

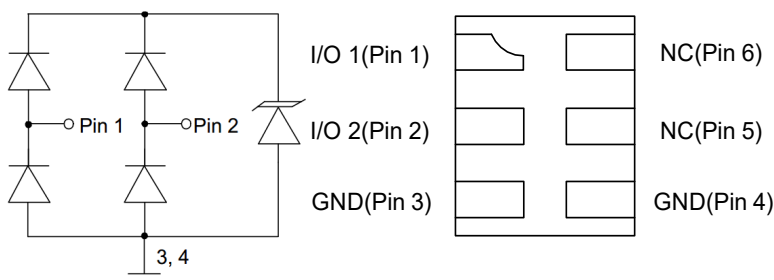
Description

The DL0502P6-SA 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-SA has an ultra-low capacitance with a typical value at 0.6pF, and complies with the IEC 61000-4-2 (ESD) standard with $\pm 20\text{kV}$ air and $\pm 20\text{kV}$ contact discharge. It is assembled into an ultra-small 1.6x1.0x0.50mm lead-free DFN package. The small size, ultra-low capacitance and high ESD surge protection make DL0502P6-SA 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

Dimensions and Pin Configuration



Circuit Schematic

PIN Schematic

Features

- ◆ Ultra small package: 1.6 x1.0 x0.50mm
- ◆ Ultra low capacitance: 1.0pF 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: $\pm 20\text{kV}$
 - Contact discharge: $\pm 20\text{kV}$
 - IEC 61000-4-5 (Lightning) 6A (8/20 μs)
- ◆ RoHS Compliant

Applications

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

Marking Information



0522P = Device Marking Code

Dot denotes Pin1

Ordering Information

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

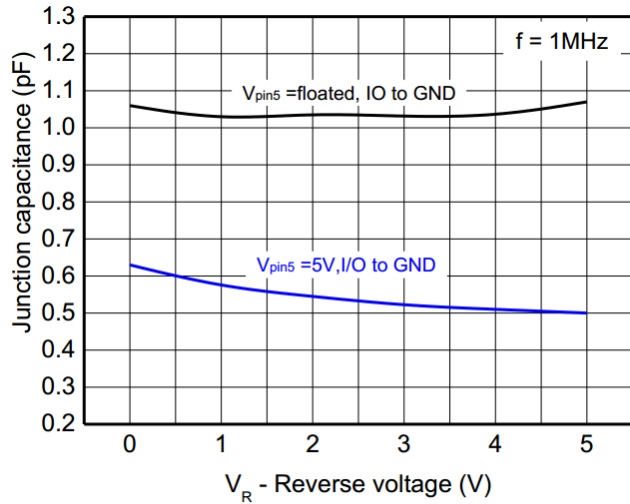
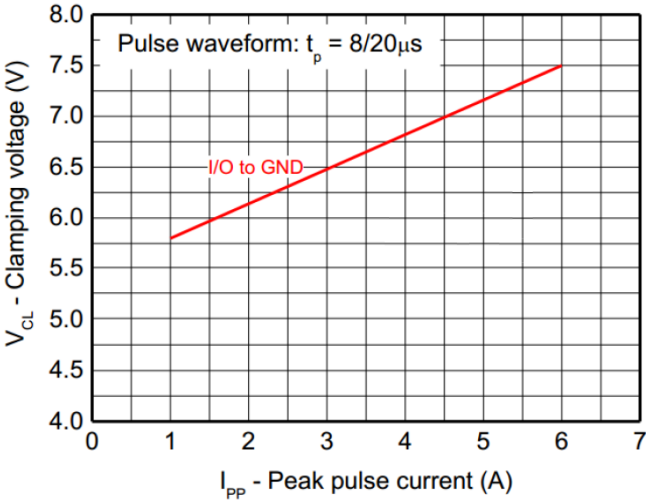
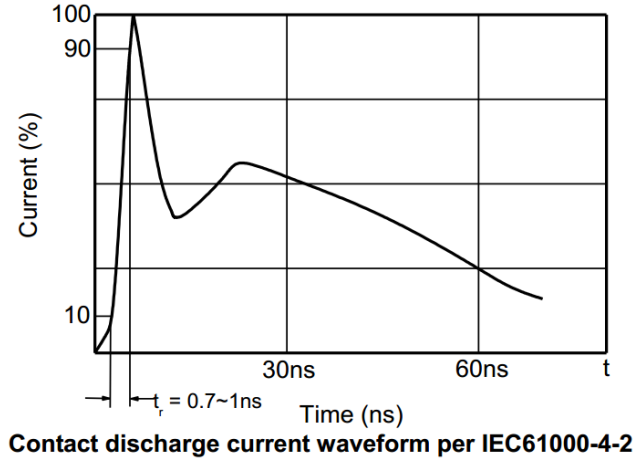
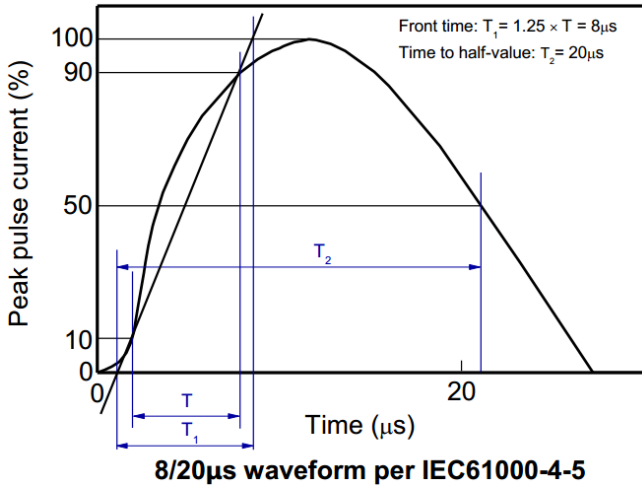
Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power(8/20 μs)	Ppk	50	W
Peak Pulse Current(8/20 μs)	Ipp	6	A
ESD per IEC 61000-4-2 (Air)	VESD	± 20	kV
ESD per IEC 61000-4-2 (Contact)		± 20	
Operating Temperature Range	TJ	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	Tstg	-55 to +150	$^{\circ}\text{C}$

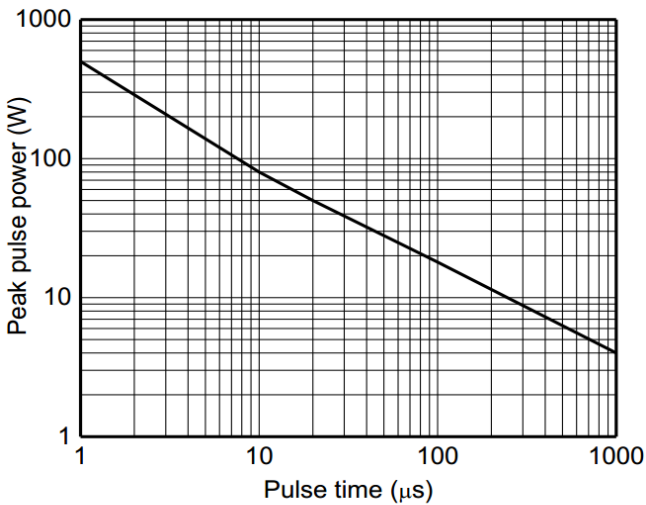
Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
I/O Pins						
Reverse stand-off voltage	V_{RWM}				5.0	V
Reverse leakage current	I_R	$V_{RWM} = 5\text{V}$			1	μA
Reverse breakdown voltage	V_{BR}	$I_{BR} = 1\text{mA}$	6.0	7.8	9.0	V
Forward voltage	V_F	$I_F = 10\text{mA}$	0.6	0.9	1.2	V
Clamping voltage ¹⁾	V_{CL}	$I_{PP} = 16\text{A}$, $t_p = 100\text{ns}$		7.5		V
Dynamic resistance ¹⁾	R_{DYN}	$t_p = 100\text{ns}$		0.18		Ω
Clamping voltage ²⁾	V_{CL}	$V_{ESD} = 8\text{kV}$		7.5		V
Clamping voltage ³⁾	V_{CL}	$I_{PP} = 1\text{A}$, $t_p = 8/20\mu\text{s}$			8.0	V
		$I_{PP} = 6\text{A}$, $t_p = 8/20\mu\text{s}$			8.5	V
Junction capacitance	$C_{I/O - GND}$	$V_R = 0\text{V}$, $f = 1\text{MHz}$, $V_{pin5} = \text{floated}$, any I/O to GND		1.0	1.4	pF
		$V_R = 2.5\text{V}$, $f = 1\text{MHz}$, $V_{pin5} = 5\text{V}$, any I/O to GND		0.7	1.0	pF
	$C_{I/O - I/O}$	$V_R = 2.5\text{V}$, $f = 1\text{MHz}$, $V_{pin5} = 5\text{V}$, $V_{pin2} = 0\text{V}$, any I/O to I/O		0.1	0.2	pF

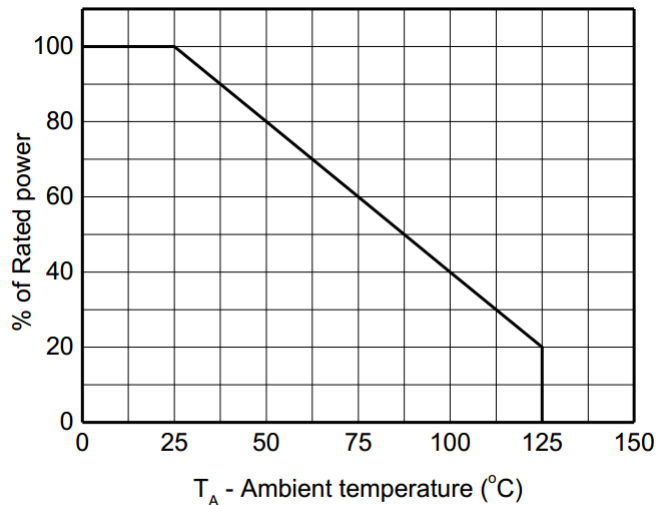
Typical Performance Characteristics (TA=25°C unless otherwise Specified)



Capacitance vs. Reverse voltage

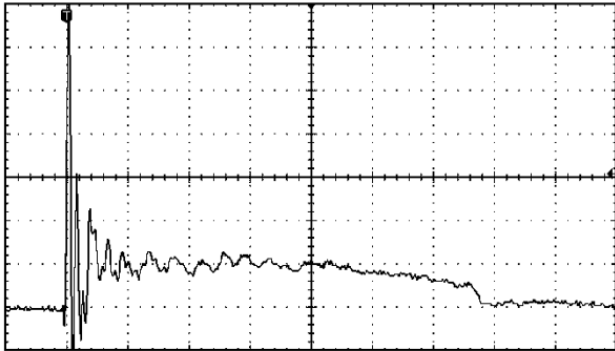


Non-repetitive peak pulse power vs. Pulse time

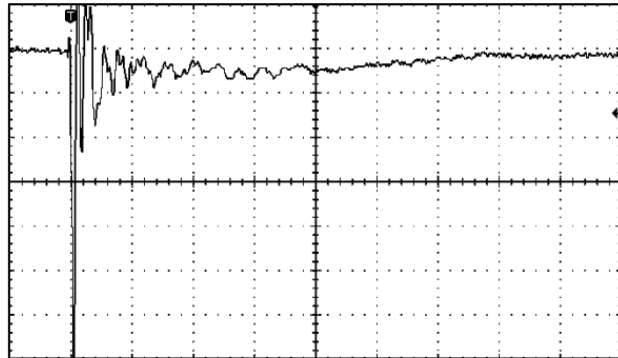


Power derating vs. Ambient temperature

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

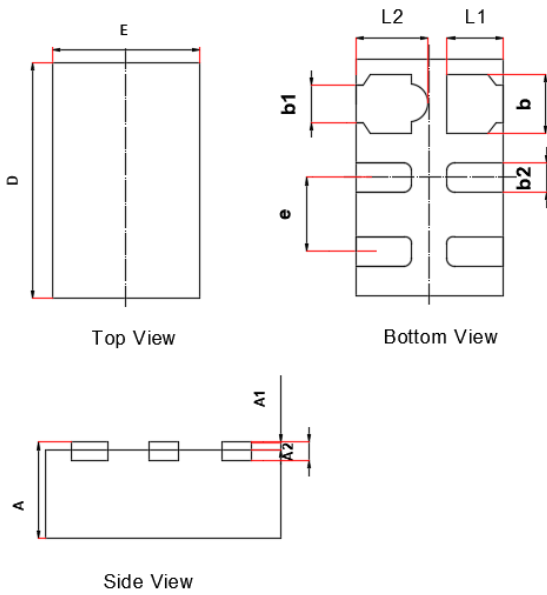


**ESD clamping - I/O to GND
(+8kV contact discharge per IEC61000-4-2)**



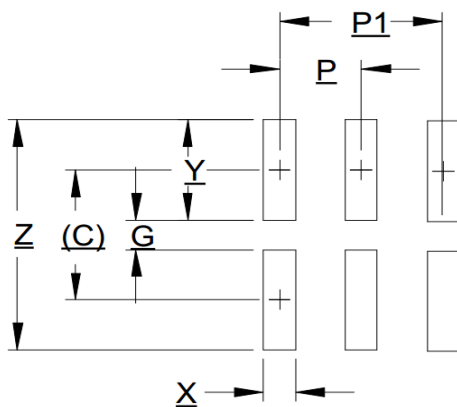
**ESD clamping - I/O to GND
(-8kV contact discharge per IEC61000-4-2)**

DFN1610-6 Package Outline Drawing



Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.45	0.50	0.55
A1	-	0.02	0.05
A2	0.12	0.15	0.20
D	1.55	1.60	1.65
E	0.95	1.00	1.05
b	0.35	0.40	0.45
b1	0.20	0.25	0.30
b2	0.15	0.20	0.25
e	0.5TYP.		
L1	0.33	0.38	0.43
L2	0.44	0.49	0.54

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

Contact Information

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