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PESD3V3S1BL**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
- Reverse standoff voltage $V_{RWM} = 3.3\text{ V}$
- Low clamping voltage: $V_{CL} = 9.3\text{ V @ } 15\text{ A } 8/20\text{ }\mu\text{s}$
- Ultra low leakage current: $I_{RM} < 1\text{ nA}$
- ESD protection up to 30 kV
- IEC 61000-4-2; level 4 (ESD)
- IEC 61000-4-5 (surge); $I_{PPM} = 15\text{ A}$
- IEC 61000-4-5 (surge); $I_{PPM} = 17.5\text{ A}$ (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	$f = 1\text{ MHz}; V_R = 0\text{ V}; T_{amb} = 25\text{ }^{\circ}\text{C}$	-	35	40	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	
PESD3V3S1BL	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
PESD3V3S1BL	F1

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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]	-	15	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] [3]	-	30	kV

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

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

[3] Measured from pin 1 to pin 2.

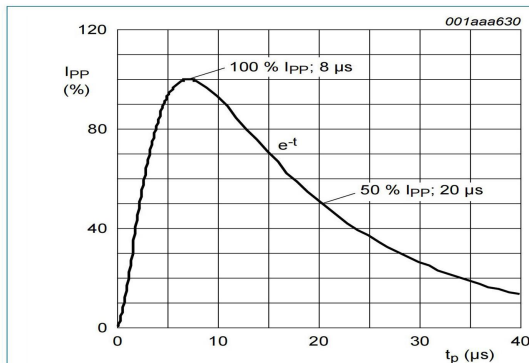


Fig. 1. 8/20 μs pulse waveform according to IEC 61000-4-5 and IEC 61643-321

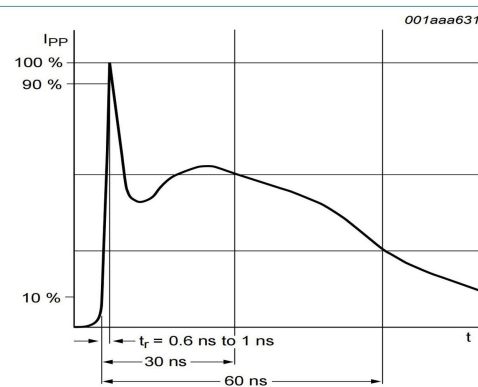


Fig. 2. ESD pulse waveform according to IEC 61000-4-2

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	$I_R = 1 \text{ mA}; T_{amb} = 25 \text{ }^{\circ}\text{C}$		4.5	-	-	V
I_R	reverse current	$T_{amb} = 25 \text{ }^{\circ}\text{C}$		-	1	-	A
I_{RM}	reverse leakage current	$V_{RWM} = 3.3 \text{ V}; T_{amb} = 25 \text{ }^{\circ}\text{C}$		-	1	100	nA
C_d	diode capacitance	$f = 1 \text{ MHz}; V_R = 0 \text{ V}; T_{amb} = 25 \text{ }^{\circ}\text{C}$		-	35	40	pF
V_{CL}	clamping voltage	$I_{PP} = 1 \text{ A}; T_{amb} = 25 \text{ }^{\circ}\text{C}$	[1] [2]	-	6.5	-	V
		$I_{PP} = 15 \text{ A}$	[1] [2]	-	9.3	11.5	V
R_{dyn}	dynamic resistance	$I_R = 10 \text{ A}; T_{amb} = 25 \text{ }^{\circ}\text{C}$	[3] [2]	-	0.1	-	Ω
		$I_R = -10 \text{ A}$	[3] [2]	-	0.15	-	Ω

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

[2] Measured from pin 1 to pin 2.

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

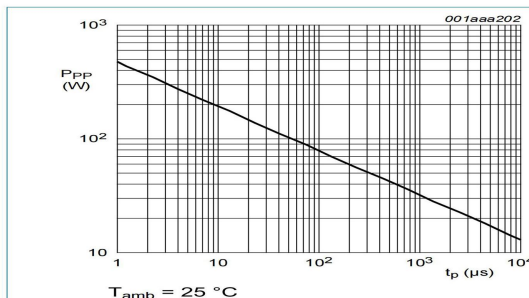


Fig. 3. Peak pulse power as a function of exponential pulse duration; typical values

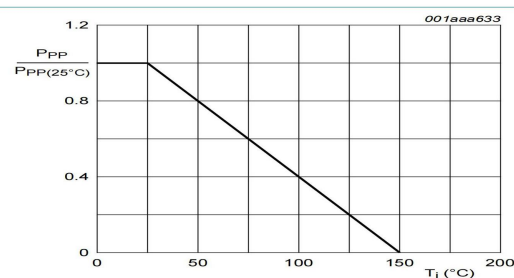


Fig. 4. Relative variation of peak pulse power as a function of junction temperature; typical values

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Fig. 5. Diode capacitance as a function of reverse voltage; typical values

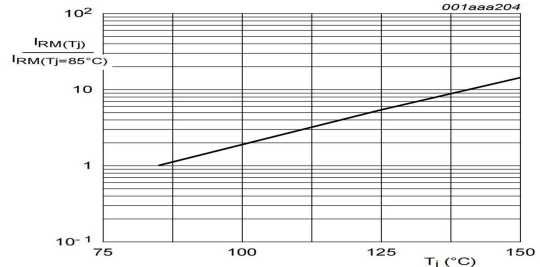


Fig. 6. Relative variation of reverse leakage current as a function of junction temperature; typical values

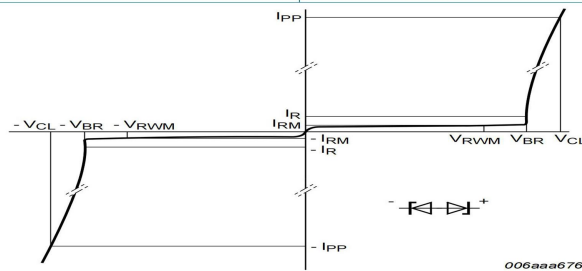


Fig. 7. V-I characteristics for a bidirectional ESD protection diode

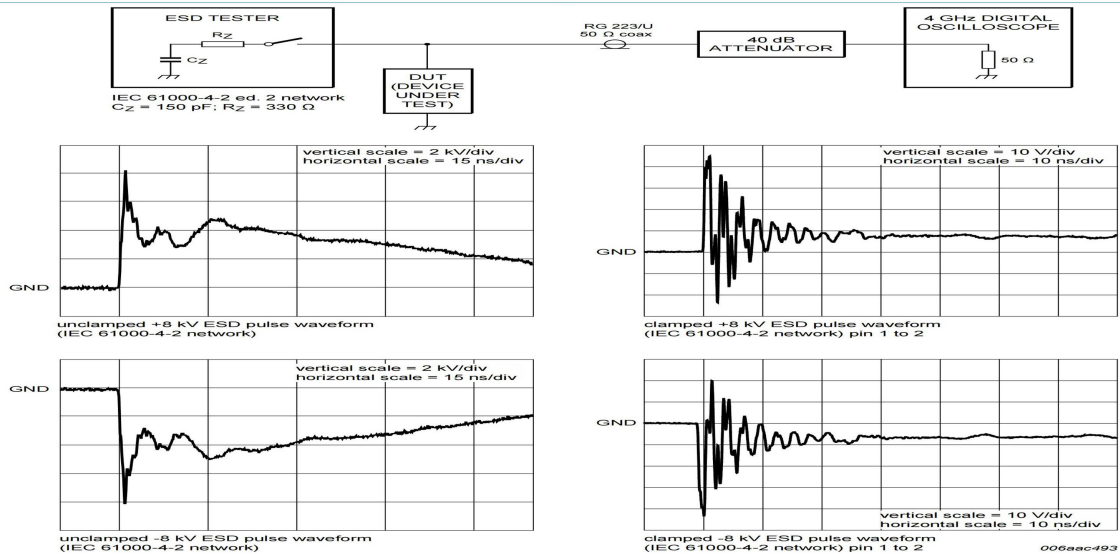


Fig. 8. ESD clamping test setup and waveforms

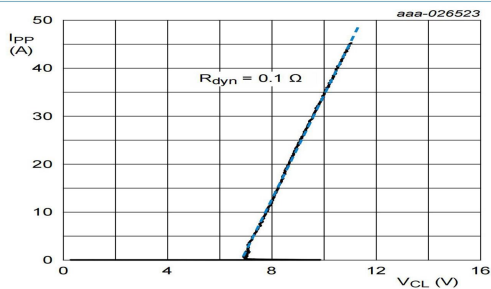


Fig. 9. Dynamic resistance with positive clamping; typical values

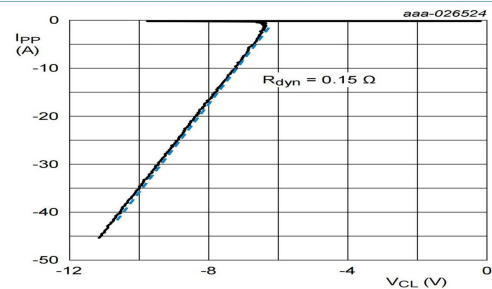


Fig. 10. Dynamic resistance with negative clamping; typical values

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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