STX616

High voltage NPN power transistor

Features

- High voltage capability
- High DC current gain
- Minimum lot-to-lot spread for reliable operation

Applications

- Switching mode power supply
- Battery charger

Description

The device is manufactured using high voltage multi epitaxial planar technology for high switching speeds and high voltage withstand capability. The device is designed for use in SMPS and battery charger.

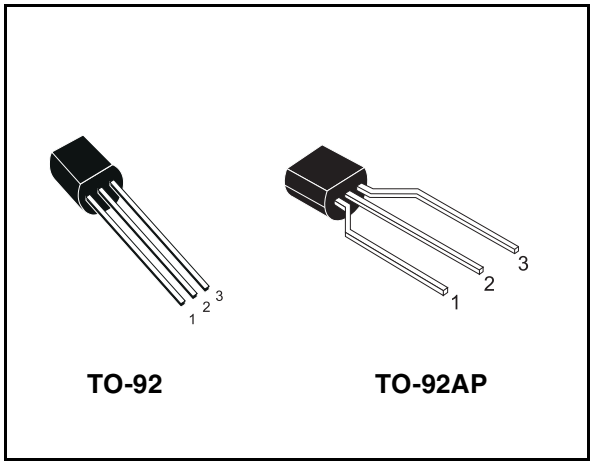


Figure 1. Internal schematic diagram

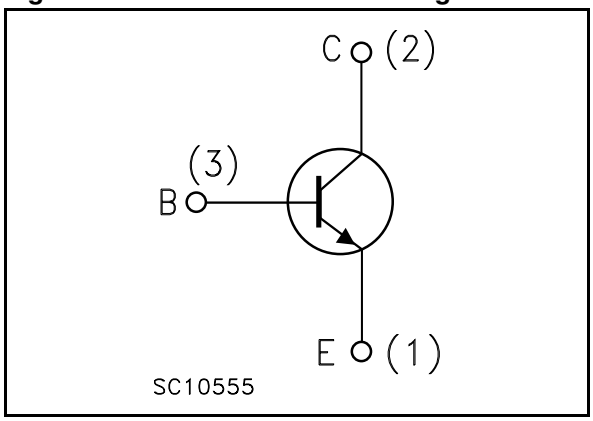


Table 1. Device summary

Order code	Marking	Package	Packaging
STX616	X616	TO-92	Bulk
STX616-AP	X616	TO-92AP	Ammopack

1 Electrical characteristics

(T_{case} = 25°C unless otherwise specified)

Table 2. Absolute maximum rating

Symbol	Parameter	Value	Unit
V_{CES}	Collector-emitter voltage (V_{BE} = 0)	980	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	500	V
V_{EBO}	Emitter-base voltage (I_C = 0)	12	V
I_C	Collector current	1.5	A
I_{CM}	Collector peak current (t_P < 5ms)	2.4	A
I_B	Base current	0.8	A
I_{BM}	Base peak current (t_P < 5ms)	1.2	A
P_{tot}	Total dissipation at T_c = 25°C	2.8	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
$R_{thj\text{-}case}$	Thermal resistance junction-case	max	44.6	°C/W
$R_{thj\text{-}amb}$	Thermal resistance junction-ambient	max	150	°C/W

2 Electrical characteristics

(T_{case} = 25°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} = 980V V_{CE} = 980V T_c = 125°C			50 0.5	µA mA
$V_{CE(sus)}$ (1)	Collector-emitter sustaining voltage (I_B = 0)	I_C = 10mA	500			V
V_{EBO}	Emitter-base voltage (I_C = 0)	I_E = 1mA	12			V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = 0.2A I_B = 40mA I_C = 1A I_B = 200mA			0.5 1	V V
$V_{BE(sat)}$ (1)	Base-emitter saturation voltage	I_C = 0.2A I_B = 40mA I_C = 1A I_B = 200mA			1 1.4	V V
h_{FE} (1)	DC current gain	I_C = 500µA V_{CE} = 2V I_C = 200mA V_{CE} = 5V I_C = 500mA V_{CE} = 5V I_C = 1.5A V_{CE} = 5V	17 25 12 4			
t_{on} t_s t_f	RESISTIVE LOAD Turn-on time Storage time Fall time	V_{CC} = 250V I_C = 250mA I_{B1} = 65mA I_{B2} = -130mA			0.2 5 0.65	µs µs µs
t_{on} t_s t_f	RESISTIVE LOAD Turn-on time Storage time Fall time	V_{CC} = 250V I_C = 0.8A I_{B1} = 160mA I_{B2} = -0.4A			1 2.5 0.35	µs µs µs
t_s t_f	INDUCTIVE LOAD Storage time Fall time	V_{cl} = 300V I_C = 250mA I_{B1} = 65mA I_{B2} = -130mA L = 200µH			5 0.5	µs µs
t_s t_f	INDUCTIVE LOAD Storage time Fall time	V_{cl} = 300V I_C = 0.8A I_{B1} = 160mA I_{B2} = -0.4A L = 200µH			2.5 0.25	µs µs

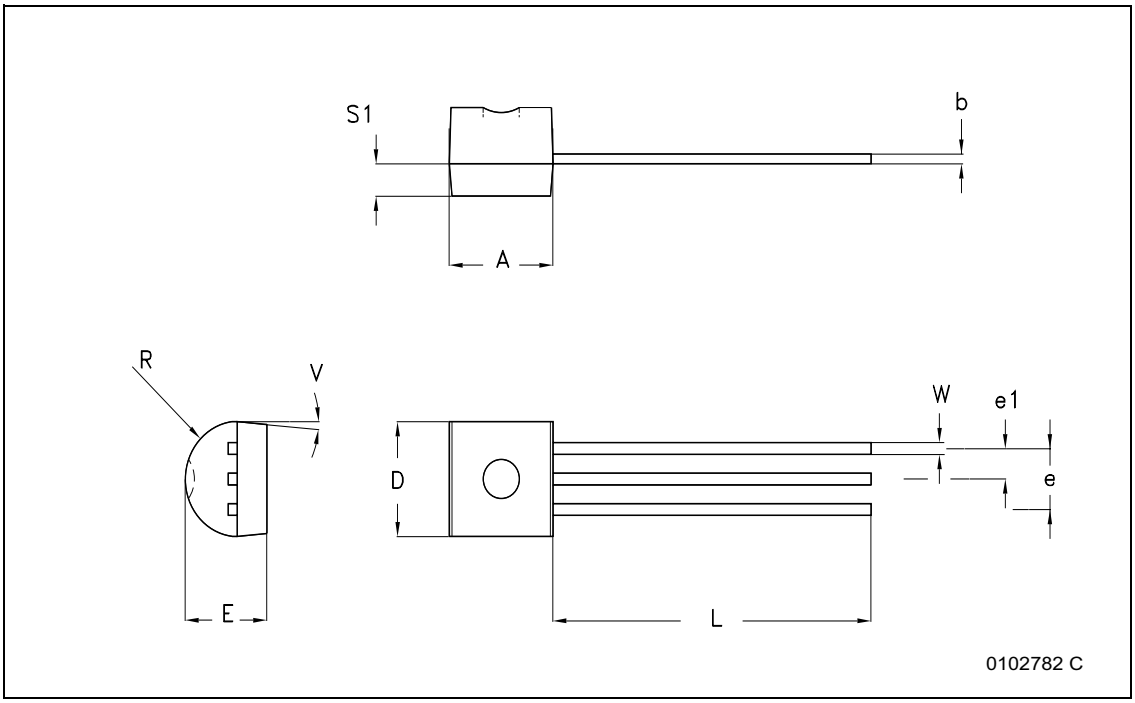
Note (1) Pulsed duration = 300 µs, duty cycle ≤1.5%

3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

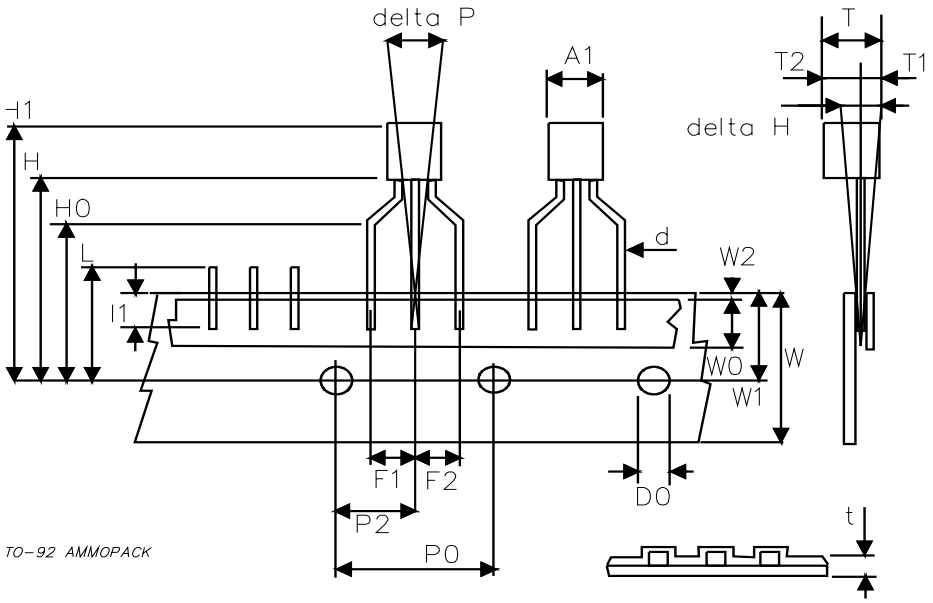
TO-92 BULK SHIPMENT MECHANICAL DATA

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}	



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



4 Revision history

Table 5. Document revision history

Date	Revision	Changes
06-Jun-2007	1	Initial release.
22-Oct-2007	2	Added TO-92AP package.

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