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PESD18VF1BL

Ultra low capacitance bidirectional ESD protection diode



1. General description

Ultra low capacitance bidirectional ElectroStatic Discharge (ESD) protection diode in a DFN1006-2 (SOD882) leadless ultra small Surface-Mounted Device (SMD) plastic package designed to protect one signal line from the damage caused by ESD and other transients.

2. Features and benefits

- Ultra low diode capacitance $C_d = 0.35$ pF
- High reverse standoff voltage $V_{RWM} = 18$ V
- Very small voltage dependency of the capacitance
- ESD protection up to ± 10 kV according to IEC 61000-4-2, level 4

3. Applications

- NFC antenna protection
- Protection of high-speed data lines

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{RWM}	reverse standoff voltage	$T_{amb} = 25$ °C	-	-	18	V
C_d	diode capacitance	$f = 1$ MHz; $V_R = 0$ V; $T_{amb} = 25$ °C	0.28	0.35	0.5	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	
PESD18VF1BL	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
PESD18VF1BL	WM

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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	$t_p = 8/20 \mu s$; IEC 61000-4-5; IEC 61643-321	[1]	-	1	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	[1] [2]	-	10	kV
		IEC 61000-4-2; air discharge	[1] [2]	-	15	kV
		MIL-STD-883; human body model; HBM	[1]	-	10	kV
		machine model; MM	[1]	-	400	V

[1] Measured from pin 1 to pin 2.

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

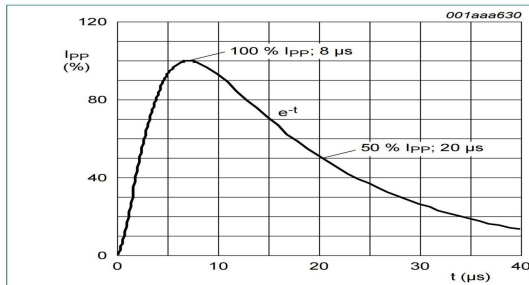


Fig. 1. 8/20 μs pulse waveform according to IEC 61000-4-5 and IEC 61643-321

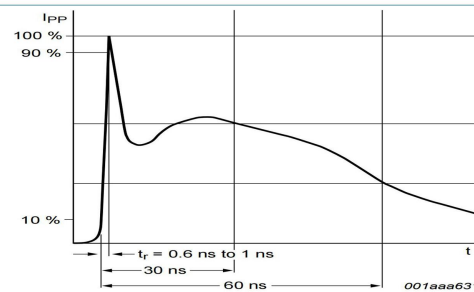


Fig. 2. ESD pulse waveform according to IEC 61000-4-2

9. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RWM}	reverse standoff voltage	$T_{amb} = 25 \text{ }^{\circ}\text{C}$		-	-	18	V
V_{BR}	breakdown voltage	$I_R = 10 \text{ mA}$; $T_{amb} = 25 \text{ }^{\circ}\text{C}$		19	22	24	V
I_{RM}	reverse leakage current	$V_R = 18 \text{ V}$; $T_{amb} = 25 \text{ }^{\circ}\text{C}$		-	1	30	nA
C_d	diode capacitance	$f = 1 \text{ MHz}$; $V_R = 0 \text{ V}$; $T_{amb} = 25 \text{ }^{\circ}\text{C}$		0.28	0.35	0.5	pF
V_{CL}	clamping voltage	$I_{PP} = 1 \text{ A}$; $t_p = 8/20 \mu s$; IEC 61000-4-5; IEC 61643-321; $T_{amb} = 25 \text{ }^{\circ}\text{C}$	[1]	-	-	17	V
R_{dyn}	dynamic resistance	$I_R = 10 \text{ A}$; $T_{amb} = 25 \text{ }^{\circ}\text{C}$	[2]	-	0.8	-	Ω

[1] Measured from pin 1 to pin 2.

[2] Non-repetitive current pulse, Transmission Line Pulse (TLP) $t_p = 100 \text{ ns}$; square pulse; ANSI / ESD STM5.5.1-2008.

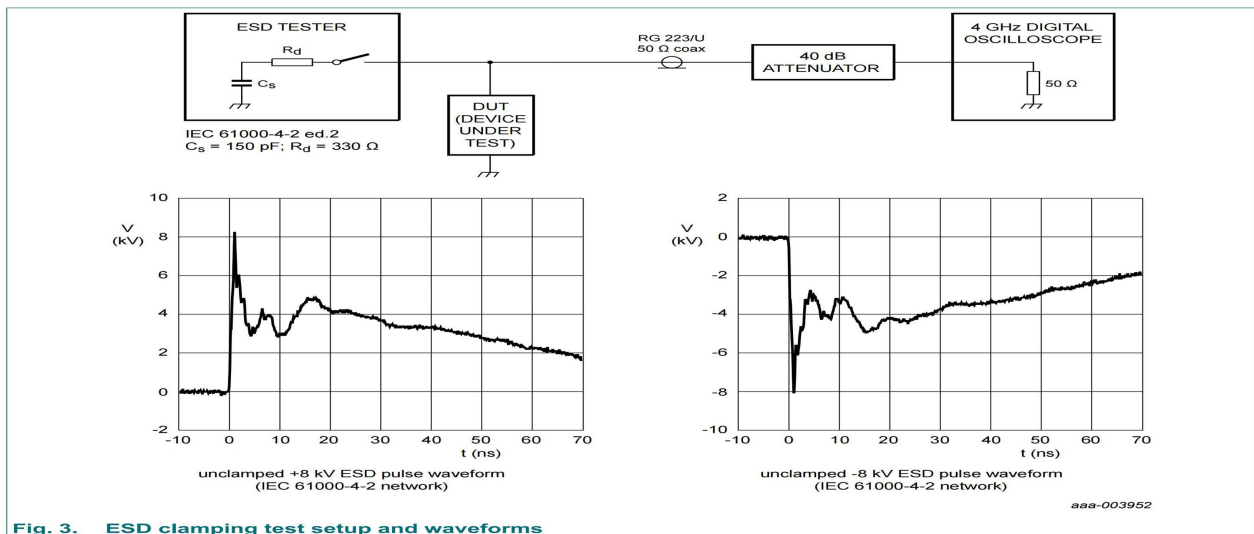


Fig. 3. ESD clamping test setup and waveforms

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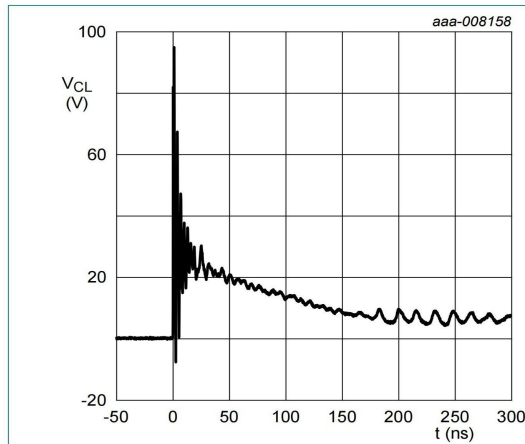


Fig. 4. Clamped +8 kV pulse waveform (IEC 61000-4-2 network)

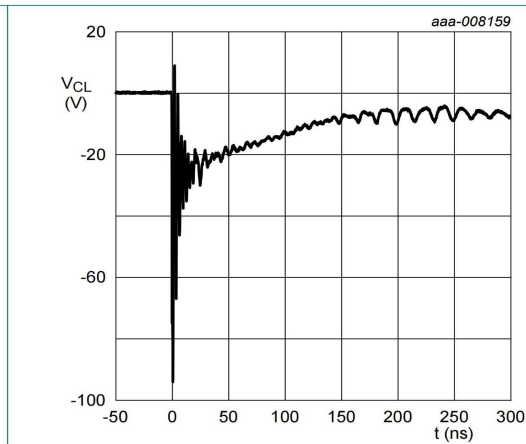
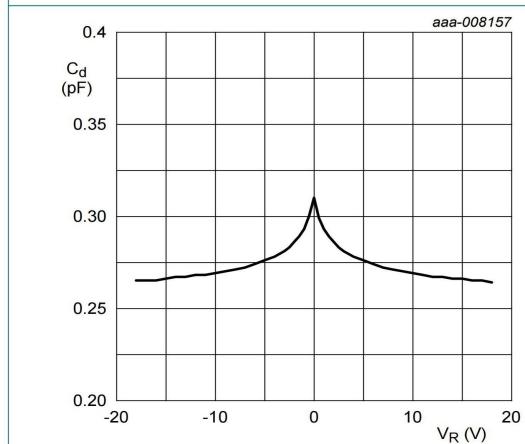


Fig. 5. Clamped -8 kV pulse waveform (IEC 61000-4-2 network)



$f = 1 \text{ MHz}; T_{\text{amb}} = 25^\circ \text{C}$

Fig. 6. Diode capacitance as a function of reverse voltage; typical values

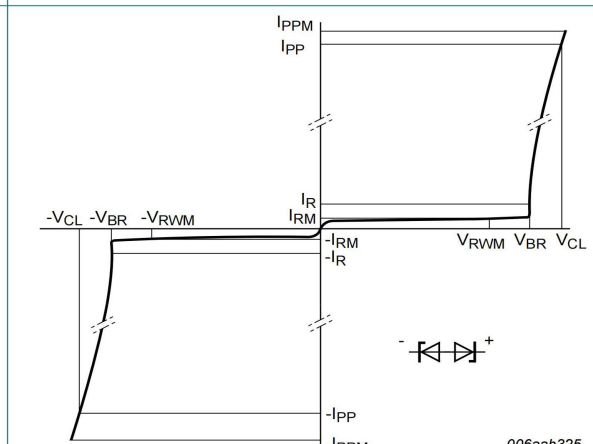
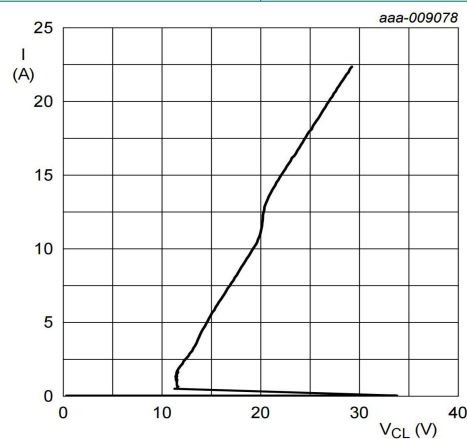


Fig. 7. V-I characteristics for a bidirectional ESD protection diode



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

Fig. 8. Dynamic resistance

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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