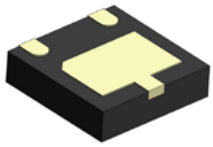
STN202XXXUXXX

TVS Diode array ESD suppressor



Applications

- Power lines
- DC Fast charging
- Microprocessors based equipment
- Notebooks, desktops, and servers
- Cellular handsets and accessories
- Portable electronics and peripherals

Product features

- Low leakage current
- Low clamping voltage
- Solid-state silicon-avalanche technology
- Meets moisture sensitivity level (MSL) 3
- Molding compound flammability rating: UL 94V-0
- Termination finish: Tin plating

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 240 A (8/20 µs)

Ordering part number

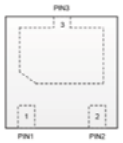
ST N20 2 075 U 173

- Family
- Package (N20- DFN2x2)
- Number of channels (2)
- Operating voltage (075- 7.5 V)
- Bi/Uni directional (U- Uni)
- Capacitance (173- 1700 pF)

Pin out/functional diagram

DFN2x2-3L

Circuit Diagram



Pin Configuration

Powering Business Worldwide

Absolute maximum ratings

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

Parameter	Symbol	Value			Unit
		STN202075U173	STN202120U952	STN202150U952	
Peak pulse power dissipation on 8/20 µs waveform	P_{PP}	5000	4500	4500	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)

STN202075U173

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	7.5	V_{RWM} (V)
Reverse breakdown voltage	I_T = 1 mA	8	9	10	V_{BR} (V)
Reverse leakage current	V_{RWM} = 7.5 V	-	-	1	I_R (µA)
Clamping voltage	I_{PP} = 50 A, t_p = 8/20 µs	-	13	15.5	V_C (V)
	I_{PP} = 100 A, t_p = 8/20 µs	-	15.5	18.5	V_C (V)
	I_{PP} = 240 A, t_p = 8/20 µs	-	21	25	V_C (V)
Junction capacitance	V_{RWM} = 0 V, f = 1 MHz	1600	1700	2200	C_J (pF)

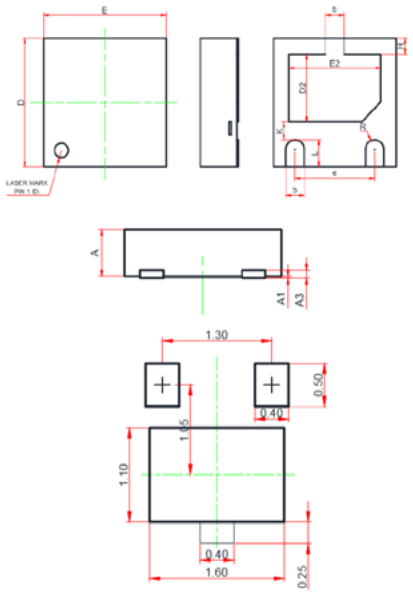
STN202120U952

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	12	V_{RWM} (V)
Reverse breakdown voltage	I_T = 1 mA	13	14.5	16	V_{BR} (V)
Reverse leakage current	V_{RWM} = 12 V	-	-	1	I_R (µA)
Clamping voltage	I_{PP} = 50 A, t_p = 8/20 µs	-	-	22	V_C (V)
	I_{PP} = 100 A, t_p = 8/20 µs	-	-	25	V_C (V)
	I_{PP} = 180 A, t_p = 8/20 µs	-	-	32	V_C (V)
Junction capacitance	V_{RWM} = 0 V, f = 1 MHz	900	950	1200	C_J (pF)

STN202150U952

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	15	V_{RWM} (V)
Reverse breakdown voltage	I_T = 1 mA	16	17.5	19	V_{BR} (V)
Reverse leakage current	V_{RWM} = 15 V	-	-	1	I_R (µA)
Clamping voltage	I_{PP} = 50 A, t_p = 8/20 µs	-	22	25	V_C (V)
	I_{PP} = 100 A, t_p = 8/20 µs	-	25	27	V_C (V)
	I_{PP} = 150 A, t_p = 8/20 µs	-	29	35	V_C (V)
Junction capacitance	V_{RWM} = 0 V, f = 1 MHz	-	950	1200	C_J (pF)

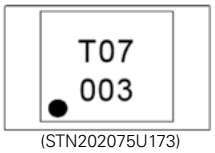
Mechanical parameters, pad layout- mm



Land pattern

Dimension	Minimum	Typical	Maximum
A	0.51	0.55	0.60
A1	0.00	0.02	0.05
A3		0.15 REF	
b	0.25	0.30	0.35
D	1.90	2.00	2.10
E	1.90	2.00	2.10
D2	0.85	1.00	1.10
E2	1.35	1.50	1.60
e	1.20	1.30	1.40
H	0.20	0.25	0.30
K	0.20	0.30	0.40
L	0.35	0.40	0.45
R	0.15	-	-

Part marking



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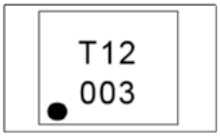

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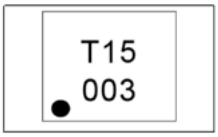
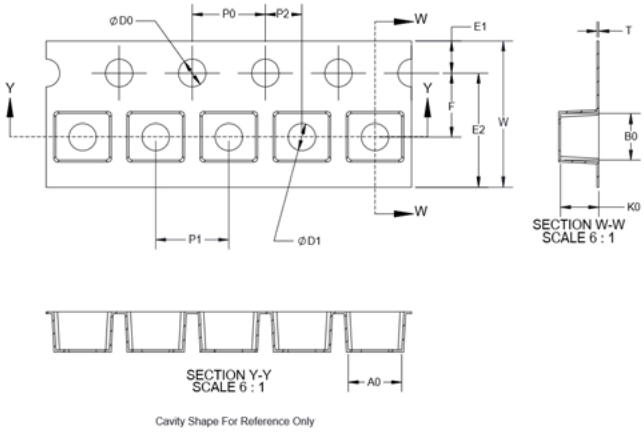


(STN202150U952)

Packaging information (mm)

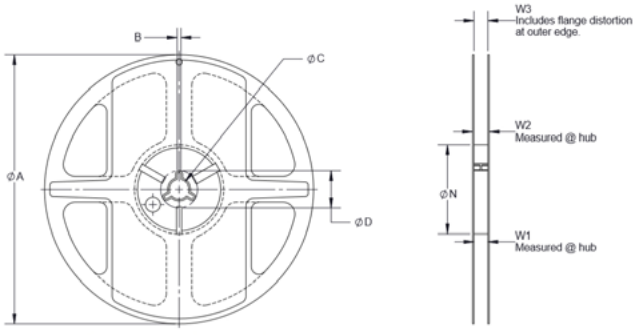
Drawing not to scale.

Supplied in tape and reel packaging, 3,000 parts per 7" diameter reel (EIA-481 compliant)



Cavity Shape For Reference Only

W	8.00
F	3.50
E1	1.75
E2	N/A
P0	4.00
P1	4.00
P2	2.00
ØD0	1.55
ØD1	N/A
A0	2.20
B0	2.20
K0	0.70
T	N/A

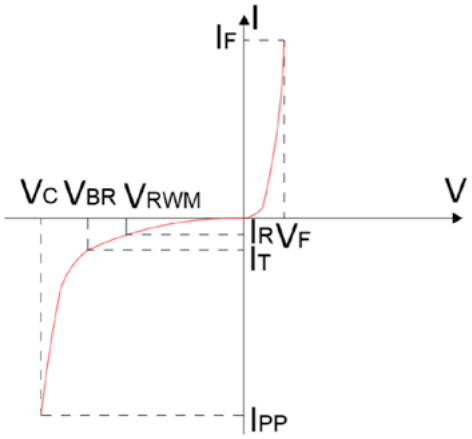


Shape & Appearance For Reference Only

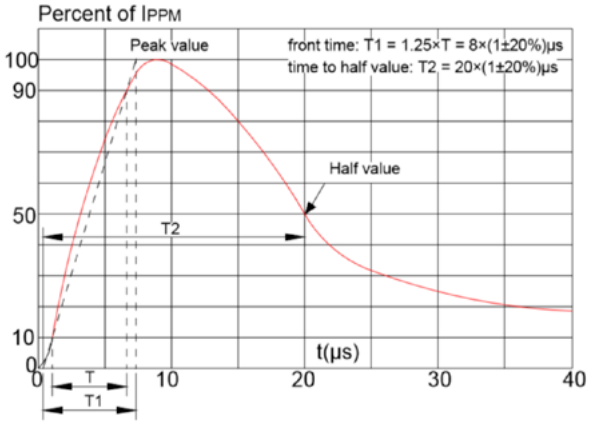
A	178.00
B	N/A
C	13.00
D	N/A
N	54.40
W1	9.50
W2	12.30
W3	N/A

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

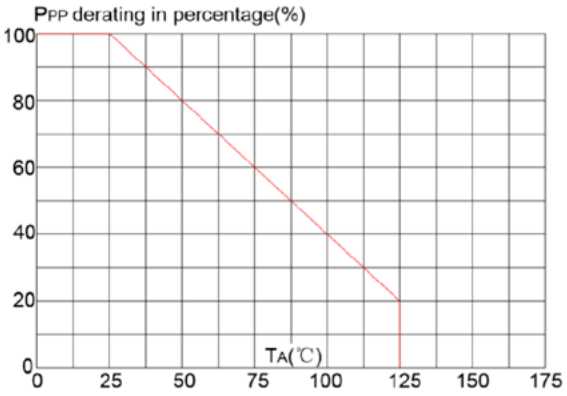
V- I curve characteristics (Uni-directional)



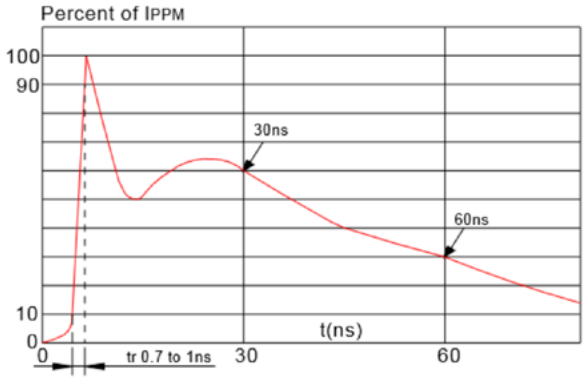
Pulse waveform (8/20 µs)



Pulse derating curve



ESD waveform



Solder reflow profile

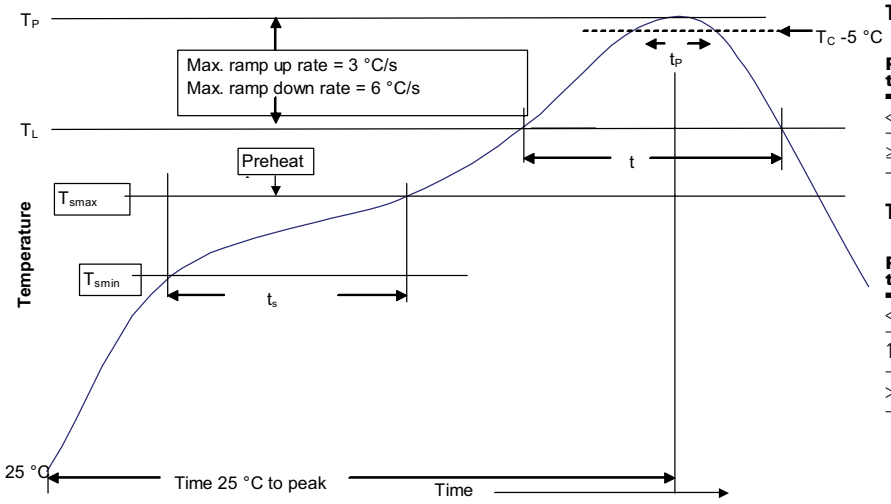


Table 1 - Standard SnPb solder (T_C)

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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