

TVN ST23 02 AB0 Engineering Specification

1. Scope

TVN ST23 02 AB0's are TVS arrays designed to protect power/control lines and low-speed signal lines from overvoltage hazard of Electrostatic Discharge (**ESD**), Electrical Fast Transients (**EFT**) and **Lightning**.

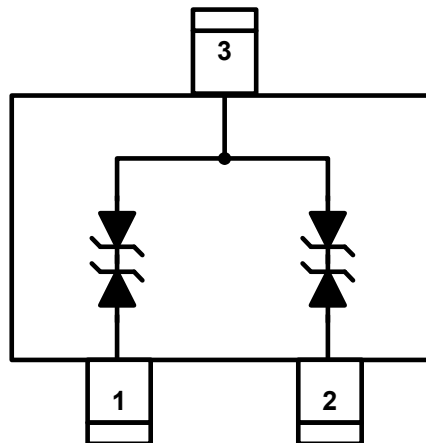
These interfaces can be used for computer interfaces protection, microprocessors protection, serial and parallel ports protection, control signal lines protection, power lines on PCB protection, latchup protection, etc. The ESD protection of TVS arrays meets the immunity standard of IEC 61000-4-2, level 4 ($\pm 15\text{kV}$ air, $\pm 8\text{kV}$ contact discharge).

2. Explanation of Part Number

<u>TV</u>	<u>N</u>	<u>ST23</u>	<u>02</u>	<u>AB0</u>
(1)	(2)	(3)	(4)	(5)

- (1) Product Type : TV=TVS Diode
- (2) Capacitance Code : L=Low Capacitance
- (3) Package Size Code
- (4) Channel Code : 02=2 Channels
- (5) Specialized Specification Code

3. Circuit Diagram /Pin Configuration



SOT23-3L (Top View)

4. Specifications

4.1 ABSOLUTE MAXIMUM RATINGS

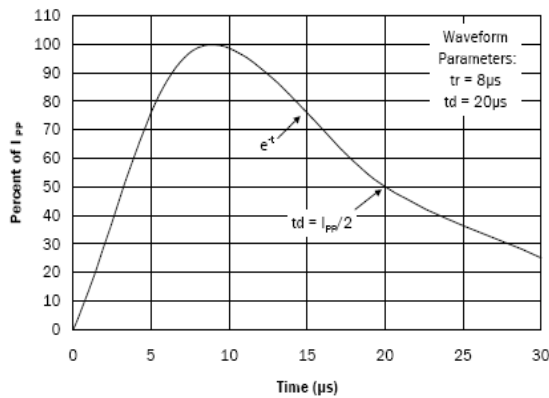
PARAMETER	PARAMETER	RATING	UNITS
Peak Pulse Current (tp =8/20us)	I_{PP}	8.5	A
Operating Supply Voltage (pin-1, -2 to pin-3)	V_{DC}	6	V
ESD per IEC 61000-4-2 (Air)	V_{ESD1}	± 22	kV
ESD per IEC 61000-4-2 (Contact)		± 15	
Lead Soldering Temperature	T_{SOL}	260 (10 sec.)	$^{\circ}C$
Operating Temperature	T_{OP}	-55 to +125	$^{\circ}C$
Storage Temperature	T_{STO}	-55 to +150	$^{\circ}C$

4.1. ELECTRICAL CHARACTERISTICS

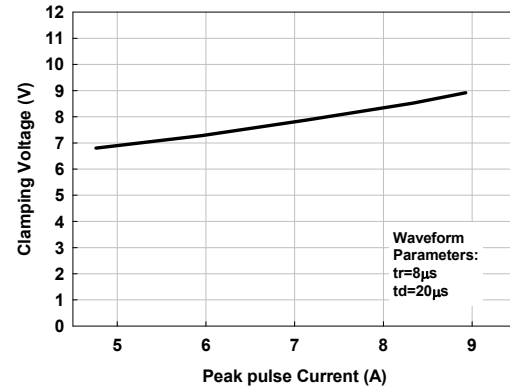
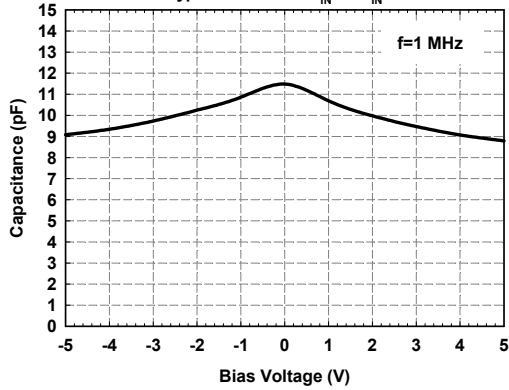
PARAMETER	SYMBOL	CONDITIONS	MINI	TYP	MAX	UNIT S
Reverse Stand-Off Voltage	V_{RWM}	Pin-1 to Pin-3, Pin-2 to Pin-3. $T=25^{\circ}C$			5	V
Reverse Leakage Current	I_{Leak}	$V_{RWM} = 5V$, $T=25^{\circ}C$. Pin-1 to Pin-3, Pin-2 to Pin-3.			2.5	μA
Reverse Breakdown Voltage	V_{BV}	$I_{BV} = 1mA$, $T=25^{\circ}C$. Pin-1 to Pin-3, Pin-2 to Pin-3.	6.1		9	V
Clamping Voltage	V_{CL}	$I_{PP}=5A$, $t_p=8/20us$, $T=25^{\circ}C$. Pin-1 to Pin-3, Pin-2 to Pin-3.		7	8	V
Clamping Voltage	V_{CL}	$I_{PP}=7A$, $t_p=8/20us$, $T=25^{\circ}C$. Pin-1 to Pin-3, Pin-2 to Pin-3.		8	9	V
ESD Holding Voltage	V_{hold}	IEC 61000-4-2 6kV, $T=25^{\circ}C$, Contact mode, Pin-1 to Pin-3, Pin-2 to Pin-3.		10.5		V
Channel Input Capacitance	C_{IN}	$V_R = 0V$, $f = 1MHz$, $T=25^{\circ}C$. Pin-1 to Pin-3, Pin-2 to Pin-3.		12	15	pF

4.3 TYPICAL CHARACTERISTICS

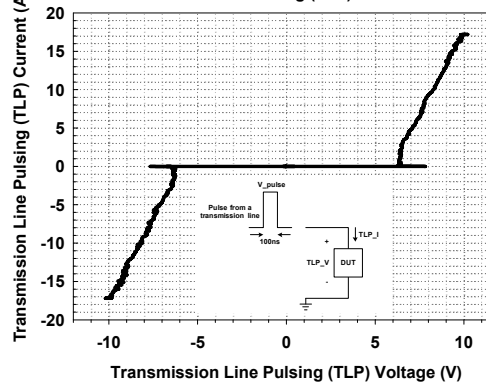
Pulse Waveform



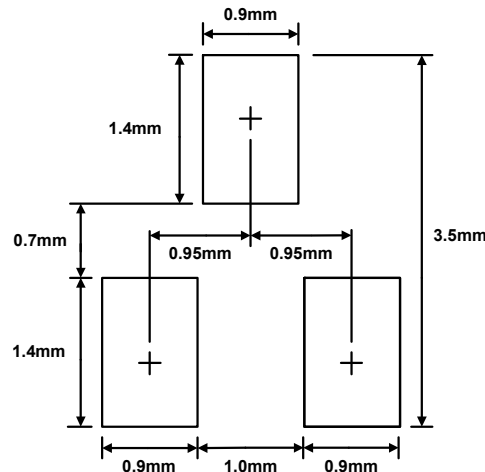
Clamping Voltage vs. Peak Pulse Current


Typical Variation C_{IN} vs V_{IN}


Transmission Line Pulsing (TLP) Measurement



5. LAND LAYOUT



Notes: This LAND LAYOUT is for reference purposes only. Please consult your manufacturing partners to ensure your company's PCB design guidelines are met.

6. Application information

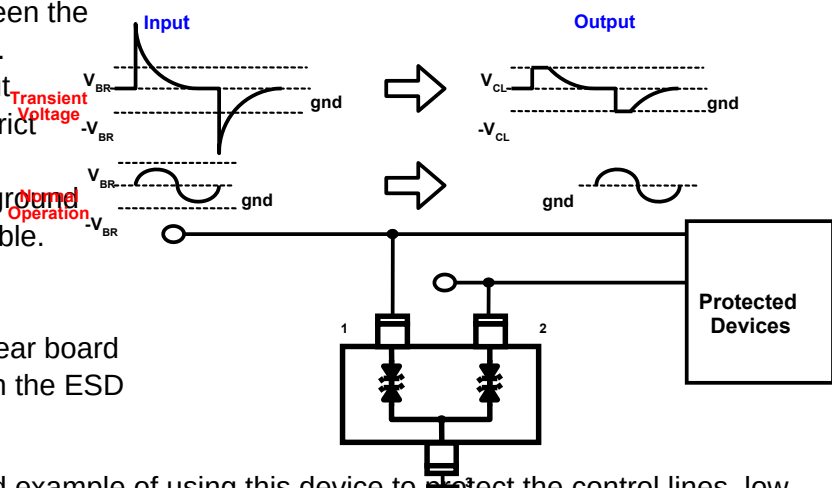
The usage of this device is as following figure. Protected lines, such as data lines, control lines, or power lines, are connected at pin 1. The pin 2 should be connected directly to a ground plane on the board. All path lengths connected to the pins should be kept as short as possible to minimize parasitic inductance in the board traces.

In order to obtain enough suppression of ESD induced transient, good circuit board is critical. Thus, the following guidelines are recommended:

- Minimize the path length between the protected lines and this device.
- Place this device near the input terminals or connectors to restrict transient coupling.

The ESD current return path to ground should be kept as short as possible.

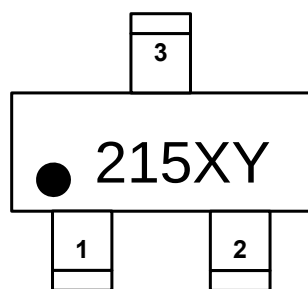
- Use ground planes whenever possible.
- NEVER route critical signals near board edges and near the lines which the ESD transient easily injects to.



This Fig. shows another simplified example of using this device to protect the control lines, low speed data lines, and power lines from ESD transient stress.

7. MARKING CODE

Marking Code: 215XY



215 = Device Code

X = Date Code

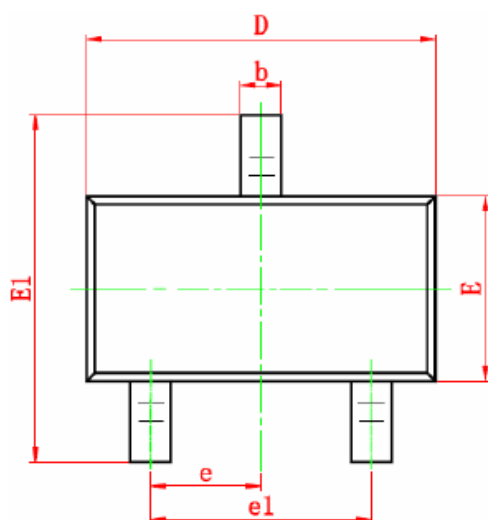
Y = Control Code

8. Mechanical Details

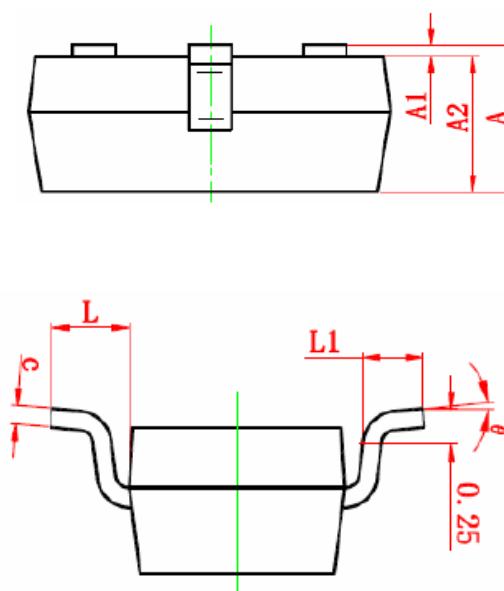
SOT23-3L

PACKAGE DIAGRAMS

TOP VIEW



SIDE VIEW



PACKAGE DIMENSIONS

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	6°

8.1 Taping Quantity:

3,000pcs/ Reel (for 7" Reel)