STN101XXXBXXX

TVS Diode ESD suppressor

Applications

- Cellular handsets and accessories
- Personal digital assistants (PDA's)
- Notebooks, desktops, and servers
- Portable instrumentation
- Microprocessor based equipment
- Digital cameras

Product features

- Protects one bi-directional I/O line
- Low clamping voltage
- Low operating voltage
- Meets moisture sensitivity level (MSL) 3
- Molding compound flammability rating: UL 94V-0
- Termination finish: Ni/Pd/Au

Environmental compliance and general specifications

- IEC61000-4-2 (ESD)
  - Up to ±30 kV (air)
  - Up to ±30 kV (contact)
- IEC61000-4-5 (Lightning) Up to 8 A (8/20 µs)

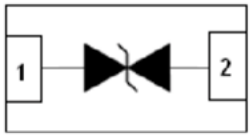
Ordering part number

ST N10 1 033 B 101

- Family
- Package (N10- DFN1006)
- Number of channels (1)
- Operating voltage (033- 3.3 V)
- Bi/Uni directional (B- Bi)
- Capacitance (101- 10 pF)

Pin out/functional diagram

DFN1006-2L



PIN Configuration

Powering Business Worldwide

Absolute maximum ratings

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

Parameter	Symbol	Value			Unit
		STN101033B101	STN101050B101	STN101120 B111	
Peak pulse power dissipation on 8/20 µs waveform	P_{pp}	100	100	150	W
ESD per IEC 61000-4-2 (Air)	V_{ESD}	+/-30	+/-30	+/-30	kV
ESD per IEC 61000-4-2 (Contact)		+/-30	+/-30	+/-30	
Lead soldering temperature	T_L	+260 (10 seconds)	+260 (10 seconds)	+260 (10 seconds)	°C
Operating junction temperature range	T_J	-55 to +125	-55 to +125	-55 to +125	°C
Storage temperature range	T_{STG}	-55 to +150	-55 to +150	-55 to +150	°C

Electrical characteristics

(+25 °C)

STN101033B101

Parameter	Test condition	Minimum	Typical	Maximum	Symbol Units)
Reverse working voltage	-	-	-	3.3	V_{RWM} (V)
Reverse breakdown voltage	I_T = 1 mA	3.6	-	-	V_{BR} (V)
Reverse holding voltage	I_H = 50 mA	3.5	-	-	V_H
Reverse leakage current	V_{RWM} = 3.3 V	-	-	1.0	I_R (µA)
Peak pulse current	t_p = 8/20 µs	-	-	7	I_{pp} (A)
Clamping voltage	I_{PP} = 7 A, t_p = 8/20 µs	-	9	11	V_C (V)
Junction capacitance	V_{RWM} = 0 V, f = 1 MHz	-	10	-	C_J (pF)

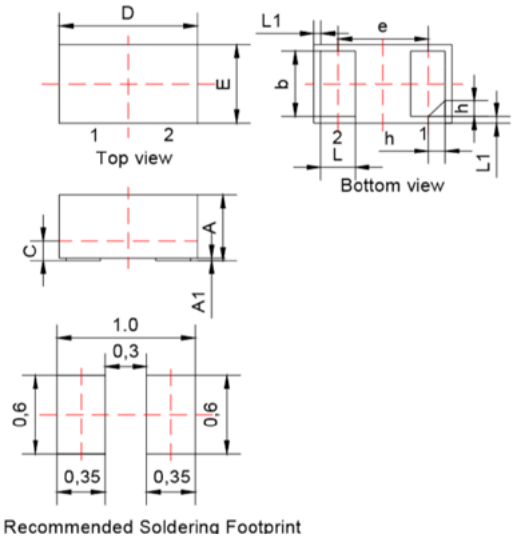
STN101050B101

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	5.0	V_{RWM} (V)
Reverse breakdown voltage	I_T = 1 mA	5.5	6	7.5	V_{BR} (V)
Reverse leakage current	V_{RWM} = 5 V	-	-	0.1	I_R (µA)
Peak pulse current	t_p = 8/20 µs	-	-	8	I_{pp} (A)
Clamping voltage	I_{PP} = 1 A, t_p = 8/20 µs	-	7	10	V_C (V)
	I_{PP} = 8 A, t_p = 8/20 µs		11	13	V_C (V)
Junction capacitance	V_{RWM} = 0 V, f = 1 MHz	-	10	18	C_J (pF)

STN101120B111

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	12	V_{RWM} (V)
Reverse breakdown voltage	I_T = 1 mA	13.3	-	-	V_{BR} (V)
Reverse leakage current	V_{RWM} = 12 V	-	-	200	I_R (µA)
Peak pulse current	t_p = 8/20 µs	-	-	4	I_{pp} (A)
Clamping voltage	I_{PP} = 1 A, t_p = 8/20 µs	-	16	20	V_C (V)
	I_{PP} = 4 A, t_p = 8/20 µs	-	22	26	V_C (V)
Junction capacitance	V_{RWM} = 0 V, f = 1 MHz	-	11	-	C_J (pF)

Mechanical parameters, pad layout- mm



Recommended Soldering Footprint

Dimension	Minimum	Typical	Maximum
A	0.45	0.50	0.55
A1	0	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

(STN101033B101)

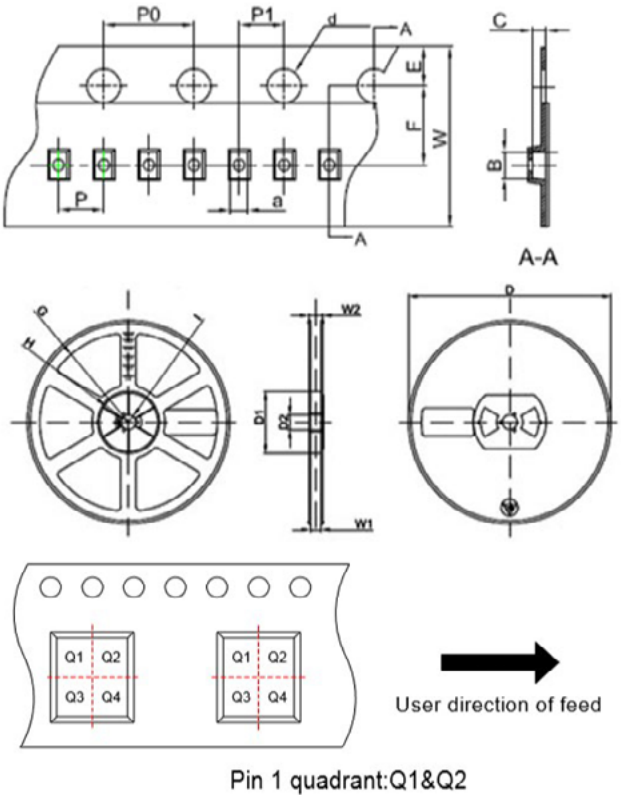
(STN101050B101)

(STN101120B111)

Packaging information- mm/inches

Drawing not to scale.

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

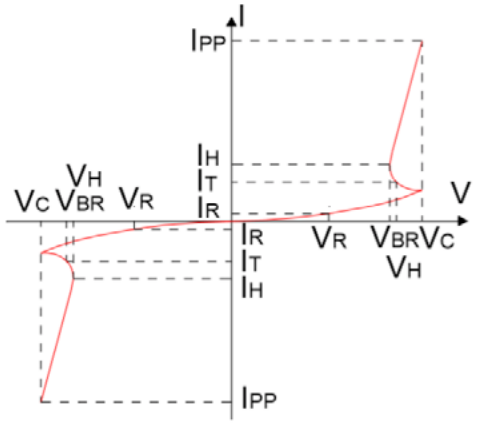


Pin 1 quadrant:Q1&Q2

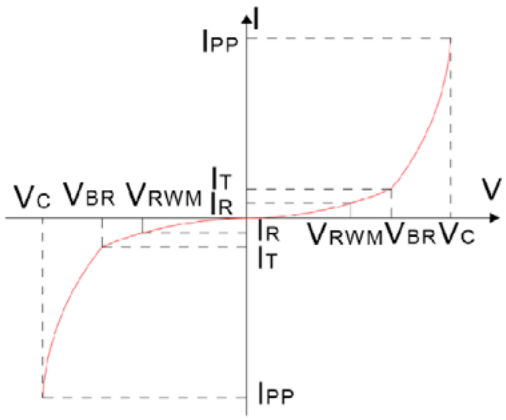
Symbol	Millimeters	Inches
	Typ.	Typ.
a	0.66	0.026
B	1.15	0.045
C	0.66	0.026
d	Φ1.50	Φ0.059
E	1.75	0.069
F	3.50	0.138
P0	4.00	0.157
P	2.00	0.079
P1	2.00	0.079
W	8.00	0.315
D	Φ178	Φ7.008
D1	54.40	2.142
D2	13.00	0.512
G	R78.00	R3.071
H	R25.60	R1.008
I	R6.50	R0.256
W1	9.50	0.374
W2	12.30	0.484

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

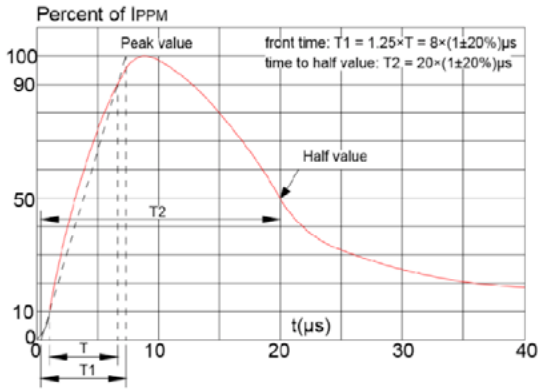
V- I curve characteristics (Bi-directional)
STN101033B101



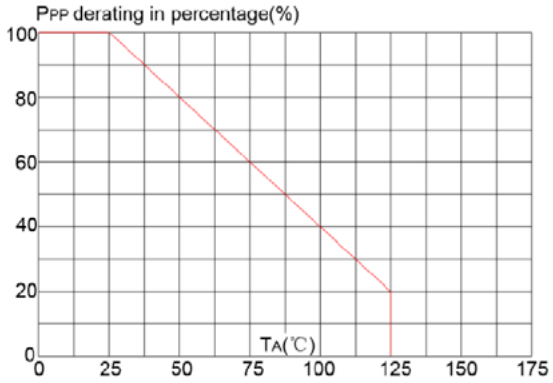
V- I curve characteristics (Bi-directional)
STN101050B101 & STN101120B111



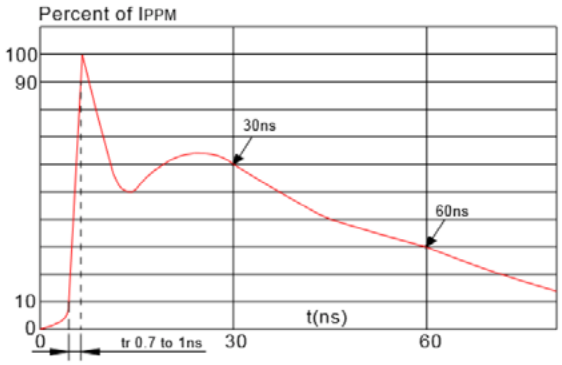
Pulse waveform (8/20 µs)



Pulse derating curve



ESD waveform



Solder reflow profile

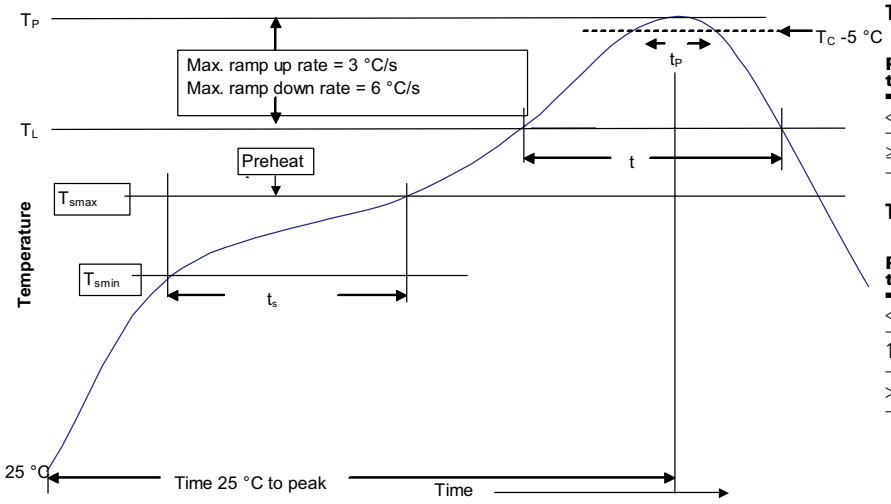


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm3 <350	Volume mm3 ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

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

Package thickness	Volume mm^3 <350	Volume mm^3 350 - 2000	Volume 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	• Temperature min. (T_{smin})	100 °C	150 °C
	• Temperature max. (T_{smax})	150 °C	200 °C
	• Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds	60-120 seconds
Ramp up rate T_L to T_p		3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L		183 °C 60-150 seconds	217 °C 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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