

## NPN low voltage transistor

### Features

- Low voltage small device for through-hole assembly
- High ruggedness

### Applications

- Voltage regulation
- Relay driver
- Generic switch

### Description

The STX715 is a NPN transistor manufactured using planar technology and it is housed in TO-92 small plastic package.

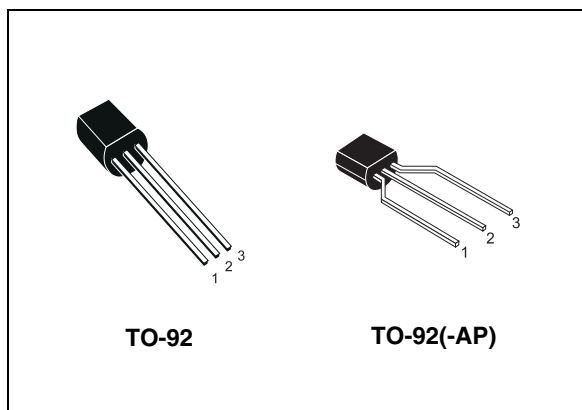


Figure 1. Internal schematic diagram

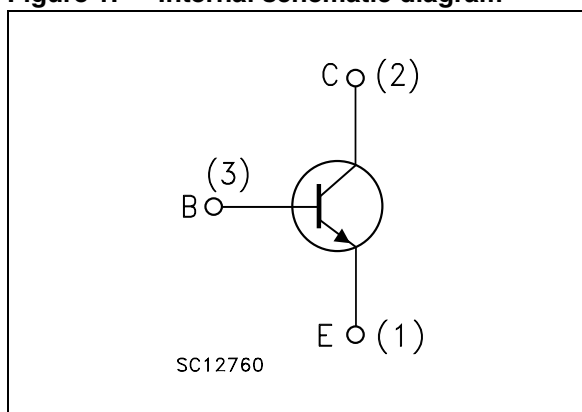


Table 1. Device summary

Order codes	Marking	Package	Packaging
STX715	X715	TO-92	Bag
STX715-AP	X715	TO-92	Ammopack

# 1 Electrical ratings

**Table 2. Absolute maximum ratings**

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-base voltage ( $I_E = 0$ )	140	V
$V_{CEO}$	Collector-emitter voltage ( $I_B = 0$ )	80	V
$V_{EBO}$	Emitter-base voltage ( $I_C = 0$ )	5	V
$I_C$	Collector current	1.5	A
$I_{CM}$	Collector peak current ( $t_P < 5$ ms)	2	A
$I_B$	Base current	0.3	A
$I_{BM}$	Base peak current ( $t_P < 5$ ms)	0.6	A
$P_{TOT}$	Total dissipation at $T_{amb} = 25$ °C	0.9	W
$T_{STG}$	Storage temperature	-65 to 150	°C
$T_J$	Max. operating junction temperature	150	°C

**Table 3. Thermal data**

Symbol	Parameter	Value	Unit
$R_{thJA}$	Thermal resistance junction-ambient max	140	°C/W

## 2 Electrical characteristics

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

**Table 4. Electrical characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$I_{\text{CES}}$	Collector cut-off current ( $V_{\text{BE}} = 0$ )	$V_{\text{CE}} = 140\text{ V}$			500	$\mu\text{A}$
$I_{\text{CEO}}$	Collector cut-off current ( $I_{\text{B}} = 0$ )	$V_{\text{CE}} = 80\text{ V}$			1	mA
$I_{\text{EBO}}$	Emitter cut-off current ( $I_{\text{C}} = 0$ )	$V_{\text{EB}} = 5\text{ V}$			100	$\mu\text{A}$
$V_{\text{CEO(sus)}}$	Collector-emitter sustaining voltage ( $I_{\text{B}} = 0$ )	$I_{\text{C}} = 10\text{ mA}$	80			V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 100\text{ mA}$ $I_{\text{B}} = 10\text{ mA}$ $I_{\text{C}} = 1\text{ A}$ $I_{\text{B}} = 100\text{ mA}$			0.25 0.5	V V
$V_{\text{BE(sat)}}^{(1)}$	Base-emitter saturation voltage	$I_{\text{C}} = 100\text{ mA}$ $I_{\text{B}} = 10\text{ mA}$ $I_{\text{C}} = 1\text{ A}$ $I_{\text{B}} = 100\text{ mA}$			1 1.1	V V
$h_{\text{FE}}^{(1)}$	DC current gain	$I_{\text{C}} = 100\text{ }\mu\text{A}$ $V_{\text{CE}} = 2\text{ V}$ $I_{\text{C}} = 500\text{ mA}$ $V_{\text{CE}} = 2\text{ V}$ $I_{\text{C}} = 1\text{ A}$ $V_{\text{CE}} = 2\text{ V}$	140 80 40			
$f_{\text{T}}$	Transition frequency	$I_{\text{C}} = 100\text{ mA}$ $V_{\text{CE}} = 10\text{ V}$		50		MHz

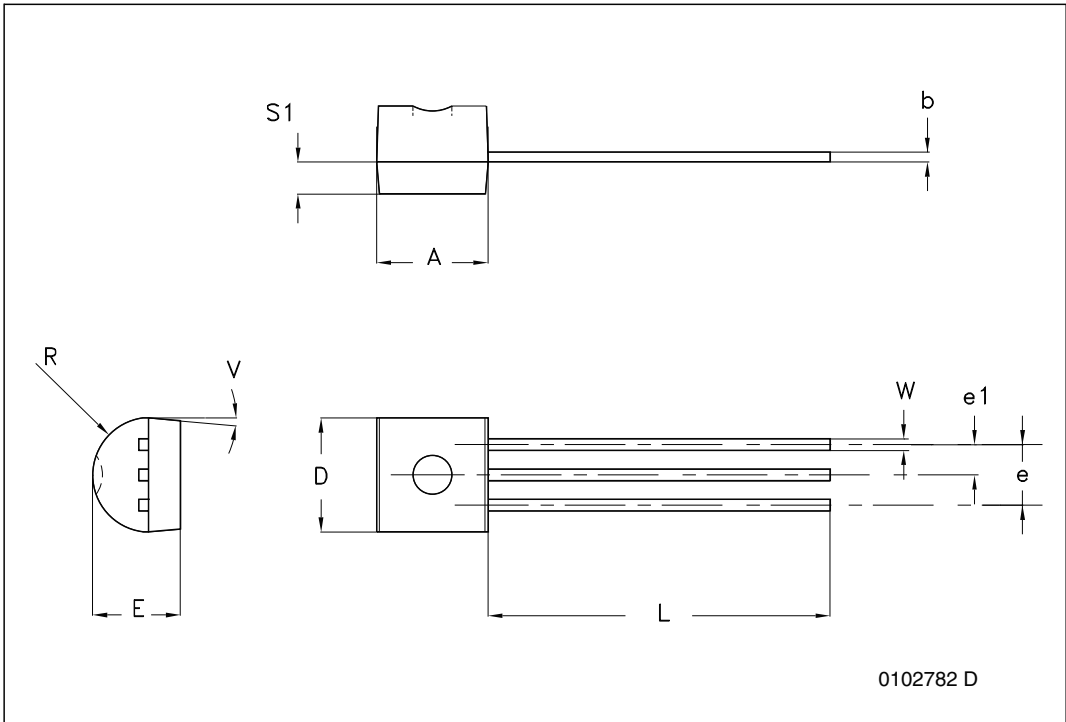
1. Pulse test: pulse duration  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$

### 3 Package mechanical data

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

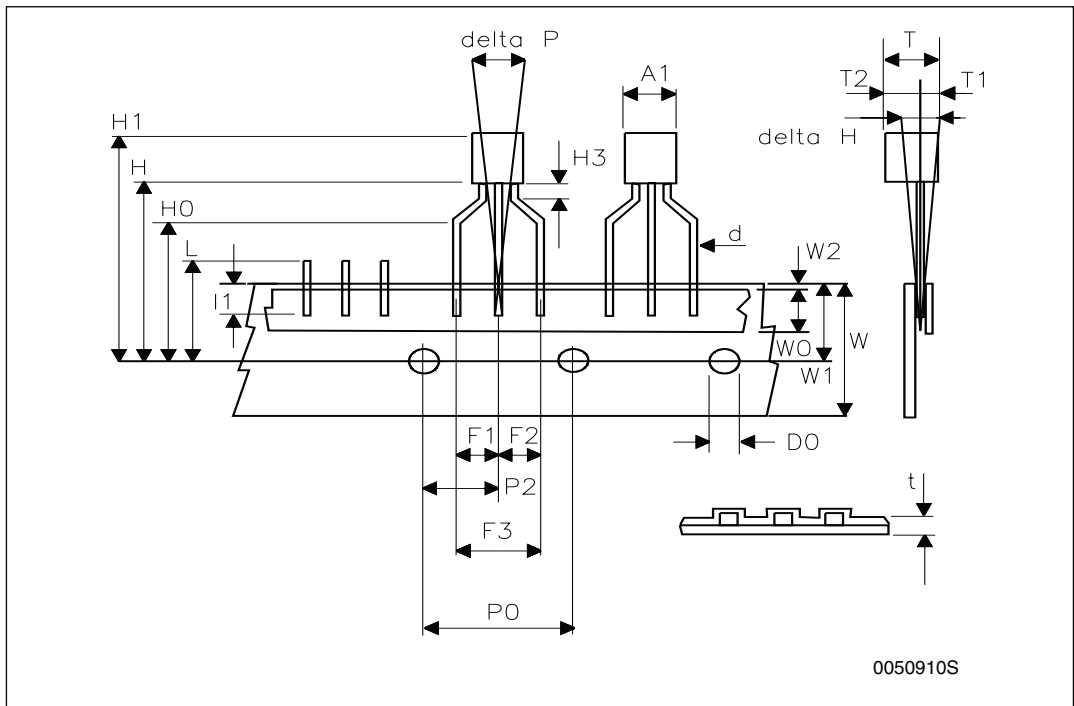
**TO-92 bulk shipment mechanical data**

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°	



**TO-92 ammpack 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
l1	3.00		
delta P	-1.00		1.00



## 4 Document revision history

**Table 5. Document revision history**

Date	Revision	Changes
21-Jun-2004	2	Document migration, no content change
01-Feb-2010	3	Updated package mechanical data

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