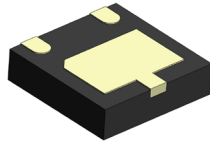


STN202XXXUXXX

TVS Diode array ESD suppressor



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

Applications

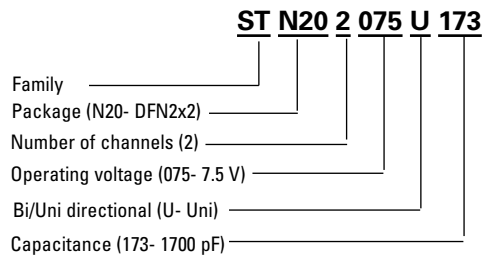
- Power lines
- DC Fast charging
- Microprocessors based equipment
- Notebooks, desktops, and servers
- Cellular handsets and accessories
- Portable electronics and peripherals

Environmental compliance and general specifications

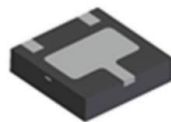
- IEC61000-4-2 (ESD)
 - Up to ±30 kV (air)
 - Up to ±30 kV (contact)
- IEC61000-4-5 (Lightning) Up to 240 A (8/20 μs)



Ordering part number



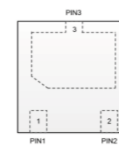
Pin out/functional diagram



DFN2x2-3L



Circuit Diagram



Pin Configuration

Absolute maximum ratings

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

Parameter	Symbol	Value				Unit
		STN202075U173	STN202120U952	STN202150U952	STN202240U752	
Peak pulse power dissipation on 8/20 μs waveform	P_{pp}	5000	4500	4500	6000	W
ESD per IEC 61000-4-2 (Air)	V_{ESD}	+/-30	+/-30	+/-30	+/-30	kV
ESD per IEC 61000-4-2 (Contact)		+/-30	+/-30	+/-30	+/-30	
Lead soldering temperature	T_L	+260 (10 seconds)	+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	-55 to +125	°C
Storage temperature range	T_{STG}	-55 to +150	-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)

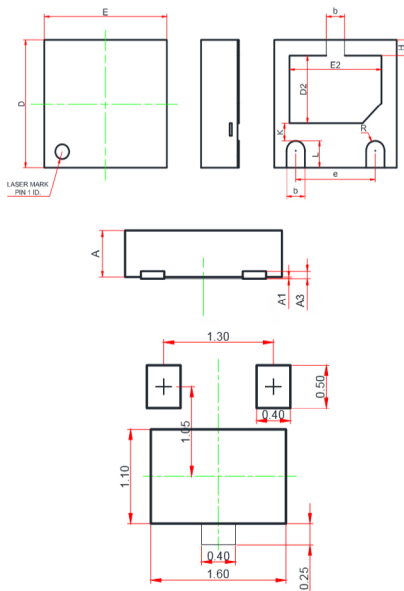
STN202150U952

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)

STN202240U752

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	24	V_{RWM} (V)
Reverse breakdown voltage	$I_T = 1$ mA	26	27	30	V_{BR} (V)
Reverse leakage current	$V_{RWM} = 24$ V	-	-	1	I_R (μ A)
Clamping voltage	$I_{PP} = 50$ A, $t_p = 8/20$ μ s	-	45	50	V_C (V)
	$I_{PP} = 120$ A, $t_p = 8/20$ μ s	-	52	60	V_C (V)
Junction capacitance	$V_{RWM} = 0$ V, $f = 1$ MHz	-	750	-	C_J (pF)

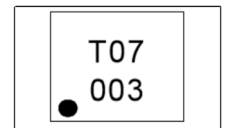
Mechanical parameters, pad layout- mm



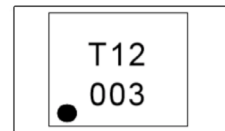
Land pattern

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	-	-

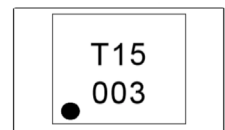
Part marking



(STN202075U173)



(STN202120U952)

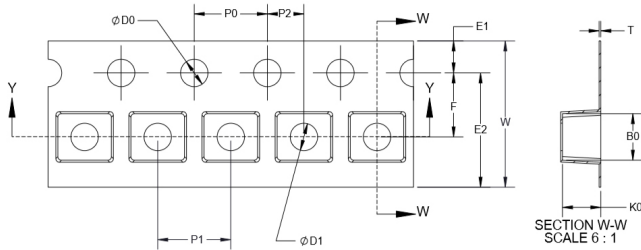


(STN202150U952)

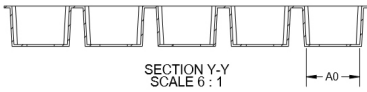
Packaging information (mm)

Drawing not to scale.

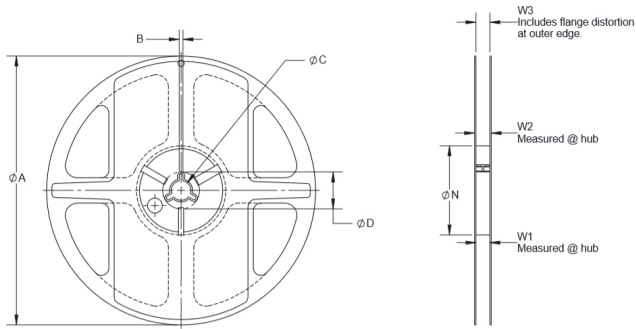
Supplied in tape and reel packaging, 3,000 parts per 7" diameter reel (EIA-481 compliant)



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



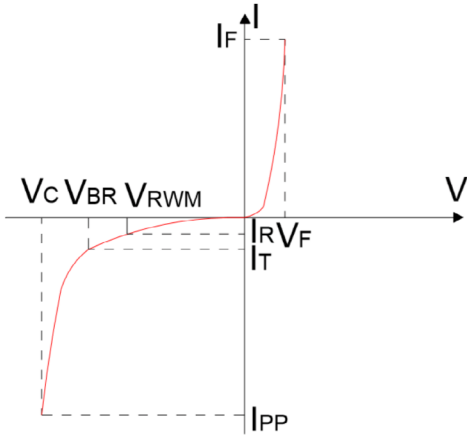
Cavity Shape For Reference Only



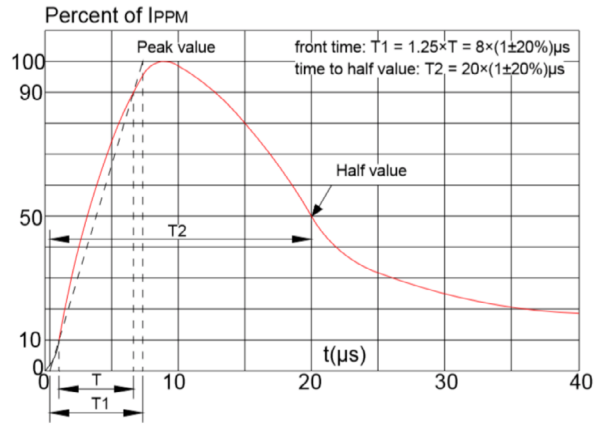
A	178.00
B	N/A
C	13.00
D	N/A
N	54.40
W1	9.50
W2	12.30
W3	N/A

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

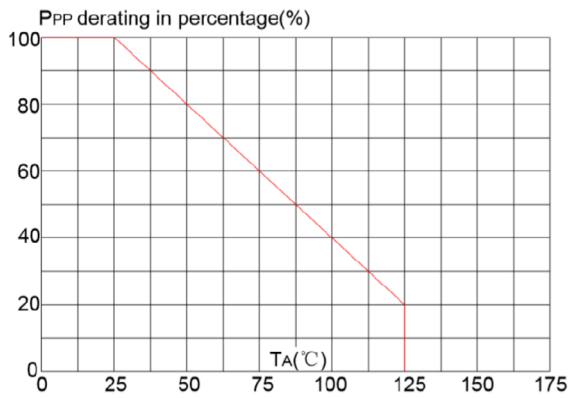
V- I curve characteristics (Uni-directional)



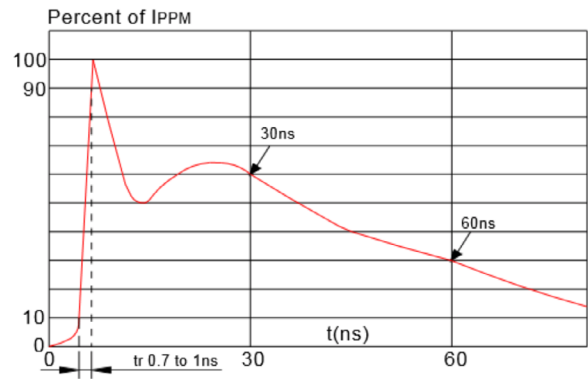
Pulse waveform (8/20 μ s)



Pulse derating curve



ESD waveform



Solder reflow profile

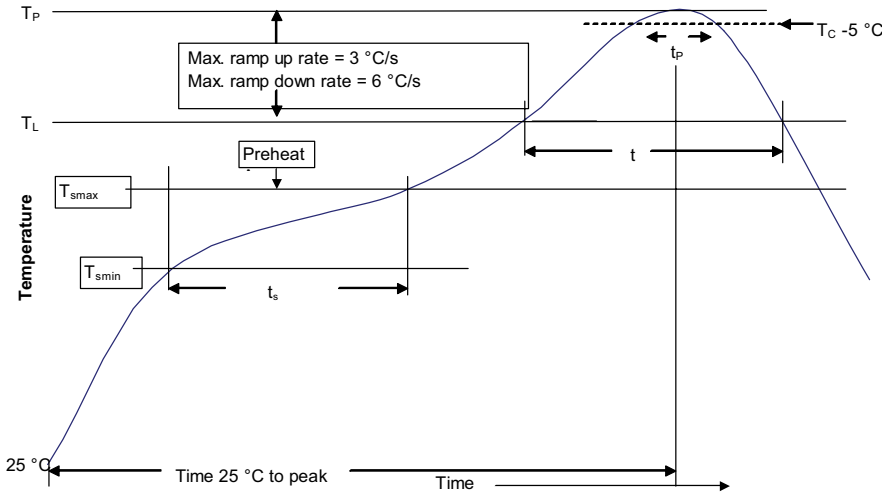


Table 1 - Standard SnPb solder (T_c)

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	<ul style="list-style-type: none"> Temperature min. (T_{smin}) Temperature max. (T_{smax}) Time (T_{smin} to T_{smax}) (t_s) 	<ul style="list-style-type: none"> 100 °C 150 °C 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	<ul style="list-style-type: none"> 183 °C 60-150 seconds 	<ul style="list-style-type: none"> 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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