

ESDL5V0BDB

Description

ESDL5V0BDB is a bi-directional TVS. It has been specifically designed to protect the sensitive electronic components which are connected to low speed data lines and control lines from over-stress caused by ESD (Electrostatic Discharge), EFT (Electrical Fast Transients) and Lightning.

ESDL5V0BDB may be used to provide ESD protection up to $\pm 30\text{kV}$ according to IEC61000-4-2, and withstand peak pulse current up to 8A (8/20 μs) according to IEC61000-4-5.

ESDL5V0BDB is available in DFN1006-2L package. Standard products are Pb-free and Halogen-free.

Features

- ◆ Stand-off voltage: $\pm 5\text{V}$ Max.
- ◆ Transient protection for each line according to IEC61000-4-2(ESD): $\pm 30\text{kV}$ (contact)
IEC61000-4-4 (EFT): 40A (5/50ns)
IEC61000-4-5(surge): 8A (8/20 μs)
- ◆ Ultra-low capacitance: $C_J = 10\text{pF}$ typ.
- ◆ Low leakage current:
- ◆ Low clamping voltage: $V_{CL} = 10.0\text{V}$ typ. @ $I_{PP} = 16\text{A}$ (TLP)
- ◆ Solid-state silicon technology

Applications

- ◆ Cellular phones
- ◆ Tablets
- ◆ Laptops
- ◆ Other portable devices
- ◆ Network communication devices

Absolute Maximum Ratings

Parameter	Symbol	Value	Units
Peak pulse power ($t_p = 8/20\mu\text{s}$)	P_{PK}	96	W
Peak pulse current ($t_p =$	I_{PP}	8	A
IEC61000-4-2 (Contact)	V_{ESD}	± 30	kV
IEC61000-4-2 (Air)	V_{ESD}	± 30	kV
Lead Temperature	T_L	260	$^{\circ}\text{C}$
Operating temperature	T_{OP}	-40 to 85	$^{\circ}\text{C}$
Junction Temperature	T_J	125	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 to 150	$^{\circ}\text{C}$

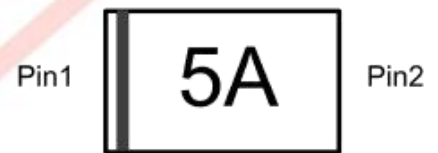
DFN1006-2L



Pin configuration



Marking



Order information

Device	Package	Shipping
ESDL5V0BDB	DFN1006-2L	10000/Tape&Reel

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Electrical Characteristics (T =25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-off voltage	V_{RWM}				± 5	V
Reverse Breakdown voltage	V_{BR}	$I_t = 1mA$	5.3	6		V
Reverse Leakage Current	I_R	$V_{RWM} = 5V$			100	nA
Reverse holding voltage	V_{HOLD}	$I_{HOLD} = 50mA$	5.3	6		V
Clamping voltage ¹⁾	V_{CL}	$I_{PP} = 16A, t_p = 100ns$		10.0		V
Dynamic resistance ¹⁾	R_{DYN}			0.2		Ω
Clamping voltage ²⁾	V_{CL}	$V_{ESD} = 8kV$		10.0		V
Clamping voltage ³⁾	V_{CL}	$I_{PP} = 1A, t_p = 8/20\mu s$			8	V
		$I_{PP} = 8A, t_p = 8/20\mu s$			12	V
Junction Capacitance	C_J	$V_R = 0V, f = 1MHz$		10	13	pF
		$V_R = 2.5V, f = 1MHz$		8	11	pF

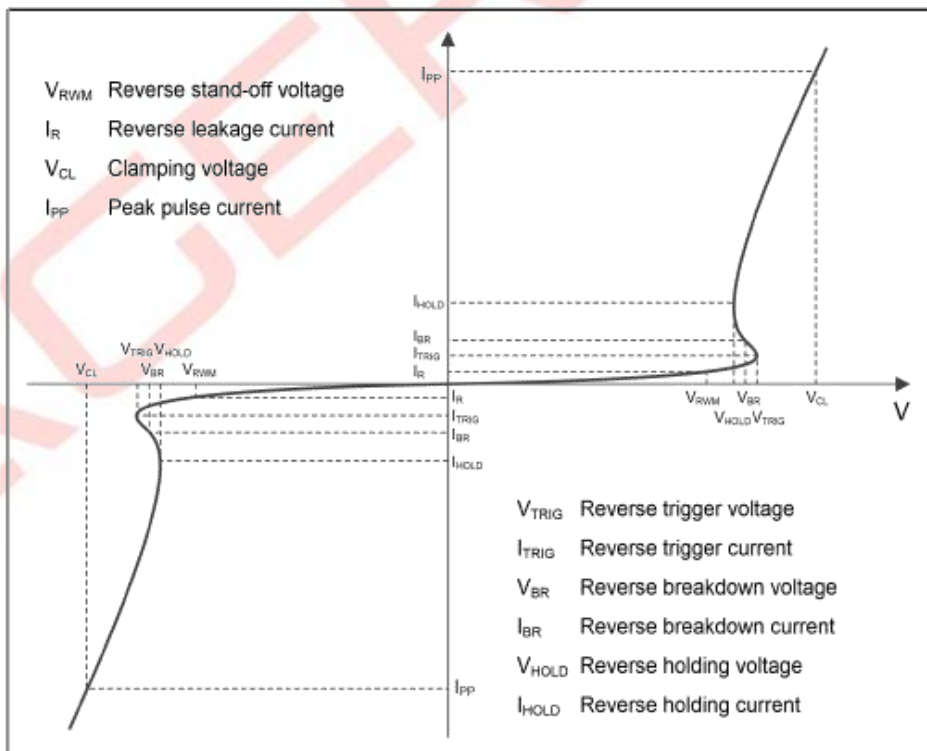
Notes:

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

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

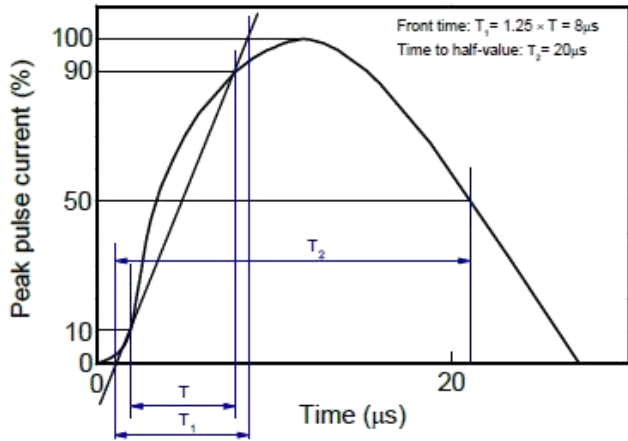
3)Non-repetitive current pulse, according to IEC61000-4-5.

Electrical Characteristics

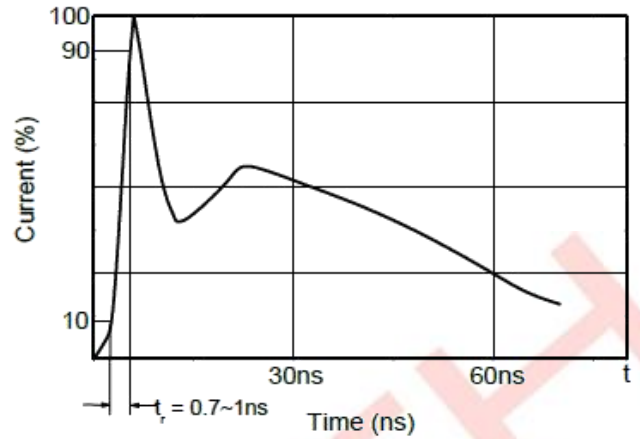


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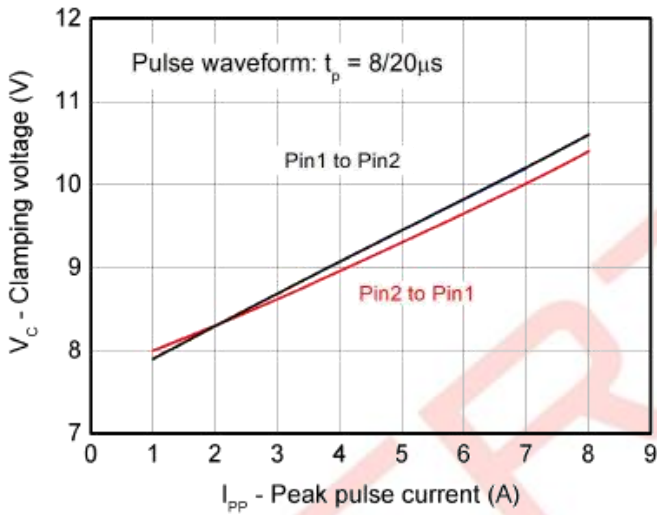
Typical characteristics (TA=25°C, unless otherwise noted)



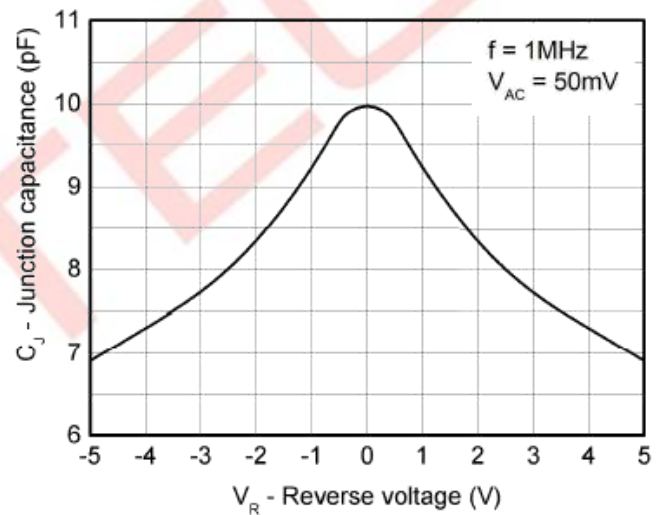
8/20μs waveform per IEC61000-4-5



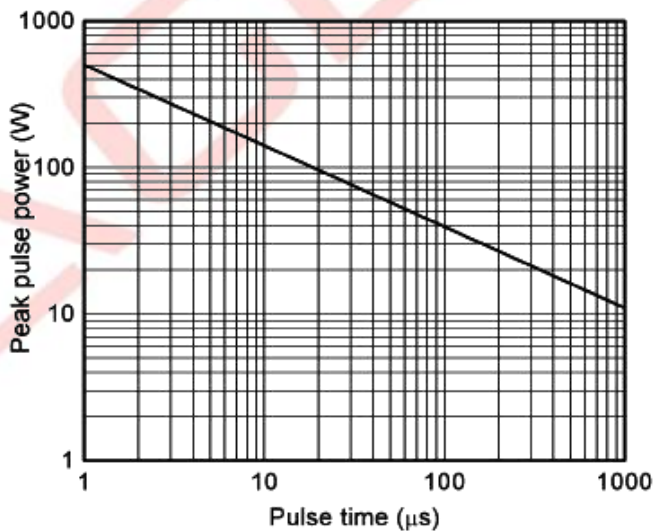
Contact discharge current waveform per IEC61000-4-2



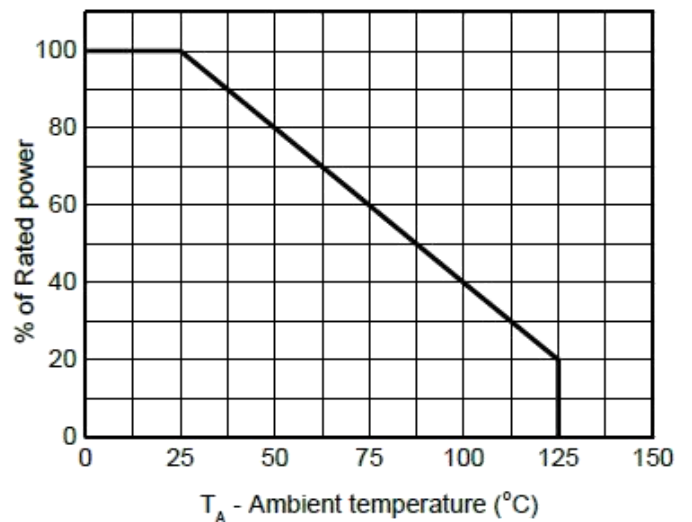
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverse voltage

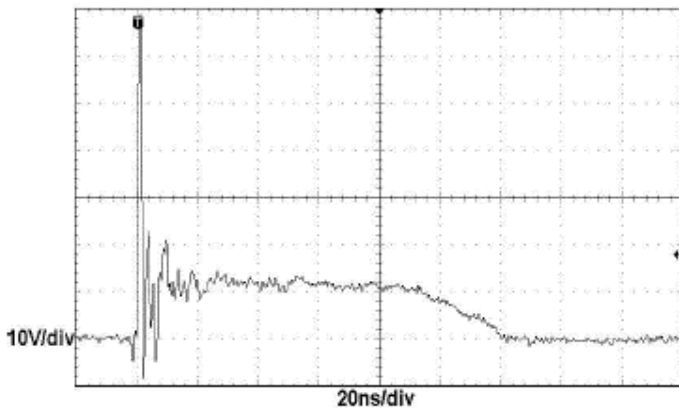


Non-repetitive peak pulse power vs. Pulse time

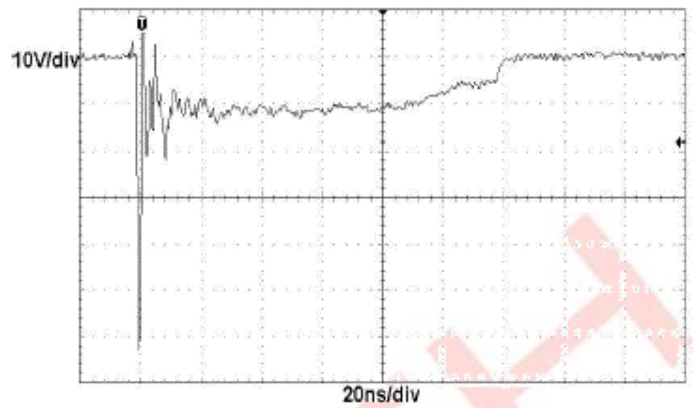


Power derating vs. Ambient temperature

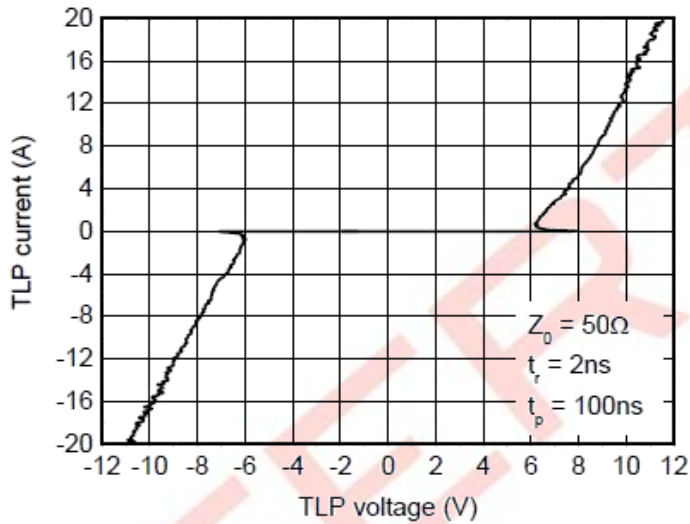
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ESD clamping
(+8kV contact discharge per IEC61000-4-2)



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

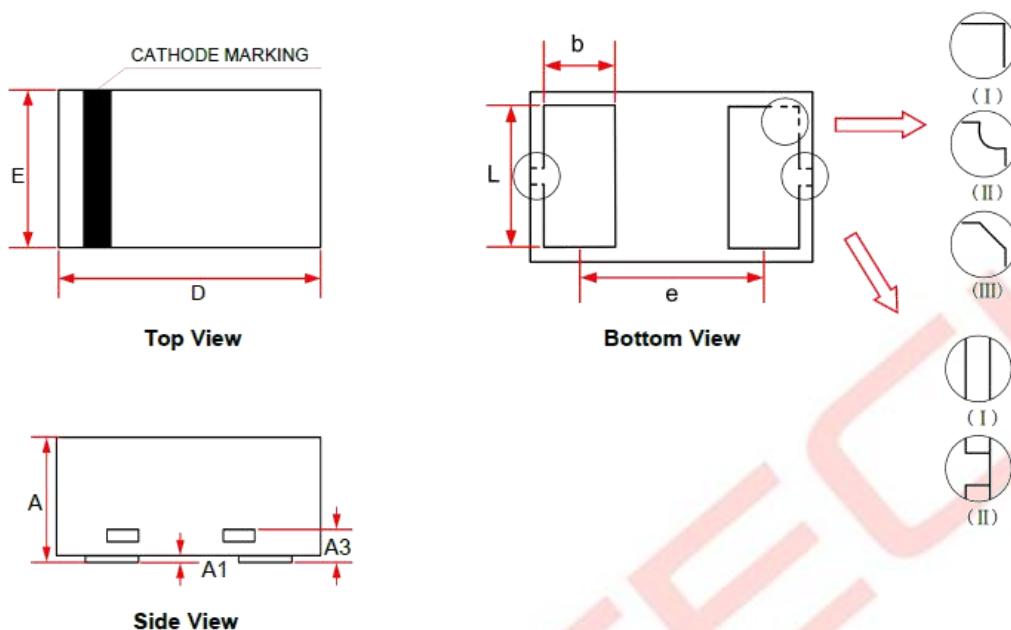


TLP Measurement

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Package Outline

DFN1006-2L



Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.340	0.450	0.530
A1	0.000	0.020	0.050
A3	0.125 Ref.		
D	0.950	1.000	1.075
E	0.550	0.600	0.675
b	0.200	0.250	0.300
L	0.450	0.500	0.550
e	0.650 BSC		

Recommended PCB Layout

