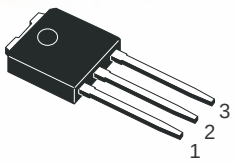
STD1805

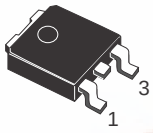
LOW VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

PRELIMINARY DATA

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



IPAK
TO-251
(Suffix "-1")



DPAK
TO-252
(Suffix "T4")

- 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:

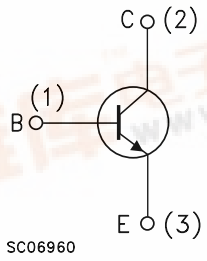
- CCFL DRIVERS
- VOLTAGE REGULATORS
- RELAY DRIVERS
- HIGH EFFICIENCY LOW VOLTAGE SWITCHING APPLICATIONS

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



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

THERMAL DATA

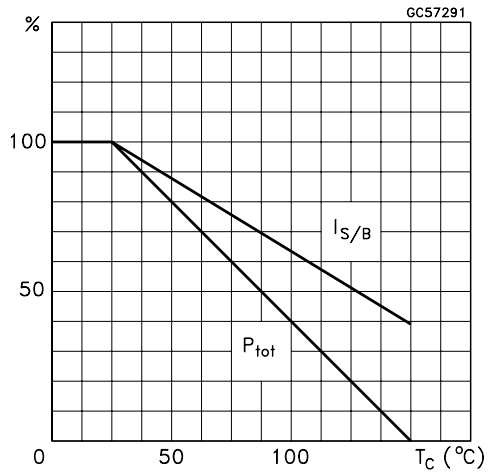
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	8.33	$^oC/W$

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

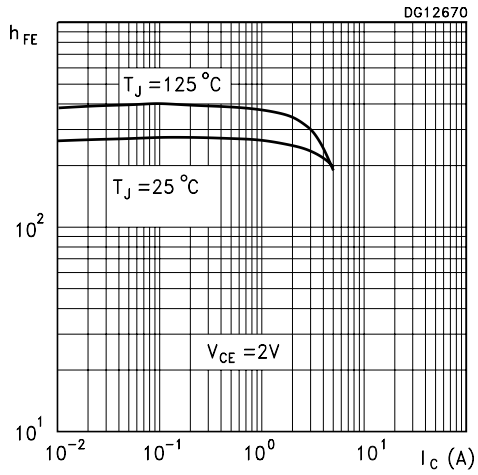
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I_E = 0)	V_{CB} = 40 V				0.1	µA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 4 V				0.1	µA
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage (I_E = 0)	I_C = 100 µA		150			V
$V_{(BR)CEO}$*	Collector-Emitter Breakdown 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 %

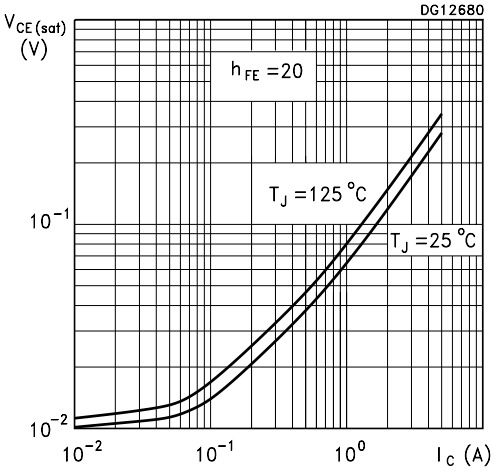
Derating Curve



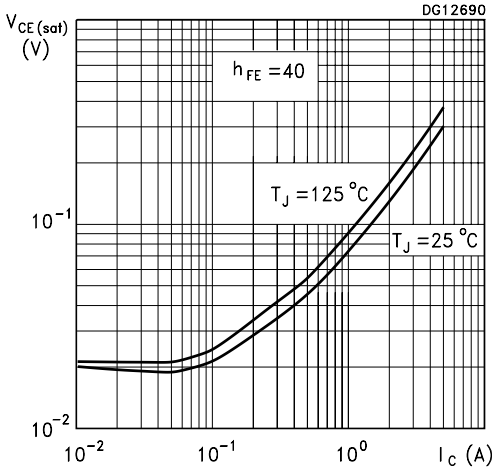
DC Current Gain



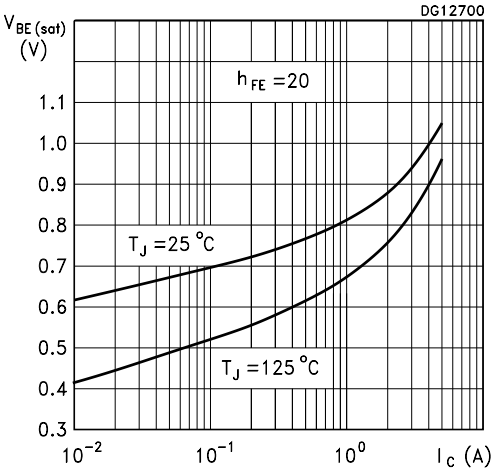
Collector-Emitter Saturation Voltage



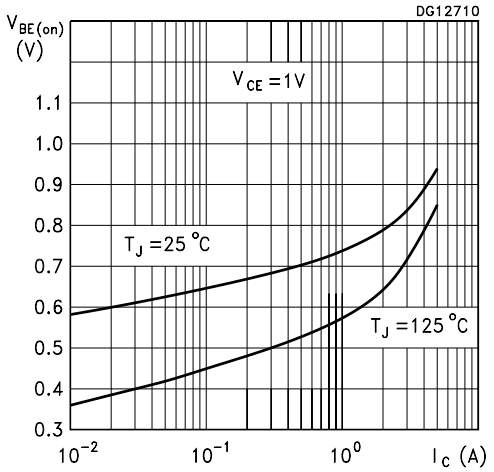
Collector-Emitter Saturation Voltage



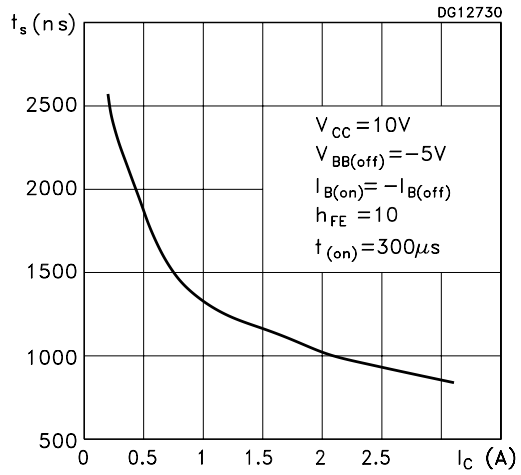
Base-Emitter Saturation Voltage



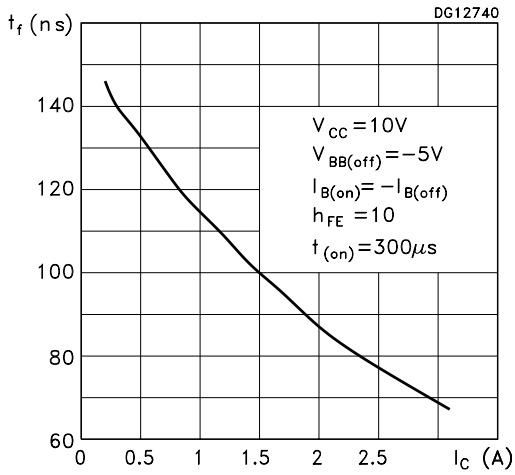
Base-Emitter On Voltage



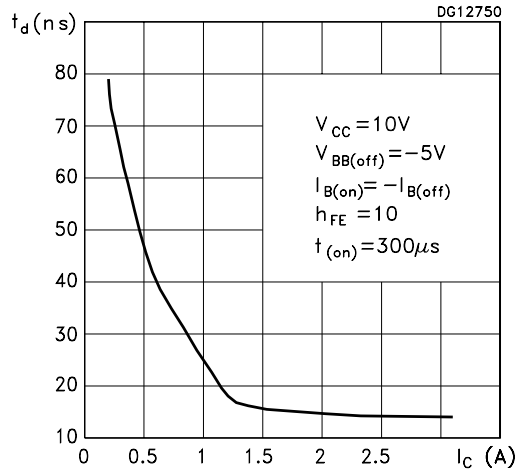
Switching Times Resistive Load



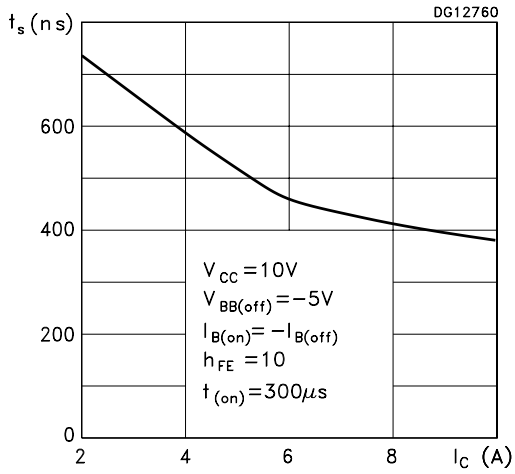
Switching Times Resistive Load



Switching Times Resistive Load



Switching Times Inductive Load



Switching Times Inductive Load

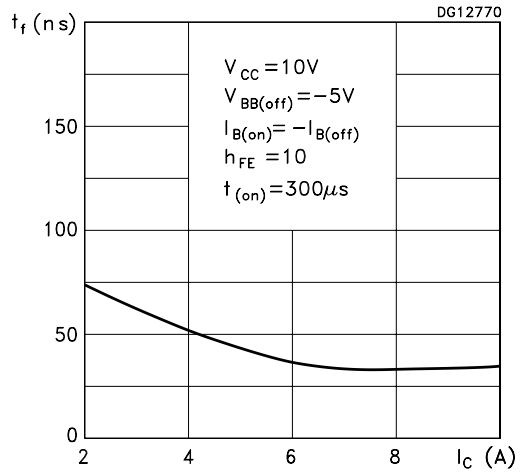
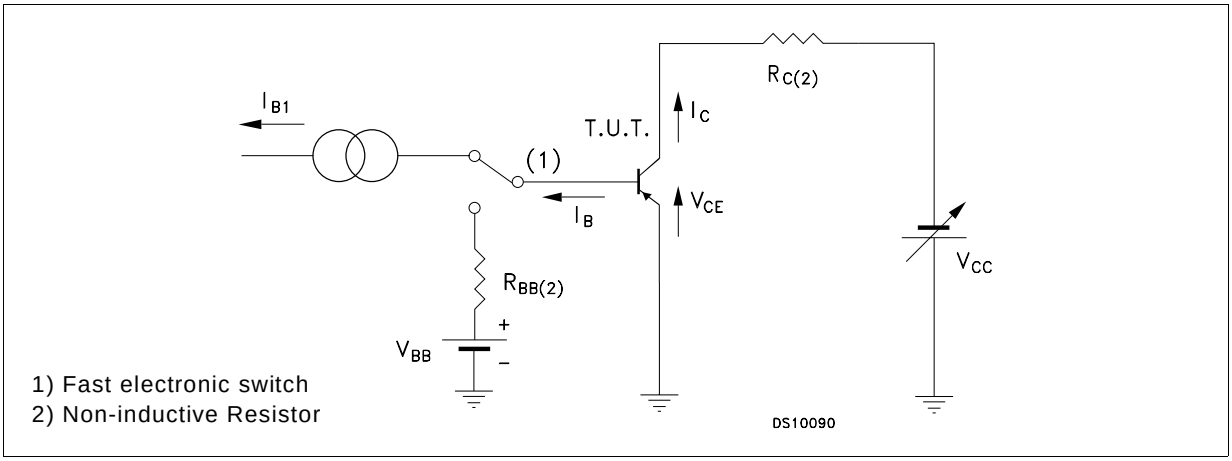
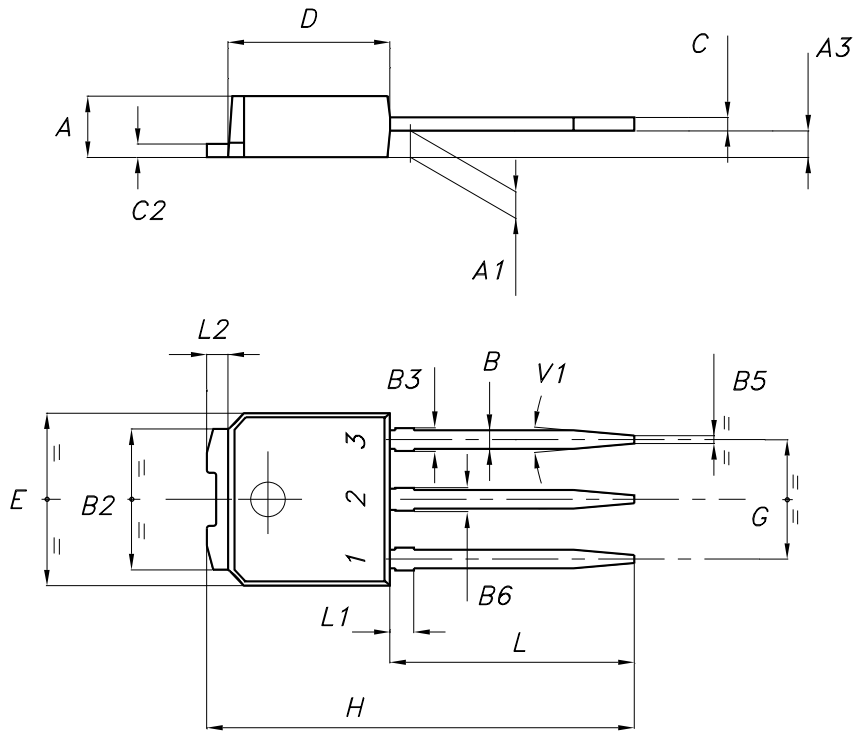


Figure 1: Resistive Load Switching Test Circuit.



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^o			10^o	



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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