

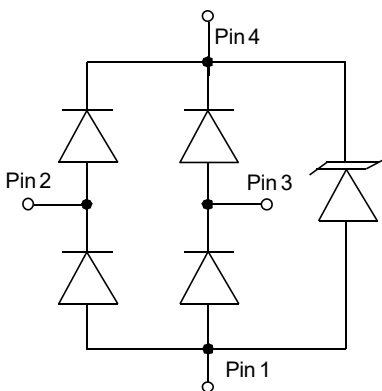
Description

The PDL0504S1-T6B0 is a 2-line ultra-low capacitance TVS diode 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 PDL0504S1-T6B0 has a very low capacitance with a typical value at 0.3pF, and complies with the IEC 61000-4-2(ESD) standard with $\pm 18\text{kV}$ air and $\pm 18\text{kV}$ contact discharge. It is assembled into a lead-free SOT-143 package. The small size, very low capacitance and high ESD surge protection make PDL0504S1-T6B0 an ideal choice to protect cell phone, digital video interfaces, high speed data ports, and many other portable applications.

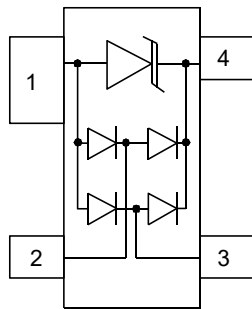
Mechanical Characteristics

- Package: SOT-143
- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Below

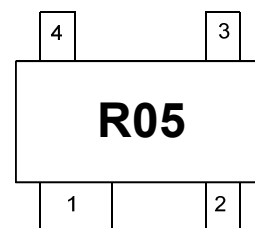
Dimensions and Pin Configuration



Circuit Diagram



Pin Schematic



Ordering Information

Part Number	Marking	Packaging	Reel Size
PDL0504S1-T6B0	R05	3000/Tape & Reel	7 inch

Features

- Ultra low capacitance: 0.3pF typical
- Ultra low leakage: nA level
- Operating voltage: 5V
- Low clamping voltage
- 4-pin SOT-143 package
- Protects two data lines and one power line
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test Air discharge: $\pm 18\text{kV}$
Contact discharge: $\pm 18\text{kV}$
 - IEC61000-4-4 (EFT) 40A (5/50ns)
 - IEC61000-4-5 (Lightning) 4A (8/20 μs)
- RoHS Compliant

Applications

- Cellular Handsets and Accessories
- Notebooks and Handhelds
- Personal Digital Assistants
- Portable Instrumentation
- Digital Cameras
- Peripherals
- Audio Players, Keypads, Side Keys, LCD
- USB 2.0

Marking Information

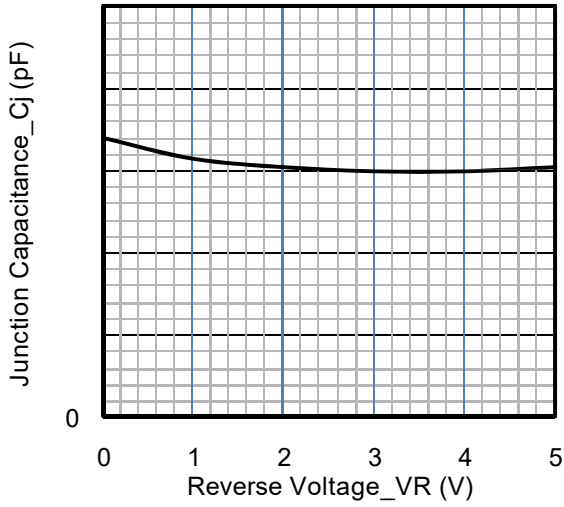
Absolute Maximum Ratings (TA=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power(8/20µs)	Ppk	60	W
Peak Pulse Current(8/20µs)	IPP	4	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	VESD	±18 ±18	kV
Operating Temperature Range	TJ	-55 to +125	°C
Storage Temperature Range	Tstg	-55 to +150	°C

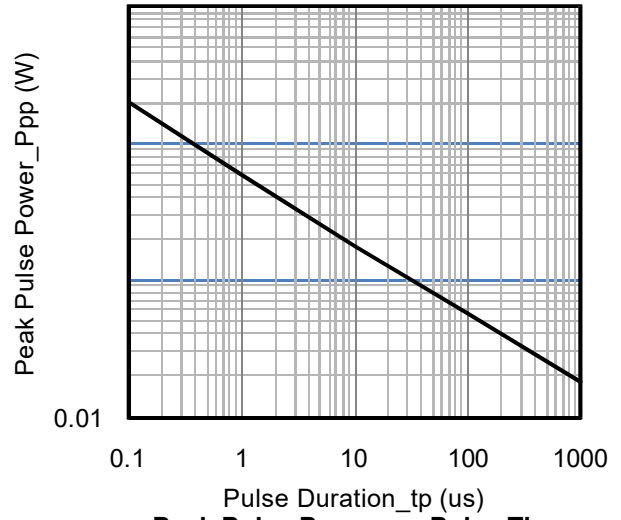
Electrical Characteristics (TA=25°C unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	VRWM			5	V	Any I/O pin to ground
Punch-Through Voltage	VBR	6			V	IT = 1mA, any I/O pin to ground
Reverse Leakage Current	IR		0.01	0.5	µA	VRWM = 5V, any I/O pin to ground
Clamping Voltage	VC			11	V	IPP = 1A (8 x 20µs pulse), any I/O pin to ground
Clamping Voltage	VC			15	V	IPP = 4A (8 x 20µs pulse), any I/O pin to ground
Junction Capacitance	CJ		0.3	0.4	pF	VR=0, f=1MHz, between I/O pins
Junction Capacitance	CJ			0.8	pF	VR=0, f=1MHz, any I/O pin to ground

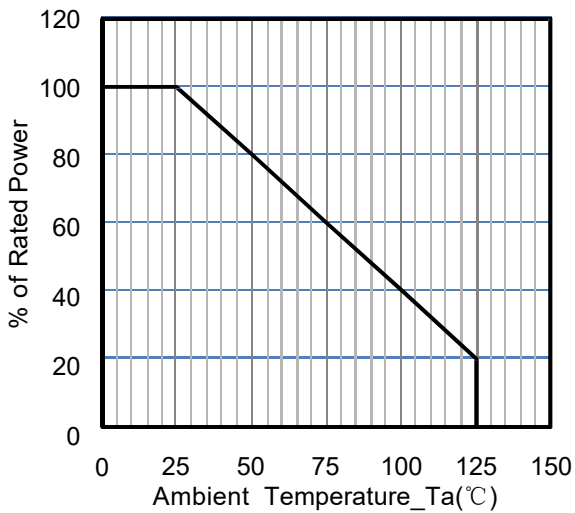
Typical Performance Characteristics (TA=25°C unless otherwise Specified)



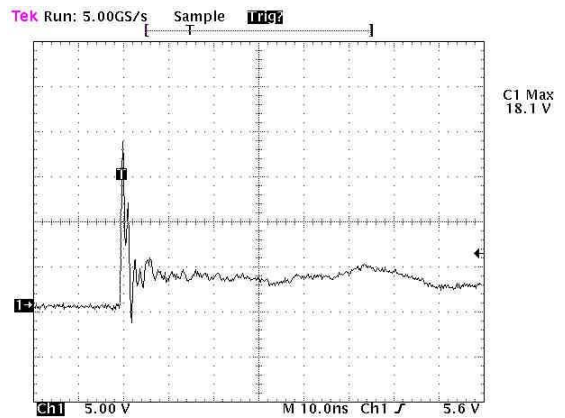
Junction Capacitance vs. Reverse Voltage



Peak Pulse Power vs. Pulse Time

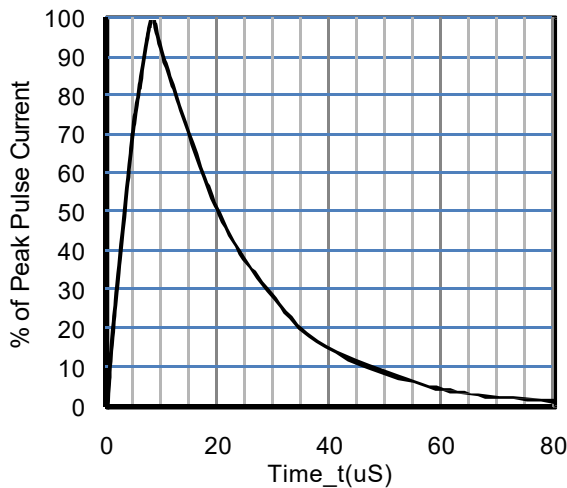


Power Derating Curve

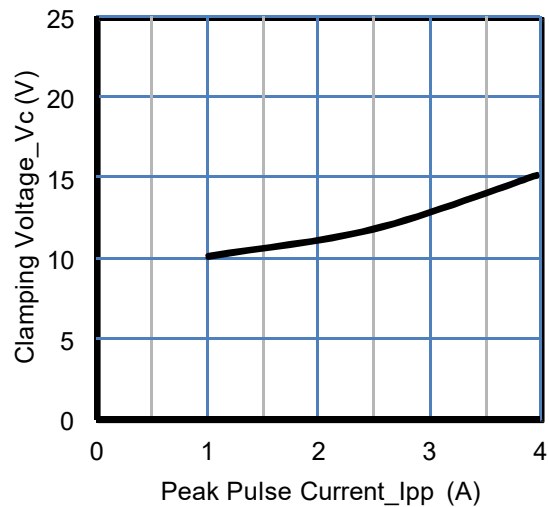


ESD Clamping Voltage

8 kV Contact per IEC61000-4-2



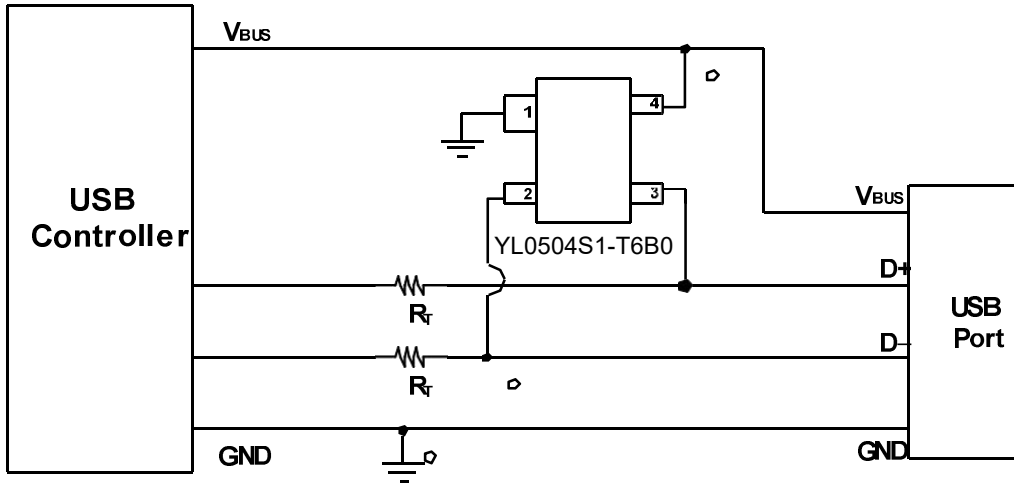
8 X 20uS Pulse Waveform



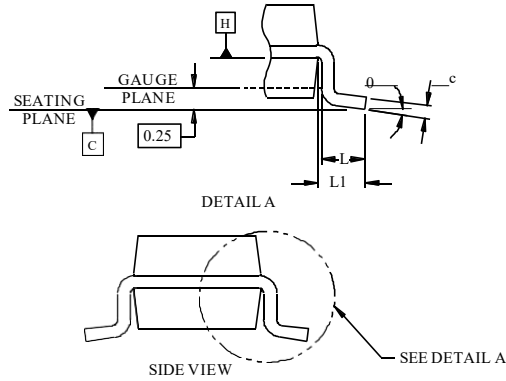
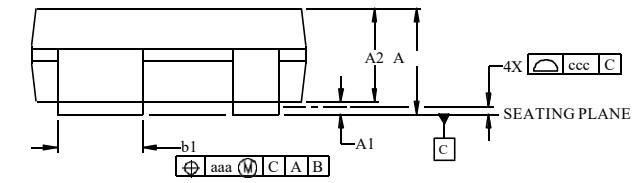
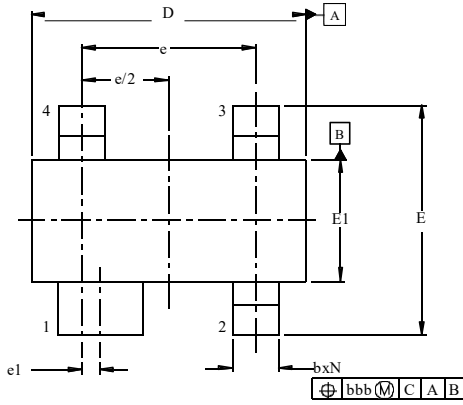
Clamping Voltage vs. Peak Pulse Current

PDL0504S1-T6B0 on USB Port Application

The PDL0504S1-T6B0 tvs can be used to protect the USB port on the monitors, computers, peripherals or portable systems. The ESD protection scheme for single USB ports is shown below figure, the voltage bus (VBUS) of USB port is connected to the power pin (pin4) of tvs YL0504S1-T6B0. Each data line (D+/D-) of USB port is connected to the ESD protection pin (pin2/pin3) of tvs YL0504S1-T6B0. When ESD voltage pulse appears on the data line, the ESD pulse current will be conducted by tvs YL0504S1-T6B0 away from the USB controller chip. In addition, the ESD pulse current also can be conducted by tvs YL0504S1-T6B0 away from the USB controller chip when the ESD voltage pulse appears on the voltage bus (VBUS) of USB port. Therefore, the data lines (D+/D-) and voltage bus (VBUS) of two USB ports are complementally protected with one YL0504S1-T6B0.

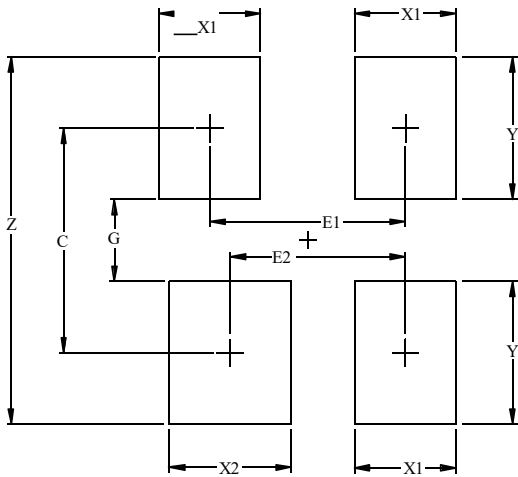


SOT-143 Package Outline Drawing



DIM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	.031	-	.048	0.80	-	1.22
A1	.000	-	.006	0.013	-	0.15
A2	.029	.035	.042	0.75	0.90	1.07
b	.011	-	.020	0.30	-	0.51
b1	.029	-	.037	0.76	-	0.94
c	.003	-	.008	0.08	-	0.20
D	.110	.114	.120	2.80	2.90	3.04
E	.082	.093	.104	2.10	2.37	2.64
E1	.047	.051	.055	1.20	1.30	1.40
e	.075			1.92 BSC		
e1	.008			0.20 BSC		
L	.015	.020	.024	0.40	0.50	0.60
L1	(.021)			(0.54)		
N	4			4		
θ	0°	-	8°	0°	-	8°
aaa	.006			0.15		
bbb	.008			0.20		
ccc	.004			0.10		

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	2.20	0.087
E1	1.92	0.076
E2	1.72	0.068
G	0.80	0.031
X1	1.00	0.039
X2	1.20	0.047
Y	1.40	0.055
Z	3.60	0.141