

## 2-Line Uni-directional TVS Diode

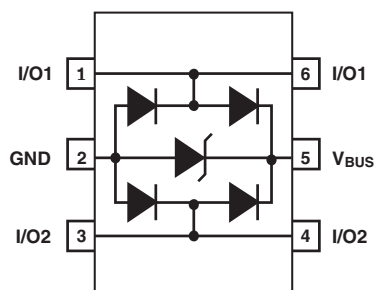
### Description

The TPD4E001DBVR is an ultra low capacitance TVS array, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines.

The TPD4E001DBVR has an ultra-low capacitance with a typical value at 0.6 pF, and complies with the IEC 61000-4-2 (ESD) standard with  $\pm 15\text{kV}$  air and  $\pm 8\text{kV}$  contact discharge. It is assembled into a 6-pin lead-free SOT23-6 package.

The combination of small size, ultra low capacitance, and high ESD surge capability make it ideal for use in applications such as multimedia, and other high speed ports.

### Circuit Diagram



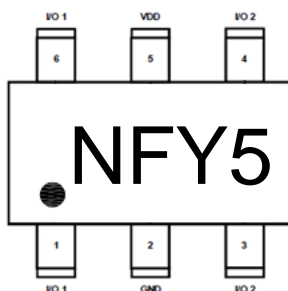
### Features

- \* Ultra low capacitance: 0.6 pF typical (I/O-GND)
- \* Ultra low leakage: nA level
- \* Low operating voltage: 5.0V
- \* Up to 4 data lines and one power line protects
- \* Low clamping voltage
- \* Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test  
Air :  $\pm 20\text{kV}$ ; discharge:  $\pm 15\text{kV}$
  - IEC61000-4-5 (Lightning) 4.5A (8/20 $\mu\text{s}$ )
- \* SOT23-6 Package
- \* RoHS Compliant

### Applications

- \* Monitors and flat panel displays
- \* Set-top box and Digital TV
- \* Video graphics cards
- \* Digital Video Interface (DVI)
- \* Notebook Computers
- \* PCI Express and Serial SATA Ports

### Marking Diagram



### Ordering Information

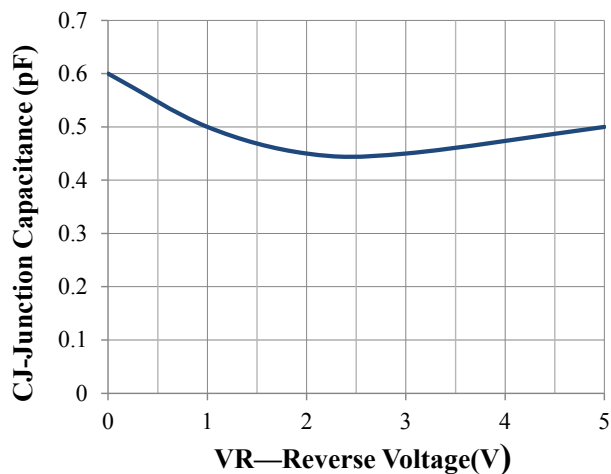
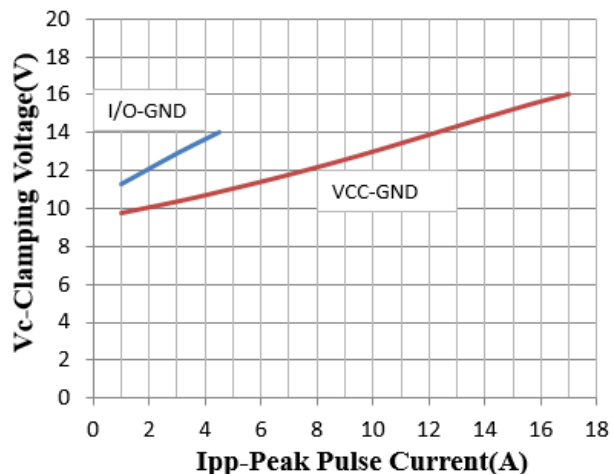
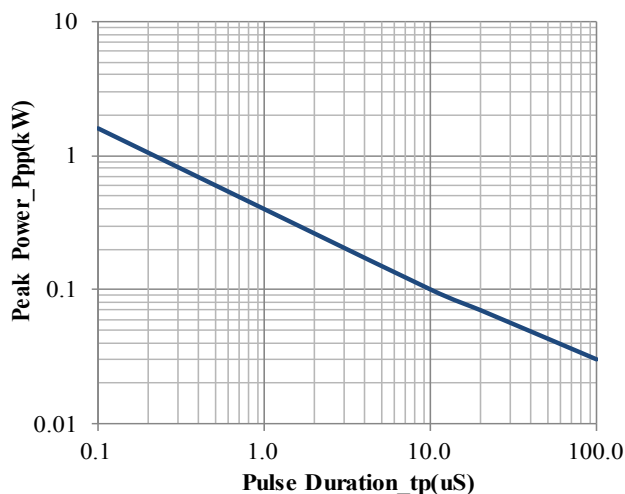
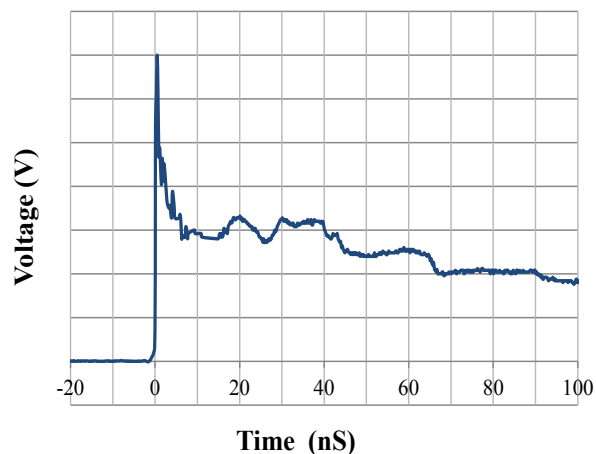
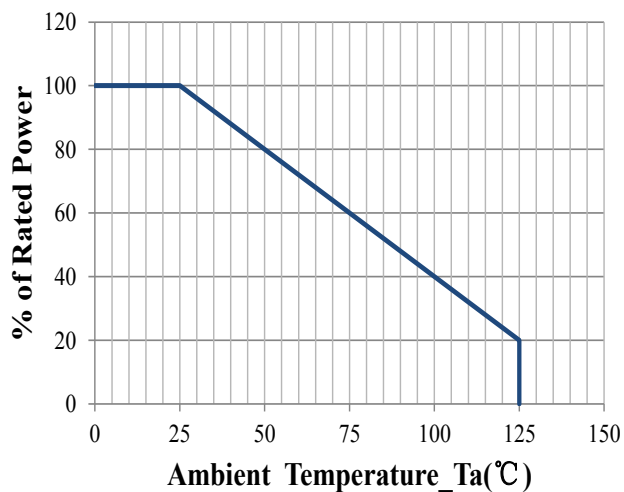
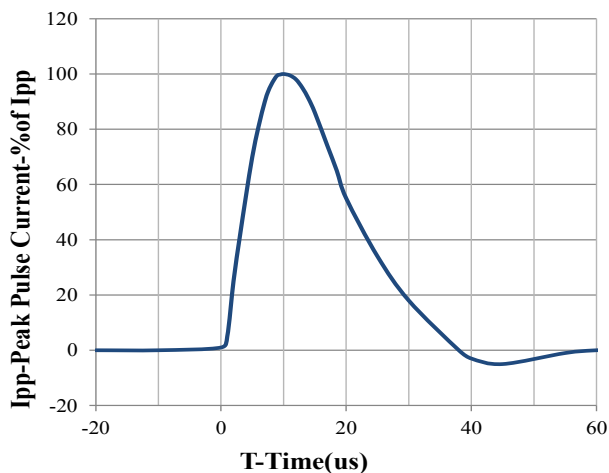
Part Number	Packaging	Reel Size
TPD4E001DBVR	3000/Tape & Reel	7 inch

### Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

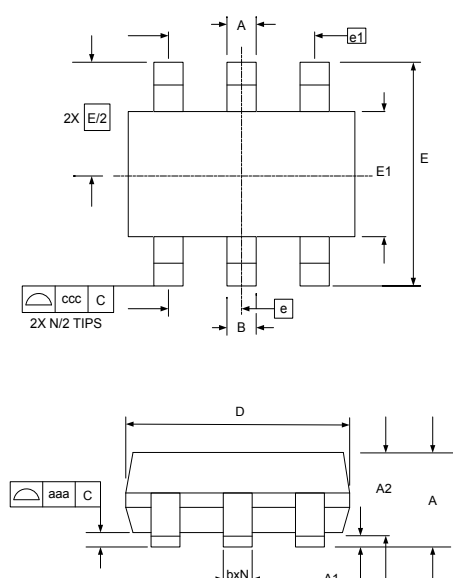
Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 $\mu\text{s}$ , I/O-GND)	Ppk	60	W
Peak Pulse Power (8/20 $\mu\text{s}$ , Vcc-GND)	Ppk	300	W
Peak Pulse Current (8/20 $\mu\text{s}$ , I/O-GND)	IPP	4.5	A
Peak Pulse Current (8/20 $\mu\text{s}$ , Vcc-GND)	IPP	17	A
ESD per IEC 61000-4-2 (Air)	$V_{\text{ESD}, \text{VDD}}$	$\pm 20$	kV
ESD per IEC 61000-4-2 (Contact)	$V_{\text{ESD}, \text{I/O}}$	$\pm 15$	
Operating Temperature Range	TJ	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	Tstg	-55 to +150	$^{\circ}\text{C}$

### Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Reverse Working Voltage	$V_{\text{RWM}}$	Pin 5 to GND, I/O-GND			5.0	V
Breakdown Voltage	$V_{\text{BR}}$	$I_{\text{T}} = 1\text{mA}$ (Pin 5 to GND, I/O-GND)	6.0	7.5	8.5	V
Reverse Leakage Current	$I_{\text{R}}$	$V_{\text{RWM}} = 5.0\text{V}$			0.5	$\mu\text{A}$
Forward Breakdown Voltage	$V_{\text{F}}$	$I_{\text{F}} = 15\text{mA}$ , GND to Pin 5/IO		0.8	1.0	V
Clamping Voltage	$V_{\text{C}}$	IPP = 4.5A (8 x 20 $\mu\text{s}$ pulse, I/O to GND)		14.0	15.0	V
Clamping Voltage	$V_{\text{C}}$	IPP = 17A (8 x 20 $\mu\text{s}$ pulse, Pin 5 to GND)		16.0	18.0	V
Junction Capacitance	$C_{\text{J}}$	$V_{\text{pin5}} = 5\text{V}$ , I/O=0V, $f = 1\text{MHz}$ , I/O-GND		0.6	0.7	pF
Junction Capacitance	$C_{\text{J}}$	$V_{\text{pin5}} = 5\text{V}$ , I/O=0V, $f = 1\text{MHz}$ , I/O-I/O pins		0.3	0.4	pF

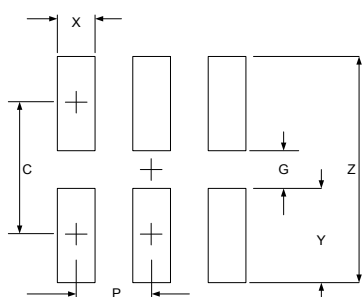
**Typical Performance Characteristics ( $T_A=25^{\circ}\text{C}$  unless otherwise Specified)**

**Junction Capacitance vs. Reverse Voltage**

**Clamping Voltage vs. Peak Pulse Current**

**Peak Pulse Power vs. Pulse Time**

**IEC61000-4-2 Pulse Waveform**

**Power Derating Curve**

**8 X 20us Pulse Waveform**

## SOT23-6 Package Outline Drawing



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90		1.45	0.035		0.057
A1	0.00		0.15	0.000		0.006
A2	0.90	1.15	1.30	0.035	0.045	0.051
b	0.25		0.50	0.010		0.020
c	0.08		0.22	0.003		0.009
D	2.80	2.90	3.10	0.110	0.114	0.122
E1	1.50	1.60	1.75	0.060	0.063	0.069
E	2.80 BSC			0.110 BSC		
e	0.95 BSC			0.037 BSC		
e1	1.90 BSC			0.075 BSC		
N	6			6		
aaa	0.10			0.004		
ccc	0.20			0.008		

## Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	2.50	0.098
G	1.40	0.055
P	0.95	0.037
X	0.60	0.024
Y	1.10	0.043
Z	3.60	0.141