



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:

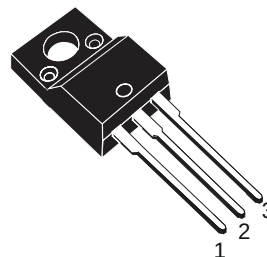
- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING

DESCRIPTION

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

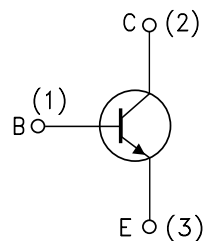
It uses a Cellular Emitter structure with planar edge termination to enhance switching speeds while maintaining the wide RBSOA.

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



TO-220FP

INTERNAL SCHEMATIC DIAGRAM



SC06960

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

THERMAL DATA

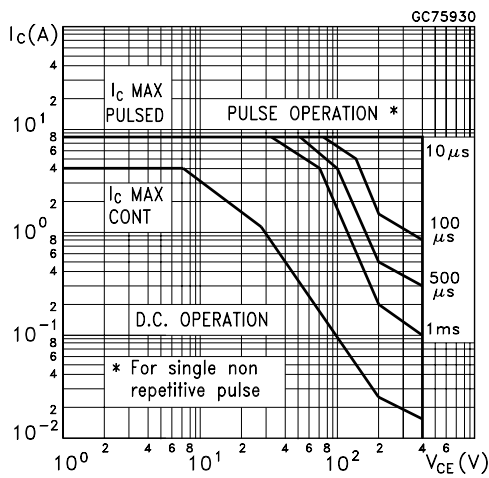
R _{thj-case}	Thermal Resistance Junction-Case	Max	4.1	°C/W
R _{thj-amb}	Thermal Resistance Junction-Ambient	Max	62.5	°C/W

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

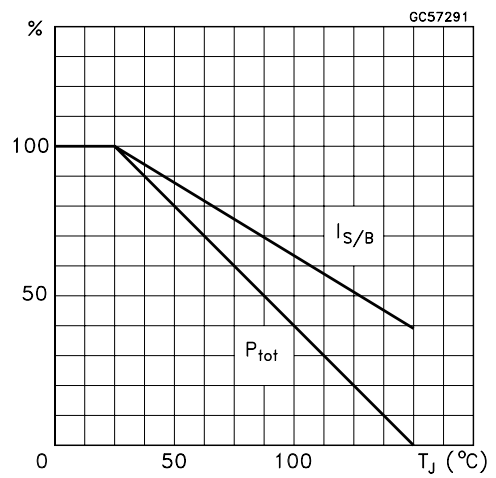
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I _{CES}	Collector Cut-off Current (V _{BE} = -1.5 V)	V _{CE} = 700 V V _{CE} = 700 V T _J = 125 °C			100 500	μA μA
V _{EBO}	Emitter-Base Voltage (I _C = 0)	I _E = 10 mA	9			V
V _{CEO(sus)*}	Collector-Emitter Sustaining Voltage (I _B = 0)	I _C = 100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

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

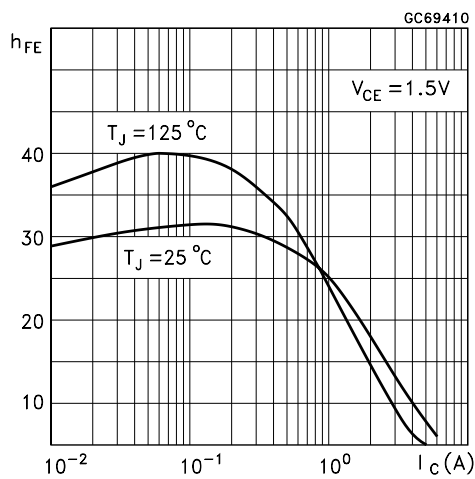
Safe Operating Areas



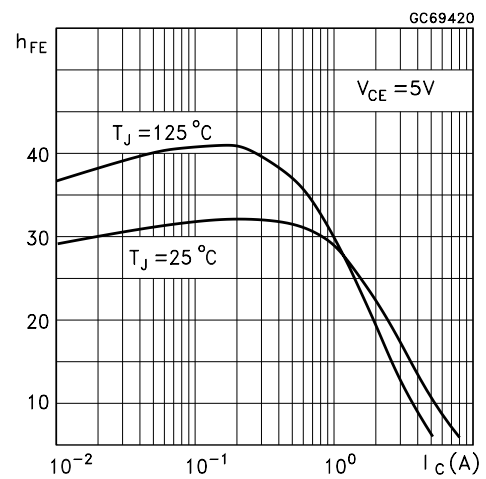
Derating Curve



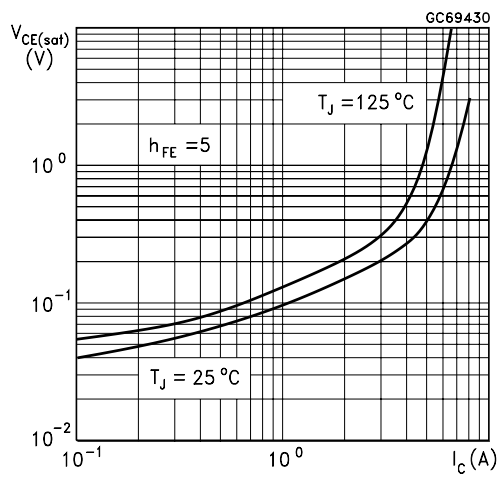
DC Current Gain



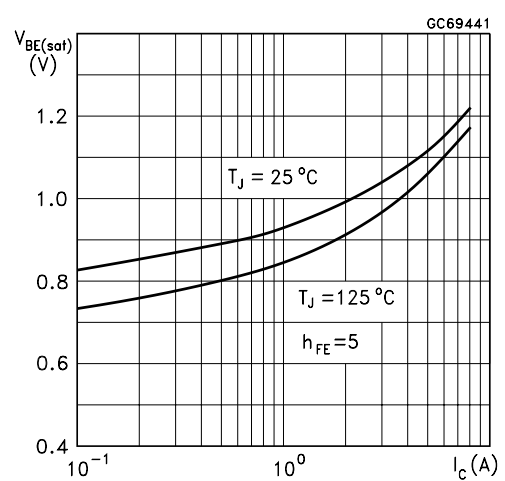
DC Current Gain



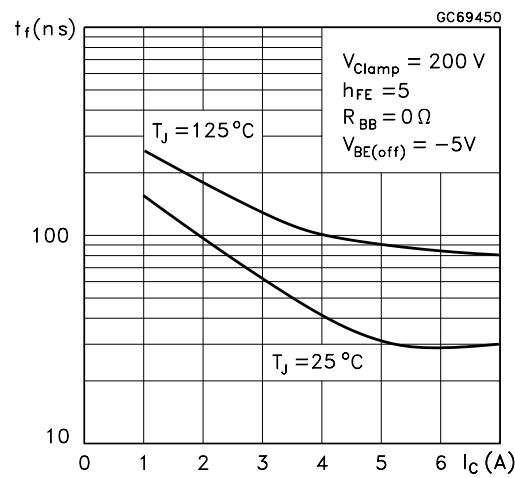
Collector Emitter Saturation Voltage



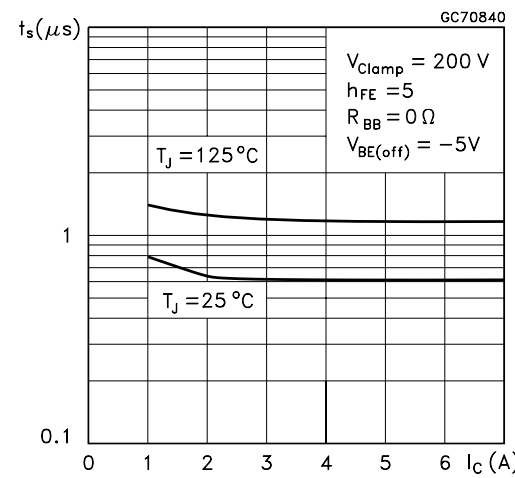
Base Emitter Saturation Voltage



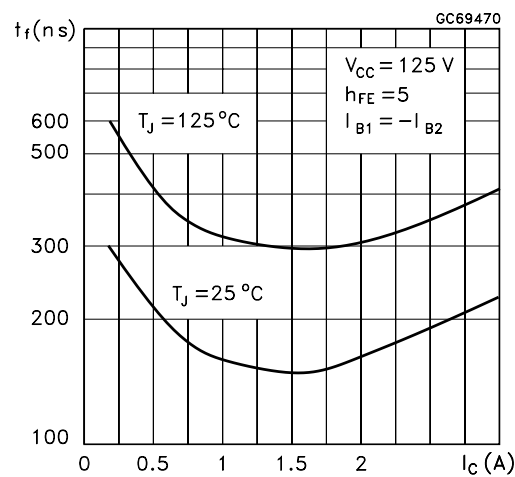
Inductive Fall Time



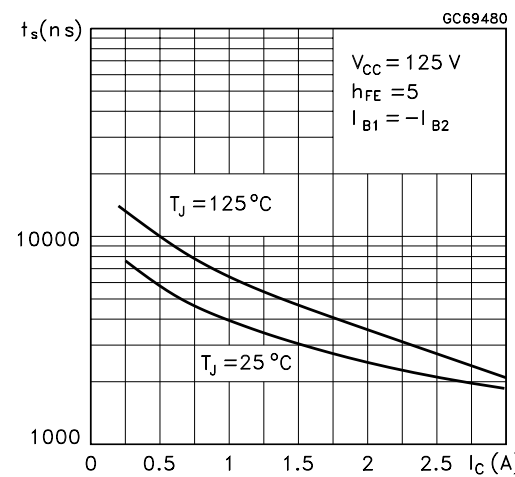
Inductive Storage Time



Resistive Fall Time



Resistive Load Storage Time



Reverse Biased SOA

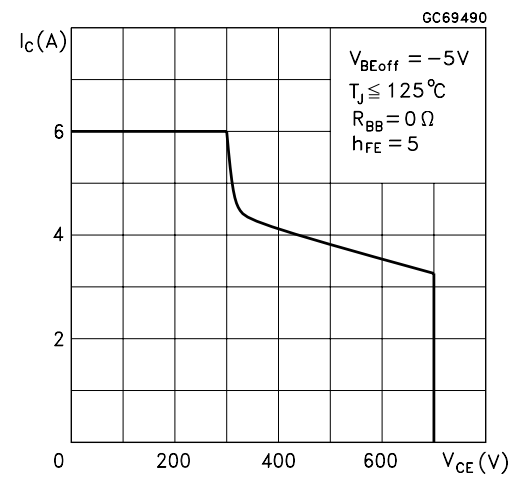
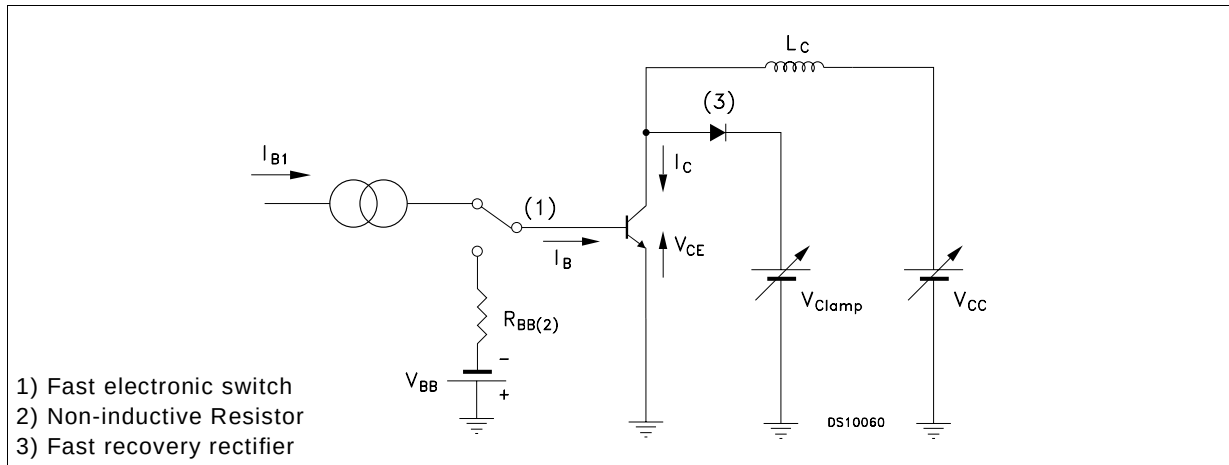
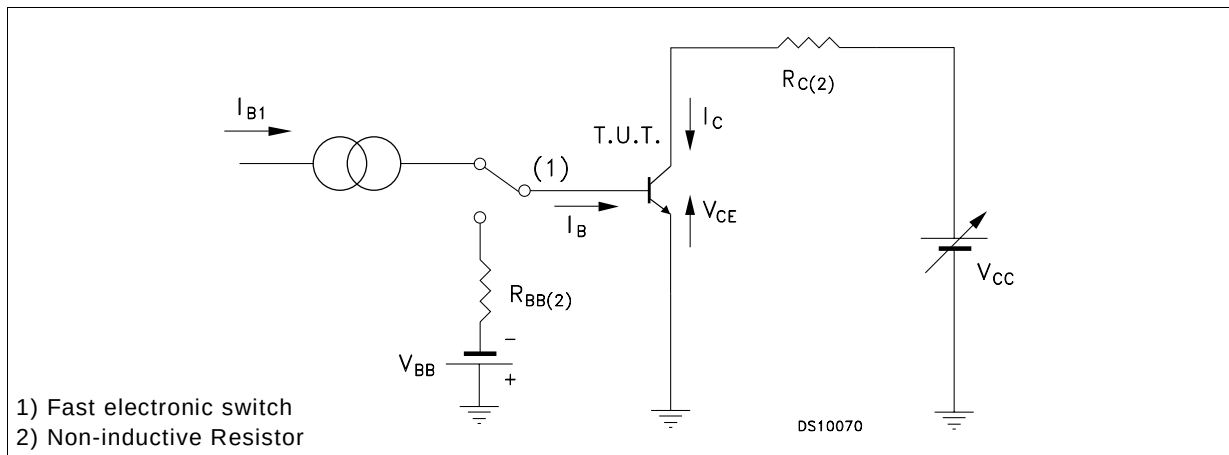
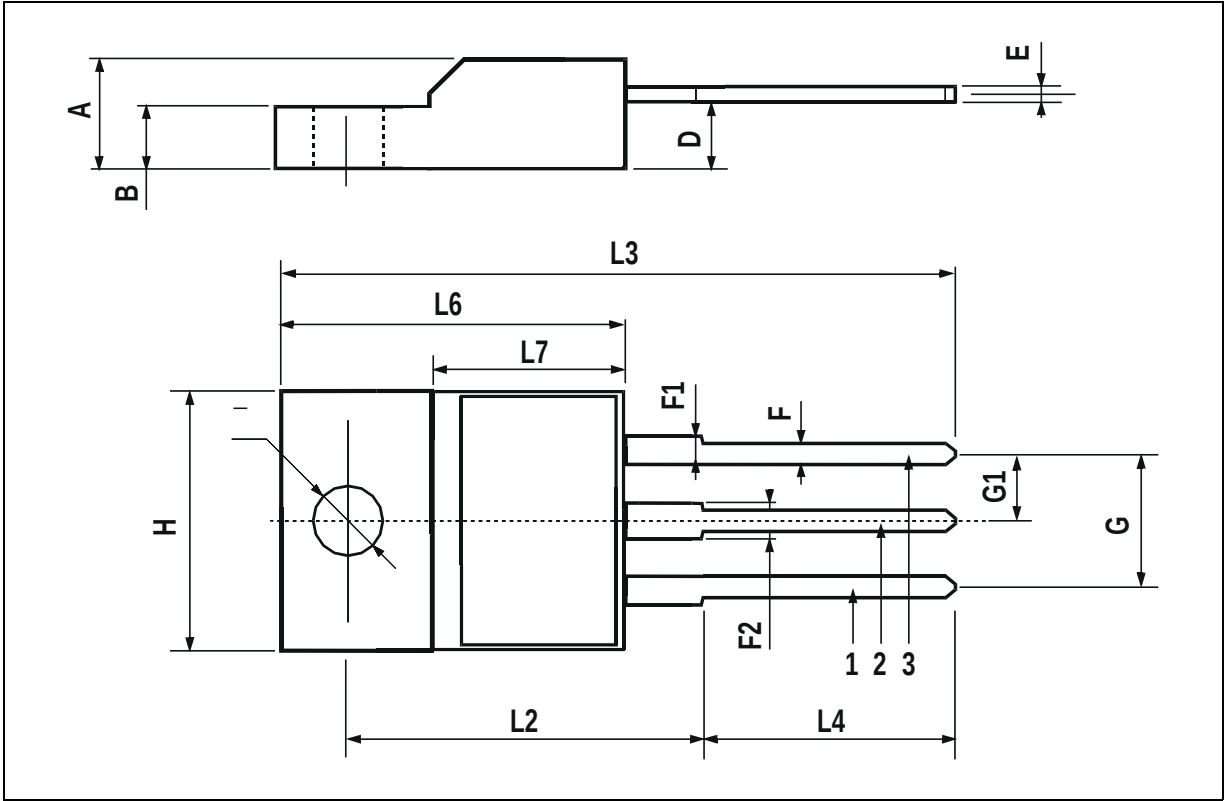


Figure 1: Inductive Load Switching Test Circuit.**Figure 2: Resistive Load Switching Test Circuit.**

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



Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specification mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a trademark of STMicroelectronics

© 2001 STMicroelectronics – Printed in Italy – All Rights Reserved

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - China - Finland - France - Germany - Hong Kong - India - Italy - Japan - Malaysia - Malta - Morocco -
Singapore - Spain - Sweden - Switzerland - United Kingdom - U.S.A.

<http://www.st.com>

