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PESD5V0F1BL

Femtofarad bidirectional ESD protection diode

**1. General description**

Femtofarad bidirectional ElectroStatic Discharge (ESD) protection diode in a leadless ultra small SOD882 Surface-Mounted Device (SMD) plastic package designed to protect one signal line from the damage caused by ESD and other transients. The combination of extremely low capacitance, high ESD maximum rating and ultra small package makes the device ideal for high-speed data line protection and antenna protection applications.

2. Features and benefits

- Bidirectional ESD protection of one line
- Femtofarad capacitance: $C_d = 400 \text{ fF}$
- Low ESD clamping voltage: 30 V at 30 ns and $\pm 8 \text{ kV}$
- Very low leakage current: $I_{RM} < 1 \text{ nA}$
- ESD protection up to 10 kV
- IEC 61000-4-2; level 4 (ESD)

3. Applications

- 10/100/1000 Mbit/s Ethernet
- Portable electronics
- FireWire
- Communication systems
- High-speed data lines
- Computers and peripherals
- Subscriber Identity Module (SIM) card protection
- Audio and video equipment
- Cellular handsets and accessories
- Antenna protection

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{RWM}	reverse standoff voltage	$T_{amb} = 25^\circ\text{C}$	-	-	5.5	V
C_d	diode capacitance	$f = 1 \text{ MHz}; V_R = 0 \text{ V}; T_{amb} = 25^\circ\text{C}$	-	0.4	0.55	pF

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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	
PESD5V0F1BL	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
PESD5V0F1BL	ZZ

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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]	-	2.5	A
T_j	junction temperature			-	125	°C
T_{amb}	ambient temperature			-40	125	°C
T_{stg}	storage temperature			-55	125	°C
ESD maximum ratings						
V_{ESD}	electrostatic discharge voltage	IEC 61000-4-2; contact discharge	[2]	-	10	kV
		IEC 61000-4-2; air discharge	[2]	-	10	kV
		MIL-STD-883; human body model (HBM)	[2]	-	10	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.

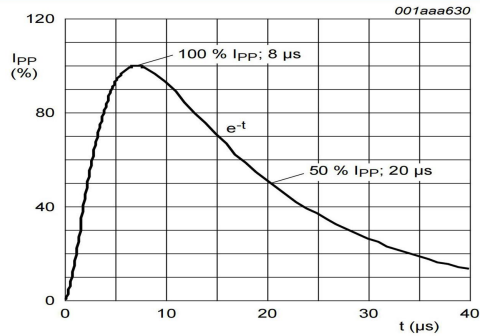


Fig. 1. 8/20 μs pulse waveform according to IEC 61000-4-5

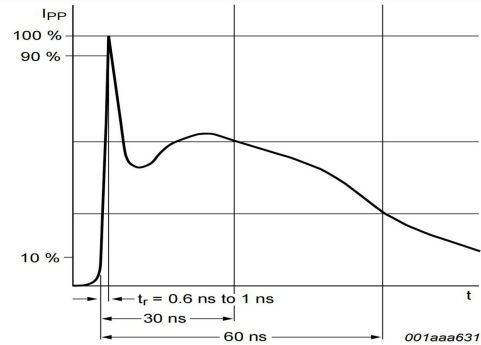


Fig. 2. ESD pulse waveform according to IEC 61000-4-2

9. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RWM}	reverse standoff voltage	$T_{amb} = 25^\circ C$		-	-	5.5	V
V_{BR}	breakdown voltage	$I_R = 1 \text{ mA}; T_{amb} = 25^\circ C$		6	8	10	V
I_{RM}	reverse leakage current	$V_{RWM} = 5 \text{ V}; T_{amb} = 25^\circ C$		-	1	100	nA
C_d	diode capacitance	$f = 1 \text{ MHz}; V_R = 0 \text{ V}; T_{amb} = 25^\circ C$		-	0.4	0.55	pF
V_{CL}	clamping voltage	$I_{PP} = 1 \text{ A}; T_{amb} = 25^\circ C$	[1]	-	-	11	V
		$I_{PPM} = 2.5 \text{ A}; T_{amb} = 25^\circ C$	[1]	-	-	15	V
R_{diff}	differential resistance	$I_R = 20 \text{ mA}; T_{amb} = 25^\circ C$		-	-	30	Ω

[1] Device stressed with 8/20 μs exponential decay waveform according to IEC 61000-4-5 and IEC 61643-321.

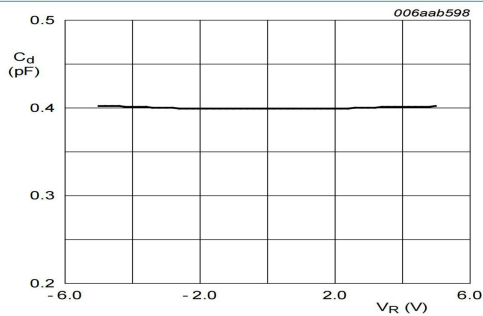


Fig. 3. Diode capacitance as a function of reverse voltage; typical values

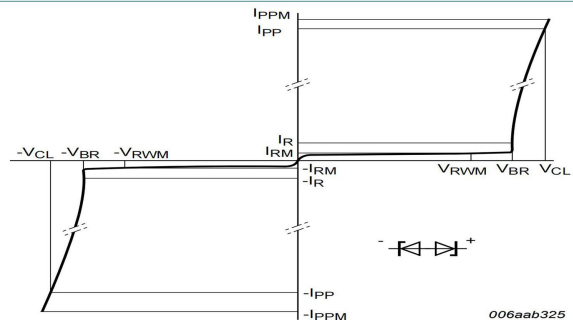


Fig. 4. V-I characteristics for a bidirectional ESD protection diode

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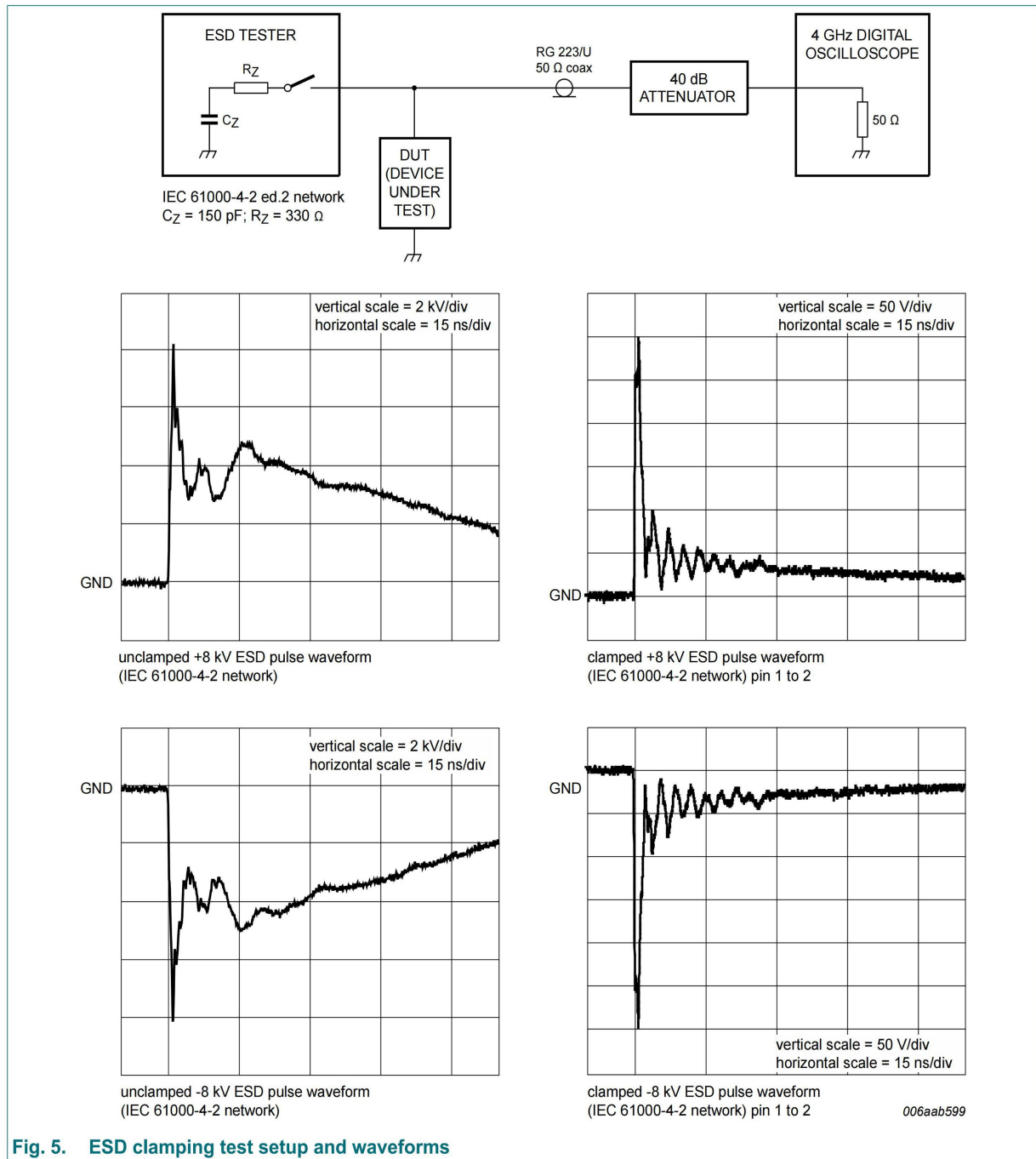


Fig. 5. ESD clamping test setup and waveforms

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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