

**HIGH VOLTAGE FAST-SWITCHING
NPN POWER TRANSISTORS**

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

APPLICATIONS

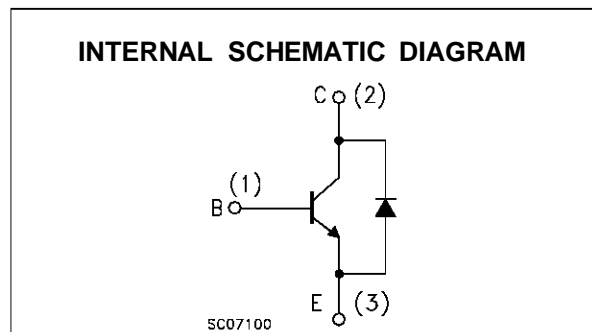
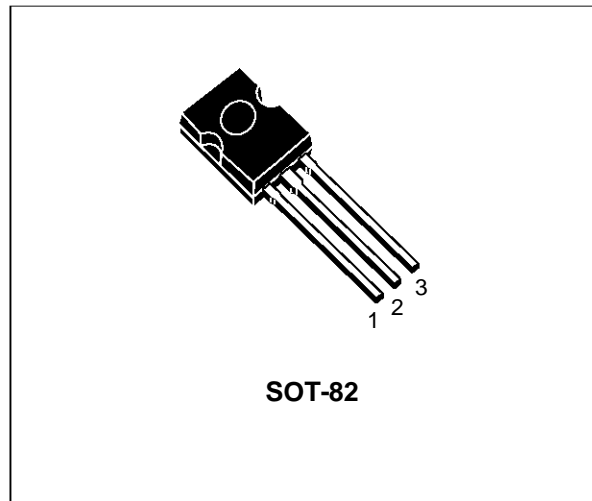
- COMPACT FLUORESCENT LAMPS (CFL)
- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING

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 the wide RBSOA.

The device is 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 ($V_{BE} = 0$)	750	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	5	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	60	W
T_{stg}	Storage Temperature	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

BULK380D / BULK381D

THERMAL DATA

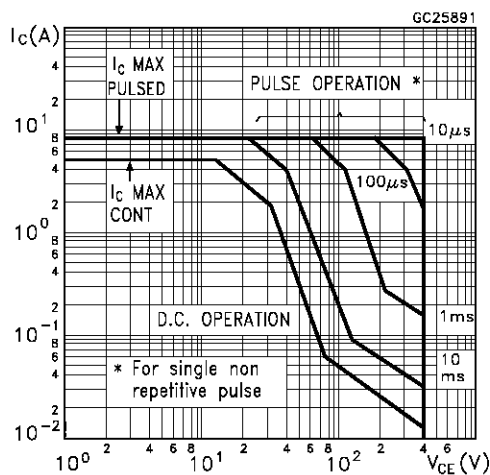
R _{thj-case}	Thermal Resistance Junction-Case	Max	2.08	°C/W
R _{thj-amb}	Thermal Resistance Junction-Ambient	Max	80	°C/W

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

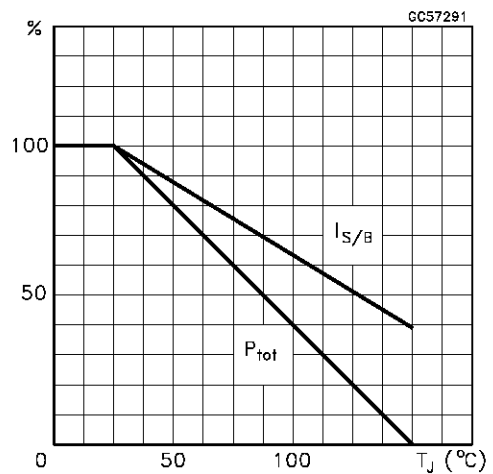
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I _{CES}	Collector Cut-off Current (V _{BE} = 0)	V _{CE} = 750 V V _{CE} = 750 V T _j = 125 °C			100 500	μA μA
V _{CEO(sus)}	Collector-Emitter Sustaining Voltage	I _C = 100 mA L = 25 mH	400			V
V _{EBO}	Emitter-Base Voltage (I _C = 0)	I _E = 10 mA	9			V
V _{CE(sat)*}	Collector-Emitter Saturation Voltage	I _C = 2 A I _B = 0.5 A			1	V
V _{BE(sat)*}	Base-Emitter Saturation Voltage	I _C = 2 A I _B = 0.5 A			1.3	V
h _{FE*}	DC Current Gain	I _C = 2 A V _{CE} = 5 V I _C = 10 mA V _{CE} = 5 V	7 10			
t _s t _s	RESISTIVE LOAD Storage Time for: BULK380D BULK381D	I _C = 2 A I _{B1} = -I _{B2} = 0.4 A V _{CC} = 250 V T _p = 30 μs	1.1 1.5		2.0 2.5	ms μs
V _f	Diode Forward Voltage	I _C = 2.5 A			2.5	V

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

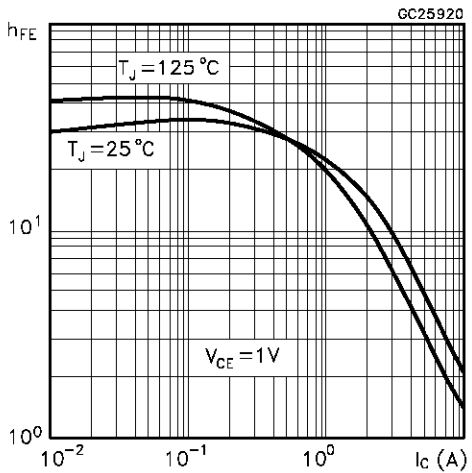
Safe Operating Areas



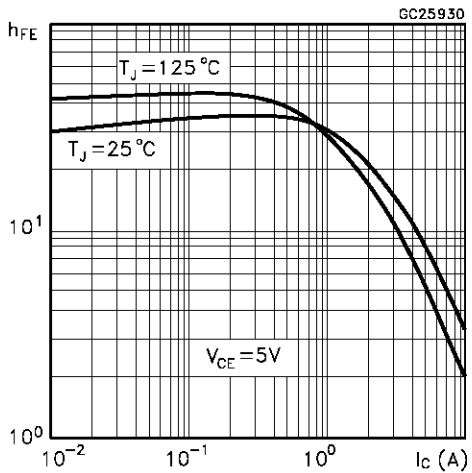
Derating Curve



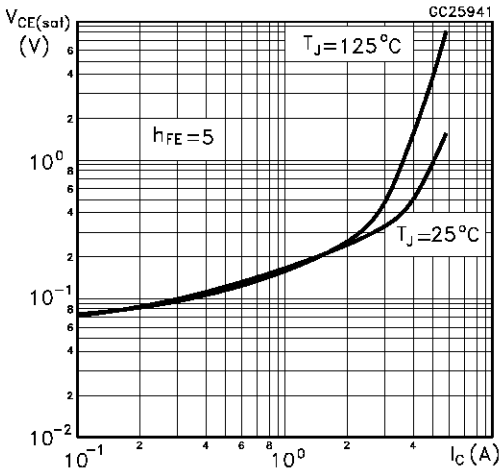
DC Current Gain



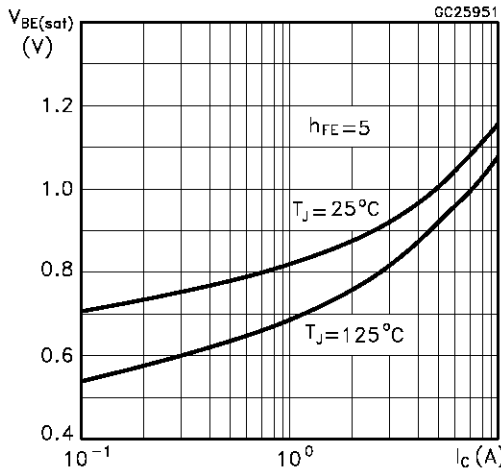
DC Current Gain



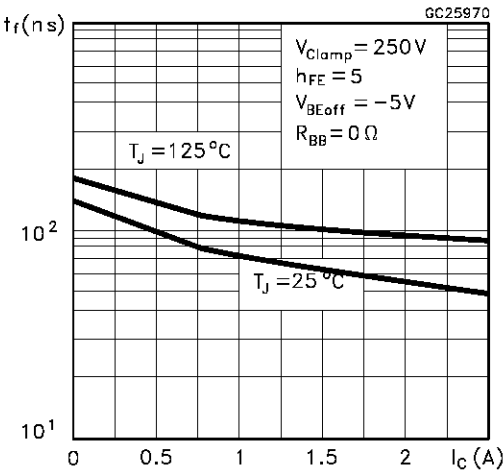
Collector Emitter Saturation Voltage



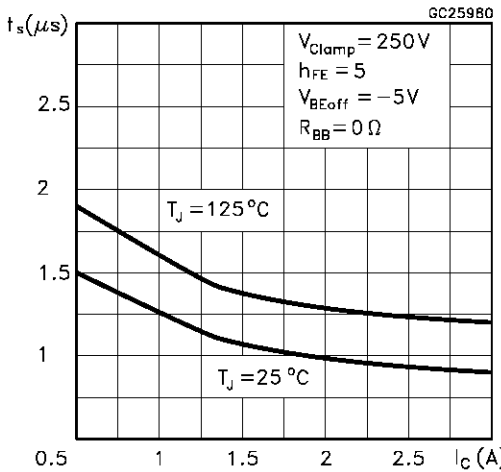
Base Emitter Saturation Voltage



Inductive Fall Time

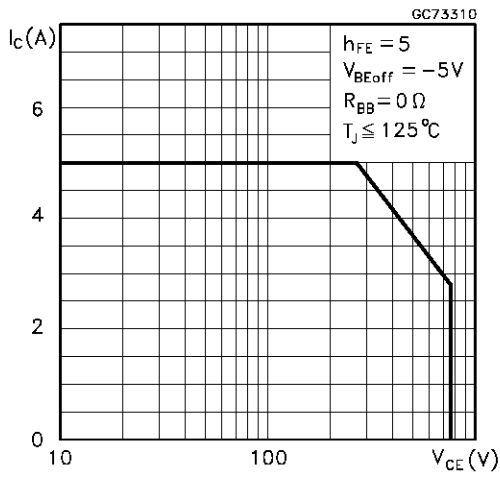


Inductive Storage Time

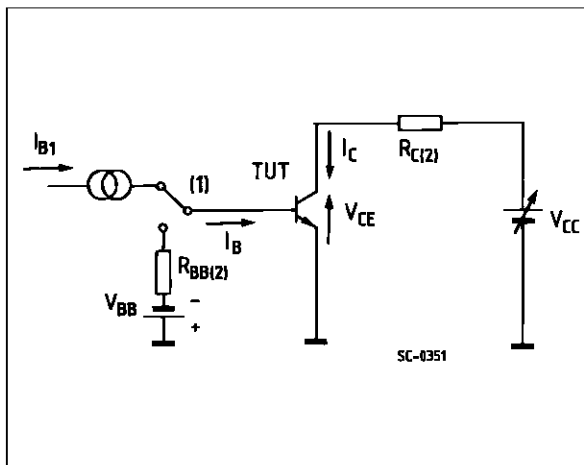


BULK380D / BULK381D

Reverse Biased SOA

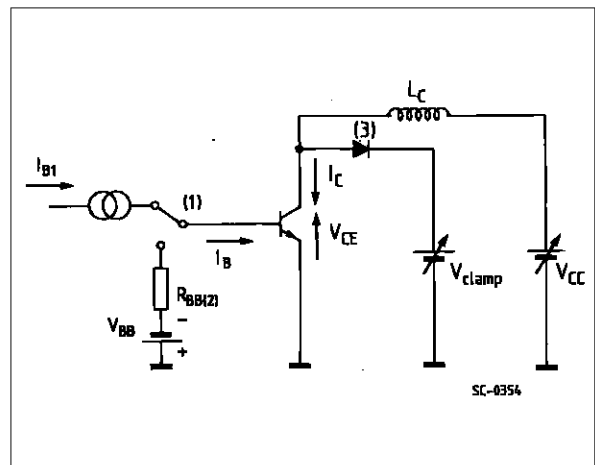


Resistive Load Switching Test Circuit



1 Fast electronic switch 2 Non-inductive Resistor

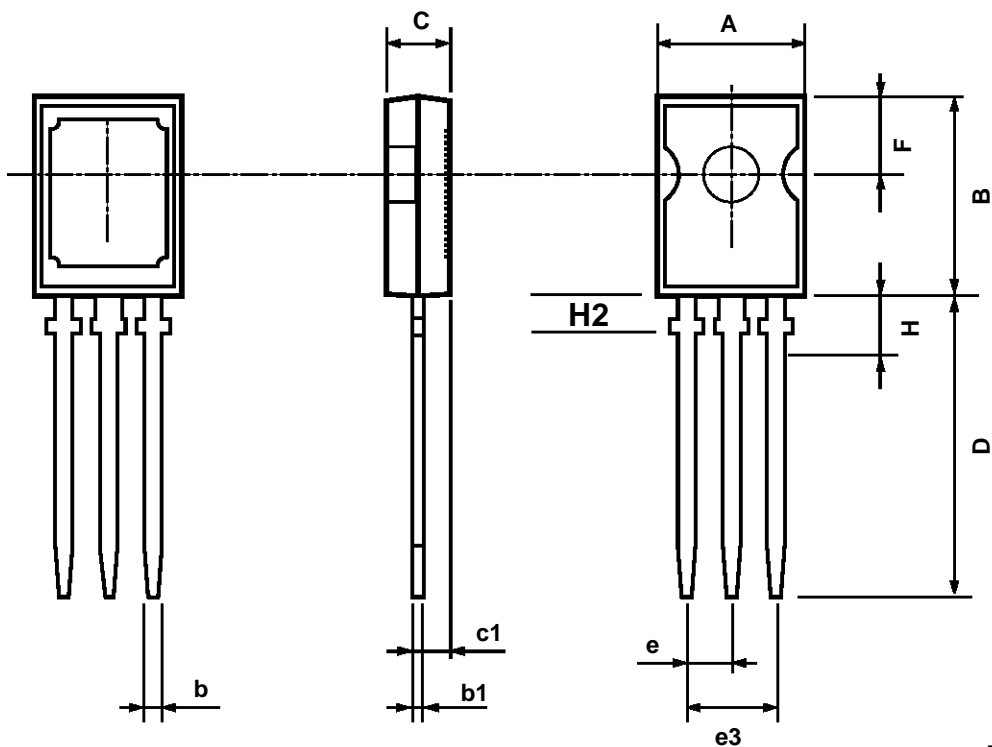
RBSOA and Inductive Load Switching Test Circuit



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

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	



P032A

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics 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 SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1997 SGS-THOMSON Microelectronics - Printed in Italy - All Rights Reserved

SGS-THOMSON Microelectronics GROUP OF COMPANIES
Australia - Brazil - Canada - China - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands -
Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A
...