

2-Line Ultra Low Capacitance TVS Diode

Description

The DL0502P6 is an uni-directional 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 DL0502P6 has an ultra-low capacitance with a typical value at 0.6pF, and complies with the IEC 61000-4-2 (ESD) standard with $\pm 25\text{kV}$ air and $\pm 20\text{kV}$ contact discharge. It is assembled into an ultra-small 1.6x1.0x0.75mm lead-free DFN package. The small size, ultra-low capacitance and high ESD surge protection make DL0502P6 an ideal choice to protect cell phone, digital video interfaces and other high speed ports.

Mechanical Characteristics

- ◆ Package: DFN1610-6
- ◆ Case Material: "Green" Molding Compound.
- ◆ Moisture Sensitivity: Level 3 per J-STD-020
- ◆ Terminal Connections: See Diagram Below
- ◆ Marking Information: See Below

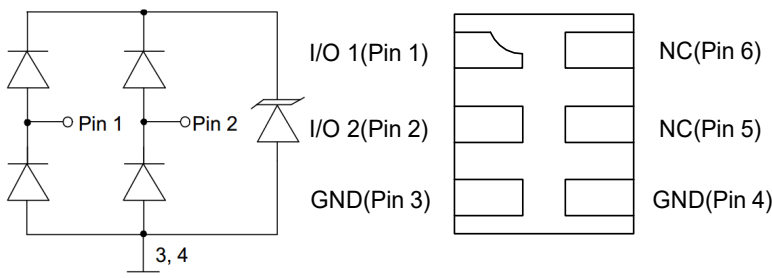
Features

- ◆ Ultra small package: 1.6 x1.0 x0.75mm
- ◆ Ultra low capacitance: 0.6pF typical
- ◆ Ultra low leakage: nA level
- ◆ Operating voltage: 5V
- ◆ Low clamping voltage
- ◆ 6-pin leadless package
- ◆ Protects two lines
- ◆ Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test Air discharge: $\pm 25\text{kV}$
 - IEC 61000-4-2 (ESD) immunity test Contact discharge: $\pm 20\text{kV}$
 - IEC 61000-4-5 (Lightning) 5A (8/20 μs)
- ◆ RoHS Compliant

Applications

- ◆ Cellular Handsets and Accessories
- ◆ USB Ports
- ◆ Video Interface
- ◆ MDDI Ports

Dimensions and Pin Configuration



Circuit Schematic

PIN Schematic

Marking Information



0522P = Device Marking Code

Dot denotes Pin1

Ordering Information

Part Number	Marking	Packaging	Reel Size
DL0502P6	0522P	3000/Tape & Reel	7 inch

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

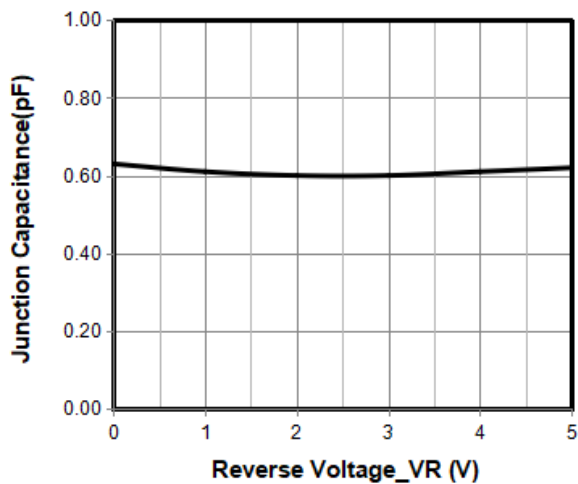
Parameter	Symbol	Value	Unit
Peak Pulse Power(8/20 μs)	Ppk	75	W
Peak Pulse Current(8/20 μs)	Ipp	5	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	VESD	± 25 ± 20	kV
Operating Temperature Range	TJ	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	Tstg	-55 to +150	$^{\circ}\text{C}$

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

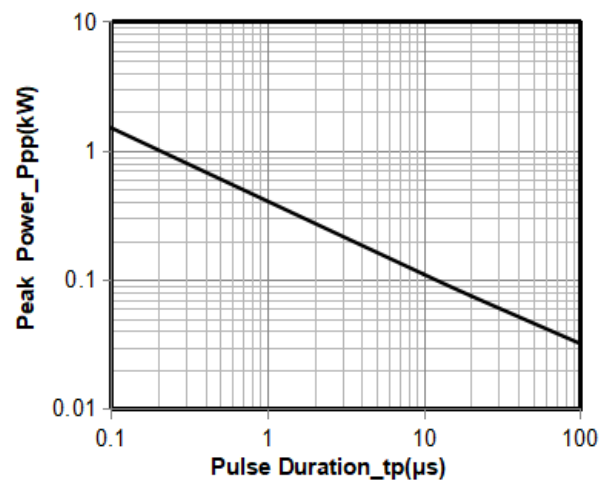
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	VRWM			5	V	
Breakdown Voltage	VBR	6			V	IT = 1mA
Reverse Leakage Current	IR			0.5	μA	VRWM = 5V
Clamping Voltage	VC			10	V	I _{PP} = 1A (8 x 20 μs pulse), any I/O pin to ground
Clamping Voltage	VC			15	V	I _{PP} = 5A (8 x 20 μs pulse), any I/O pin to ground
Junction Capacitance	CJ		0.3	0.4	pF	VR = 0V, f = 1MHz, between I/O pins
Junction Capacitance	CJ			0.8	pF	VR = 0V, f = 1MHz, any I/O pin to ground

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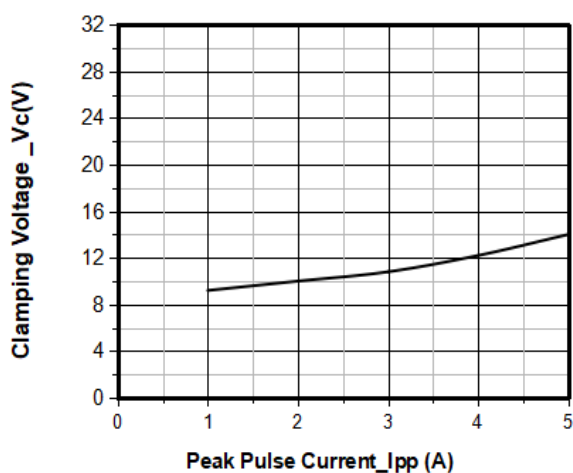
Typical Performance Characteristics (TA=25°C unless otherwise Specified)



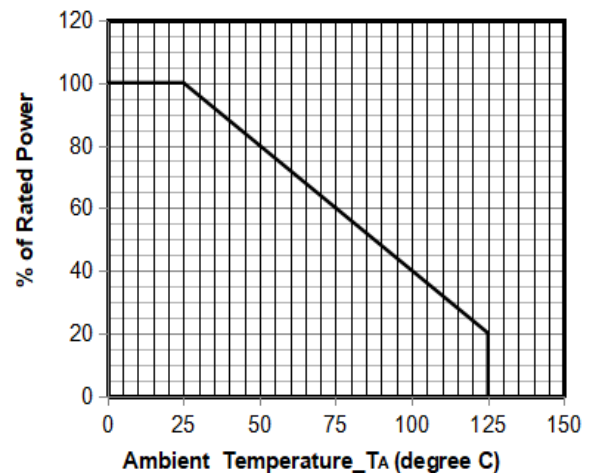
Junction Capacitance vs. Reverse Voltage



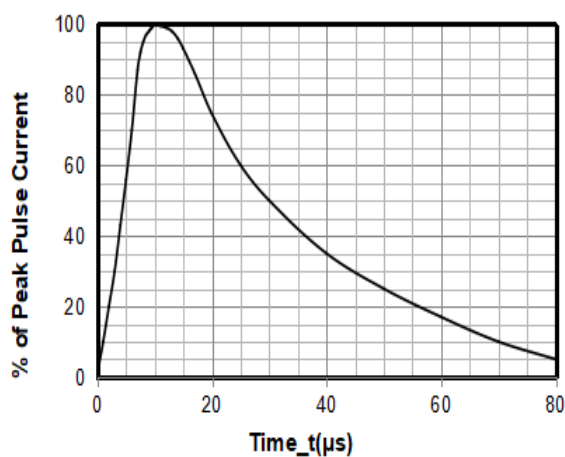
Peak Pulse Power vs. Pulse Time



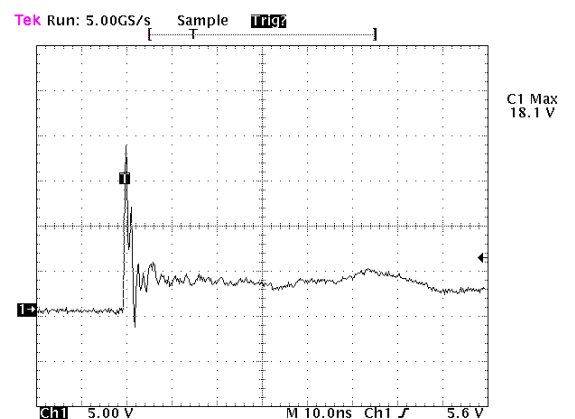
Clamping Voltage vs. Peak Pulse Current



Power Derating Curve



8 X 20 μs Pulse Waveform



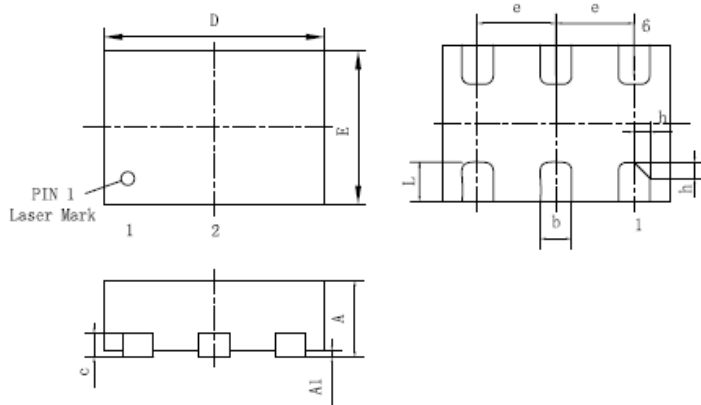
Note: Data is taken with a 10x attenuator

ESD Clamping Voltage

8 kV Contact per IEC61000-4-2

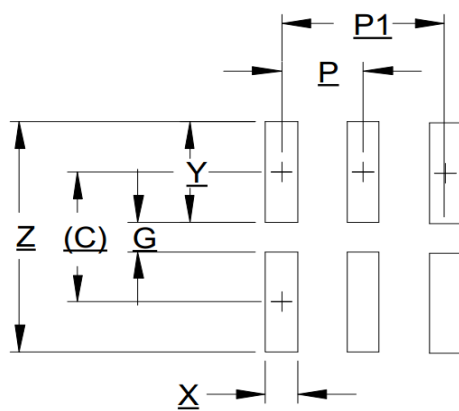
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DFN1610-6 Package Outline Drawing



SYM	MILLIMETERS		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	--	0.02	0.05
b	0.17	0.20	0.25
c	0.15	0.20	0.25
D	1.55	1.60	1.65
E	0.90	1.00	1.10
e	0.50BSC		
L	0.20	0.25	0.30
h	0.08	0.10	0.12

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	0.034	0.87
G	0.007	0.19
P	0.020	0.50
P1	0.039	1.00
X	0.008	0.20
Y	0.027	0.68
Z	0.061	1.55