

High voltage fast-switching NPN power transistor

Features

- High voltage capability
- Low spread of dynamic parameters
- Minimum lot-to-lot spread for reliable operation
- Very high switching speed

Applications

- Compact fluorescent lamps (CFLs)
- SMPS for battery charger

Description

)bsolete

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 STBV45G and STBV45G-AP are supplied using halogen-free molding compound.

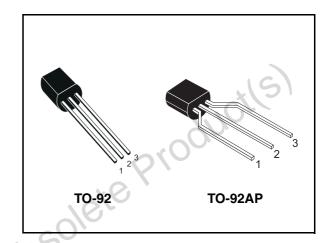


Figure 1. Internal schematic diagram

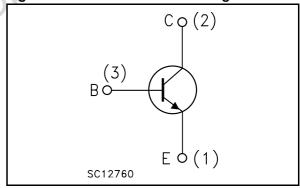


Table 1. Device summary

Order codes	order codes Marking		Packaging	
STBV45	BV45	TO-92	Bulk	
STBV45G	BV45G	TO-92	Bulk	
STBV45-AP	BV45	TO-92AP	Ammopack	
STBV45G-AP	BV45G	TO-92AP	Ammopack	

Electrical ratings STBV45

1 Electrical ratings

Table 2. Absolute maximum rating

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	0.75	Α
I _{CM}	Collector peak current (t _P < 5 ms)	1.5	Α
Ι _Β	Base current	0.4	A
I_{BM}	Base peak current (t _P < 5 ms)	0.75	A
P_{TOT}	Total dissipation at T _c = 25 °C	0.95	W
T _{stg}	Storage temperature	-65 to 150	°C
T _J	Max. operating junction temperature	150)

Table 3. Thermal data

	Symbol	Parameter		Value	Unit
	R _{thj-case}	Thermal resistance junction-case	max	131.6	°C/W
Obsole	<i>P</i> '	coduct(s)			

2 Electrical characteristics

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

Table 4. Electrical characteristics

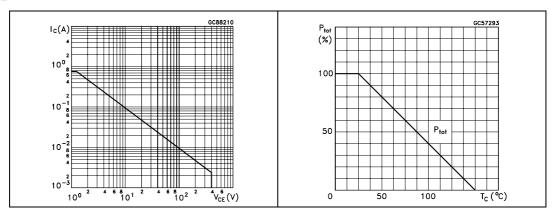
Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
I _{CES}	Collector cut-off current (V _{BE} = 0)	V _{CE} = 700 V			250	μΑ
I _{EBO}	Emitter cut-off current $(I_C = 0)$	V _{EB} = 9 V			1	mA
V _{CEO(sus)}	Collector-emitter sustaining voltage (I _B = 0)	I _C = 1 mA	400	Ċ.	S	٧
	Collector emitter esturation	$I_C = 0.2 \text{ A}$ $I_B = 40 \text{ mA}$	11	0.2	0.5	V
V _{CE(sat)} (1)	Collector-emitter saturation voltage	$I_C = 0.3 \text{ A}$ $I_B = 75 \text{ mA}$	'O'	0.3	1	V
		$I_C = 0.4 \text{ A}$ $I_B = 135 \text{ mA}$		0.4	1.5	V
v (1)	Base-emitter saturation	$I_C = 0.2 \text{ A}$ $I_B = 40 \text{ mA}$			1	٧
V _{BE(sat)} (1)	voltage	$I_C = 0.3 \text{ A}$ $I_B = 75 \text{ mA}$			1.2	٧
		$I_{C} = 0.5 \text{ mA}$ $V_{CE} = 2 \text{ V}$	12			
h _{FE}	DC current gain	$I_C = 0.2 \text{ A}$ $V_{CE} = 5 \text{ V}$	10		30	
		$I_C = 0.4 \text{ A}$ $V_{CE} = 5 \text{ V}$	5		20	
	Inductive load	$I_C = 0.2 \text{ A}$ $V_{clamp} = 300 \text{ V}$				
t _f	Fall time	$I_{B1} = -I_{B2} = 40 \text{ mA}$		0.3		μs
	*(2)	L = 3 mH Figure 8.				

^{1.} Pulsed duration = 300 μ s, duty cycle \leq 1.5%

2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

Figure 3. Derating curve



Electrical characteristics STBV45

Figure 4. DC current gain

Figure 5. DC current gain

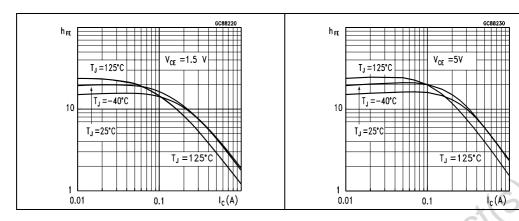
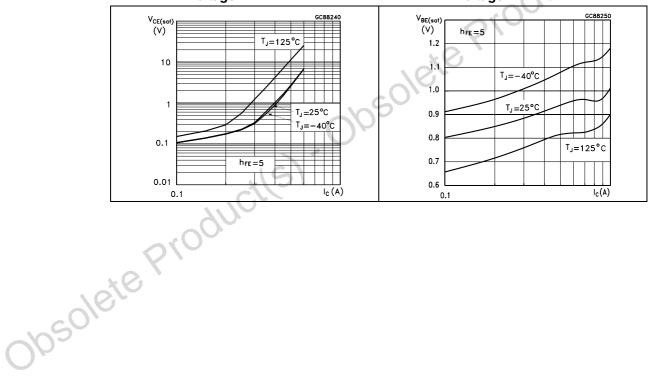


Figure 6. Collector-emitter saturation voltage

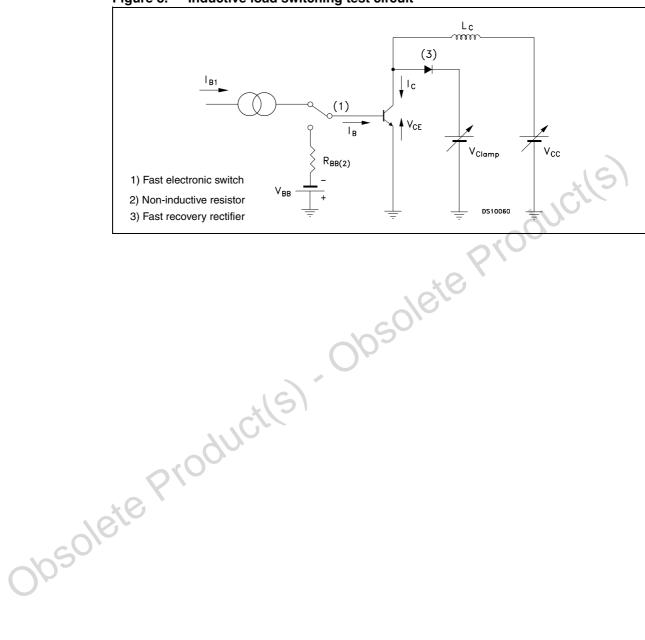
Figure 7. Base-emitter saturation voltage



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2.2 Test circuit

Figure 8. Inductive load switching test circuit



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3 Package mechanical data

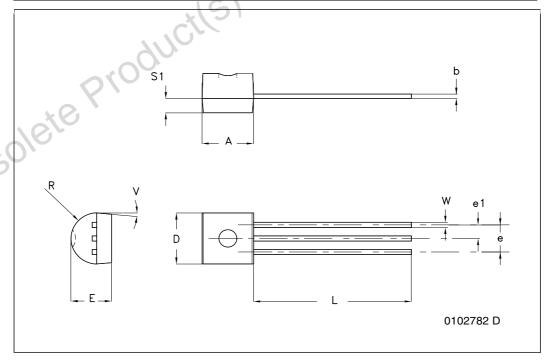
In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings 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

Obsolete Product(s). Obsolete Product(s)

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TO-92 bulk shipment mechanical data

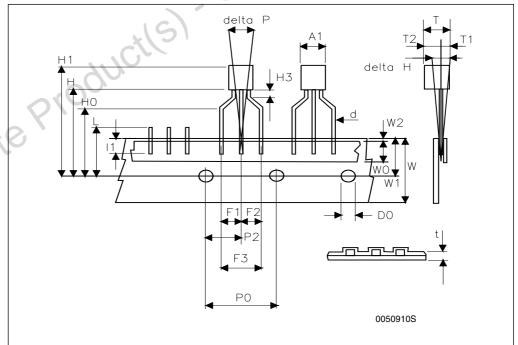
DIM.	mm.				
DIN.	MIN.	ТҮР	MAX.		
Α	4.32		4.95		
b	0.36		0.51		
D	4.45		4.95		
E	3.30		3.94		
е	2.41		2.67		
e1	1.14		1.40		
L	12.70		15.49		
R	2.16		2.41		
S1	0.92	-105	1.52		
W	0.41	OA	0.56		
V		5°			



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TO-92 ammopack shipment (suffix"-AP") mechanical data

Dim.	mm				
DIM.	Min	Тур	Max		
A1			4.80		
Т			3.80		
T1			1.60		
T2			2.30		
d			0.48		
P0	12.50	12.70	12.90		
P2	5.65	6.35	7.05		
F1,F2	2.44	2.54	2.94		
F3	4.98	5.08	5.48		
delta H	-2.00		2.00		
W	17.50	18.00	19.00		
W0	5.70	6.00	6.30		
W1	8.50	9.00	9.25		
W2			0.50		
Н	18.50		20.50		
H3	0.5	1	1.5		
H0	15.50	16.00	16.50		
H1		10.	25.00		
D0	3.80	4.00	4.20		
t		60.	0.90		
L		-103	11.00		
I1	3.00				
delta P	-1.00		1.00		



STBV45 Revision history

4 Revision history

Table 5. Document revision history

Date	Revision	Changes
13-Jul-2004	4	
03-Jul-2008	5	Added halogen-free molding compound package.
22-Oct-2008	6	Updated Table 2 on page 2 and Table 4 on page 3

Obsolete Product(s). Obsolete Product(s)

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