

STN10XXXXLXX

TVS Diode ESD suppressor



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

Applications

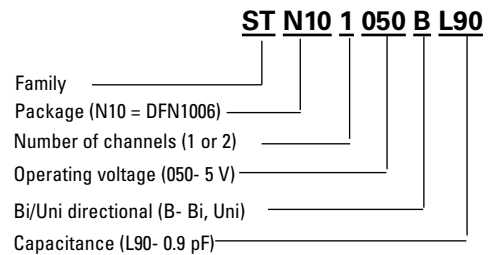
- USB ports
- Display port
- Wireless communications
- Digital visual interface (DVI)
- Cellular handsets & accessories
- Microcontroller input protection

Environmental compliance and general specifications

- IEC61000-4-2 (ESD)
 - ±15 kV (air)
 - ±8 kV (contact)
- IEC61000-4-5 (Lightning) 1 A (8/20 μs)



Ordering part number

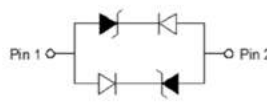


Pin out/functional diagram

STN101050BL90



DFN1006-2L

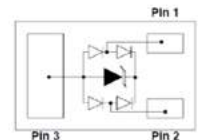


Pin Configuration

STN102050UL80



DFN1006-3L



Absolute maximum ratings

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

Parameter	Symbol	Value		Unit
		STN101050BL90	STN102050UL80	
Peak pulse power dissipation on 8/20 μs waveform	P_{pp}	30	60	W
ESD per IEC 61000-4-2 (Air)	V_{ESD}	+/-15	+/-15	kV
ESD per IEC 61000-4-2 (Contact)		+/-8	+/-8	
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)

STN101050BL90

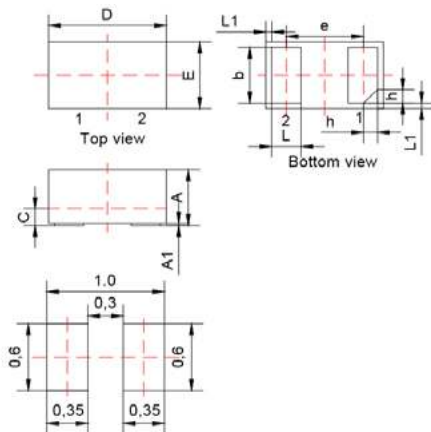
Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	5.0	V_{RWM} (V)
Reverse breakdown voltage	$I_T = 1$ mA	6.0	-	-	V_{BR} (V)
Reverse leakage current	$V_{RWM} = 5$ V	-	-	1.0	I_R (μA)
Peak pulse current	$t_p = 8/20$ μs	-	-	1	I_{pp} (A)
Clamping voltage	$I_{pp} = 1$ A, $t_p = 8/20$ μs	-	8.5	12.5	V_C (V)
Junction capacitance	$V_{RWM} = 0$ V, $f = 1$ MHz	-	0.9	1.5	C_J (pF)

STN102050UL80

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	-	-	1.0	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	-	8.5	12	V_C (V)
Junction capacitance	$V_{RWM} = 0$ V, $f = 1$ MHz Between I/O	-	-	0.8	C_J (pF)

Mechanical parameters, pad layout- mm

STN101050BL90



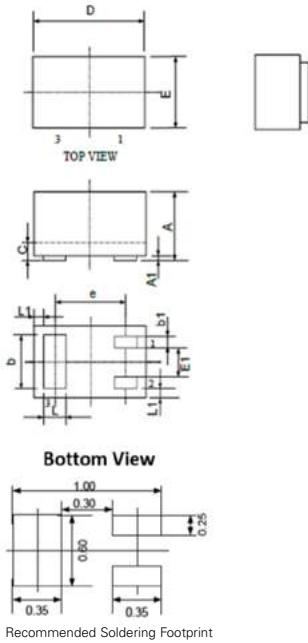
Recommended Soldering Footprint

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



Mechanical parameters, pad layout- mm
STN102050UL80



Dimension	Minimum	Typical	Maximum
A	0.41	0.45	0.50
A1	0	0.02	0.05
b	0.45	0.50	0.55
b1	0.10	0.15	0.20
C	0.12	0.15	0.18
D	0.95	1.00	1.05
e		0.65 SBC	
E	0.55	0.60	0.65
E1	0.15	0.20	0.25
L	0.20	0.25	0.30
L1		0.05 REF	

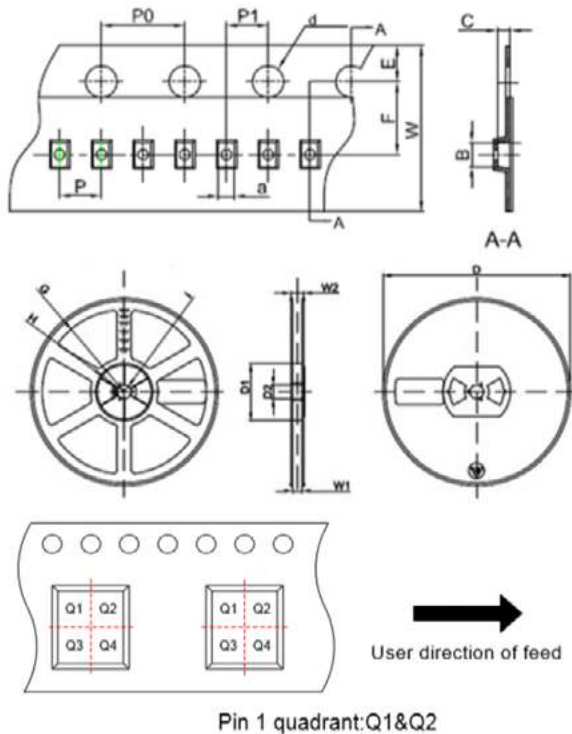
Part marking



Packaging information- mm/inches

Drawing not to scale.

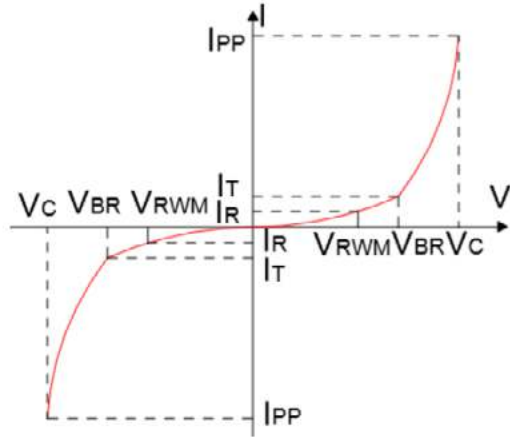
Supplied in tape and reel packaging, 10,000 parts per 7" diameter reel (EIA-481 compliant)



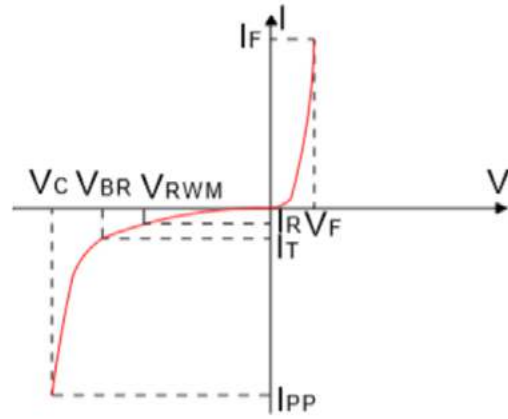
Symbol	Millimeters	Inches
	Typ.	Typ.
a	0.66	0.026
B	1.15	0.045
C	0.66	0.026
d	Φ1.50	Φ0.059
E	1.75	0.069
F	3.50	0.138
P0	4.00	0.157
P	2.00	0.079
P1	2.00	0.079
W	8.00	0.315
D	Φ178	Φ7.008
D1	54.40	2.142
D2	13.00	0.512
G	R78.00	R3.071
H	R25.60	R1.008
I	R6.50	R0.256
W1	9.50	0.374
W2	12.30	0.484

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

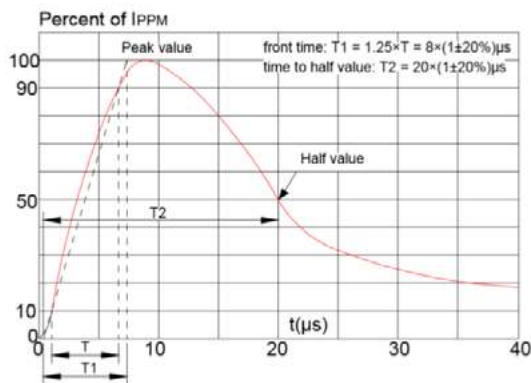
V- I curve characteristics (Bi-directional)
STN101050BL90



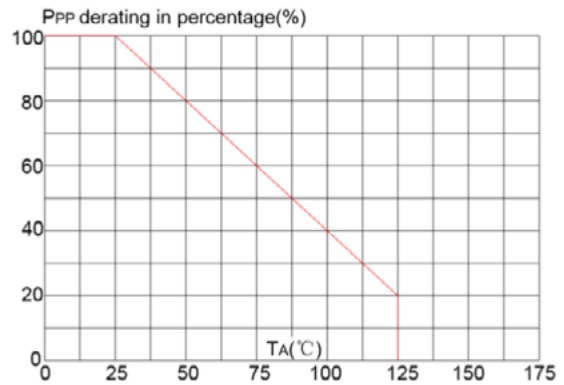
V- I curve characteristics (Uni-directional)
STN102050UL80



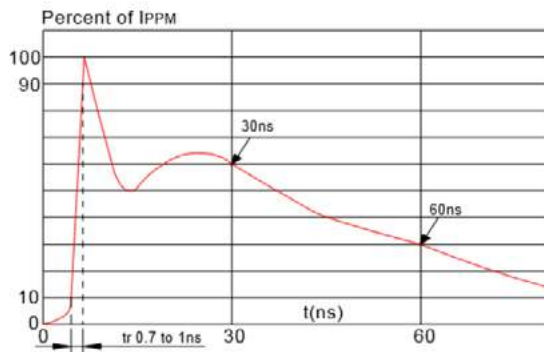
Pulse waveform (8/20 μs)



Pulse derating curve



ESD waveform



Solder reflow profile

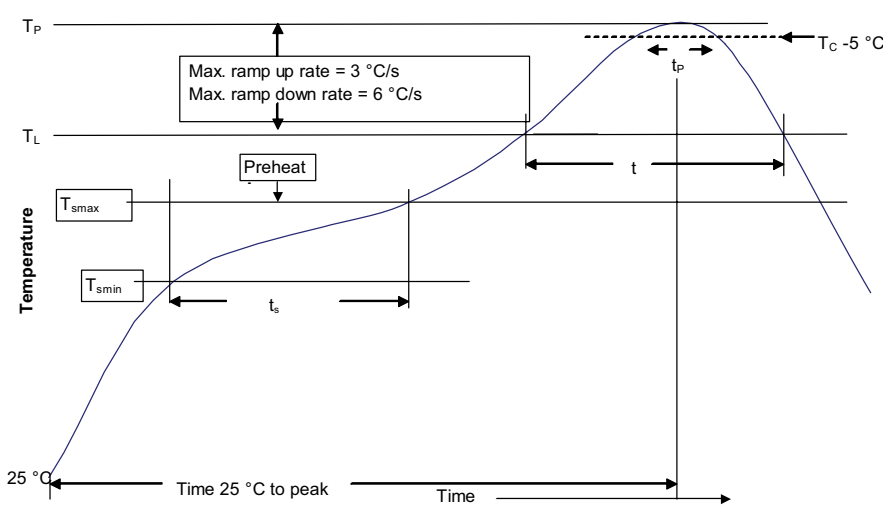


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm ³ <350	Volume mm ³ ≥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)	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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