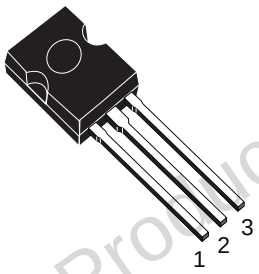
BULK128D-B

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- STMicroelectronics PREFERRED SALESTYPE
- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE
- 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

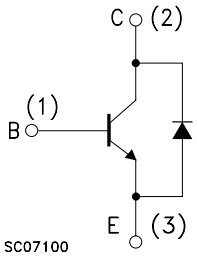
DESCRIPTION

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.

INTERNAL SCHEMATIC DIAGRAM



Obsolete Product(s) - Obsolete Product(s)

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, I_B = 2 A, t_p < 10µs, T_j < 150°C)	BV_{EBO}	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	55	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	2.27	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-Ambient Max	80	°C/W

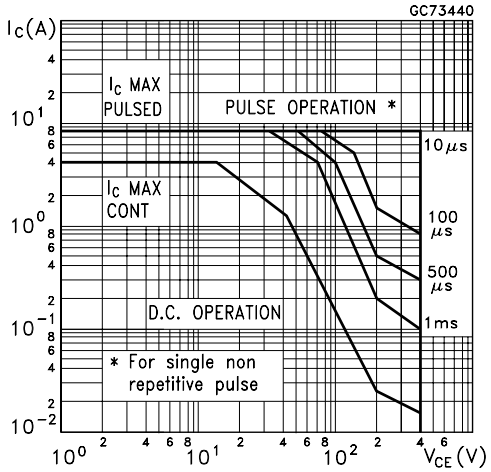
ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

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_C = 125 °C			100 500	µA µA
I_{CEO}	Collector-Emitter Leakage Current (I_B = 0)	V_{CE} = 400 V			250	µA
BV_{EBO}	Emitter-Base Breakdown Voltage (I_C = 0)	I_E = 10 mA	9		18	V
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 100 mA L = 25 mH	400			V
$V_{CE(sat)}$*	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			0.7 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 = 2.5 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 = 2 A V_{CE} = 5 V	10 8		 40	
V_f	Forward Voltage Drop	I_f = 2 A			2.5	V
 t_s t_f	RESISTIVE LOAD Storage Time Fall Time	V_{CC} = 250 V I_C = 2 A I_{B1} = 0.4 A I_{B2} = -0.4 A T_p = 30 µs (see fig. 2)	 2	 0.2	 2.9	 µs µs
 t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	V_{CC} = 200 V I_C = 2 A I_{B1} = 0.4 A $V_{BE(off)}$ = -5 V R_{BB} = 0 Ω L = 200 µH (see fig. 1)		 0.6 0.1		 µs µs

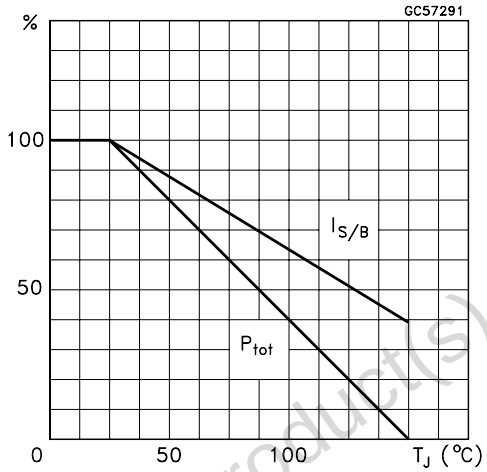
∗ Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %

Obsolete Product(s) - Obsolete Product(s)

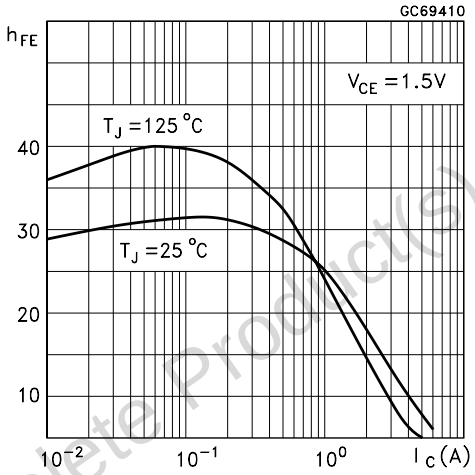
Safe Operating Areas



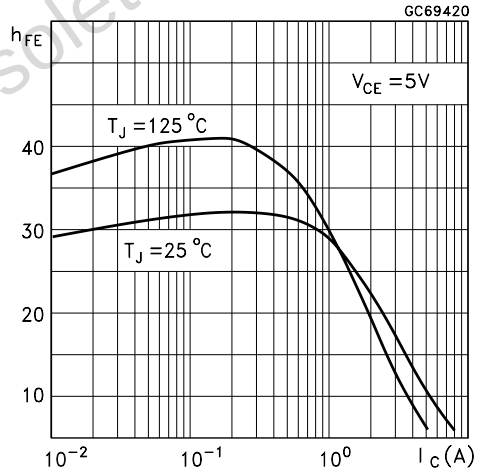
Derating Curve



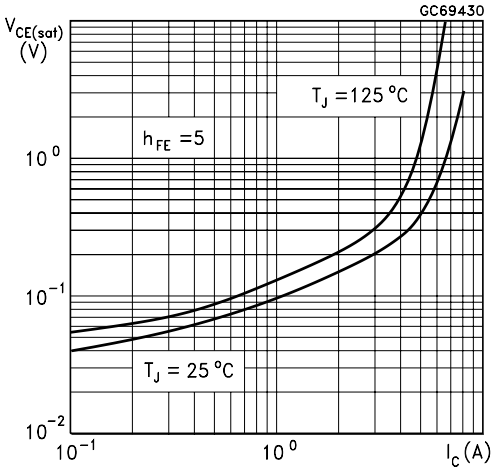
DC Current Gain



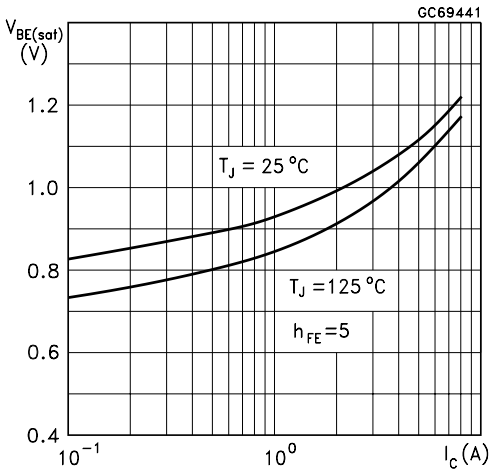
DC Current Gain



Collector Emitter Saturation Voltage

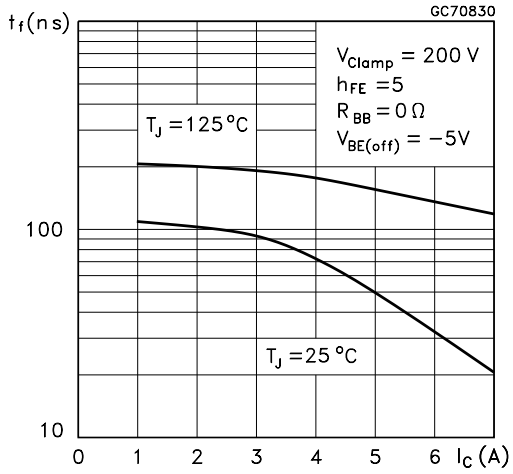


Base Emitter Saturation Voltage

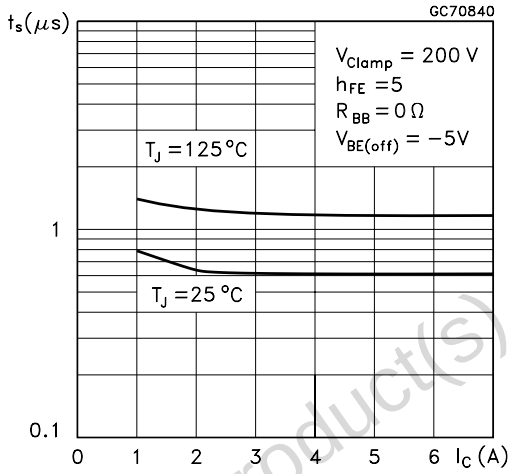


Obsolete Product(s) - Obsolete Product(s)

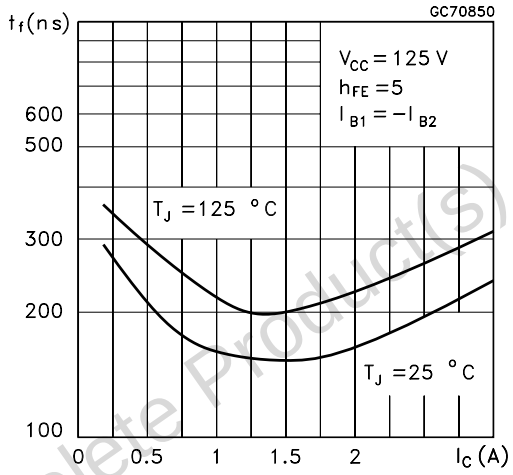
Inductive Fall Time



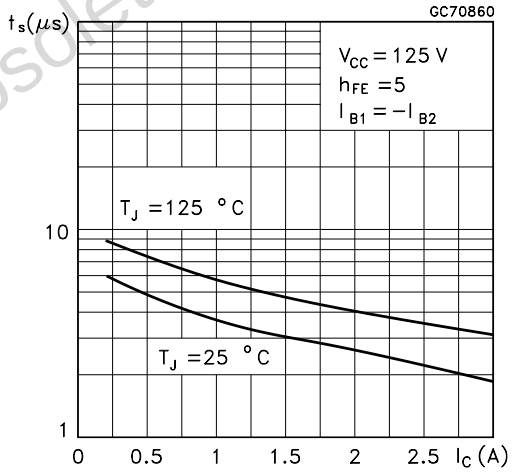
Inductive Storage Time



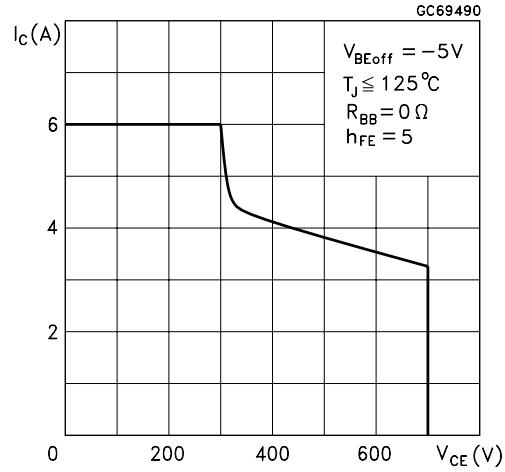
Resistive Load Fall Time



Resistive Load Storage Time



Reverse Biased SOA



Obsolete Product(s) - Obsolete Product(s)

Figure 1: Inductive Load Switching Test Circuit.

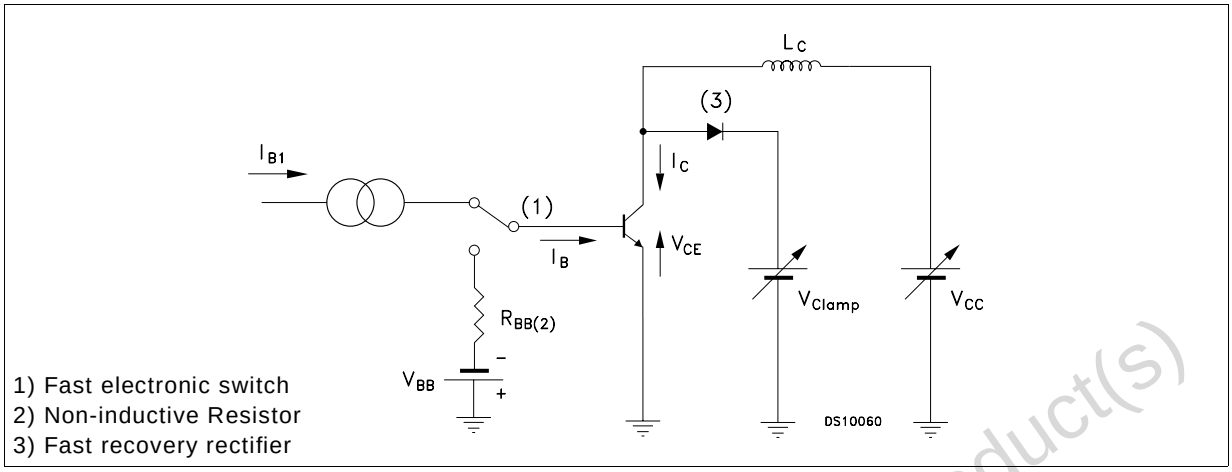
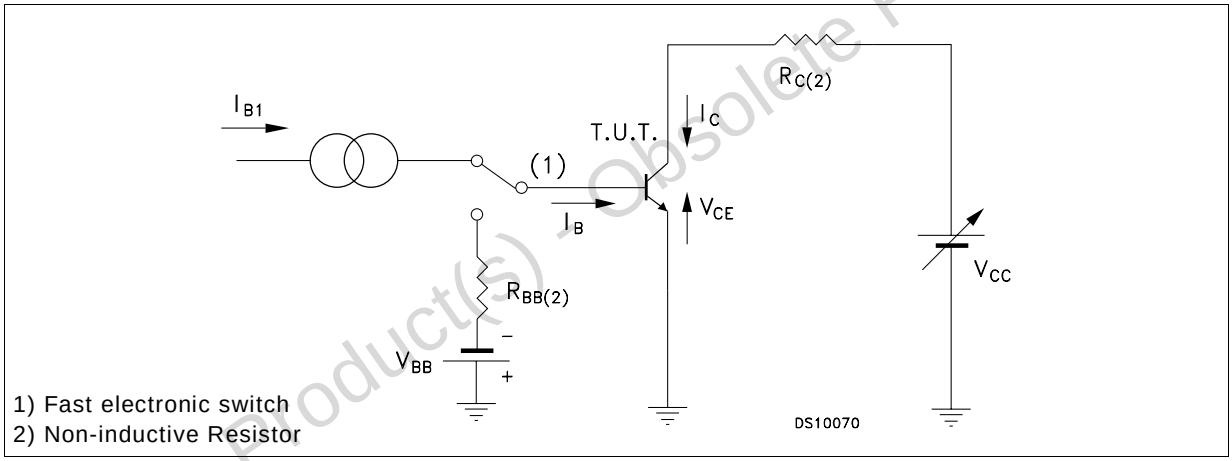


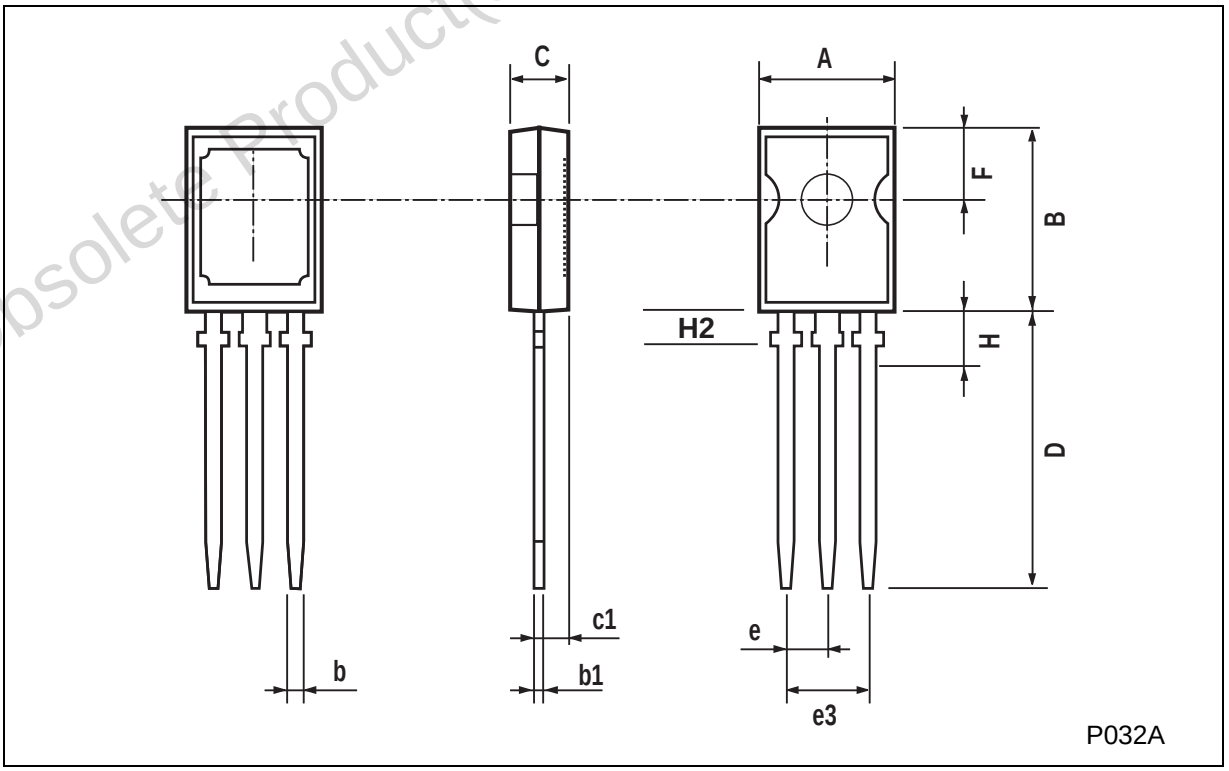
Figure 2: Resistive Load Switching Test Circuit.



Obsolete Product(s) - Obsolete Product(s)

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	



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