

BUL310FP

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 CHARACTERIZED AT 125°C
- LARGE RBSOA
- FULLY MOLDED INSULATED PACKAGE
- 2000 V DC INSULATION (U.L. COMPLIANT)

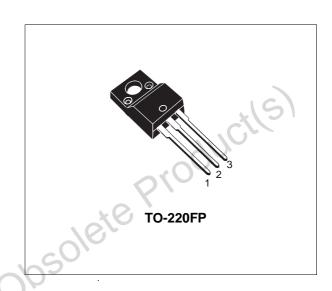


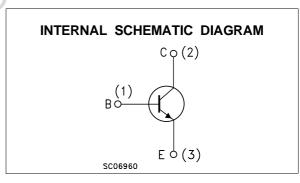
- HORIZONTAL DEFLECTION FOR COLOUR TV
- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING
- FLYBACK AND FORWARD SINGLE TRANSISTOR LOW POWER CONVERTERS



The BUL310FP 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	٧
V_{CEO}	Collector-Emitter Voltage (I _B = 0)	500	٧
V_{EBO}	Emitter-Base Voltage (I _C = 0)	9	٧
Ic	Collector Current	5	Α
I _{CM}	Collector Peak Current (t _p <5 ms)	10	Α
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	36	W
T _{stg}	Storage Temperature	-65 to 150	°C
Tj	Max. Operating Junction Temperature	150	O°

April 2003 1/6

THERMAL DATA

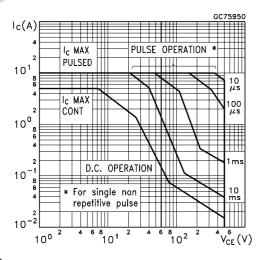
R _{thj-case}	Thermal Resistance	Junction-Case	Max	3.5	°C/W
$R_{thj-amb}$	Thermal Resistance	Junction-Ambient	Max	62.5	°C/W

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

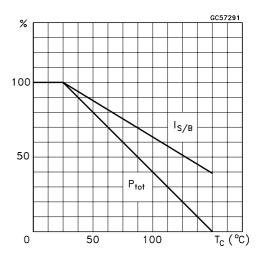
Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
I _{CES}	Collector Cut-off Current (V _{BE} = 0)	V _{CE} = 1000 V V _{CE} = 1000 V T _j = 125 °C			100 500	μA μA
I _{CEO}	Collector Cut-off Current (I _B = 0)	V _{CE} = 500 V			250	μА
V _{CEO(sus)} *	Collector-Emitter Sustaining Voltage (I _B = 0)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

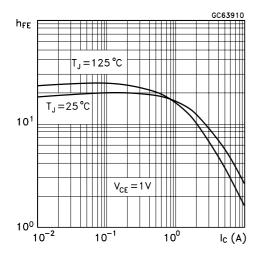


Derating Curve

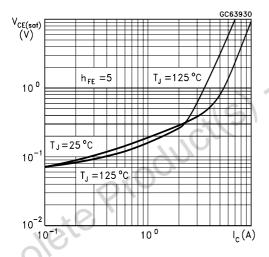


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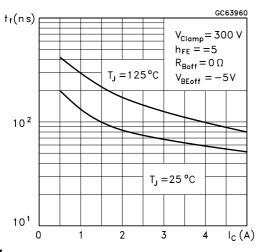
DC Current Gain



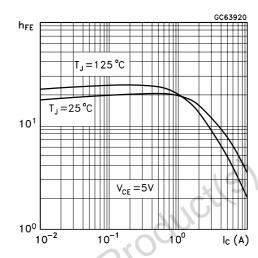
Collector Emitter Saturation Voltage



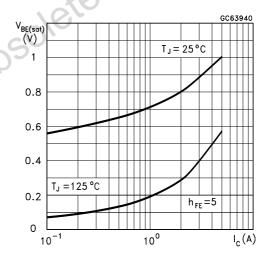
Inductive Load Fall Time



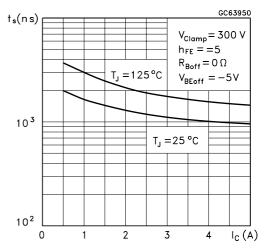
DC Current Gain



Base Emitter Saturation Voltage



Inductive Load Storage Time



Reverse Biased SOA

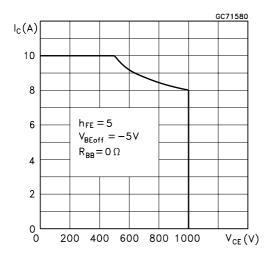
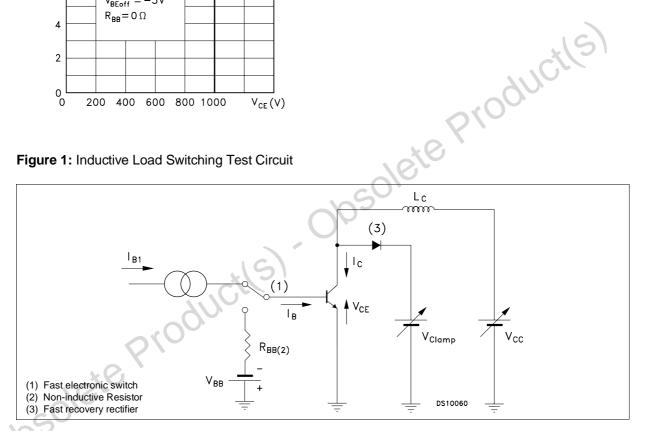
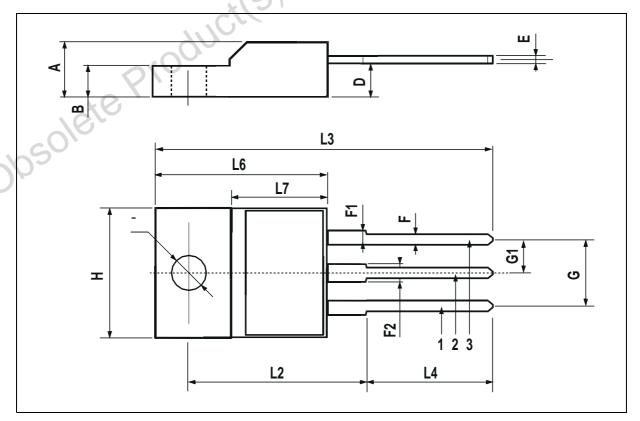


Figure 1: Inductive Load Switching Test Circuit



TO-220FP MECHANICAL DATA

DIM.	mm			inch			
DIIVI.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
А	4.4		4.6	0.173		0.181	
В	2.5		2.7	0.098		0.106	
D	2.5		2.75	0.098		0.108	
Е	0.45		0.7	0.017		0.027	
F	0.75		1	0.030		0.039	
F1	1.15		1.7	0.045		0.067	
F2	1.15		1.7	0.045		0.067	
G	4.95		5.2	0.195	900	0.204	
G1	2.4		2.7	0.094	240	0.106	
Н	10		10.4	0.393		0.409	
L2		16		10	0.630		
L3	28.6		30.6	1.126		1.204	
L4	9.8		10.6	0.385		0.417	
L6	15.9		16.4	0.626		0.645	
L7	9		9.3	0.354		0.366	
Ø	3	16	3.2	0.118		0.126	



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