STBV32

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

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

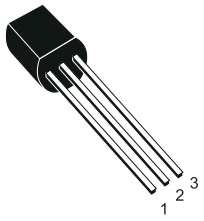
APPLICATIONS

- 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.

Figure 1: Package



TO-92

Figure 2: Internal Schematic Diagram

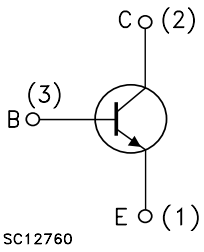


Table 1: Order Codes

Part Number	Marking	Package	Packaging
STBV32	BV32	TO-92	Bulk
STBV32-AP	BV32	TO-92	Ammopack

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, I_B = 0.5 A, t_p < 10 ms)	$V_{(BR)EBO}$	V
I_C	Collector Current ($f \geq 100$ Hz, duty-cycle $\leq$ 50 %, T_C = 25 °C)	1.5	A
I_{CM}	Collector Peak Current (t_p < 5ms)	3	A
I_B	Base Current	0.5	A
I_{BM}	Base Peak Current (t_p < 5ms)	1.5	A
P_{tot}	Total Dissipation at T_C = 25 °C	1.5	W

Symbol	Parameter	Value	Unit
T_{stg}	Storage Temperature	-65 to 150	°C
T_J	Max. Operating Junction Temperature	150	°C

Table 3: Thermal Data

$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	83.3	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-Ambient	Max	112	°C/W

Table 4: Electrical Characteristics (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CEV}	Collector Cut-off Current (V_{BE} = -1.5 V)	V_{CE} = 700 V				1	mA
		V_{CE} = 700 V	T_j =125 °C			5	mA
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage (I_C = 0)	I_E = 10 mA		9		18	V
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 10 mA		400			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 0.5 A	I_B = 100 mA			0.5	V
		I_C = 1 A	I_B = 250 mA			1	V
		I_C = 1.5 A	I_B = 500 mA			1.5	V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 0.5 A	I_B = 100 mA			1.0	V
		I_C = 1 A	I_B = 250 mA			1.2	V
h_{FE}	DC Current Gain	I_C = 0.5 A	V_{CE} = 2 V	8		35	
		I_C = 1 A	V_{CE} = 2 V	5		25	
	RESISTIVE LOAD	I_C = 1 A	V_{CC} = 125 V				
t_r	Rise Time	I_{B1} = -I_{B2} = 200 mA	t_p = 25 µs			1	µs
t_s	Storage Time	(see figure 12)				4	µs
t_f	Fall Time					0.7	µs
	INDUCTIVE LOAD	I_C = 1 A	V_{clamp} = 300 V				
t_s	Storage Time	I_{B1} = 200 mA	$V_{BE(off)}$ = -5V		0.8		µs
		L = 50 mH	R_{BB} = 0				
		(see figure 13)					

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

Figure 3: Safe Operating Area

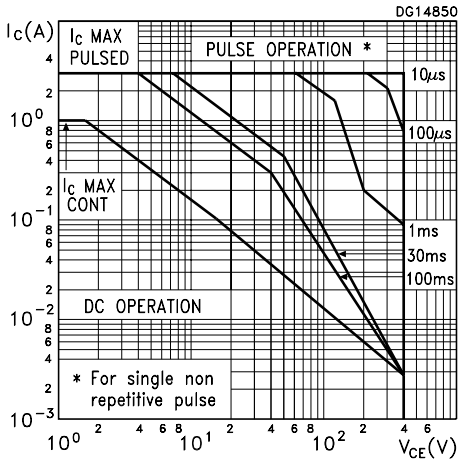


Figure 4: Output Characteristics

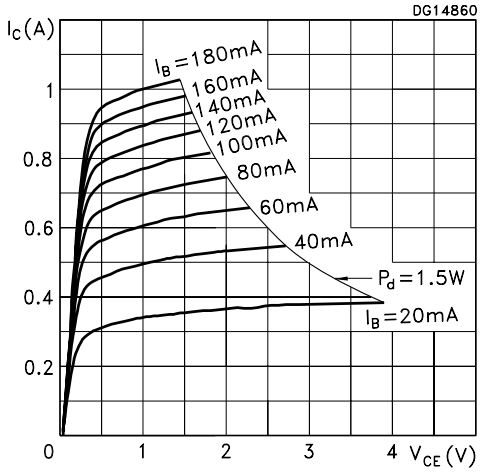


Figure 5: Base-Emitter Saturation Voltage

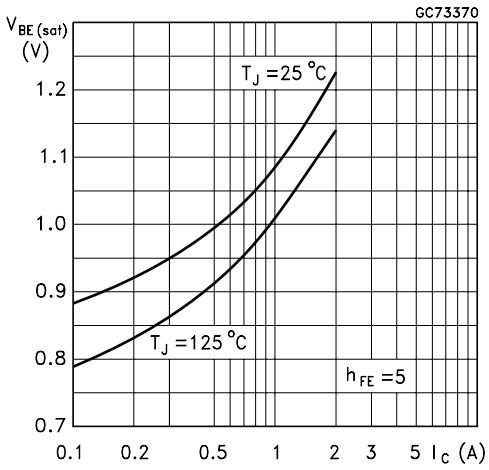


Figure 6: Derating Curve

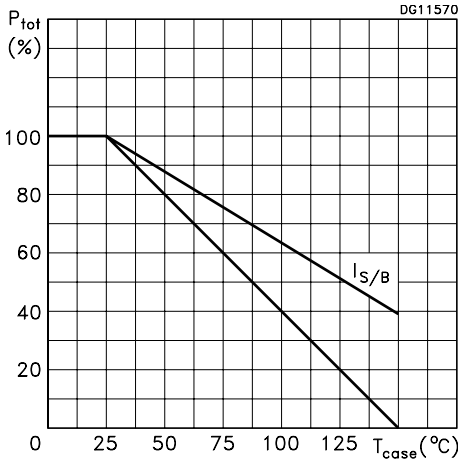


Figure 7: Collector-Emitter Saturation Voltage

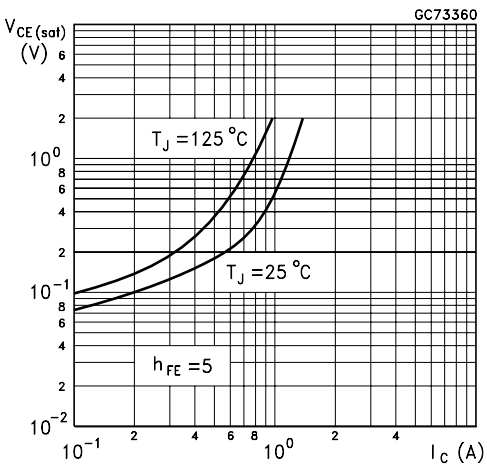


Figure 8: DC Current Gain

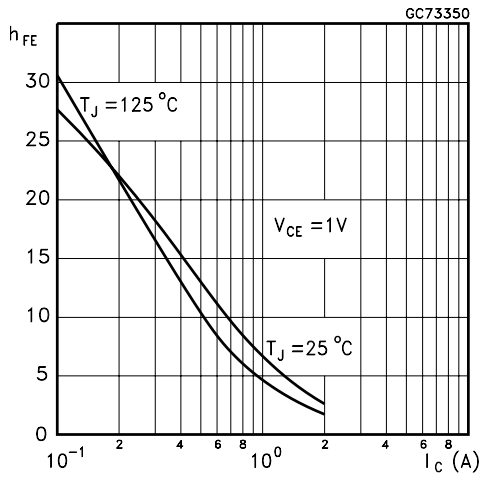


Figure 9: DC Current Gain

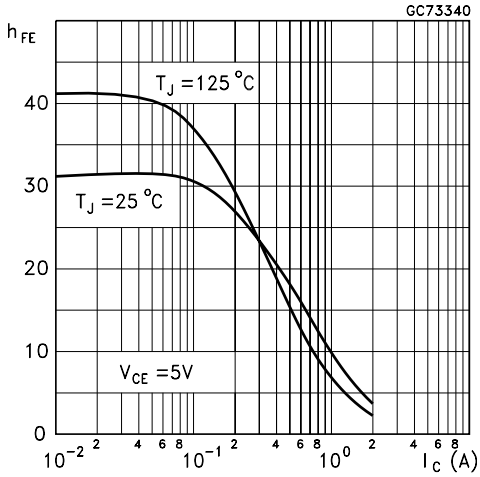


Figure 10: Reverse Biased Operating Area

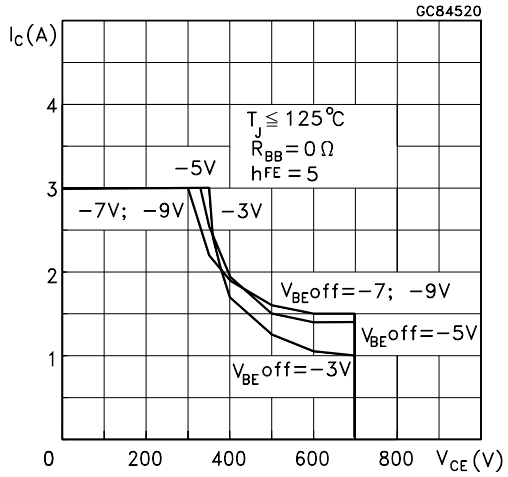


Figure 11: Inductive Load Switching Times

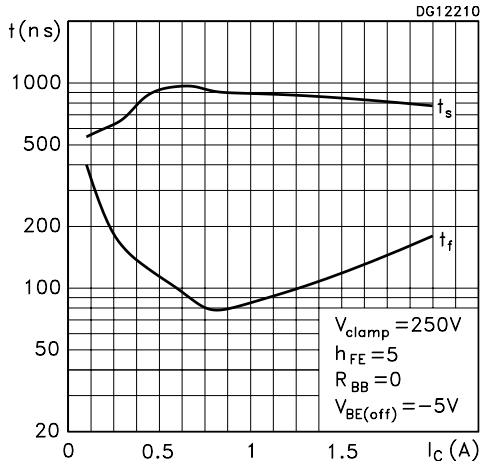


Figure 12: Resistive Load Switching Test Circuit

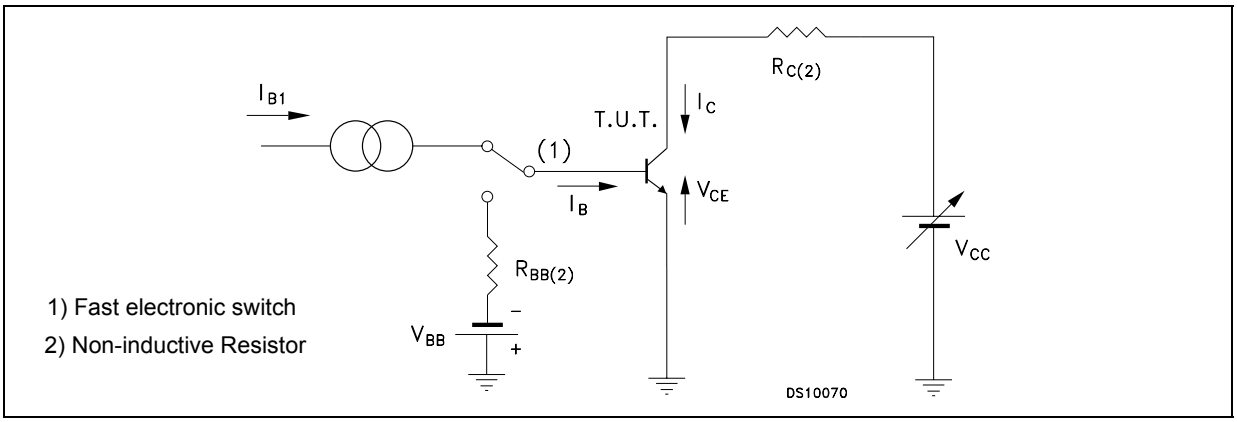
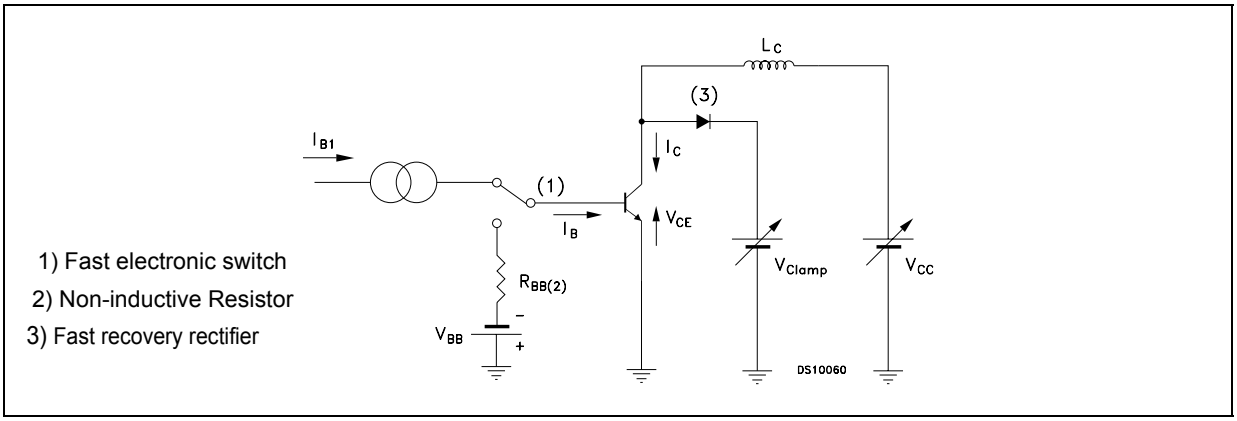
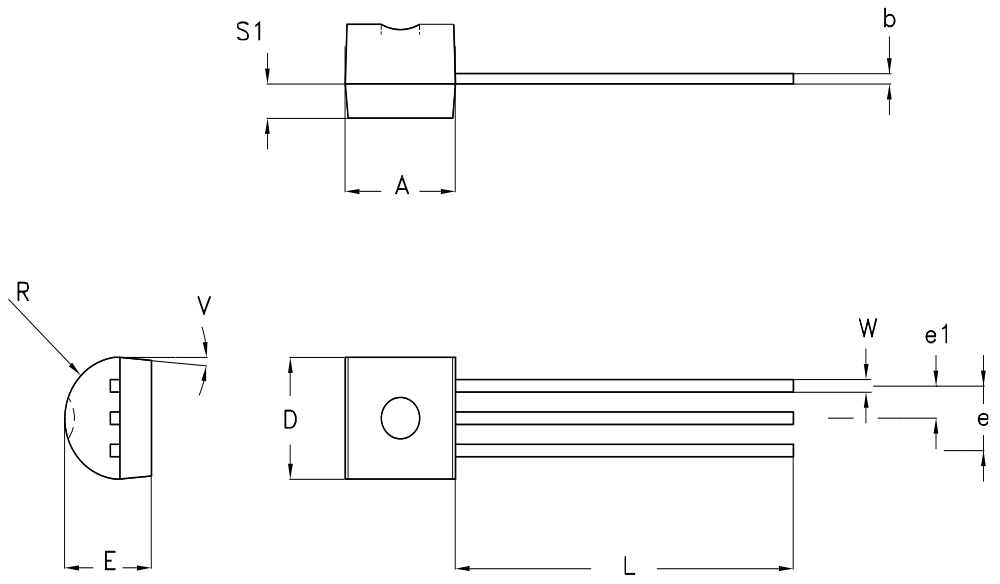


Table 13: Inductive Load Switching Test Circuit



TO-92 BULK SHIPMENT MECHANICAL DATA

DIM.	mm.		
	MIN.	TYP	MAX.
A	4.32		4.95
b	0.36		0.51
D	4.45		4.95
E	3.30		3.94
e	2.41		2.67
e1	1.14		1.40
L	12.70		15.49
R	2.16		2.41
S1	0.92		1.52
W	0.41		0.56
V		5^{o}	



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

DIM.	mm.		
	MIN.	TYP	MAX.
A1			4.80
T			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
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
H	18.50		20.50
H0	15.50	16.00	16.50
H1			25.00
D0	3.80	4.00	4.20
t			0.90
L			11.00
I1	3.00		
delta P	-1.00		1.00

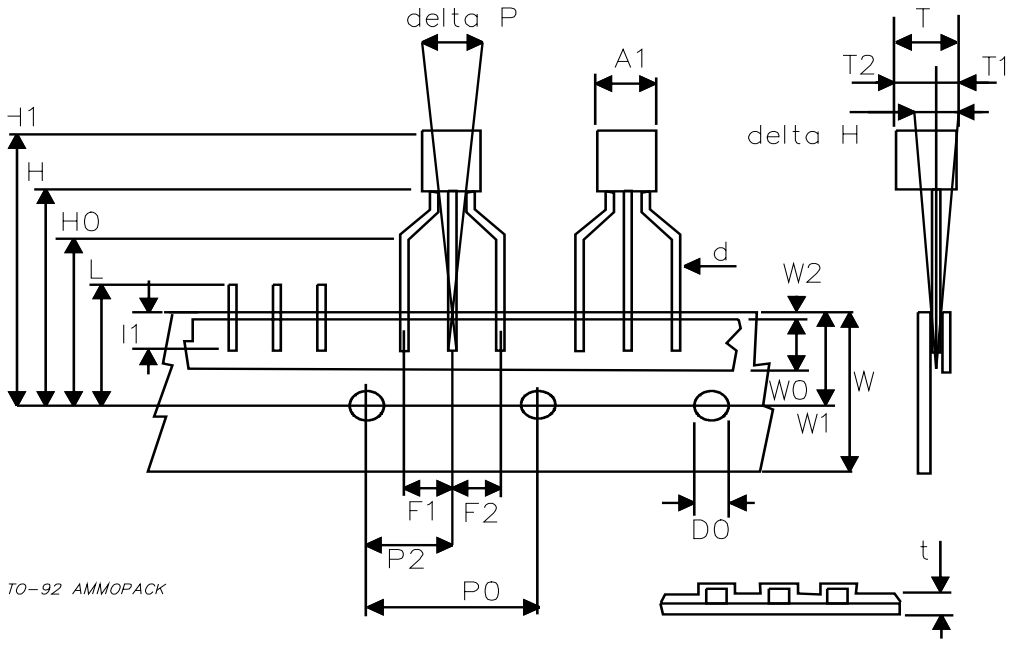

Figure 1: Revision History

Version	Release Date	Change Designator
01-Dec-2002	1	First Release.
27-Apr-2005	1	Total dissipation value has been modified.