

# STN101050BL30

## TVS Diode ESD suppressor



### Product features

- Protects one bi-directional I/O line
- Low clamping voltage
- Low operating voltage: 5.0 V
- Low leakage current
- Ultra low capacitance: 0.3 pF typical
- Meets moisture sensitivity level (MSL) 3
- Molding compound flammability rating: UL 94V-0
- Termination finish: Ni/Pd/Au

### Applications

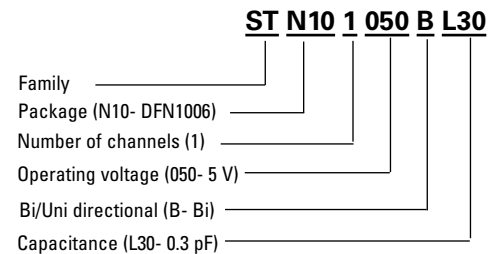
- USB ports
- Display port
- Wireless communications
- Digital visual interface (DVI)
- Cellular handsets & accessories

### Environmental compliance and general specifications

- IEC61000-4-2 (ESD)
  - ±20 kV (air)
  - ±20 kV (contact)
- IEC61000-4-5 (Lightning) 4.5 A (8/20 us)



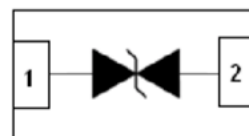
### Ordering part number



### Pin out/functional diagram



DFN1006-2L



PIN Configuration

### Absolute maximum ratings

(+25 °C, RH=45%-75%, unless otherwise noted)

#### STN101050BL30

Parameter	Symbol	Value	Unit
Peak pulse power dissipation on 8/20 $\mu$ s waveform	P <sub>pp</sub>	100	W
ESD per IEC 61000-4-2 (Air)	V <sub>ESD</sub>	+/-20	kV
ESD per IEC 61000-4-2 (Contact)		+/-20	
Lead soldering temperature	T <sub>L</sub>	+260 (10 seconds)	°C
Operating junction temperature range	T <sub>J</sub>	-55 to +125	°C
Storage temperature range	T <sub>STG</sub>	-55 to +150	°C

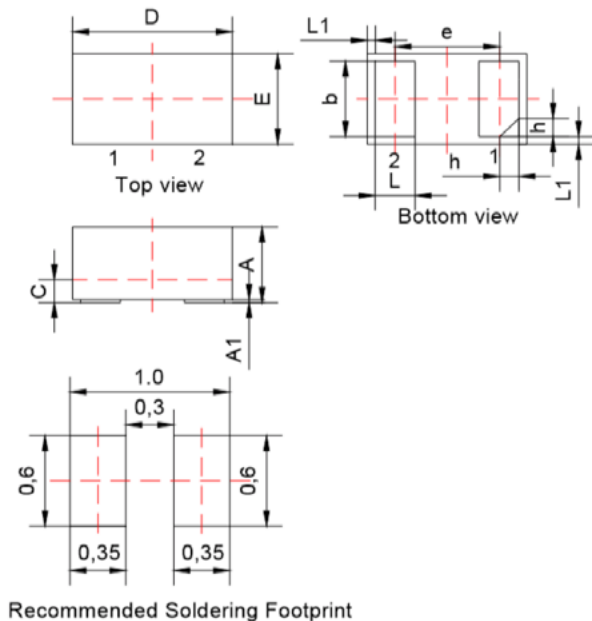
### Electrical characteristics

(+25 °C)

#### STN101050BL30

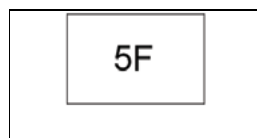
Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	5.0	V <sub>RWM</sub> (V)
Reverse breakdown voltage	I <sub>T</sub> = 1 mA	6.0	-	-	V <sub>BR</sub> (V)
Reverse leakage current	V <sub>RWM</sub> = 5 V	-	-	1.0	I <sub>R</sub> ( $\mu$ A)
Peak pulse current	t <sub>p</sub> = 8/20 $\mu$ s	-	-	4.5	I <sub>PP</sub> (A)
Clamping voltage	I <sub>PP</sub> = 1 A, t <sub>p</sub> = 8/20 $\mu$ s	-	10	12.5	V <sub>C</sub> (V)
	I <sub>PP</sub> = 2.5 A, t <sub>p</sub> = 8/20 $\mu$ s	-	15	18	V <sub>C</sub> (V)
	I <sub>PP</sub> = 4.5 A, t <sub>p</sub> = 8/20 $\mu$ s	-	25	30	V <sub>C</sub> (V)
Junction capacitance	V <sub>RWM</sub> = 0 V, f = 1 MHz	-	0.3	0.5	C <sub>J</sub> (pF)

### Mechanical parameters, pad layout- mm



Dimension	Minimum	Typical	Maximum
A	0.45	0.50	0.55
A1	0.00	0.02	0.05
b	0.45	0.50	0.55
C	0.12	0.15	0.18
D	0.95	1.00	1.05
e		0.65 BSC	
E	0.55	0.60	0.65
L	0.20	0.25	0.30
L1		0.05 REF	
h	0.07	0.12	0.17

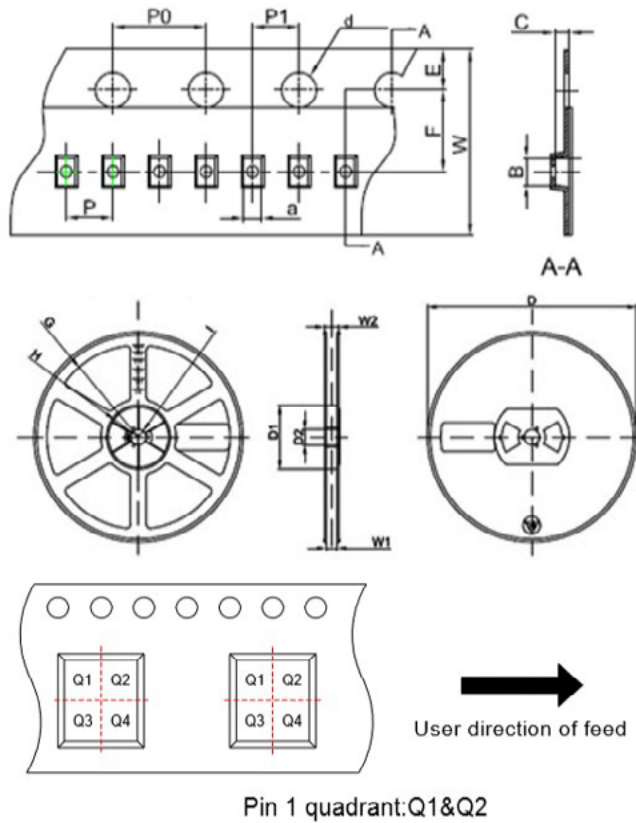
### Part marking



**Packaging information mm/inches**

Drawing not to scale.

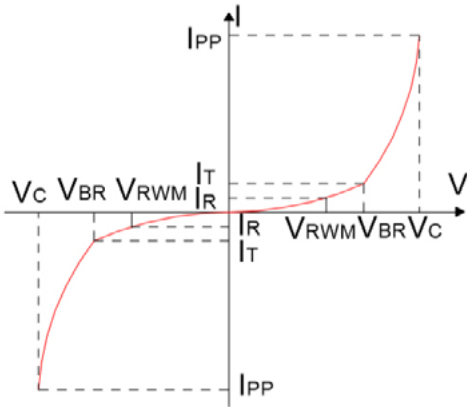
Supplied in tape and reel packaging, 10,000 parts per 7" EIA-481 diameter reel



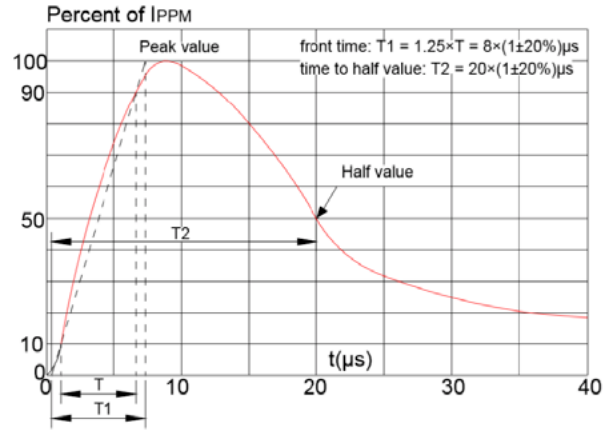
Symbol	Millimeters	Inches
	Typ.	Typ.
a	0.66	0.026
B	1.15	0.045
C	0.66	0.026
d	Φ1.50	Φ0.059
E	1.75	0.069
F	3.50	0.138
P0	4.00	0.157
P	2.00	0.079
P1	2.00	0.079
W	8.00	0.315
D	Φ178	Φ7.008
D1	54.40	2.142
D2	13.00	0.512
G	R78.00	R3.071
H	R25.60	R1.008
I	R6.50	R0.256
W1	9.50	0.374
W2	12.30	0.484

**Ratings and V-I characteristic curves** (+25 °C unless otherwise noted)

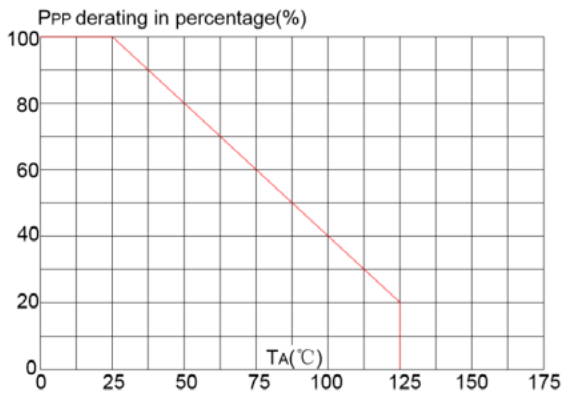
**V- I curve characteristics (Bi-directional)**



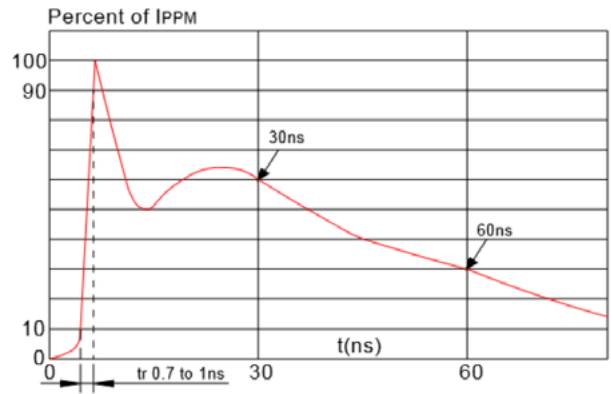
**Pulse waveform (8/20  $\mu$ s)**



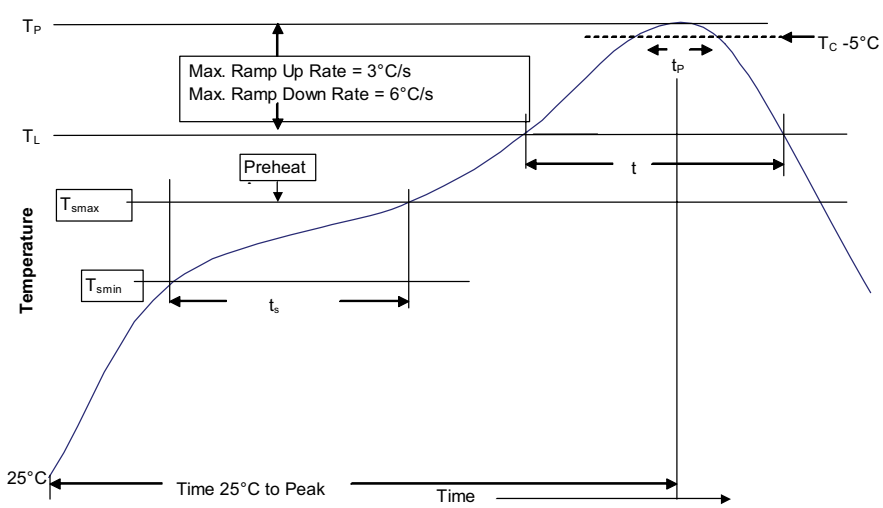
**Pulse derating curve**



**ESD waveform**



**Solder reflow profile**



**Table 1 - Standard SnPb solder (T<sub>C</sub>)**

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

**Table 2 - Lead (Pb) free solder (T<sub>C</sub>)**

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350 - 2000	Volume mm <sup>3</sup> >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

**Reference J-STD-020**

Profile feature	Standard SnPb solder	Lead (Pb) free solder
Preheat and soak		
• Temperature min. (T <sub>smin</sub> )	100 °C	150 °C
• Temperature max. (T <sub>smax</sub> )	150 °C	200 °C
• Time (T <sub>smin</sub> to T <sub>smax</sub> ) (t <sub>s</sub> )	60-120 seconds	60-120 seconds
Ramp up rate T <sub>L</sub> to T <sub>p</sub>	3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T <sub>L</sub> )	183 °C	217 °C
Time (t <sub>L</sub> ) maintained above T <sub>L</sub>	60-150 seconds	60-150 seconds
Peak package body temperature (T <sub>p</sub> )*	Table 1	Table 2
Time (t <sub>p</sub> )* within 5 °C of the specified classification temperature (T <sub>C</sub> )	20 seconds*	30 seconds*
Ramp-down rate (T <sub>p</sub> to T <sub>L</sub> )	6 °C/ second max.	6 °C/ second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

\* Tolerance for peak profile temperature (T<sub>p</sub>) is defined as a supplier minimum and a user maximum.

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