



# STBV45

## HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

**Table 1: Order Codes**

Ordering Code	Marking	Package / Shipment
STBV45	BV45	TO-92 / Bulk
STBV45-AP	BV45	TO-92 / Ammopack

- HIGH VOLTAGE CAPABILITY
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED

**APPLICATIONS:**

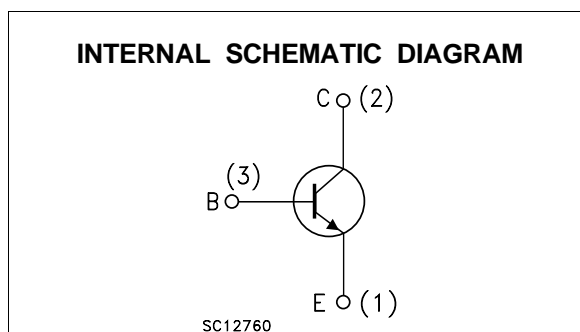
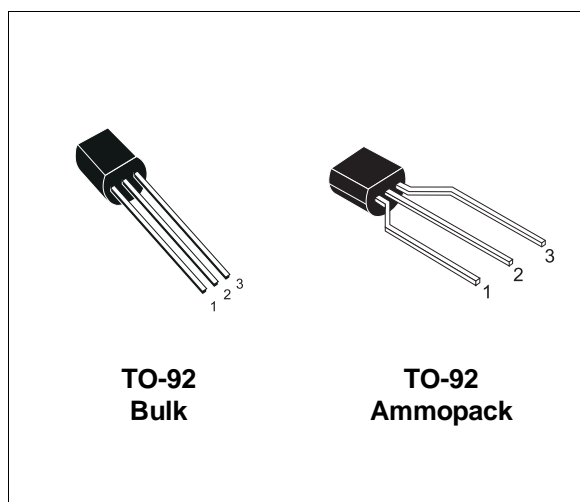
- COMPACT FLUORESCENT LAMPS (CFLS)

**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 STBV series is designed for use in Compact Fluorescent Lamps.



**Table 2: 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	0.75	A
$I_{CM}$	Collector Peak Current ( $t_p < 5$ ms)	1.5	A
$I_B$	Base Current	0.4	A
$I_{BM}$	Base Peak Current ( $t_p < 5$ ms)	0.75	A
$P_{tot}$	Total Dissipation at $T_{amb} = 25$ °C	0.95	W
$T_{stg}$	Storage Temperature	-65 to 150	°C
$T_j$	Max. Operating Junction Temperature	150	°C

Rev. 2

**Table 3: Thermal Data**

$R_{thj-amb}$	Thermal Resistance Junction-ambient	Max	131.6	$^{\circ}\text{C}/\text{W}$
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**Table 4: Electrical Characteristics** ( $T_{case} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
$I_{CEV}$	Collector Cut-off Current ( $V_{BE} = -1.5\text{V}$ )	$V_{CE} = 700\text{ V}$				250	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{EB} = 9\text{ V}$				1	mA
$V_{CEO(sus)*}$	Collector-Emitter Sustaining Voltage ( $I_B = 0$ )	$I_C = 1\text{ mA}$		400			V
$V_{CE(sat)*}$	Collector-Emitter Saturation Voltage	$I_C = 0.2\text{ A}$ $I_C = 0.3\text{ A}$ $I_C = 0.4\text{ A}$	$I_B = 40\text{ mA}$ $I_B = 75\text{ mA}$ $I_B = 135\text{ mA}$		0.2 0.3 0.4	0.5 1 1.5	V V V
$V_{BE(sat)*}$	Base-Emitter Saturation Voltage	$I_C = 0.2\text{ A}$ $I_C = 0.3\text{ A}$	$I_B = 40\text{ mA}$ $I_B = 75\text{ mA}$			1 1.2	V V
$h_{FE*}$	DC Current Gain	$I_C = 0.2\text{ A}$ $I_C = 0.4\text{ A}$	$V_{CE} = 5\text{ V}$ $V_{CE} = 5\text{ V}$	10 5		30 20	
$t_f$	INDUCTIVE LOAD Fall Time	$I_C = 0.2\text{ A}$ $I_{B1} = -I_{B2} = 40\text{ mA}$ (see figure 7)	$V_{clamp} = 300\text{ V}$ $L = 3\text{ mH}$		0.3		$\mu\text{s}$

\* Pulsed: Pulse duration = 300 $\mu\text{s}$ , duty cycle = 1.5 %

Figure 1: Safe Operating Area

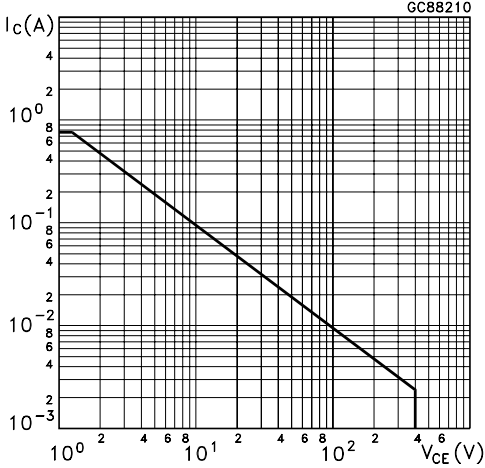


Figure 2: Derating Curve

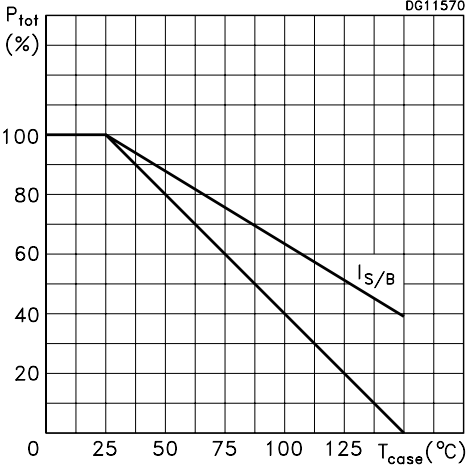


Figure 3: Collector Emitter Saturation Voltage

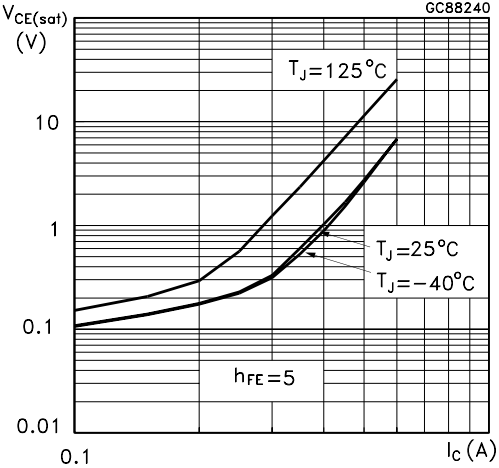


Figure 4: Base Emitter Saturation Voltage

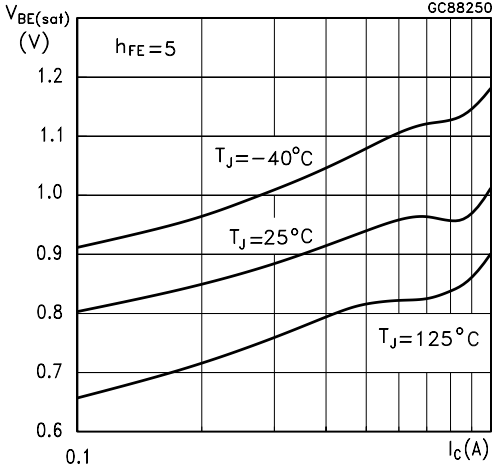


Figure 5: DC Current Gain

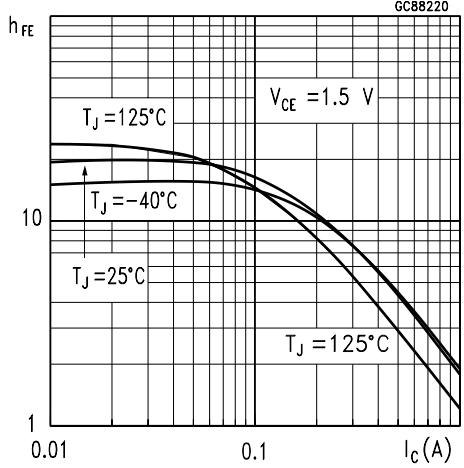


Figure 6: DC Current Gain

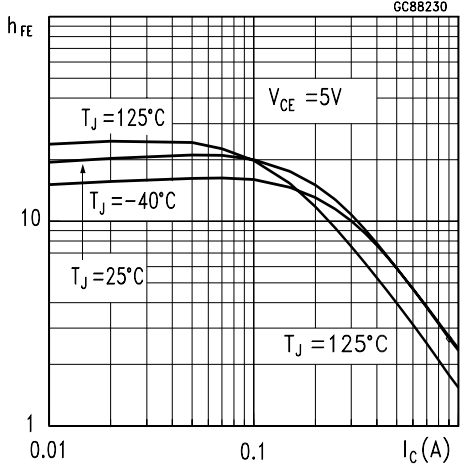
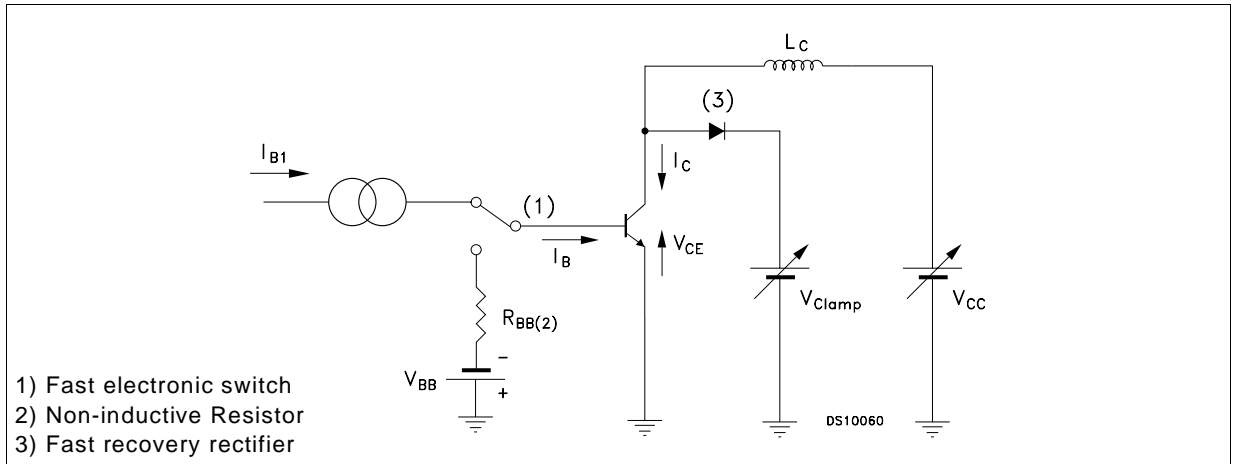
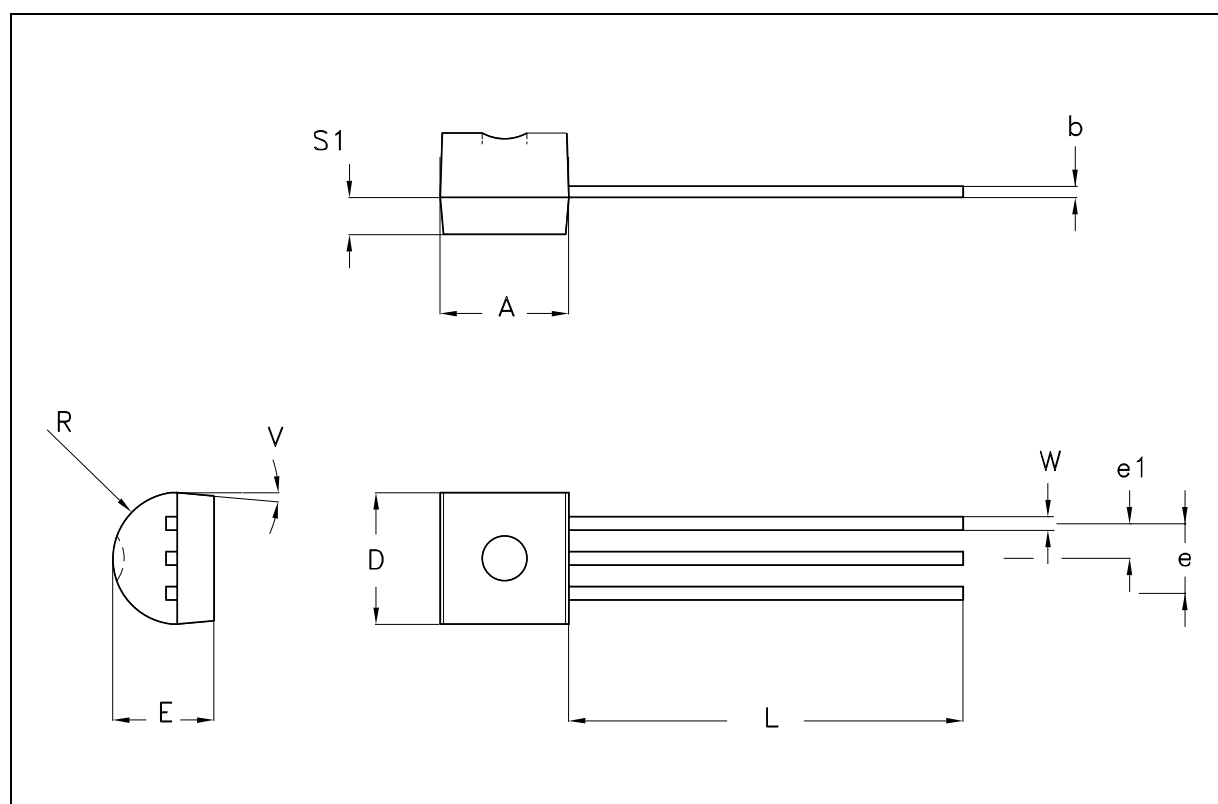


Figure 7: Inductive Load Switching Test Circuit.



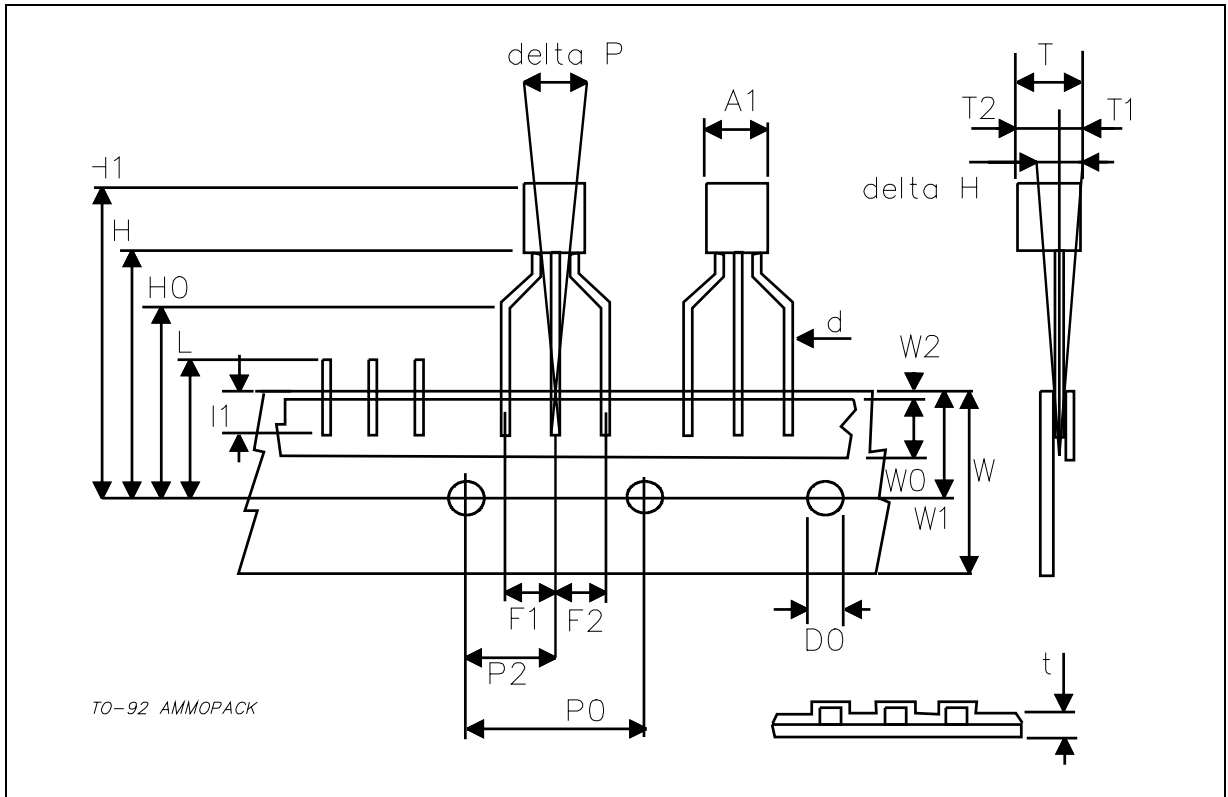
## TO-92 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.32		4.95	0.170		0.195
b	0.36		0.51	0.014		0.020
D	4.45		4.95	0.175		0.194
E	3.30		3.94	0.130		0.155
e	2.41		2.67	0.095		0.105
e1	1.14		1.40	0.045		0.055
L	12.70		15.49	0.500		0.609
R	2.16		2.41	0.085		0.094
S1	1.14		1.52	0.045		0.059
W	0.41		0.56	0.016		0.022
V	4 degree		6 degree	4 degree		6 degree



**TO-92 AMMOPACK SHIPMENT (Suffix"-AP") MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A1			4.80			0.189
T			3.80			0.150
T1			1.60			0.063
T2			2.30			0.091
d			0.48			0.019
P0	12.50	12.70	12.90	0.492	0.500	0.508
P2	5.65	6.35	7.05	0.222	0.250	0.278
F1,F2	2.44	2.54	2.94	0.096	0.100	0.116
delta H	-2.00		2.00	-0.079		0.079
W	17.50	18.00	19.00	0.689	0.709	0.748
W0	5.70	6.00	6.30	0.224	0.236	0.248
W1	8.50	9.00	9.25	0.335	0.354	0.364
W2			0.50			0.020
H	18.50		20.50	0.728		0.807
H0	15.50	16.00	16.50	0.610	0.630	0.650
H1			25.00			0.984
D0	3.80	4.00	4.20	0.150	0.157	0.165
t			0.90			0.035
L			11.00			0.433
l1	3.00			0.118		
delta P	-1.00		1.00	-0.039		0.039



**Table 5: Revision History**

Date	Revision	Description of Changes
6 July 2004	2	Updated the $V_{CE}$ Maximum Rating value from 600V to 700V

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