STD1802

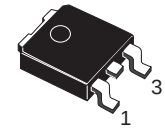
LOW VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

PRELIMINARY DATA

Table 1: GENERAL FEATURES

Ordering Code	Marking	Shipment
STD1802T4	D1802	Tape & Reel

- VERY LOW COLLECTOR TO EMITTER SATURATION VOLTAGE
- HIGH CURRENT GAIN CHARACTERISTIC
- FAST-SWITCHING SPEED
- SURFACE-MOUNTING DPAK POWER PACKAGE IN TAPE & REEL (Suffix "T4")

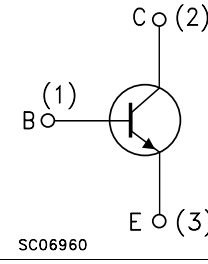


DPAK
(TO-252)

APPLICATIONS:

- CCFL DRIVERS
- VOLTAGE REGULATORS
- RELAY DRIVERS
- HIGH EFFICIENCY LOW VOLTAGE SWITCHING APPLICATIONS

INTERNAL SCHEMATIC DIAGRAM



DESCRIPTION

The device is manufactured in NPN Planar Technology by using a "Base Island" layout.

The resulting Transistor shows exceptional high gain performance coupled with very low saturation voltage.

Table 2: ABSOLUTE MAXIMUM RATINGS

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 < 5 ms)	6	A
I_B	Base Current	1	A
P_{tot}	Total Dissipation at T_{case} = 25 °C	15	W
T_{stg}	Storage Temperature	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

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Table 3: THERMAL DATA

$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	8.33	$^oC/W$

Table 4: ELECTRICAL CHARACTERISTICS (T_{case} = 25 ^oC unless otherwise specified)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I_E = 0)	V_{CB} = 40 V				0.1	µA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 4 V				0.1	µA
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage (I_E = 0)	I_C = 100 µA		80			V
$V_{(BR)CEO}$*	Collector-Emitter Breakdown Voltage (I_B = 0)	I_C = 1 mA		60			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage (I_C = 0)	I_E = 100 µA		6			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 2 A I_C = 3 A	I_B = 100 mA I_B = 150 mA		150 200	300 400	mV mV
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 2 A	I_B = 100 mA		0.9	1.2	V
h_{FE}*	DC Current Gain	I_C = 100 mA I_C = 3 A	V_{CE} = 2 V V_{CE} = 2 V	200 100		400	
f_T	Transition frequency	V_{CE} = 10 V	I_C = 50 mA		150		MHz
C_{CBO}	Collector-Base Capacitance	V_{CB} = 10 V	f = 1 MHz		50		pF
	RESISTIVE LOAD						
t_{ON}	Turn- on Time	I_C = 1 A	V_{CC} = 30 V		50		ns
t_s	Storage Time	I_{B1} = - I_{B2} = 0.1 A			1.35		µs
t_f	Fall Time				120		ns

∗ Pulsed: Pulse duration = 300µs, duty cycle = 1.5 %

Figure 1: Derating Curve

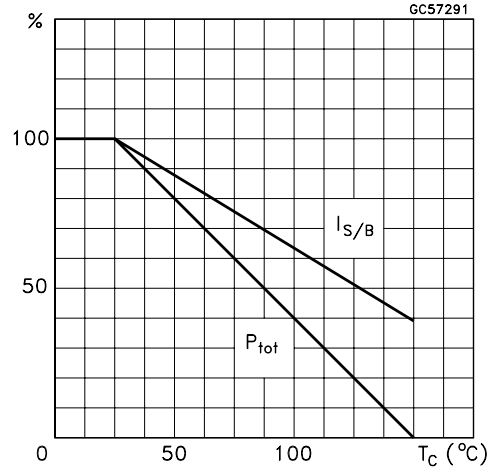


Figure 2: DC Current Gain

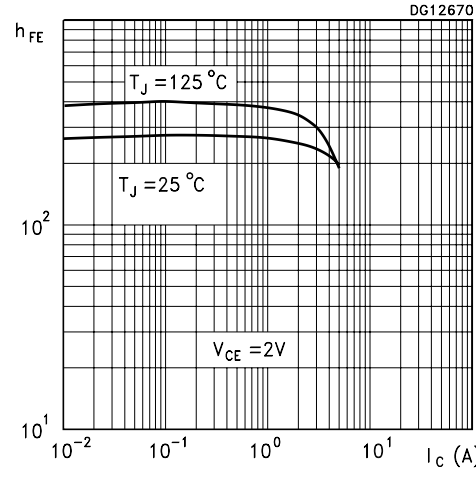


Figure 3: Collector-Emitter Saturation Voltage

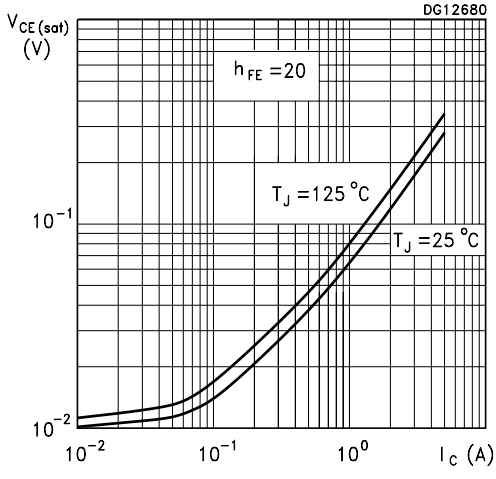


Figure 4: Collector-Emitter Saturation Voltage

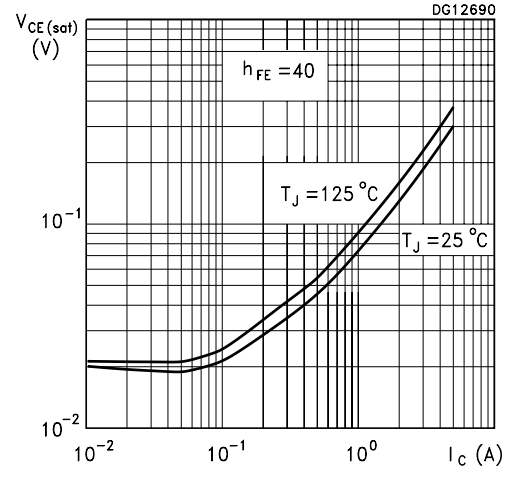


Figure 5: Base-Emitter Saturation Voltage

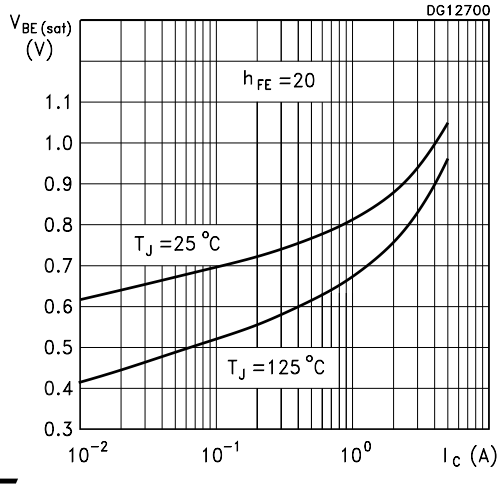


Figure 6: Base-Emitter On Voltage

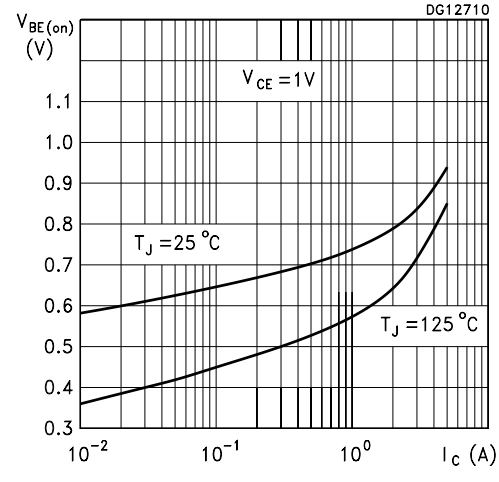


Figure 7: Switching Times Resistive Load

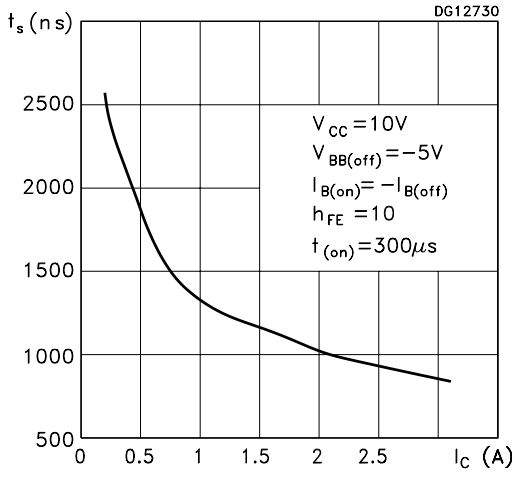


Figure 8: Switching Times Resistive Load

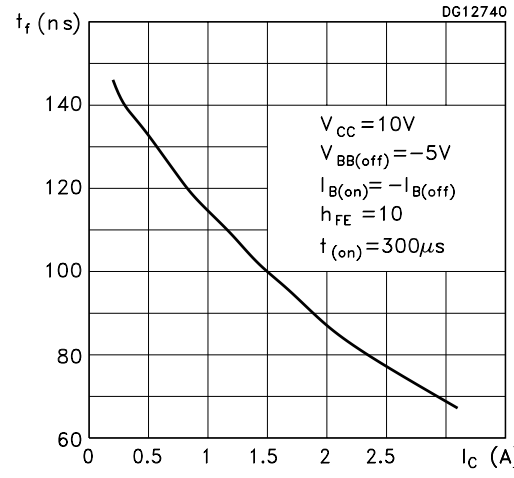


Figure 9: Switching Times Resistive Load

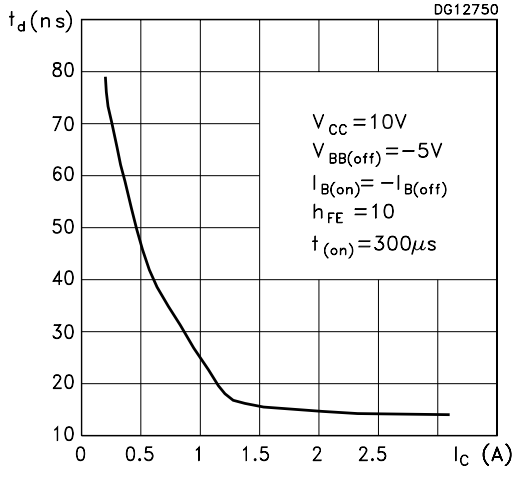


Figure 10: Switching Times Inductive Load

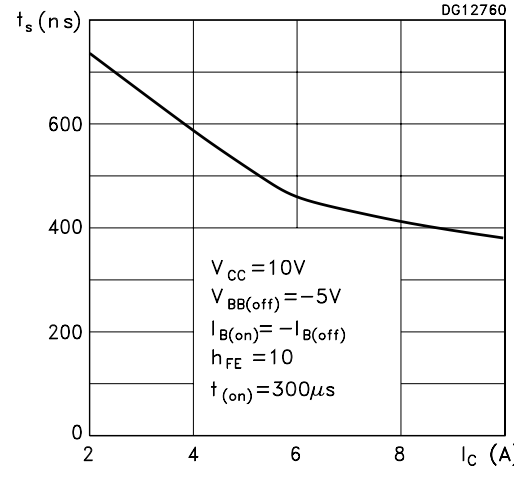


Figure 11: Switching Times Inductive Load

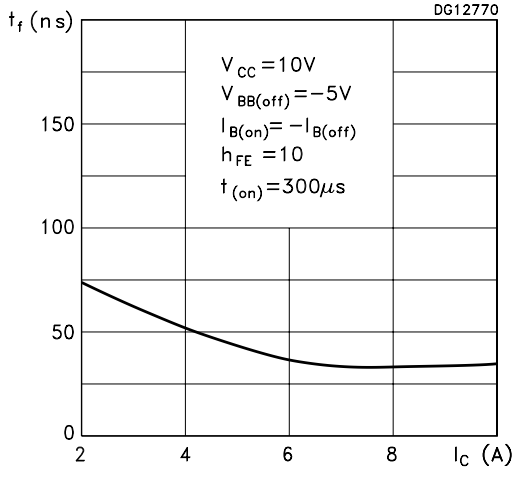


Figure 12: Resistive Load Switching Test Circuit.

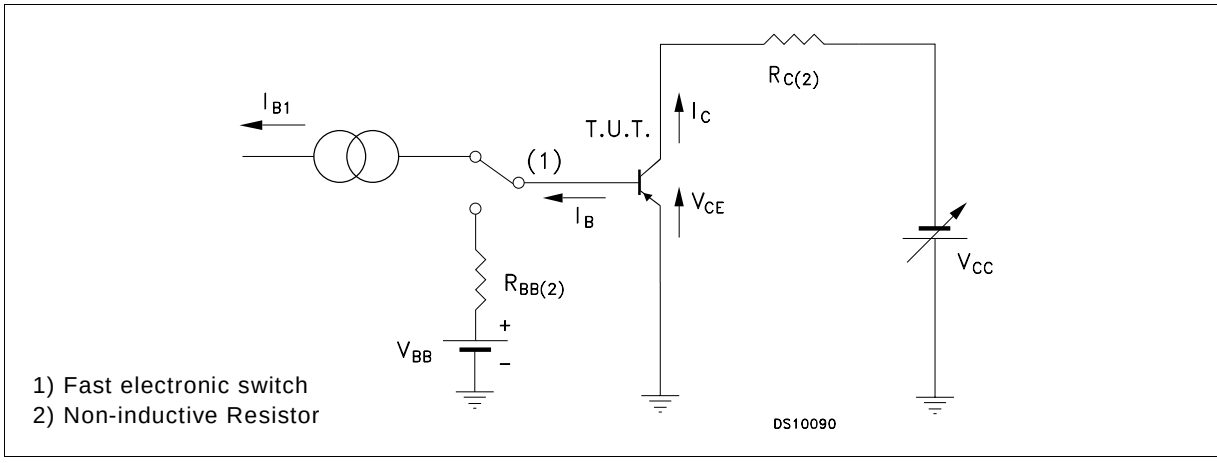
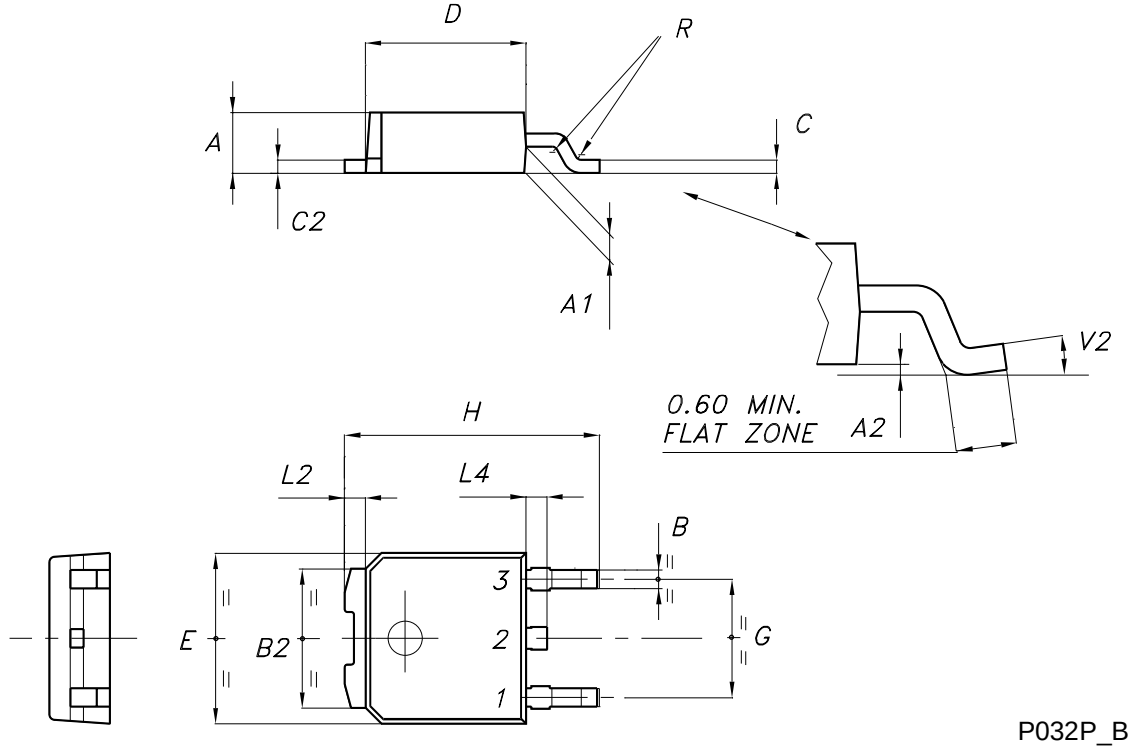


Table 5: Revision History

Date	Revision	Description of Changes
12 July 2004	1	Third Revision

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



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