



# STD1805

## LOW VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

### PRELIMINARY DATA

Ordering Code	Marking	Shipment
STD1805T4	D1805	Tape & Reel
STD1805-1	D1805	Tube

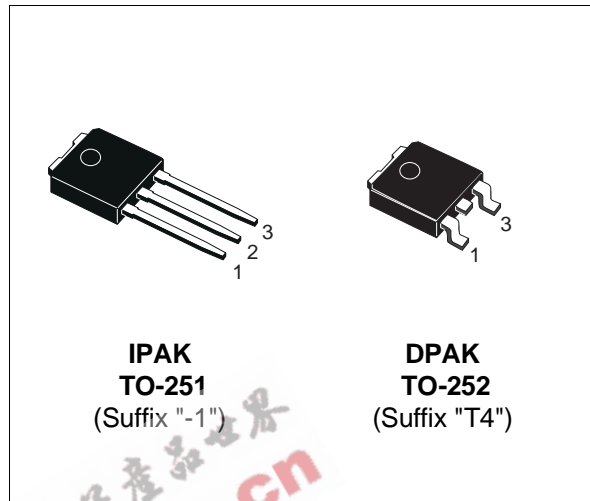
- VERY LOW COLLECTOR TO EMITTER SATURATION VOLTAGE
- HIGH CURRENT GAIN CHARACTERISTIC
- FAST-SWITCHING SPEED
- THROUGH-HOLE IPAK (TO-251) POWER PACKAGE IN TUBE (Suffix "-1")
- SURFACE-MOUNTING DPAK (TO-252) POWER PACKAGE IN TAPE & REEL (Suffix "T4")

#### APPLICATIONS:

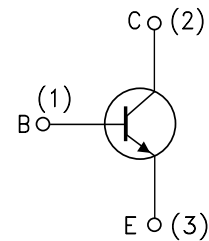
- CCFL DRIVERS
- VOLTAGE REGULATORS
- RELAY DRIVERS
- HIGH EFFICIENCY LOW VOLTAGE SWITCHING APPLICATIONS

#### 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.



#### INTERNAL SCHEMATIC DIAGRAM



SC06960

#### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )	150	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	60	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	7	V
$I_C$	Collector Current	5	A
$I_{CM}$	Collector Peak Current ( $t_p < 5$ ms)	10	A
$I_B$	Base Current	2	A
$P_{tot}$	Total Dissipation at $T_c = 25$ °C	15	W
$T_{stg}$	Storage Temperature	-65 to 150	°C
$T_j$	Max. Operating Junction Temperature	150	°C

# STD1805

## THERMAL DATA

R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	8.33	°C/W
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## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

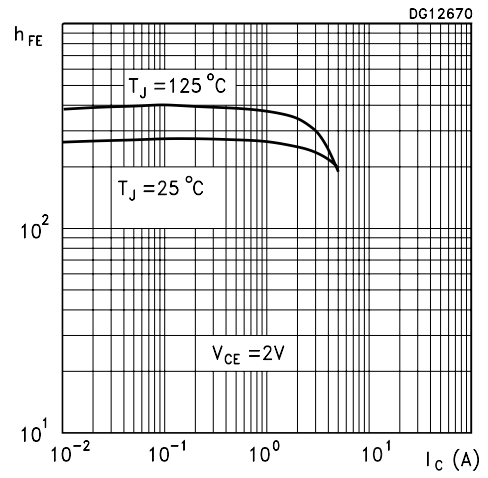
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CB0</sub>	Collector Cut-off Current (I <sub>E</sub> = 0)	V <sub>CB</sub> = 40 V			0.1	μA
I <sub>EB0</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 4 V			0.1	μA
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage (I <sub>E</sub> = 0)	I <sub>C</sub> = 100 μA	150			V
V <sub>(BR)CEO*</sub>	Collector-Emitter Breakdown Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = 1 mA	60			V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = 100 μA	7			V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 100 mA I <sub>C</sub> = 2 A I <sub>C</sub> = 3 A I <sub>C</sub> = 5 A	I <sub>B</sub> = 5 mA I <sub>B</sub> = 50 mA I <sub>B</sub> = 150 mA I <sub>B</sub> = 200 mA	150 200	50 300 400 600	mV mV mV mV
V <sub>BE(sat)*</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 2 A	I <sub>B</sub> = 100 mA	0.9	1.2	V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = 100 mA I <sub>C</sub> = 5 A I <sub>C</sub> = 10 A	V <sub>CE</sub> = 2 V V <sub>CE</sub> = 2 V V <sub>CE</sub> = 2 V	200 85 20	400	
f <sub>T</sub>	Transition frequency	V <sub>CE</sub> = 10 V	I <sub>C</sub> = 50 mA		150	MHz
C <sub>CB0</sub>	Collector-Base Capacitance	V <sub>CB</sub> = 10 V	f = 1 MHz		50	pF
t <sub>ON</sub> t <sub>s</sub> t <sub>f</sub>	RESISTIVE LOAD Turn- on Time Storage Time Fall Time	I <sub>C</sub> = 1 A I <sub>B1</sub> = - I <sub>B2</sub> = 0.1 A	V <sub>CC</sub> = 30 V		50 1.35 120	ns μs ns

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

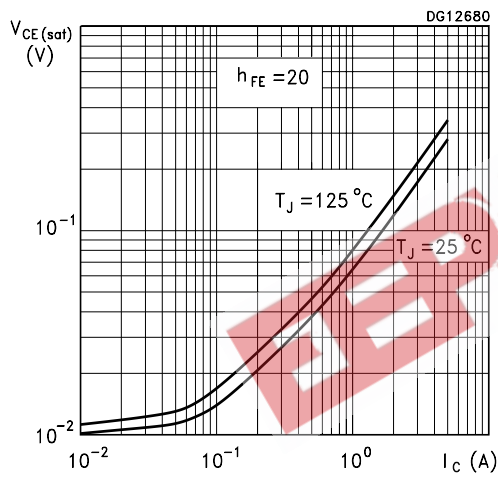
Derating Curve



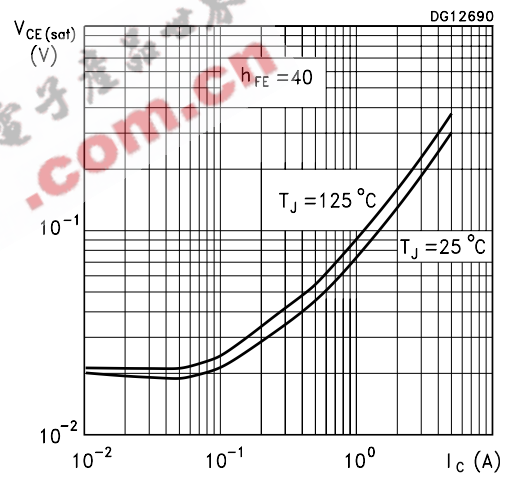
DC Current Gain



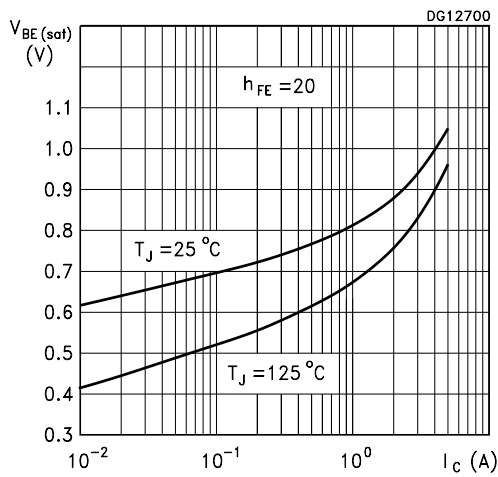
Collector-Emitter Saturation Voltage



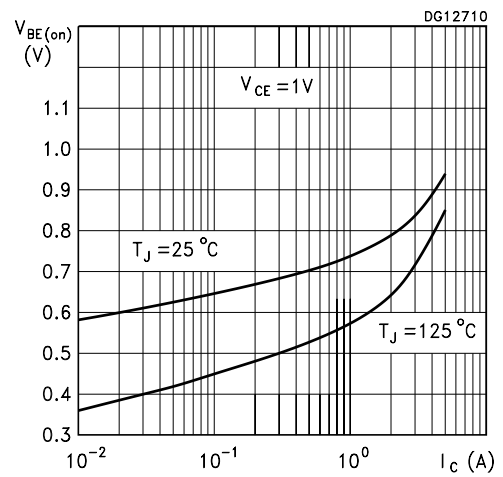
Collector-Emitter Saturation Voltage



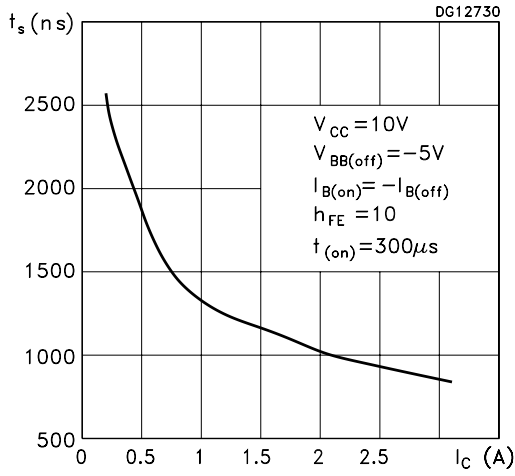
Base-Emitter Saturation Voltage



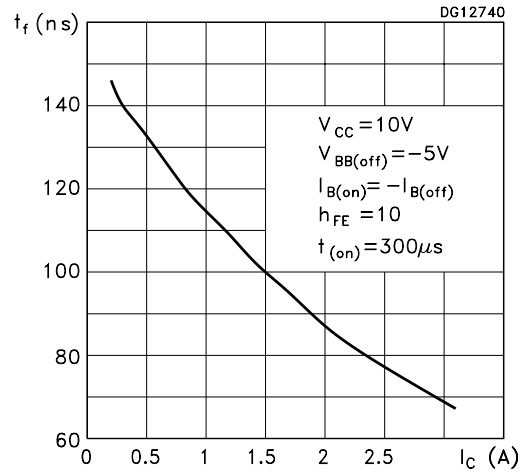
Base-Emitter On Voltage



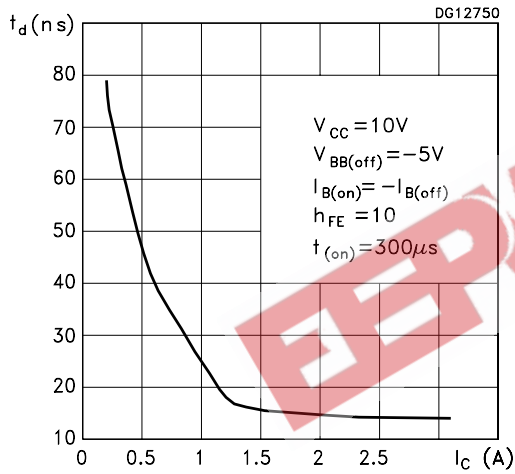
Switching Times Resistive Load



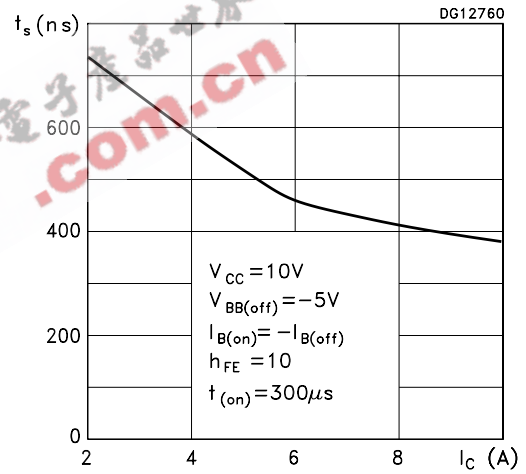
Switching Times Resistive Load



Switching Times Resistive Load



Switching Times Inductive Load



Switching Times Inductive Load

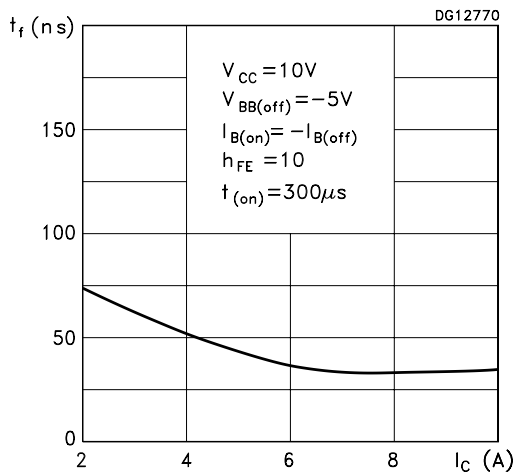
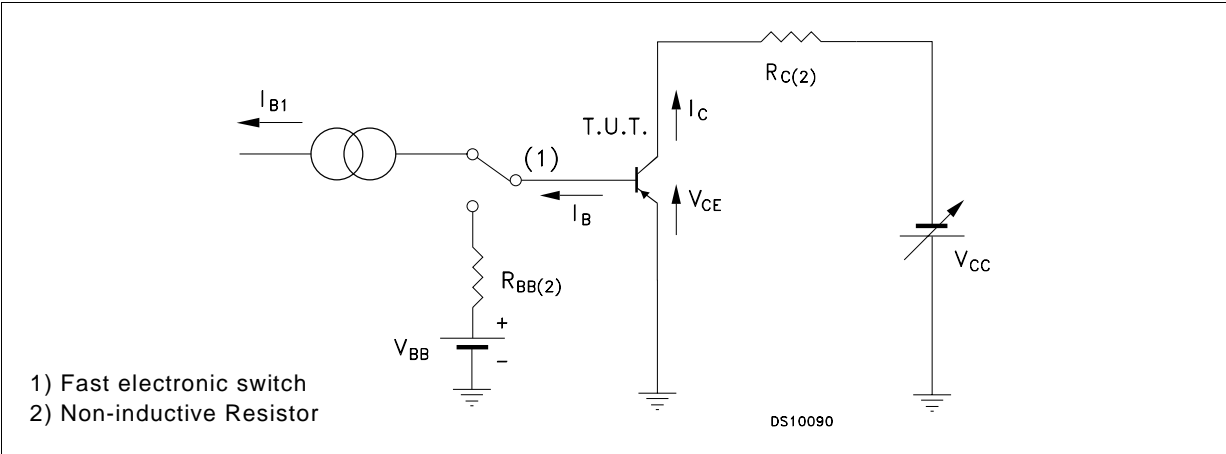


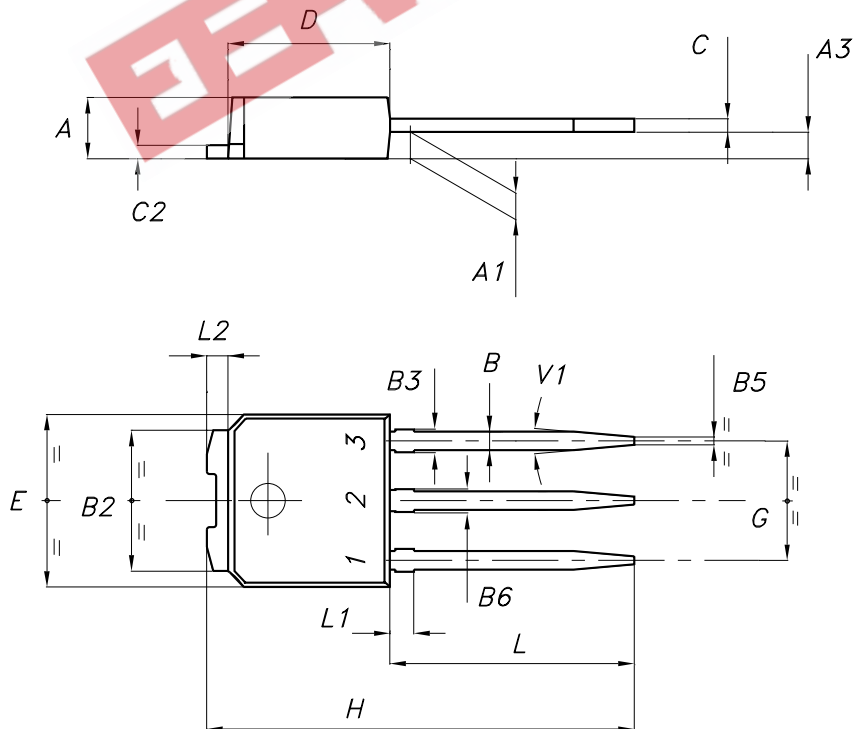
Figure 1: Resistive Load Switching Test Circuit.



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TO-251 (IPAK) MECHANICAL DATA

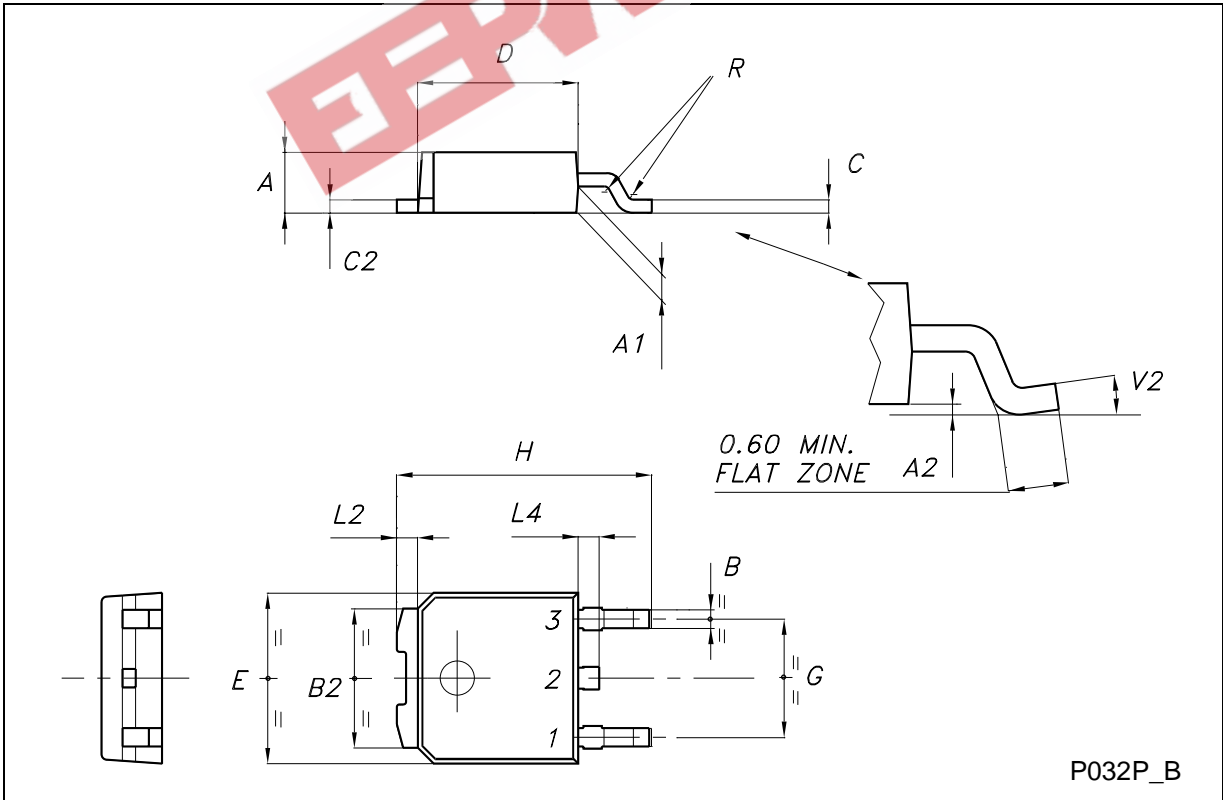
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	2.20		2.40	0.087		0.094
A1	0.90		1.10	0.035		0.043
A3	0.70		1.30	0.028		0.051
B	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204		0.213
B3			0.85			0.033
B5		0.30			0.012	
B6			0.95			0.037
C	0.45		0.60	0.018		0.024
C2	0.48		0.60	0.019		0.024
D	6.00		6.20	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°	



P032N\_E

**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°



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