



STD1805

LOW VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

PRELIMINARY DATA

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

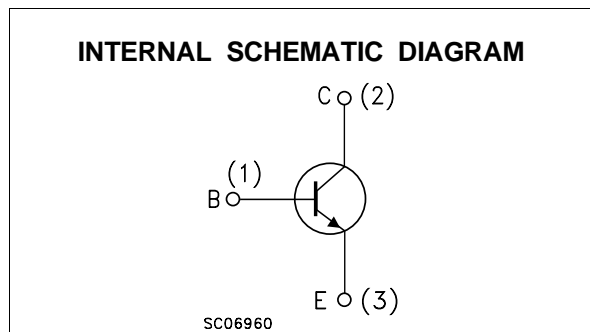
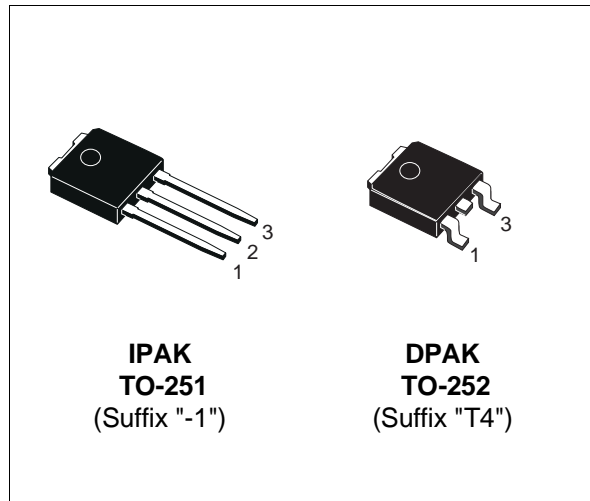
- VERY LOW COLLECTOR TO EMITTER SATURATION VOLTAGE
- HIGH CURRENT GAIN CHARACTERISTIC
- FAST-SWITCHING SPEED
- THROUGH-HOLE IPAK (TO-251) POWER PACKAGE IN TUBE (Suffix "-1")
- SURFACE-MOUNTING DPAK (TO-252) POWER PACKAGE IN TAPE & REEL (Suffix "T4")

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.



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

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THERMAL DATA

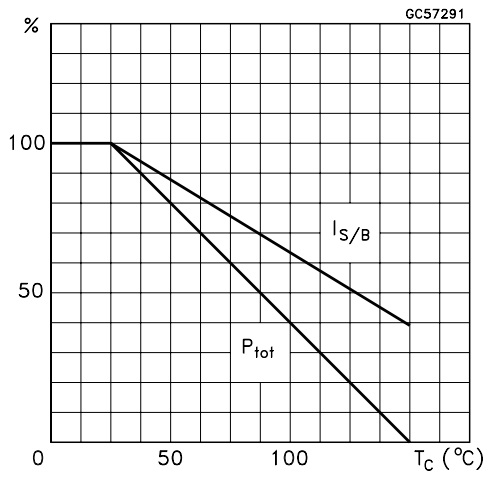
R _{thj-case}	Thermal Resistance Junction-case	Max	8.33	°C/W
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ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

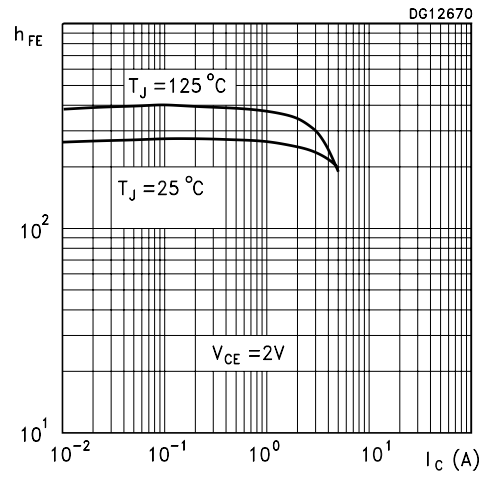
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I _{CBO}	Collector Cut-off Current (I _E = 0)	V _{CB} = 40 V				0.1	μA
I _{EBO}	Emitter Cut-off Current (I _C = 0)	V _{EB} = 4 V				0.1	μA
V _{(BR)CBO}	Collector-Base Breakdown Voltage (I _E = 0)	I _C = 100 μA		150			V
V _{(BR)CEO*}	Collector-Emitter 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		7			V
V _{CE(sat)*}	Collector-Emitter Saturation Voltage	I _C = 100 mA I _C = 2 A I _C = 3 A I _C = 5 A	I _B = 5 mA I _B = 50 mA I _B = 150 mA I _B = 200 mA		150 200	50 300 400 600	mV mV 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 = 5 A I _C = 10 A	V _{CE} = 2 V V _{CE} = 2 V V _{CE} = 2 V	200 85 20		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
t _{ON} t _s t _f	RESISTIVE LOAD Turn- on Time Storage Time Fall Time	I _C = 1 A I _{B1} = - I _{B2} = 0.1 A	V _{CC} = 30 V		50 1.35 120		ns μs ns

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

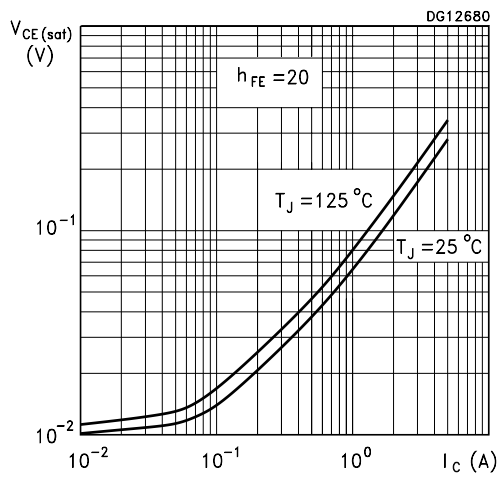
Derating Curve



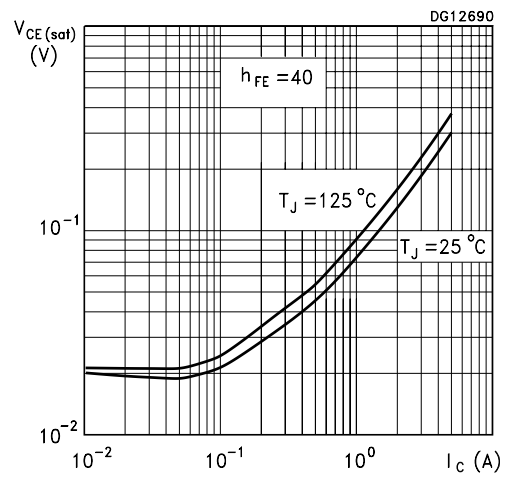
DC Current Gain



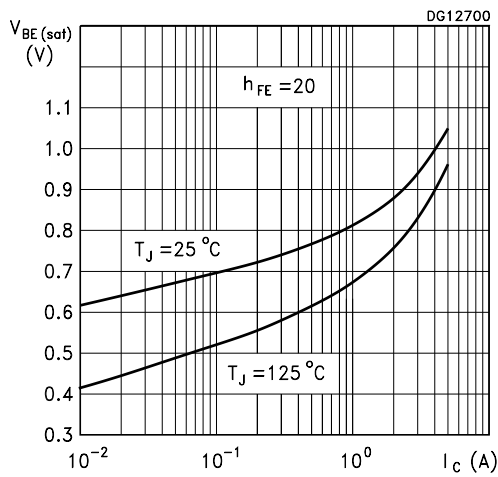
Collector-Emitter Saturation Voltage



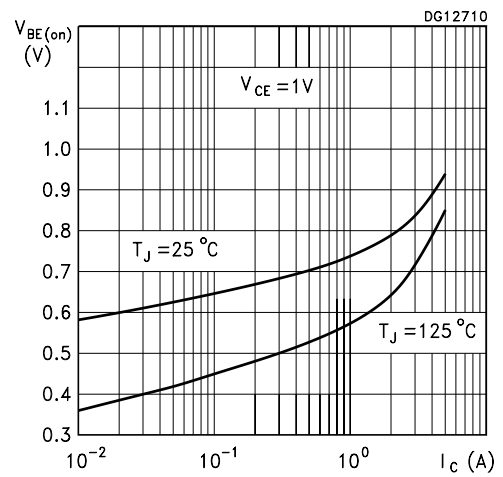
Collector-Emitter Saturation Voltage



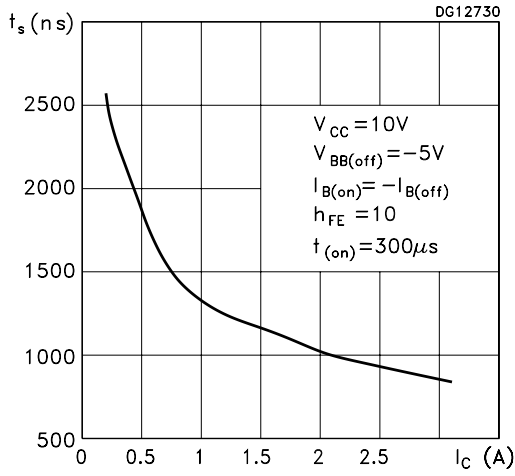
Base-Emitter Saturation Voltage



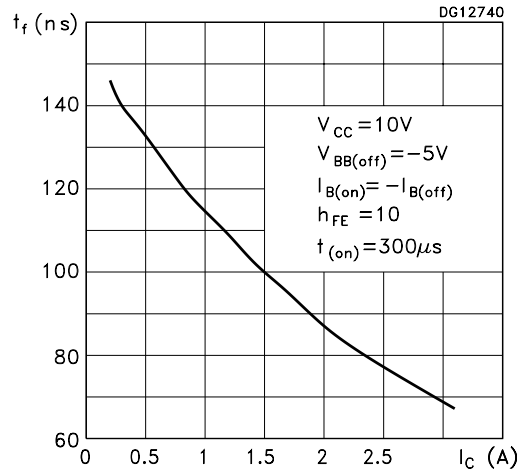
Base-Emitter On Voltage



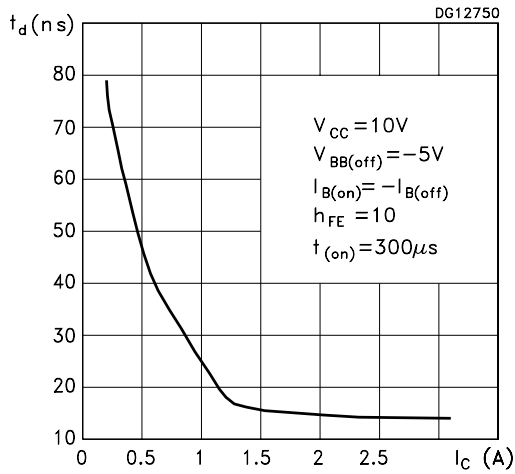
Switching Times Resistive Load



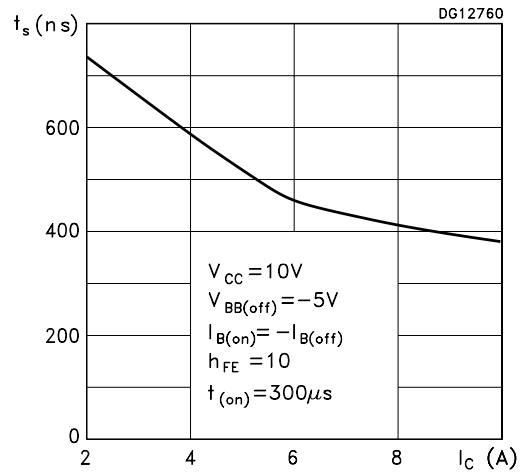
Switching Times Resistive Load



Switching Times Resistive Load



Switching Times Inductive Load



Switching Times Inductive Load

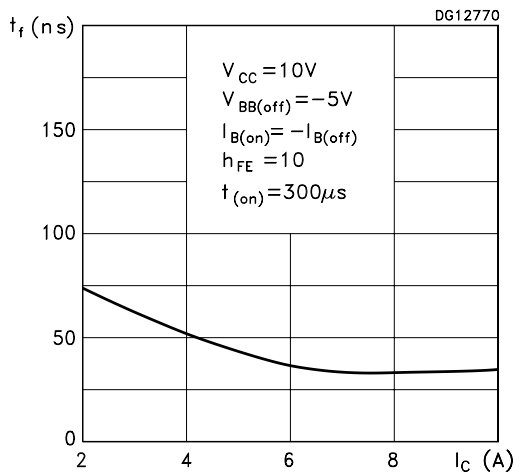
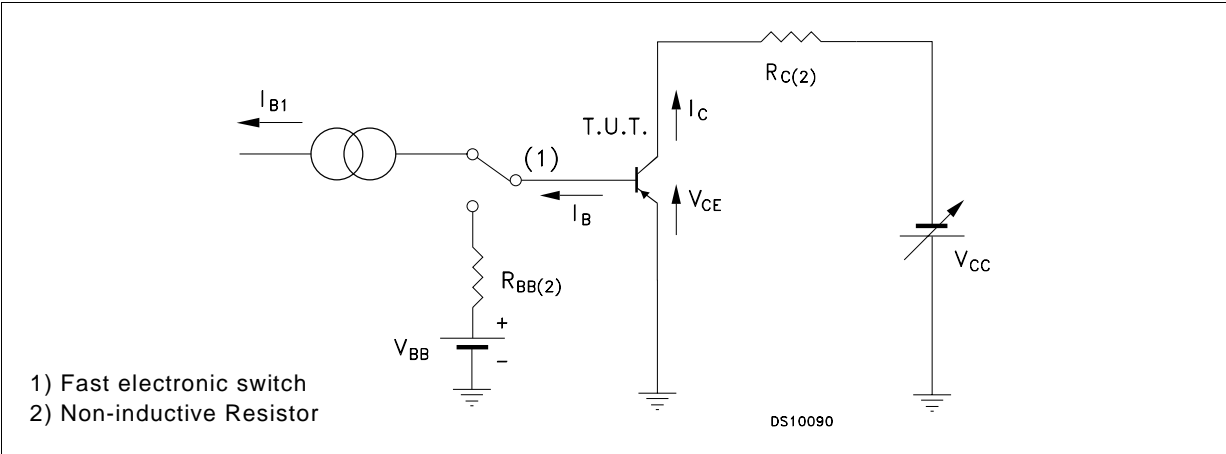
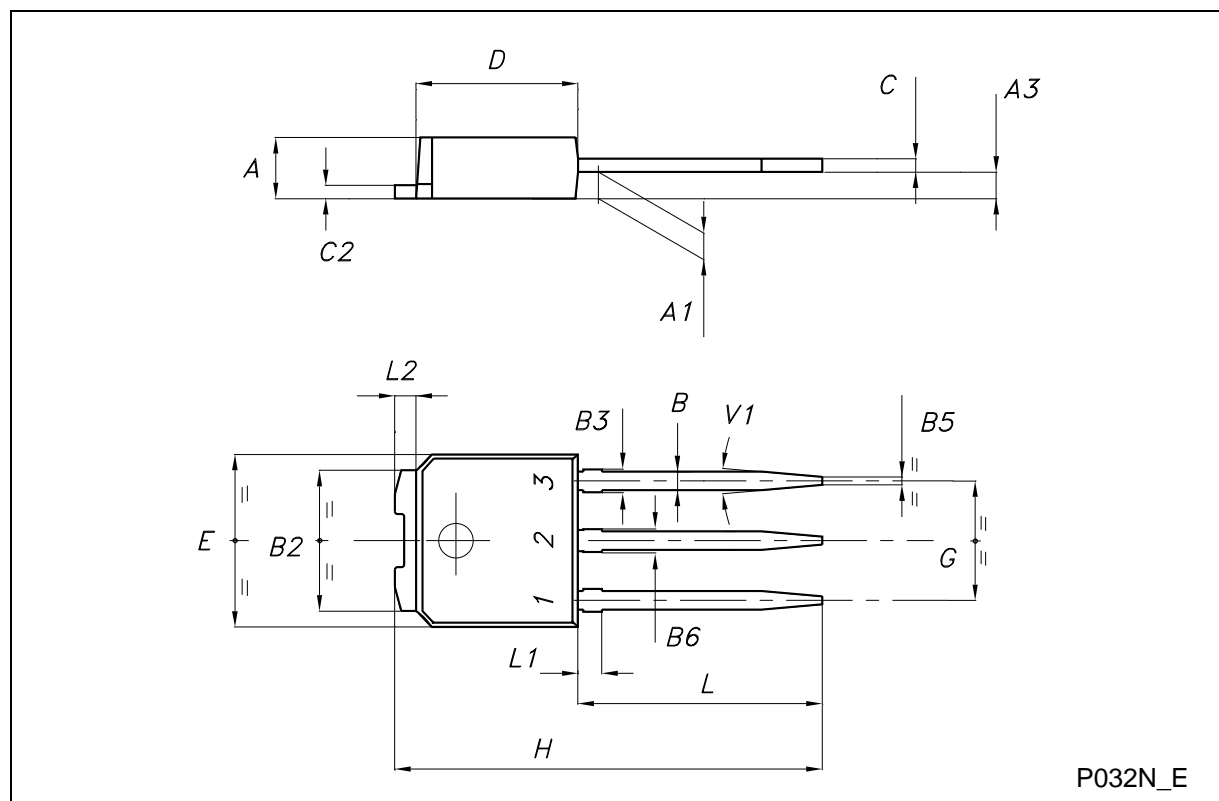


Figure 1: Resistive Load Switching Test Circuit.



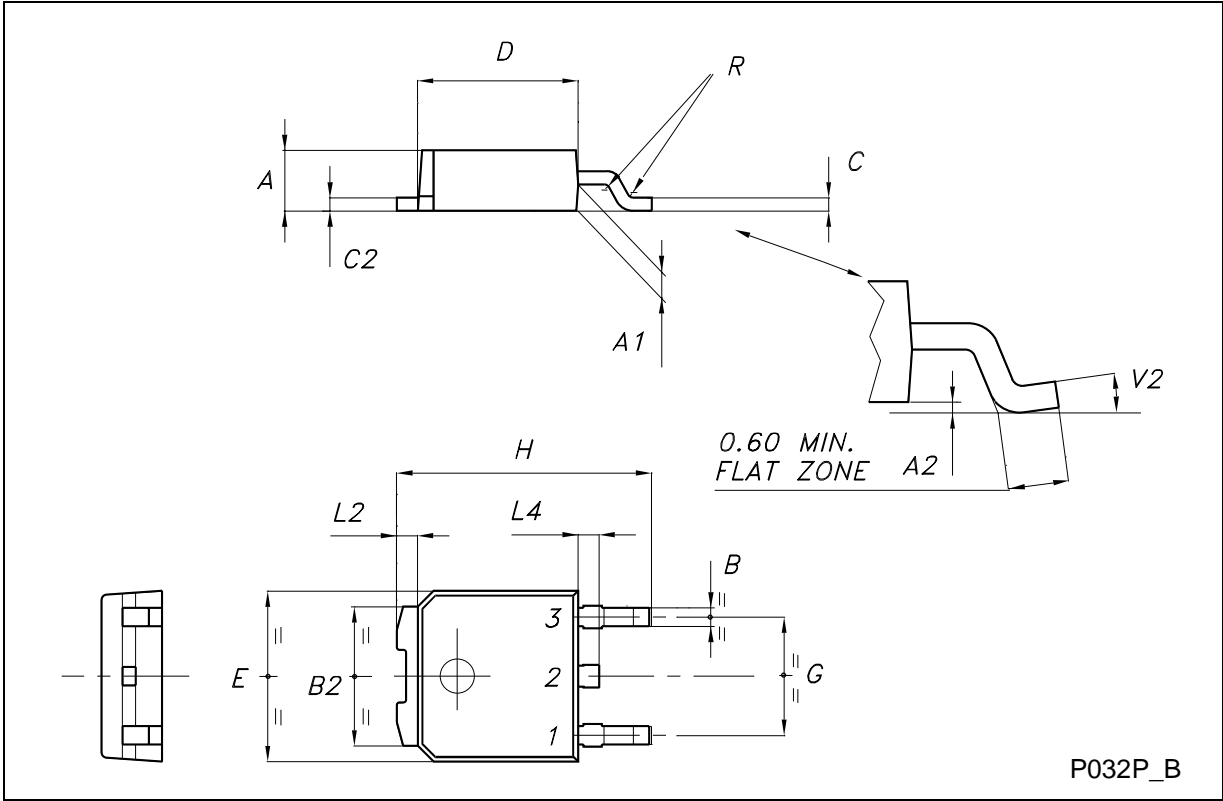
TO-251 (IPAK) MECHANICAL DATA

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°	



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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