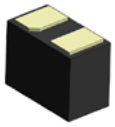
STN061050B300

TVS Diode ESD suppressor



Applications

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

Product features

- Protects one bi-directional I/O line
- Low clamping voltage
- Low operating voltage: 5.0 V
- Low leakage current
- Ultra-low capacitance
- 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)
  - ± 30 kV (air)
  - ± 30 kV (contact)
- IEC61000-4-5 (Lightning) 3.5 A (8/20 µs)

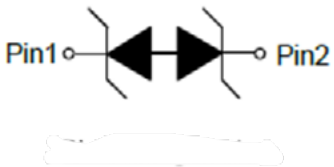
Ordering part number

ST N06 1 050 B 300

- Family
- Package (N06=DFN0603)
- Number of channels
- Operating voltage (050=5 V)
- Bi/Uni directional (B=Bi)
- Capacitance (300= 3 pF)

Pin out/functional diagram

DFN0603-2L



Powering Business Worldwide

Absolute maximum ratings

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

STN061050B300

Parameter	Symbol	Value	Unit
Peak pulse power dissipation on 8/20 µs waveform	P_{pp}	41	W
ESD per IEC 61000-4-2 (Air)	V_{ESD}	+/-30	kV
ESD per IEC 61000-4-2 (Contact)		+/-30	
Lead soldering temperature	T_L	+260 (10 seconds)	°C
Operating junction temperature range	T_J	-55 to +125	°C
Storage temperature range	T_{STG}	-55 to +150	°C

Electrical characteristics

(+25 °C)

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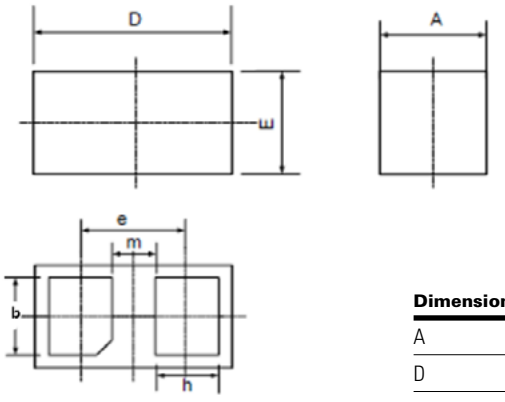
Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	-	-	-	5.0	V_{RWM} (V)
Reverse breakdown voltage	I_T = 1 mA	5.3	-	-	V_{BR} (V)
Reverse leakage current	V_{RWM} = 3.3 V	-	-	0.1	I_R (µA)
Holding voltage	t_p = 8/20 µs	5.3	-	-	V_H (V)
Clamping voltage	I_{PP} =16 A, t_p = 100 ns	-	15	-	V_C (V)*
	V_{ESD} = 8 kV	-	15	-	V_C (V)**
	I_{PP} = 1 A, t_p = 8/20 µs	-	-	8.5	V_C (V)***
	I_{PP} = 7 A, t_p = 8/20 µs	-	-	12	V_C (V)***
Dynamic resistance	t_p = 100 ns	-	0.35	-	R_{DYN} (Ω)*
Junction capacitance	V_{RWM} = 0 V, f = 1 MHz	-	3.0	4.0	C_J (pF)
	V_{RWM} = 2.5 V, f = 1 MHz	-	2.4	3.0	C_J (pF)

*TLP parameter: Z0 = 50 Ω,tP = 100 ns, tr = 2 ns, averaging window from 60 ns to 80 ns. RDYN is calculated from 4 A to 16 A.
** Contact discharge mode, according to IEC61000-4-2.
*** Non-repetitive current pulse, according to IEC61000-4-5.

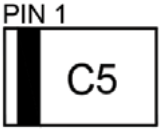
Mechanical parameters, pad layout- mm



Land Pattern

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

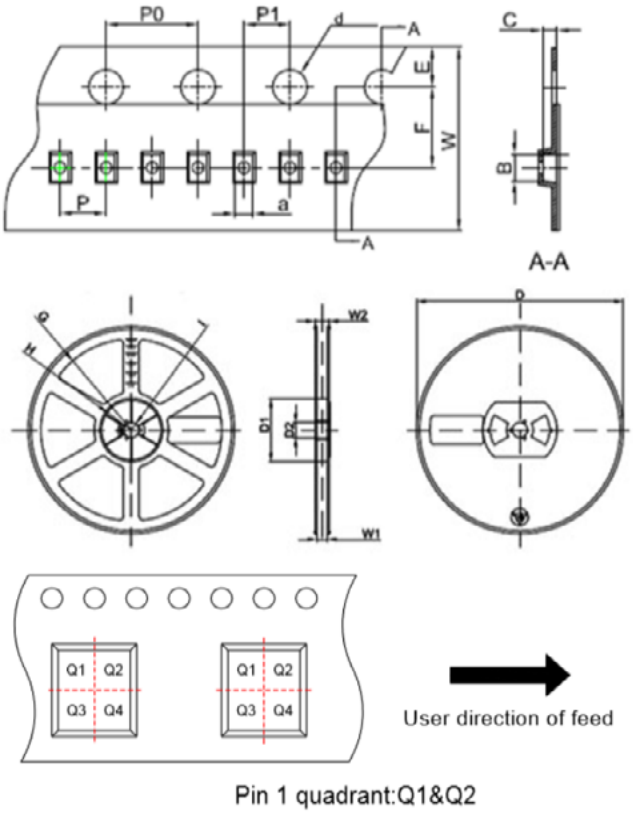
Part marking



Packaging information- mm/inches

Drawing not to scale.

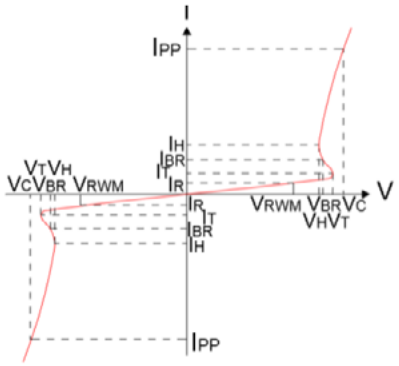
Supplied in tape and reel packaging, 10,000 parts per 7" diameter reel (EIA-481 compliant)



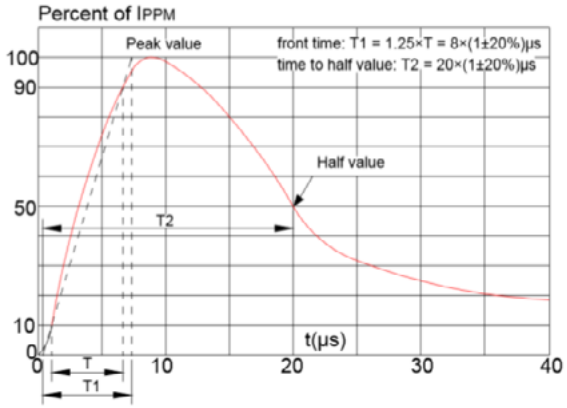
Symbol	Millimeters	Inches
	Typ.	Typ.
a	0.41	0.016
B	0.70	0.028
C	0.38	0.015
d	Φ1.50	Φ0.059
E	1.75	0.069
F	3.50	0.138
P0	4.00	0.157
P	2.00	0.079
P1	2.00	0.079
W	8.00	0.315
D	Φ178	Φ7.008
D1	54.40	2.142
D2	13.00	0.512
G	R78.00	R3.071
H	R25.60	R1.008
I	R6.50	R0.256
W1	9.50	0.374
W2	12.30	0.484

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

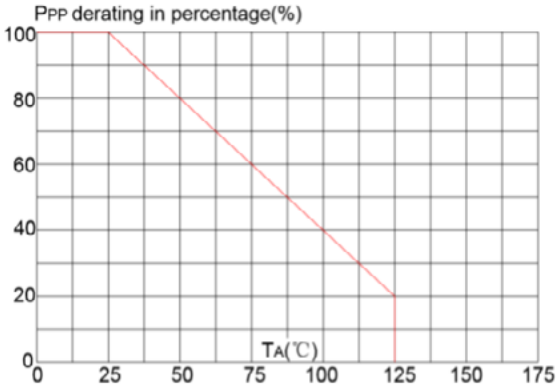
V- I curve characteristics (Bi-directional)



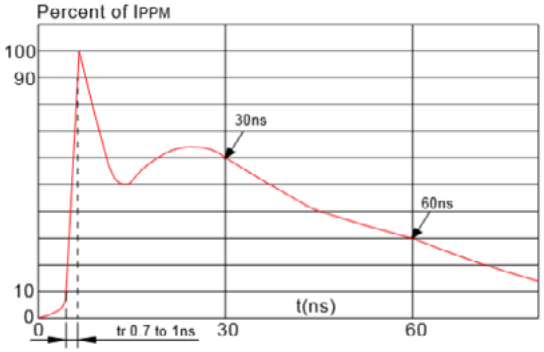
Pulse waveform (8/20 µs)



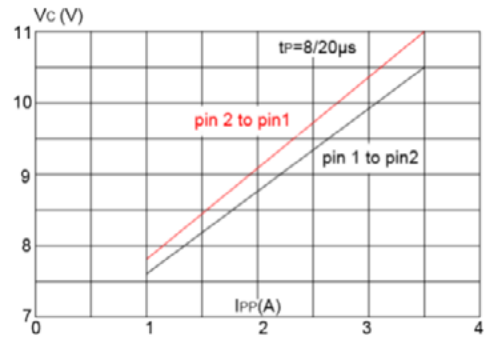
Pulse derating curve



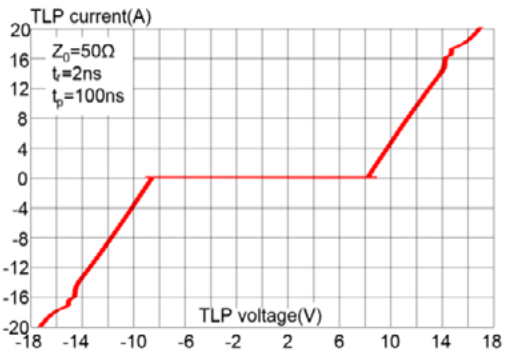
ESD waveform



Clamping voltage vs.peak pulse current



TLP Measurement



Solder reflow profile

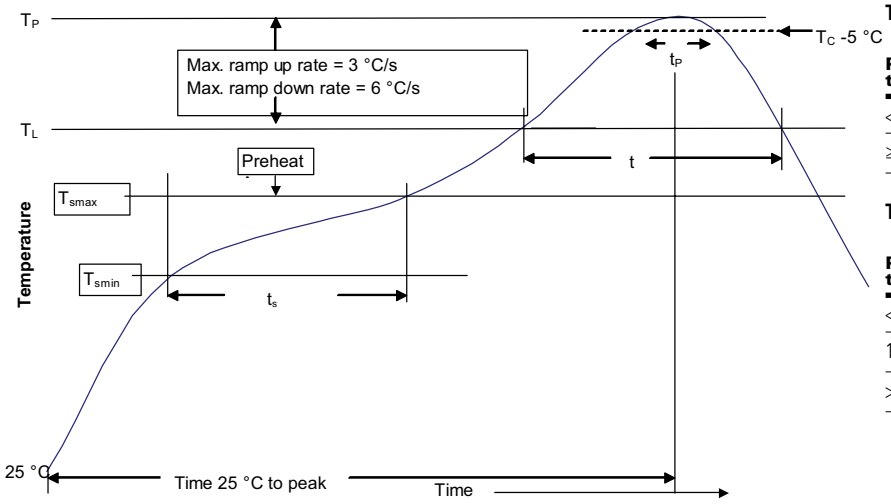


Table 1 - Standard SnPb solder (T_C)

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 mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >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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