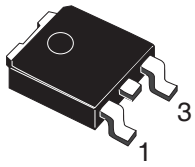
STD1802

Low voltage fast-switching NPN power transistor

Features

- Very low collector to emitter saturation voltage
- High current gain characteristic
- Fast-switching speed
- Surface-mounting DPAK (TO-252) power package in tape & reel (suffix “T4)



TO-252
DPAK
(suffix “T4”)

Description

The device is manufactured in Planar technology with “Base Island” layout. The resulting transistor shows exceptional high gain performance coupled with very low saturation voltage.

Applications

- CCFL drivers
- Voltage regulators
- Relay drivers
- High efficiency, low voltage, switching applications

Figure 1. Internal schematic diagram

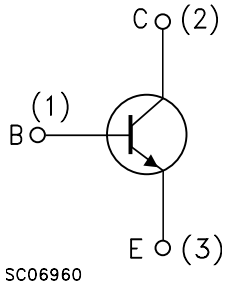


Table 1. Device summary

Order code	Marking	Package	Packaging
STD1802T4	D1802	DPAK	Tape & reel

1 Electrical ratings

Table 2. Absolute maximum rating

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage (I_E =0)	80	V
V_{CEO}	Collector-emitter voltage (I_B =0)	60	V
V_{EBO}	Emitter-base voltage (I_C =0)	6	V
I_C	Collector current	3	A
I_{CM}	Collector peak current (t_P < 5ms)	6	A
I_B	Base current	1	A
P_{tot}	Total dissipation at $T_c \leq 25°C$	15	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	8.33	°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} = 40V			0.1	µA
I_{EBO}	Emitter cut-off current (I_C =0)	V_{EB} = 4V			0.1	µA
$V_{(BR)CBO}$	Collector-base breakdown voltage (I_E = 0)	I_C =100µA	80			V
$V_{(BR)CEO}$	Collector-emitter breakdown voltage (I_B = 0)	I_C =1mA	60			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage (I_C = 0)	I_E =100µA	6			V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C =2A I_B =100mA I_C =3A I_B =150mA		150 200	300 400	mV mV
$V_{BE(sat)}$ (1)	Base-emitter saturation voltage	I_C =2A I_B =100mA		0.9	1.2	V
h_{FE} (1)	DC current gain	I_C =100mA V_{CE} =2V I_C =3A V_{CE} =2V	200 100		400	
f_T	Transition frequency	V_{CE} =10V I_C =50mA		150		MHz
C_{CBO}	Collector-base capacitance	V_{CB} =10V f = 1MHz		50		pF
t_{ON} t_s t_f	Resistive load Turn-on time Storage time Fall time	I_C =1A V_{CC} =30V I_{B1} =-I_{B2} =0.1A		50 1.35 120		ns µs ns

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

2.1 Electrical characteristics (curves)

Figure 2. Derating curve

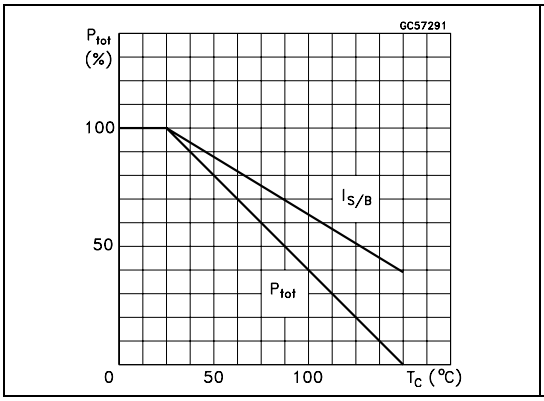


Figure 3. DC current gain

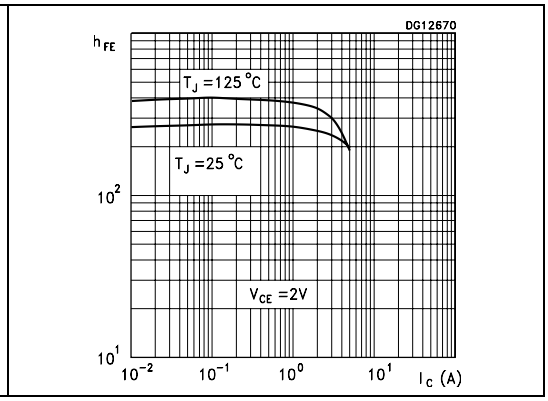


Figure 4. Collector-emitter saturation voltage

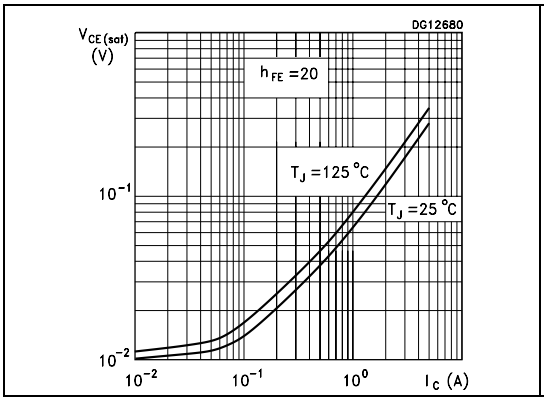


Figure 5. Collector-emitter saturation voltage

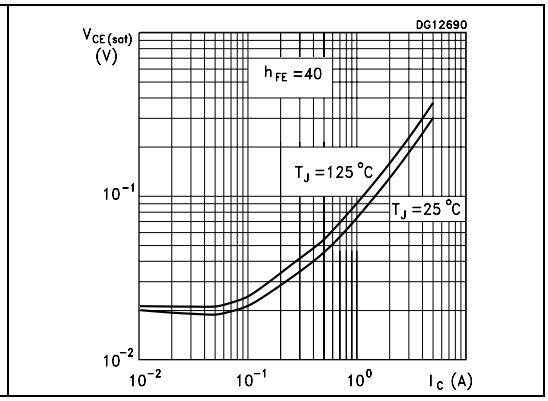


Figure 6. Base-emitter saturation voltage

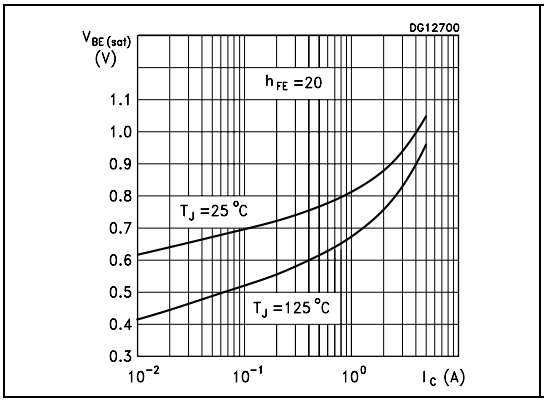


Figure 7. Base-emitter on voltage

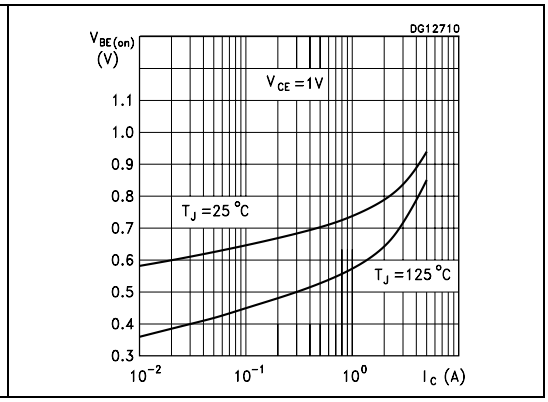


Figure 8. Switching times resistive load

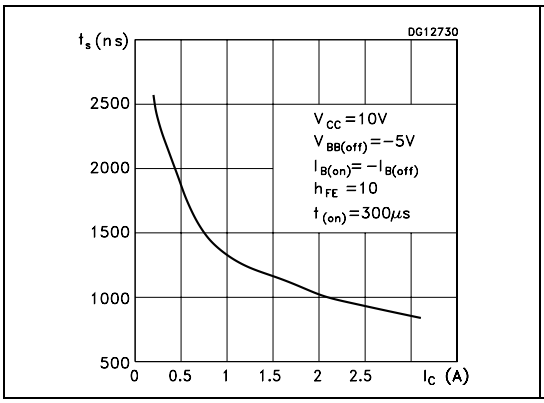


Figure 9. Switching times resistive load

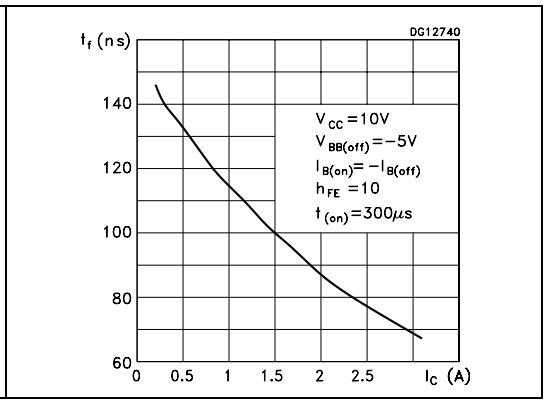


Figure 10. Switching times resistive load

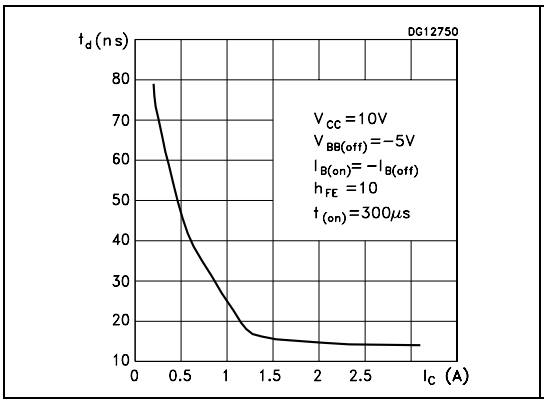


Figure 11. Switching times inductive load

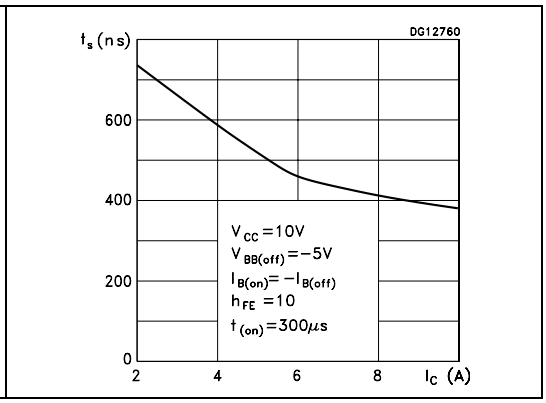
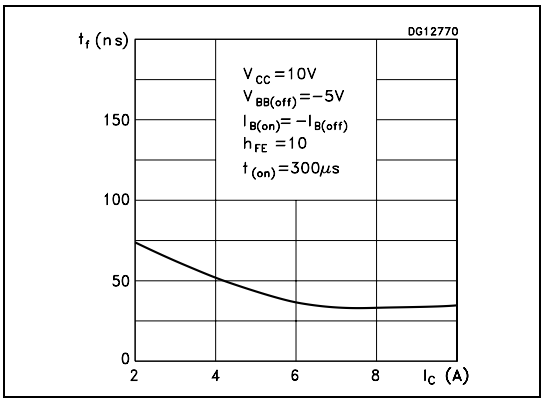
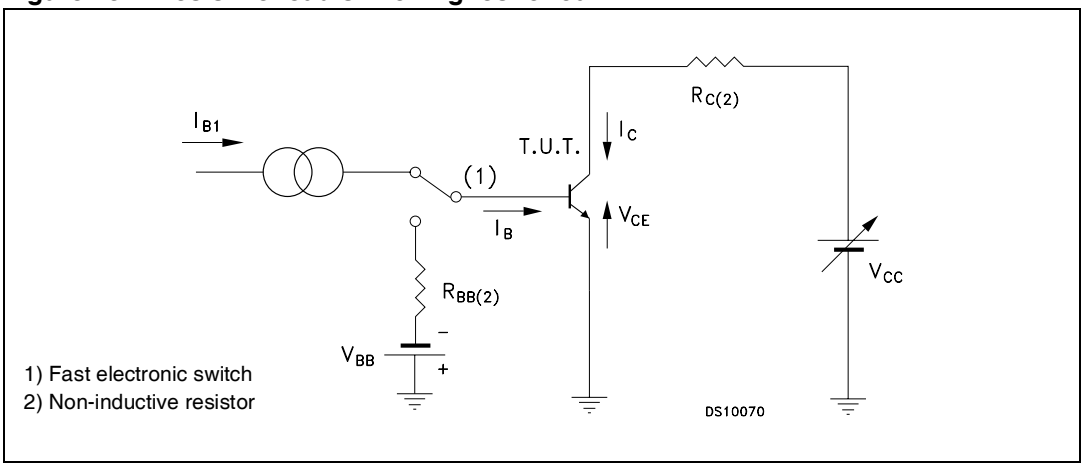


Figure 12. Switching times resistive load



2.2 Test circuits

Figure 13. Resistive load switching test circuit



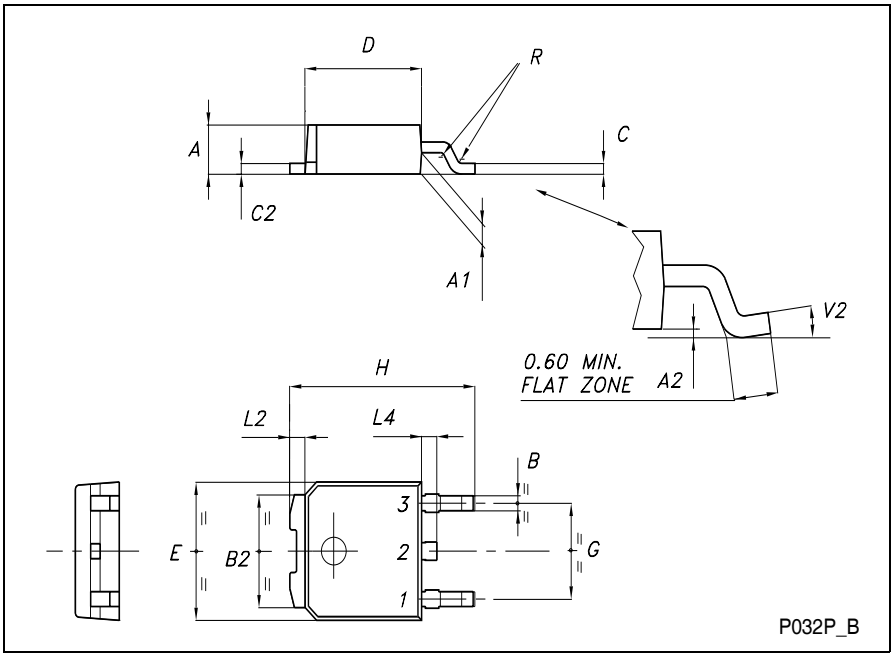
1) Fast electronic switch
2) Non-inductive resistor

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-252 (DPAK) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	2.20		2.40	0.087		0.094
A1	0.90		1.10	0.035		0.043
A2	0.03		0.23	0.001		0.009
B	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204		0.213
C	0.45		0.60	0.018		0.024
C2	0.48		0.60	0.019		0.024
D	6.00		6.20	0.236		0.244
E	6.40		6.60	0.252		0.260
G	4.40		4.60	0.173		0.181
H	9.35		10.10	0.368		0.398
L2		0.8			0.031	
L4	0.60		1.00	0.024		0.039
V2	0^o		8^o	0^o		0^o



4 Revision history

Table 5. Revision history

Date	Revision	Changes
11-Mar-2003	1	Initial release.
05-Sep-2003	2	Minor text change
12-Jun-2004	3	New disclaimer
12-Jul-2007	4	Package name added on table 1.

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