

STBV42

High voltage fast-switching NPN power transistor

Features

- High voltage capability
- Low spread of dynamic parameters
- Very high switching speed

Applications

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

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 STBV42G and STBV42G-AP are supplied using halogen-free molding compound.

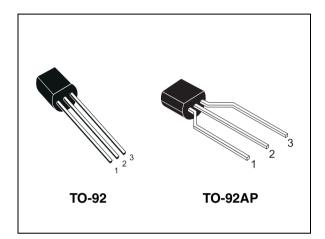


Figure 1. Internal schematic diagram

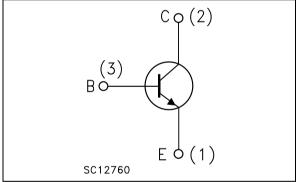


Table 1. Device summary

Order codes	Marking	Package	Packaging
STBV42	BV42	TO-92	Bulk
STBV42-AP	BV42	TO-92AP	Ammopack
STBV42G	BV42G	TO-92	Bulk
STBV42G-AP	BV42G	TO-92AP	Ammopack

1 Electrical ratings

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	
۱ _C	Collector current	1	А	
I _{CM}	Collector peak current (t _P < 5 ms)	2	А	
I _B	Base current	0.5	А	
I _{BM}	Base peak current (t _P < 5 ms)	1	А	
P _{TOT}	Total dissipation at $T_c = 25 \ ^{\circ}C$	1	W	
T _{stg}	Storage temperature	-65 to 150	°C	
Т _Ј	Max. operating junction temperature	150		

Table 3.Thermal data

Symbol	Parameter	Value	Unit
R _{thJC}	Thermal resistance junction-case max	125	°C/W



μs

0.3

2 **Electrical characteristics**

(T_C = 25 °C; unless otherwise specified)

Table 4.	Electrical characterist	ics					
Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
I _{CES}	Collector cut-off current (V _{BE} = 0)	V _{CE} = 700 V V _{CE} = 700 V	T _C = 125 °C			1 5	mA mA
I _{EBO}	Emitter cut-off current $(I_{C} = 0)$	V _{EB} = 9 V				1	mA
V _{CEO(sus)} ⁽¹⁾	Collector-emitter sustaining voltage $(I_B = 0)$	I _C = 1 mA		400			v
V _{CE(sat)} ⁽¹⁾	Collector-emitter saturation voltage	$I_{\rm C} = 0.25 \text{ A}$ $I_{\rm C} = 0.5 \text{ A}$ $I_{\rm C} = 0.75 \text{ A}$	D		0.2 0.3 0.4	0.5 1 1.5	V V V
V _{BE(sat)} ⁽¹⁾	Base-emitter saturation voltage	I _C = 0.25 A I _C = 0.5 A	l _B = 50 mA l _B = 125 mA			1 1.2	V V
h _{FE} ⁽¹⁾	DC current gain	$I_{C} = 0.5 \text{ mA}$ $I_{C} = 0.4 \text{ A}$ $I_{C} = 0.8 \text{ A}$		12 10 5		30 20	
	Inductive Load	I _C = 0.25 A	$V_{clamp} = 300 V$				

1. Pulse test: pulse duration \leq 300 µs, duty cycle \leq 2 %

Electrical characteristics (curves) 2.1

Fall time

t_f

Figure 2.	Safe operating area	Figure 3.	Derating curve	
I _C (A) 4 2	AM02273v1 PULSE OPERATION Ic CONT.	P _{tot} (%) 100 50		GC57293
0.001	1 ^{0.2} ^{0.4} 1 ² ⁴ 10 ²⁰ ⁴⁰ 100 V _{CE} (V)	0	50 100	T _c (°C)

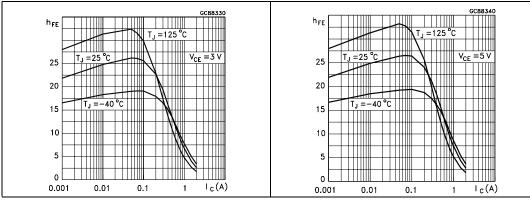
I_{B1} = -I_{B2} = 50 mA

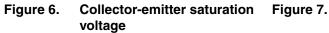
Figure 9

L = 3 mH











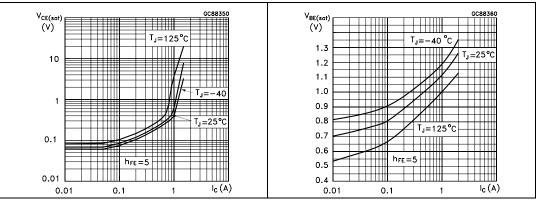
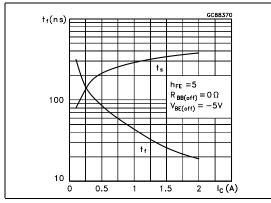


Figure 8. Switching time inductive load





2.2 Test circuit

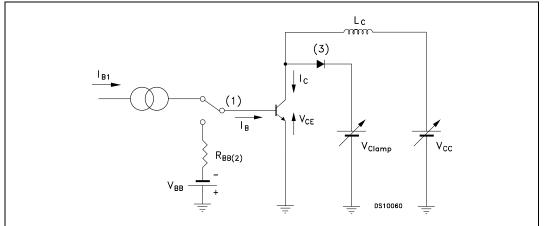


Figure 9. Inductive load switching test circuit

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

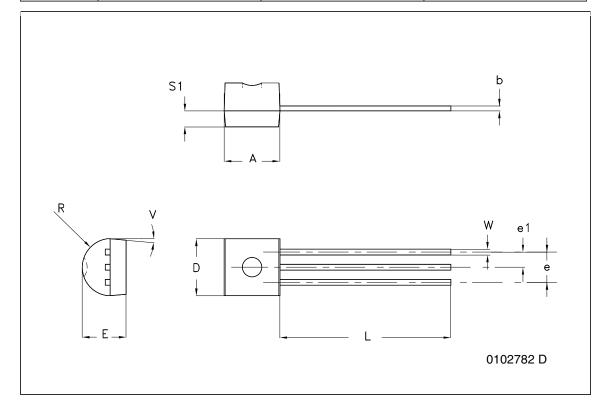


3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK[®] packages, depending on their level of environmental compliance. ECOPACK[®] specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK[®] is an ST trademark.



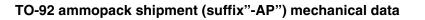
	TO-92 bulk shipment mechanical data				
DIM.		mm.			
DIN.	MIN.	ТҮР	MAX.		
А	4.32		4.95		
b	0.36		0.51		
D	4.45		4.95		
E	3.30		3.94		
е	2.41		2.67		
e1	1.14		1.40		
L	12.70		15.49		
R	2.16		2.41		
S1	0.92		1.52		
W	0.41		0.56		
V		5°			

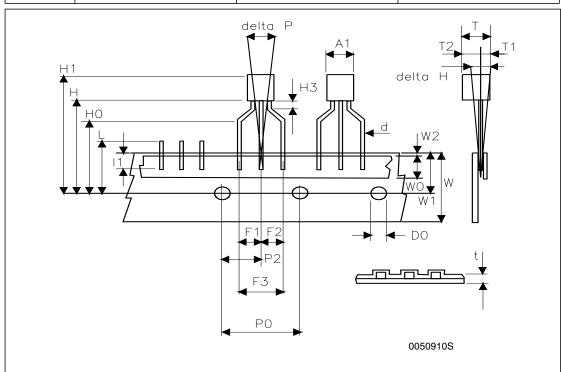




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Dim.	mm			
	Min	Тур	Max	
A1			4.80	
Т			3.80	
T1			1.60	
T2			2.30	
d			0.48	
P0	12.50	12.70	12.90	
P2	5.65	6.35	7.05	
F1,F2	2.44	2.54	2.94	
F3	4.98	5.08	5.48	
delta H	-2.00		2.00	
W	17.50	18.00	19.00	
W0	5.70	6.00	6.30	
W1	8.50	9.00	9.25	
W2			0.50	
н	18.50		20.50	
H3	0.5	1	1.5	
HO	15.50	16.00	16.50	
H1			25.00	
D0	3.80	4.00	4.20	
t			0.90	
L			11.00	
11	3.00			
delta P	-1.00		1.00	







4 Revision history

Table 5.Document revision history

Date	Revision	Changes	
06-Sep-2001	3	Document migration, no content change.	
03-Jul-2008	4	Added halogen-free molding compound package.	
21-Oct-2008	5	Updated Table 2 on page 2 and Table 4 on page 3.	
29-Jul-2009	6	Updated safe operating area Figure 2 on page 3.	



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