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## High voltage fast-switching NPN power transistor

Preliminary data

### Features

- High voltage capability
- 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.

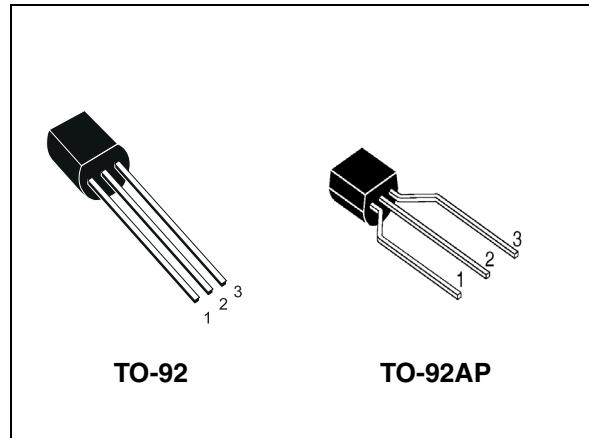


Figure 1. Internal schematic diagram

Table 1. Device summary

Order codes	Marking	Package	Packaging
STX0560	X0560	TO-92	Bag
STX0560-AP	X0560	TO-92AP	Ammopack

# 1 Electrical ratings

**Table 2. Absolute maximum ratings**

Symbol	Parameter	Value	Unit
$V_{CES}$	Collector-emitter voltage ( $V_{BE} = 0$ )	800	V
$V_{CEO}$	Collector-emitter voltage ( $I_B = 0$ )	600	V
$V_{EBO}$	Emitter-base voltage ( $I_C = 0$ )	7	V
$I_C$	Collector current	1	A
$I_{CM}$	Collector peak current ( $t_P < 5$ ms)	2	A
$I_B$	Base current	0.5	A
$I_{BM}$	Base peak current ( $t_P < 5$ ms)	1	A
$P_{TOT}$	Total dissipation at $T_c = 25$ °C	1.5	W
$T_{stg}$	Storage temperature	-65 to 150	°C
$T_J$	Max. operating junction temperature	150	

**Table 3. Thermal data**

Symbol	Parameter	Value	Unit
$R_{thJC}$	Thermal resistance junction-case	83	°C/W

## 2 Electrical characteristics

$T_{case} = 25^\circ\text{C}$  unless otherwise specified.

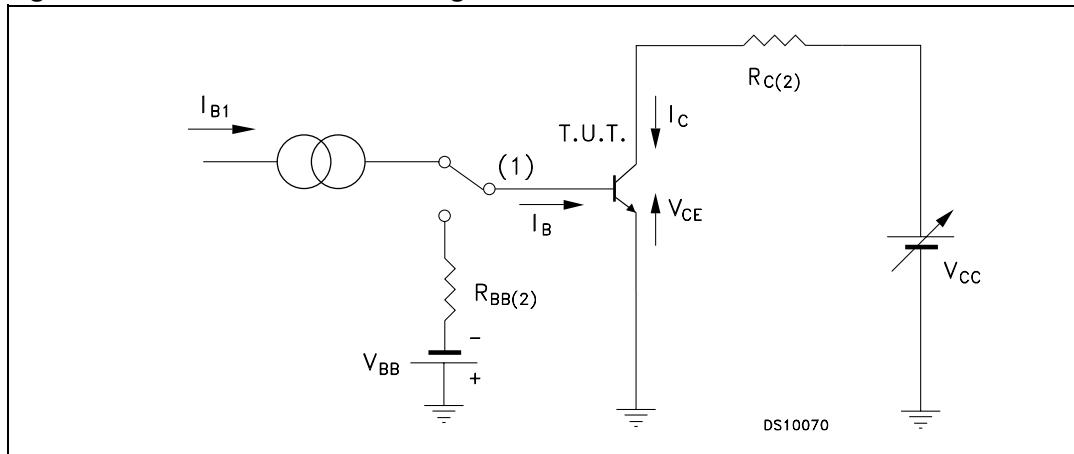
**Table 4. Electrical characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$I_{CES}$	Collector cut-off current ( $V_{BE} = 0$ )	$V_{CE} = 800\text{ V}$			10	$\mu\text{A}$
$V_{(BR)EBO}$	Emitter-base breakdown voltage ( $I_C = 0$ )	$I_E = 10\text{ mA}$	7			$\text{V}$
$V_{CEO(sus)}^{(1)}$	Collector-emitter sustaining voltage ( $I_B = 0$ )	$I_C = 10\text{ mA}$	600			$\text{V}$
$V_{CE(sat)}^{(1)}$	Collector-emitter saturation voltage	$I_C = 0.5\text{ A}$ $I_B = 100\text{ mA}$			1	$\text{V}$
$V_{BE(sat)}^{(1)}$	Base-emitter saturation voltage	$I_C = 0.5\text{ A}$ $I_B = 100\text{ mA}$			1	$\text{V}$
$h_{FE}$	DC current gain	$I_C = 5\text{ mA}$ $V_{CE} = 5\text{ V}$ $I_C = 20\text{ mA}$ $V_{CE} = 5\text{ V}$	70	100		
$t_r$ $t_s$ $t_f$	Resistive load Rise time Storage time Fall time	TBD				
$t_s$	Inductive Load Storage time	TBD				

1. Pulse test: pulse duration  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .

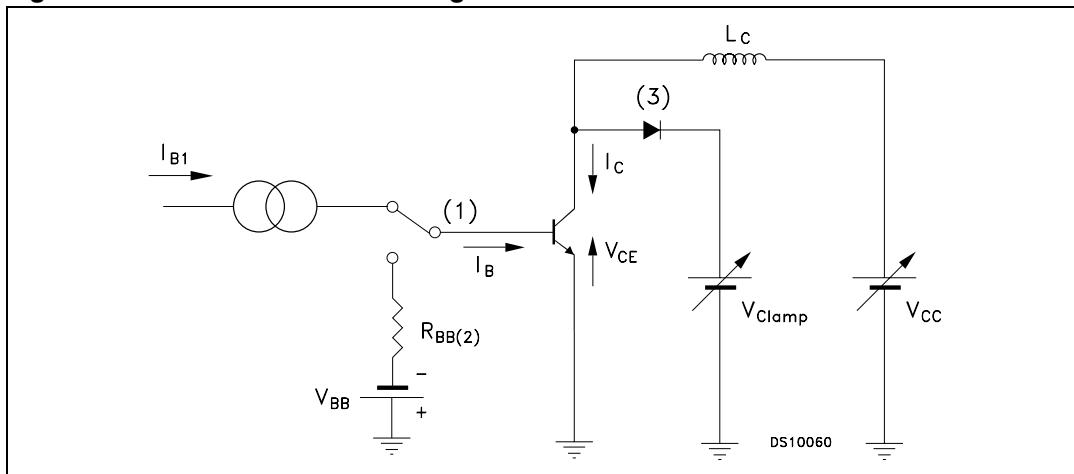
## 2.1 Test circuits

**Figure 2. Resistive load switching test circuit**



1. Fast electronic switch
2. Non-inductive resistor

**Figure 3. Inductive load switching test circuit**



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

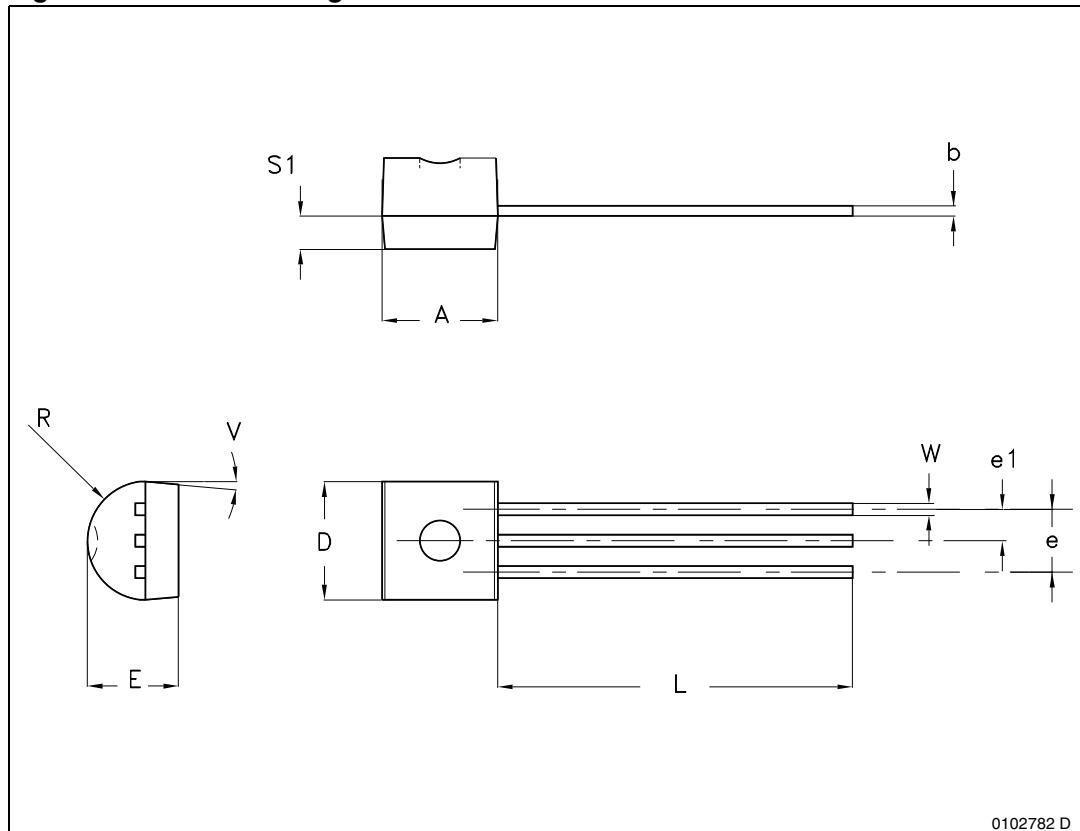
### 3 Package mechanical data

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](http://www.st.com).  
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Table 5. TO-92 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°	

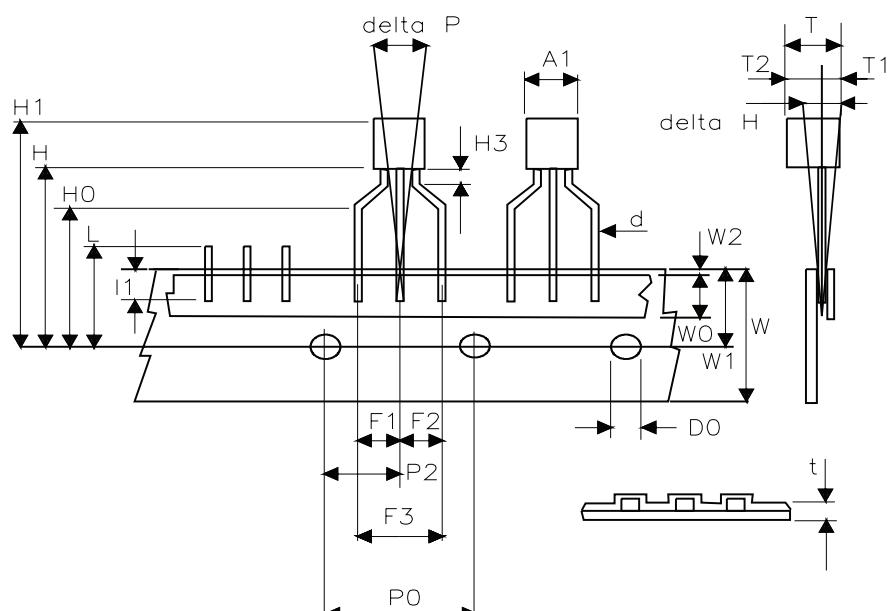
Figure 4. TO-92 drawing



0102782 D

## 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
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
H	18.50		20.50
H3	0.5	1	1.5
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



0050910S

## 4 Revision history

**Table 6. Document revision history**

Date	Revision	Changes
15-Dec-2010	1	Initial release.

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