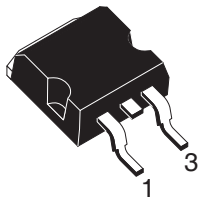
BULB49DT4

High voltage fast-switching NPN power transistor

General features

- High voltage capability
- Low spread of dynamic parameters
- Minimum lot-to-lot spread for reliable operation
- Very high switching speed
- High ruggedness
- Surface mounting TO-263 (D^2PAK) power package
- In compliance with the 2002/93/EC European Directive



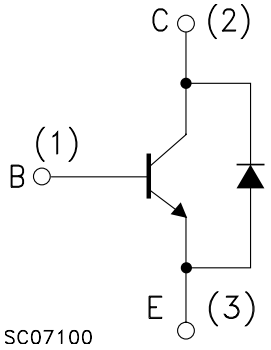
TO-263
D^2PAK

Description

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

The device is designed for use in electronic transformer for halogen lamps.

Internal schematic diagrams



Applications

- Electronic transformers for halogen lamps
- Flyback and forward single transistor low power converters

Order codes

Part Number	Marking	Package	Packing
BULB49DT4	BULB49D	D^2PAK	Tape & reel

Contents

1 Electrical ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CES}	Collector-emitter voltage (V_{BE} =0)	850	V
V_{CEO}	Collector-emitter voltage (I_B =0)	450	V
V_{EBO}	Emitter-base voltage (I_C =0, I_B <2A, t_P < 10ms)	$V_{(BR)EBO}$	V
I_C	Collector current	5	A
I_{CM}	Collector peak current (t_P < 5ms)	10	A
I_B	Base current	2	A
I_{BM}	Base peak current (t_P < 5ms)	4	A
P_{tot}	Total dissipation at $T_c \leq 25°C$	80	W
T_{stg}	Storage temperature	-65 to 150	°C
T_J	Max. operating junction temperature	150	°C

Table 2. Thermal data

Symbol	Parameter		Value	Unit
$R_{thj\text{-}case}$	Thermal resistance junction-case	max	1.56	°C/W
$R_{thj\text{-}amb}$	Thermal resistance junction-ambient	max	62.5	°C/W

2 Electrical characteristics

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

Table 3. Electrical characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector cut-off current (V_{BE} =0)	V_{CE} = 850V V_{CE} = 850V T_j = 125°C			100 500	µA µA
I_{EBO}	Emitter cut-off current (I_C =0)	V_{EB} = 9V			100	µA
$V_{(BR)EBO}$	Emitter-base brakdown voltage (I_C = 0)	I_E =10mA	10		18	V
$V_{CEO(sus)}$ (1)	Collector-emitter sustaining voltage (I_B = 0)	I_C =10mA	450			V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C =1A I_B =0.2A I_C =2A I_B =0.4A I_C =4A I_B =0.8A		0.1	0.3 0.6 1.2	V V V
$V_{BE(sat)}$ (1)	Base-emitter saturation voltage	I_C =1A I_B =0.2A I_C =4A I_B =0.8A			1 1.3	V V
h_{FE} (1)	DC current gain	I_C =10mA V_{CE} =5V I_C =500mA V_{CE} =5V I_C =7A V_{CE} =10V	10 4		 60 10	
V_{CEW} (1)	Maximum collector-emitter voltage without snubber	I_C =8A V_{BB}= -2.5V L =50µH R_{BB} =0 t_p =10µs	450			V
t_s t_f	Resistive load Storage time Fall time	V_{CC} =250V I_C =2A I_{B1}=-I_{B2} =400mA t_p =30µs (see figure 11)	2		3 0.8	µs µs
t_s t_f	Inductive load Storage time Fall time	V_{CL} =300V I_C =4A $I_{B(on)}$ =800mA $R_{BB(off)}$ =0 $V_{BE(off)}$ =-5V L =1mH (see figure 12)		0.5 50	1.3 100	µs ns
V_F	Diode forward voltage	I_C = 3A			1.5	V

Note (1) Pulsed duration = 300 µs, duty cycle ≤1.5%

2.1 Electrical characteristics (curves)

Figure 1. Safe operating area

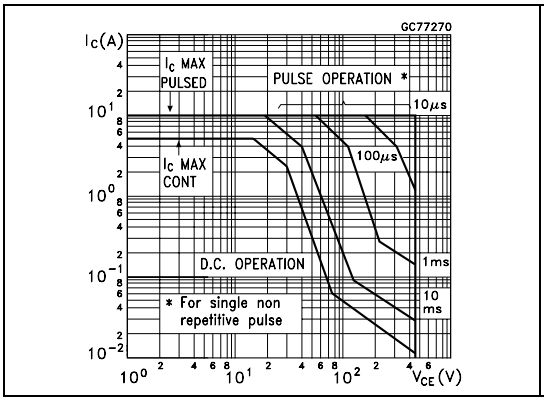


Figure 2. Derating current

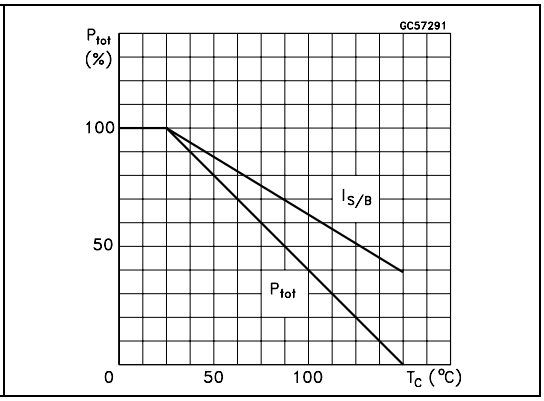


Figure 3. Output characteristics

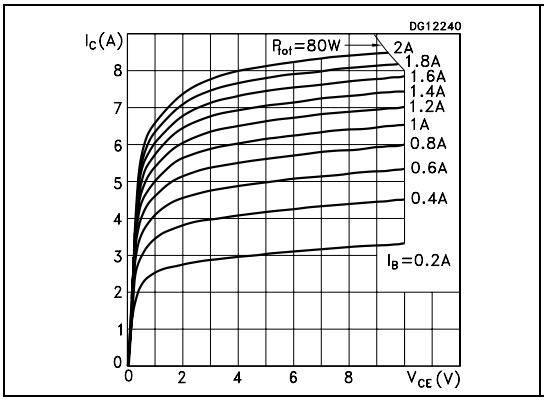


Figure 4. Collector-emitter saturation voltage

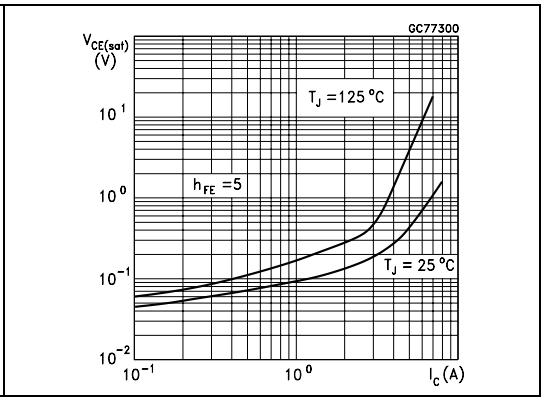


Figure 5. Base-emitter saturation voltage

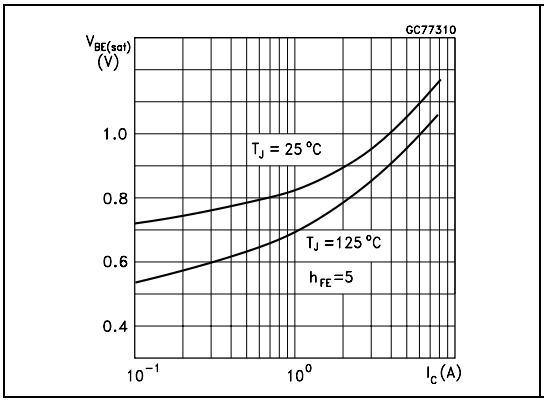


Figure 6. DC current gain

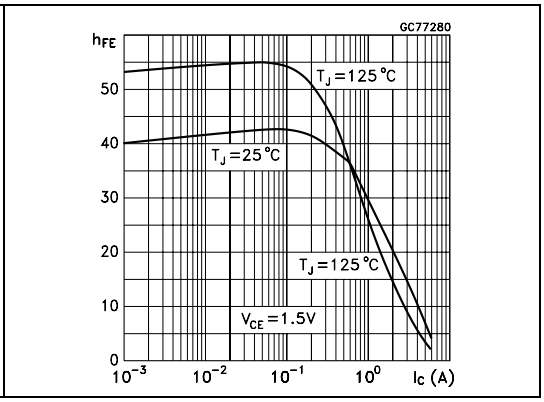


Figure 7. DC current gain

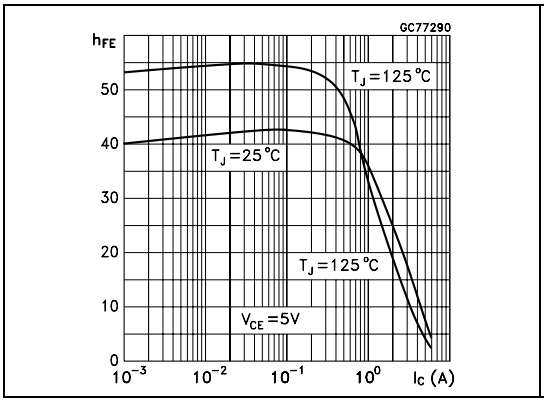


Figure 8. Inductive load storage time

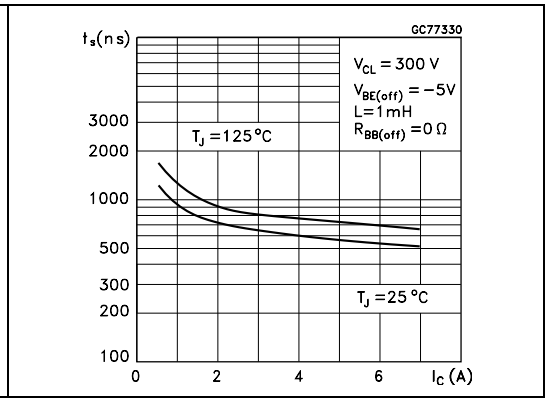


Figure 9. Inductive load fall time

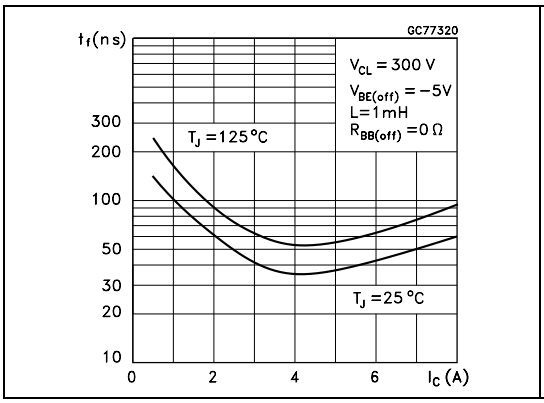
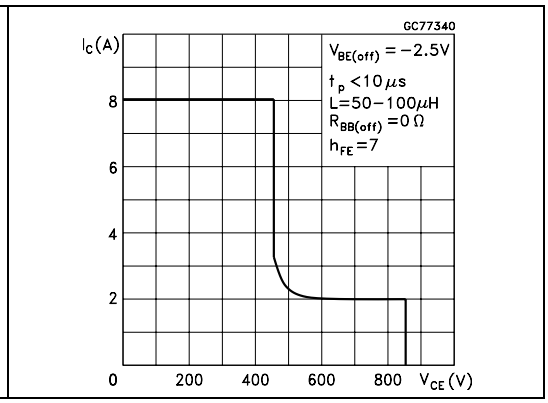
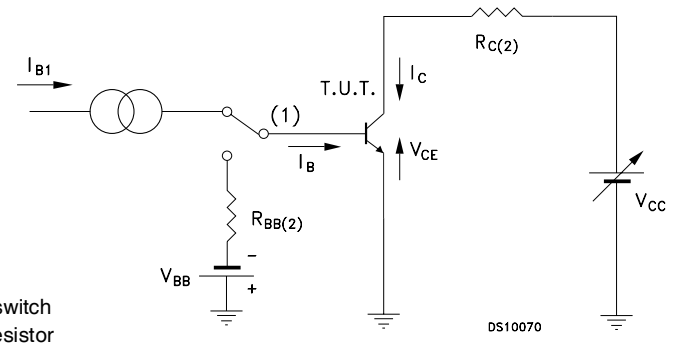


Figure 10. Reverse biased safe operating area



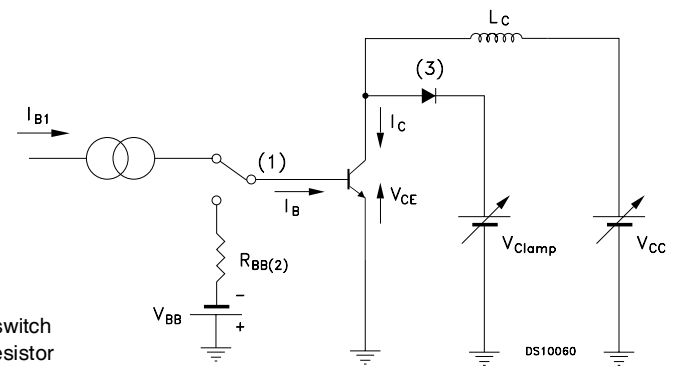
2.2 Test circuits

Figure 11. Resistive load switching test circuit



1) Fast electronic switch
2) Non-inductive resistor

Figure 12. Inductive load switching test circuit



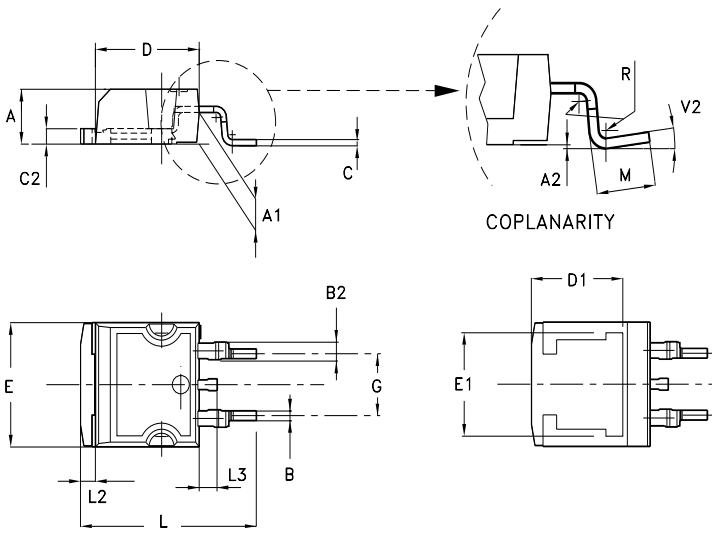
1) Fast electronic switch
2) Non-inductive resistor
3) Fast recovery rectifier

3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

TO-263 (D^2PAK) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
A1	2.49		2.69	0.098		0.106
A2	0.03		0.23	0.001		0.009
B	0.70		0.93	0.027		0.036
B2	1.14		1.70	0.044		0.067
C	0.45		0.60	0.017		0.023
C2	1.23		1.36	0.048		0.053
D	8.95		9.35	0.352		0.368
D1		8.00			0.315	
E	10.00		10.40	0.393		0.409
E1		8.50			0.334	
G	4.88		5.28	0.192		0.208
L	15.00		15.85	0.590		0.624
L2	1.27		1.4	0.050		0.055
L3	1.40		1.75	0.055		0.068
M	2.40		3.2	0.094		0.126
R		0.40			0.016	
V2	0°		8°	0°		8°



- Weight : 1.38 g (typ.)
- The planaty of the slug must be within 30 µm

P011P6/G

4 Revision history

Table 4. Revision history

Date	Revision	Changes
10-Sep-2003	1	First release.
21-Jul-2006	2	New template

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