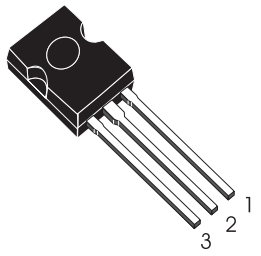
BULK118

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- BULK118 IS REVERSE PINS OUT Vs STANDARD SOT-82 PACKAGE AND SAME PINS OUT Vs BULT118 (SOT-32 PACKAGE)
- STMicroelectronics PREFERRED SALESTYPES
- NPN TRANSISTOR
- HIGH VOLTAGE CAPABILITY
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED

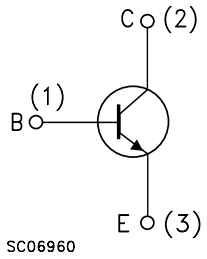


SOT-82

APPLICATIONS:

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

INTERNAL SCHEMATIC DIAGRAM



DESCRIPTION

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

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

The devices are 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	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	45	W
T_{stg}	Storage Temperature	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

THERMAL DATA

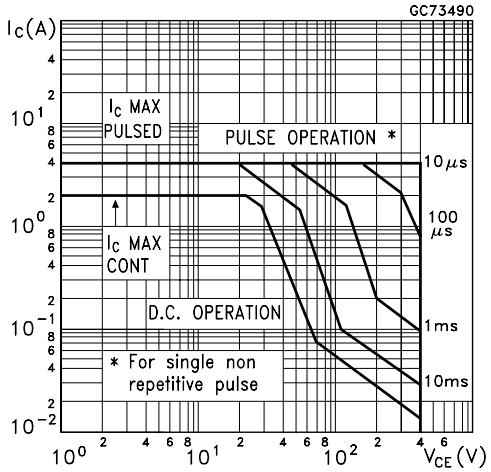
$R_{thj\text{-}case}$	Thermal Resistance Junction-Case	Max	2.77	$^oC/W$
$R_{thj\text{-}amb}$	Thermal Resistance Junction-Ambient	Max	80	$^oC/W$

ELECTRICAL CHARACTERISTICS (T_{case} = 25 ^oC unless otherwise specified)

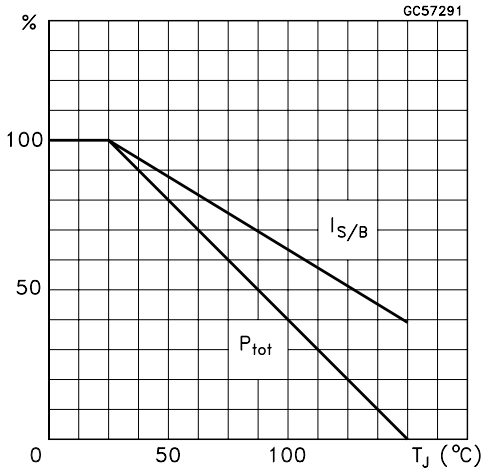
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	V_{CE} = 700 V V_{CE} = 700 V	 T_j = 125 ^oC			100 500	µA µA
V_{EBO}	Emitter-Base Voltage	I_E = 10 mA		9			V
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 100 mA	L = 25 mH	400			V
I_{CEO}	Collector-Emitter Leakage Current	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 A	I_B = 0.1 A I_B = 0.2 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_C = 1 A I_C = 2 A	I_B = 0.1 A I_B = 0.2 A I_B = 0.4 A			1.0 1.2 1.3	V V V
h_{FE}*	DC Current Gain	I_C = 10 mA I_C = 0.5 A I_C = 2 A	V_{CE} = 5 V V_{CE} = 5 V V_{CE} = 5 V	10 10 8		 50	
 t_r t_s t_f	RESISTIVE LOAD Rise Time Storage Time Fall Time	 V_{CC} = 125 V I_{B1} = 0.2 A	 I_C = 1 A I_{B2} = -0.2 A		 0.4 3.2 0.25	 0.7 4.5 0.4	 µs µs µs
 t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 1 A V_{BE} = -5 V V_{clamp} = 300 V	I_{B1} = 0.2 A L = 50 mH		 0.8 0.16		 µs µs

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

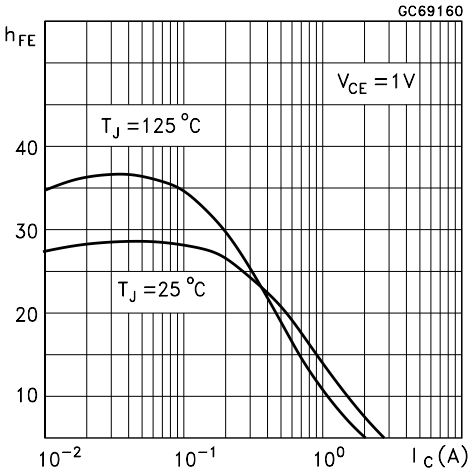
Safe Operating Areas



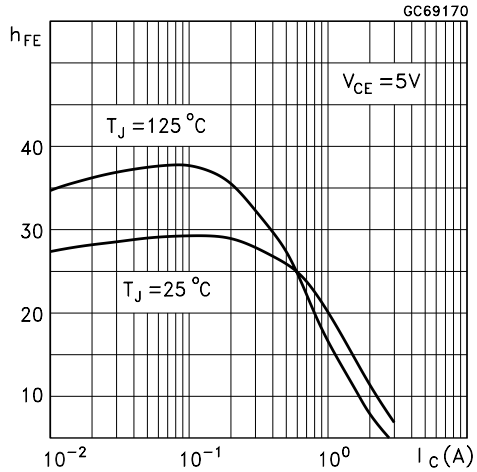
Derating Curve



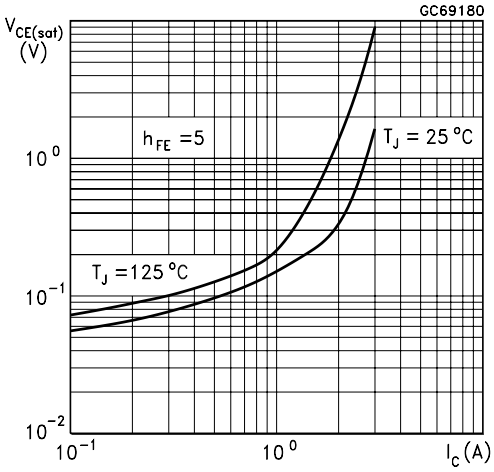
DC Current Gain



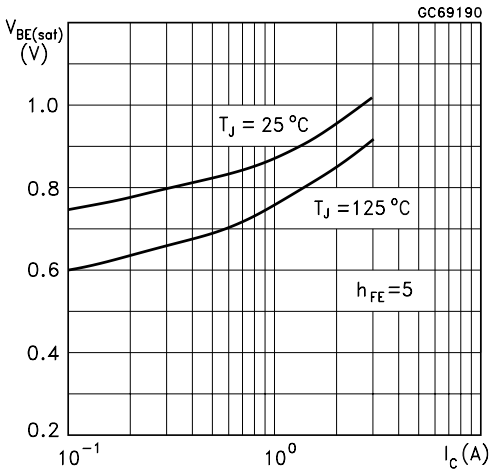
DC Current Gain



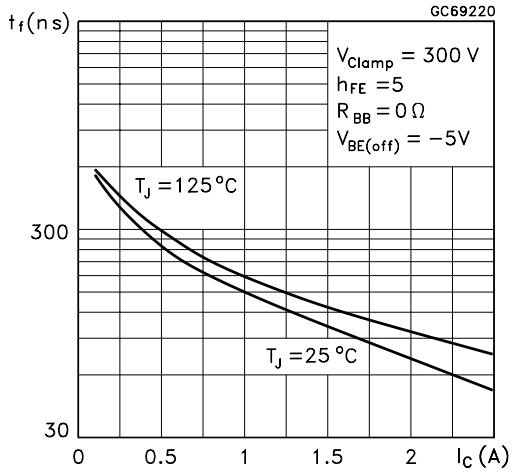
Collector Emitter Saturation Voltage



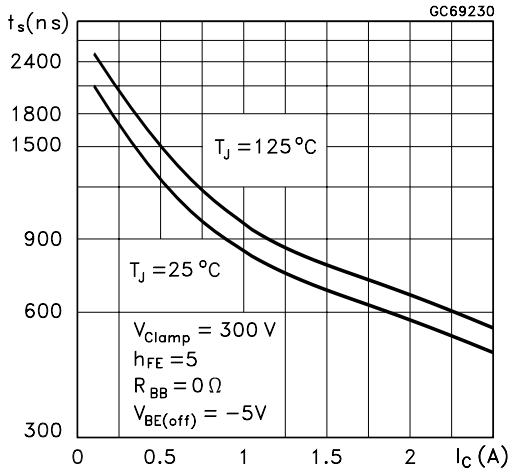
Base Emitter Saturation Voltage



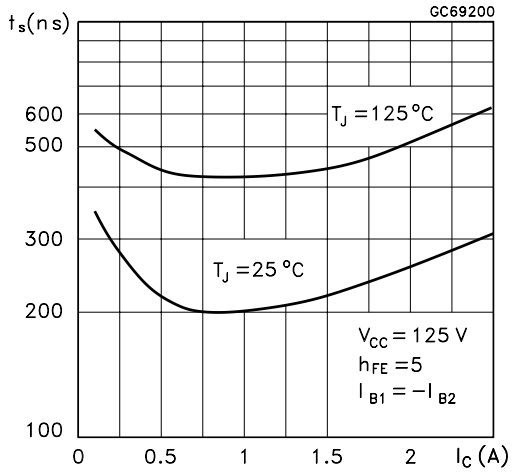
Inductive Load Fall Time



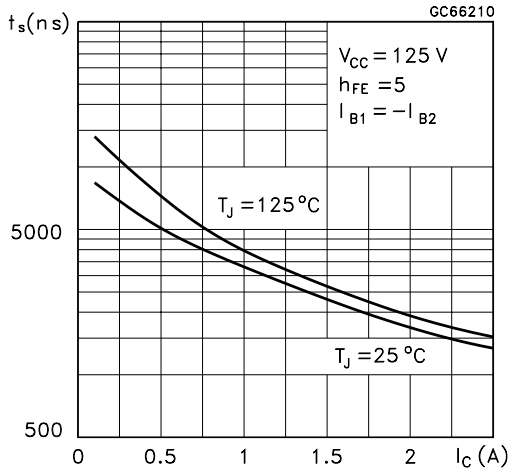
Inductive Load Storage Time



Resistive Load Fall Time



Resistive Load Storage Time



Reverse Biased SOA

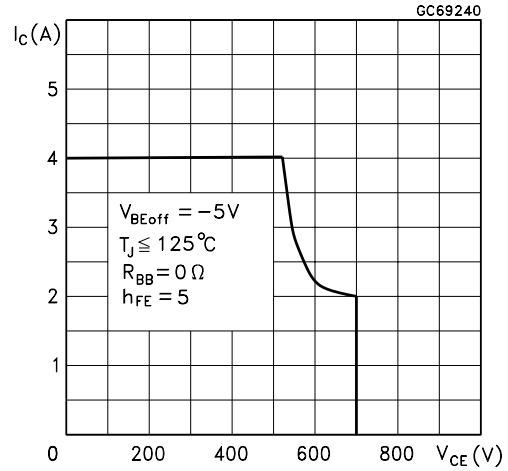


Figure 1: Inductive Load Switching Test Circuits.

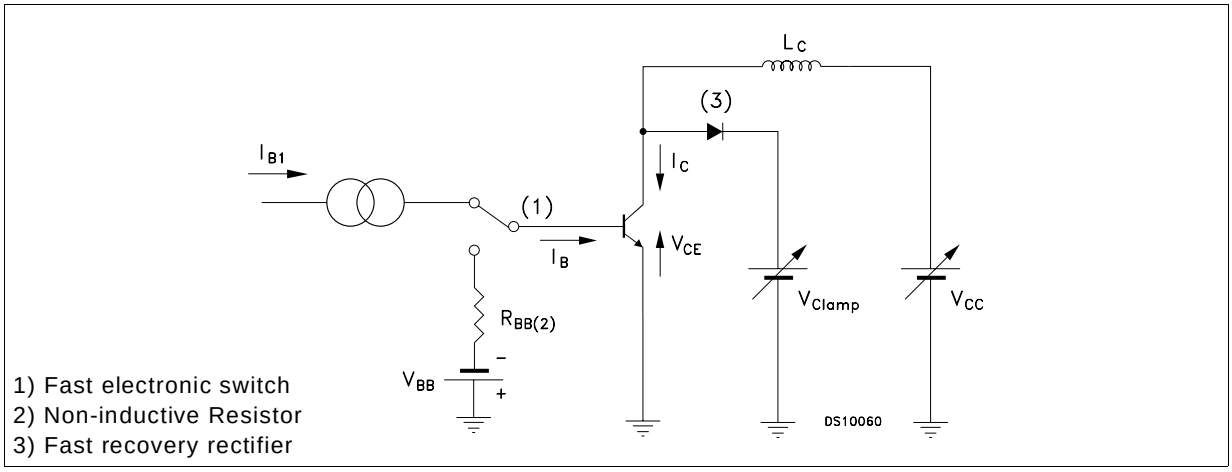
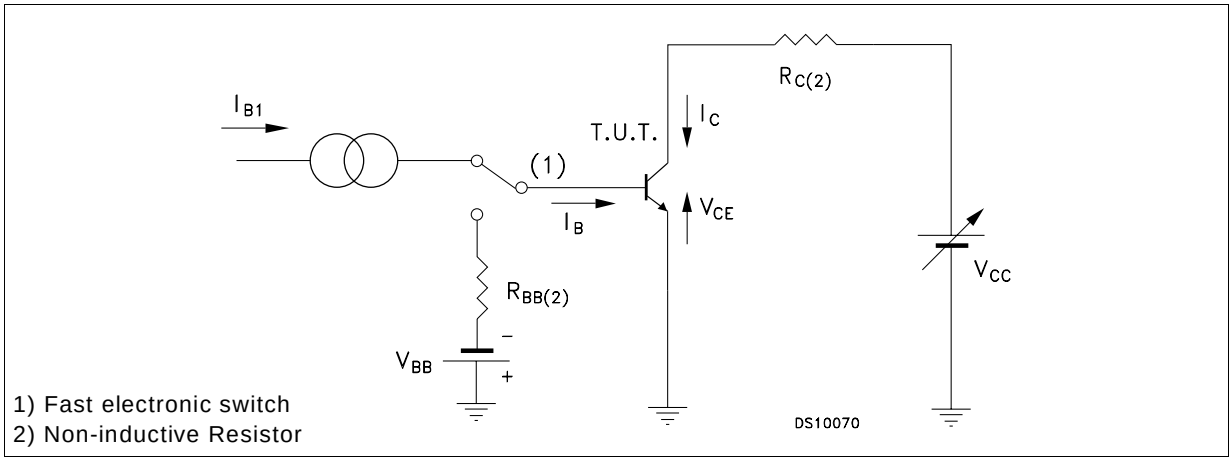


Figure 2: Resistive Load Switching Test Circuits.



SOT-82 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	7.4		7.8	0.291		0.307
B	10.5		10.8	0.413		0.444
b	0.7		0.9	0.028		0.035
b1	0.49		0.75	0.019		0.030
C	2.4		2.7	0.04		0.106
c1	1.0		1.3	0.039		0.05
D	15.4		16	0.606		0.629
e		2.2			0.087	
e3	4.15		4.65	0.163		0.183
F		3.8			0.150	
H			2.54		0.100	
H2		2.15			0.084