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BUL128FP

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

APPLICATIONS:

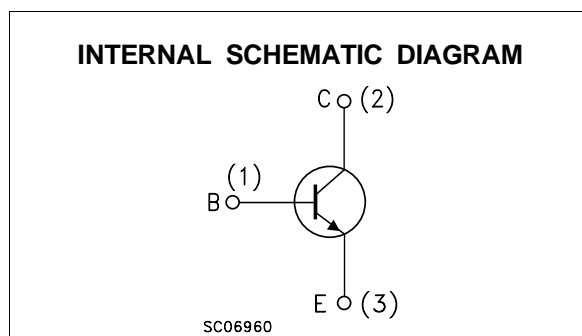
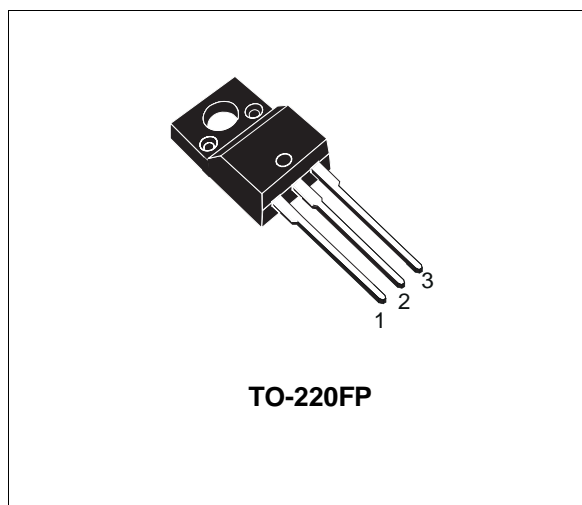
- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING

DESCRIPTION

The device is manufactured using high voltage Multi Epitaxial Planar technology for high switching speeds and medium voltage capability.

It uses a Cellular Emitter structure with planar edge termination to enhance switching speeds while maintaining the wide RBSOA.

The device 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 ($V_{BE} = 0$)	700	V
V_{CEO}	Collector-Emitter Voltage ($I_B = 0$)	400	V
V_{EBO}	Emitter-Base Voltage ($I_C = 0$)	9	V
I_C	Collector Current	4	A
I_{CM}	Collector Peak Current ($t_p < 5$ ms)	8	A
I_B	Base Current	2	A
I_{BM}	Base Peak Current ($t_p < 5$ ms)	4	A
P_{tot}	Total Dissipation at $T_c = 25$ °C	31	W
T_{stg}	Storage Temperature	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

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THERMAL DATA

R _{thj-case}	Thermal Resistance Junction-Case	Max	4.1	°C/W
R _{thj-amb}	Thermal Resistance Junction-Ambient	Max	62.5	°C/W

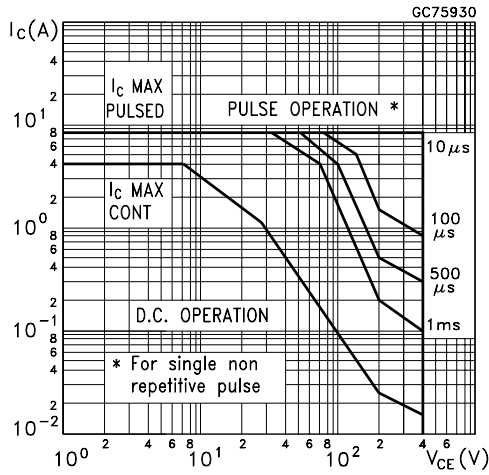
ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I _{CES}	Collector Cut-off Current (V _{BE} = -1.5 V)	V _{CE} = 700 V V _{CE} = 700 V T _j = 125 °C			100 500	μA μA
V _{EBO}	Emitter-Base Voltage (I _C = 0)	I _E = 10 mA	9			V
V _{CEO(sus)*}	Collector-Emitter Sustaining Voltage (I _B = 0)	I _C = 100 mA L = 25 mH	400			V
I _{CEO}	Collector Cut-Off Current (I _B = 0)	V _{CE} = 400 V			250	μA
V _{CE(sat)*}	Collector-Emitter Saturation Voltage	I _C = 0.5 A I _C = 1 A I _C = 2.5 A I _C = 4 A I _B = 0.1 A I _B = 0.2 A I _B = 0.5 A I _B = 1 A		0.5	0.7 1 1.5 V	V V V V
V _{BE(sat)*}	Base-Emitter Saturation Voltage	I _C = 0.5 A I _C = 1 A I _C = 2.5 A I _B = 0.1 A I _B = 0.2 A I _B = 0.5 A			1.1 1.2 1.3	V V V
h _{FE*}	DC Current Gain	I _C = 10 mA I _C = 1 A I _C = 2 A V _{CE} = 5 V V _{CE} = 5 V V _{CE} = 5 V	10 15 14		45 40	
t _s t _f	RESISTIVE LOAD Storage Time Fall Time	V _{CC} = 125 V I _{B1} = 0.4 A T _p = 30 μs I _C = 2 A I _{B2} = -0.4 A (see fig.2)	1.9	0.2	2.9 0.4	μs μs
t _s t _f	INDUCTIVE LOAD Storage Time Fall Time	I _C = 2 A V _{BE(off)} = -5 V V _{clamp} = 200 V I _{B1} = 0.4 A R _{BB} = 0 Ω (see fig.1)		0.6 0.1	1 0.2	μs μs

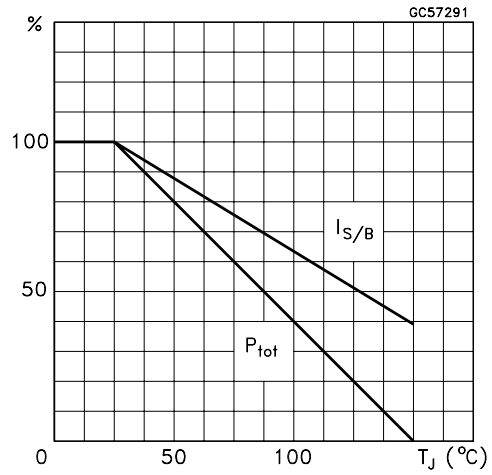
* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %

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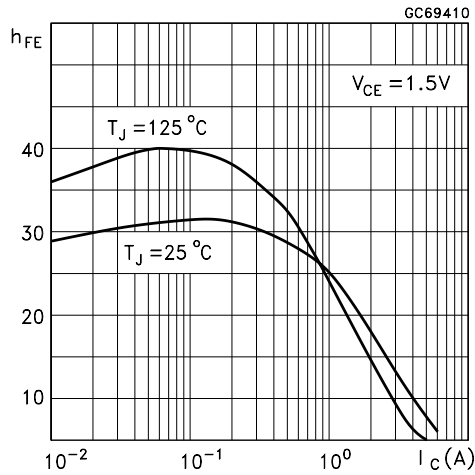
Safe Operating Areas



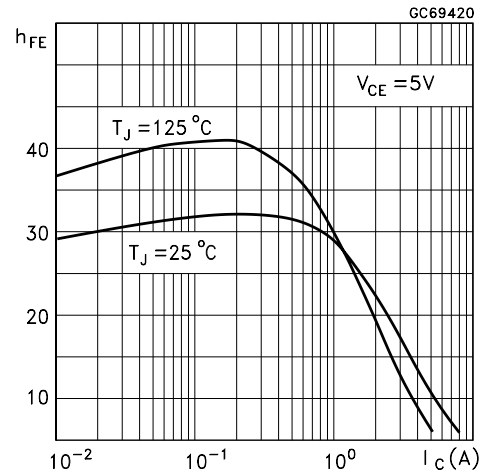
Derating Curve



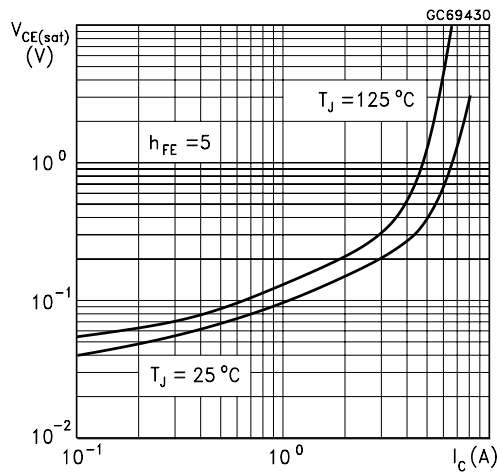
DC Current Gain



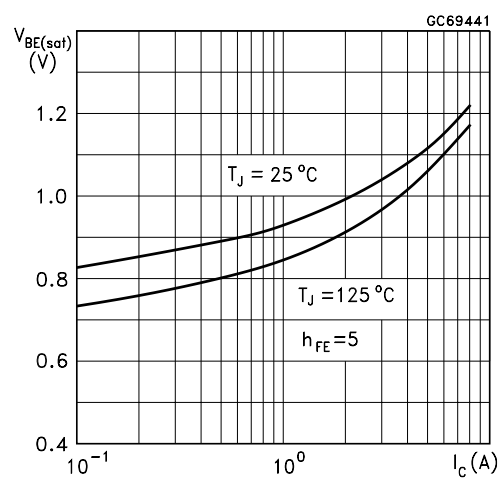
DC Current Gain



Collector Emitter Saturation Voltage

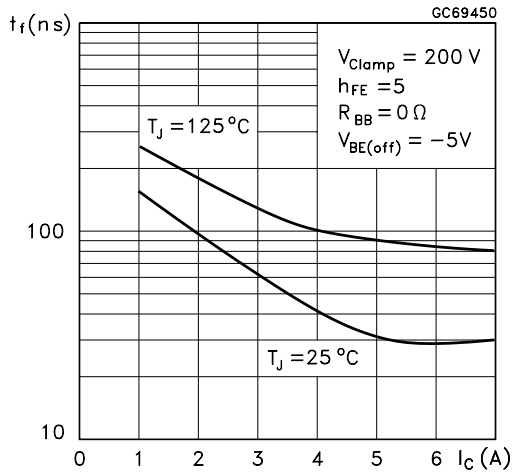


Base Emitter Saturation Voltage

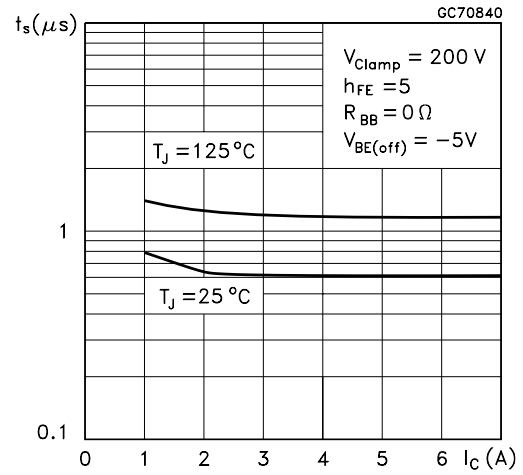


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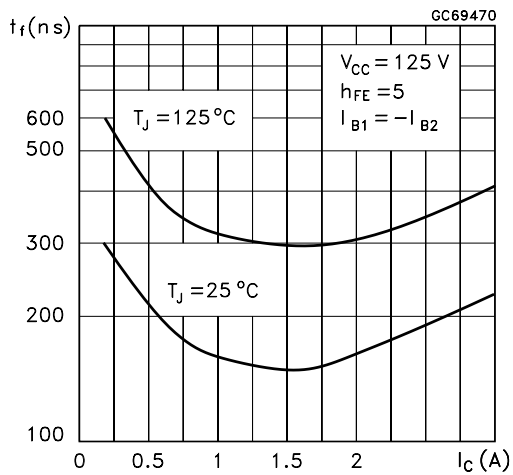
Inductive Fall Time



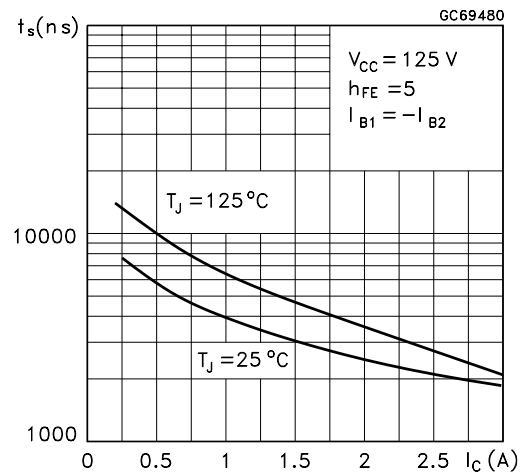
Inductive Storage Time



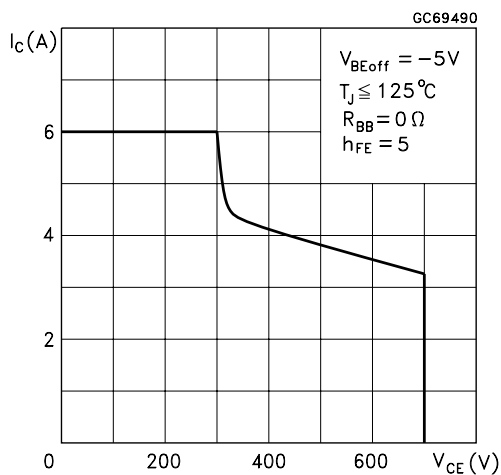
Resistive Fall Time



Resistive Load Storage Time



Reverse Biased SOA



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Figure 1: Inductive Load Switching Test Circuit.

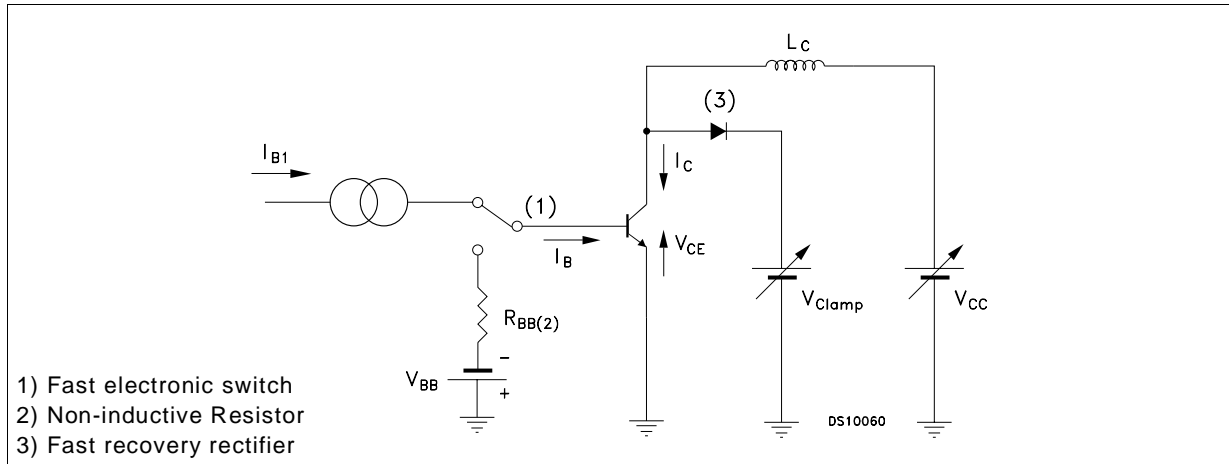
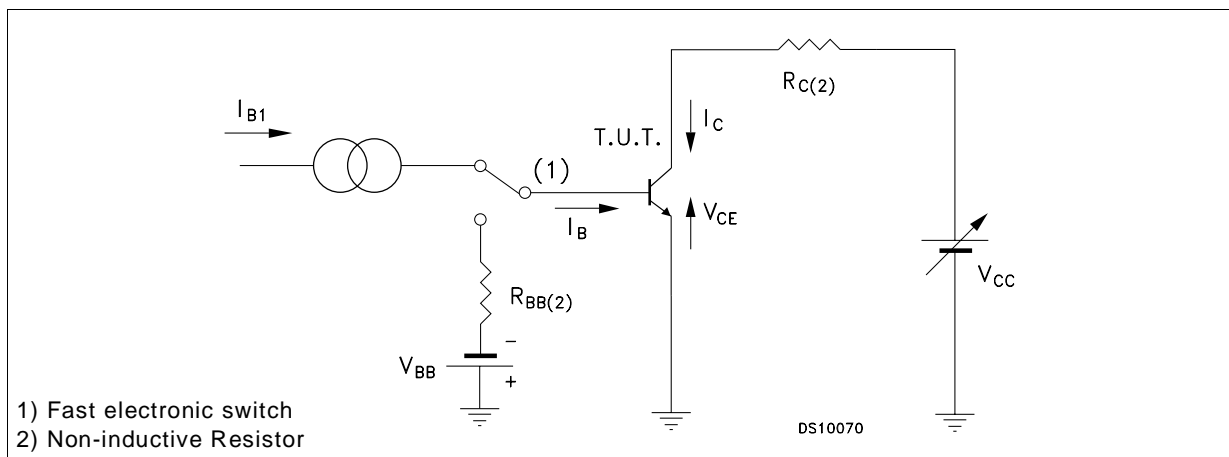


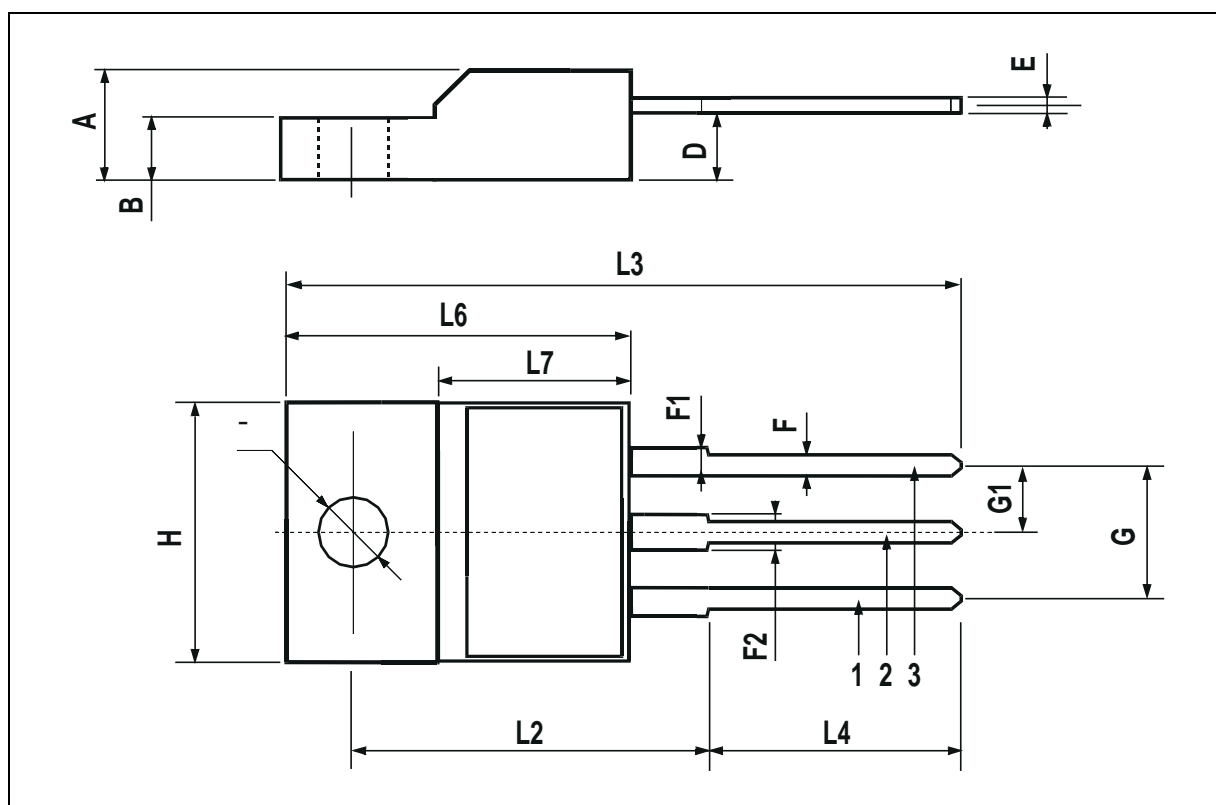
Figure 2: Resistive Load Switching Test Circuit.



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TO-220FP MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.4		4.6	0.173		0.181
B	2.5		2.7	0.098		0.106
D	2.5		2.75	0.098		0.108
E	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		0.204
G1	2.4		2.7	0.094		0.106
H	10		10.4	0.393		0.409
L2		16			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		3.2	0.118		0.126



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