SGS-THOMSON MICROELECTRONICS

BUL810

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

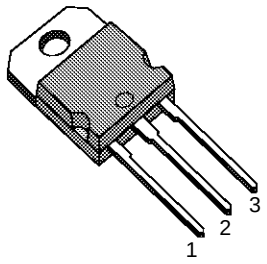
- SGS-THOMSON PREFERRED SALESTYPE
- HIGH VOLTAGE CAPABILITY
- LOW SPREAD OF DYNAMIC PARAMETERS
- LOW BASE-DRIVE REQUIREMENTS
- VERY HIGH SWITCHING SPEED
- FULLY CHARACTERISED AT 125°C

APPLICATIONS

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

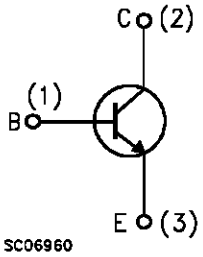
DESCRIPTION

The BUL810 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.



TO-218

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	15	A
I_{CM}	Collector Peak Current (t_p < 5 ms)	22	A
I_B	Base Current	5	A
I_{BM}	Base Peak Current (t_p < 5 ms)	10	A
P_{tot}	Total Dissipation at T_c = 25 °C	125	W
T_{stg}	Storage Temperature Range	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

THERMAL DATA

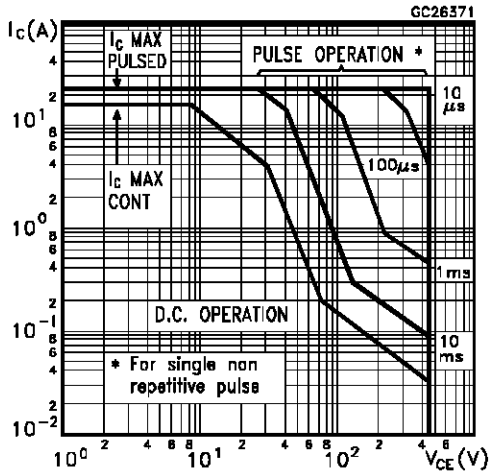
$R_{thj\text{-}case}$	Thermal Resistance Junction-Case Max	1	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-Ambient Max	62.5	°C/W

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

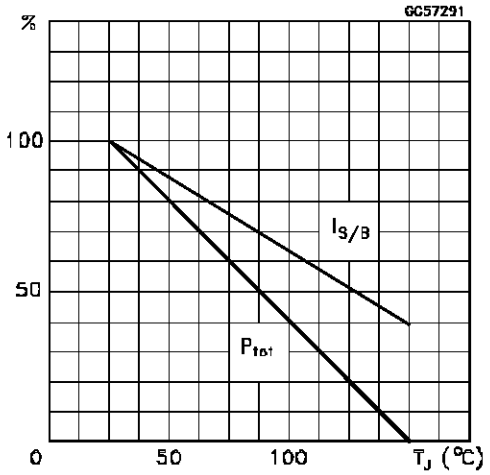
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	V_{CE} = 1000 V V_{CE} = 1000 V T_j = 125 °C			100 500	µA µA
I_{CEO}	Collector Cut-off Current (I_B = 0)	V_{CE} = 450 V			250	µA
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage	I_C = 100 mA L = 25 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 = 5 A I_B = 1 A I_C = 8 A I_B = 1.6 A I_C = 12 A I_B = 2.4 A			1 1.5 5	V V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 5 A I_B = 1 A I_C = 8 A I_B = 1.6 A			1.3 1.6	V V
h_{FE}*	DC Current Gain	I_C = 5 A V_{CE} = 5 V I_C = 10 mA V_{CE} = 5 V	10 10		40	
t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 8 A I_{B1} = 1.6 A $V_{BE(off)}$ = -5 V R_{BB} = 0.4 Ω V_{CL} = 350 V L = 200 µH		 1.5 55	 2.3 110	 µs ns
t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 8 A I_{B1} = 1.6 A $V_{BE(off)}$ = -5 V R_{BB} = 0.4 Ω V_{CL} = 350 V L = 200 µH T_j = 100 °C		 1.9 80		 µs ns

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

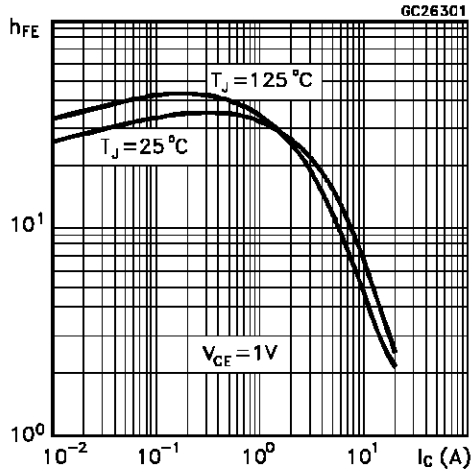
Safe Operating Areas



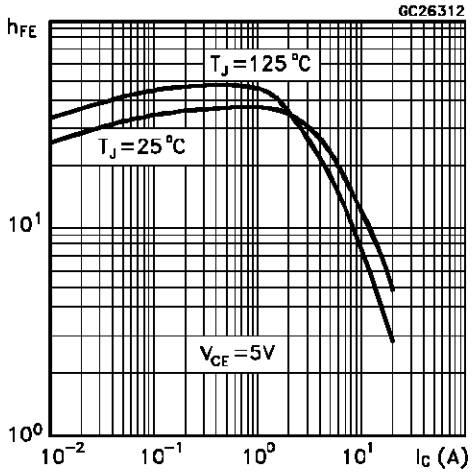
Derating Curves



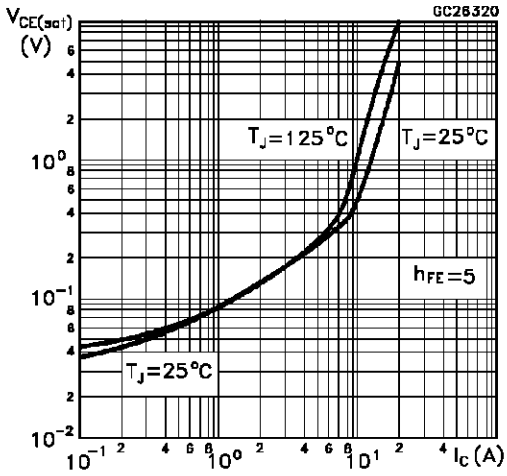
DC Current Gain



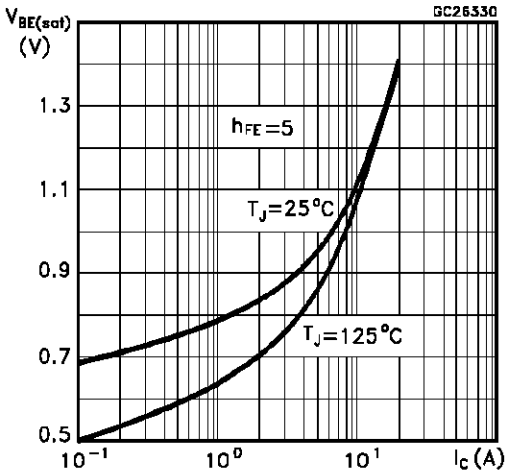
DC Current Gain



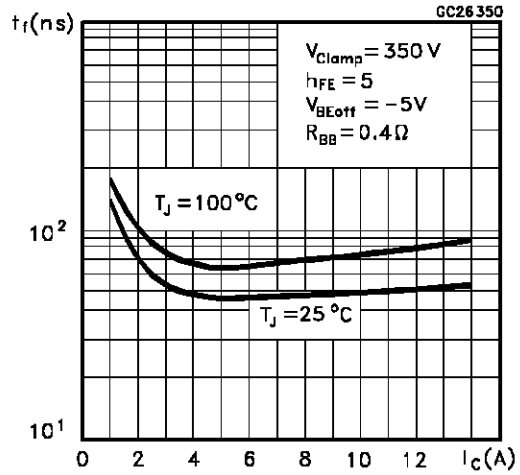
Collector Emitter Saturation Voltage



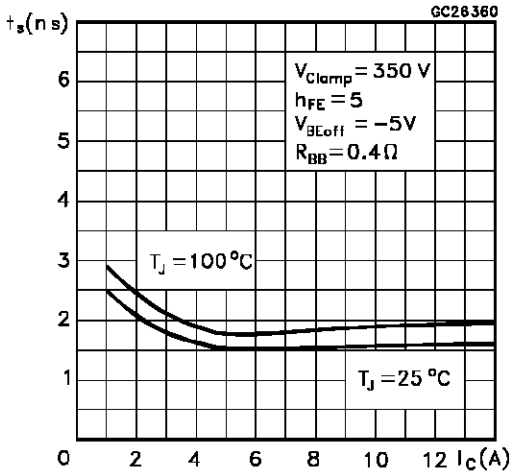
Base Emitter Saturation Voltage



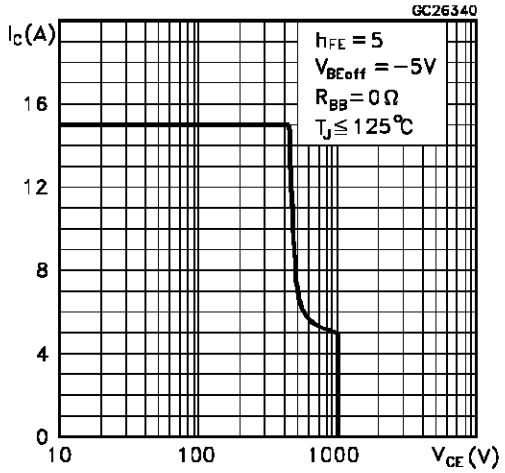
Inductive Fall Time



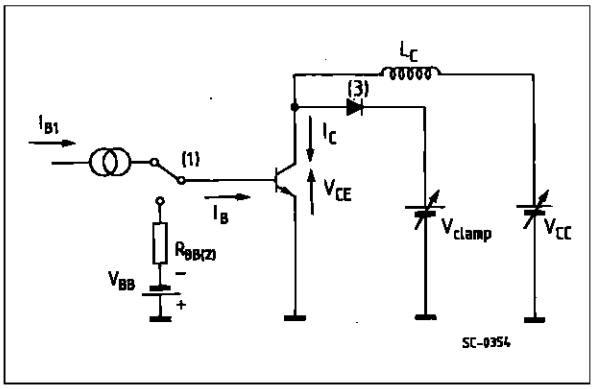
Inductive Storage Time



Reverse Biased SOA



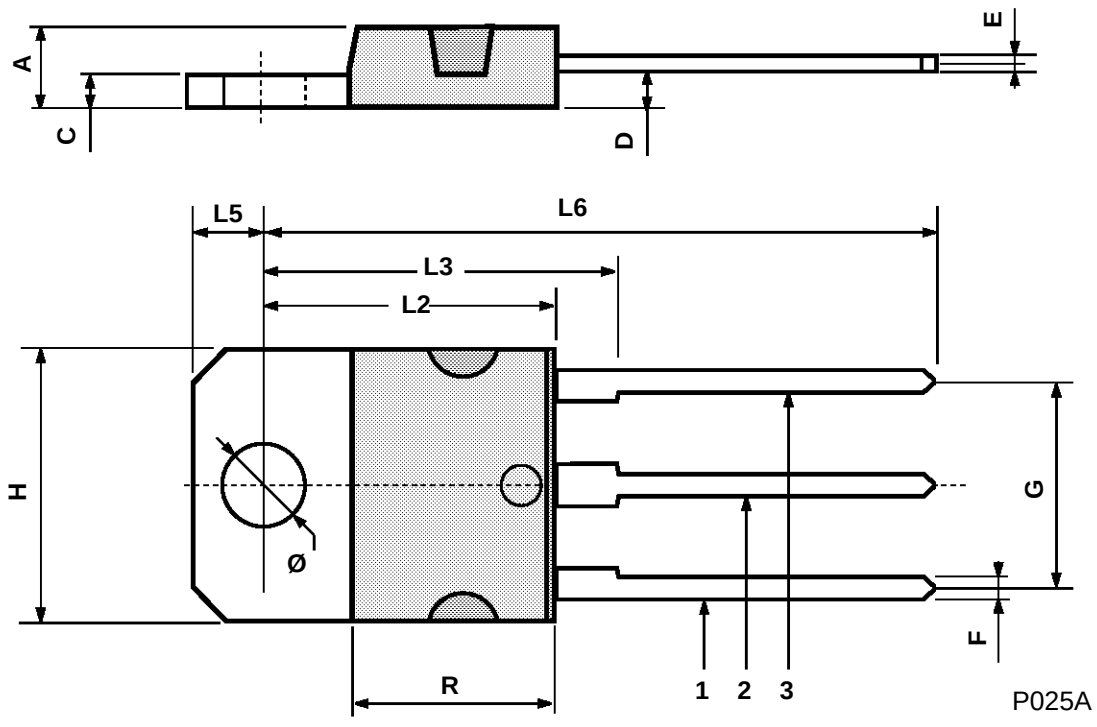
RBSOA and Inductive Load Switching Test Circuit



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

TO-218 (SOT-93) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.7		4.9	0.185		0.193
C	1.17		1.37	0.046		0.054
D		2.5			0.098	
E	0.5		0.78	0.019		0.030
F	1.1		1.3	0.043		0.051
G	10.8		11.1	0.425		0.437
H	14.7		15.2	0.578		0.598
L2	–		16.2	–		0.637
L3		18			0.708	
L5	3.95		4.15	0.155		0.163
L6		31			1.220	
R	–		12.2	–		0.480
Ø	4		4.1	0.157		0.161



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