## 1. General description

Low capacitance unidirectional 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 SOD882D leadless ultra small Surface-Mounted Device (SMD) plastic package with visible and solderable side pads.

### 2. Features and benefits

- · ESD protection of one line
- Ultra small SMD plastic package
- Solderable side pads
- Package height typ. 0.37 mm
- Low diode capacitance C<sub>d</sub> = 25 pF
- ESD protection up to 26 kV
- IEC 61000-4-2; level 4 (ESD)
- IEC 61000-4-5 (surge); I<sub>PPM</sub> = 3.5 A
- Low clamping voltage: V<sub>CL</sub> = 12 V

## 3. Applications

- Computers and peripherals
- · Audio and video equipment
- · Communication systems
- Portable electronics

## 4. Quick reference data

#### Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
$V_{RWM}$	reverse standoff voltage	T <sub>amb</sub> = 25 °C	-	-	5	V
C <sub>d</sub>	diode capacitance	f = 1 MHz; V <sub>R</sub> = 0 V; T <sub>amb</sub> = 25 °C	-	25	30	pF



# 5. Pinning information

#### **Table 2. Pinning information**

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode[1]		
2	A	anode	Transparent top view  DFN1006D-2 (SOD882D)	K A 006aaa152

[1] The marking bar indicates the cathode.

## 6. Ordering information

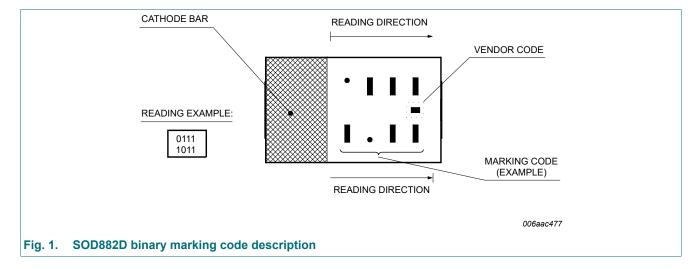
**Table 3. Ordering information** 

Type number	Package			
	Name	Description	Version	
PESD5V0L1ULD		leadless ultra small plastic package with side-wettable flanks (SWF); 2 terminals; 0.65 mm pitch; 1 mm x 0.6 mm x 0.4 mm body	SOD882D	

# 7. Marking

#### Table 4. Marking codes

Type number	Marking code
PESD5V0L1ULD	1110
	0000



# 8. Limiting values

#### Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
P <sub>PPM</sub>	rated peak pulse power	t <sub>p</sub> = 8/20 μs	[1] [2]	-	42	W
I <sub>PPM</sub>	rated peak pulse current		[1] [2]	-	3.5	Α
T <sub>j</sub>	junction temperature			-	150	°C
T <sub>amb</sub>	ambient temperature			-55	150	°C
T <sub>stg</sub>	storage temperature			-65	150	°C
ESD maxim	um ratings		-			
V <sub>ESD</sub>	electrostatic discharge voltage	IEC 61000-4-2 (contact discharge), T <sub>amb</sub> = 25 °C	[3] [2]	-	26	kV
		IEC 61000-4-2 (air discharge), T <sub>amb</sub> = 25 °C		-	15	kV
		machine model, T <sub>amb</sub> = 25 °C		-	400	V
		MIL-STD-883 (human body model), T <sub>amb</sub> = 25 °C	[2]	-	10	kV

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

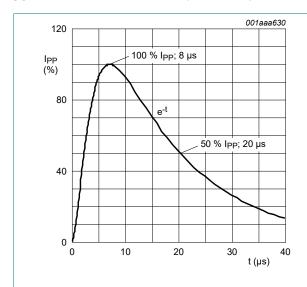


Fig. 2. 8/20 µs pulse waveform according to IEC 61000-4-5

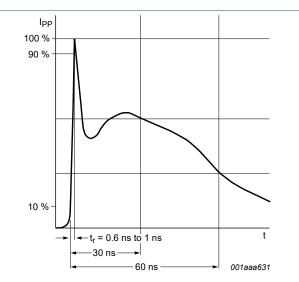


Fig. 3. ESD pulse waveform according to IEC 61000-4-2

## 9. Characteristics

**Table 6. Characteristics** 

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
V <sub>RWM</sub>	reverse standoff voltage	T <sub>amb</sub> = 25 °C		-	-	5	V
$V_{BR}$	breakdown voltage	I <sub>R</sub> = 5 mA; T <sub>amb</sub> = 25 °C		6.4	6.8	7.2	V
I <sub>RM</sub>	reverse leakage current	V <sub>RWM</sub> = 5 V; T <sub>amb</sub> = 25 °C		-	10	100	nA
C <sub>d</sub>	diode capacitance	f = 1 MHz; V <sub>R</sub> = 0 V; T <sub>amb</sub> = 25 °C		-	25	30	pF
V <sub>CL</sub>	clamping voltage	I <sub>PPM</sub> = 1 A; T <sub>amb</sub> = 25 °C	[1] [2]	-	-	9	V
		I <sub>PPM</sub> = 3.5 A; T <sub>amb</sub> = 25 °C	[1] [2]	-	-	12	V
R <sub>dyn</sub>	dynamic resistance	I <sub>R</sub> = 10 A; T <sub>amb</sub> = 25 °C	[3]	-	0.7	-	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) tp = 100 ns; square pulse; ANSI / ESD STM5.5.1-2008.

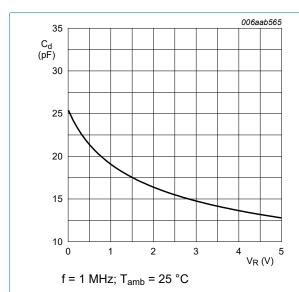


Fig. 4. Diode capacitance as a function of reverse voltage; typical values

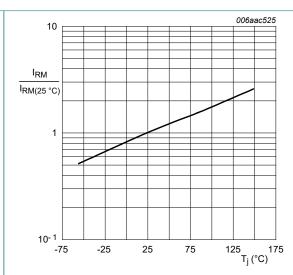


Fig. 5. Relative variation of reverse leakage current as a function of junction temperature; typical values

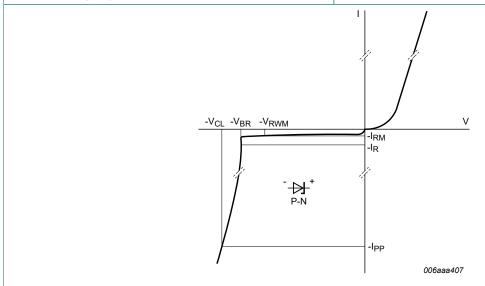
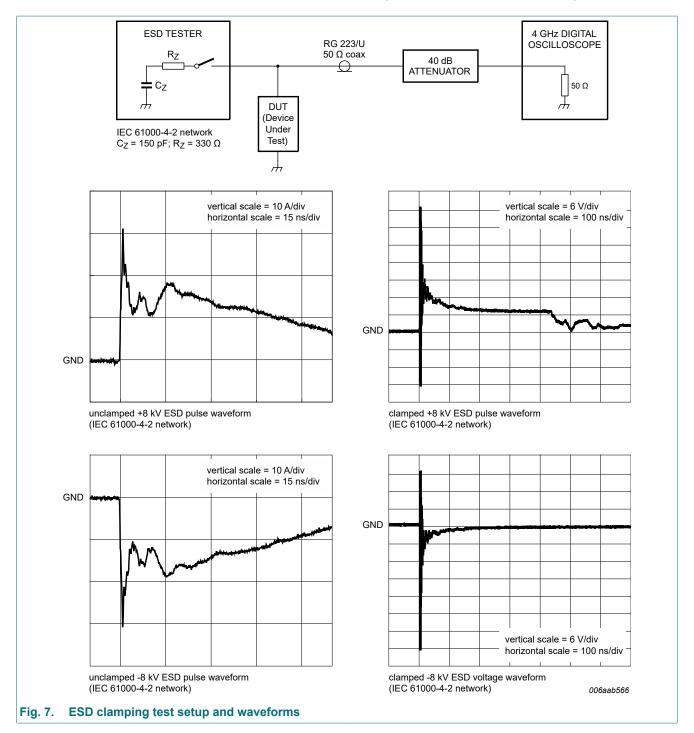
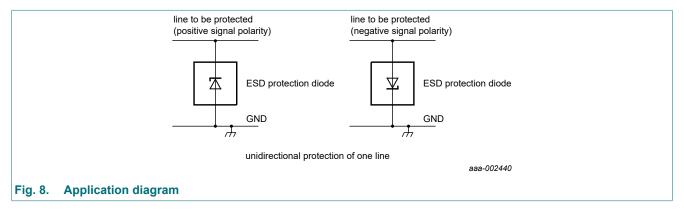


Fig. 6. V-I characteristics for a unidirectional ESD protection diode



## 10. Application information

The device is designed for protection of one unidirectional data or signal line from surge pulses and ESD damage. The device is suitable on lines where the signal polarities are either positive or negative with respect to ground.

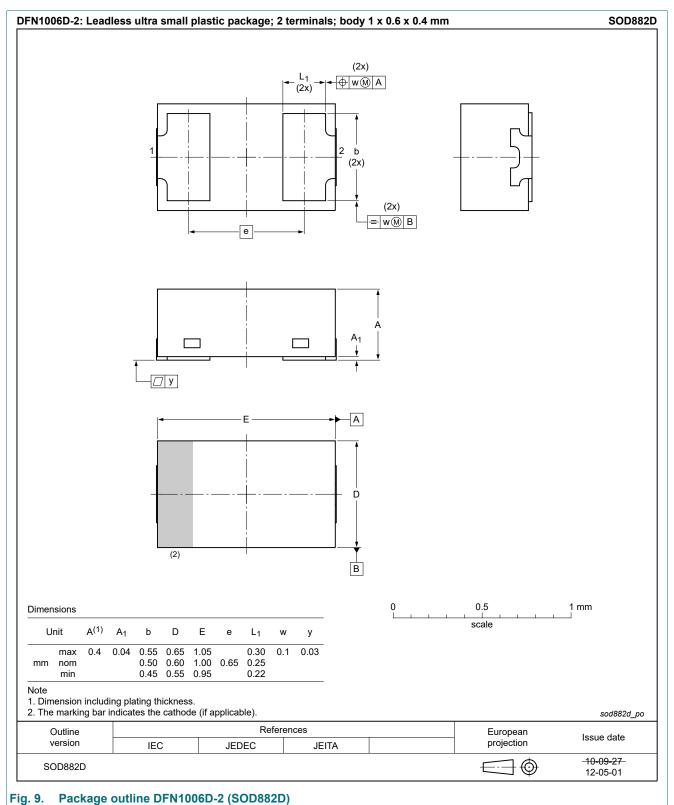


#### Circuit board layout and protection device placement

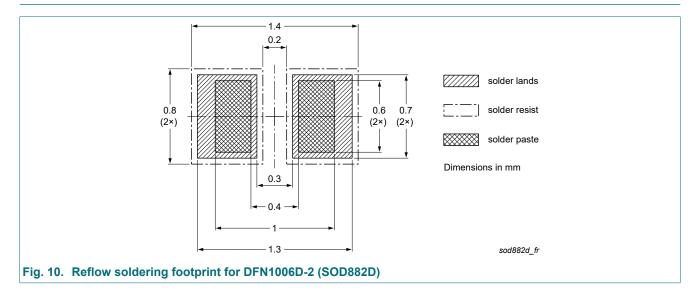
Circuit board layout is critical for the suppression of ESD, Electrical Fast Transient (EFT) and surge transients. The following guidelines are recommended:

- 1. Place the device as close to the input terminal or connector as possible.
- 2. Minimize the path length between the device and the protected line.
- 3. Keep parallel signal paths to a minimum.
- 4. Avoid running protected conductors in parallel with unprotected conductors.
- 5. Minimize all Printed-Circuit Board (PCB) conductive loops including power and ground loops.
- **6.** Minimize the length of the transient return path to ground.
- 7. Avoid using shared transient return paths to a common ground point.
- 8. Use ground planes whenever possible. For multilayer PCBs, use ground vias.

# 11. Package outline



# 12. Soldering



8 / 11

# 13. Revision history

## Table 7. Revision history

uble 7. Revision mistory							
Data sheet ID	sheet ID Release date D		Change notice	Supersedes			
PESD5V0L1ULD v.2	20230414	Product data sheet	-	PESD5V0L1ULD v.1			
Modifications:	· ·	Product changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).					
PESD5V0L1ULD v.1	20110419	Product data sheet	-	-			

## 14. Legal information

#### **Data sheet status**

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

- Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
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#### Low capacitance unidirectional ESD protection diode

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