

OM SENI

PESD5V0V1BL

Very low capacitance bidirectional ESD protection diode

**1. General description**

Very low capacitance bidirectional ElectroStatic Discharge (ESD) protection diode in an 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

- Bidirectional ESD protection of one line
- Very low diode capacitance: $C_d = 11 \text{ pF}$
- Max. peak pulse power: $P_{PPM} = 45 \text{ W}$
- Low clamping voltage: $V_{CL} = 12.5 \text{ V}$
- 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); $I_{PPM} = 4.8 \text{ A}$

3. Applications

- Computers and peripherals
- Audio and video equipment
- Cellular handsets and accessories
- SIM card protection
- Communication systems
- Portable electronics
- 10/100 Mbit/s Ethernet

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{RWM}	reverse standoff voltage	$T_{amb} = 25 \text{ }^{\circ}\text{C}$	-	-	5	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		
	Name	Description	Version
PESD5V0V1BL	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
PESD5V0V1BL	X1

OM SENI

8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
P_{PPM}	rated peak pulse power	$t_p = 8/20 \mu s$	[1]	-	45	W
I_{PPM}	rated peak pulse current		[1]	-	4.8	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
		machine model		-	2	kV
		MIL-STD-883; human body model (HBM)		-	16	kV

[1] Non-repetitive current pulse 8/20 μs exponentially decaying waveform according to IEC 61000-4-5

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

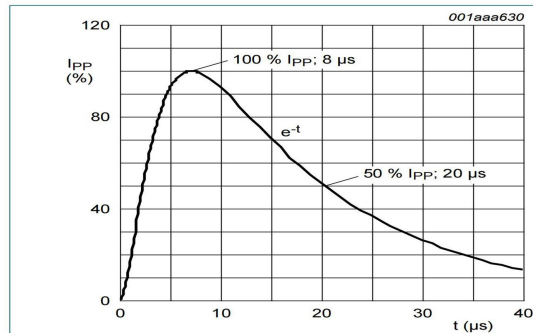


Fig. 1. 8/20 μs pulse waveform according to IEC 61000-4-5

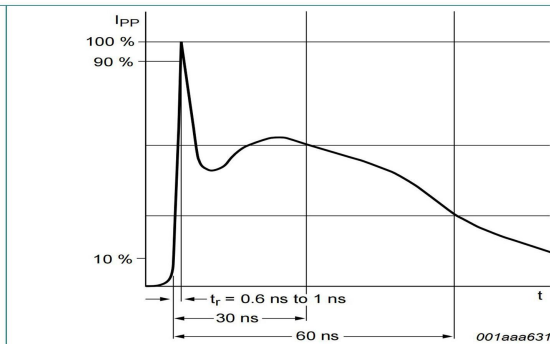


Fig. 2. ESD pulse waveform according to IEC 61000-4-2

9. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RWM}	reverse standoff voltage	$T_{amb} = 25 \text{ }^{\circ}\text{C}$		-	-	5	V
V_{BR}	breakdown voltage	$I_R = 5 \text{ mA}; T_{amb} = 25 \text{ }^{\circ}\text{C}$		5.8	6.8	7.8	V
I_{RM}	reverse leakage current	$V_{RWM} = 5 \text{ V}; T_{amb} = 25 \text{ }^{\circ}\text{C}$		-	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	$I_{PPM} = 4.8 \text{ A}; t_p = 8/20 \mu s; T_{amb} = 25 \text{ }^{\circ}\text{C}$	[1]	-	-	12.5	V
R_{dyn}	dynamic resistance	$I_R = 10 \text{ A}; t_p = 100 \text{ ns}; T_{amb} = 25 \text{ }^{\circ}\text{C}$	[2]	-	0.2	-	Ω
R_{diff}	differential resistance	$I_R = 5 \text{ mA}; T_{amb} = 25 \text{ }^{\circ}\text{C}$		-	-	35	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

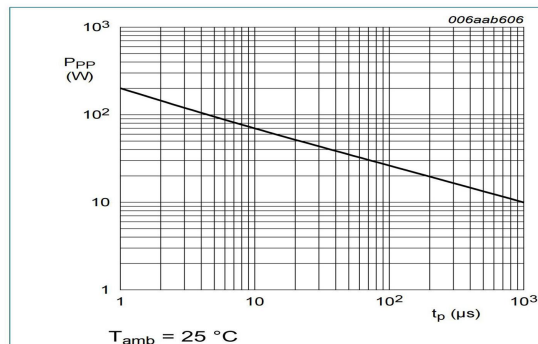


Fig. 3. Peak pulse power as a function of exponential pulse duration; typical values

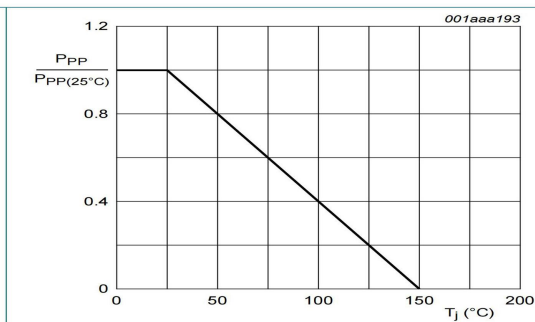
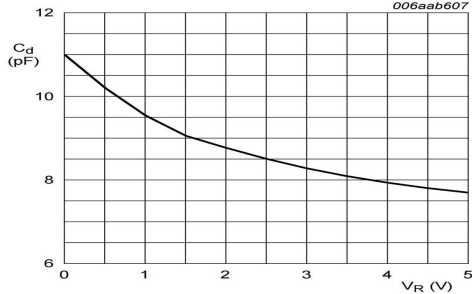


Fig. 4. Relative variation of peak pulse power as a function of junction temperature; typical values

OM SENI



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

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

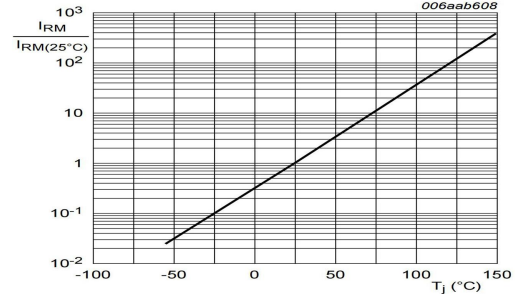


Fig. 6. Relative variation of reverse leakage current as a function of junction temperature; typical values

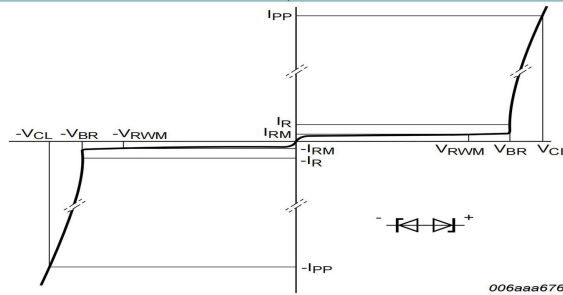


Fig. 7. V-I characteristics for a bidirectional ESD protection diode

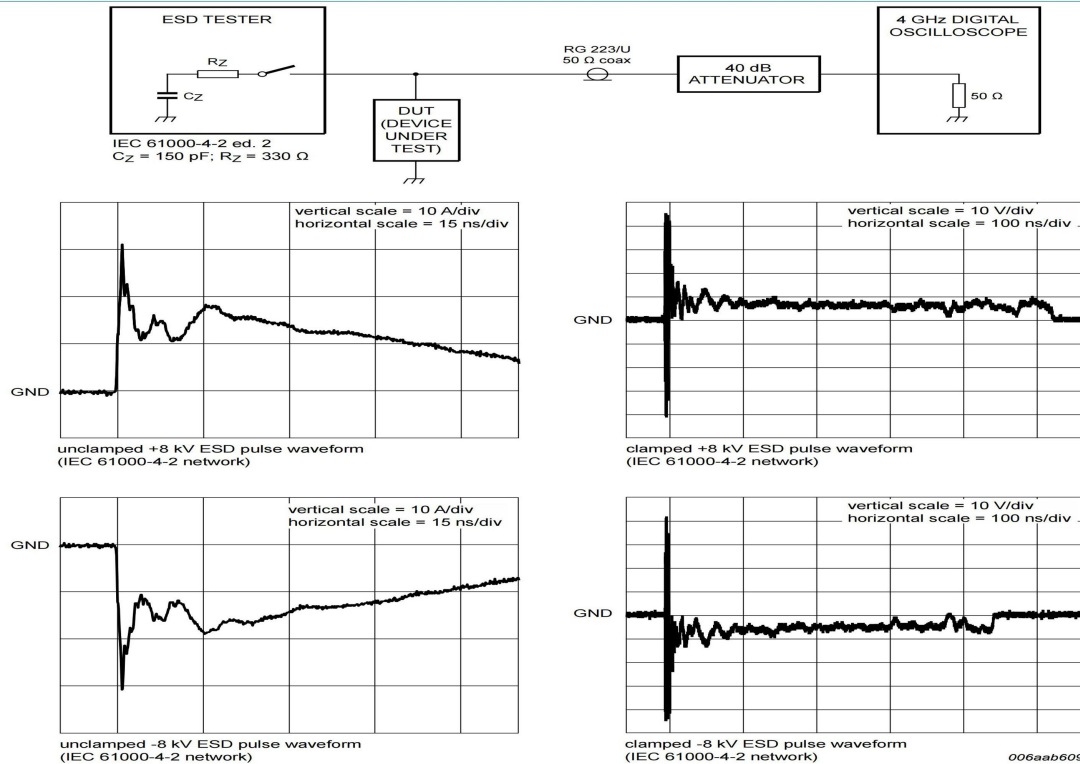


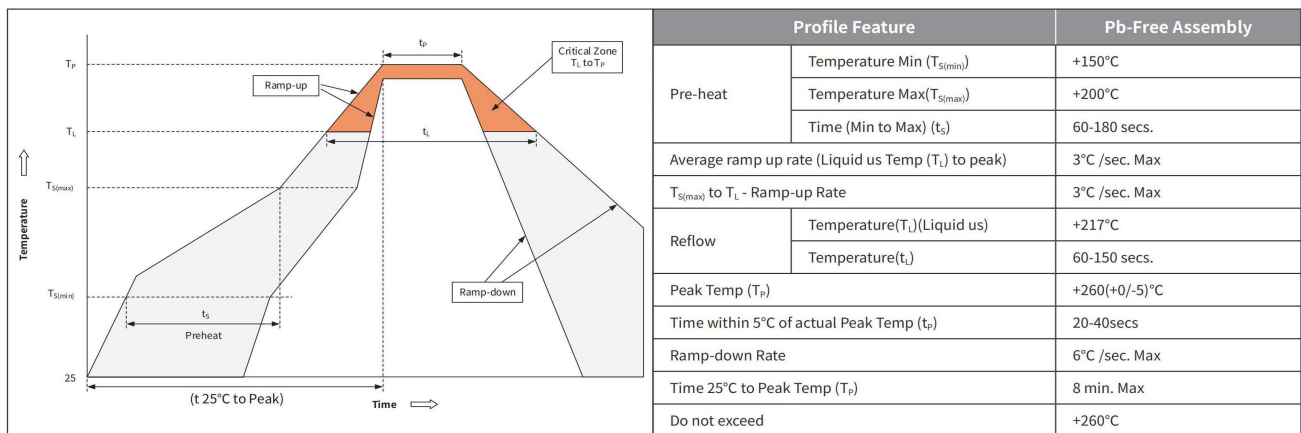
Fig. 8. ESD clamping test setup and waveforms

OM SENI

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