STX13003

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- ST13003 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:

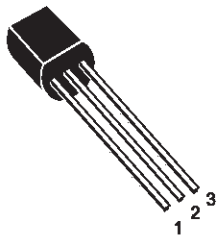
- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING

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 STX13003 is designed for use in compact fluorescent lamp application.



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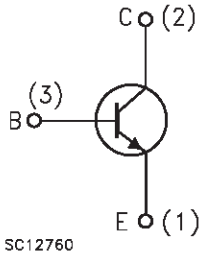
INTERNAL SCHEMATIC DIAGRAM



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 = 0.5 A, t_p < 10µs, T_j < 150°C)	BV_{EBO}	V
I_C	Collector Current	1	A
I_{CM}	Collector Peak Current (t_p < 5 ms)	3	A
I_B	Base Current	0.5	A
I_{BM}	Base Peak Current (t_p < 5 ms)	1.5	A
P_{tot}	Total Dissipation at T_C = 25 °C	1.5	W
T_{stg}	Storage Temperature	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

THERMAL DATA

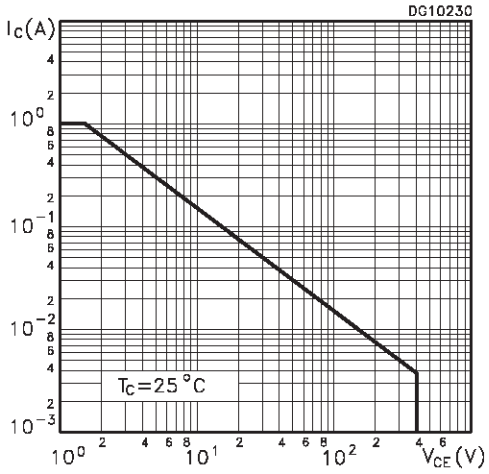
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	83.3	°C/W

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

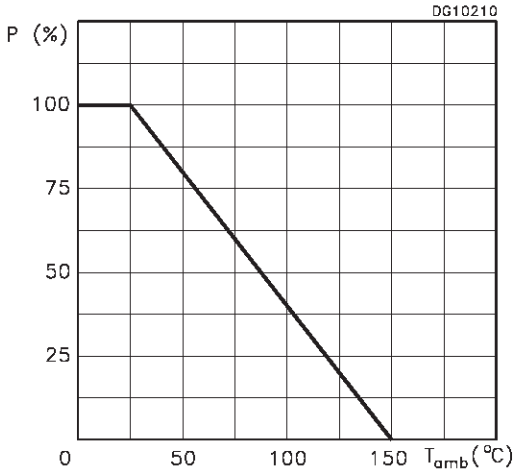
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEV}	Collector Cut-off Current (V_{BE} = -1.5V)	V_{CE} = 700V V_{CE} = 700V T_j = 125°C			1 5	mA mA
BV_{EBO}	Emitter-Base Breakdown Voltage (I_C = 0)	I_E = 10 mA	9		18	V
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 10 mA L = 25 mH	400			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 0.5 A I_B = 0.1 A I_C = 1 A I_B = 0.25 A I_C = 1.5 A I_B = 0.5 A			0.5 1 3	V V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 0.5 A I_B = 0.1 A I_C = 1 A I_B = 0.25 A			1 1.2	V V
h_{FE}*	DC Current Gain	I_C = 0.5 A V_{CE} = 2 V I_C = 1 A V_{CE} = 2 V	8 5		35 25	
 t_r t_s t_f	RESISTIVE LOAD Rise Time Storage Time Fall Time	 I_C = 1 A V_{CC} = 125 V I_{B1} = 0.2 A I_{B2} = -0.2 A T_p= 25 µs			 1 4 0.7	 µs µs µs
 t_s	INDUCTIVE LOAD Storage Time	I_C = 1 A I_{B1} = 0.2 A V_{BE} = -5 V L = 50 mH V_{clamp} = 300 V		0.8		µs

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

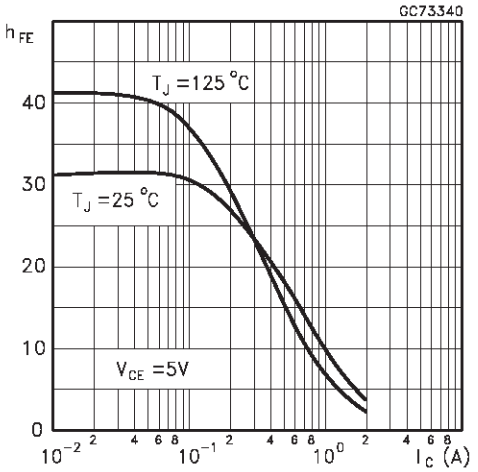
Safe Operating Area



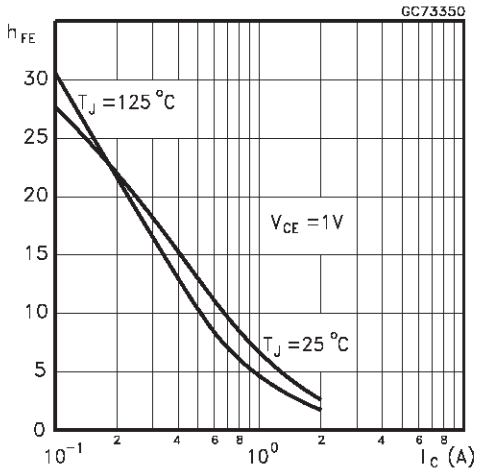
Derating Curve



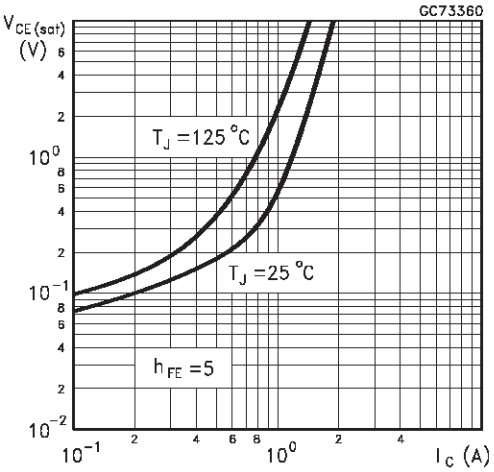
DC Current Gain



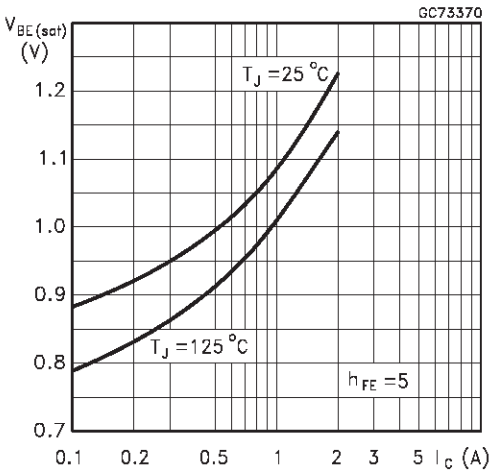
DC Current Gain



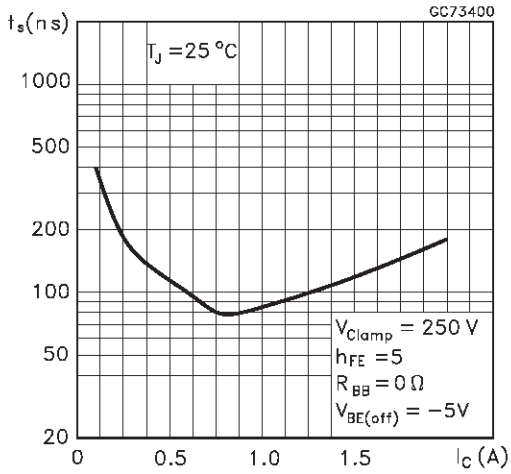
Collector Emitter Saturation Voltage



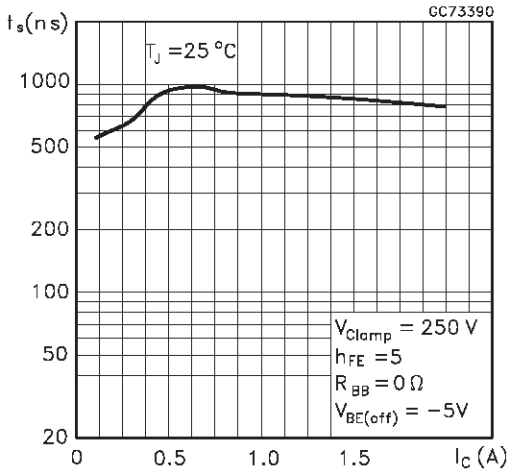
Base Emitter Saturation Voltage



Inductive Fall Time



Inductive Storage Time



Reverse Biased SOA

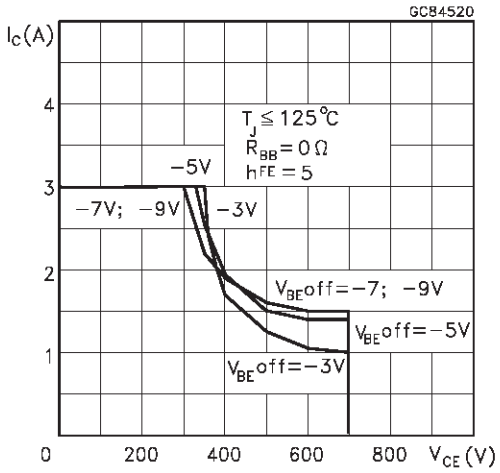


Figure 1: Inductive Load Switching Test Circuits.

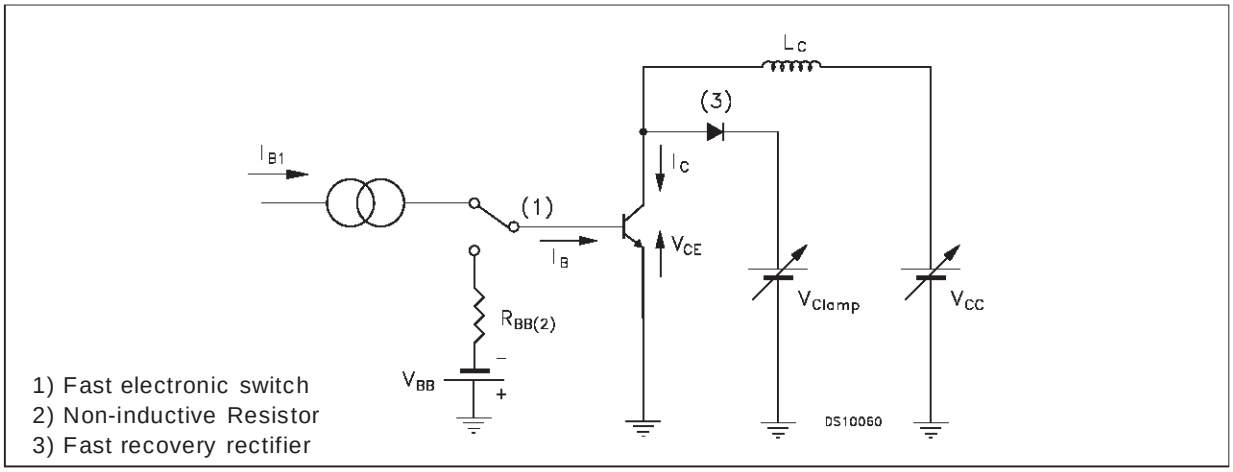
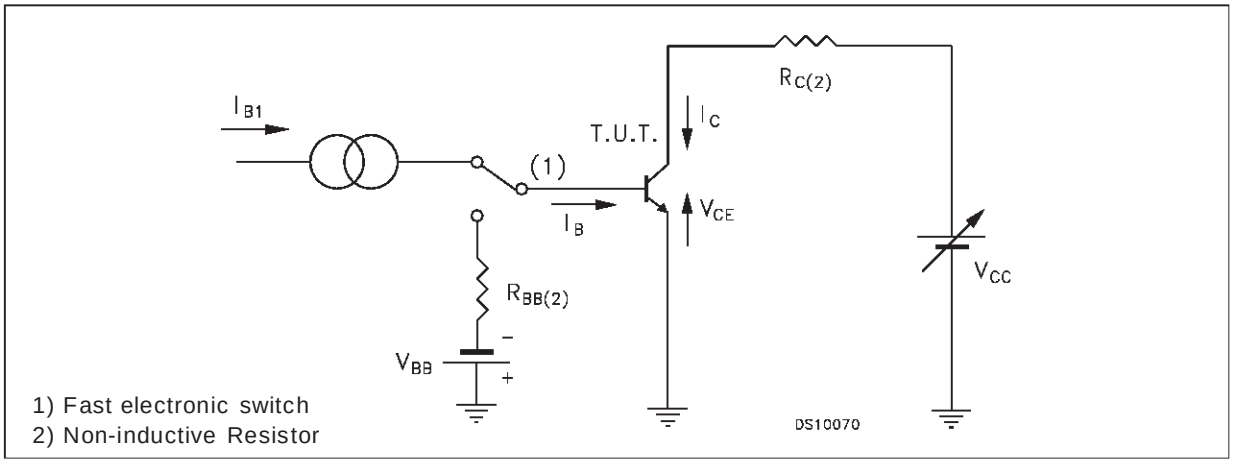


Figure 2: Resistive Load Switching Test Circuits.



TO-92 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.58		5.33	0.180		0.210
B	4.45		5.2	0.175		0.204
C	3.2		4.2	0.126		0.165
D	12.7			0.500		
E		1.27			0.050	
F	0.4		0.51	0.016		0.020
G	0.35			0.14