2STL1525

Low voltage high performance NPN power transistor

Features

- Very low collector-emitter saturation voltage
- High current gain characteristic
- Fast switching speed

Applications

- Emergency lighting
- LED drive
- Motherboard and hard disk drive
- Mobile equipment
- DC-DC converter, voltage regulation

Description

The device is a NPN transistor manufactured using new “PB-HCD” (power bipolar high current density) technology. The resulting transistor shows exceptional high gain performances coupled with very low saturation voltage.

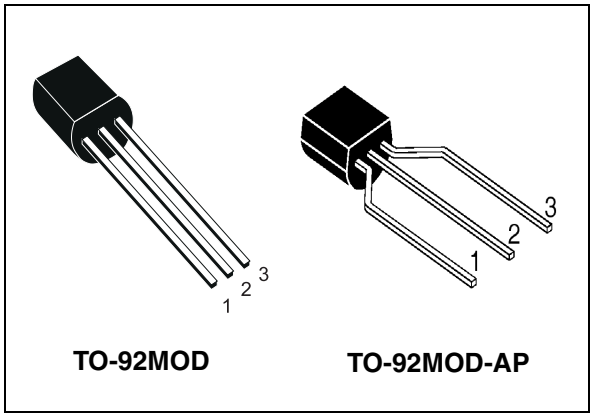


Figure 1. Internal schematic diagram

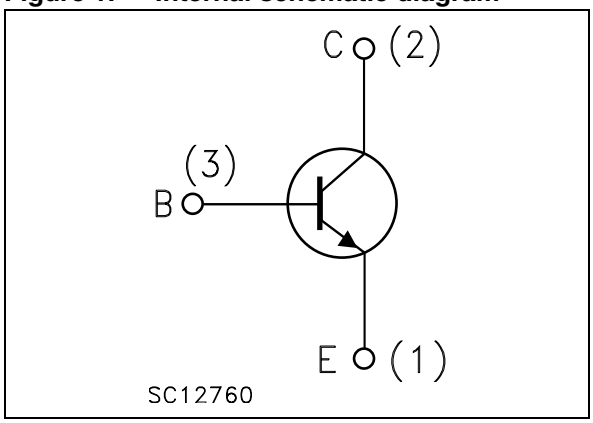


Table 1. Device summary

Order codes	Marking	Package	Packaging
2STL1525	2STL1525	TO-92MOD	Bag
2STL1525-AP	2STL1525	TO-92MOD-AP	Ammopack

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CEX}	Collector-emitter voltage (V_{BE} = -1.5 V)	95	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	25	V
V_{EBO}	Emitter-base voltage (I_C = 0)	5	V
I_C	Collector current	5	A
I_{CM}	Collector peak current (t_P < 5 ms)	10	A
I_B	Base current	1	A
P_{TOT}	Total dissipation at T_{amb} = 25 °C	1.5	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	83	°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_{CBO}	Collector cut-off current (I_E = 0)	V_{CB} = 50 V			0.1	µA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = 4 V			0.1	µA
$V_{(BR)CEX}$	Collector-emitter breakdown voltage (V_{BE} = -1.5 V)	I_C = 1 mA	95			V
$V_{(BR)CEO}$ (1)	Collector-emitter breakdown voltage (I_B = 0)	I_C = 10 mA	25			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage (I_C = 0)	I_E = 100 µA	5			V
h_{FE} (1)	DC current gain	I_C = 0.5 A V_{CE} = 2 V I_C = 3 A V_{CE} = 2 V I_C = 5 A V_{CE} = 5 V	150 100	 150	500	
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = 3 A I_B = 300 mA I_C = 3.5 A I_B = 40 mA		220	 500	mV mV
$V_{BE(sat)}$ (1)	Base-emitter saturation voltage	I_C = 3 A I_B = 300 mA			1.2	V
C_{CBO}	Collector-base capacitance (I_E = 0)	V_{CB} = 10 V, f = 1 MHz		20		pF
f_T	Transition frequency	V_{CE} = 10 V I_C = 50 mA		120		MHz
 t_{on} t_{off}	Resistive load Turn-on time Turn-off time	 I_C = 1.5 A V_{CC} = 10 V I_{B1} = -I_{B2} = 150 mA		 60 450		 ns ns

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

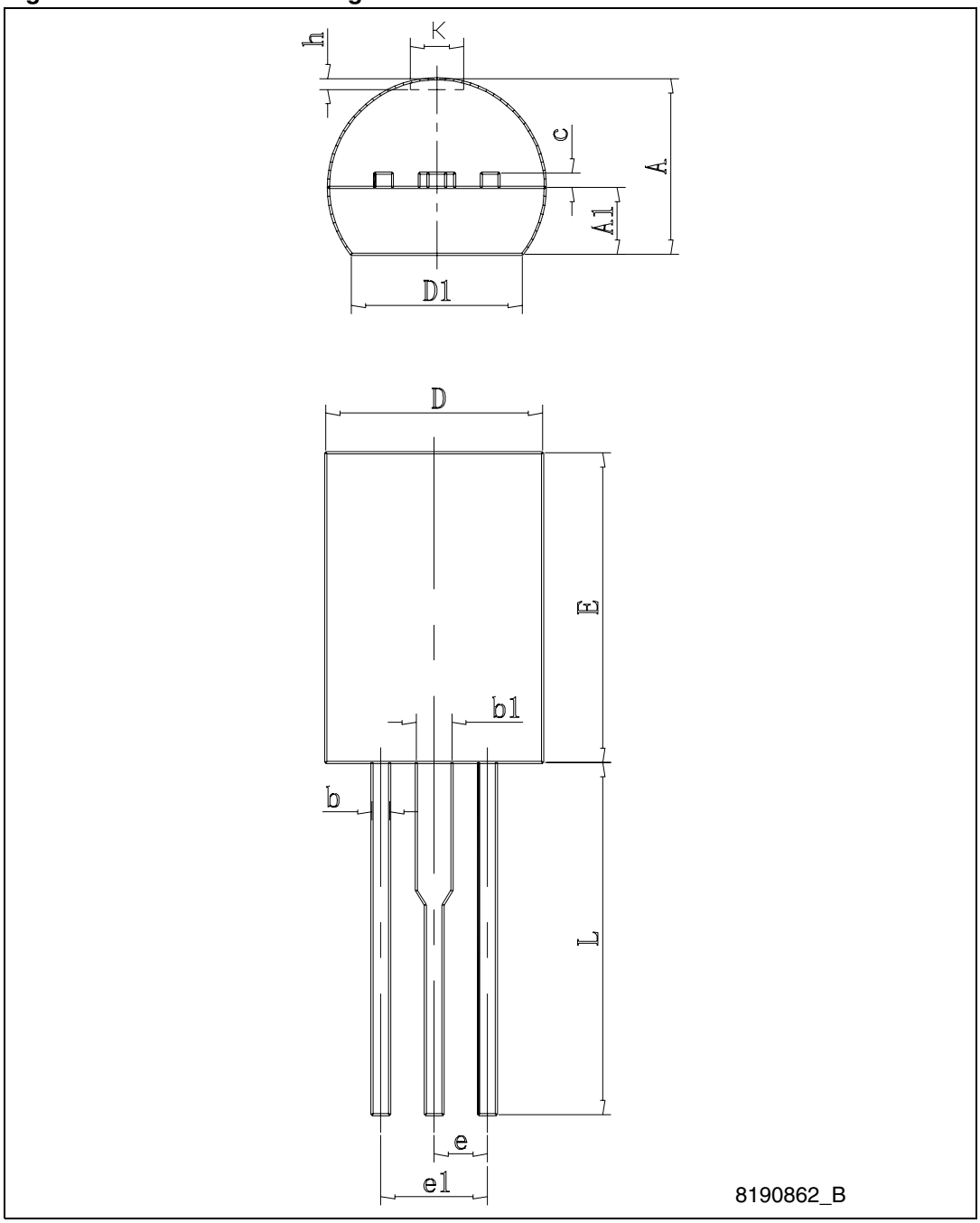
3 Package mechanical data

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.

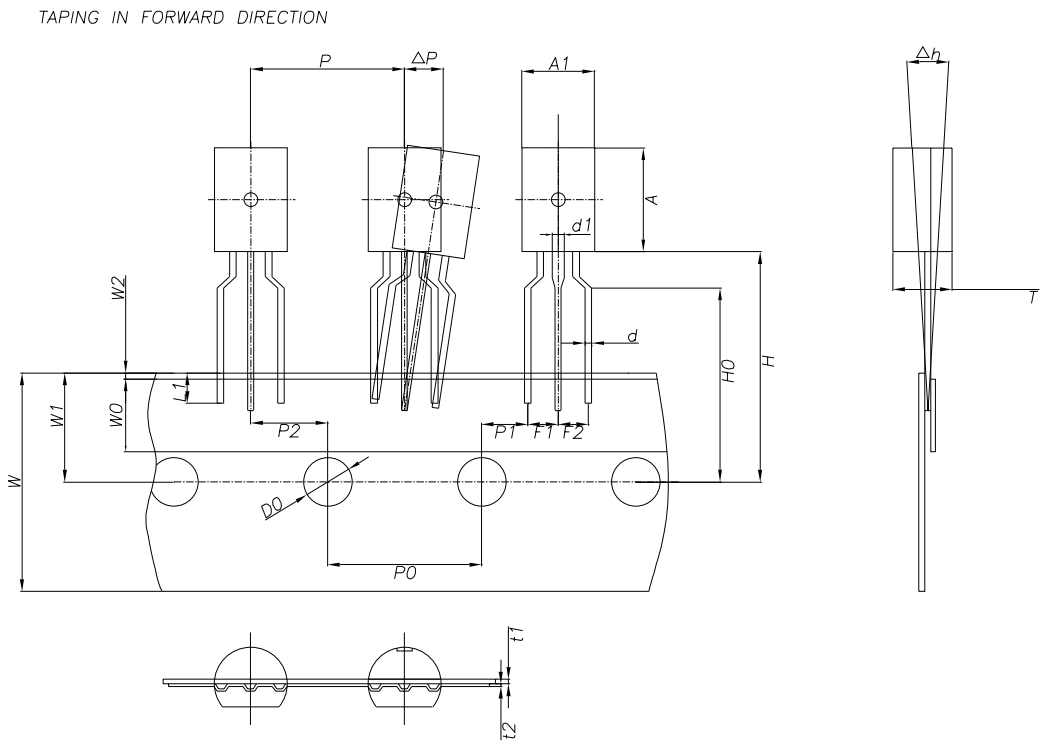
Table 5. TO-92MOD mechanical data

Dim.	mm.		
	Min.	Typ.	Max.
A	4.7		5.1
A1	1.730		2.030
b	0.4		0.6
b1	0.9		1.1
c	0.4		0.5
D	5.8		6.2
D1	4.0		
E	8.4		8.8
e		1.5	
e1	2.9		3.1
L	13.8		14.2
K			1.6
h	0.0		0.380

Figure 2. TO-92MOD drawing mechanical data



TO-92MOD-AP ammopack dimension



ITEM	SYMBOL	VALUE & TOLERANCE
Body Width	A1	6.0 ± 0.2
Body Eigth	A	8.6 ± 0.2
Body Thickness	T	4.9 ± 0.2
Lead Wire Diameter	d	0.5 ± 0.05
Lead Wire Diameter 1	d1	1.0 ± 0.05
Pitch of component	P	12.7 ± 0.3
Feed Hole Pitch	P0	12.7 ± 0.2
Hole center to component center	P2	6.35 ± 0.3
Lead to lead distance	F1, F2	2.5 ± 0.3
Component alignment F-R	Δh	0 ± 1.0
Type width	W	18.0 +1.0, −0.5
Hole down tape width	W0	6.0 ± 0.5
Hole position	W1	9.0 ± 0.5
Hole down tape position	W2	1.0 MAX
Height of component from tape center	H	19.0 ± 1.0
Lead wire clinch height	H0	16.0 ± 0.5
Lead wire (tape portion)	L1	2.5 MIN
Feed hole diameter	D0	4.0 ± 0.2
Taped Lead Thickness	t1	0.4 ± 0.05
Carrier tape Thickness	t2	0.2 ± 0.05
Position of Hole	P1	3.85 ± 0.03
Component alignment	ΔP	0 ± 1.0
		Unit: mm

*Dimensions in mm

*Cumulative pitch error: 1.0mm/20 pitches

*Groung paper tape: 0.5mm+/−0.1

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4 Revision history

Table 6. Document revision history

Date	Revision	Changes
31-Jul-2009	1	Initial release.
01-Dec-2010	2	Document status promoted from preliminary data to datasheet. Updated package mechanical data *Table 5 on page 4* and *Figure 2 on page 5*.