BUL59

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- NPN TRANSISTOR
- HIGH VOLTAGE CAPABILITY
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED
- HIGH RUGGEDNESS

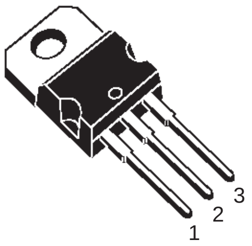
APPLICATIONS

- ELECTRONIC TRANSFORMERS FOR HALOGEN LAMPS
- SWITCH MODE POWER SUPPLIES

DESCRIPTION

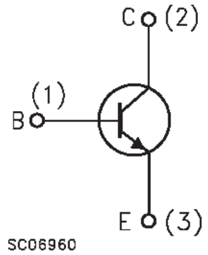
The BUL59 is manufactured using high voltage Multi Epitaxial Mesa technology to enhance switching speeds while maintaining wide RBSOA.

The BUL series 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)	850	V
V_{CEO}	Collector-Emitter Voltage (IB = 0)	400	V
V_{EBO}	Emitter-Base Voltage (IC = 0)	9	V
I_C	Collector Current	8	A
I_{CM}	Collector Peak Current (t_p <5 ms)	16	A
I_B	Base Current	4	A
I_{BM}	Base Peak Current (t_p <5 ms)	8	A
P_{tot}	Total Dissipation at Tc = 25 °C	90	W
T_{stg}	Storage Temperature	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

THERMAL DATA

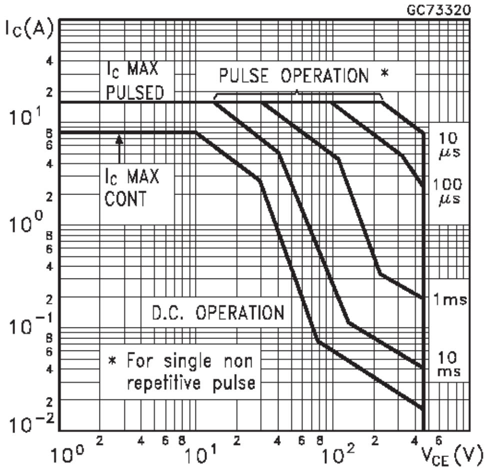
$R_{thj\text{-}case}$	Thermal Resistance Junction-Case	Max	1.39	$^oC/W$
$R_{thj\text{-}amb}$	Thermal Resistance Junction-Ambient	Max	62.5	$^oC/W$

ELECTRICAL CHARACTERISTICS (T_{case} = 25 ^oC unless otherwise specified)

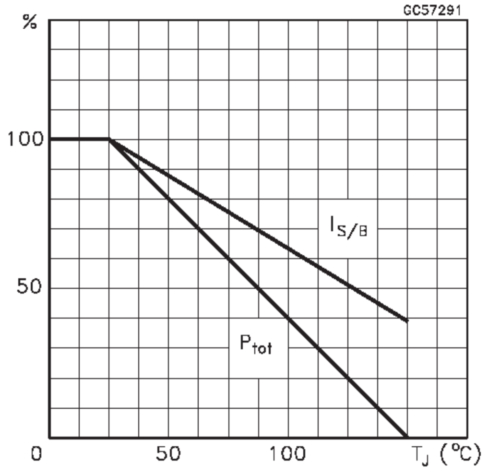
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	V_{CE} = rated V_{CES} V_{CE} = rated V_{CES} T_j = 125 ^oC			200 500	μA μA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 9 V			100	μA
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 10 mA L = 25 mH	400			V
$V_{CE(sat)}*$	Collector-Emitter Saturation Voltage	I_C = 2 A I_B = 0.4 A I_C = 5 A I_B = 1 A		0.18	0.5 1.5	V V
$V_{BE(sat)}*$	Base-Emitter Saturation Voltage	I_C = 2 A I_B = 0.4 A I_C = 5 A I_B = 1 A			1.2 1.6	V V
V_{CEW}	Maximum Collector Emitter Voltage Without Snubber	IC = 15 A R_{BB} = 0 Ω V_{BB} = -2.5 V L = 50μH t_p = 10 μs	450			V
$h_{FE}*$	DC Current Gain	I_C = 2 A V_{CE} = 5 V I_C = 5 A V_{CE} = 5 V I_C = 8 A V_{CE} = 10 V	8 6 4		40 30	
 t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 2 A I_{Bon} = 0.4 A $V_{BE(off)}$ = -5 V R_{BB} = 0 Ω V_{CC} = 250 V L = 200 μH			 0.8 0.15	 μs μs

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

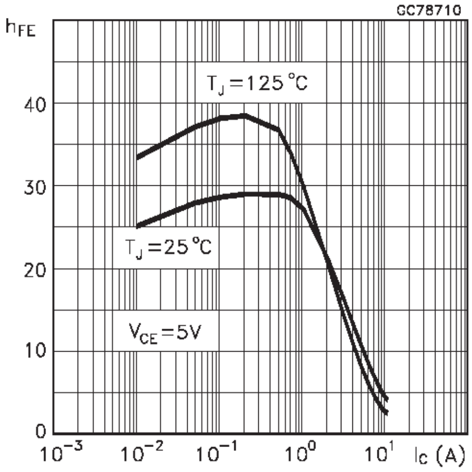
Safe Operating Areas



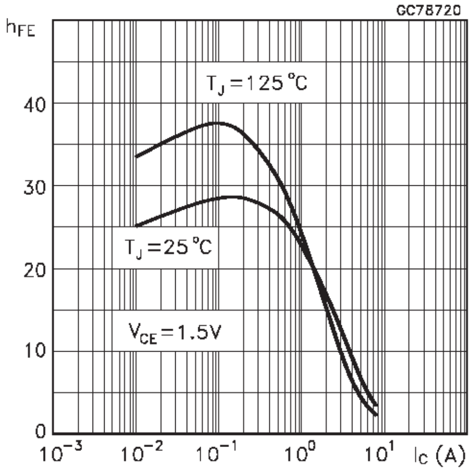
Derating Curve



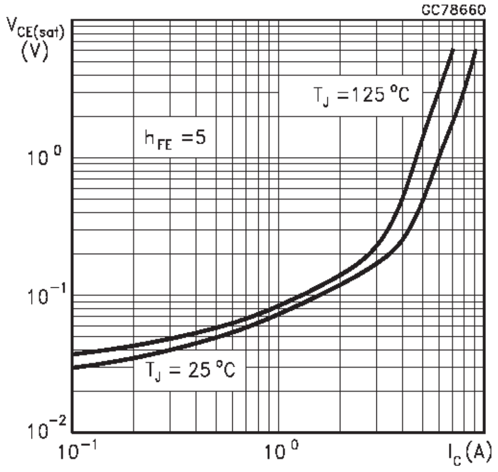
DC Current Gain



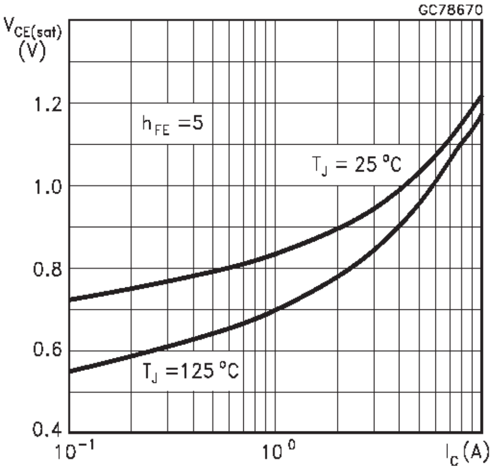
DC Current Gain



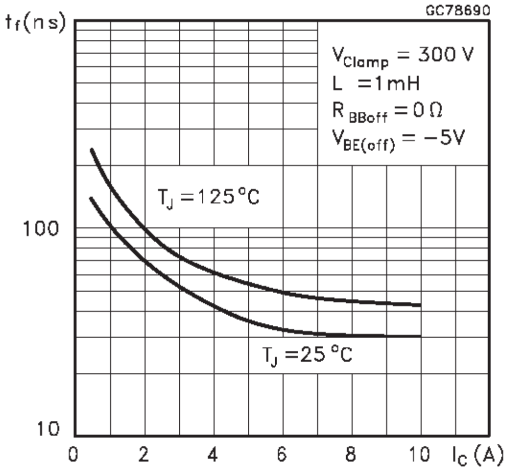
Collector Emitter Saturation Voltage



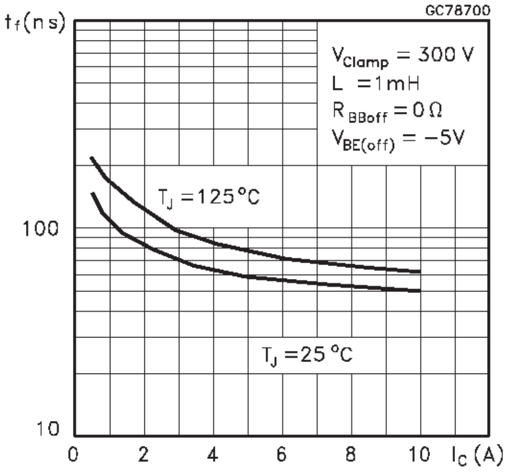
Base Emitter Saturation Voltage



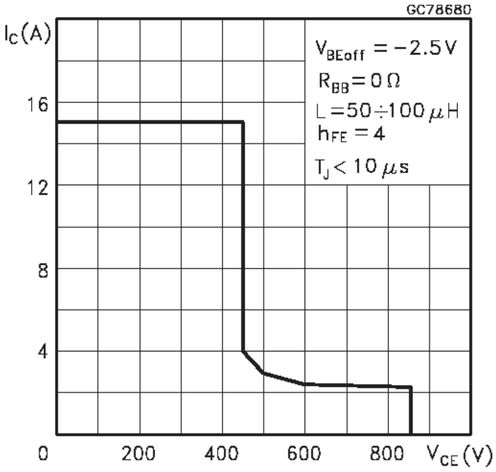
Inductive Fall Time



Inductive Storage Time

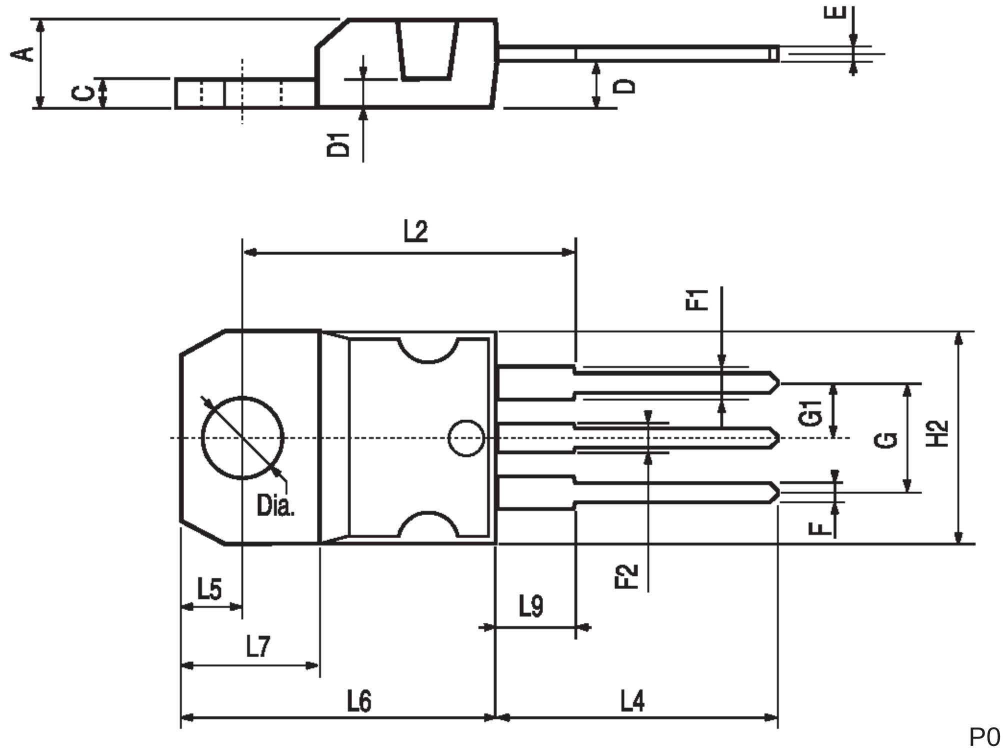


DC Current Gain



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



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