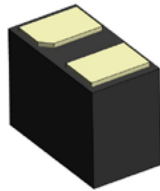


# STN06XXXB101

## TVS Diode ESD suppressor



### Product features

- Protects one bi-directional I/O line
- Low clamping voltage
- Low operating voltage
- 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

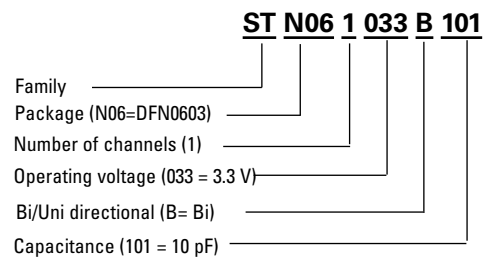
- Cellular handsets and accessories
- Wearables
- Notebooks, desktops, and servers
- Portable instrumentation
- Communication systems
- Microprocessor based equipment

### Environmental compliance and general specifications

- IEC61000-4-2 (ESD)
  - Up to  $\pm 30$  kV (air)
  - Up to  $\pm 30$  kV (contact)
- IEC61000-4-5 (Lightning) Up to 7 A (8/20  $\mu$ s)



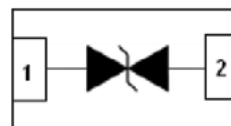
### Ordering part number



### Pin out/functional diagram



DFN0603-2L



PIN Configuration

### Absolute maximum ratings

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

Parameter	Symbol	Value		Unit
		STN061033B101	STN061050B101	
Peak pulse power dissipation on 8/20 μs waveform	$P_{pp}$	60	80	W
ESD per IEC 61000-4-2 (Air)	$V_{ESD}$	+/-30	+/-30	kV
ESD per IEC 61000-4-2 (Contact)		+/-30	+/-30	
Lead soldering temperature	$T_L$	+260 (10 seconds)	+260 (10 seconds)	°C
Operating junction temperature range	$T_J$	-55 to +125	-55 to +125	°C
Storage temperature range	$T_{STG}$	-55 to +150	-55 to +150	°C

### Electrical characteristics

(+25 °C)

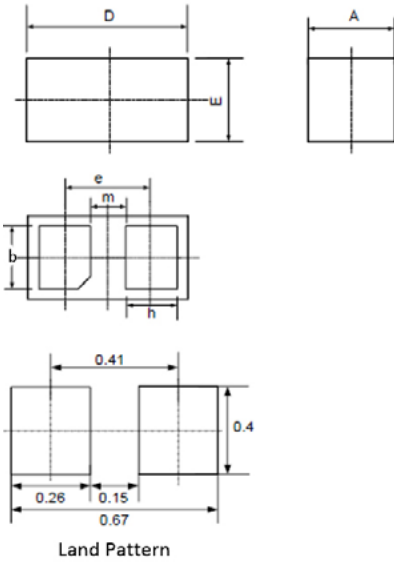
#### STN061033B101

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	3.3	$V_{RWM}$ (V)
Reverse breakdown voltage	$I_T = 1$ mA	3.7	-	-	$V_{BR}$ (V)
Reverse leakage current	$V_{RWM} = 3.3$ V	-	-	100	$I_R$ (μA)
Peak pulse current	$t_p = 8/20$ μs	-	-	7	$I_{pp}$ (A)
Clamping voltage	$I_{pp} = 1$ A, $t_p = 8/20$ μs	-	5.5	7	$V_C$ (V)
	$I_{pp} = 7$ A, $t_p = 8/20$ μs	-	8.5	10	$V_C$ (V)
Junction capacitance	$V_{RWM} = 0$ V, $f = 1$ MHz	-	10	15	$C_J$ (pF)

#### STN061050B101

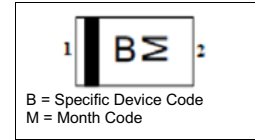
Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	5	$V_{RWM}$ (V)
Reverse breakdown voltage	$I_T = 1$ mA	5.5	-	-	$V_{BR}$ (V)
Reverse leakage current	$V_{RWM} = 5$ V	-	-	100	$I_R$ (μA)
Peak pulse current	$t_p = 8/20$ μs	-	-	5	$I_{pp}$ (A)
Clamping voltage	$I_{pp} = 1$ A, $t_p = 8/20$ μs	-	9.5	11	$V_C$ (V)
	$I_{pp} = 5$ A, $t_p = 8/20$ μs	-	13	15	$V_C$ (V)
Junction capacitance	$V_{RWM} = 0$ V, $f = 1$ MHz	-	10	15	$C_J$ (pF)

**Mechanical parameters, pad layout- mm**

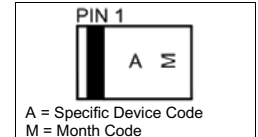


Dimension	Minimum	Maximum
A	0.28	0.32
D	0.55	0.65
E	0.25	0.35
b	0.20	0.30
e	0.350	
m	0.165	
h	0.14	0.24

**Part marking**



(STN061033B101)

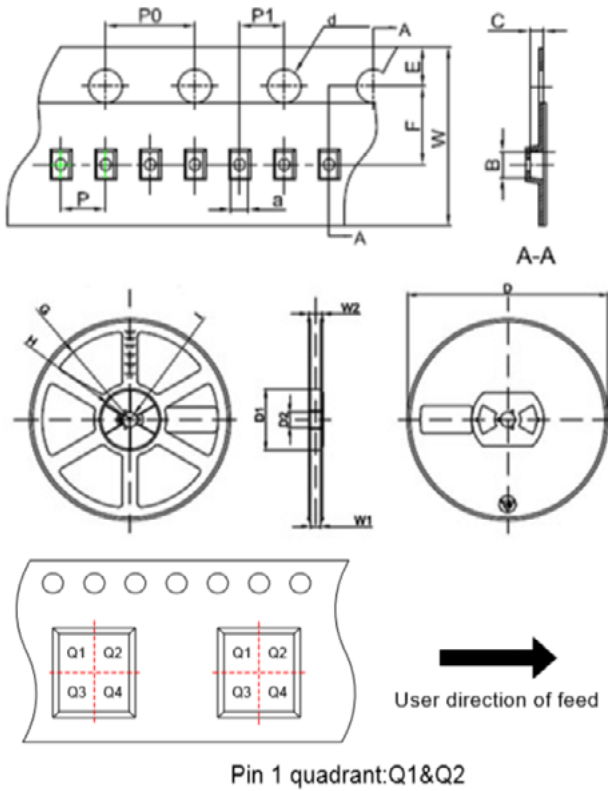


(STN061050B101)

**Packaging information mm/inches**

Drawing not to scale.

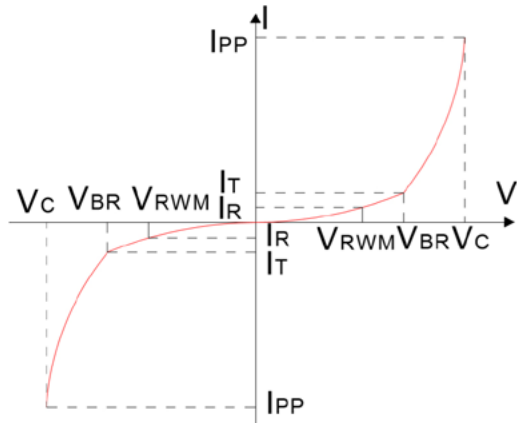
Supplied in tape and reel packaging, 10,000 parts per 7" diameter reel (EIA-481 compliant)



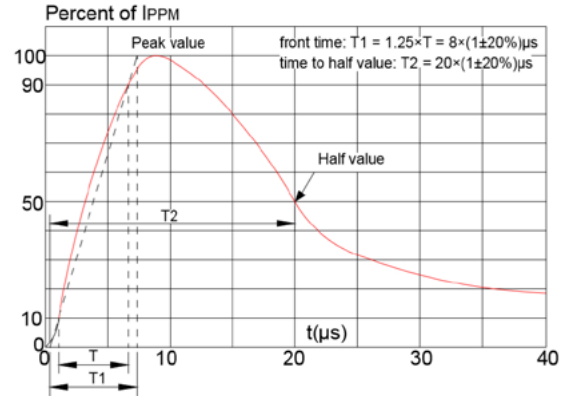
Symbol	Millimeters	Inches
	Typ.	Typ.
a	0.41	0.016
B	0.70	0.028
C	0.38	0.015
d	Φ1.50	Φ0.059
E	1.75	0.069
F	3.50	0.138
P0	4.00	0.157
P	2.00	0.079
P1	2.00	0.079
W	8.00	0.315
D	Φ178	Φ7.008
D1	54.40	2.142
D2	13.00	0.512
G	R78.00	R3.071
H	R25.60	R1.008
I	R6.50	R0.256
W1	9.50	0.374
W2	12.30	0.484

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

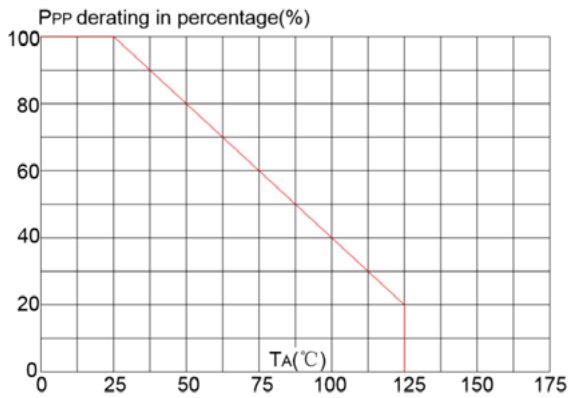
**V- I curve characteristics (Bi-directional)**



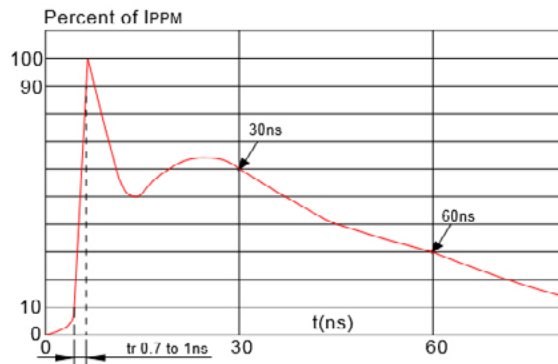
**Pulse waveform (8/20  $\mu$ s)**



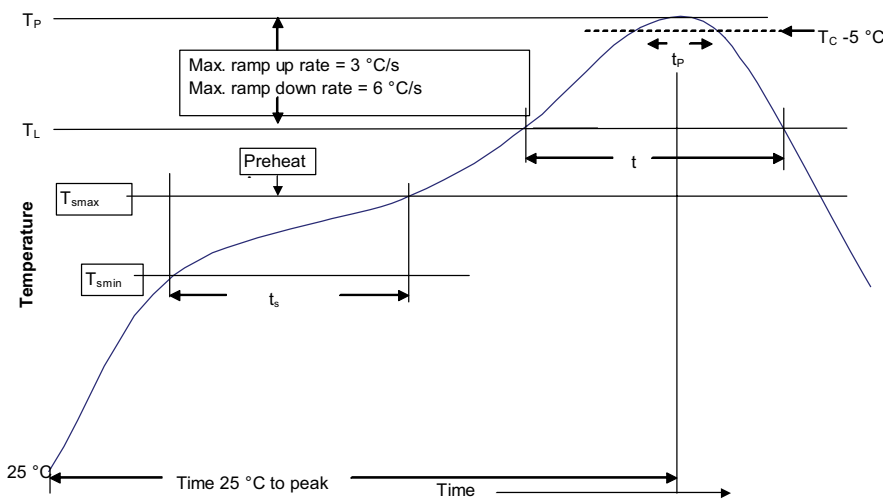
**Pulse derating curve**



**ESD waveform**



**Solder reflow profile**



**Table 1 - Standard SnPb solder ( $T_C$ )**

Package thickness	Volume 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 ( $T_C$ )**

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. ( $T_{smin}$ )	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 ( $T_L$ )	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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