

# 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 $\mu\text{s}$ ) 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  $\mu\text{s}$ )
- ◆ 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)	$V_{ESD}$	$\pm 30$	kV
IEC61000-4-2 (Air)	$V_{ESD}$	$\pm 30$	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	$^{\circ}\text{C}$

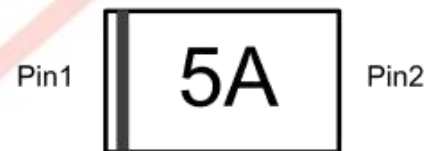
DFN1006-2L



Pin configuration



Marking



Order information

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

# ESDL5V0BDB

## Electrical Characteristics (T =25°C)

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

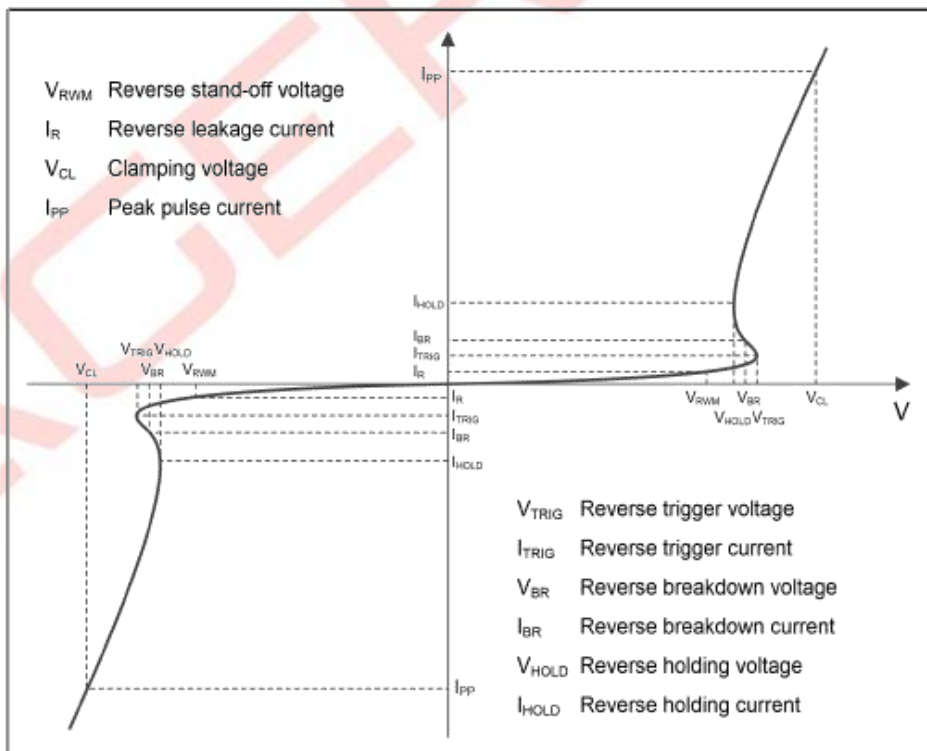
### Notes:

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

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

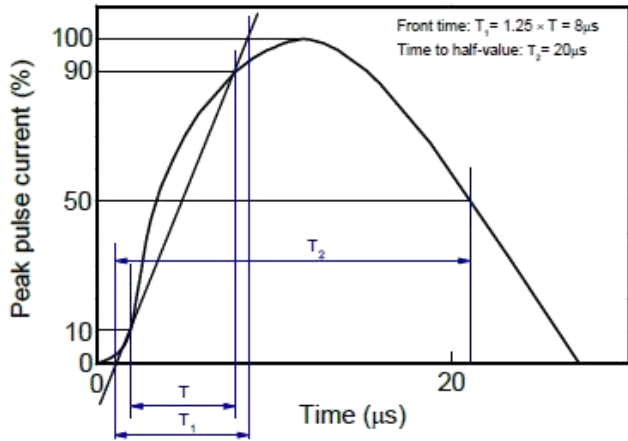
3)Non-repetitive current pulse, according to IEC61000-4-5.

## Electrical Characteristics

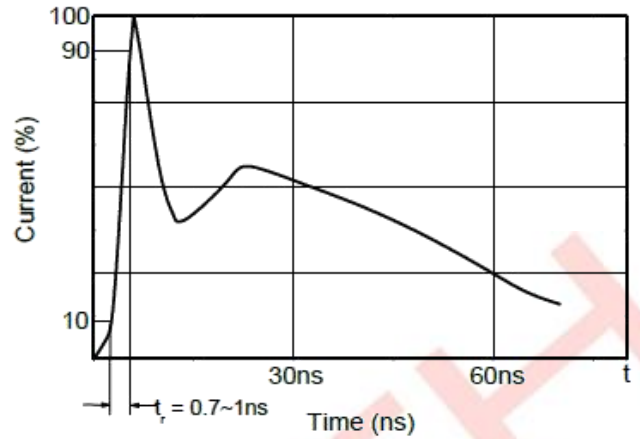


# ESDL5V0BDB

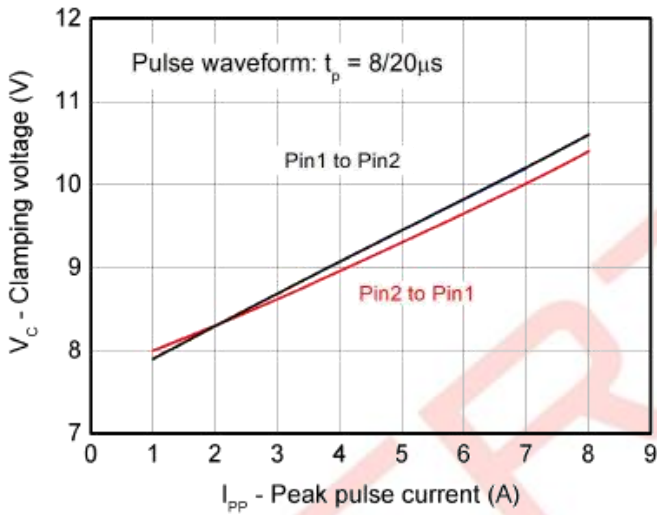
Typical characteristics (TA=25°C, unless otherwise noted)



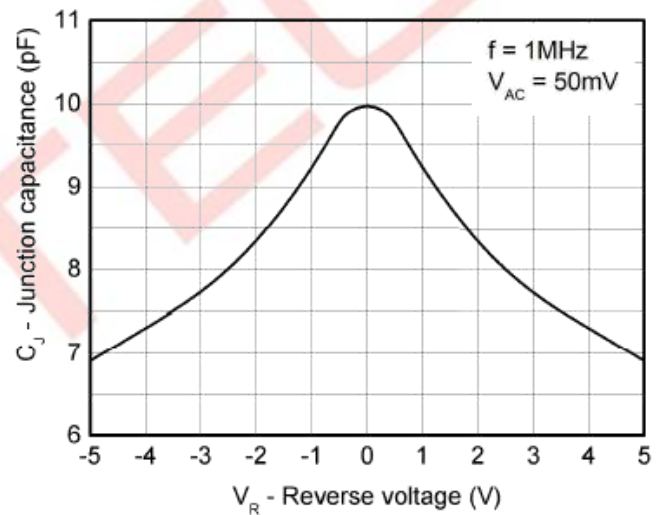
8/20μs waveform per IEC61000-4-5



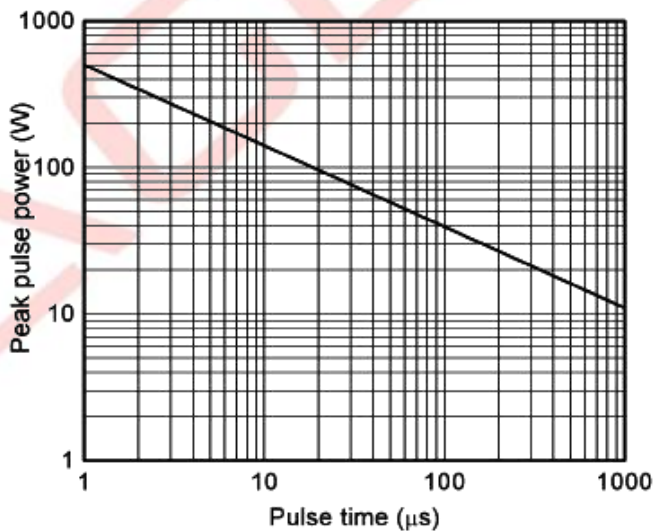
Contact discharge current waveform per IEC61000-4-2



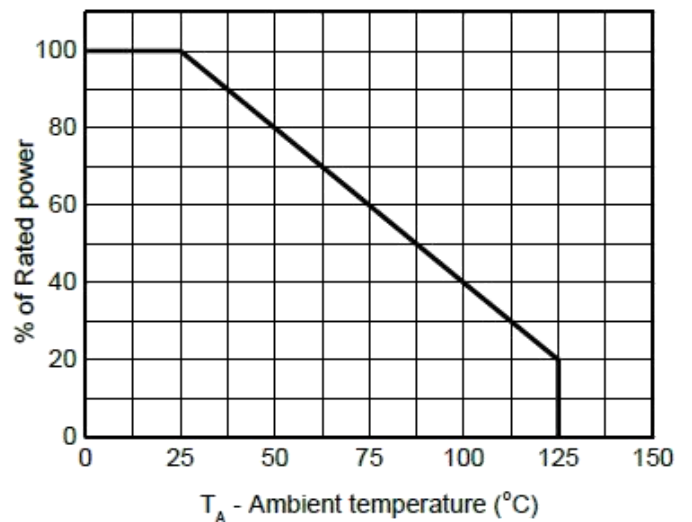
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverse voltage

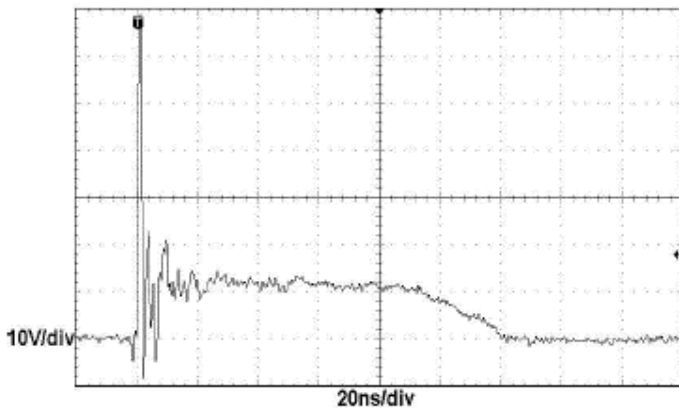


Non-repetitive peak pulse power vs. Pulse time

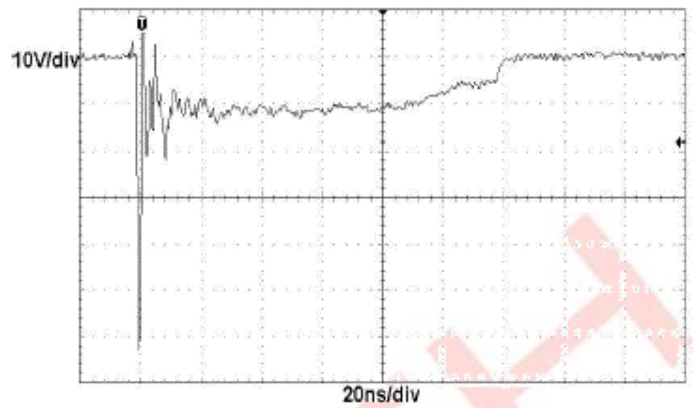


Power derating vs. Ambient temperature

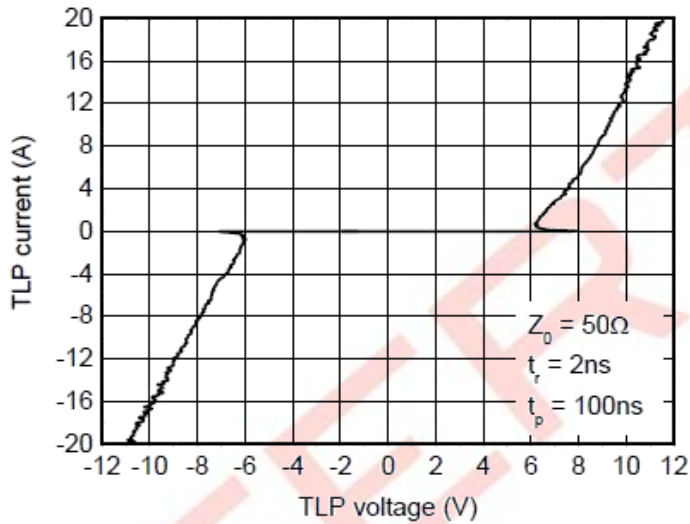
# ESDL5V0BDB



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



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

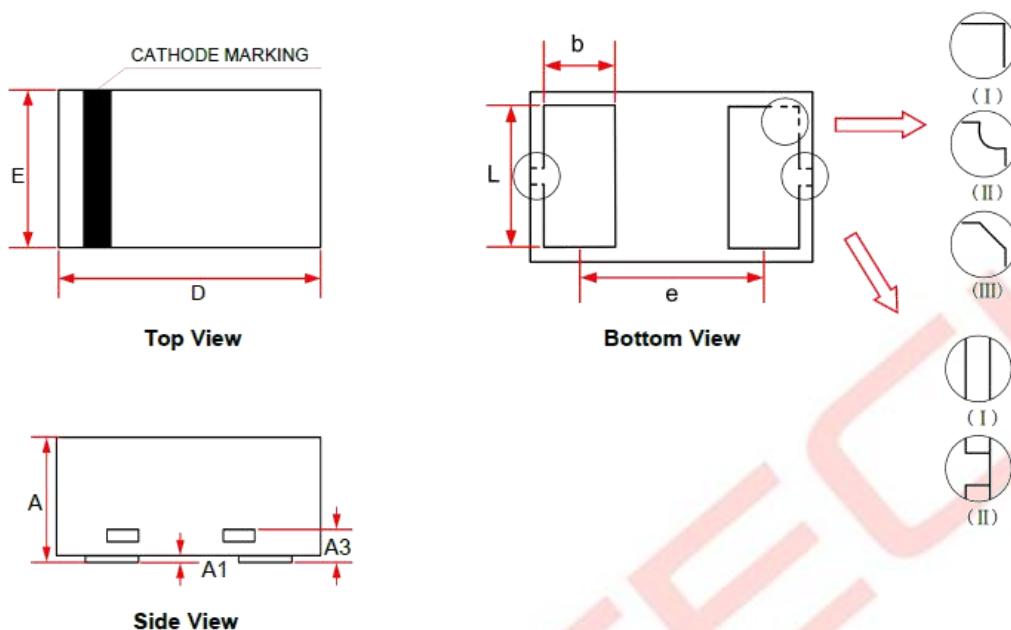


**TLP Measurement**

# ESDL5V0BDB

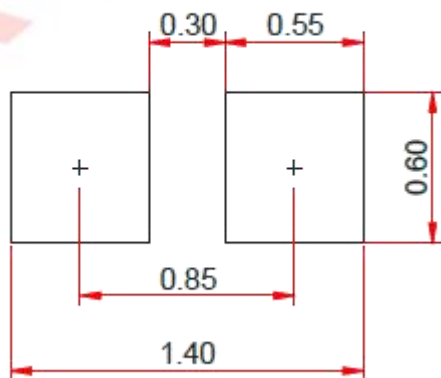
## Package Outline

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



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