

# STN101050BL25

## 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
- Meets moisture sensitivity level (MSL) 3
- Molding compound flammability rating: UL 94V-0
- Termination finish: Ni/Pd/Au

### Applications

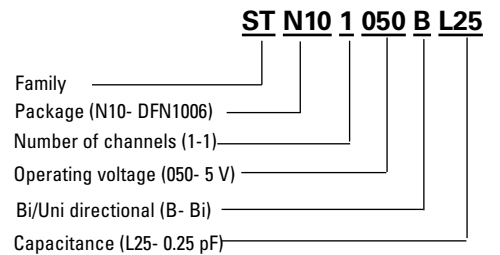
- USB ports
- Display port
- Desktops, servers and notebooks
- Digital visual interface (DVI)
- Cellular phones
- High definition multi-media interface (HDMI)

### Environmental compliance and general specifications

- IEC61000-4-2 (ESD)
  - ±25 kV (air)
  - ±25 kV (contact)
- IEC61000-4-5 (Lightning) 5 A (8/20 μs)



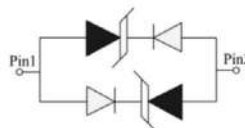
### Ordering part number



### Pin out/functional diagram



DFN1006-2L



PIN Configuration

### Absolute maximum ratings

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

#### STN101050BL25

Parameter	Symbol	Value	Unit
Peak pulse power dissipation on 8/20 μs waveform	$P_{PP}$	60	W
ESD per IEC 61000-4-2 (Air)	$V_{ESD}$	+/-25	kV
ESD per IEC 61000-4-2 (Contact)		+/-25	
Lead soldering temperature	$T_L$	+260 (10 seconds)	°C
Operating junction temperature range	$T_J$	-55 to +125	°C
Storage temperature range	$T_{STG}$	-55 to +150	°C

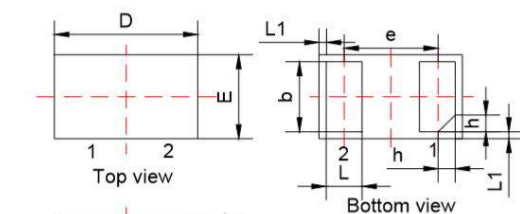
### Electrical characteristics

(+25 °C)

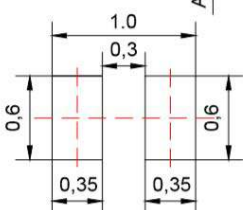
#### STN101050BL25

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	5.0	$V_{RWM}$ (V)
Reverse breakdown voltage	$I_T = 1$ mA	6.0	-	-	$V_{BR}$ (V)
Reverse leakage current	$V_{RWM} = 5$ V	-	-	0.1	$I_R$ (μA)
Peak pulse current	$t_p = 8/20$ μs	-	-	5	$I_{PP}$ (A)
Clamping voltage	$I_{PP} = 1$ A, $t_p = 8/20$ μs	-	9.5	10	$V_C$ (V)
	$I_{PP} = 3$ A, $t_p = 8/20$ μs	-	10	11	$V_C$ (V)
	$I_{PP} = 5$ A, $t_p = 8/20$ μs	-	12.5	13.5	$V_C$ (V)
Junction capacitance	$V_{RWM} = 0$ V, $f = 1$ MHz	-	0.25	0.35	$C_J$ (pF)

### Mechanical parameters, pad layout- mm/inches



Dimension	Millimeters			Inches		
	Minimum	Typical	Maximum	Minimum	Typical	Maximum
A	0.45	0.50	0.55	0.018	0.020	0.022
A1	0.00	0.02	0.05	0.000	0.001	0.002
b	0.45	0.50	0.55	0.018	0.020	0.022
C	0.12	0.15	0.18	0.005	0.006	0.007
D	0.95	1.00	1.05	0.037	0.039	0.041
e		0.65 BSC			0.02 6BSC	
E	0.55	0.60	0.65	0.022	0.024	0.026
L	0.20	0.25	0.30	0.008	0.010	0.012
L1		0.05 REF			0.002 REF	
h	0.07	0.12	0.17	0.003	0.005	0.007



Recommended soldering footprint

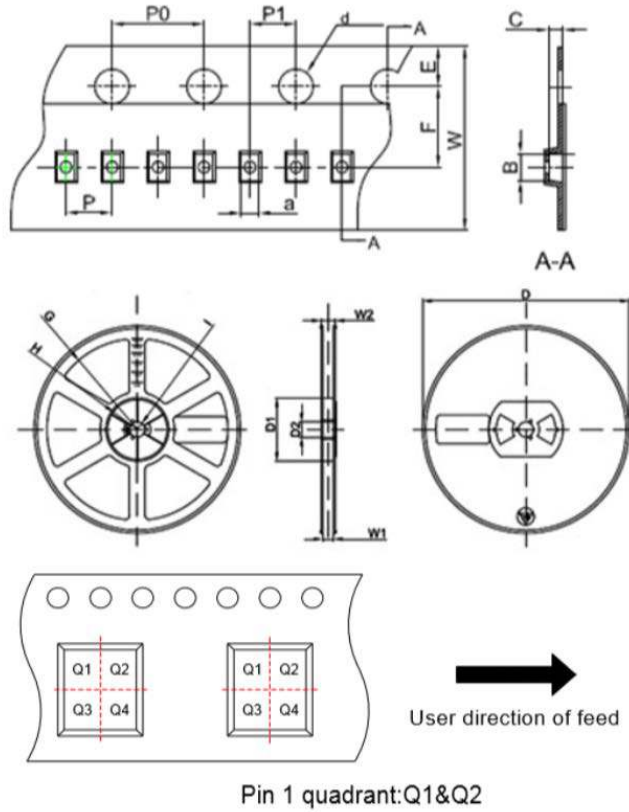
### Part marking



**Packaging information mm/inches**

Drawing not to scale.

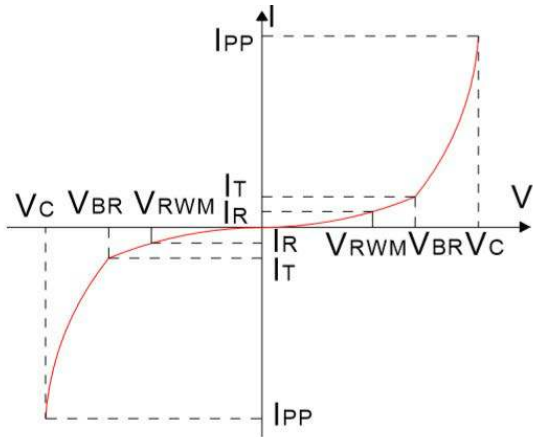
Supplied in tape and reel packaging, 10,000 parts per 7" diameter reel (EIA-481 compliant)



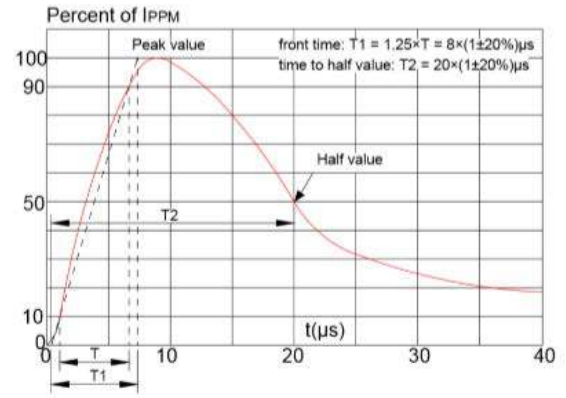
Symbol	Millimeters	Inches
	Typ.	Typ.
a	0.66	0.026
B	1.15	0.045
C	0.66	0.026
d	Φ1.50	Φ0.059
E	1.75	0.069
F	3.50	0.138
P0	4.00	0.157
P	2.00	0.079
P1	2.00	0.079
W	8.00	0.315
D	Φ178	Φ7.008
D1	54.40	2.142
D2	13.00	0.512
G	R78.00	R3.071
H	R25.60	R1.008
I	R6.50	R0.256
W1	9.50	0.374
W2	12.30	0.484

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

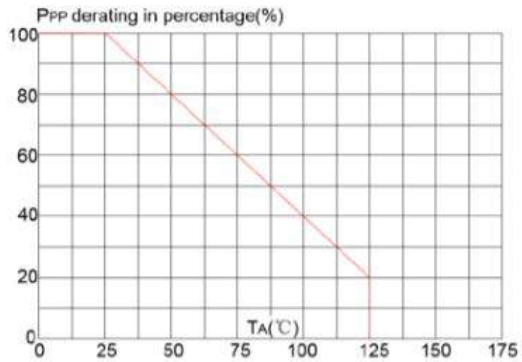
**V- I curve characteristics (Bi-directional)**



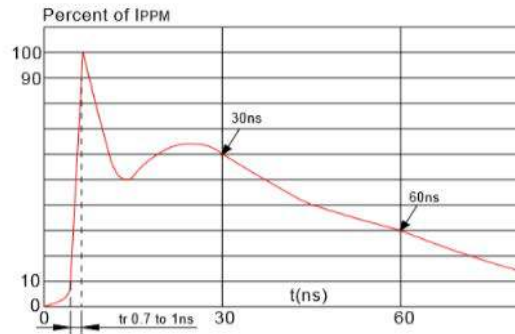
**Pulse waveform (8/20  $\mu$ s)**



**Pulse derating curve**



**ESD waveform**



Solder reflow profile

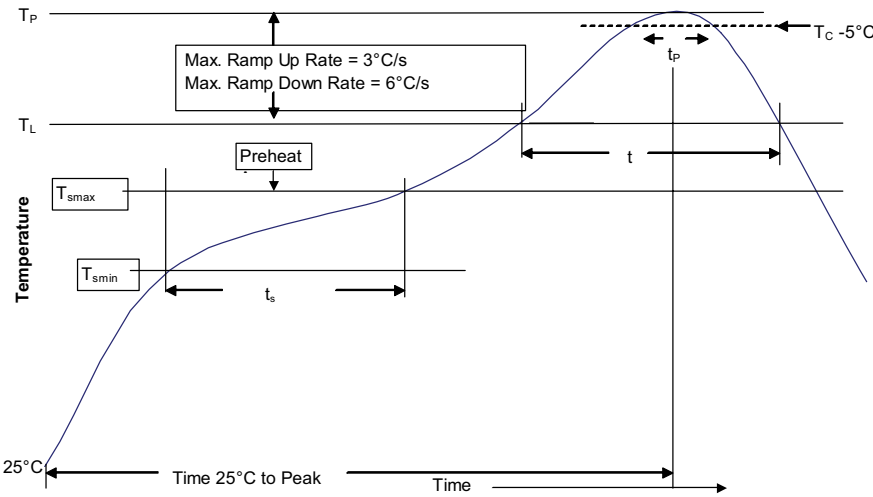


Table 1 - Standard SnPb solder ( $T_C$ )

Package thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ $\geq$ 350
<2.5 mm	235 °C	220 °C
$\geq$ 2.5 mm	220 °C	220 °C

Table 2 - Lead (Pb) free solder ( $T_C$ )

Package thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ 350 - 2000	Volume $\text{mm}^3$ >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	<ul style="list-style-type: none"> <li>Temperature min. (<math>T_{smin}</math>)</li> <li>Temperature max. (<math>T_{smax}</math>)</li> <li>Time (<math>T_{smin}</math> to <math>T_{smax}</math>) (<math>t_s</math>)</li> </ul>	<ul style="list-style-type: none"> <li>100 °C</li> <li>150 °C</li> <li>60-120 seconds</li> </ul>
Ramp up rate $T_L$ to $T_p$	3 °C/ second max.	3 °C/ second max.
Liquidous temperature ( $T_L$ )	183 °C	217 °C
Time ( $t_L$ ) maintained above $T_L$	60-150 seconds	60-150 seconds
Peak package body temperature ( $T_p$ )*	Table 1	Table 2
Time ( $t_p$ )* within 5 °C of the specified classification temperature ( $T_C$ )	20 seconds*	30 seconds*
Ramp-down rate ( $T_p$ to $T_L$ )	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 ( $T_p$ ) is defined as a supplier minimum and a user maximum.

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