



PESD5V0V1BLD

Very low capacitance bidirectional ESD protection diode

3 July 2018

Product data sheet

1. General description

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

2. Features and benefits

- Bidirectional ESD protection of one line
- Ultra small SMD plastic package
- Solderable side pads
- Package height typ. 0.37 mm
- Very low diode capacitance: $C_d = 11$ pF
- Max. peak pulse power: $P_{PPM} = 45$ W
- Low clamping voltage: $V_{CL} = 12.5$ V
- Ultra low leakage current: $I_{RM} < 1$ nA
- ESD protection up to 30 kV
- IEC 61000-4-2; level 4 (ESD)
- IEC 61000-4-5 (surge); $I_{PPM} = 4.8$ A
- AEC-Q101 qualified

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
- FireWire

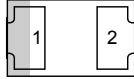
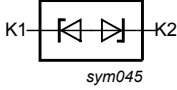
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
C_d	diode capacitance	$f = 1$ MHz; $V_R = 0$ V; $T_{amb} = 25$ °C	-	11	13	pF
V_{RWM}	reverse standoff voltage	$T_{amb} = 25$ °C	-	-	5	V

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K1	cathode ^[1]	 <p>Transparent top view</p> <p>DFN1006D-2 (SOD882D)</p>	 <p><i>sym045</i></p>
2	K2	cathode 2		

[1] The marking bar indicates pin 1.

6. Ordering information

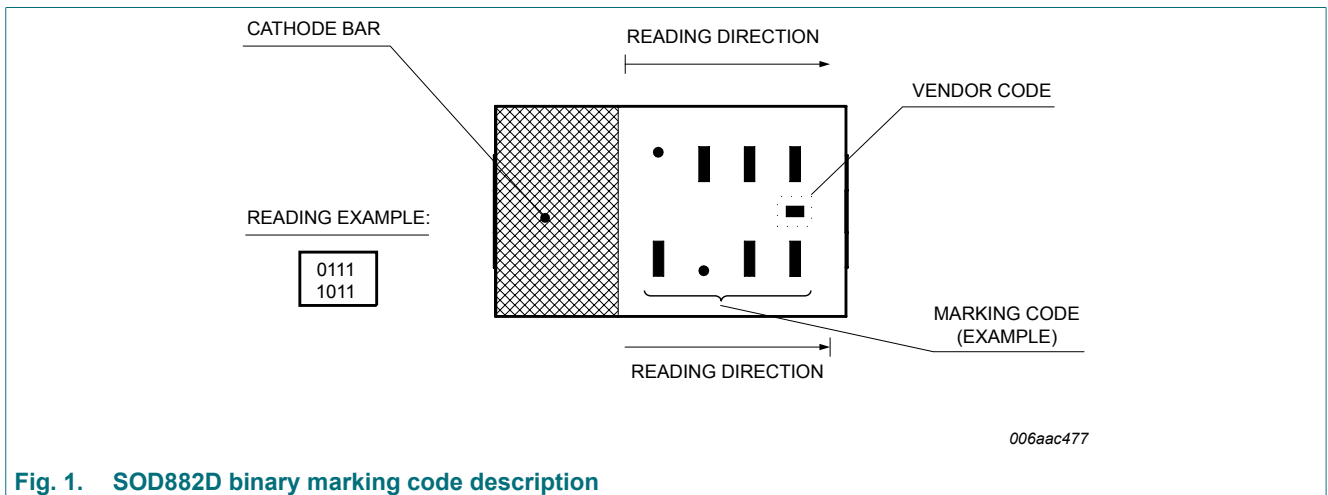
Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PESD5V0V1BLD	DFN1006D-2	leadless ultra small plastic package; 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
PESD5V0V1BLD	0111 0000



8. Limiting values

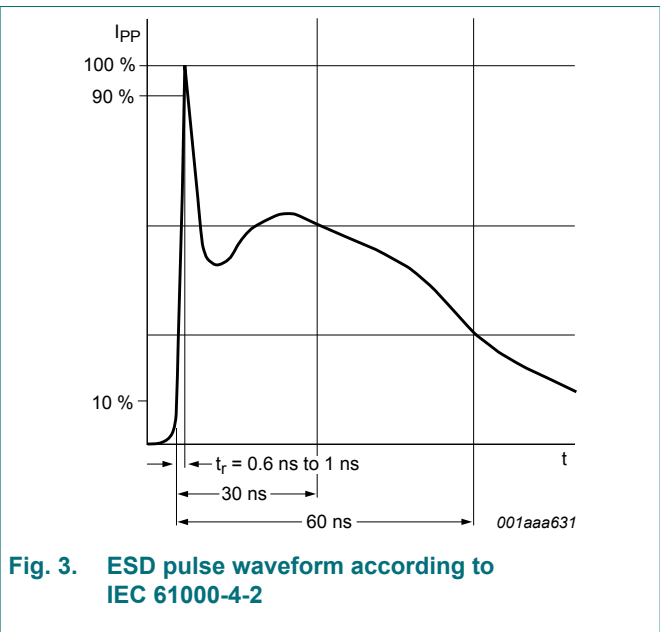
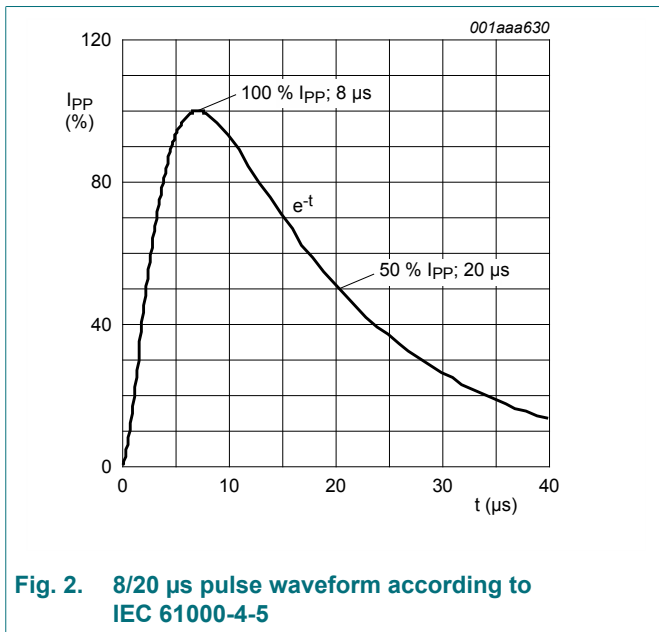
Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
Per diode						
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
Per device						
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)		-	16	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.



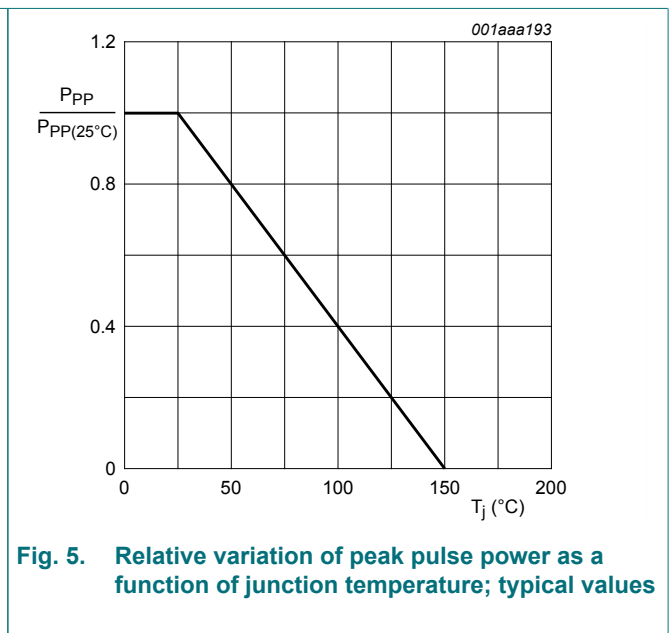
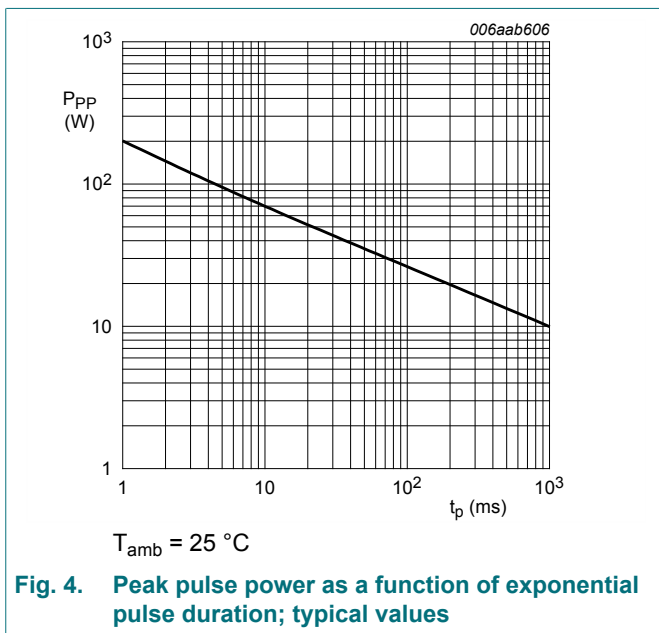
9. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{RWM}	reverse standoff voltage	$T_{amb} = 25\text{ °C}$	-	-	5	V
V_{BR}	breakdown voltage	$I_R = 5\text{ mA}; T_{amb} = 25\text{ °C}$	5.8	6.8	7.8	V
I_{RM}	reverse leakage current	$V_{RWM} = 5\text{ V}; T_{amb} = 25\text{ °C}$	-	1	10	nA
C_d	diode capacitance	$f = 1\text{ MHz}; V_R = 0\text{ V}; T_{amb} = 25\text{ °C}$	-	11	13	pF
V_{CL}	clamping voltage	$I_{PP} = 4.8\text{ A}; T_{amb} = 25\text{ °C}$	[1]	-	12.5	V
R_{dyn}	dynamic resistance	$I_R = 10\text{ A}; T_{amb} = 25\text{ °C}$	[2]	0.2	-	Ω

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

[2] Non-repetitive current pulse, Transmission Line Pulse (TLP) $t_p = 100\text{ ns}$; square pulse; ANSI/ESD STM5.5.1-20088.



Very low capacitance bidirectional ESD protection diode

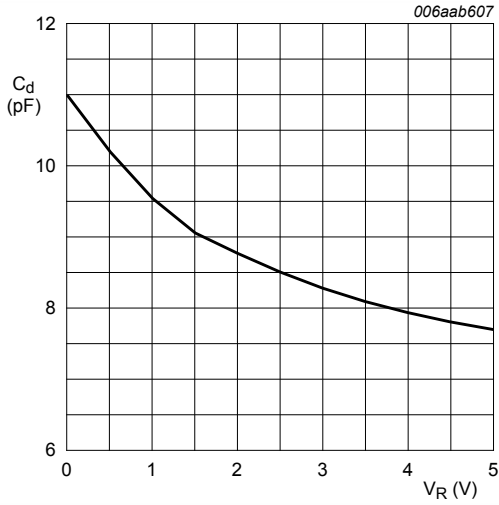


Fig. 6. Diode capacitance as a function of reverse voltage; typical values

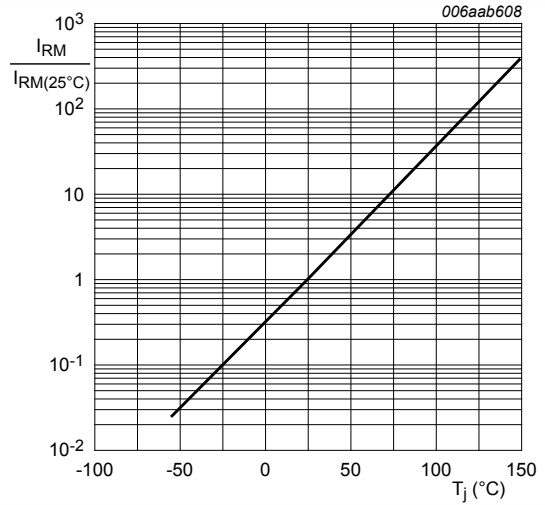


Fig. 7. Relative variation of reverse leakage current as a function of junction temperature; typical values

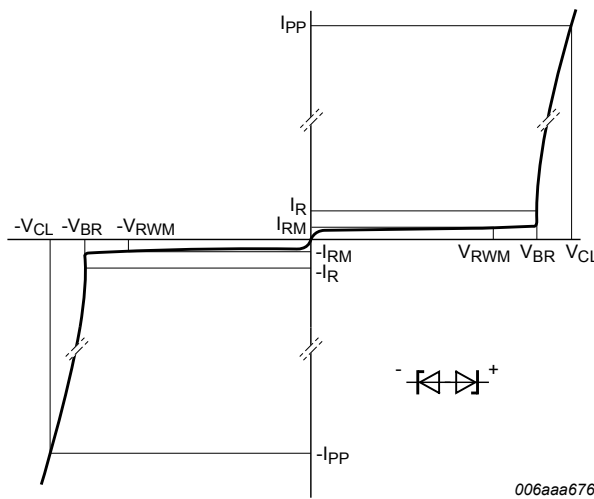


Fig. 8. V-I characteristics for a bidirectional ESD protection diode

Very low capacitance bidirectional ESD protection diode

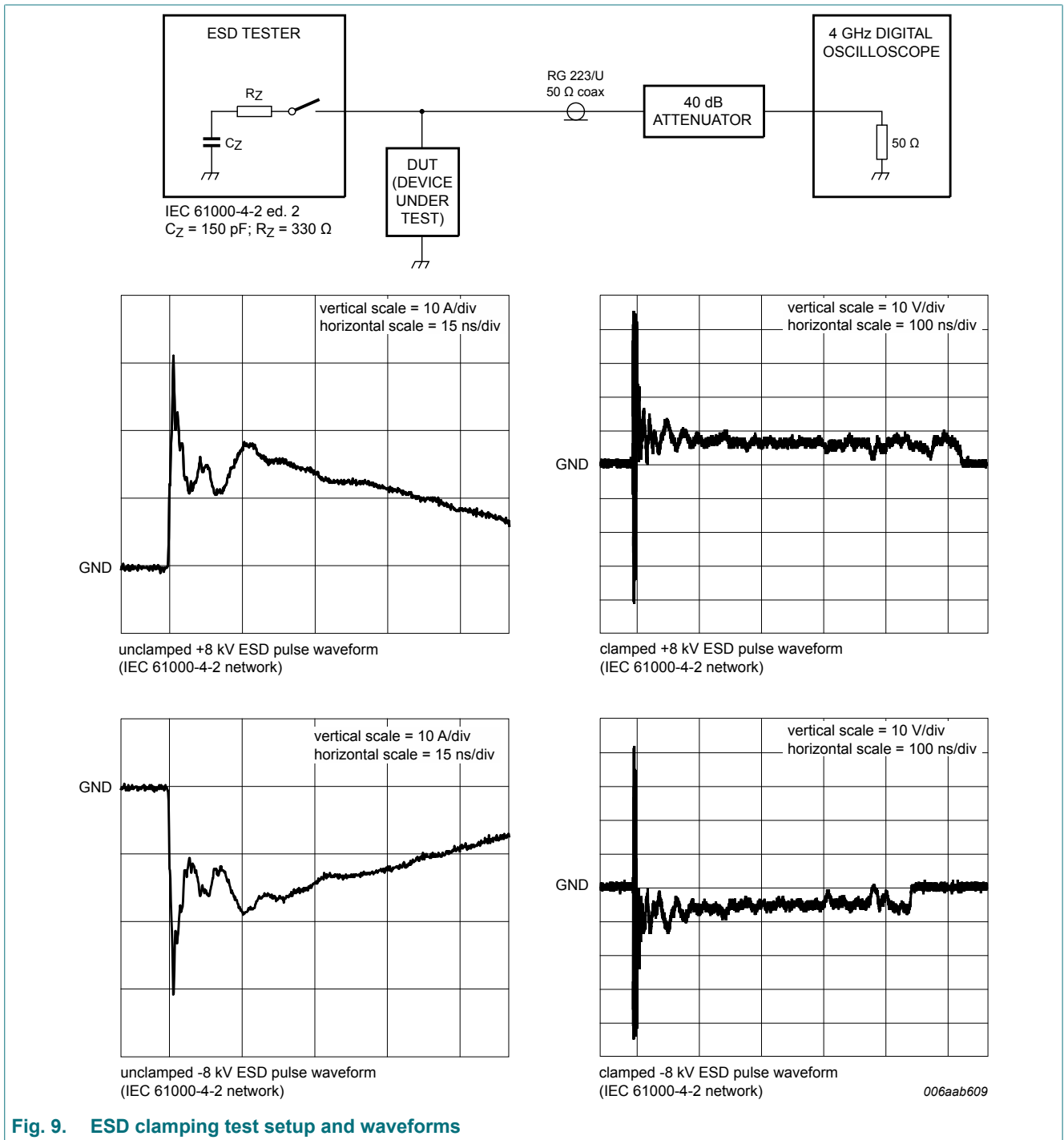


Fig. 9. ESD clamping test setup and waveforms

10. Application information

The PESD5V0V1BLD is designed for the protection of one bidirectional data of signal line from the damage caused by ESD and surge pulses. The device may be used on lines where the signal polarities are both, positive or negative with respect to ground. The PESD5V0V1BLD provides a surge capability of 45 W per line for an 8/20 μ s waveform.

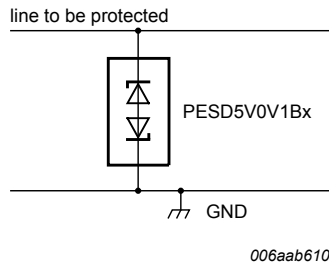


Fig. 10. Application diagram

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. Test information

Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - *Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

12. Package outline

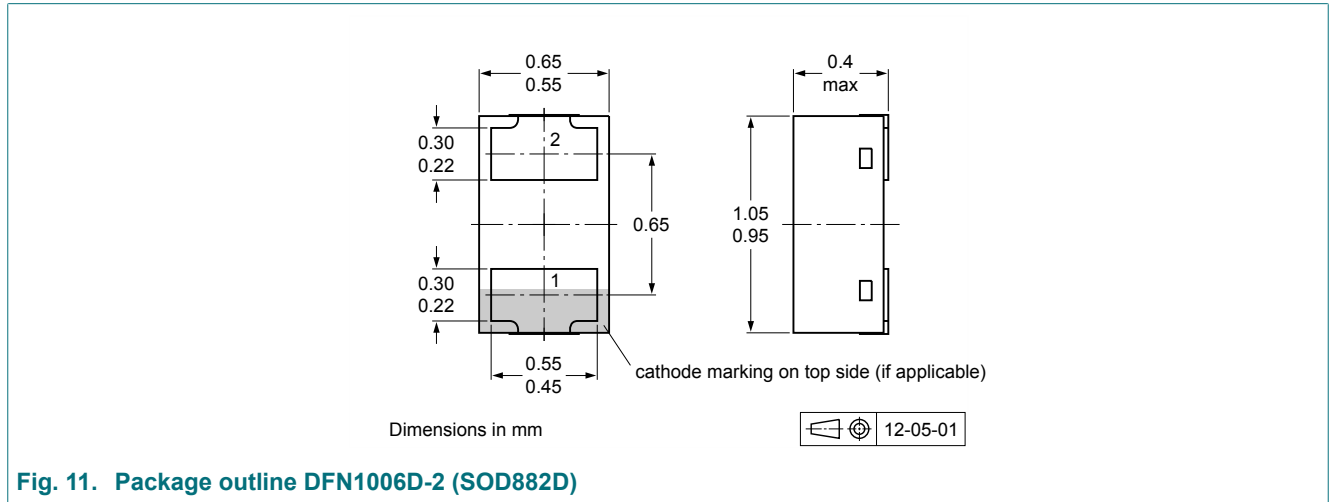


Fig. 11. Package outline DFN1006D-2 (SOD882D)

13. Soldering

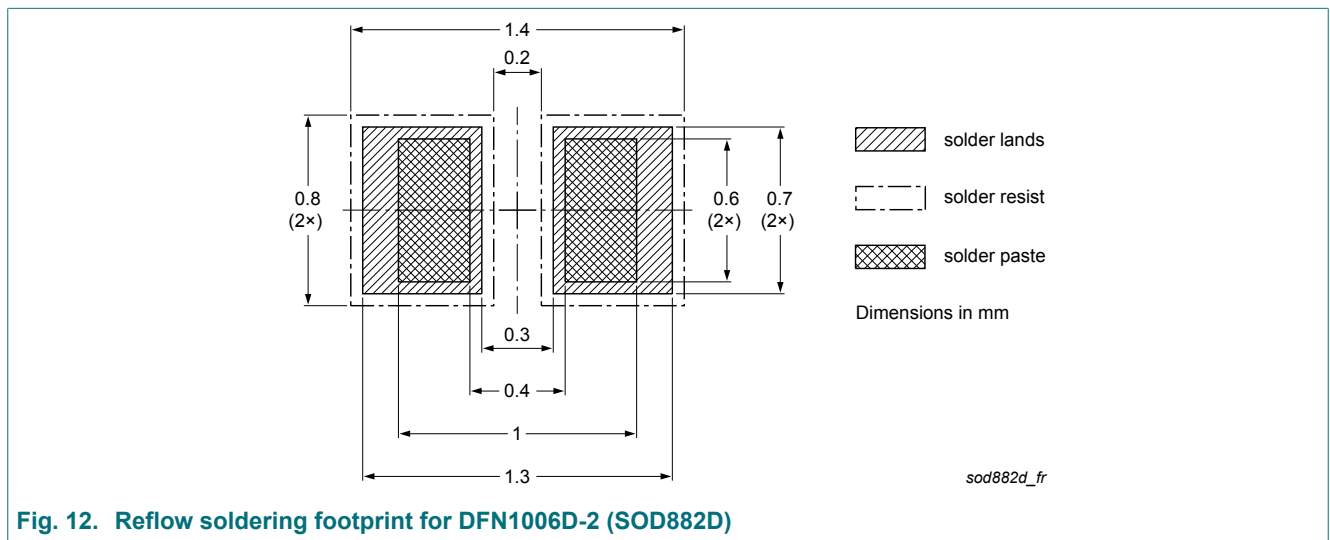


Fig. 12. Reflow soldering footprint for DFN1006D-2 (SOD882D)

14. Revision history

Table 7. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PESD5V0V1BLD_v.2	20180703	Product data sheet	-	PESD5V0V1BLD_v.1
Modifications	<ul style="list-style-type: none">• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.• Legal texts have been adapted to the new company name where appropriate.			
PESD5V0V1BLD_v.1	20101207	Product data sheet		

15. 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.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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