		20.15
E	15.45		15.75
e		5.45	
L	14.20		14.80
L1	3.70		4.30
L2		18.50	
øP	3.55		3.65
øR	4.50		5.50
S		5.50	



4 Revision history

Table 5. Document revision history

Date	Revision	Changes
10-Oct-2007	1	Initial release

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