BUL118

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- NPN TRANSISTOR
- HIGH VOLTAGE CAPABILITY
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED

APPLICATIONS:

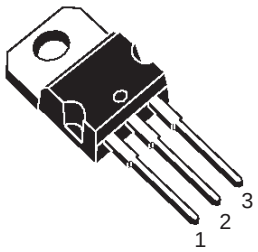
- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING

DESCRIPTION

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

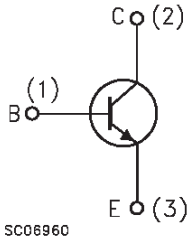
It uses a Cellular Emitter structure with planar edge termination to enhance switching speeds while maintaining the wide RBSOA.

The device is designed for use in lighting applications and low cost switch-mode power supplies.



TO-220

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 <1.5A, t_p <10µs, Tj < 150°C)	BV_{EBO}	V
I_C	Collector Current	3	A
I_{CM}	Collector Peak Current (t_p < 5 ms)	6	A
I_B	Base Current	1.5	A
I_{BM}	Base Peak Current (t_p < 5 ms)	3	A
P_{tot}	Total Dissipation at T_c = 25 °C	60	W
T_{stg}	Storage Temperature	-65 to 150	°C

THERMAL DATA

$R_{thj\text{-}case}$	Thermal Resistance Junction-Case	Max	2.08	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-Ambient	Max	62.5	°C/W

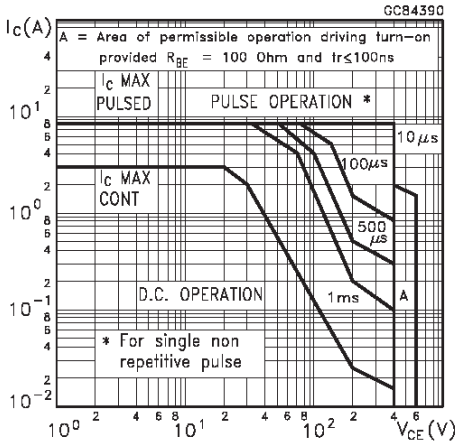
ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current (V_{BE} = -1.5 V)	V_{CE} = 700 V V_{CE} = 700 V	 T_j = 125 °C			100 500	µA µA
BV_{EBO}	Emitter-Base Breakdown Voltage (I_C=0)	I_E = 10 mA		9		18	V
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage	I_C = 100 mA	L = 25 mH	400			V
I_{CEO}	Collector Cut-Off Current (I_B = 0)	V_{CE} = 400 V				250	µA
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 0.5 A I_C = 1 A I_C = 2 A	I_B = 0.1 A I_B = 0.2 A I_B = 0.4 A			0.5 1 1.3	V V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 0.5 A I_C = 1 A I_C = 2 A	I_B = 0.1 A I_B = 0.2 A I_B = 0.4 A			1.0 1.2 1.3	V V V
h_{FE}*	DC Current Gain	I_C = 10 mA I_C = 0.5 A Group A Group B I_C = 2 A	V_{CE} = 5 V V_{CE} = 5 V V_{CE} = 5 V	10 10 18 8		 22 40	
t_r t_s t_f	RESISTIVE LOAD Resistive Time Storage Time Fall Time	V_{CC} = 125 V I_{B1} = 0.2 A T_p = 30 µs	I_C = 1 A I_{B2} = -0.2 A (see fig.2)		 0.4 3.2 0.25	 0.7 4.5 0.4	 µs µs µs
t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 1 A V_{BEoff} = -5 V V_{clamp} = 200 V (see fig.1)	I_{B1} = 0.2 A R_{BB} = 0 Ω L = 50mH		 0.8 0.16		 µs µs

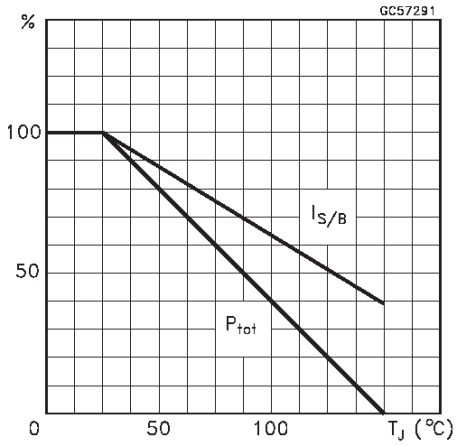
* Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %

Note : Product is pre-seleded in DC current gain (GROUP A and GROUP B). STMicroelectronics reserves the right to ship either groups according to production availability. Please contact your nearest STMicroelectronics sales office for delivery details.

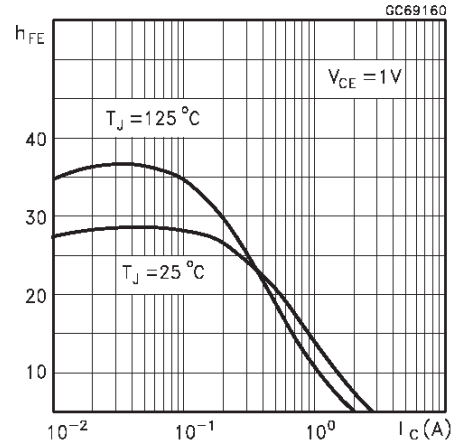
Safe Operating Areas



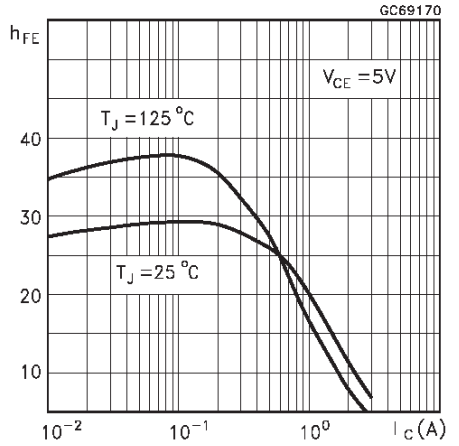
Derating Curve



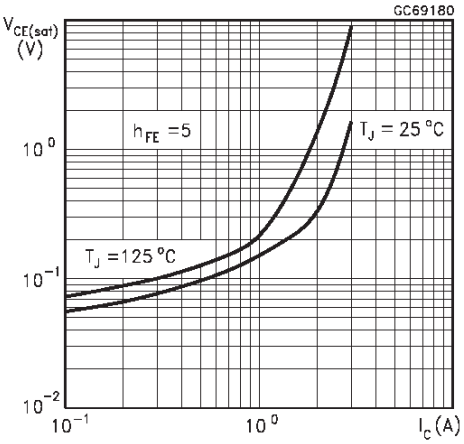
DC Current Gain



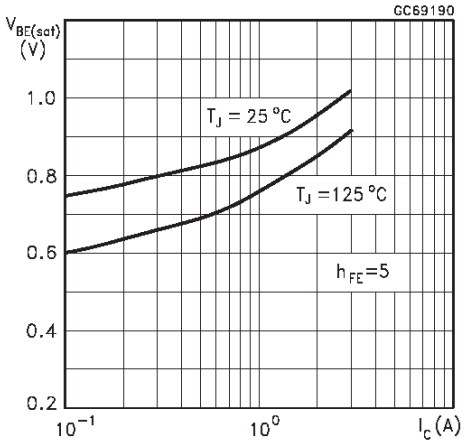
DC Current Gain



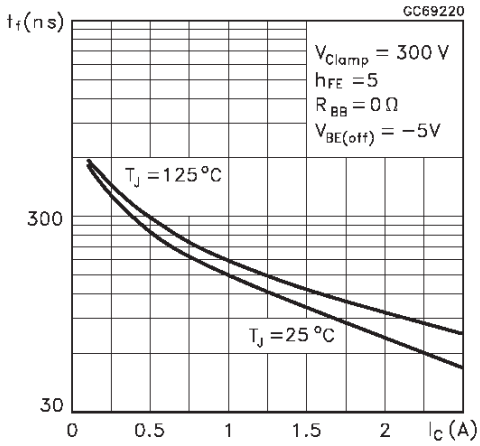
Collector Emitter Saturation Voltage



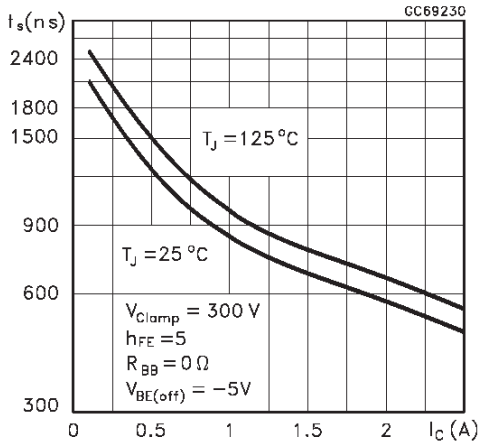
Base Emitter Saturation Voltage



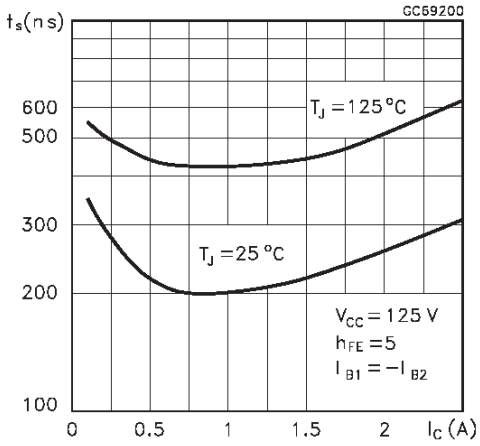
Inductive Fall Time



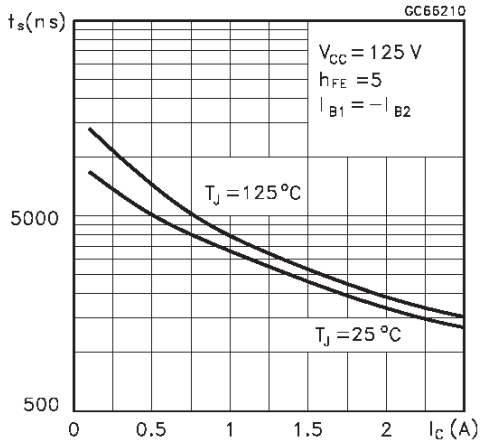
Inductive Storage Time



Resistive Fall Time



Resistive Load Storage Time



Reverse Biased SOA

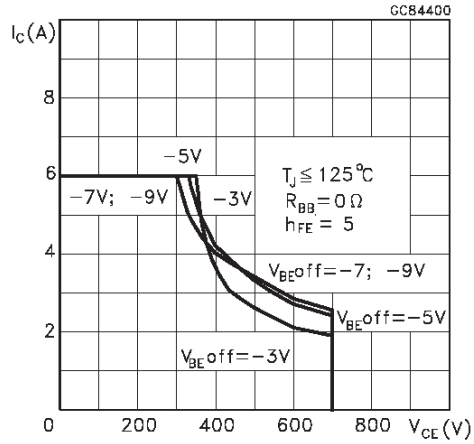
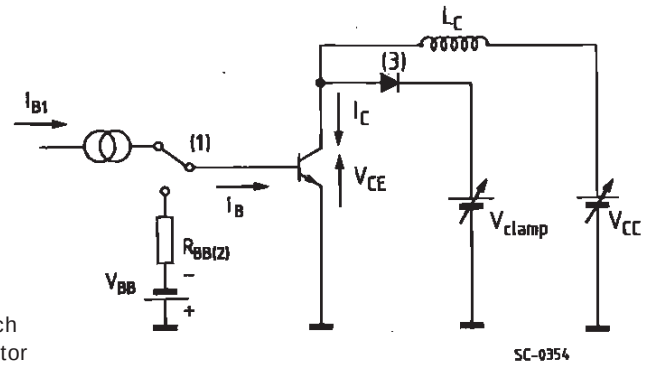
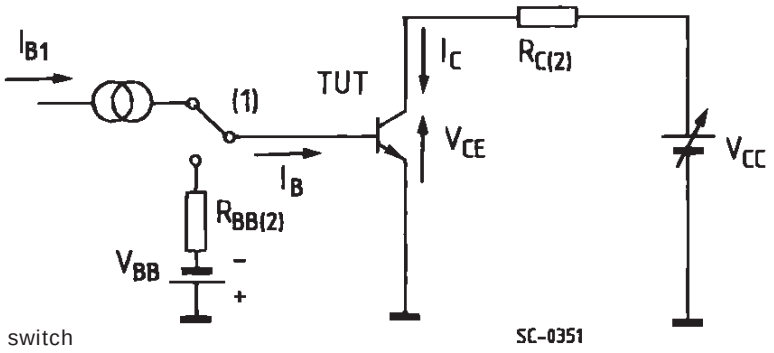


Figure 1: Inductive Load Switching Test Circuit.



1) Fast electronic switch
2) Non-inductive Resistor
3) Fast recovery rectifier

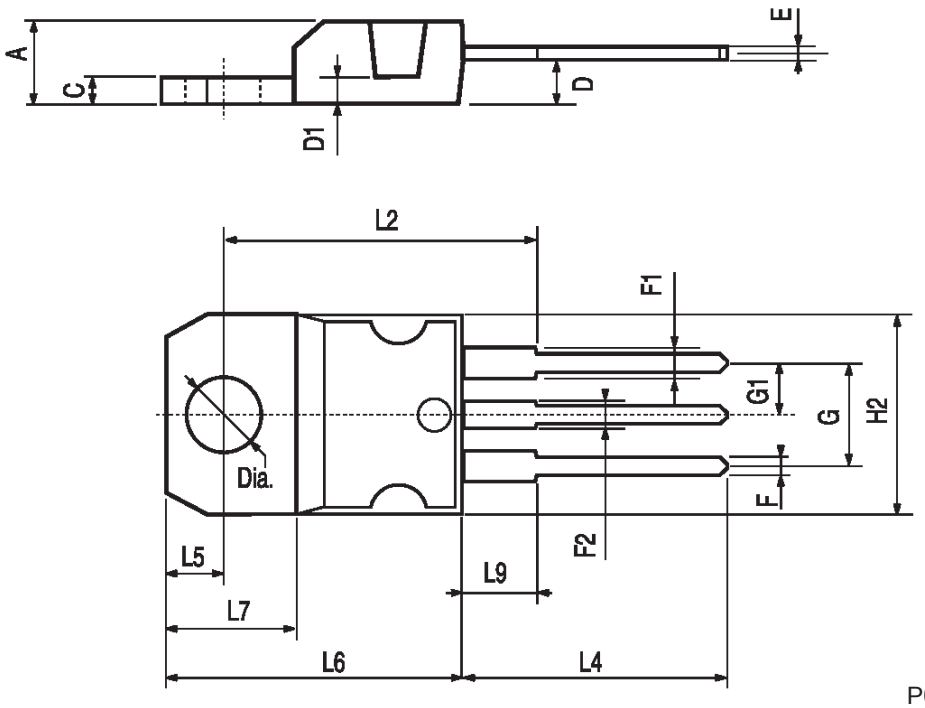
Figure 2: Resistive Load Switching Test Circuit.



1) Fast electronic switch
2) Non-inductive Resistor

TO-220 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106
H2	10.0		10.40	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.2		6.6	0.244		0.260
L9	3.5		3.93	0.137		0.154
DIA.	3.75		3.85	0.147		0.151



P011C