

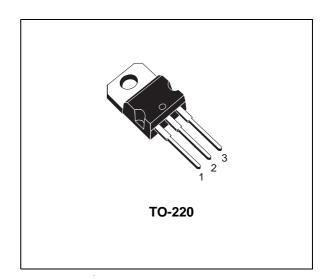
BUL310

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- STMicroelectronics PREFERRED SALESTYPE
- NPN TRANSISTOR
- HIGH VOLTAGE CAPABILITY
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED
- FULLY CHARACTERISED AT 125°C
- LARGE RBSOA

APPLICATIONS

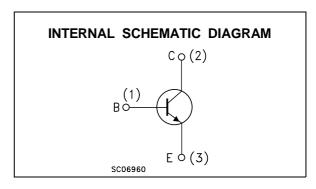
- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING
- FLYBACK AND FORWARD SINGLE TRANSISTOR LOW POWER CONVERTERS



DESCRIPTION

The device is manufactured using high voltage Multi Epitaxial Planar technology for high switching speeds and high voltage capability. It uses a Cellular Emitter structure with planar edge termination to enhance switching speeds while maintaining a wide RBSOA.

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



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CES}	Collector-Emitter Voltage (V _{BE} = 0)	1000	V
$V_{\sf CEO}$	Collector-Emitter Voltage (I _B = 0)	500	V
V_{EBO}	Emitter-Base Voltage (I _C = 0)	9	V
Ic	Collector Current	5	V
I _{CM}	Collector Peak Current (t _p <5 ms)	10	А
I_{B}	Base Current	3	Α
I_{BM}	Base Peak Current (t _p <5 ms)	4	Α
P _{tot}	Total Dissipation at Tc = 25 °C	75	W
T_{stg}	Storage Temperature	-65 to 150	°C
Tj	Max. Operating Junction Temperature	150	°C

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THERMAL DATA

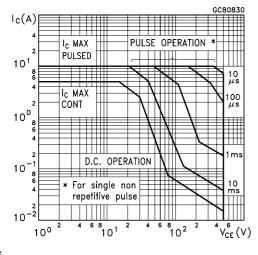
R _{thj-case}	Thermal Resistance Junction-Case	Max	1.65	°C/W
R _{thj-amb}	Thermal Resistance Junction-Ambient	Max	62.5	°C/W

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

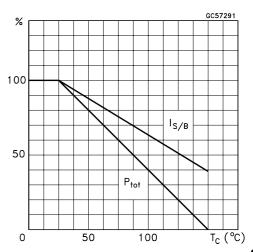
Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
I _{CES}	Collector Cut-off Current (V _{BE} = 0)	V _{CE} = 1000 V V _{CE} = 1000 V T _j = 125 °C			100 500	μA μA
I _{CEO}	Collector Cut-off Current (I _B = 0)	V _{CE} = 500 V			250	μΑ
V _{CEO(sus)} *	Collector-Emitter Sustaining Voltage (I _B = 0)	I _C = 100 mA	500			V
V _{EBO}	Emitter-Base Voltage (I _C = 0)	I _E = 10 mA	9			V
V _{CE(sat)} *	Collector-Emitter Saturation Voltage	$\begin{split} I_C &= 1 \ A & I_B = 0.2 \ A \\ I_C &= 2 \ A & I_B = 0.4 \ A \\ I_C &= 3 \ A & I_B = 0.6 \ A \end{split}$			0.5 0.7 1.1	> > >
V _{BE(sat)} *	Base-Emitter Saturation Voltage	$\begin{split} I_C &= 1 \ A & I_B = 0.2 \ A \\ I_C &= 2 \ A & I_B = 0.4 \ A \\ I_C &= 3 \ A & I_B = 0.6 \ A \end{split}$			1 1.1 1.2	< < <
h _{FE} *	DC Current Gain	$I_{C} = 10 \text{ mA}$ $V_{CE} = 5 \text{ V}$ $I_{C} = 3 \text{ A}$ $V_{CE} = 2.5 \text{ V}$	10 6	10	14	
t _s	INDUCTIVE LOAD Storage Time Fall Time	$\begin{array}{lll} I_{C} = 2 \; A & I_{B1} = 0.4 \; A \\ V_{BE(off)} = -5 \; V & R_{BB} = 0 \; \Omega \\ V_{CL} = 250 \; V & L = 200 \; \mu H \\ (see figure 1) & \end{array}$		1.2 80	1.9 160	μs ns
t _s t _f	INDUCTIVE LOAD Storage Time Fall Time	$\begin{array}{lll} I_{C} = 2 \; A & I_{B1} = 0.4 \; A \\ V_{BE(off)} = \text{-5V} & R_{BB} = 0 \; \Omega \\ V_{CL} = 250 \; V & L = 200 \; \mu\text{H} \\ T_{j} = 125 \; ^{\circ}\text{C} & (\text{see figure 1}) \end{array}$		1.8 150		μs ns

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

Safe Operating Areas

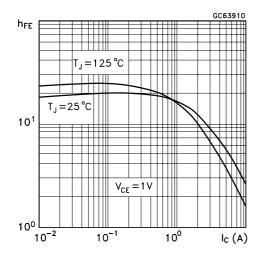


Derating Curve

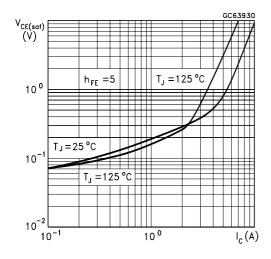


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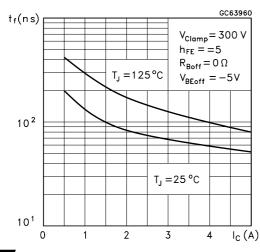
DC Current Gain



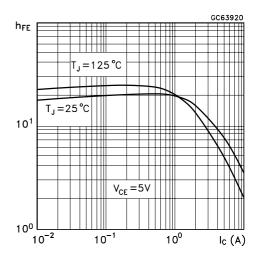
Collector Emitter Saturation Voltage



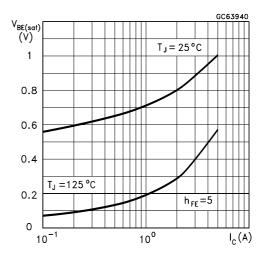
Inductive Load Fall Time



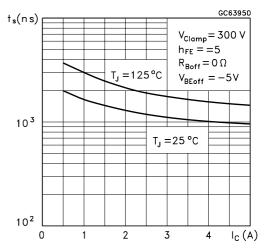
DC Current Gain



Base Emitter Saturation Voltage



Inductive Load Storage Time



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Reverse Biased SOA

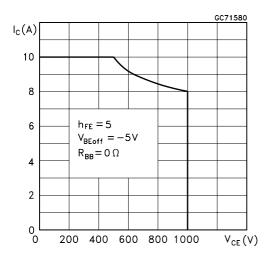
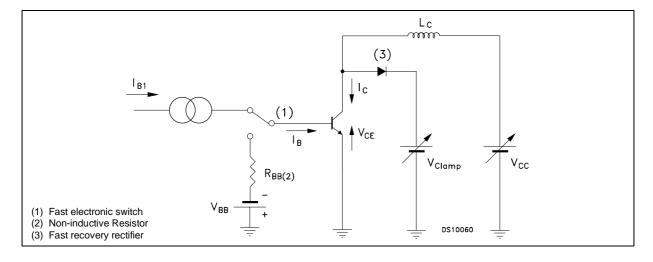


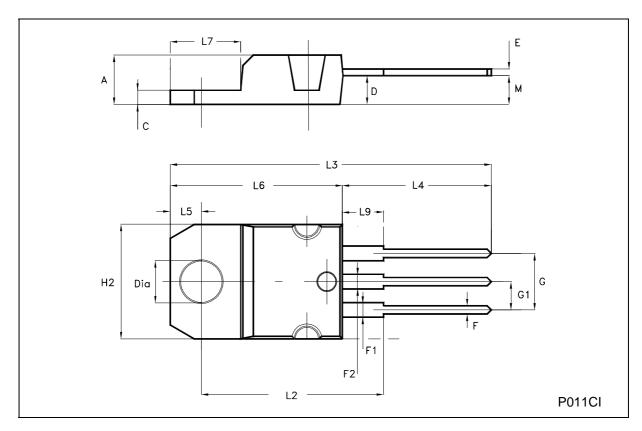
Figure 1: Inductive Load Switching Test Circuit



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TO-220 MECHANICAL DATA

DIM.	mm		inch			
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
Α	4.40		4.60	0.173		0.181
С	1.23		1.32	0.048		0.052
D	2.40		2.72	0.094		0.107
Е	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
М		2.60			0.102	
DIA.	3.75		3.85	0.147		0.151



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