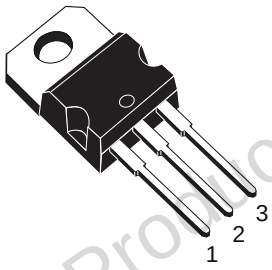
BUL510

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- STMicroelectronics PREFERRED SALESTYPE
- NPN TRANSISTOR
- HIGH VOLTAGE CAPABILITY
- LOW SPREAD OF DYNAMIC PARAMETERS
- VERY HIGH SWITCHING SPEED
- FULLY CHARACTERIZED AT 125°C



TO-220

APPLICATIONS

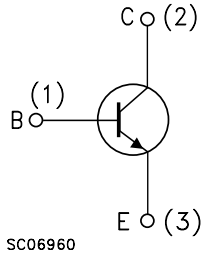
- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING
- SWITCH MODE POWER SUPPLIES
- ELECTRONIC TRANSFORMER FOR HALOGEN LAMP

DESCRIPTION

The BUL510 is manufactured using high voltage Multiepitaxial Mesa technology for cost-effective high performance. It uses a Hollow Emitter structure to enhance switching speeds.

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

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CES}	Collector-Emitter Voltage (V_{BE} = 0)	1000	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)	450	V
V_{EBO}	Emitter-Base Voltage (I_C = 0)	9	V
I_C	Collector Current	10	A
I_{CM}	Collector Peak Current (t_p < 5 ms)	18	A
I_B	Base Current	3.5	A
I_{BM}	Base Peak Current (t_p < 5 ms)	7	A
P_{tot}	Total Dissipation at T_c = 25 °C	100	W
T_{stg}	Storage Temperature	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

THERMAL DATA

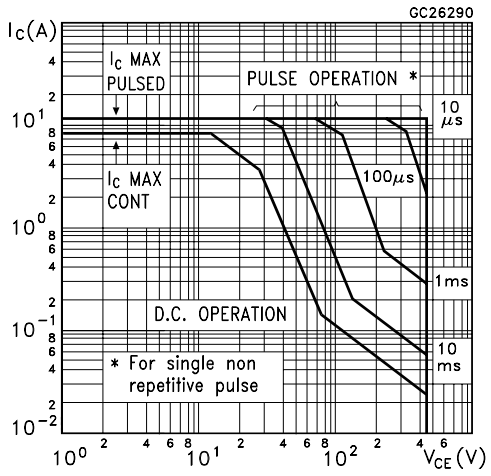
$R_{thj\text{-}case}$	Thermal Resistance Junction-Case	Max	1.25	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-Ambient	Max	62.5	°C/W

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

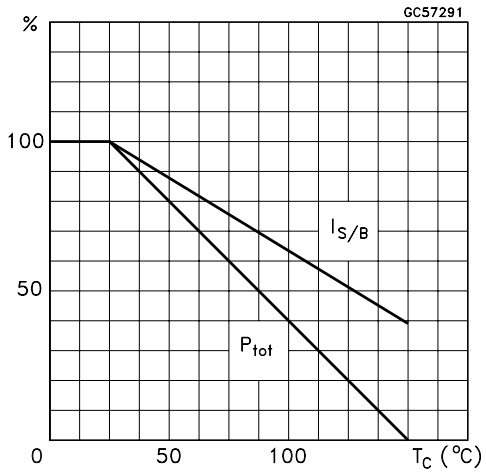
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	V_{CE} = 1000 V V_{CE} = 1000 V	 T_c = 125 °C			100 500	µA µA
I_{CEO}	Collector Cut-off Current (I_B = 0)	V_{CE} = 450 V				250	µA
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 100 mA	L = 25 mH	450			V
V_{EBO}	Emitter-Base Voltage (I_C = 0)	I_E = 10 mA		9			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 3 A I_C = 4 A I_C = 5 A	I_B = 0.6 A I_B = 0.8 A I_B = 1.25 A			0.8 1 1.5	V V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 3 A I_C = 5 A	I_B = 0.6 A I_B = 1.25 A			1.2 1.5	V V
h_{FE}*	DC Current Gain	I_C = 1 A I_C = 10 mA	V_{CE} = 5 V V_{CE} = 5 V	15 10		45	
 t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 4 A I_{B1} = 0.8 A L = 200 µH	V_{CL} = 300 V I_{B2} = -1.6 A		 2.2 80	 3.4 150	 µs ns
 t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 4 A I_{B1} = 0.8 A L = 200 µH	V_{CL} = 300 V I_{B2} = -1.6 A T_c = 125 °C		 3 120		 µs ns

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

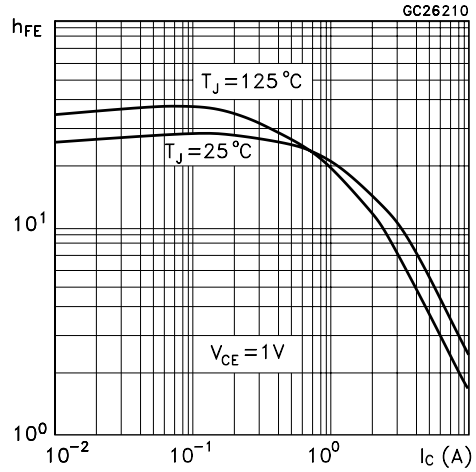
Safe Operating Areas



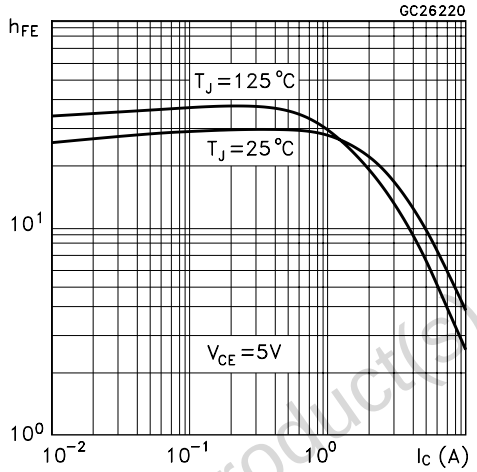
Derating Curve



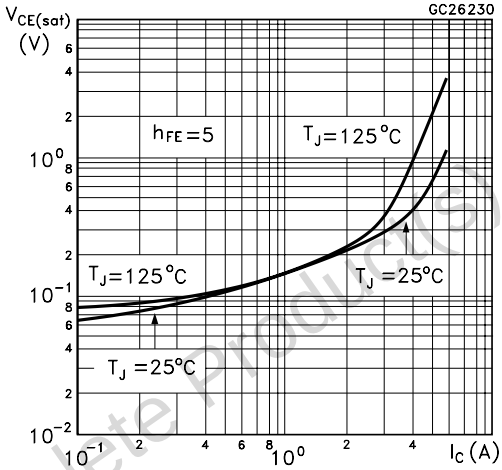
DC Current Gain



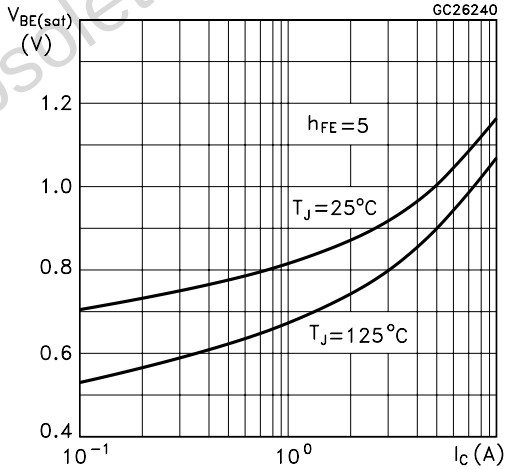
DC Current Gain



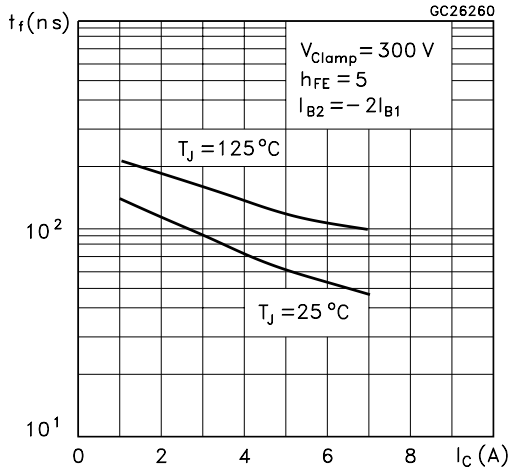
Collector Emitter Saturation Voltage



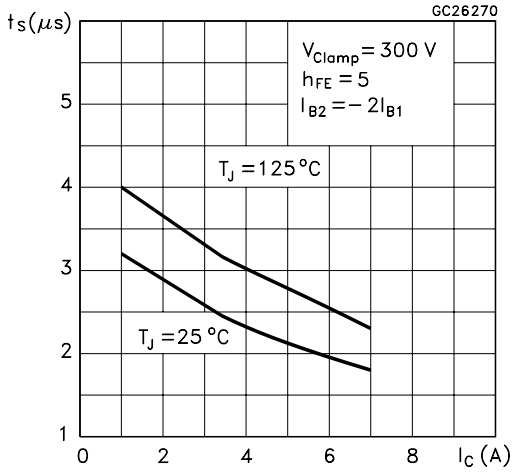
Base Emitter Saturation Voltage



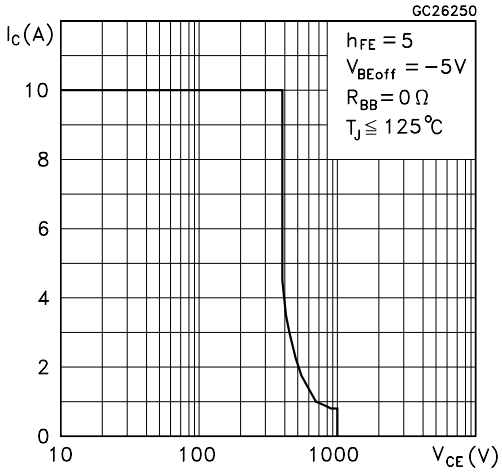
Inductive Fall Time



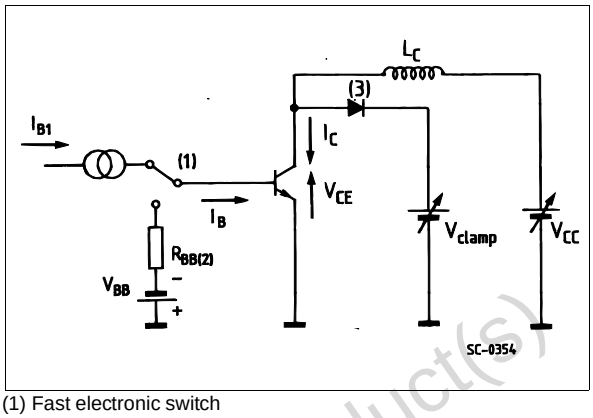
Inductive Storage Time



Reverse Biased SOA



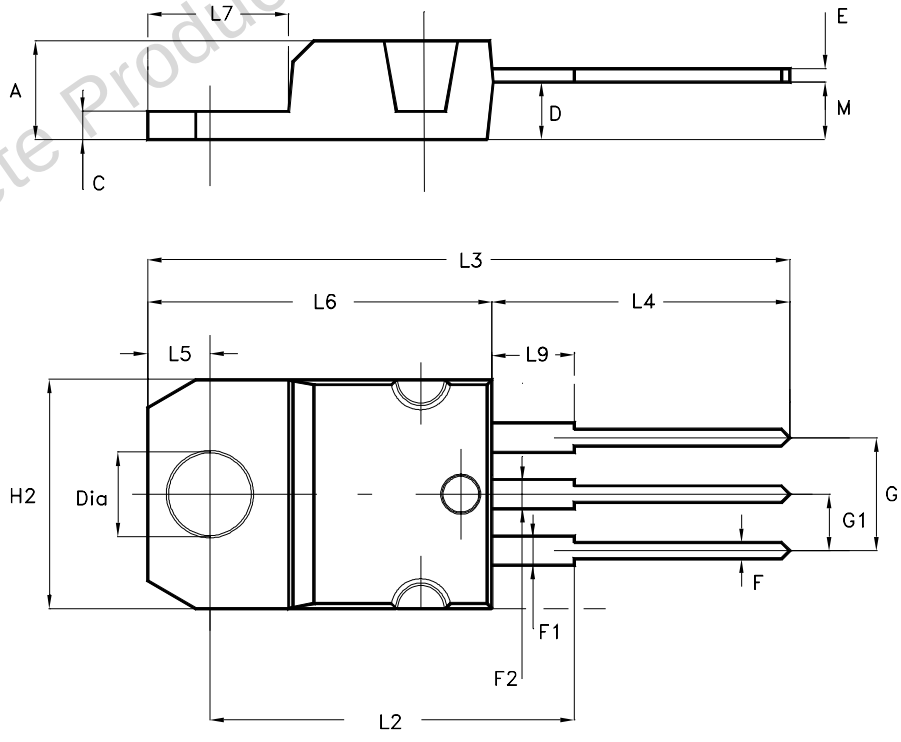
RBSOA and Inductive Load Switching Test Circuits



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

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		0.052
D	2.40		2.72	0.094		0.107
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		0.202
G1	2.40		2.70	0.094		0.106
H2	10.00		10.40	0.394		0.409
L2		16.40			0.645	
L4	13.00		14.00	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.20		6.60	0.244		0.260
L9	3.50		3.93	0.137		0.154
M		2.60			0.102	
DIA.	3.75		3.85	0.147		0.151



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