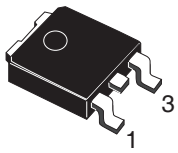
STD2805

Low voltage fast-switching PNP power transistor

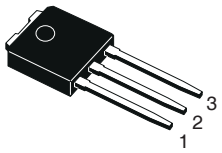
Preliminary Data

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)
- Through-hole IPAK (TO-251) power package in tube (suffix “-1”)



TO-252
DPAK
(suffix “T4”)



TO-251
IPAK
(suffix “-1”)

Description

The device is manufactured in PNP Planar technology by using a “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

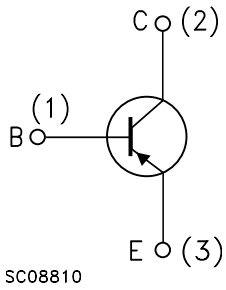


Table 1. Devices summary

Order codes	Marking	Package	Packaging
STD2805T4	D2805	DPAK	Tape & reel
STD2805-1	D2805	IPAK	Tube

1 Electrical ratings

Table 1. Absolute maximum rating

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage (I_E =0)	-60	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	-5	A
I_{CM}	Collector peak current (t_P < 5ms)	-10	A
I_B	Base current	-2	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 2. 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)

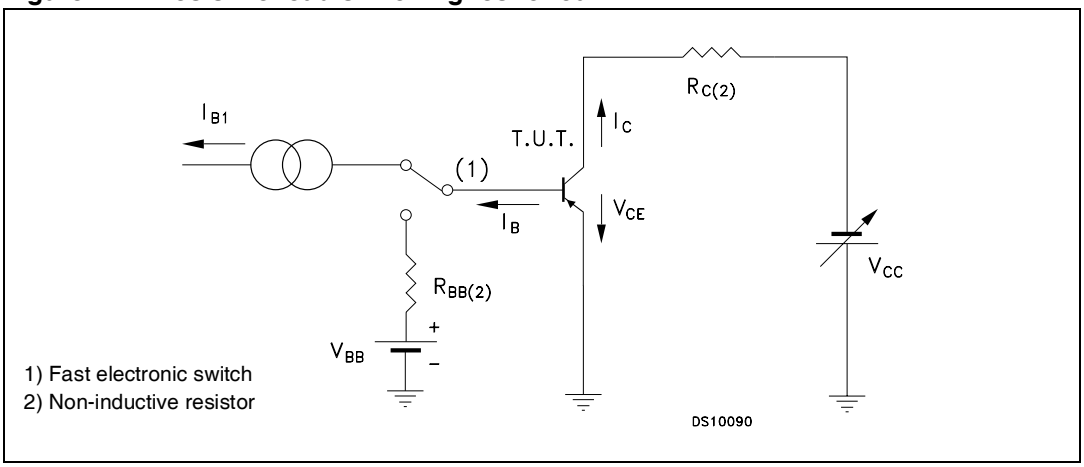
Table 3. Electrical characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current (I_E =0)	V_{CB} = -60V			0.1	µA
I_{EBO}	Emitter cut-off current (I_C =0)	V_{EB} = -5V			0.1	µA
$V_{(BR)CBO}$	Collector-base breakdown voltage (I_E = 0)	I_C =-100µA	-60			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 =-100mA I_B =-5mA I_C =-2A I_B =-50mA I_C =-3A I_B =-150mA I_C =-5A I_B =-200mA		 -150 -200	-50 -300 -400 -600	mV mV mV mV
$V_{BE(sat)}$ (1)	Base-emitter saturation voltage	I_C =-2A I_B =-50mA		-0.9	-1.2	V
h_{FE} (1)	DC current gain	I_C =-100mA V_{CE} =-2V I_C =-5A V_{CE} =-2V I_C =-10A V_{CE} =-2V	200 85 20		400	
f_T	Transition frequency	V_{CE} =-10V I_C =-50mA		150		MHz
C_{CBO}	Collector-base capacitance	V_{CB} =-10V f =1MHz		60		pF
t_{ON} t_s t_f	Resistive load Turn-on time Storage time Fall time	V_{CC} = -30V I_C = -1A I_{B1} =-I_{B2} = -0.1A		 80 600 70		 ns ns ns

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

2.1 Test circuit

Figure 2. Resistive load switching test circuit

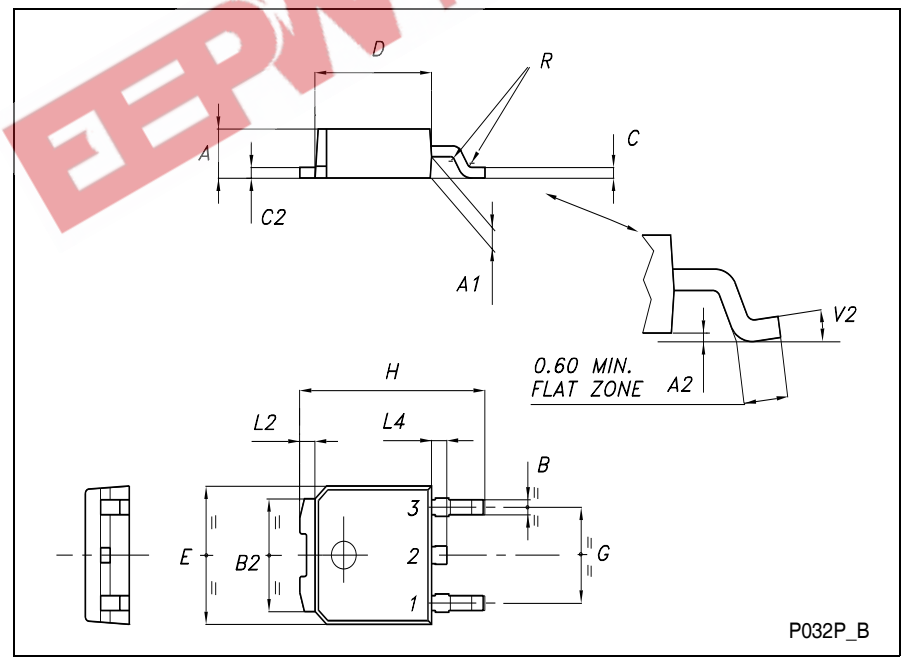


3 Package mechanical data

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

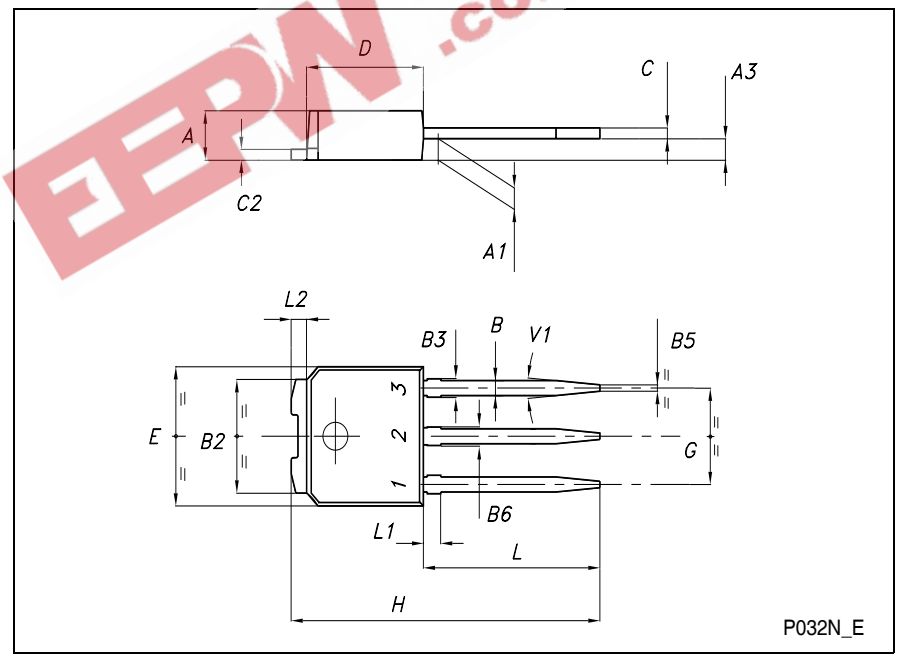
TO-252 (DPAK) MECHANICAL DATA

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°		8°	0°		0°



TO-251 (IPAK) 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
A3	0.70		1.30	0.028		0.051
B	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204		0.213
B3			0.85			0.033
B5		0.30			0.012	
B6			0.95			0.037
C	0.45		0.60	0.018		0.024
C2	0.48		0.60	0.019		0.024
D	6.00		6.20	0.237		0.244
E	6.40		6.60	0.252		0.260
G	4.40		4.60	0.173		0.181
H	15.90		16.30	0.626		0.642
L	9.00		9.40	0.354		0.370
L1	0.80		1.20	0.031		0.047
L2		0.80	1.00		0.031	0.039
V1		10°			10°	



4 Revision history

Table 4. Revision history

Date	Revision	Changes
26-Jun-2007	1	Initial release.

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