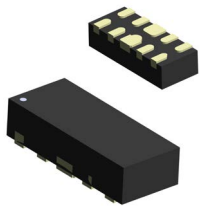
STN254050UL50AH

Automotive TVS diode ESD suppressor



Product features

- AEC-Q101
- Protects up to four I/O lines
- 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) ±15 kV (air), ±8 kV (contact)
- IEC61000-4-4 (EFT) 40 A (5/50 ns)
- IEC61000-4-5 (Lightning) 3.5 A (8/20 µs)

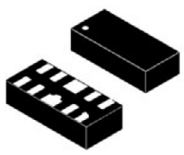
Pb HALOGEN HF FREE RoHS

Ordering part number

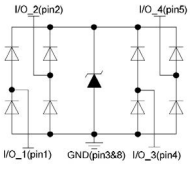
ST N25 4 050 U L50 AH

- Family
- Package (N25 - DFN2510)
- Number of channels
- Operating voltage (050- 5 V)
- Bi/Uni directional (U - Uni)
- Capacitance (L50- 0.5 pF)
- Automotive grade

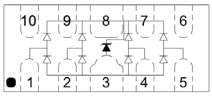
DFN2510-10L



Pin configuration



Pin configuration (top view)



EATON

Powering Business Worldwide

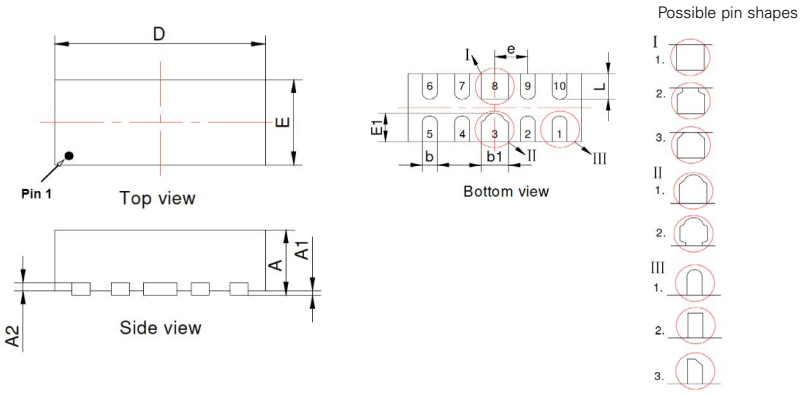
Product specifications

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

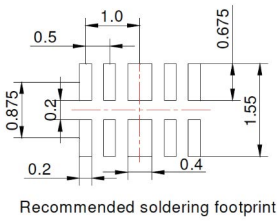
STN254050UL50AH

Parameter	Test condition	Minimum	Typical	Maximum	Symbol (Units)
Reverse working voltage	I/O to GND	-	-	5.0	V_{RWM} (V)
Reverse breakdown voltage	I/O to GND I_T = 1 mA	6.0	7.5	9.0	V_{BR} (V)
Reverse leakage current	I/O to GND V_{RWM} = 5 V	-	0.1	1.0	I_R (µA)
Clamping voltage	I_{PP} = 1 A, tp = 8/20 µs	-	9	10	V_C (V)
	I_{PP} = 3.5 A, tp = 8/20 µs	-	11	12	V_C (V)
Junction capacitance	V_{RWM} = 0 V, f = 1 MHz I/O pin to GND	-	0.50	0.65	C_J (pF)
	V_{RWM} = 0 V, f = 1 MHz Between I/O pins		0.25	0.40	C_J (pF)
Peak pulse power dissipation	8/20 µs waveform	-	100	-	P_{PP} (W)
ESD per IEC 61000-4-2 (Air)	-	-	±15	-	V_{ESD} (kV)
ESD per IEC 61000-4-2 (Contact)	-	-	±8	-	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_{STG} (° C)

Mechanical parameters- mm/inches



Recommended pad layout-mm



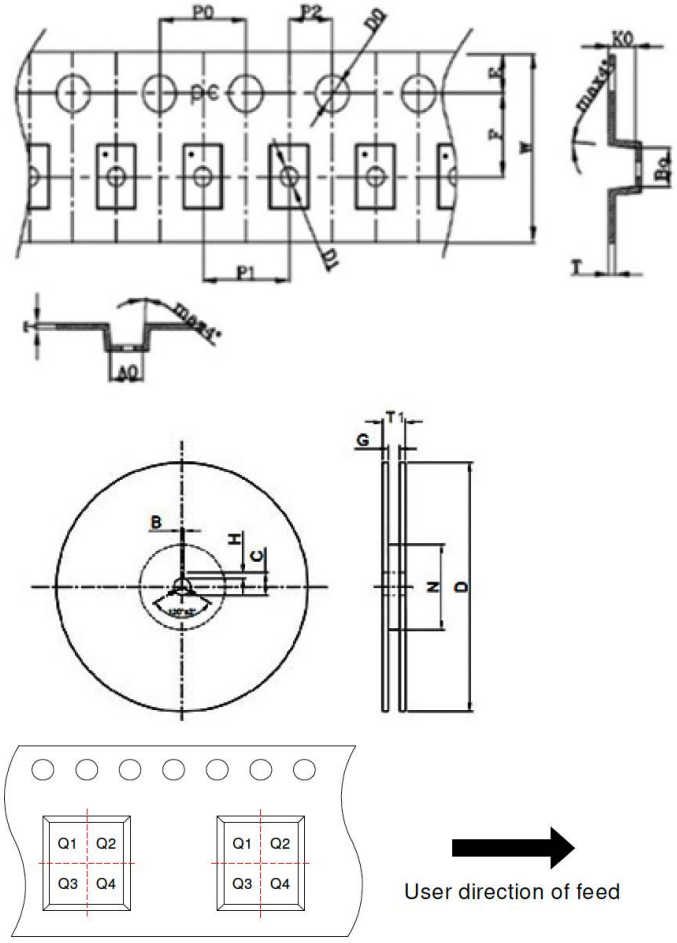
Marking (top view)

	Millimeters			Inches		
Dimension	**Minimum**	**Typical**	**Maximum**	**Minimum**	**Typical**	**Maximum**
A	0.46	0.53	0.6	0.018	0.020	0.024
A1	-	0.02	0.05	-	0.001	0.002
A2	-	0.15 ref	-	-	0.006 ref	-
b	0.15	0.2	0.25	0.006	0.008	0.010
b1	0.35	0.4	0.45	0.014	0.016	0.018
D	2.4	2.5	2.6	0.094	0.098	0.102
E	0.9	1	1.1	0.035	0.039	0.043
E1	0.3	0.4	0.56	0.012	0.016	0.022
e	-	0.50 BSC	-	-	0.020 BSC	-
L	0.3	0.4	0.45	0.012	0.016	0.018

Packaging information mm/inches

Drawing not to scale.

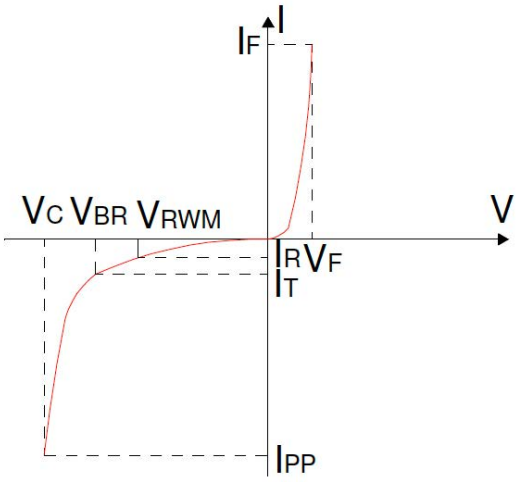
Supplied in tape and reel packaging, 3,000 parts per 7" diameter reel (EIA-481 compliant)



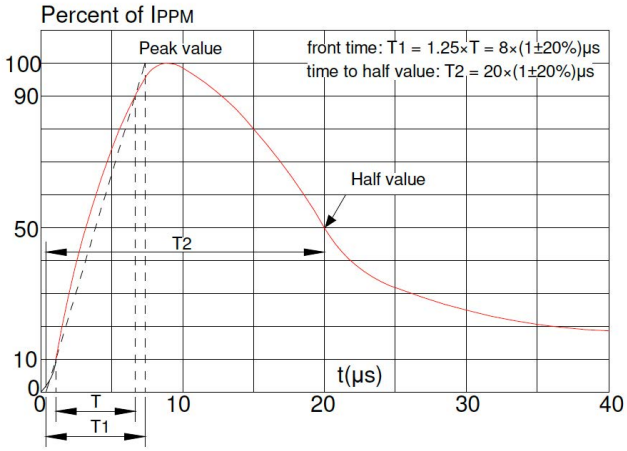
Dimension	Millimeter (typical)	Inches (typical)
A0	1.2	0.047
B0	2.75	0.108
K0	0.7	0.028
P0	4	0.157
P1	4	0.157
P2	2	0.079
T	0.2	0.008
E	1.75	0.069
F	3.5	0.138
D0	1.55	0.061
D1	0.6	0.024
W	8	0.315
B	2	0.079
H	4	0.157
C	13	0.512
G	8.4	0.331
T1	14.9 (maximum)	0.587 (maximum)
N	60	2.362
D	178	7

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

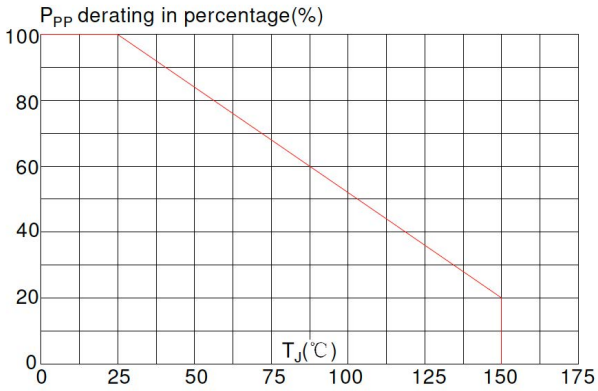
V- I curve characteristics (Uni-directional)



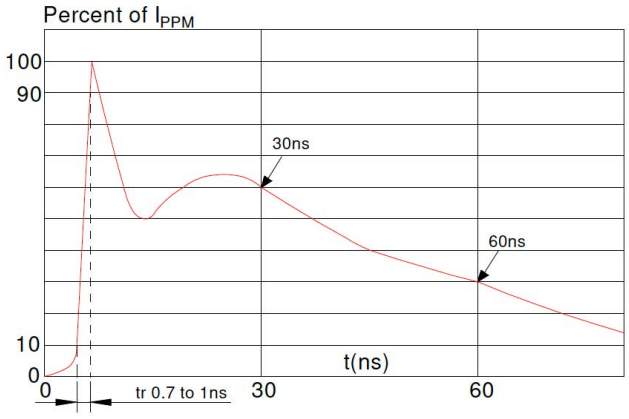
Pulse waveform (8/20 µs)



Pulse derating curve



ESD waveform (8 kV contact)



Solder reflow profile

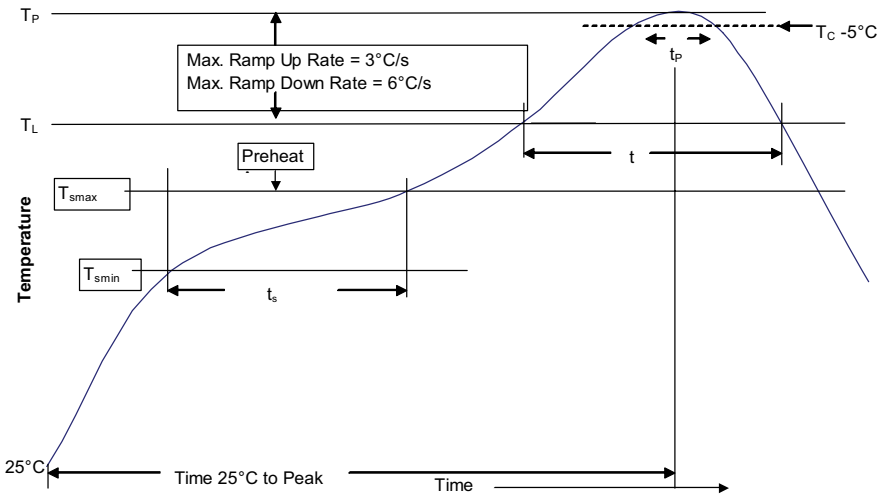


Table 1 - Standard SnPb solder (T_C)

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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