



# TVL9VB1S-DFN1006-2LDG

## Data Sheet

<b>Product Name</b>	<b>TL9VB1S-DFN1006-2LDG</b>
<b>Series</b>	<b>TVS Diodes</b>
<b>Size</b>	<b>DFN1006</b>
<b>Version</b>	<b>A0</b>

### 1. Features

- Bi-directional ESD protection of one line
- IEC 61000-4-2 (ESD)  $\pm 25\text{kV}$ (Contact)  $\pm 25\text{kV}$ (Air)
- IEC 61000-4-5 (Surge) 6A (8/20 $\mu\text{s}$ )
- For 9.0V and Below the Operating Voltage
- Low capacitance: 8pF(Typical)
- Excellent package:1.0mm $\times$ 0.6mm $\times$ 0.5mm

### 2. Applications

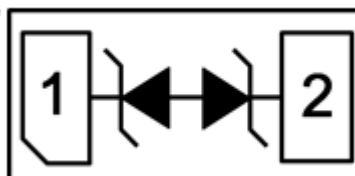
- Computers and peripherals
- Data line Protection
- Audio and video equipment
- Cellular handsets and accessories
- Subscriber identity module(SIM) card protection
- Portable electronics

### 3. Explanation of Part Number

<u>TV</u>	<u>L</u>	<u>9V</u>	<u>B1</u>	<u>S</u>	<u>-DFN1006</u>	<u>-2L</u>	<u>DG</u>
-1	-2	-3	-4	-5	-6	-7	-8

- (1) Product Type : TV=TVS Diode
- (2) Capacitance Code
- (3) Working Voltage
- (4) Direction/Channel Code : B=Bi-directional, 1=Channel
- (5) Control Code
- (6) Package Size
- (7) Pin Code : 2L=2 Pin
- (8) Inpaq Control Code

### 4. Circuit Diagram & Pin Configuration



### 5. Maximum Ratings (Ta=25°C unless otherwise noted)

Characteristics	Symbol	Ratings	Unit
ESD Per IEC61000-4-2 (Air)	V <sub>ESD</sub> <sup>(1)</sup>	±25	kV
ESD Per IEC61000-4-2 (Contact)		±25	kV
Peak pulse Current	I <sub>PP</sub> <sup>(2)</sup>	6	A
Junction Temperature	T <sub>J</sub>	-55 to +125	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C
Lead Soldering Temperature	T <sub>SOL</sub>	260	°C

(1) Device stressed with ten non-repetitive ESD pulses.

(2) Non-repetitive current pulse 8/20µs exponential decay waveform according to IEC61000-4-5.

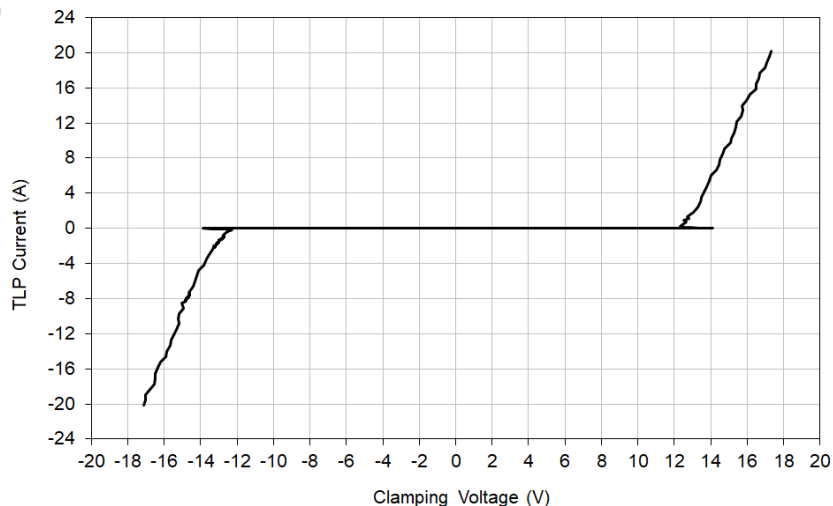
### 6. Electrical Characteristics (T=25 °C)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V <sub>RWM</sub> <sup>(1)</sup>	T=25 °C			9	V
Breakdown Voltage	V <sub>B</sub>	I <sub>B</sub> =1mA; I/O to GND	9.8	13	16	V
Reverse Leakage Current	I <sub>R</sub>	V <sub>RWM</sub> =9V; T=25 °C			0.1	µA
Clamping Voltage	V <sub>TLP</sub>	I <sub>TLP</sub> = 1A (100ns transmission line) I <sub>TLP</sub> = 16A(100ns transmission line)		12.8 16		V
Junction Capacitance	C <sub>J</sub>	V <sub>R</sub> = 0V, f = 1 MHz,		8	9.5	pF

(1) Guaranteed by design and not subject to production test.

(2) Non-repetitive current pulse 8/20µs exponential decay waveform according to IEC61000-4-5.

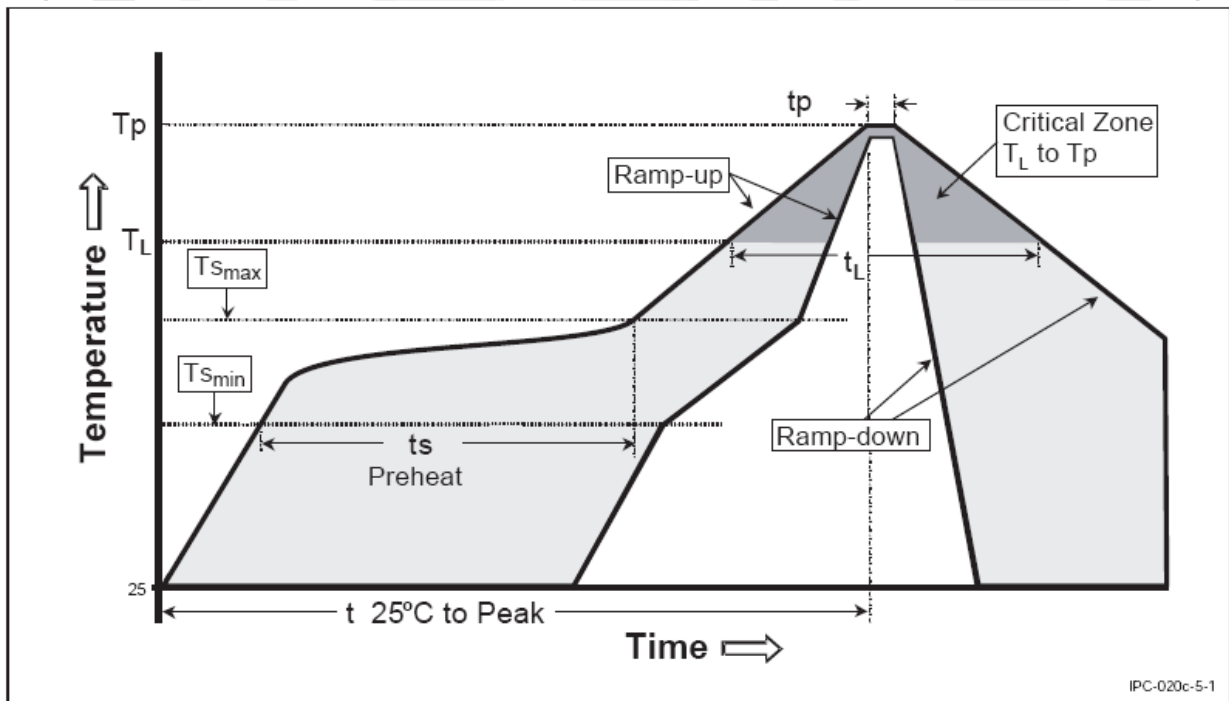
### 7. Typical Characteristics



## 8. Soldering Parameters

Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (T <sub>smax</sub> to T <sub>p</sub> )	3°C/second max.
Preheat – Temperature Min (T <sub>smin</sub> ) – Temperature Max (T <sub>smax</sub> ) – Time (t <sub>smin</sub> to t <sub>smax</sub> )	150°C 200°C 60-120 seconds
Time maintained above: – Temperature (T <sub>L</sub> ) – Time (t <sub>L</sub> )	217°C 60-150 seconds
Peak/Classification Temperature (T <sub>p</sub> )	260°C
Time within 5°C of actual Peak Temperature (t <sub>p</sub> )	30 seconds
Ramp-Down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

Note: Heat Resistance to Reflow Soldering 3 Cycles



\*According to J-STD-020C

## 9. General specifications

### Environmental Specifications

Item	Specifications	Test condition	Reference
Bias Humidity	$I_L \leq 10 \mu A$	90%RH, 40°C, Rated voltage, 1000hr	MIL-STD-202 Method 103
Thermal Shock	$I_L \leq 10 \mu A$	-55°C to 125°C, 30 min. cycle, 500 cycles	JIS C 0025 (1998) Test Na
High Temperature Load Voltage	$I_L \leq 10 \mu A$	Rated voltage, 125°C, 1000hr	MIL-STD-202 Method 108
Solder Leach Resistance	$I_L \leq 10 \mu A$	260°C, 10sec	MIL-STD-202 Method 210F

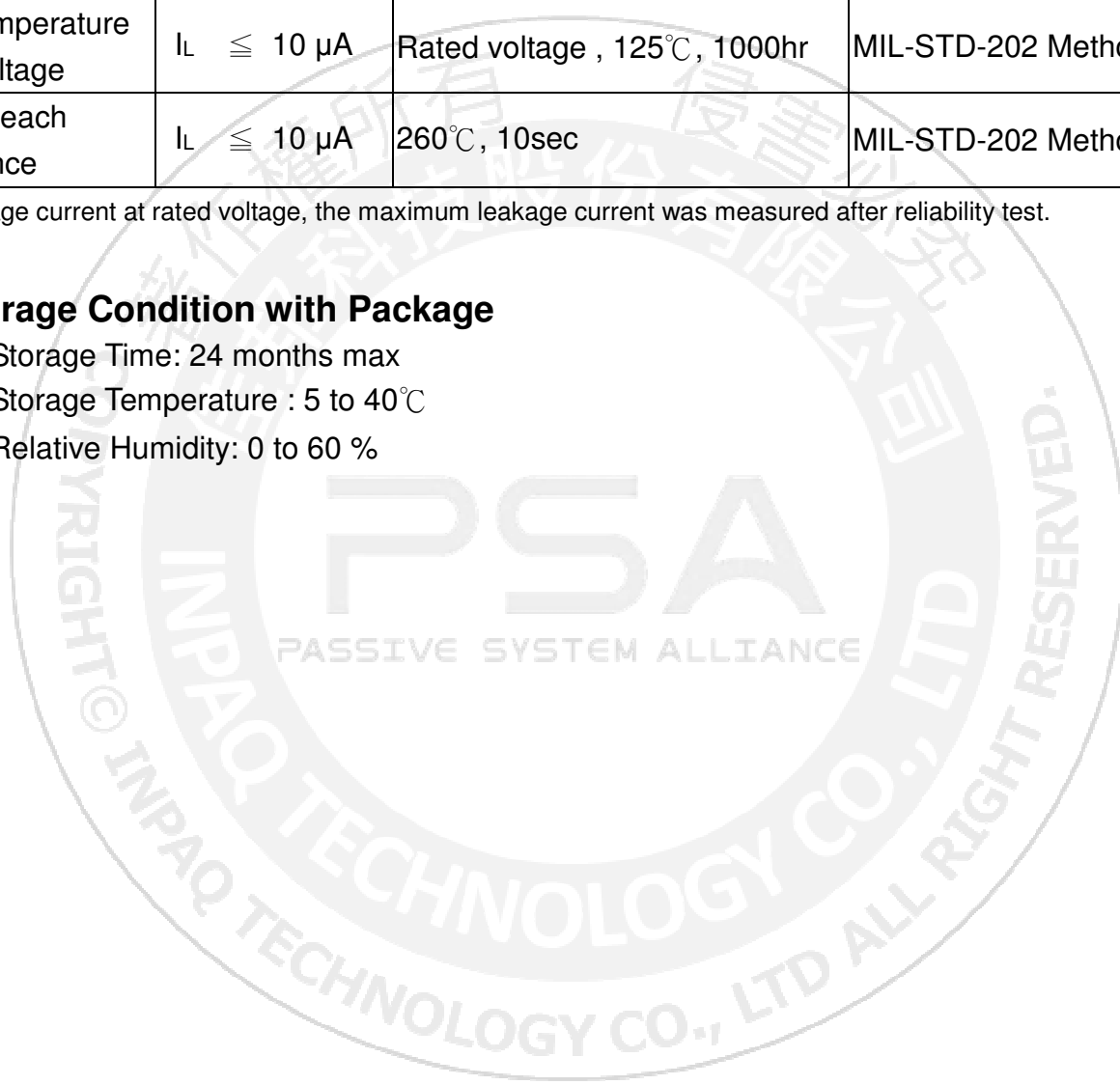
$I_L$  – Leakage current at rated voltage, the maximum leakage current was measured after reliability test.

## 10. Storage Condition with Package

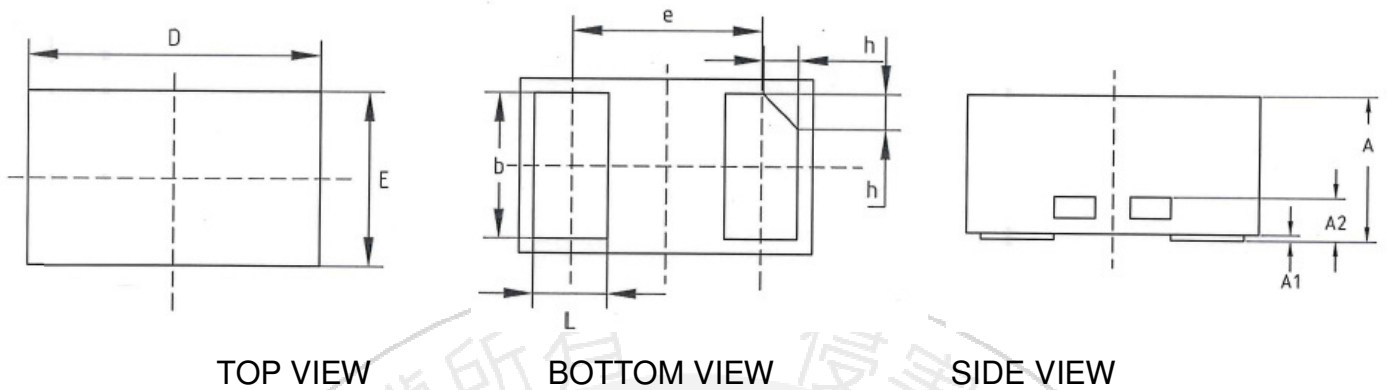
Storage Time: 24 months max

Storage Temperature : 5 to 40°C

Relative Humidity: 0 to 60 %

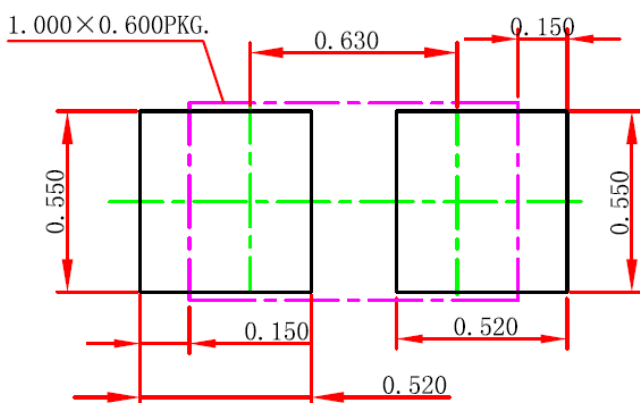


## 11. Outline Dimensions



Symbol	Dimensions (mm)		
	Min	Typical	Max
A	0.45	0.50	0.55
A1	0.00	0.02	0.05
A2	0.127 REF		
b	0.45	0.50	0.55
D	0.95	1.00	1.05
e	0.65 BSC		
E	0.55	0.60	0.65
L	0.20	0.25	0.30
h	0.07	0.12	0.17

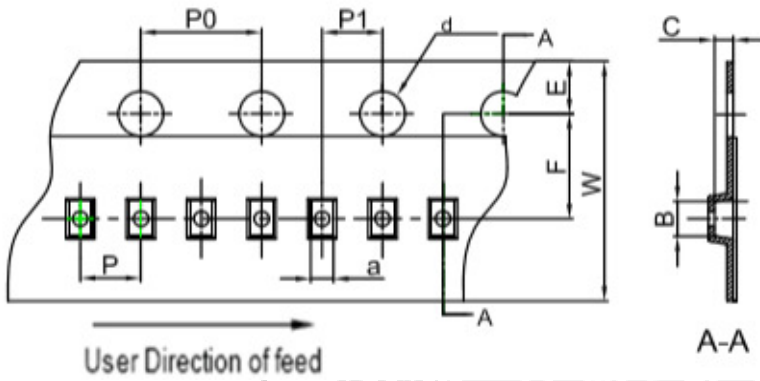
## 12. Pad Layout



### Note

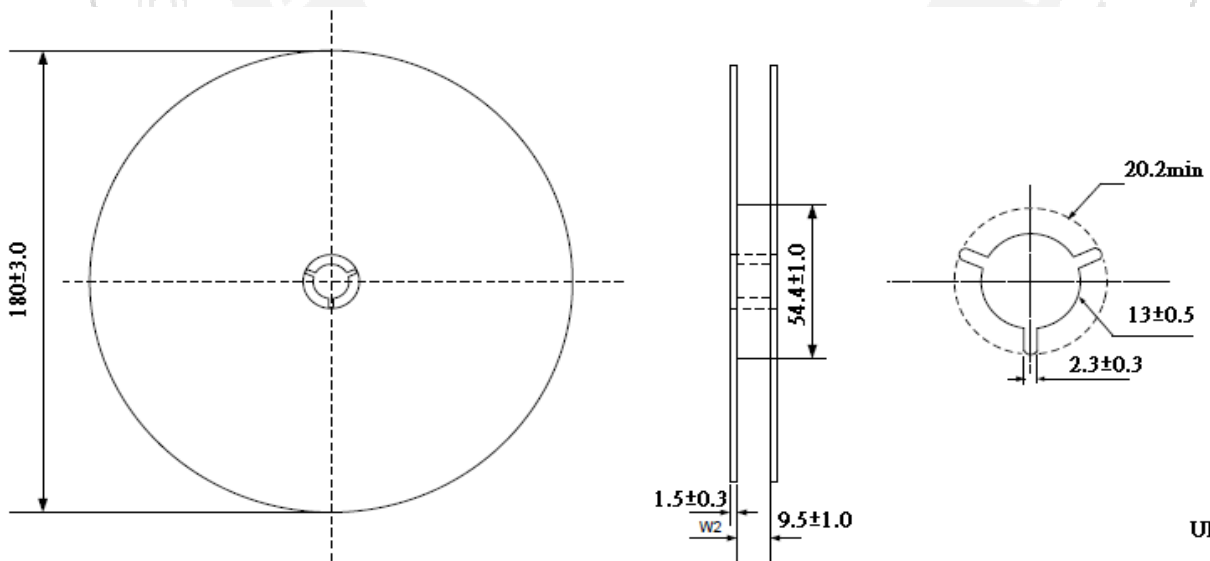
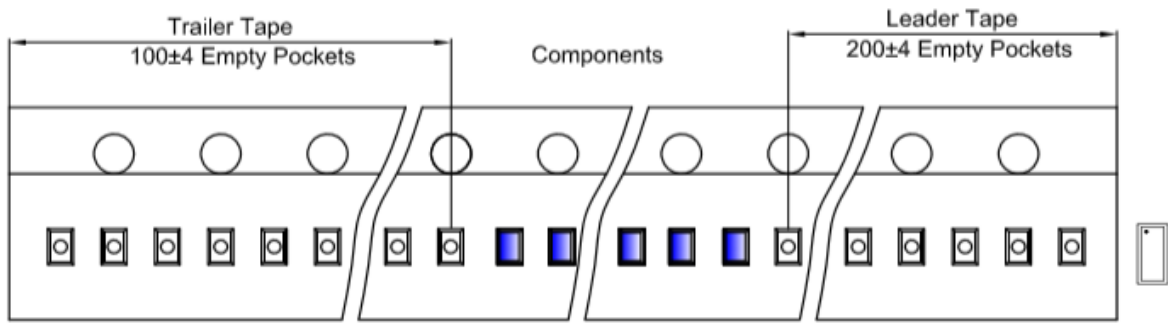
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.050\text{mm}$ .
3. The pad layout is for reference purposes only.

### 13. Tape & Reel Information



Dimensions (mm)

Symbol	a	B	C	d	E	F	P0	P	P1	W
DFN/FBP(1.0x0.6)	0.66	1.15	0.66	Ø1.50	1.75	3.50	4.00	2.00	2.00	8.00



UNIT:mm

**14. Order Information:**

Marking Code

**. ACA**

.ACA = Device code

Part Number	Marking Code	Quantity	Packaging Option
TVL9VB1S-DFN1006-2LDG	.ACA	10,000	Tape & reel- 8mm tape/7"reel

**15. MSL Level:**

Level 1

