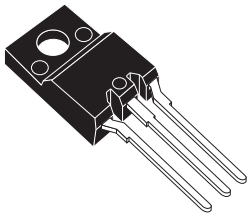
BUL312FH

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

Ordering Code	Marking	Shipment
BUL312FH	BUL312FH	Tube

- 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 R.B.S.O.A.
- FULLY INSULATED PACKAGE (U.L. COMPLIANT) FOR EASY MOUNTING



TO-220FH

APPLICATIONS:

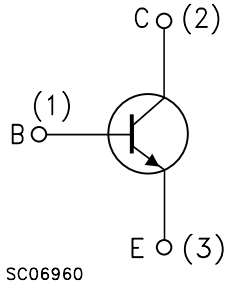
- HORIZONTAL DEFLECTION FOR COLOR TV
- SWITCH MODE POWER SUPPLIES
- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING

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 R.B.S.O.A.

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CES}	Collector-Emitter Voltage (V_{BE} = 0)	1150	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)	500	V
V_{EBO}	Emitter-Base Voltage (I_C = 0)	9	V
I_C	Collector Current	5	A
I_{CM}	Collector Peak Current (t_p < 5 ms)	10	A
I_B	Base Current	3	A
I_{BM}	Base Peak Current (t_p < 5 ms)	4	A
P_{tot}	Total Dissipation at T_c = 25 °C	36	W
V_{isol}	Insulation Withstand Voltage (RMS) from All Three Leads to External Heatsink	2500	V
T_{stg}	Storage Temperature	–65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

THERMAL DATA

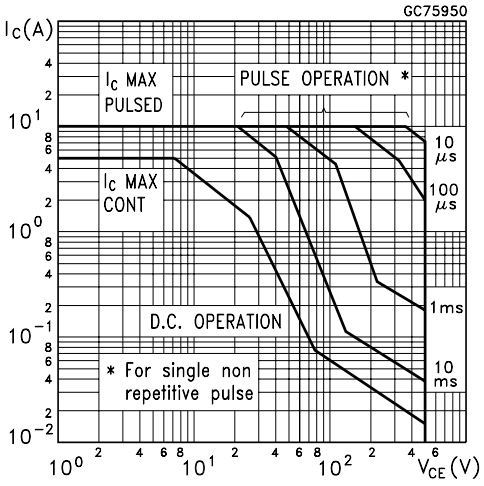
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	3.47	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-ambient	Max	62.5	°C/W

ELECTRICAL CHARACTERISTICS (T_j = 25 °C unless otherwise specified)

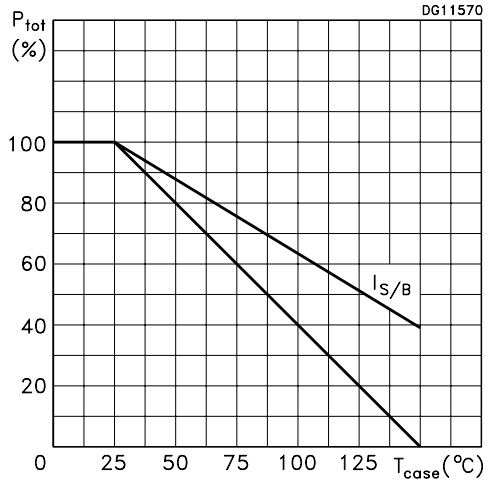
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	V_{CE} = 1150 V V_{CE} = 1150 V	 T_j = 125 °C			1 2	mA mA
I_{CEO}	Collector Cut-off Current (I_B = 0)	V_{CE} = 500 V				250	µA
V_{EBO}	Emitter-Base Voltage (I_C = 0)	I_E = 10 mA		9			V
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 100 mA		500			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 1 A I_C = 2 A I_C = 3 A	I_B = 200 mA I_B = 400 mA I_B = 600 mA			0.5 0.7 1.1	V V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 1 A I_C = 2 A I_C = 3 A	I_B = 200 mA I_B = 400 mA I_B = 600 mA			1 1.1 1.2	V V V
h_{FE}*	DC Current Gain	I_C = 10 mA I_C = 3 A	V_{CE} = 5 V V_{CE} = 2.5 V	8 8		 16	
t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 2 A I_{B1} = 400 mA L = 200 µH (See Figure 1)	V_{clamp} = 250 V $V_{BE(off)}$ = -5 V R_{BB} = 0		1.2 80	1.9 160	µs ns
t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 2 A I_{B1} = 400 mA L = 200 µH T_j = 125 °C	V_{clamp} = 250 V $V_{BE(off)}$ = -5 V R_{BB} = 0 (See Figure 1)		1.8 150		µs ns

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

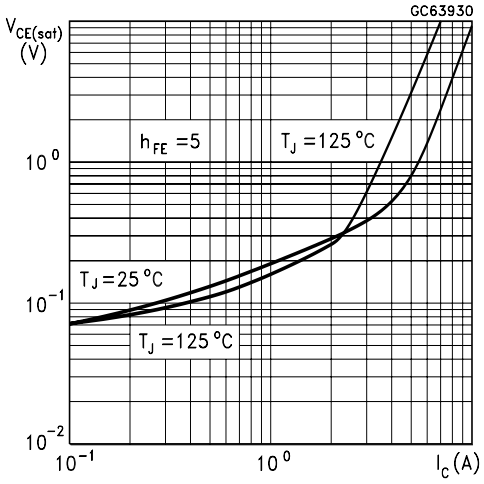
Safe Operating Area



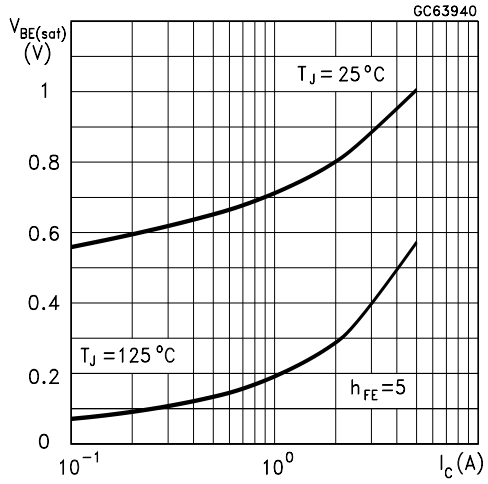
Derating Curve



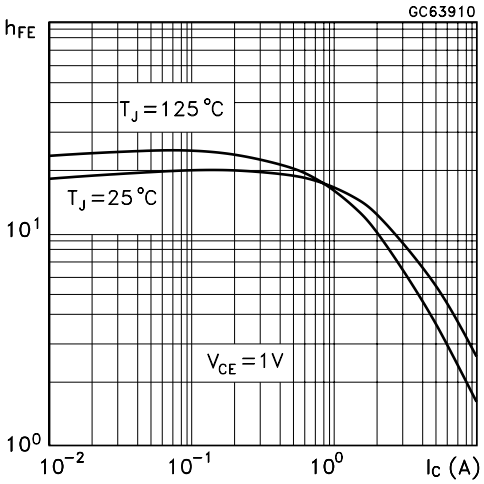
Collector-Emitter Saturation Voltage



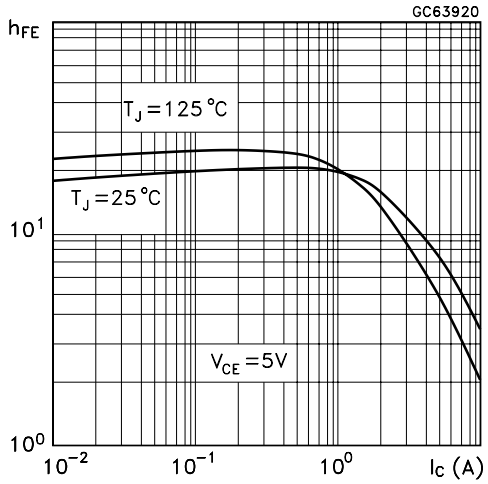
Base-Emitter Saturation Voltage



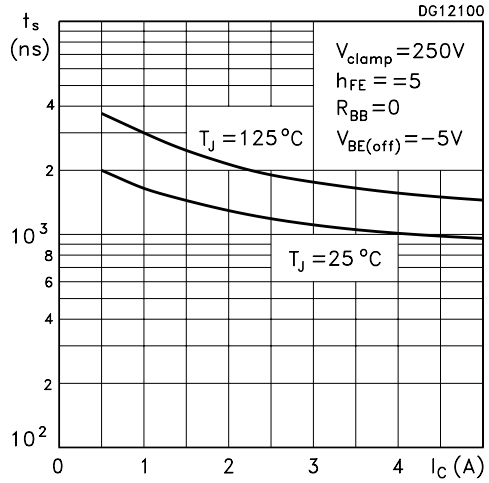
DC Current Gain



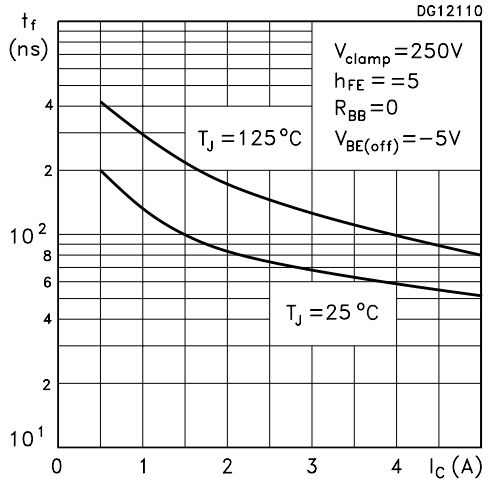
DC Current Gain



Inductive Load Storage Time



Inductive Load Fall Time



Reverse Biased Safe Operating Area

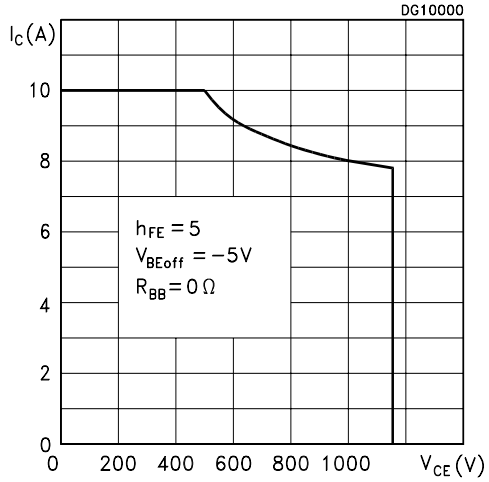
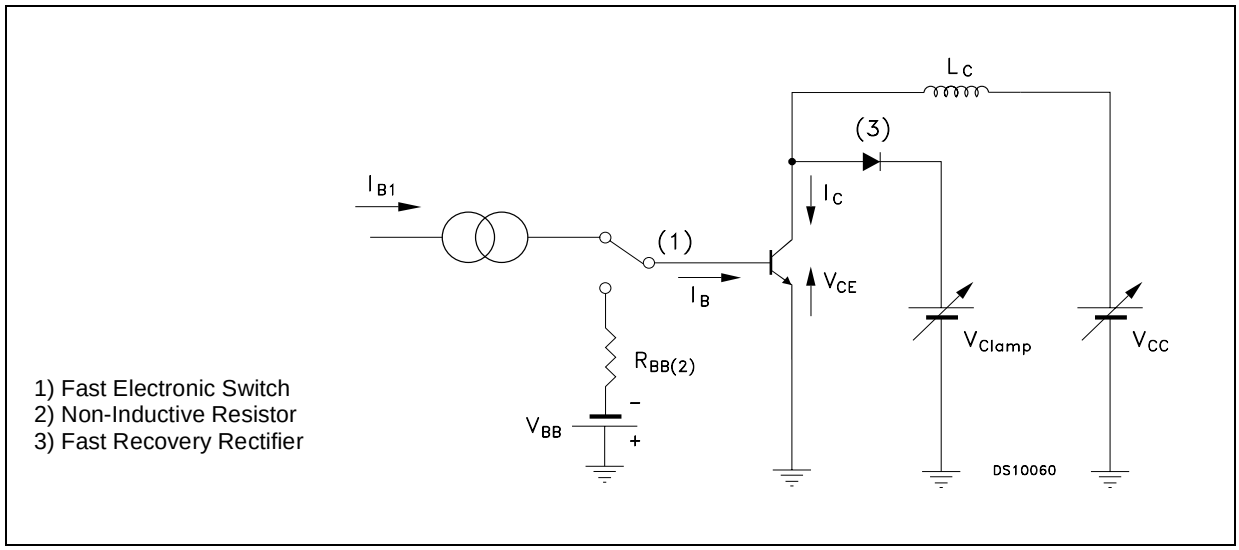
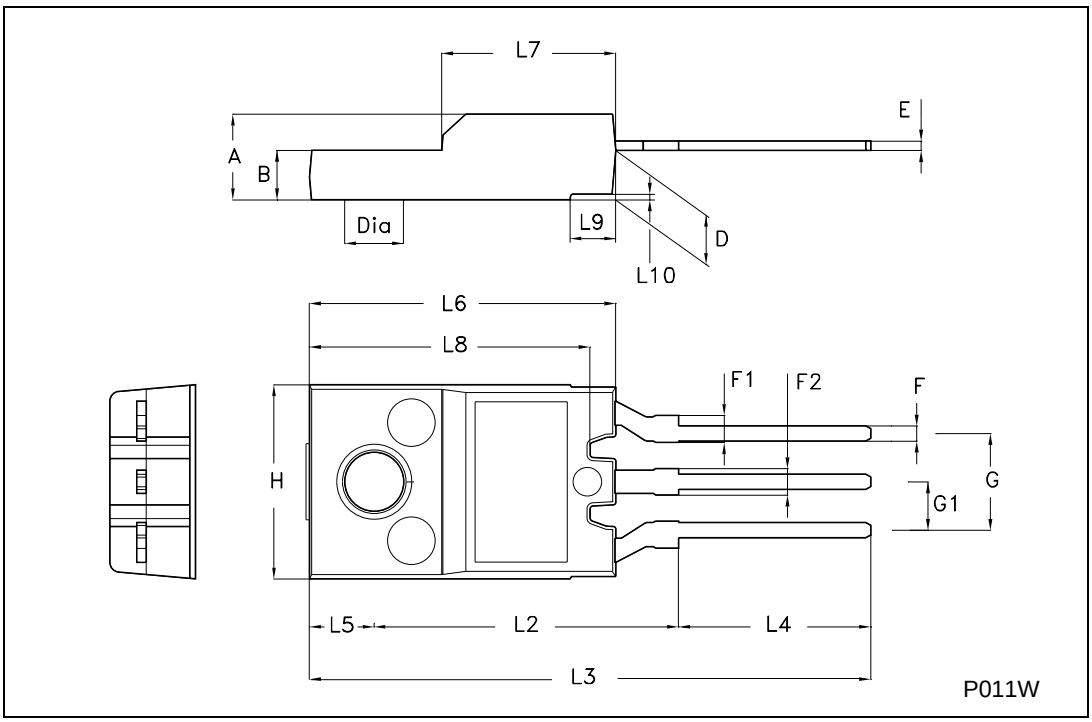


Figure 1: Inductive Load Switching Test Circuit



TO-220FH (Fully plastic High voltage) 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	1.3		1.8	0.051		0.070
F2	1.3		1.8	0.051		0.070
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
L5		3.4			0.134	
L6	15.9		16.4	0.626		0.645
L7	9		9.3	0.354		0.366
L8	14.5		15	0.570		0.590
L9		2.4			0.094	



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