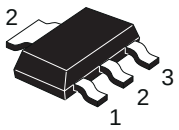
STN83003

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

PRELIMINARY DATA

- MEDIUM VOLTAGE CAPABILITY
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED
- SOT-223 PLASTIC PACKAGE FOR SURFACE MOUNTING CIRCUITS
- TAPE AND REEL PACKING



SOT-223

APPLICATIONS:

- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING
- SWITCH MODE POWER SUPPLIES

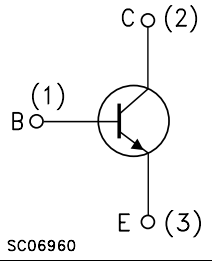
DESCRIPTION

The device is manufactured using high voltage Multi-Epitaxial Planar technology for high switching speeds and medium voltage capability.

It uses a Cellular Emitter structure with planar edge termination to enhance switching speeds while maintaining the wide RBSOA.

The STN83003 is expressly designed for a new solution to be used in compact fluorescent lamps, where it is coupled with the STN93003, its complementary PNP transistor.

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CES}	Collector-Emitter Voltage (V_{BE} = 0)	700	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)	400	V
V_{EBO}	Emitter-Base Voltage (I_C = 0, I_B = 0.75 A, t_p < 10µs, T_j < 150°C)	$V_{(BR)EBO}$	V
I_C	Collector Current	1.5	A
I_{CM}	Collector Peak Current (t_p < 5 ms)	3	A
I_B	Base Current	0.75	A
I_{BM}	Base Peak Current (t_p < 5 ms)	1.5	A
P_{tot}	Total Dissipation at T_c = 25 °C	1.6	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-ambient	Max	78	$^oC/W$

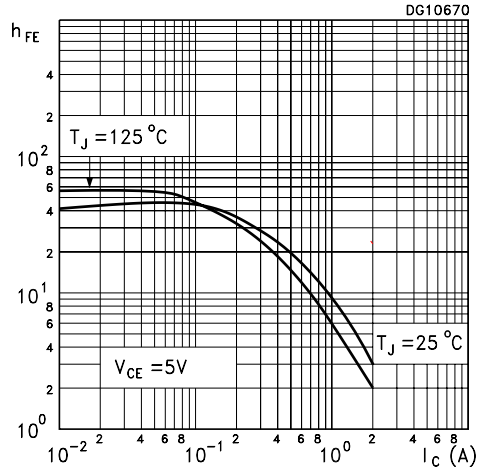
* Device mounted on a PCB area of 1 cm^2.

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

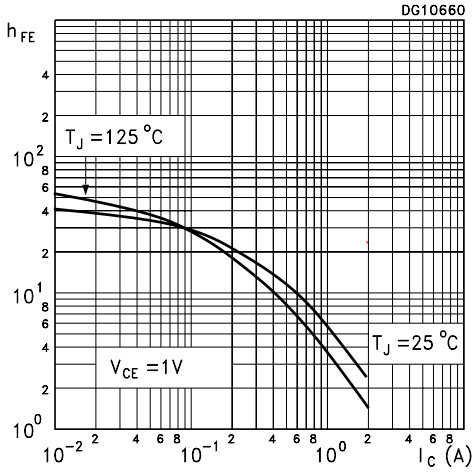
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CEV}	Collector Cut-off Current (V_{BE} = -1.5V)	V_{CE} = 700V V_{CE} = 700V	 T_j = 125^oC			1 5	mA mA
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage (I_C = 0)	I_E = 10 mA		12		18	V
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 10 mA L = 25 mH		400			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 0.5 A I_C = 0.35 A	I_B = 0.1 A I_B = 50 mA			0.5 1	V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 0.5 A	I_B = 0.1 A			1	V
h_{FE}*	DC Current Gain	I_C = 10 mA I_C = 0.35 A I_C = 1 A	V_{CE} = 5 V V_{CE} = 5 V V_{CE} = 5 V	10 16 4	25	32	
 t_r t_s t_f	RESISTIVE LOAD Rise Time Storage Time Fall Time	 I_C = 0.35 A I_{B1} = 70 mA $T_p \geq$ 25 µs	 V_{CC} = 125 V I_{B2} = -70 mA (see figure 2)	 1.5	 100 2.2 0.2	 2.9	 ns µs µs
 t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 0.5 A $V_{BE(off)}$ = -5 V V_{clamp} = 300 V	I_{B1} = 0.1 A L = 10 mH (see figure 1)		 450 90		 ns ns

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

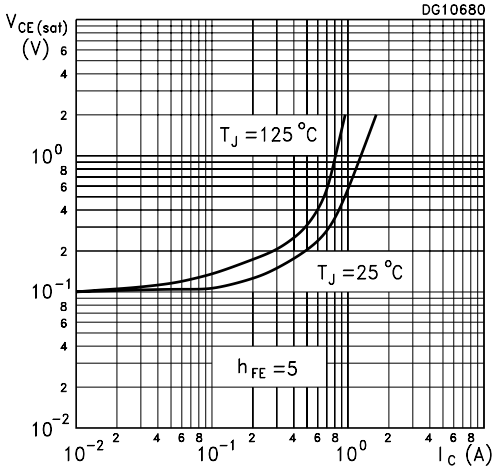
DC Current Gain



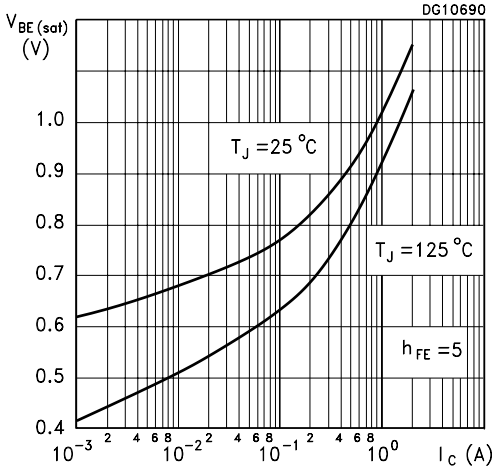
DC Current Gain



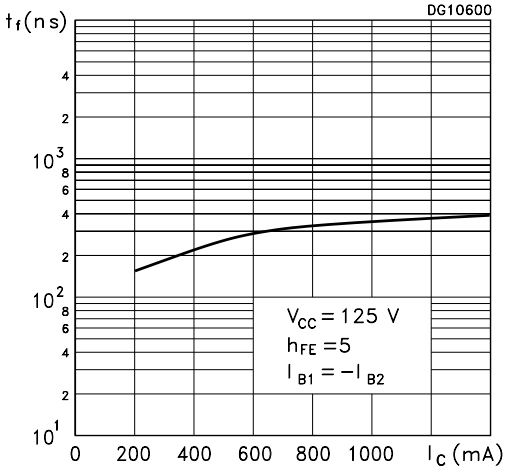
Collector Emitter Saturation Voltage



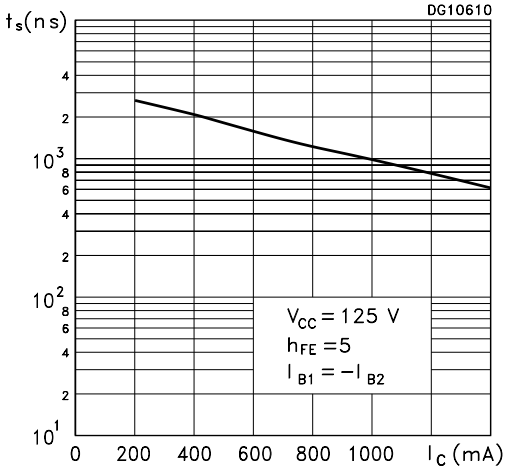
Base Emitter Saturation Voltage



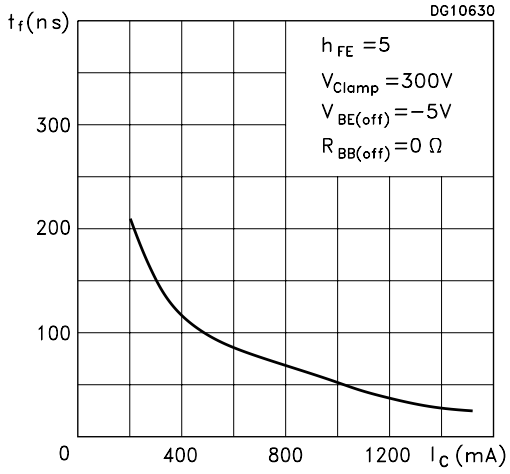
Resistive Load Fall Time



Resistive Load Storage Time



Inductive Load Fall Time



Inductive Load Storage Time

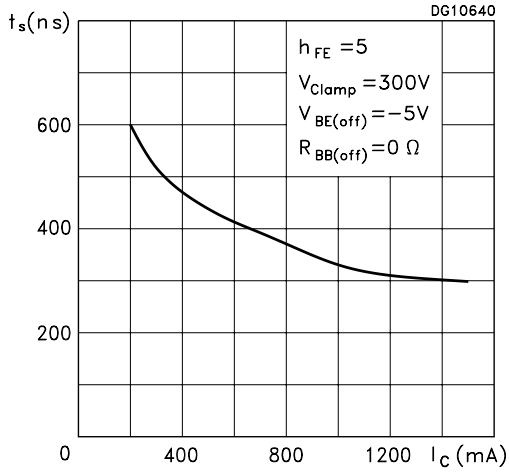


Figure 1: Inductive Load Switching Test Circuit.

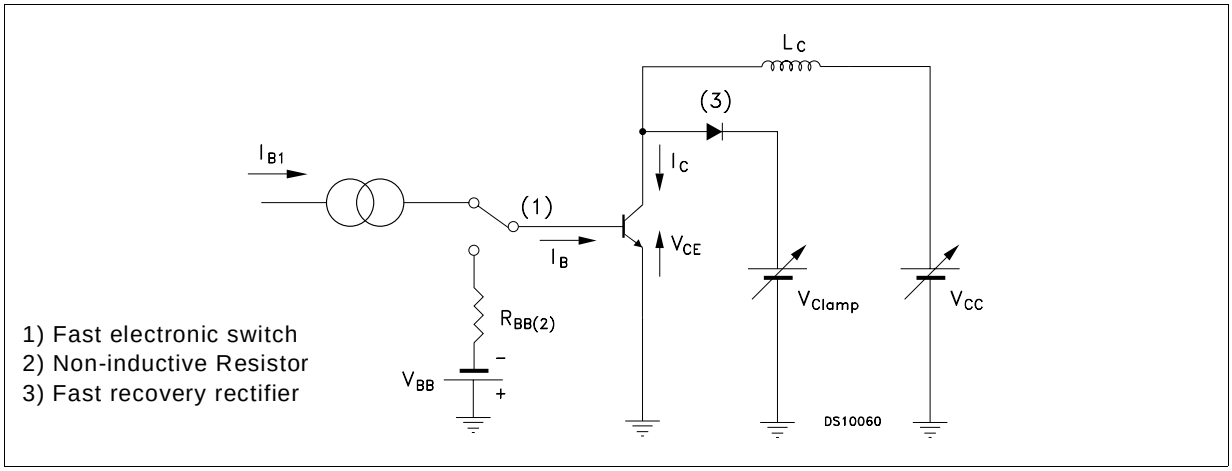
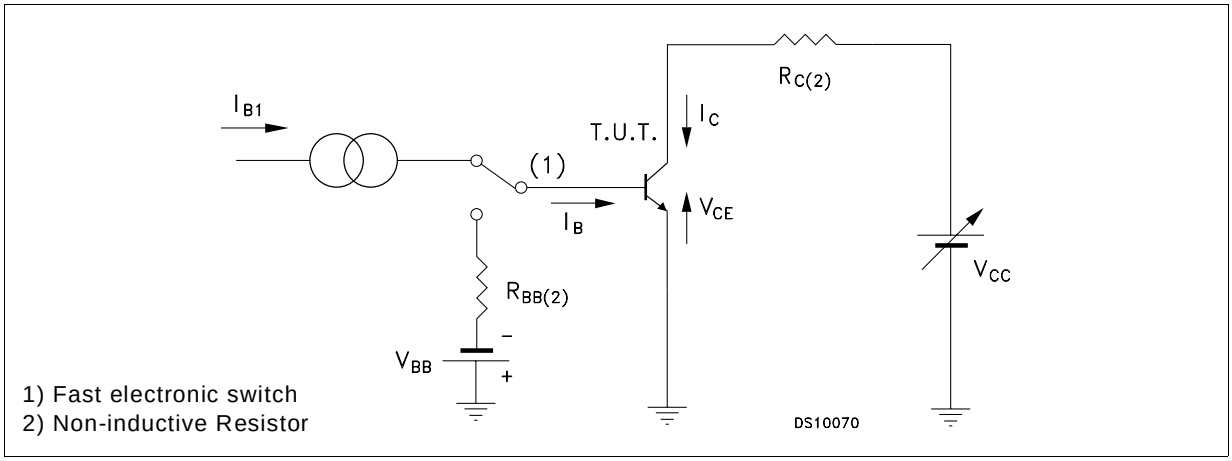
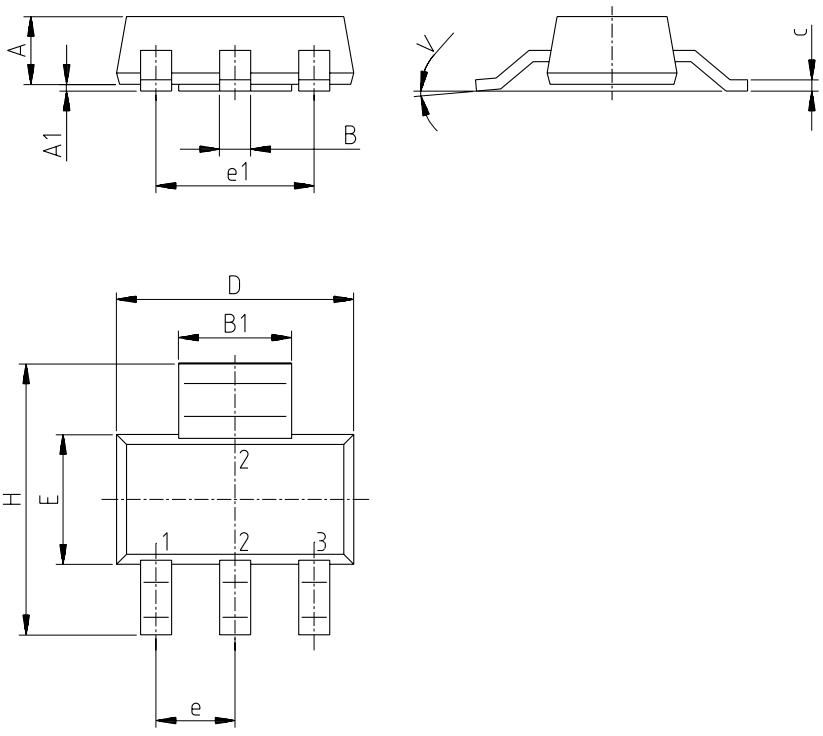


Figure 2: Resistive Load Switching Test Circuit.



SOT-223 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.80			0.071
B	0.60	0.70	0.80	0.024	0.027	0.031
B1	2.90	3.00	3.10	0.114	0.118	0.122
c	0.24	0.26	0.32	0.009	0.010	0.013
D	6.30	6.50	6.70	0.248	0.256	0.264
e		2.30			0.090	
e1		4.60			0.181	
E	3.30	3.50	3.70	0.130	0.138	0.146
H	6.70	7.00	7.30	0.264	0.276	0.287
V			10^o			10^o
A1		0.02				



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