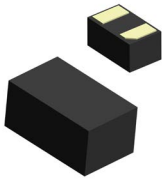
STN101050BLXXAH

Automotive TVS diode ESD suppressor



Product features

- AEC-Q101
- Protects one bi-directional I/O line
- Low clamping voltage
- Low capacitance
- High peak power
- Meets moisture sensitivity level (MSL) 1
- Molding compound flammability rating: UL 94V-0

Applications

- Automotive chassis and safety systems
- Advanced driver assistance systems (ADAS)
- Communication and infotainment systems
- CAN-bus, LIN and Ethernet communication modules
- Network systems and body electronics
- Power train controls
- Automotive lighting

Environmental compliance and general specifications

- IEC61000-4-2 (ESD) Up to ±25 kV (air), ±25 kV (contact)
- IEC61000-4-4 (EFT) 40 A (5/50 ns)
- IEC61000-4-5 (Lightning) 4 A (8/20 µs) STN101050BL25AH
- IEC61000-4-5 (Lightning) 4.5 A (8/20 µs) STN101050BL30AH

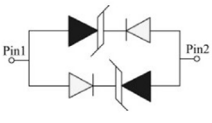
Ordering part number

ST N10 1 050 B L30 AH

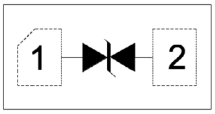
- Family
- Package (N10 - DFN1006)
- Number of channels
- Operating voltage (050- 5 V)
- Bi/Uni directional (B- Bi)
- Capacitance (L30- 0.3 pF)
- Automotive grade

DFN1006-2L (bottom view)

Pin configuration STN101050BL25AH



Pin configuration STN101050BL30AH



Powering Business Worldwide

Product Specifications

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

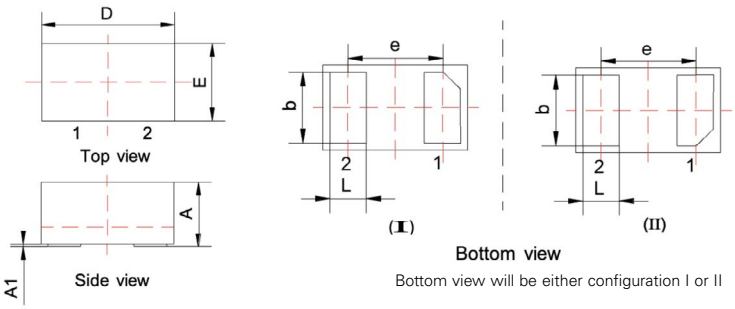
STN101050BL25AH

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Peak pulse power dissipation	8/20 µs waveform	-	60	-	P_{pp} (W)
ESD per IEC 61000-4-2 (Air)	-	-	±25	-	V_{ESD} (kV)
ESD per IEC 61000-4-2 (Contact)			±25		V_{ESD} (kV)
Lead soldering temperature	-	-	-	+260 (10 seconds)	T_L (° C)
Operating junction temperature range	-	-55	-	+150	T_J (° C)
Storage temperature range	-	-55	-	+150	T_{STB} (° C)
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	-	-	0.1	I_R (µA)
Peak pulse current	t_p = 8/20 µs	-	-	4	I_{PP} (A)
Clamping voltage	I_{PP} = 1 A, t_p = 8/20 µs	-	9.5	10.5	V_C (V)
	I_{PP} = 3 A, t_p = 8/20 µs	-	10	12.5	V_C (V)
	I_{PP} = 4 A, t_p = 8/20 µs	-	12.5	15	V_C (V)
Junction capacitance	V_{RWM} = 0 V, f = 1 MHz	-	0.25	0.5	C_J (pF)

STN101050BL30AH

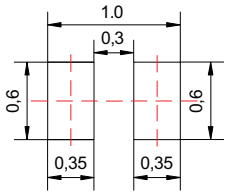
Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Peak pulse power dissipation	8/20 µs waveform	-	100	-	P_{pp} (W)
ESD per IEC 61000-4-2 (Air)	-	-	±20	-	V_{ESD} (kV)
ESD per IEC 61000-4-2 (Contact)			±20		V_{ESD} (kV)
Lead soldering temperature	-	-	-	+260 (10 seconds)	T_L (° C)
Operating junction temperature range	-	-55	-	+150	T_J (° C)
Storage temperature range	-	-55	-	+150	T_{STB} (° C)
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	-	-	4.5	I_{PP} (A)
Clamping voltage	I_{PP} = 1 A, t_p = 8/20 µs	-	10	12.5	V_C (V)
	I_{PP} = 2.5 A, t_p = 8/20 µs	-	15	18	V_C (V)
	I_{PP} = 4.5 A, t_p = 8/20 µs	-	25	30	V_C (V)
Junction capacitance	V_{RWM} = 0 V, f = 1 MHz	-	0.3	0.5	C_J (pF)

Mechanical parameters - mm/inches



Bottom view will be either configuration I or II

Recommended pad layout- mm



	Millimeters			Inches		
Dimension	**Minimum**	**Typical**	**Maximum**	**Minimum**	**Typical**	**Maximum**
A	0.4	0.5	0.55	0.016	0.020	0.022
A1	-	0.02	0.05	-	0.001	0.002
b	0.45	0.5	0.55	0.018	0.020	0.022
D	0.95	1.0	1.05	0.037	0.039	0.041
e	-	0.65 BSC	-	-	0.026 BSC	-
E	0.55	0.6	0.65	0.022	0.024	0.026
L	0.2	0.25	0.3	0.008	0.010	0.012

Marking code STN101050BL25AH

5T

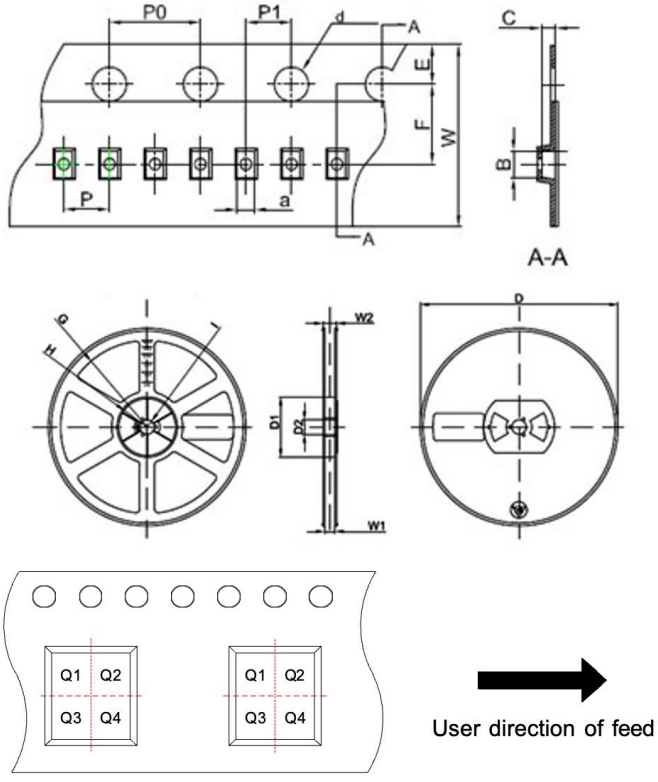
Marking code STN101050BL30AH

5F

Packaging information- mm/inches

Drawing not to scale.

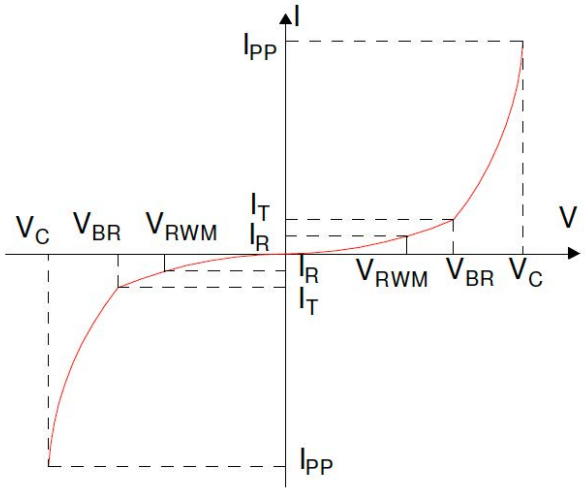
Supplied in tape and reel packaging, 10,000 parts per 7" diameter reel (EIA-481 compliant)



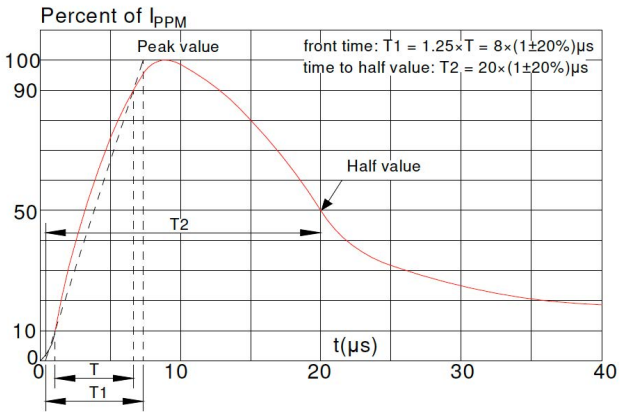
Dimension	**Millimeter (typical)**	**Inches (typical)**
a	0.66	0.026
B	1.15	0.045
C	0.66	0.026
d	1.50	0.059
E	1.75	0.069
F	3.50	0.138
P0	4	0.157
P	2	0.079
P1	2	0.079
W	8	0.315
D	178	7.008
D1	54.40	2.142
D2	13	0.512
G	R78	R3.071
H	R25	R1.008
I	R6.50	R0.256
W1	9.50	0.374
W2	12.30	0.484

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

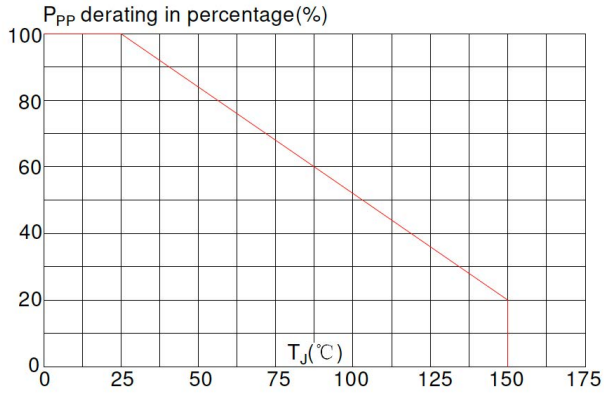
V- I curve characteristics (Bi-directional)



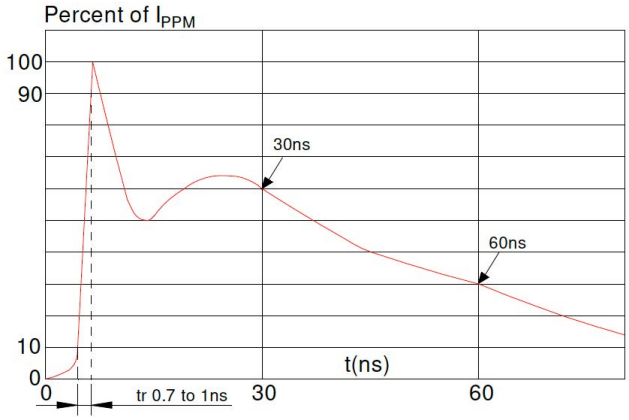
Pulse waveform (8/20 µs)



Pulse derating curve



ESD waveform (15 kV contact)



Solder reflow profile

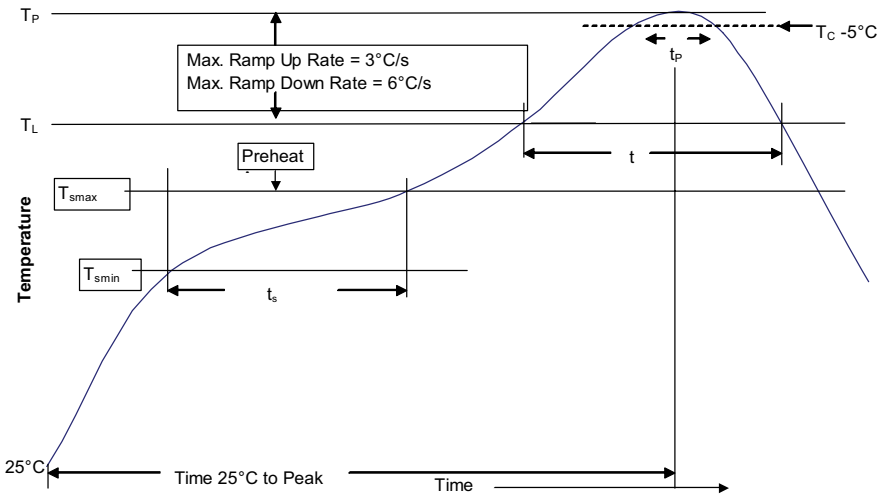


Table 1 - Standard SnPb solder (T_C)

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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