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PESD3V3T1BL**Bidirectional ESD protection diode****1. General description**

Bidirectional ElectroStatic Discharge (ESD) protection diode designed to protect one signal line from the damage caused by ESD and other transients.

The device is housed in a SOD882 leadless ultra small Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Bidirectional ESD protection of one line
- Ultra small SMD plastic package 1 x 0.6 x 0.48 mm
- ESD protection up to 30 kV
- Very high surge robustness; $I_{PP} = 12\text{ A}$ for 8/20 μs ; average measured

3. Applications

- ESD and surge protection for interface lines

4. Quick reference data**Table 1. Quick reference data**

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RWM}	reverse standoff voltage	$T_{amb} = 25\text{ }^{\circ}\text{C}$		-	-	3.3	V
I_{PPM}	rated peak pulse current	$t_p = 8/20\text{ }\mu\text{s}$	[1]	-	-	10	A
V_{CL}	clamping voltage	$I_{PPM} = 10\text{ A}$; $t_p = 8/20\text{ }\mu\text{s}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$	[1]	-	9.3	11	V

5. Pinning information**Table 2. Pinning information**

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K1	cathode 1[1]	Transparent top view DFN1006-2 (SOD882)	sym045
2	K2	cathode 2		

[1] The marking band indicates the cathode

6. Ordering information**Table 3. Ordering information**

Type number	Package		
	Name	Description	Version
PESD3V3T1BL	DFN1006-2	plastic, leadless ultra small package; 2 terminals; 0.65 mm pitch; 1 mm x 0.6 mm x 0.48 mm body	SOD882

7. Marking**Table 4. Marking codes**

Type number	Marking code
PESD3V3T1BL	L6

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8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
I_{PPM}	rated peak pulse current	$t_p = 8/20 \mu s$	[1]	-	10	A
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-55	150	°C
T_{stg}	storage temperature			-65	150	°C
ESD maximum ratings						
V_{ESD}	electrostatic discharge voltage	IEC 61000-4-2; contact discharge	[2]	-	30	kV

[1] Non-repetitive current pulse 8/20 μs exponential decay waveform according to IEC 61000-4-5.

[2] Device stressed with ten non-repetitive ESD pulses.

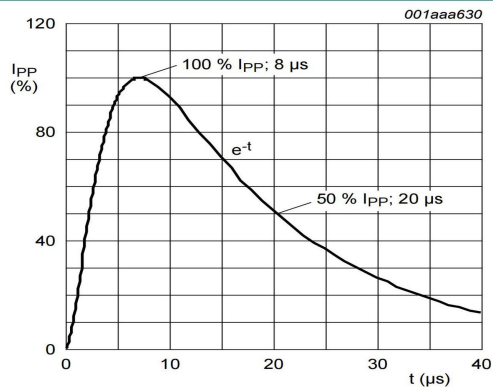


Fig. 1. 8/20 μs pulse waveform according to IEC 61000-4-5

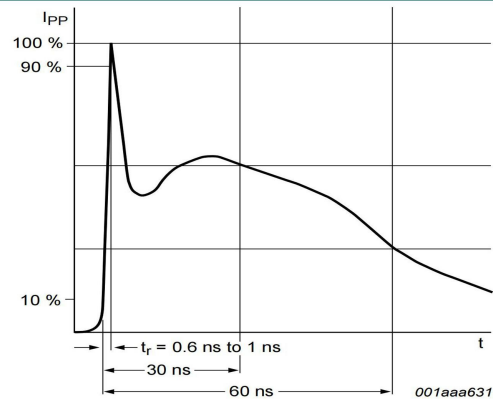


Fig. 2. ESD pulse waveform according to IEC 61000-4-2

9. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RWM}	reverse standoff voltage	$T_{amb} = 25 \text{ }^{\circ}\text{C}$		-	-	3.3	V
V_{BR}	breakdown voltage	$I_R = 5 \text{ mA}; T_{amb} = 25 \text{ }^{\circ}\text{C}$		4.7	5.5	8.7	V
I_{RM}	reverse leakage current	$V_{RWM} = 3.3 \text{ V}; T_{amb} = 25 \text{ }^{\circ}\text{C}$		-	0.1	50	nA
C_d	diode capacitance	$f = 1 \text{ MHz}; V_R = 0 \text{ V}; T_{amb} = 25 \text{ }^{\circ}\text{C}$		-	20	25	pF
V_{CL}	clamping voltage	$I_{PP} = 1 \text{ A}; t_p = 8/20 \mu s; T_{amb} = 25 \text{ }^{\circ}\text{C}$	[1]	-	6.5	-	V
		$I_{PPM} = 10 \text{ A}; t_p = 8/20 \mu s; T_{amb} = 25 \text{ }^{\circ}\text{C}$	[1]	-	9.3	11	V
		$I_{PP} = 16 \text{ A}; t_p = 100 \text{ ns}; T_{amb} = 25 \text{ }^{\circ}\text{C}$	[2]	-	9.5	-	V
R_{dyn}	dynamic resistance	$I_R = 10 \text{ A}; t_p = 100 \text{ ns}; T_{amb} = 25 \text{ }^{\circ}\text{C}$	[2]	-	0.12	-	Ω
		$I_R = -10 \text{ A}; t_p = 100 \text{ ns}; T_{amb} = 25 \text{ }^{\circ}\text{C}$	[2]	-	0.21	-	Ω

[1] Non-repetitive current pulse 8/20 μs exponential decay waveform according to IEC 61000-4-5.

[2] Non-repetitive current pulse, Transmission Line Pulse (TLP); square pulse; ANSI/ESD STM5.5.1-2008.

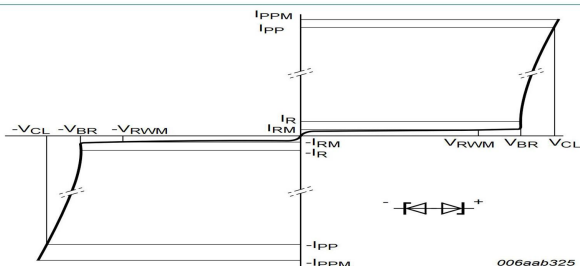


Fig. 3. V-I characteristics for a bidirectional ESD protection diode

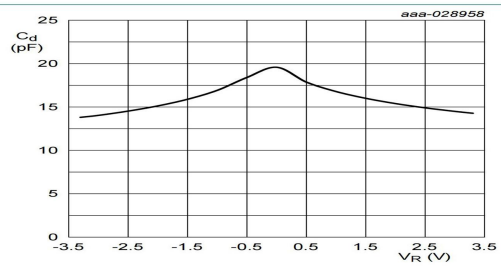
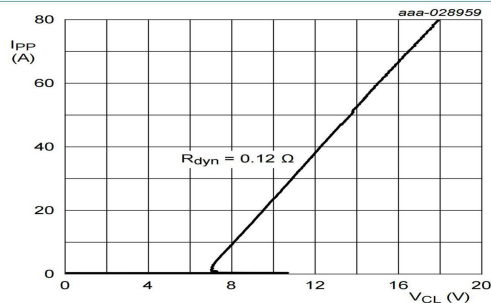


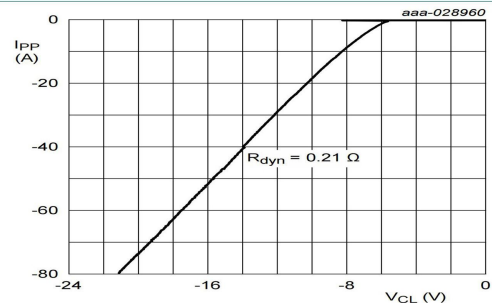
Fig. 4. Diode capacitance as a function of reverse voltage; typical values

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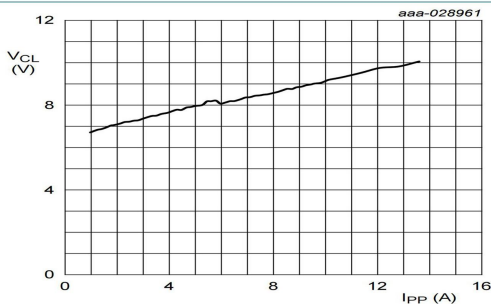
Transmission Line Pulse (TLP);
 $t_p = 100 \text{ ns}$; $t_r = 1 \text{ ns}$

Fig. 5. Dynamic resistance with positive clamping; typical values



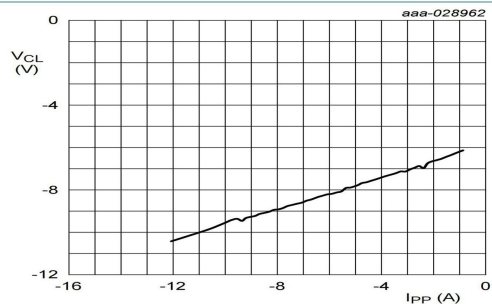
Transmission Line Pulse (TLP);
 $t_p = 100 \text{ ns}$; $t_r = 1 \text{ ns}$

Fig. 6. Dynamic resistance with negative clamping; typical values



IEC 61000-4-5; $t_p = 8/20 \mu\text{s}$; positive pulse

Fig. 7. Positive clamping voltage (8/20 μs pulse); typical values



IEC 61000-4-5; $t_p = 8/20 \mu\text{s}$; negative pulse

Fig. 8. Negative clamping voltage (8/20 μs pulse); typical values

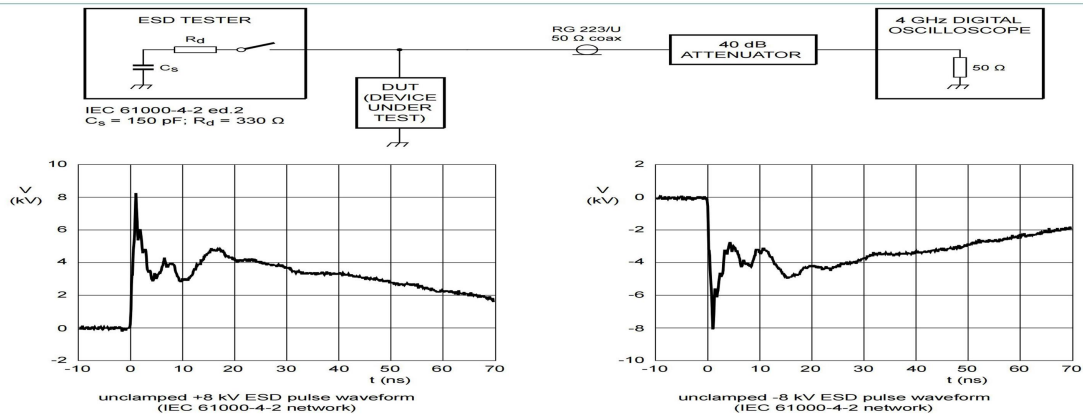


Fig. 9. ESD clamping test setup and waveforms

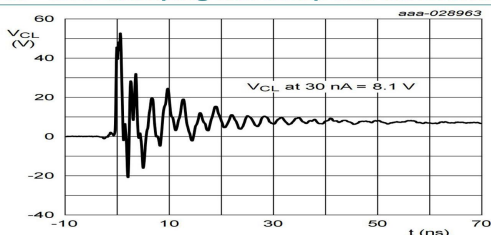


Fig. 10. Clamped +8 kV pulse waveform (IEC 61000-4-2 network)

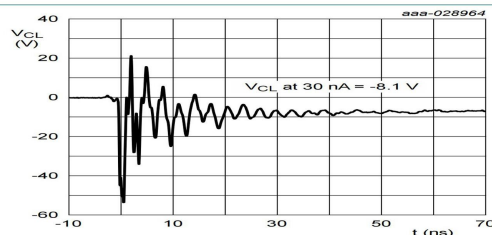


Fig. 11. Clamped -8 kV pulse waveform (IEC 61000-4-2 network)

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Ordering Information

PREFERRED P/N	PACKAGE	SIZE(mm)	DELIVERY MODE	MPQ(PCS)
	DFN1006-2L	1.00×0.60×0.37	7" REEL	10,000

Recommended Soldering Conditions



Package Outline Dimensions (DFN1006-2L)

Symbol	Dimensions			
	Millimeters		Inches	
	Min	Max	Min	Max
A	0.950	1.050	0.037	0.041
B	0.550	0.650	0.022	0.026
C	0.350	0.450	0.014	0.018
D	0.550	0.650	0.022	0.026
D ₁	0.280	0.380	0.011	0.015
E	0.450	0.550	0.018	0.022
L	0.000	0.100	0.000	0.004

Suggested Pad Layout

Symbol	Dimensions			
	Millimeters		Inches	
	Min	Max	Min	Max
J	0.50	0.60	0.020	0.024
K	0.25	0.35	0.010	0.014
M	0.55	0.65	0.022	0.026