

STX93003

HIGH VOLTAGE FAST-SWITCHING PNP POWER TRANSISTOR

- ST93003 SILICON IN TO-92 PACKAGE
- MEDIUM VOLTAGE CAPABILITY
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED

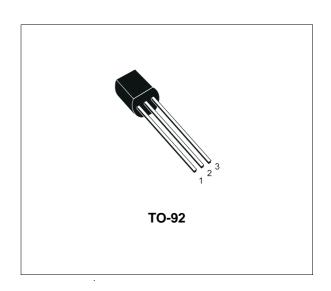
APPLICATIONS:

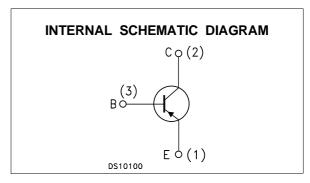
 ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING

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 STX93003 is expressly designed for a new solution to be used in compact fluorescent lamps, where it is coupled with the STX83003, its complementary NPN transistor.





ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter Value		Unit
V _{CES}	Collector-Emitter Voltage (V _{BE} = 0)	-500	V
V_{CEO}	Collector-Emitter Voltage (I _B = 0)	-400	V
V _{EBO}	Emitter-Base Voltage ($I_C = 0$) ($I_C = 0$, $I_B = -0.5$ A, $t_p < 10\mu s$, $T_j < 150$ °C)	$V_{(BR)EBO}$	V
Ic	Collector Current	-1	Α
I _{CM}	Collector Peak Current (tp < 5 ms)	-3	Α
I_{B}	Base Current	-0.5	Α
I _{BM}	Base Peak Current (t _p < 5 ms)	-1.5	Α
P _{tot}	Total Dissipation at T _C = 25 °C	1.5	W
T _{stg}	Storage Temperature	-65 to 150	°C
Tj	Max. Operating Junction Temperature	150	°C

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THERMAL DATA

R _{thj-case}	Thermal Resistance Junction-Case	Max	83.3	°C/W	
$R_{thj-Amb}$	Thermal Resistance Junction-Ambient	Max	200	°C/W	

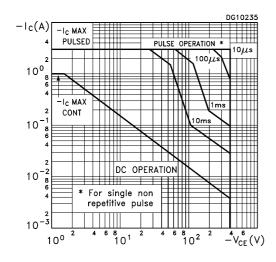
ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions		Min.	Тур.	Max.	Unit
I _{CES}	Collector Cut-off Current (V _{BE} = 0)	V _{CE} = -500V V _{CE} = -500V	T _j = 125°C			-1 -5	mA mA
V _{(BR)EBO}	Emitter Base Breakdown Voltage (I _C = 0)	I _E = -10 mA		-5		-10	V
$V_{\text{CEO(sus)}}^*$	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 -0.5	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	$I_{C} = -10 \text{ mA}$ $I_{C} = -0.35 \text{ A}$ $I_{C} = -1 \text{ A}$	$V_{CE} = -5 V$ $V_{CE} = -5 V$ $V_{CE} = -5 V$	10 16 4	25	32	
t _r t _s t _f	RESISTIVE LOAD Rise Time Storage Time Fall Time	$I_{C} = -0.35 \text{ A}$ $I_{B1} = -70 \text{ mA}$ $T_{p} \ge 25 \mu\text{s}$	$V_{CC} = 125 V$ $I_{B2} = 70 mA$ (see Figure 2)	1.5	90 2.2 0.1	2.9	ns μs μs
t _s	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)		400 40		ns ns
E _{sb}	Avalanche Energy	$L = 4 \text{ mH}$ $I_{BR} \le 2.5 \text{ A}$	C = 1.8 nF 25°C < T _C < 125°C	12			mJ

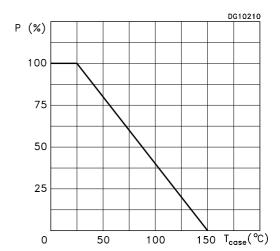
^{*} Pulsed: Pulse duration = 300μs, duty cycle = 1.5 %.

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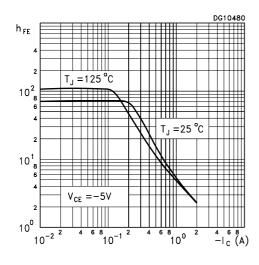
Safe Operating Area



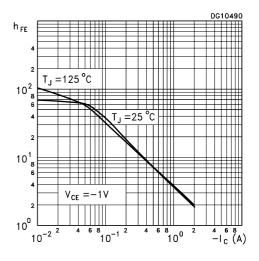
Derating Curve



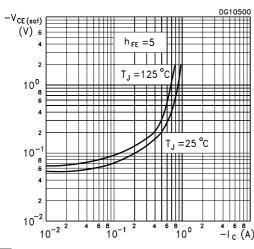
DC Current Gain



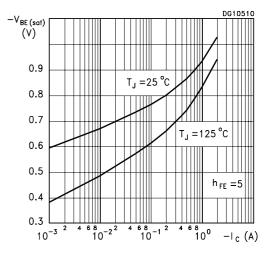
DC Current Gain



Collector Emitter Saturation Voltage

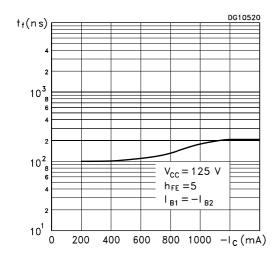


Base Emitter Saturation Voltage

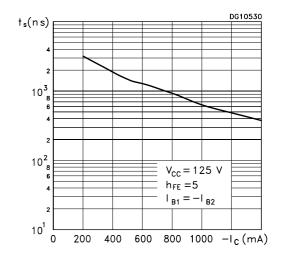


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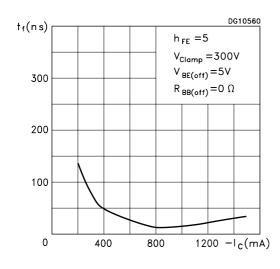
Resistive Load Fall Time



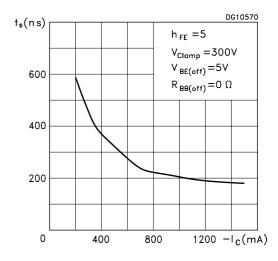
Resistive Load Storage Time



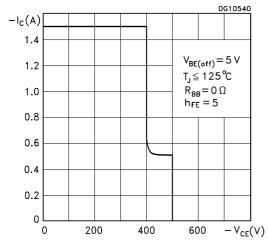
Inductive Load Fall Time



Inductive Load Storage Time



Reverse Biased SOA



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Figure 1: Inductive Load Switching Test Circuit.

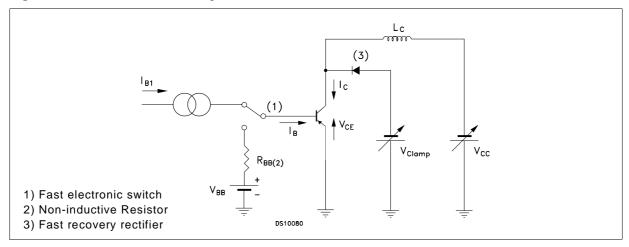
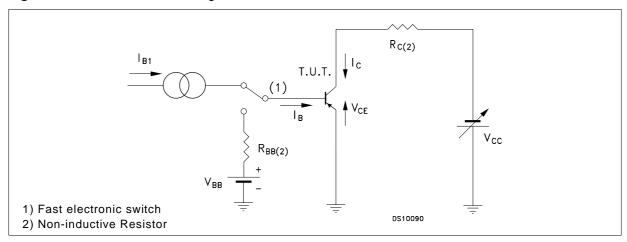
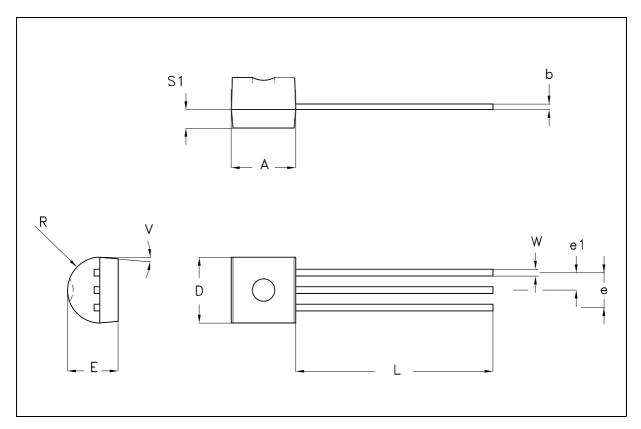


Figure 2: Resistive Load Switching Test Circuit.



TO-92 MECHANICAL DATA

DIM.	mm			inch			
2	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
А	4.32		4.95	0.170		0.195	
b	0.36		0.51	0.014		0.020	
D	4.45		4.95	0.175		0.194	
Е	3.30		3.94	0.130		0.155	
е	2.41		2.67	0.095		0.105	
e1	1.14		1.40	0.045		0.055	
L	12.70		15.49	0.500		0.609	
R	2.16		2.41	0.085		0.094	
S1	1.14		1.52	0.045		0.059	
W	0.41		0.56	0.016		0.022	
V	4 degree	,	6 degree	4 degree		6 degree	



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