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PESD3V3V1BL

Low capacitance bidirectional ESD protection diode

**1. General description**

Low capacitance 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 leadless ultra small SOD882 (DFN1006-2) Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Bidirectional ESD protection of one line
- Ultra small SMD plastic package
- Low clamping voltage: $V_{CL} = 9.8 \text{ V @ } 16 \text{ A TLP}$
- Ultra low leakage current: $I_{RM} < 1 \text{ nA}$
- ESD protection up to 30 kV
- Reverse standoff voltage $V_{RWM} = 3.3 \text{ V}$
- IEC 61000-4-2; level 4 (ESD)
- IEC 61000-4-5 (surge); $I_{PPM} = 5 \text{ A}$
- IEC 61000-4-5 (surge); $I_{PPM} = 6.14 \text{ A}$ (average measured)
- AEC-Q101 qualified

3. Applications

ESD and surge protection for:

- very sensitive interface lines
- generic interface lines

in portable electronics, communication, consumer and computing devices.

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
C_d	diode capacitance	$f = 1 \text{ MHz}; V_R = 0 \text{ V}; T_{amb} = 25 \text{ }^{\circ}\text{C}$	-	11	13	pF

5. Pinning information

Table 2. Pinning information

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

6. Ordering information

Table 3. Ordering information

Type number	Package		Version
	Name	Description	
PESD3V3V1BL	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
PESD3V3V1BL	X1

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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]	-	5	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] According to IEC 61000-4-5.

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

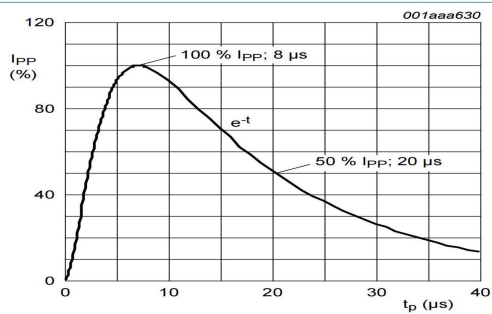


Fig. 1. 8/20 μs pulse waveform according to IEC 61000-4-5

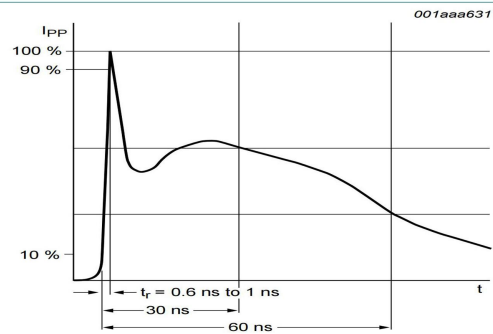


Fig. 2. ESD pulse waveform according to IEC 61000-4-2

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	$I_R = 5 \text{ mA}$; $T_{amb} = 25 \text{ }^{\circ}\text{C}$		4.5	-	-	V
I_{RM}	reverse leakage current	$V_{RWM} = 3.3 \text{ V}$; $T_{amb} = 25 \text{ }^{\circ}\text{C}$		-	1	10	nA
C_d	diode capacitance	$f = 1 \text{ MHz}$; $V_R = 0 \text{ V}$; $T_{amb} = 25 \text{ }^{\circ}\text{C}$		-	11	13	pF
V_{CL}	clamping voltage	$I_{PP} = 5 \text{ A}$; $t_p = 8/20 \mu s$; $T_{amb} = 25 \text{ }^{\circ}\text{C}$	[1]	-	8.5	10	V
R_{dyn}	dynamic resistance	$I_R = 10 \text{ A}$; $T_{amb} = 25 \text{ }^{\circ}\text{C}$	[2]	-	0.2	-	Ω

[1] Device stressed with 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.

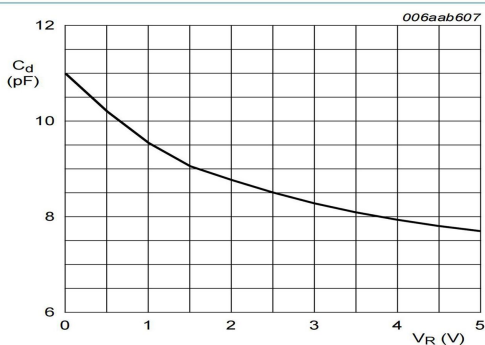


Fig. 3. Diode capacitance as a function of reverse voltage; typical values

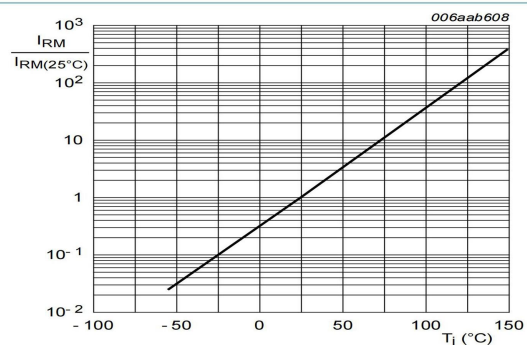


Fig. 4. Relative variation of reverse leakage current as a function of junction temperature; typical values

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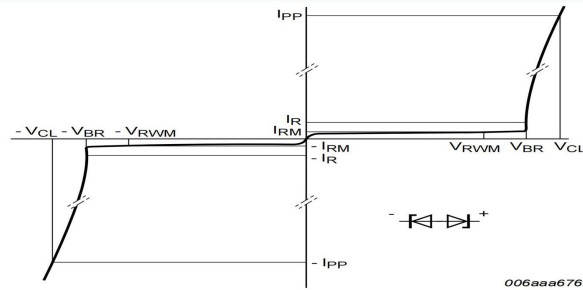


Fig. 5. V-I characteristics for a bidirectional ESD protection diode

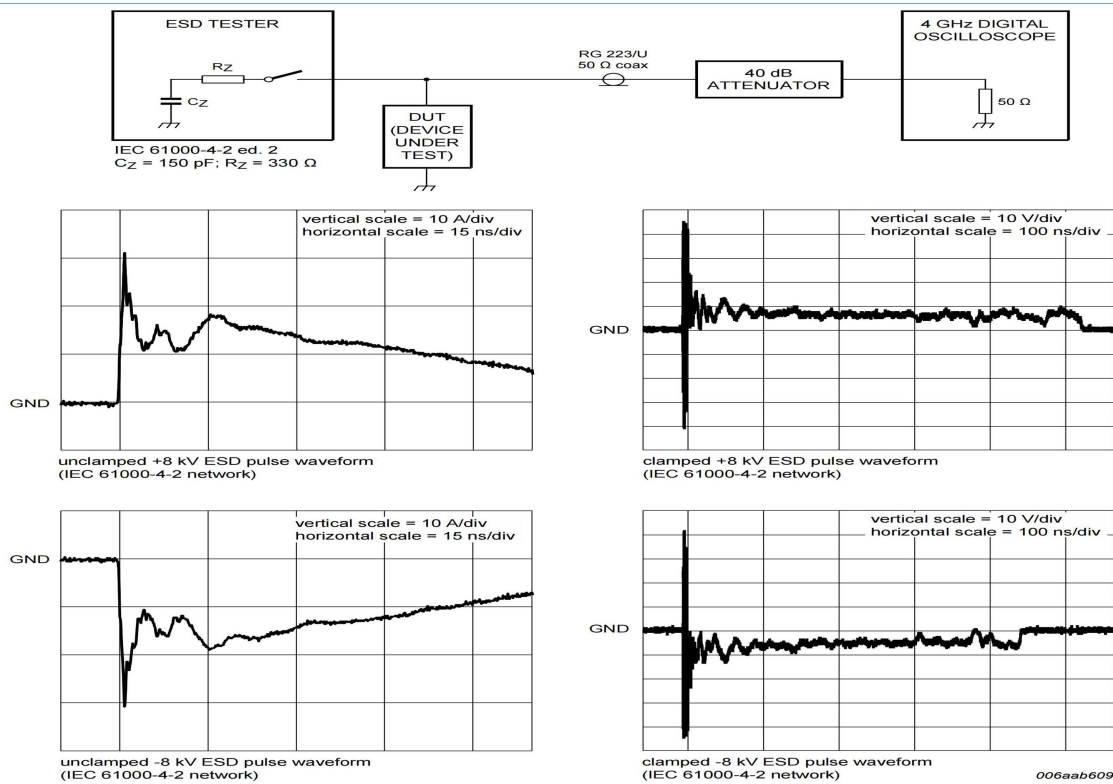


Fig. 6. ESD clamping test setup and waveforms

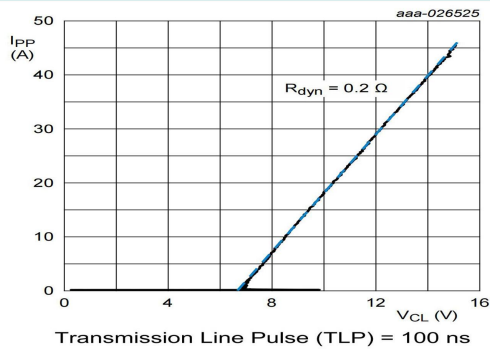


Fig. 7. Dynamic resistance with positive clamping; typical values

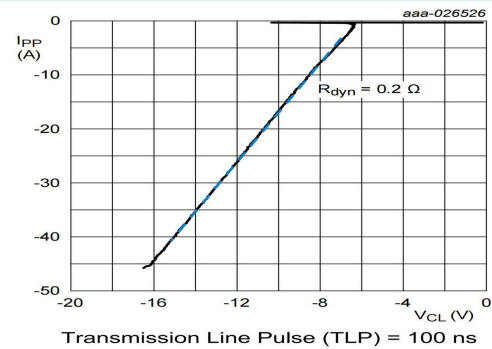


Fig. 8. Dynamic resistance with negative clamping; typical values

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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