

## Ultra Low Capacitance ESD Protection Diode

### DESCRIPTION

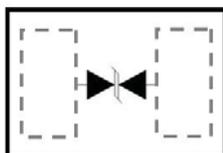
ESD0501BDV is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 0.20pF, ESD0501BDV is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4 ( $\pm 15\text{kV}$  air,  $\pm 8\text{kV}$  contact discharge), IEC 61000-4-4 (electrical fast transient - EFT) (40A, 5/50 ns), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

ESD0501BDV uses ultra-small DFN1006 package. Each ESD0501BDV device can protect one high-speed data line. It offers system designers flexibility to protect single data line where space is a premium concern. The combined features of low capacitance, ultra-small size and high ESD robustness make ESD0501BDV ideal for high-speed data port and high-frequency line applications, such as cellular phones and HD visual devices.

### ORDERING INFORMATION

- ✧ Device: ESD0501BDV
- ✧ Package: DFN1006
- ✧ Marking: 5B+code(U or L)
- ✧ Material: Halogen free
- ✧ Packing: Tape & Reel
- ✧ Quantity per reel: 10,000pcs

### PIN CONFIGURATION



### FEATURES

- ✧ Transient protection for high-speed data lines  
IEC 61000-4-2 (ESD)  $\pm 20\text{kV}$  (Contact)  
 $\pm 20\text{kV}$  (Air)  
IEC 61000-4-4 (EFT) 40A (5/50 ns)  
Cable Discharge Event (CDE)
- ✧ Package optimized for high-speed lines
- ✧ Ultra-small package (1.0mm $\times$ 0.6mm $\times$ 0.5mm)
- ✧ Protects one data, control line
- ✧ Low capacitance: 0.20pF (Typical)
- ✧ Low leakage current
- ✧ Low clamping voltage
- ✧ P/N suffix V means AEC-Q101 qualified, e.g: ESD0501BDV

### MACHANICAL DATA

- ✧ DFN1006 package
- ✧ Flammability Rating: UL 94V-0
- ✧ Packaging: Tape and Reel
- ✧ High temperature soldering guaranteed:  
260 $^{\circ}\text{C}$ /10s
- ✧ Reel size: 7 inch

### APPLICATIONS

- ✧ Serial ATA
- ✧ Desktops, Servers and Notebooks
- ✧ Cellular Phones
- ✧ MDDI Ports
- ✧ USB Data Line Protection
- ✧ Display Ports
- ✧ Digital Visual Interfaces (DVI)
- ✧ RF antenna

### PACKAGE OUTLINE



2023-02/01  
REV:A

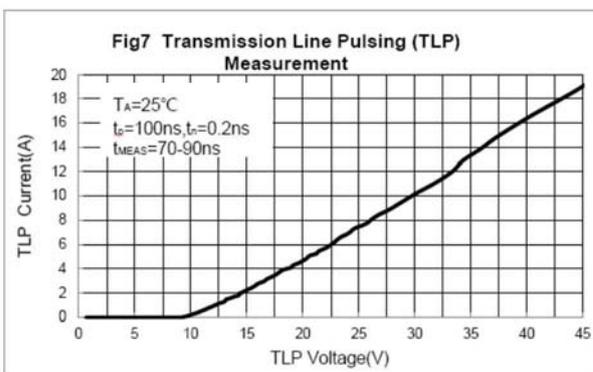
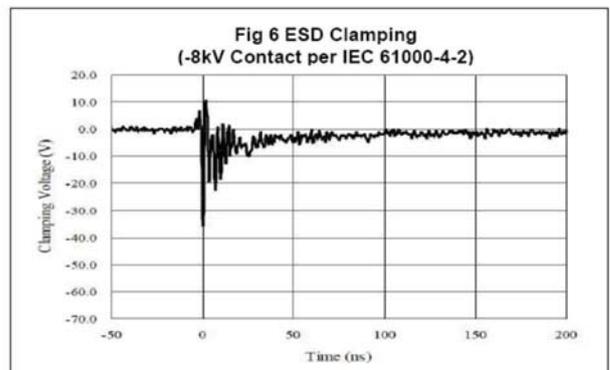
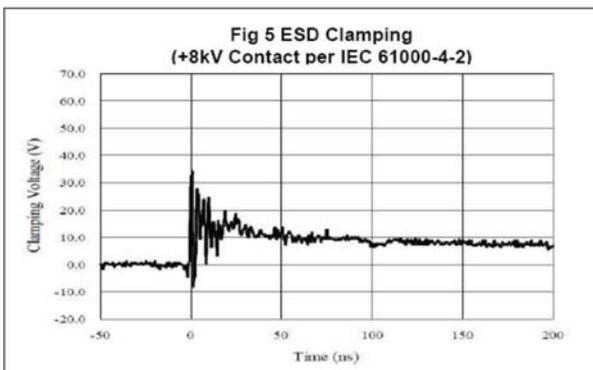
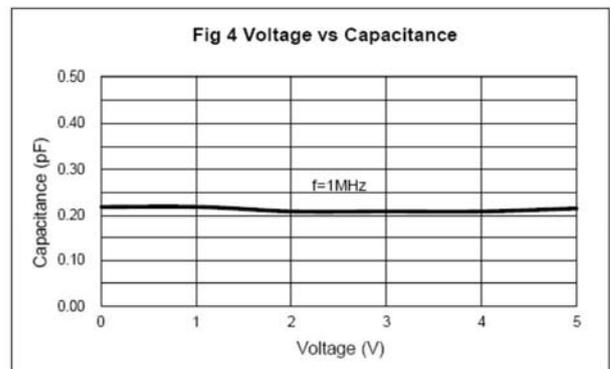
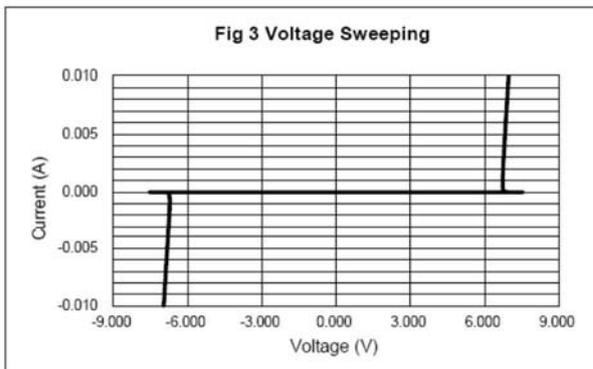
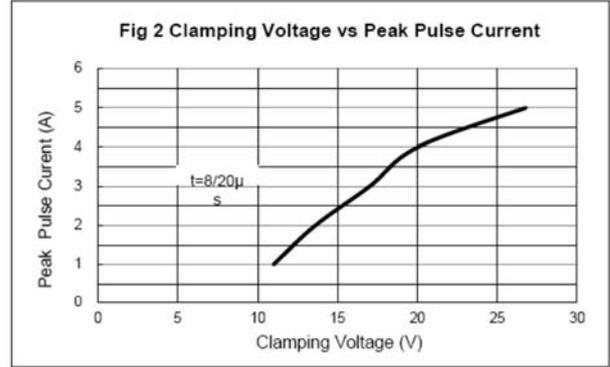
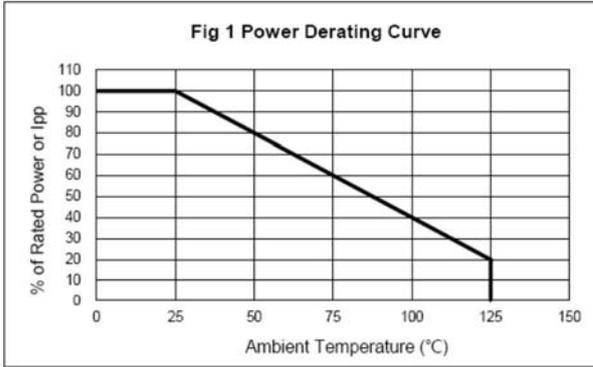
**ABSOLUTE MAXIMUM RATING (Tamb=25°C, unless otherwise specified)**

Symbol	Parameter	Value	Units
V <sub>ESD</sub>	ESD per IEC 61000-4-2 (Contact) ESD per IEC 61000-4-2 (Air)	±20 ±20	kV
P <sub>PP</sub>	Peak Pulse Power (8/20µs)	100	W
T <sub>OPT</sub>	Operating Temperature	-55~125	°C
T <sub>STG</sub>	Storage Temperature	-55~150	°C

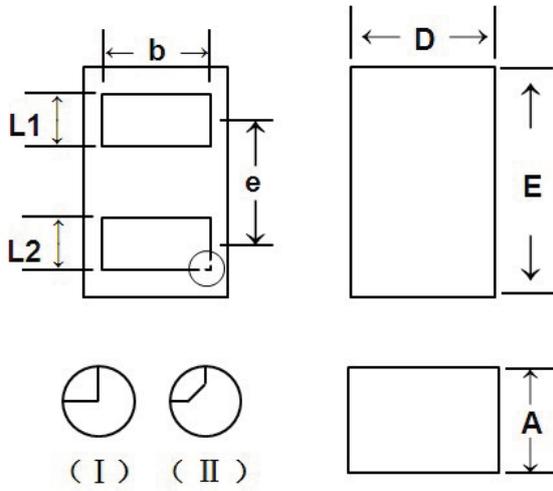
**ELECTRICAL CHARACTERISTICS (Tamb=25°C, unless otherwise specified)**

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V <sub>RWM</sub>	Reverse Working Voltage				5.0	V
V <sub>BR</sub>	Reverse Breakdown Voltage	I <sub>T</sub> = 1mA	6.0			V
I <sub>R</sub>	Reverse Leakage Current	V <sub>RWM</sub> = 5V			100	nA
V <sub>C</sub>	Clamping Voltage	I <sub>PP</sub> = 1A, t <sub>p</sub> = 8/20µs			13	V
		I <sub>PP</sub> = 4A, t <sub>p</sub> = 8/20µs		18	25	V
V <sub>CTLP</sub>	TLP Clamping Voltage	I <sub>PP</sub> = 8A IEC61000-4-2 Level 2 equivalent (±4kV Contact, ±8kV Air)		26		V
		I <sub>PP</sub> = 16A IEC61000-4-2 Level 4 equivalent (±8kV Contact, ±16kV Air)		38		V
C <sub>J</sub>	Junction Capacitance	V <sub>R</sub> = 0V, f = 1MHz		0.25	0.40	pF

# RATING AND CHARACTERISTICS CURVES (ESD0501BDV)

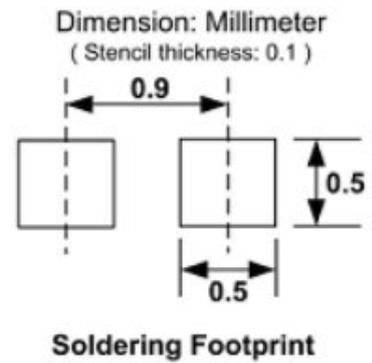


## DFN1006 PACKAGE OUTLINE DIMENSIONS



**NOTE: ALL DIMENSIONS IN MM**

	MIN	NOM	MAX
<b>D</b>	<b>0.55</b>	<b>0.60</b>	<b>0.65</b>
<b>E</b>	<b>0.95</b>	<b>1.00</b>	<b>1.05</b>
<b>L1</b>	<b>0.20</b>	<b>0.25</b>	<b>0.30</b>
<b>L2</b>	<b>0.20</b>	<b>0.25</b>	<b>0.30</b>
<b>A</b>	<b>0.45</b>	<b>0.50</b>	<b>0.55</b>
<b>b</b>	<b>0.45</b>	<b>0.50</b>	<b>0.55</b>
<b>e</b>		<b>0.64BSC</b>	



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