

ULTRA LOW CAPACITANCE SURGE PROTECTOR

DESCRIPTION

The PTB05-ULC is an ultra low capacitance surge protection device, designed to protect high speed data lines from ESD and EOS (electrical over-stress). The device is offered in a customized DFN package and is compliant with IEC 61000-4-2 (ESD), IEC 61000-4-4 (EFT) and IEC 61000-4-5 (Surge) standards.

FEATURES

- Compatible with IEC 61000-4-2 (ESD): Contact $\pm 15\text{kV}$, Air $\pm 15\text{kV}$
- Compatible with IEC 61000-4-4 (EFT): 40A - 5/50ns
- Compatible with IEC 61000-4-5 (Surge): 7A - 8/20 μs
- PCB Single Connect & Flow-Through Design
- Solid-state Silicon-avalanche Technology
- Protects 8 Lines
- Ultra Low Capacitance: 0.15pF Max (I/O to GND)
- RoHS Compliant
- REACH Compliant

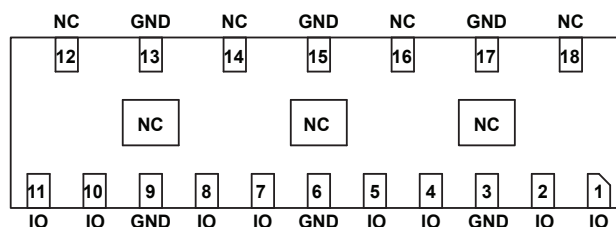
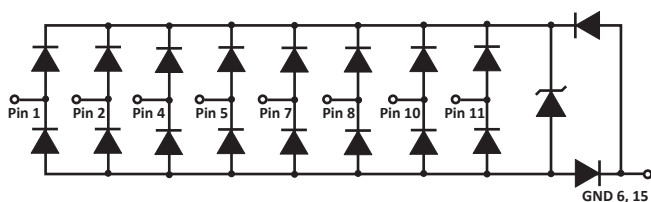
APPLICATIONS

- V-by-One HS
- Thunderbolt (Light Peak)
- HDMI 2.0
- LVDS

MECHANICAL CHARACTERISTICS

- Molded DFN-18 Package
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:
Pure-Tin - Sn, 100: 260-270°C
- 12mm Tape and Reel Per EIA Standard 481
- Flammability Rating UL 94V-0

CIRCUIT DIAGRAM & PIN CONFIGURATION



TYPICAL DEVICE CHARACTERISTICS
MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

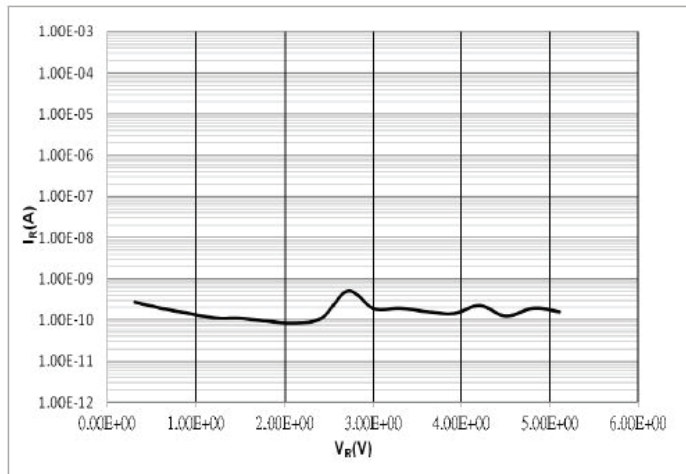
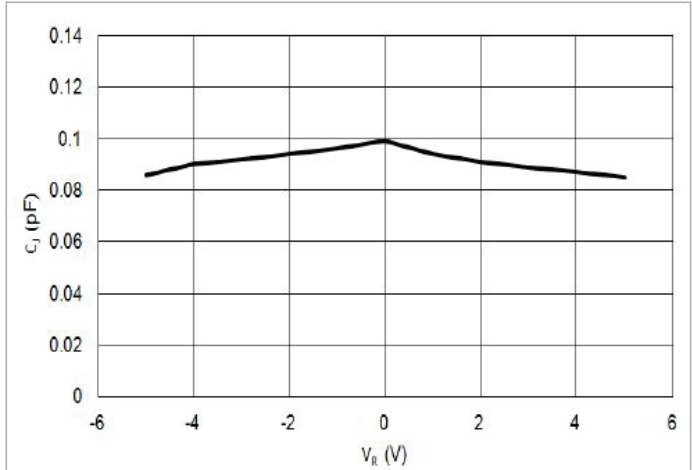
PARAMETER	SYMBOL	VALUE	UNITS
Operating Temperature - Junction	T_J	-55 to 125	°C
Storage Temperature	T_{STG}	-55 to 150	°C
Lead Soldering Temperature	T_{SOL}	260 (10s)	°C
Peak Pulse Current 8/20 μ s @ $T_A = 25^\circ\text{C}$ (I/O Pin to GND)	I_{PP}	7	A

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER	DEVICE MARKING	REVERSE WORKING VOLTAGE (Note 1)	MINIMUM BREAKDOWN VOLTAGE (Note 1)	TYPICAL CLAMPING VOLTAGE (Note 1)	MAXIMUM LEAKAGE CURRENT (Note 1)	TYPICAL DYNAMIC RESISTANCE (Note 1)	MAXIMUM CAPACITANCE (Note 1)
		V_{RWM} VOLTS	@ 1mA $V_{(BR)}$ VOLTS	@ $I_{PP} = 5A$ V_C VOLTS	@ V_{RWM} I_D μA	8/20MS R_{DYN} OHMS	@ 0V, 1MHz C pF
PTB05-8UL	PTB05-8UL	5.0	5.5	11.5	1	0.55	0.15

NOTES

1. I/O to ground.

**FIGURE 1
REVERSE LEAKAGE CURRENT**

**FIGURE 2
JUNCTION CAPACITANCE (IO TO GND)**


TYPICAL DEVICE CHARACTERISTICS

FIGURE 3
POSITIVE SURGE CLAMPING VOLTAGE

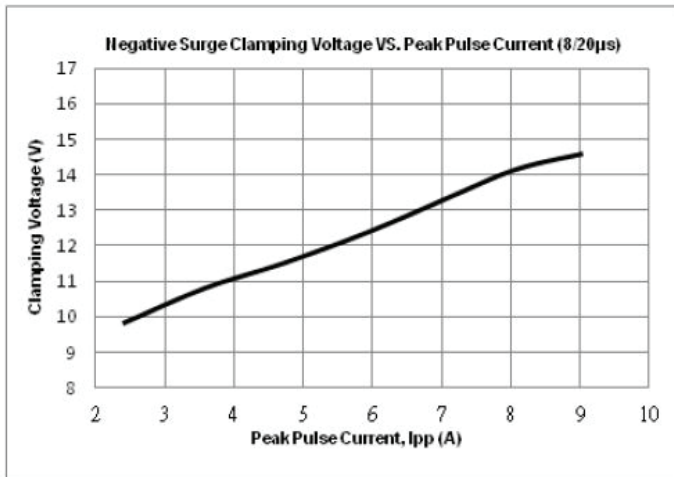


FIGURE 4
NEGATIVE SURGE CLAMPING VOLTAGE

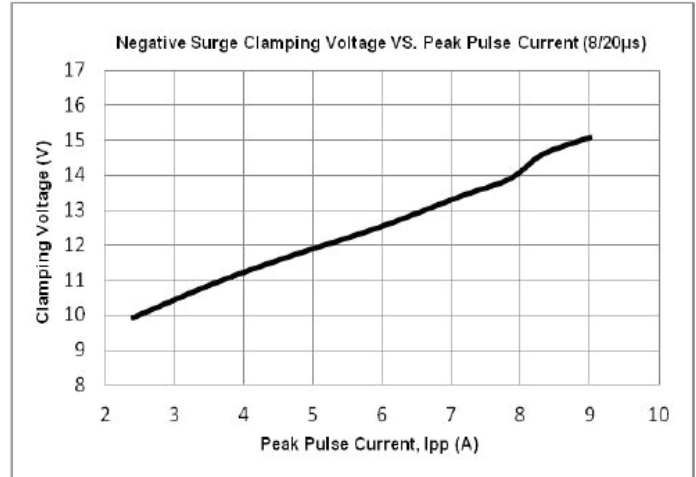


FIGURE 5
POSITIVE SURGE CLAMPING VOLTAGE (tp = 100ns, tr = 1ns)

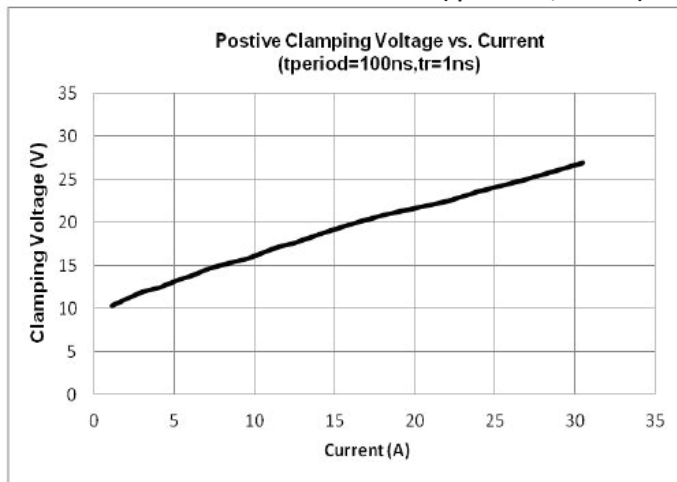
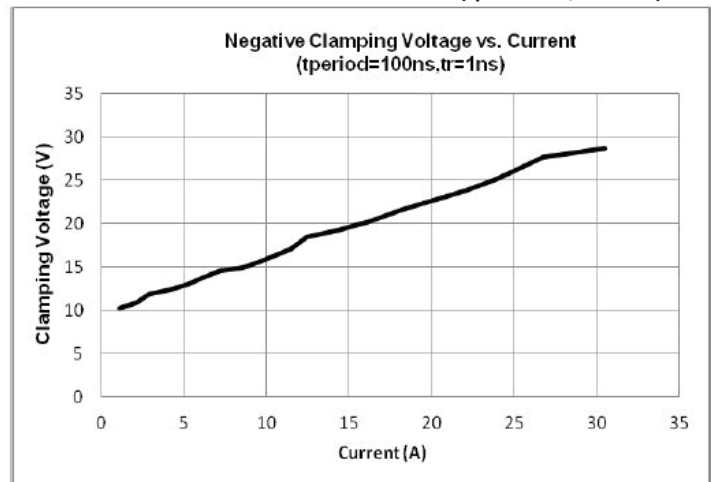


FIGURE 6
NEGATIVE SURGE CLAMPING VOLTAGE (tp = 100ns, tr = 1ns)



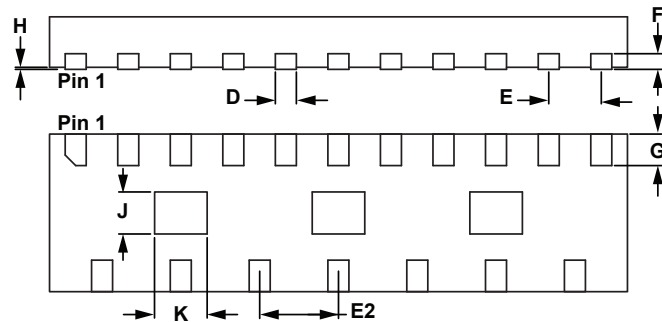
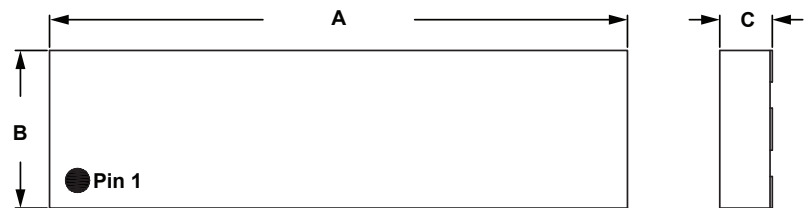
PACKAGE INFORMATION

OUTLINE DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	5.45	5.55	0.213	0.220
B	1.45	1.55	0.055	0.063
C	0.45	0.55	0.018	0.022
D	0.15	0.25	0.006	0.010
E	0.50		0.020	
E2	0.75		0.030	
F	0.10	0.20	0.005	0.008
G	0.25	0.35	0.010	0.014
H	0.00	0.05	0.000	0.002
J	0.35	0.45	0.012	0.018
K	0.45	0.55	0.018	0.022

NOTES

1. Controlling dimension: millimeters.

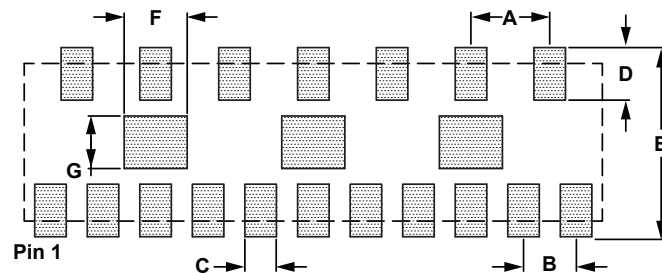


PAD LAYOUT

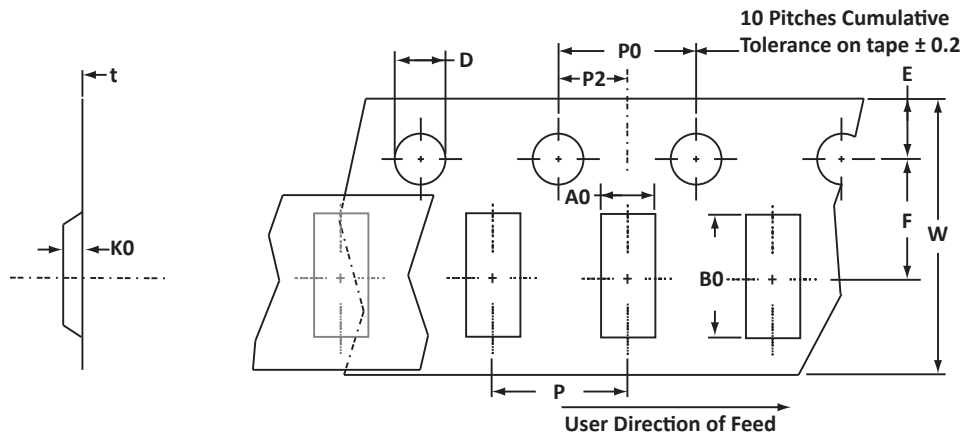
DIM	MILLIMETERS	INCHES
	NOMINAL	NOMINAL
A	0.75	0.030
B	0.50	0.020
C	0.30	0.012
D	0.50	0.020
E	1.80	0.071
F	0.60	0.024
G	0.50	0.020
H	0.40	0.016
J	0.25	0.010

NOTES

1. Controlling dimension: millimeters.



TAPE AND REEL



SPECIFICATIONS

REEL DIA.	TAPE WIDTH	A0	B0	K0	D	E	F	W	P0	P2	P	tmax
178mm (7")	12mm	1.68 ± 0.05	5.68 ± 0.05	0.62 ± 0.05	1.50 ± 0.10	1.75 ± 0.10	5.5 ± 0.05	12.00 ± 0.30	4.00 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	0.25

NOTES

- Dimensions are in millimeters.
- Surface mount product is taped and reeled in accordance with EIA-481.
- Suffix - T73 = 7" Reel - 3,000 pieces per 8mm tape.
- Marking on Part - marking code (see page 2).

ORDERING INFORMATION

BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
PTB05-8UL	n/a	-T73	3,000	7"	n/a

This device is only available in a Lead-Free configuration.

COMPANY INFORMATION

COMPANY PROFILE

In business more than 20 years, ProTek Devices™ is a privately held semiconductor company. The company offers a product line of overvoltage protection and overcurrent protection components. These include transient voltage suppressor array (TVS arrays) avalanche breakdown diode, steering diode TVS array and electronics SMD chip fuses. These components deliver circuit protection in electronic systems from numerous overvoltage and overcurrent events. They include lightning; electrostatic discharge (ESD); nuclear electromagnetic pulses (NEMP); inductive switching; and electromagnetic interference (EMI) / radio frequency interference (RFI). ProTek Devices also offers LED wafer die for ESD protection and related high frequency products.

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