Description

The DL73002S1 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 DL73002S1 has a very low capacitance with a typical value at 1.5pF, and complies with the IEC 61000-4-2(ESD) standard with ±30kV air and ±30kV contact discharge. It is assembled into a lead-free SOT-143 package. The small size, very low capacitance and high ESD surge protection make DL73002S1 an ideal choice to protect cell phone, digital video interfaces, high speed data ports, and many other portable applications.

Features

- Ultra low capacitance: 1.5pF 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: ±30kV
    Contact discharge: ±30kV
  - IEC61000-4-4 (EFT) 40A (5/50ns)
  - IEC61000-4-5 (Lightning) 11A (8/20μs)
- RoHS Compliant

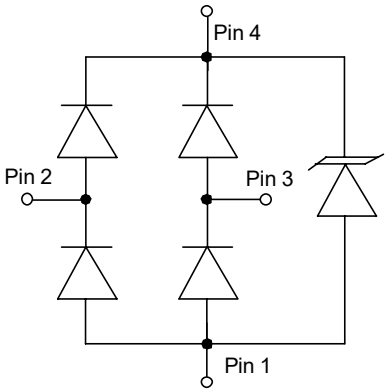
Mechanical Characteristics

- 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

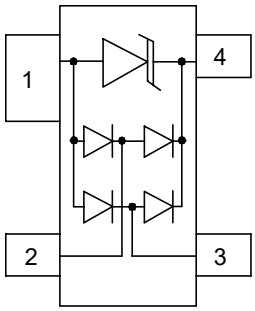
Applications

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

Dimensions and Pin Configuration

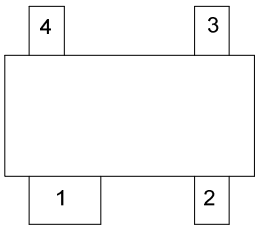


Circuit Diagram



Pin Schematic

Marking Information



Ordering Information

Part Number	Marking	Packaging	Reel Size
DL73002S1		3000/Tape & Reel	7 inch

Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse power (t_p = 8/20μs)	P_{pk}	77	W
Peak pulse current (t_p = 8/20μs)	I_{PP}	11	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	±30	kV
ESD according to IEC61000-4-2 contact discharge		±30	
Junction temperature	T_J	125	°C
Operating temperature	T_{OP}	-40~85	°C
Lead temperature	T_L	260	°C
Storage temperature	T_{STG}	-55~150	°C

Electrical characteristics (T_A = 25°C, unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse maximum working voltage	V_{RWM}				5.0	V
Reverse leakage current	I_R	V_{RWM} = 5V			200	nA
Reverse breakdown voltage	V_{BR}	I_T = 1mA	6.5			V
Forward voltage	V_F	I_T = 10mA	0.6	0.9	1.2	V
Clamping voltage 1)	V_{CL}	I_{PP} = 16A, t_p = 100ns		5.8		V
Dynamic resistance 1)	R_{DYN}			0.16		Ω
Clamping voltage 2)	V_{CL}	V_{ESD} = 8kV		5.5		V
Clamping voltage 3)	V_{CL}	I_{PP} = 1A, t_p = 8/20μs			4.0	V
		I_{PP} = 11A, t_p = 8/20μs			7.0	V
Junction capacitance	C_J	V_{GND} = 0V, V_{IN} = 1.5V, f = 1MHz, T = 25°C, Any I/O to GND		1.50	1.75	pF
		V_{GND} = 0V, V_{IN} = 1.5V, f = 1MHz, T = 25°C, Between I/O1 and I/O2		0.15	0.20	pF

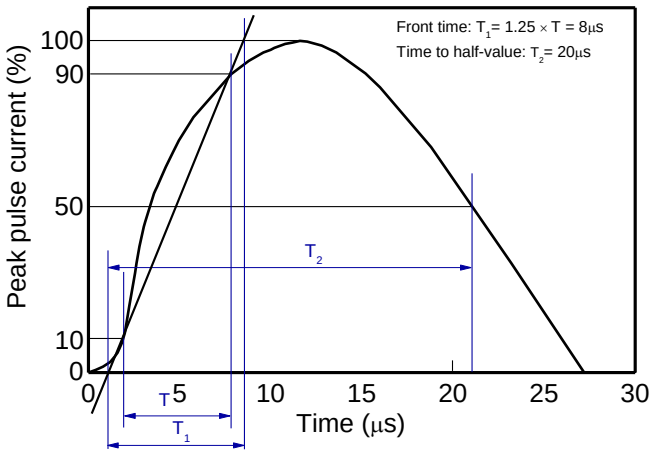
Notes:

1) *TLP parameter: Z_0 = 50 Ω, t_p = 100ns, t_r = 2ns, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.*

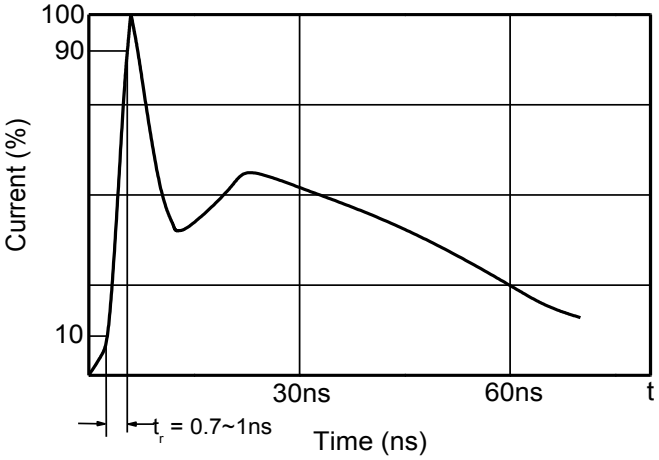
2) *Contact discharge mode, according to IEC61000-4-2.*

3) *Non-repetitive current pulse, according to IEC61000-4-5.*

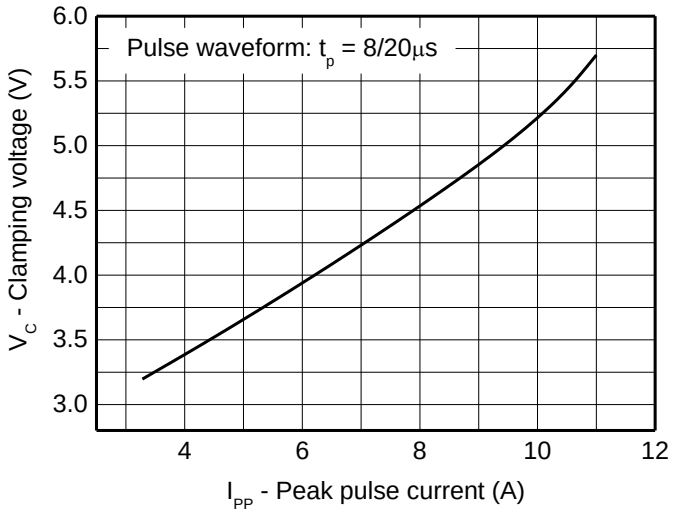
Typical characteristics (T_A = 25 °C, unless otherwise noted)



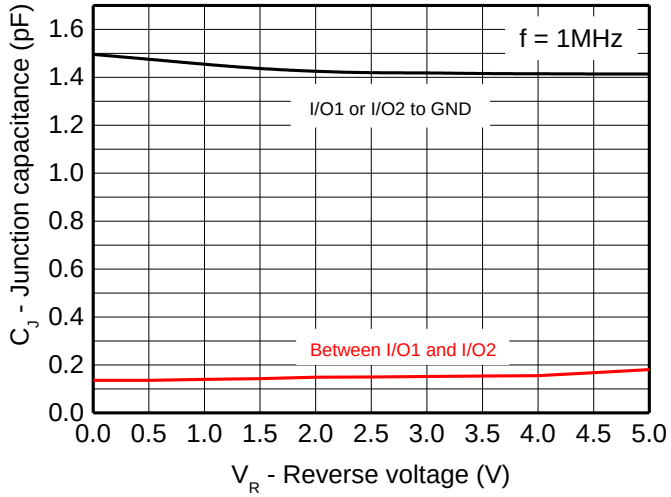
8/20μs waveform per IEC61000-4-5



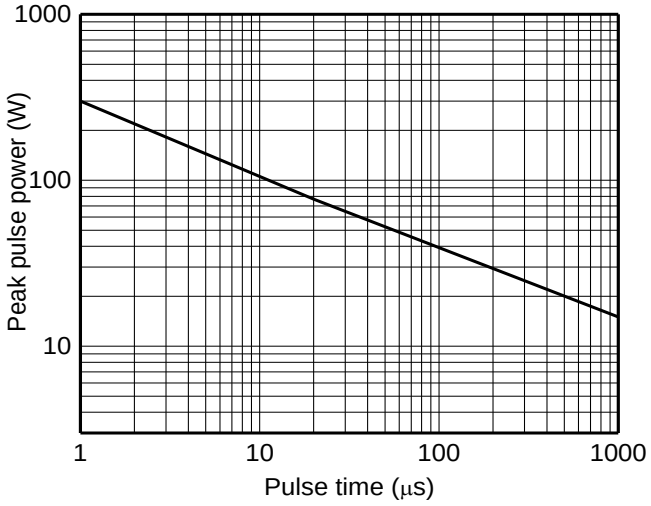
Contact discharge current waveform per IEC61000-4-2



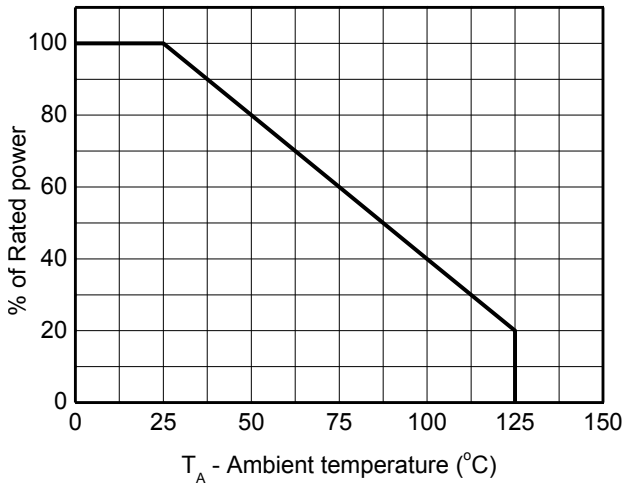
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverse voltage

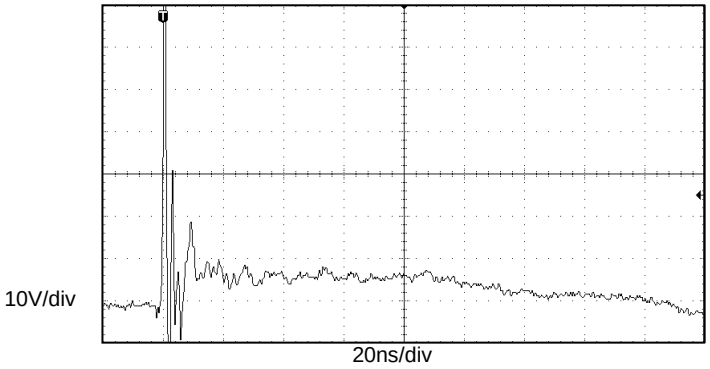


Non-repetitive peak pulse power vs. Pulse time

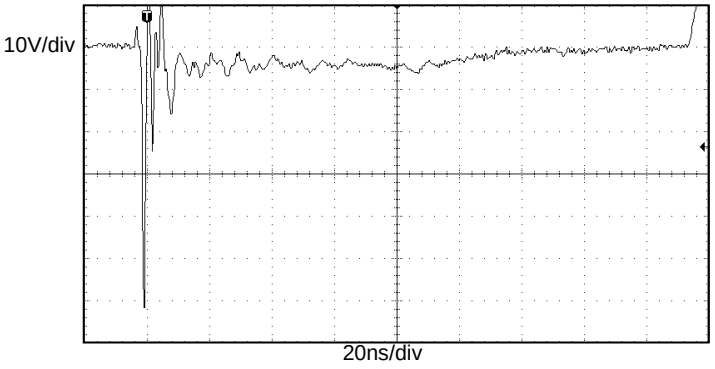


Power derating vs. Ambient temperature

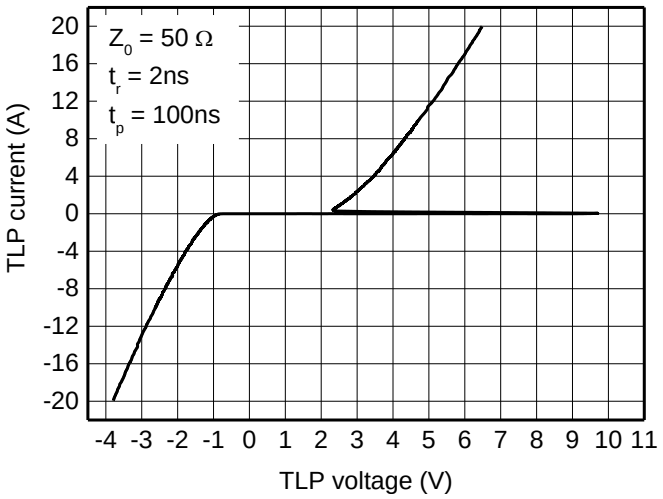
Typical characteristics (T_A = 25 °C, unless otherwise noted)



ESD clamping
(+8kV contact discharge per IEC61000-4-2)

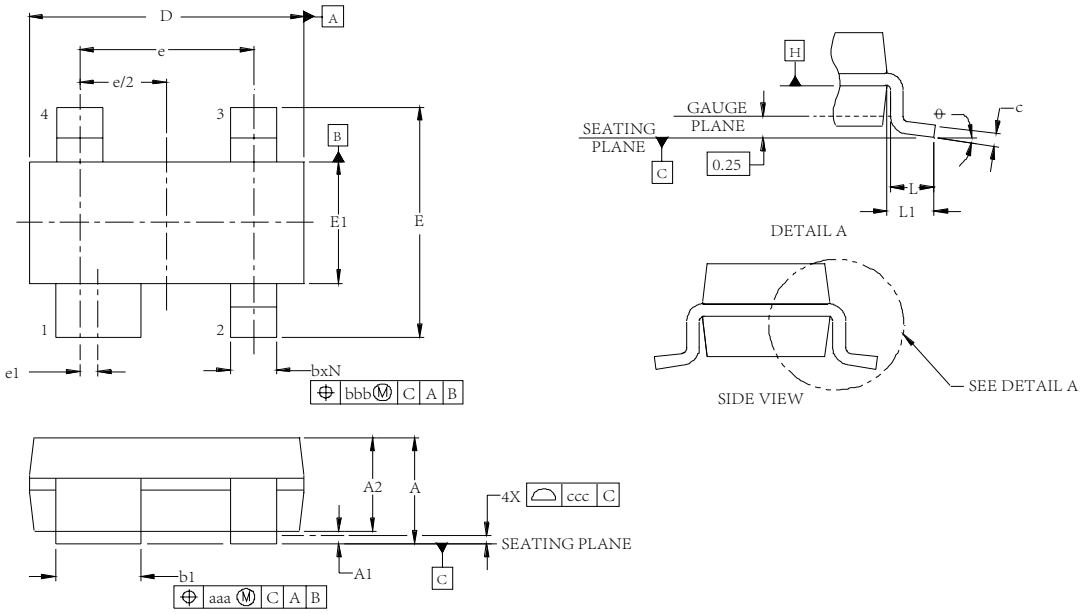


ESD clamping
(-8kV contact discharge per IEC61000-4-2)



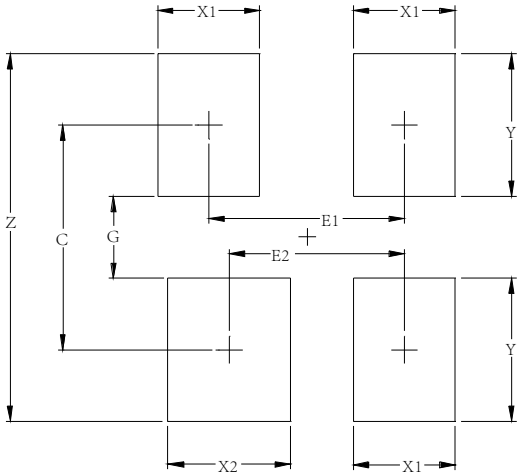
TLP Measurement

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

Contact Information

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