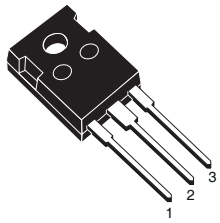
2STW1695

High power PNP epitaxial planar bipolar transistor

General features

- High breakdown voltage V_{CEO} = -140V
- Complementary to 2STW4468
- Typical f_t =20MHz
- Fully characterized at 125 ^oC
- In compliance with the 2002/93/EC European Directive



TO-247

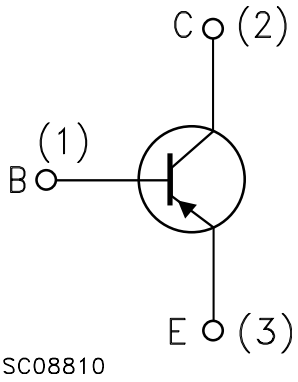
Applications

- Audio power amplifier

Description

The device is a PNP transistor manufactured using new BiT-LA (Bipolar transistor for linear amplifier) technology. The resulting transistor shows good gain linearity behaviour. Recommended for 70W to 100W high fidelity audio frequency amplifier output stage.

Internal schematic diagram



Order codes

Part Number	Marking	Package	Packing
2STW1695	2STW1695	TO-247	Tube

Electrical ratings

Table 1. Absolute maximum rating

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-emitter voltage (I_E = 0)	-140	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	-140	V
V_{EBO}	Collector-base voltage (I_C = 0)	-6	V
I_C	Collector current	-10	A
I_{CM}	Collector peak current (t_P < 5ms)	-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 2. Thermal data

Symbol	Parameter		Value	Unit
$R_{thj\text{-}case}$	Thermal resistance junction-case	max	1.25	°C/W

1 Electrical characteristics

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

Table 3. Electrical characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current (I_E = 0)	V_{CB} = -140V			-0.1	µA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = -6V			-0.1	µA
$V_{(BR)CEO}$ (1)	Collector-emitter breakdown voltage (I_B = 0)	I_C = -50mA	-140			V
$V_{(BR)CBO}$	Collector-emitter breakdown voltage (I_E = 0)	I_C = -100µA	-140			V
$V_{(BR)EBO}$ (1)	Collector-emitter breakdown voltage (I_C = 0)	I_E = -1mA	-6			V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = -5A I_B = -500mA I_C = -7A I_B = -700mA			-0.5 -0.7	V V
V_{BE} (1)	Base-emitter voltage	V_{CE} = -5V I_C = -5A			-1.3	V
h_{FE}	DC current gain	I_C = -3A V_{CE} = -4V I_C = -5A V_{CE} = -4V	70 50		140	
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		225		pF
	Resistive load					
t_{on}	Turn-on time	I_C = -5A V_{CC} = -60V		0.24		µs
t_{stg}	Storage time	I_{B1} = -I_{B2} = -0.5A		1.2		µs
t_{off}	Fall time			0.24		µs

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

1.1 Electrical characteristics (curves)

Figure 1. Safe operating area

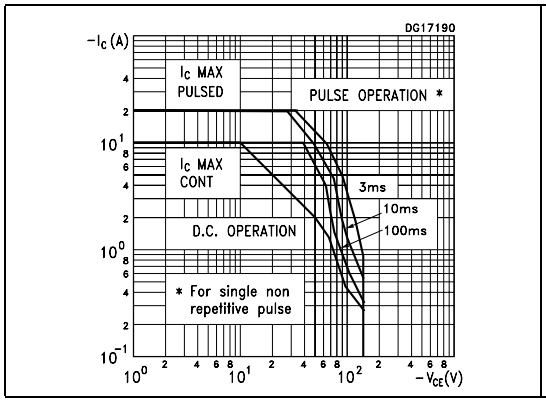


Figure 2. Output characteristics

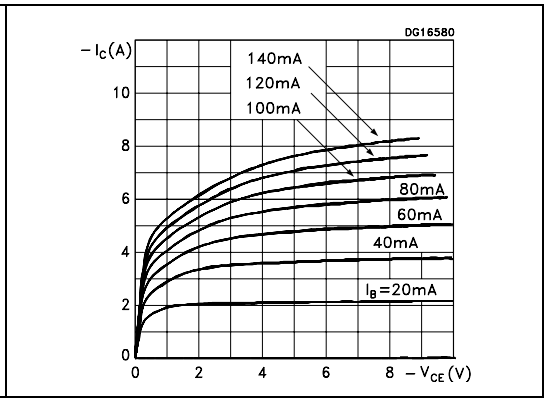


Figure 3. DC current gain

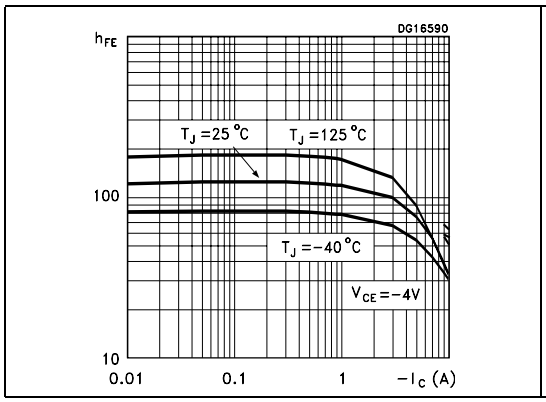


Figure 4. Collector-emitter saturation voltage

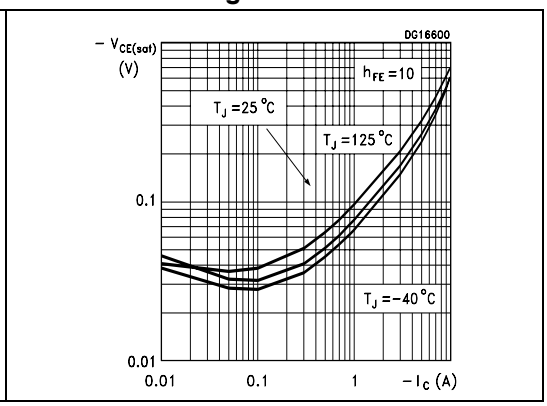


Figure 5. Base-emitter on voltage

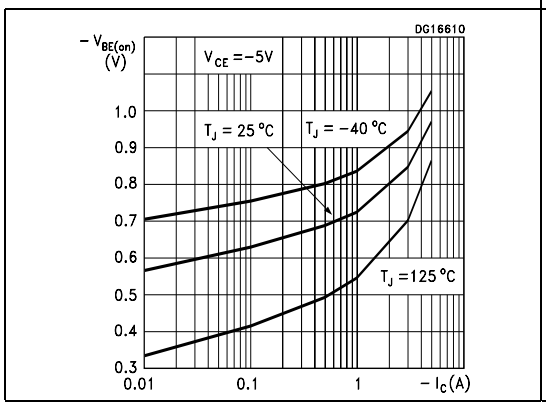
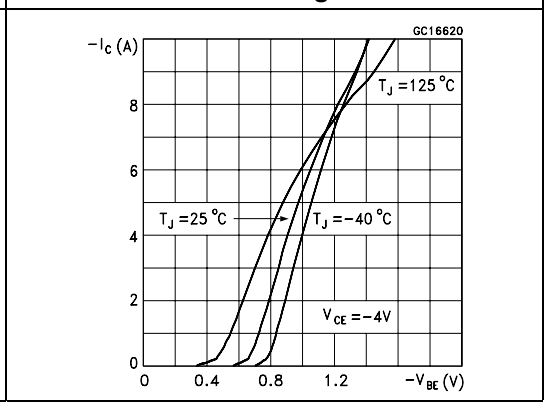
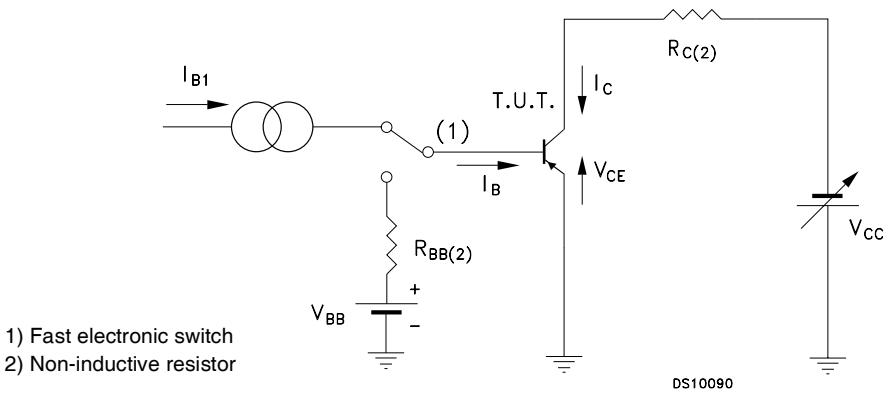


Figure 6. Collector current vs base-emitter voltage



1.2 Test circuit

Figure 7. Resistive load switching test circuit



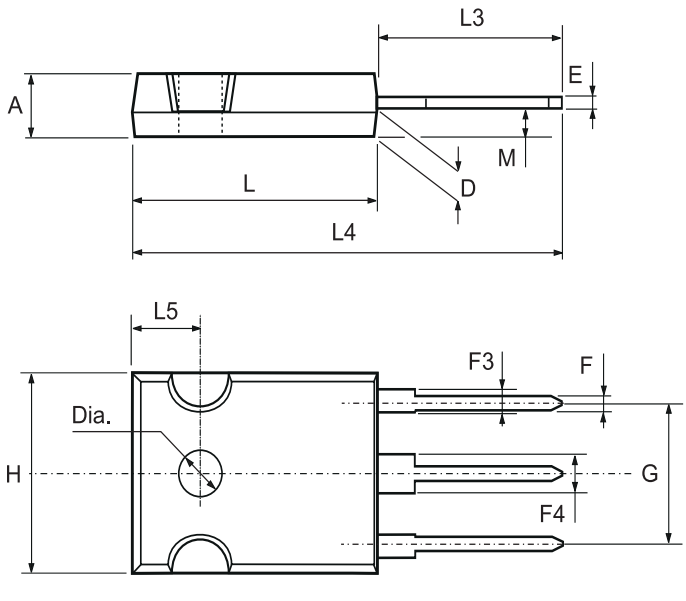
1) Fast electronic switch
2) Non-inductive resistor

2 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			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.7		5.3	0.185		0.209
D	2.2		2.6	0.087		0.102
E	0.4		0.8	0.016		0.031
F	1		1.4	0.039		0.055
F3	2		2.4	0.079		0.094
F4	3		3.4	0.118		0.134
G		10.9			0.429	
H	15.3		15.9	0.602		0.626
L	19.7		20.3	0.776		0.779
L3	14.2		14.8	0.559		0.582
L4		34.6			1.362	
L5		5.5			0.217	
M	2		3	0.079		0.118



3 Revision history

Table 4. Revision history

Date	Revision	Changes
23-Oct-2006	1	First release
09-Feb-2007	2	New graphics
20-Feb-2007	3	The device's commercial code has been changed from preliminary to full.

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST’s terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST’S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZE REPRESENTATIVE OF ST, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS, WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS “AUTOMOTIVE GRADE” MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER’S OWN RISK.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com