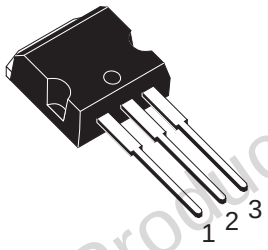
BULB128-1

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

Ordering Code	Marking	Shipment
BULB128-1	BULB128	Tube

- 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
- THROUGH HOLE I^2PAK (TO-262) POWER PACKAGE IN TUBE (SUFFIX "-1")

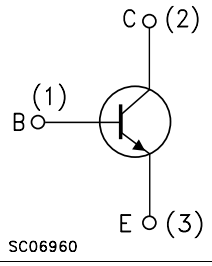


I^2PAK
(TO-262)
(Suffix "-1")

APPLICATIONS:

- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING

INTERNAL SCHEMATIC DIAGRAM



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.

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)	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	70	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	1.78	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-Ambient Max	62.5	°C/W

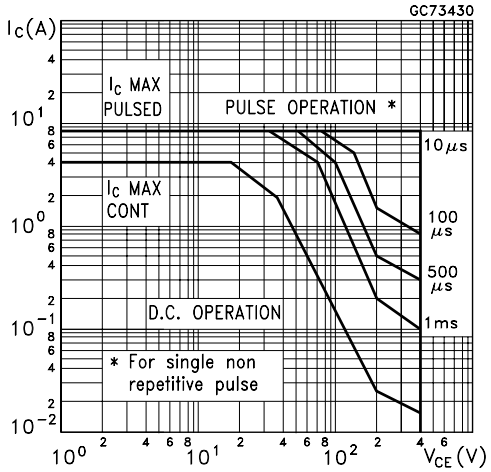
ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	V_{CE} = 700 V V_{CE} = 700 V T_C = 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
$V_{BE(sat)}$*	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 14		 28	
 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)	 1.5	 0.2	 3 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

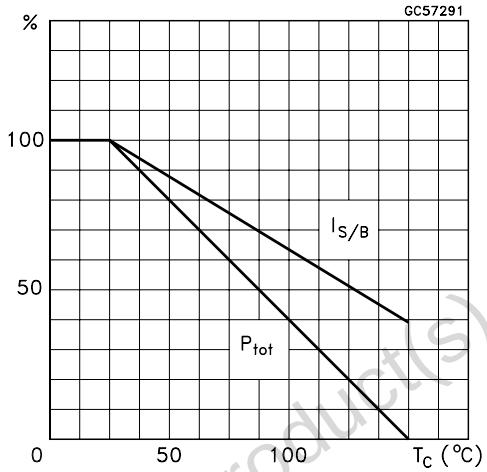
* Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %

Obsolete Product(s) - Obsolete Product(s)

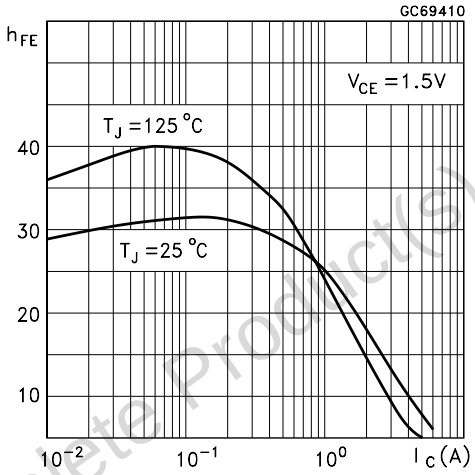
Safe Operating Areas



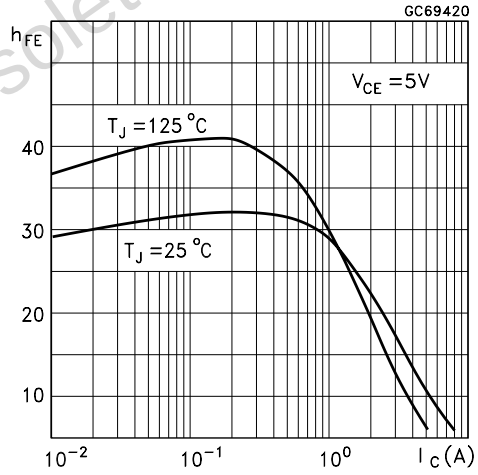
Derating Curve



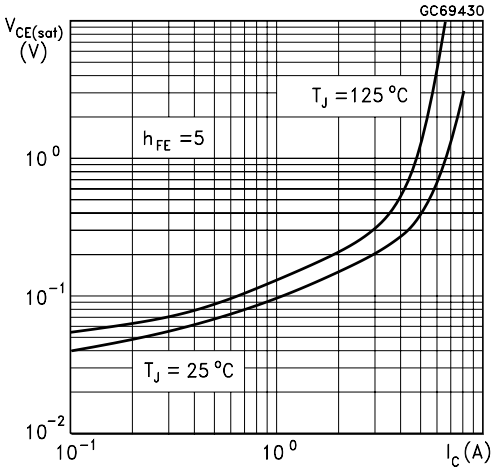
DC Current Gain



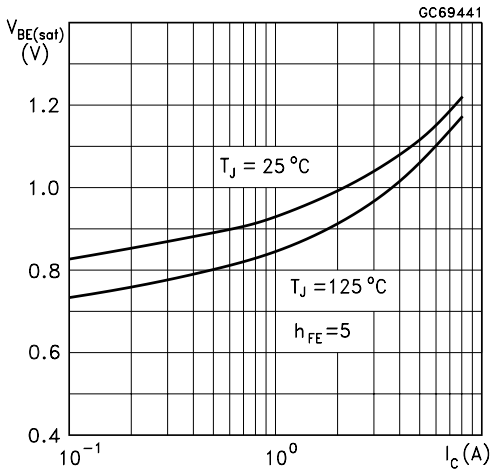
DC Current Gain



Collector Emitter Saturation Voltage

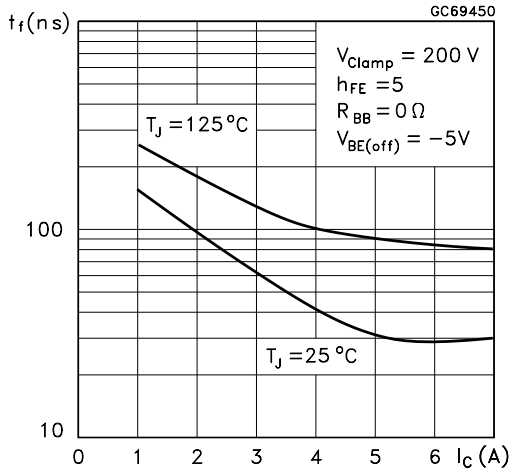


Base Emitter Saturation Voltage

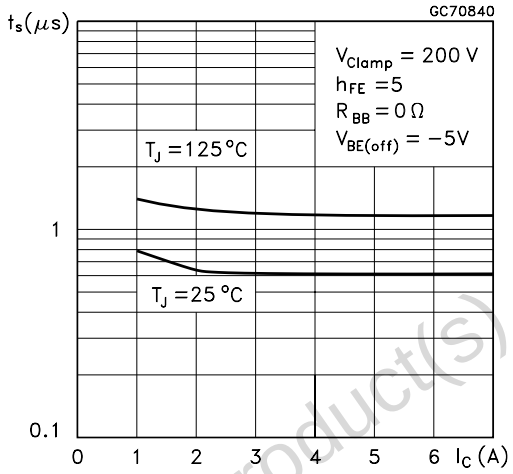


Obsolete Product(s) - Obsolete Product(s)

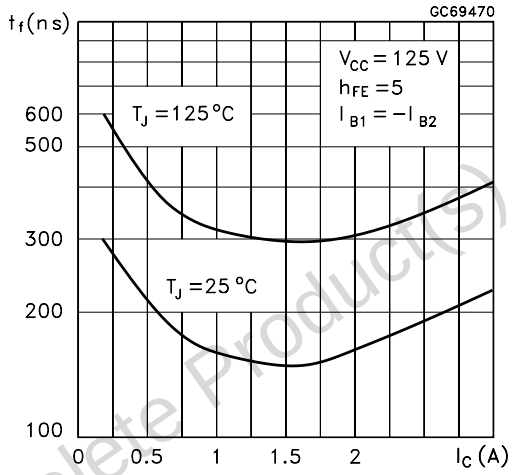
Inductive Fall Time



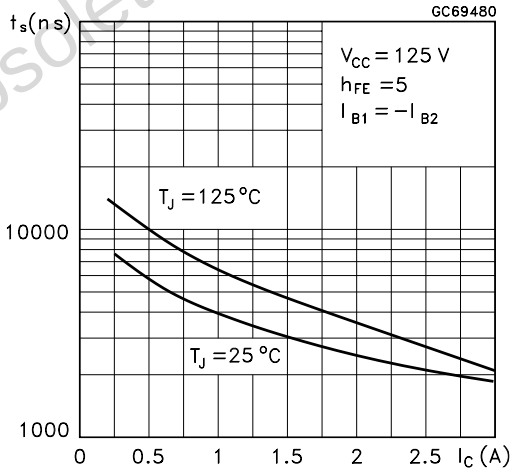
Inductive Storage Time



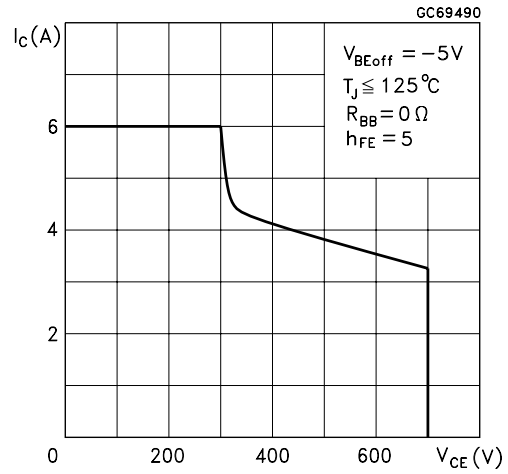
Resistive Fall Time



Resistive Load Storage Time



Reverse Biased SOA



Obsolete Product(s) - Obsolete Product(s)

Figure 1: Inductive Load Switching Test Circuit.

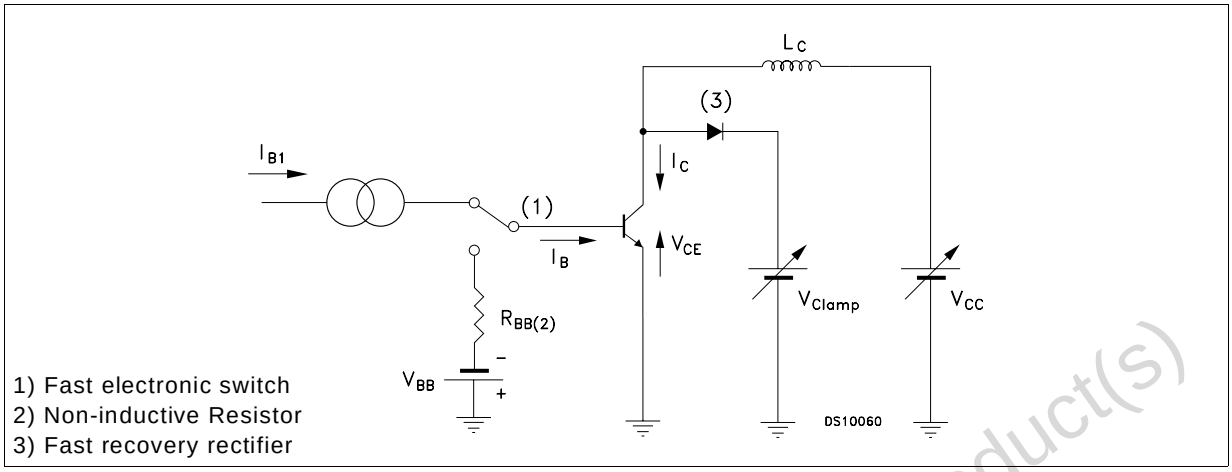
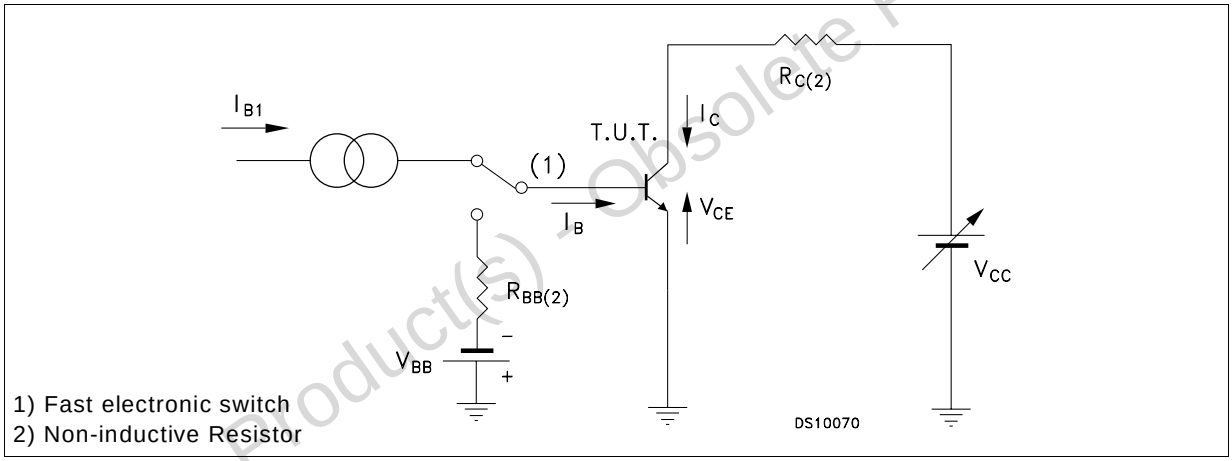


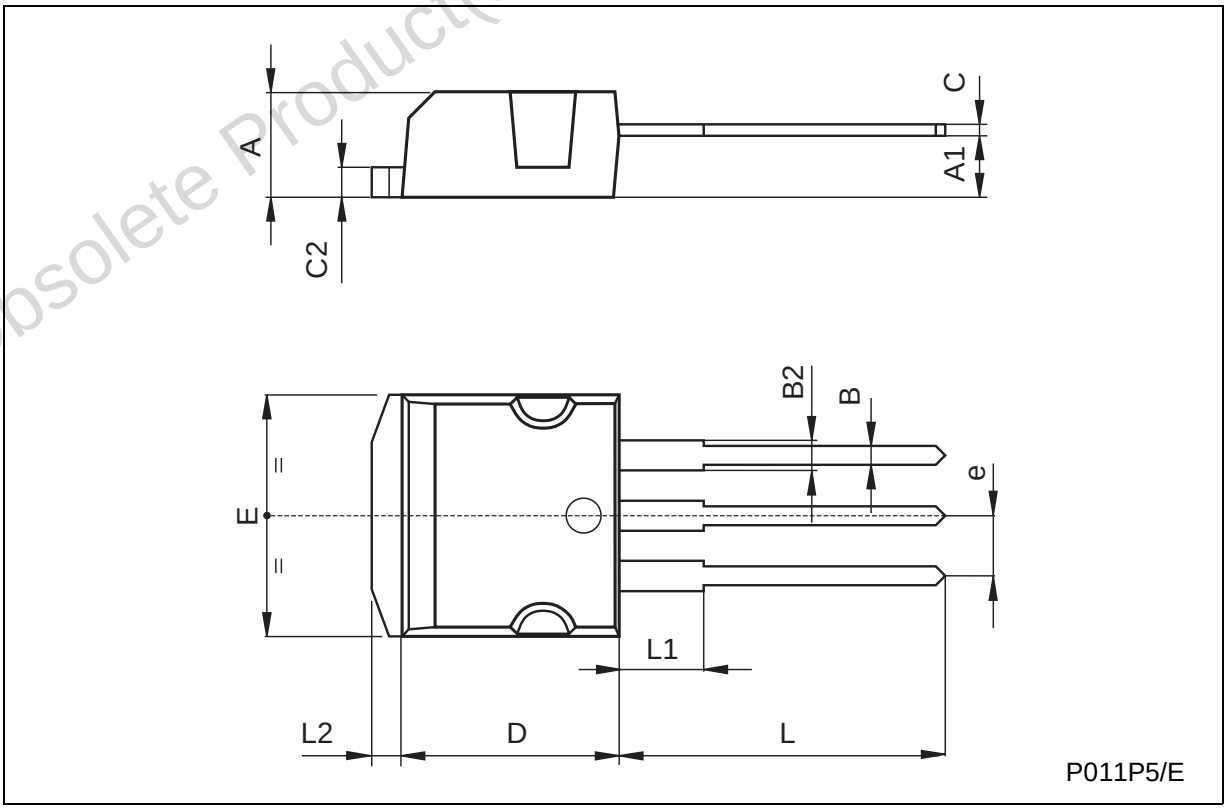
Figure 2: Resistive Load Switching Test Circuit.



Obsolete Product(s) - Obsolete Product(s)

TO-262 (I^2PAK) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.4		4.6	0.173		0.181
A1	2.49		2.69	0.098		0.106
B	0.7		0.93	0.027		0.036
B2	1.14		1.7	0.044		0.067
C	0.45		0.6	0.017		0.023
C2	1.23		1.36	0.048		0.053
D	8.95		9.35	0.352		0.368
e	2.4		2.7	0.094		0.106
E	10		10.4	0.393		0.409
L	13.1		13.6	0.515		0.531
L1	3.48		3.78	0.137		0.149
L2	1.27		1.4	0.050		0.055



Obsolete Product(s) - Obsolete Product(s)

Obsolete Product(s) - Obsolete Product(s)

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.

All other names are the property of their respective owners.

© 2003 STMicroelectronics – All Rights reserved

STMicroelectronics GROUP OF COMPANIES

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States.

http://www.st.com