BULD118D-1

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- INTEGRATED ANTIPARALLEL COLLECTOR- EMITTER DIODE
- HIGH VOLTAGE CAPABILITY
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED

APPLICATIONS:

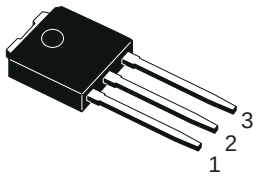
- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING
- FLYBACK AND FORWARD SINGLE TRANSISTOR LOW POWER CONVERTERS

DESCRIPTION

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

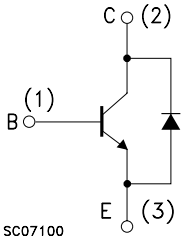
It uses a Cellular Emitter structure with planar edge termination to enhance switching speeds while maintaining the wide RBSOA.

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



IPAK
(TO-251)

INTERNAL SCHEMATIC DIAGRAM



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	2	A
I_{CM}	Collector Peak Current (t_p < 5 ms)	4	A
I_B	Base Current	1	A
I_{BM}	Base Peak Current (t_p < 5 ms)	2	A
P_{tot}	Total Dissipation at T_c = 25 °C	20	W
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	6.25	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-Ambient Max	100	°C/W

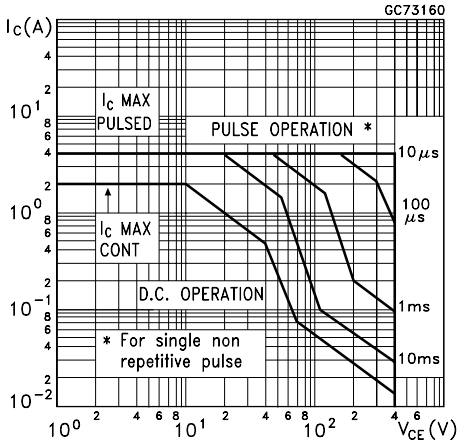
ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	V_{CE} = 700 V V_{CE} = 700 V T_j = 125 °C			100 500	µA µA
V_{EBO}	Emitter-Base Voltage	I_E = 10 mA	9			V
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage	I_C = 100 mA L = 25 mH	400			V
I_{CEO}	Collector-Emitter Leakage Current	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 A I_B = 0.4 A			0.5 1 1.5	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 A I_B = 0.4 A			1.0 1.2 1.3	V V V
h_{FE}*	DC Current Gain	I_C = 10 mA V_{CE} = 5 V I_C = 0.5 A V_{CE} = 5 V I_C = 2 A V_{CE} = 5 V	10 10 8		 50	
 t_r t_f t_s 	RESISTIVE LOAD Rise Time Fall Time Storage Time group A group B	 V_{CC} = 125 V I_C = 2 A I_{B1} = 0.4 A I_{B2} = -0.2 A t_p = 30 µs	 1.4 2	 0.7 0.3 	 0.5 2.1 2.75	 µs µs µs µs
 t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 1 A I_{B1} = 0.2 A V_{BE} = -5 V L = 50 mH V_{clamp} = 300 V		 0.8 0.10		 µs µs
V_F	Diode Forward Voltage	I_C = 1 A			2.5	V

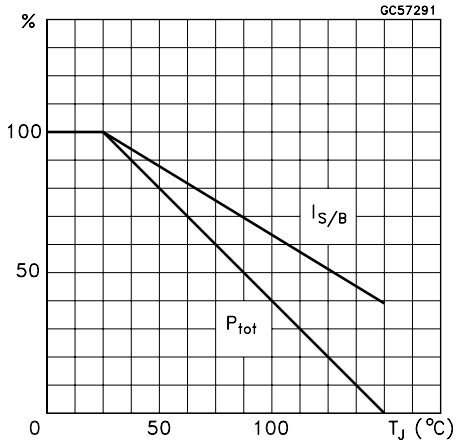
∗ Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %

Note : Product is pre-selected in storage time (GROUP A and GROUP B). STMicroelectronics reserves the right to ship either groups according to production availability. Please contact your nearest STMicroelectronics sales office for delivery details.

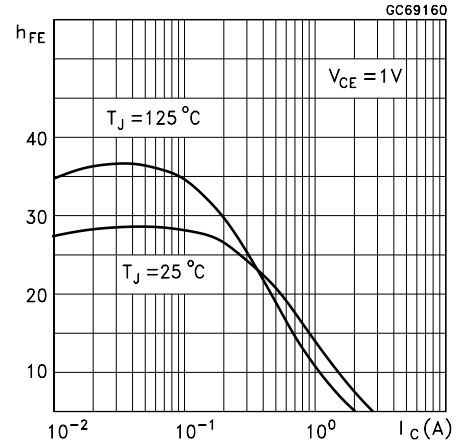
Safe Operating Areas



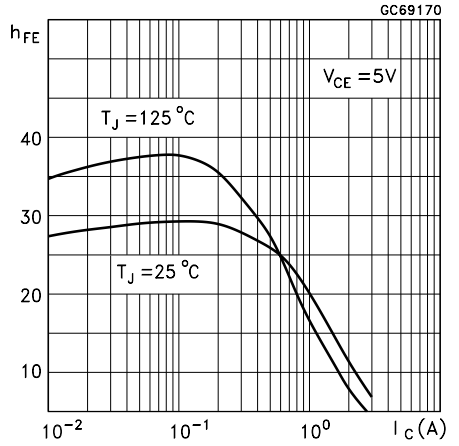
Derating Curve



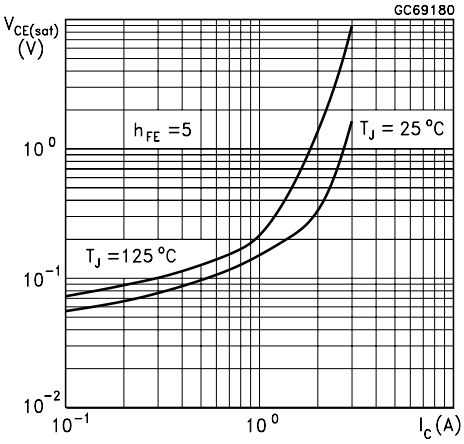
DC Current Gain



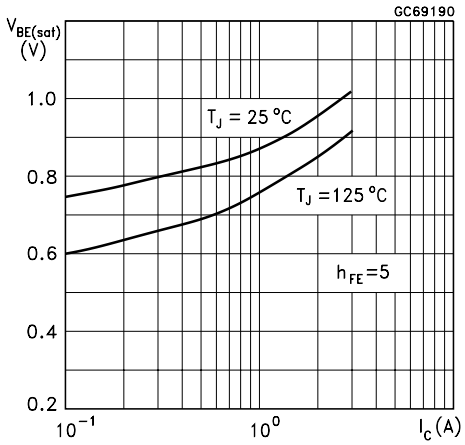
DC Current Gain



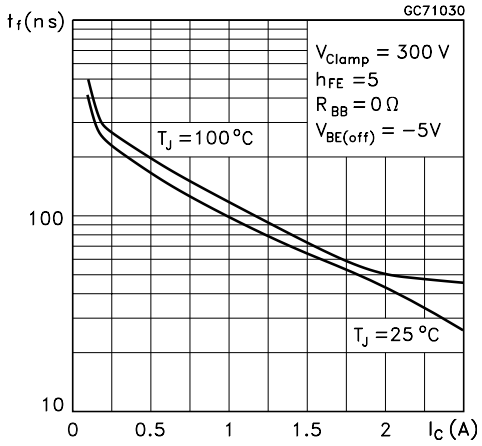
Collector Emitter Saturation Voltage



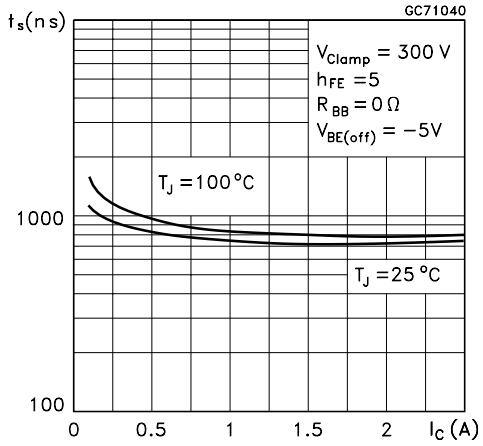
Base Emitter Saturation Voltage



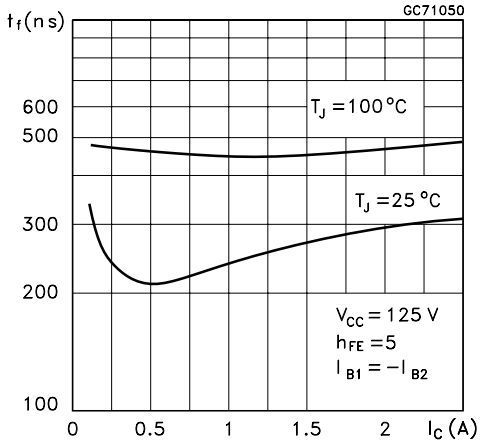
Inductive Fall Time



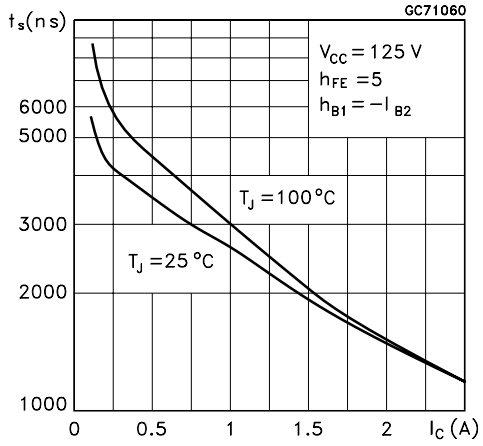
Inductive Storage Time



Resistive Fall Time



Resistive Load Storage Time



Reverse Biased SOA

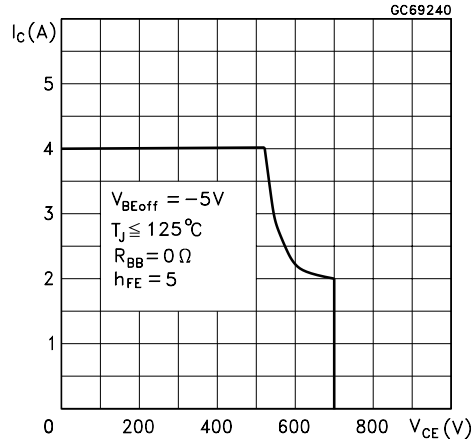
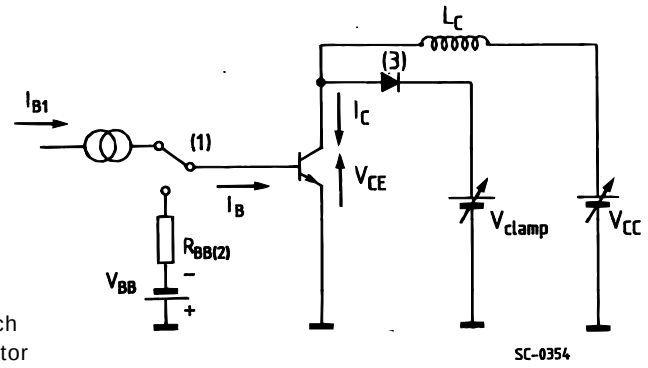
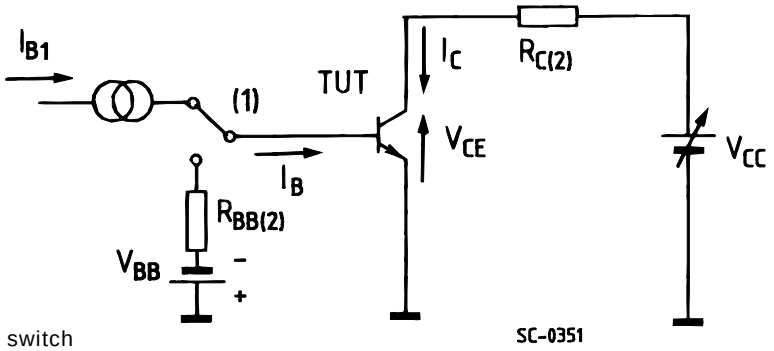


Figure 1: Inductive Load Switching Test Circuit.



1) Fast electronic switch
2) Non-inductive Resistor
3) Fast recovery rectifier

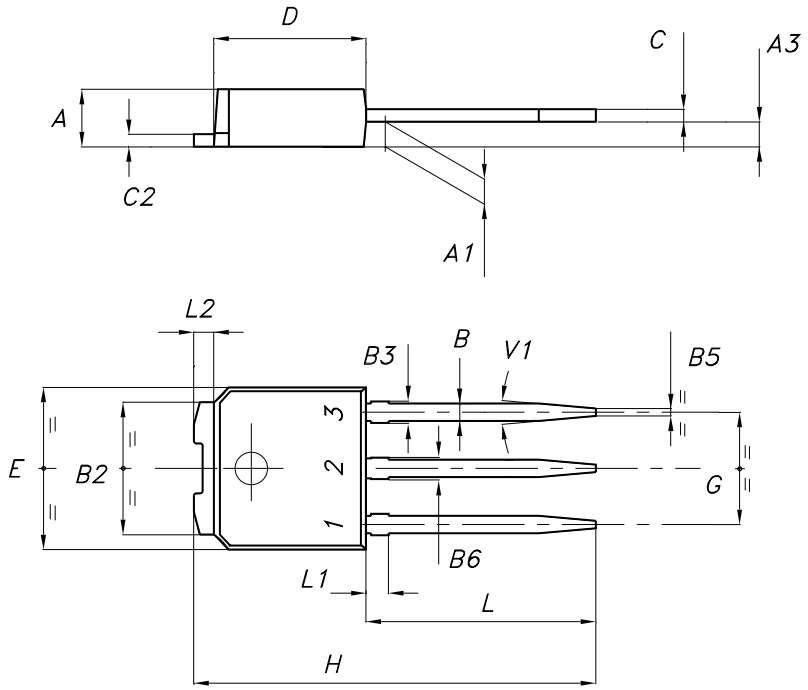
Figure 2: Resistive Load Switching Test Circuit.



1) Fast electronic switch
2) Non-inductive Resistor

TO-251 (IPAK) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	2.20		2.40	0.087		0.094
A1	0.90		1.10	0.035		0.043
A3	0.70		1.30	0.028		0.051
B	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204		0.213
B3			0.85			0.033
B5		0.30			0.012	
B6			0.95			0.037
C	0.45		0.60	0.018		0.024
C2	0.48		0.60	0.019		0.024
D	6.00		6.20	0.237		0.244
E	6.40		6.60	0.252		0.260
G	4.40		4.60	0.173		0.181
H	15.90		16.30	0.626		0.642
L	9.00		9.40	0.354		0.370
L1	0.80		1.20	0.031		0.047
L2		0.80	1.00		0.031	0.039
V1		10°			10°	



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