

Description

The TPD4E1U06DCKR 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 TPD4E1U06DCKR 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 SOT-363 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.

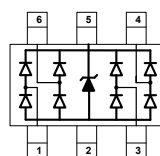
Features

- 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 μs)
- SOT-363 Package
- RoHS Compliant

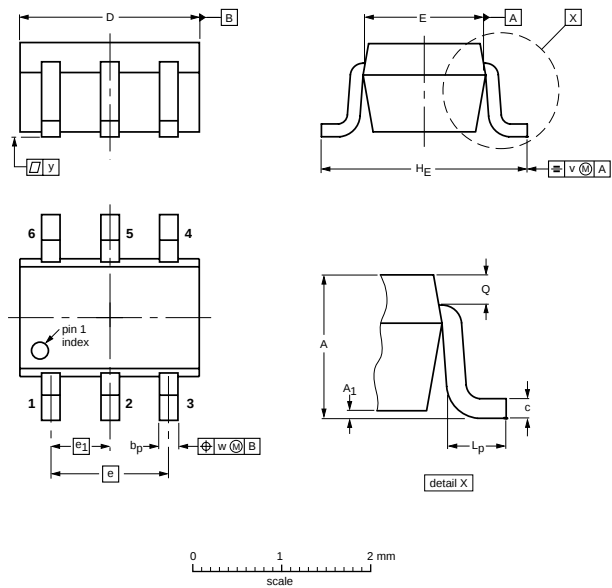
Applications

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

Circuit Diagram



SOT-363



DIMENSIONS (mm are the original dimensions)

UNIT	A	A1 max	bp	c	D	E	e	e1	HE	LP	Q	v	w	y
mm	1.1 0.8	0.1	0.30 0.20	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.25 0.15	0.2	0.2	0.1

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

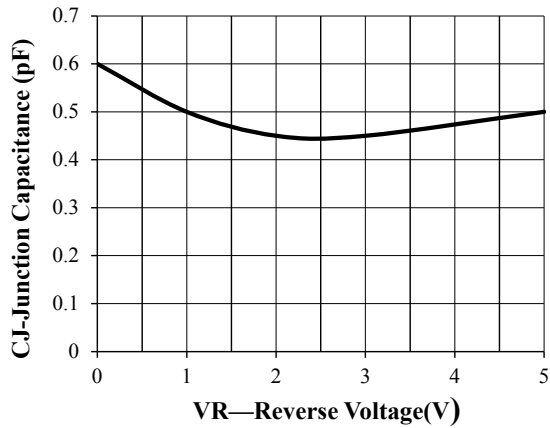
Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 μs , I/O-GND)	Ppk	60	W
Peak Pulse Power (8/20 μs , Vcc-GND)	Ppk	300	W
Peak Pulse Current (8/20 μs , I/O-GND)	IPP	4.5	A
Peak Pulse Current (8/20 μs , Vcc-GND)	IPP	17	A
ESD per IEC 61000-4-2 (Air)	VESD,VDD	± 20	kV
ESD per IEC 61000-4-2 (Contact)	VESD,I/O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

TPD4E1U06DCKR

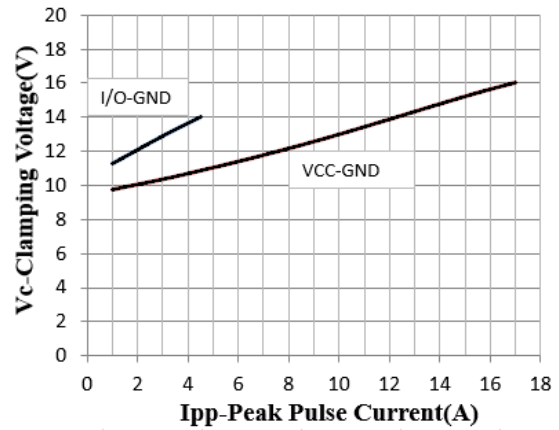
Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

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

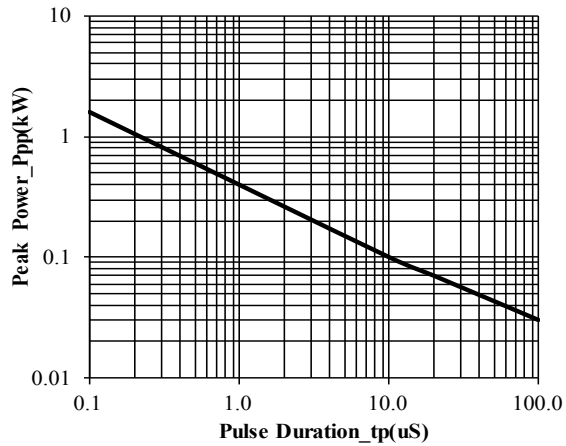
RATING AND CHARACTERISTIC CURVES (TPD4E1U06DCKR)



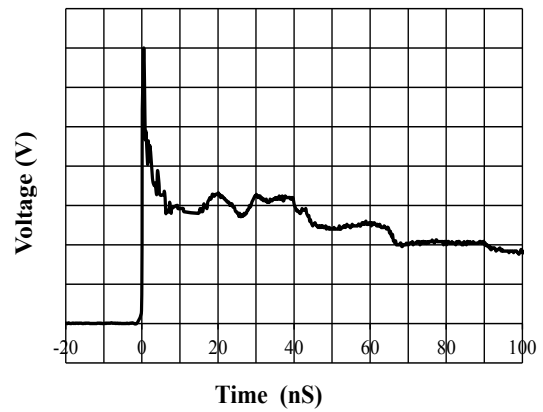
Junction Capacitance vs. Reverse Voltage



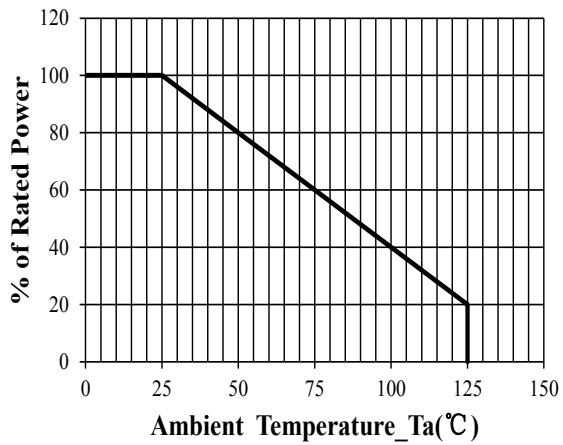
Clamping Voltage vs. Peak Pulse Current



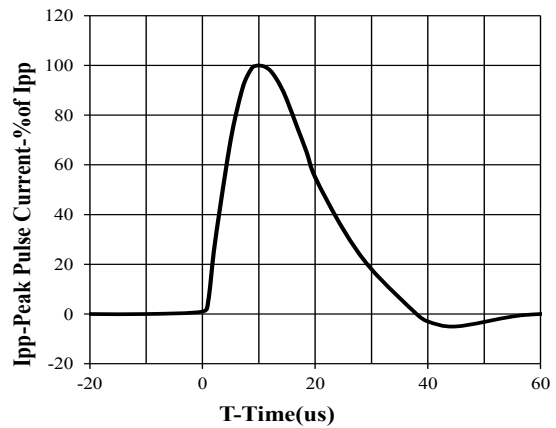
Peak Pulse Power vs. Pulse Time



IEC61000-4-2 Pulse Waveform



Power Derating Curve



8 X 20us Pulse Waveform