



PESD5V0U1USL

Ultra low capacitance unidirectional ESD protection diode

16 October 2024

Product data sheet

1. General description

Ultra low capacitance unidirectional ElectroStatic Discharge (ESD) protection diode in a DFN1006-2 (SOD882-S1) ultra small and leadless Surface-Mounted Device (SMD) package, designed to protect one signal line against ESD, high surge currents and other transients.

2. Features and benefits

- Unidirectional protection of one line
- Reverse standoff voltage: $V_{RWM} = 5\text{ V}$
- Very high surge robustness: rated $I_{PPM} = 8\text{ A}$ (8/20 μs)
- Ultra low clamping voltage $V_{CL} = 12\text{ V typ}$ at 8 A
- ESD protection up to 20 kV

3. Applications

Surge protection for:

- USB Type-C D+/D- lines

in portable communication, consumer and computing devices

4. Quick reference data

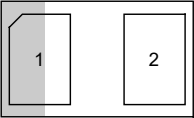

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RWM}	reverse standoff voltage	$T_{amb} = 25\text{ }^{\circ}\text{C}$		-	-	5	V
I_{PPM}	rated peak pulse current	$t_p = 8/20\text{ }\mu\text{s}$	[1]	-	-	8	A
V_{CL}	clamping voltage	$I_{PPM} = 8\text{ A}$; $t_p = 8/20\text{ }\mu\text{s}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$	[1]	-	12	15	V

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

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 Transparent top view DFN1006-2 (SOD882-S1)	 <i>sym035</i>
2	A	anode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PESD5V0U1USL	DFN1006-2	plastic, leadless ultra small outline package; 2 terminals;0.60 mm pitch; 1 mm x 0.6 mm x 0.4 mm body	SOD882-S1

7. Marking

Table 4. Marking codes

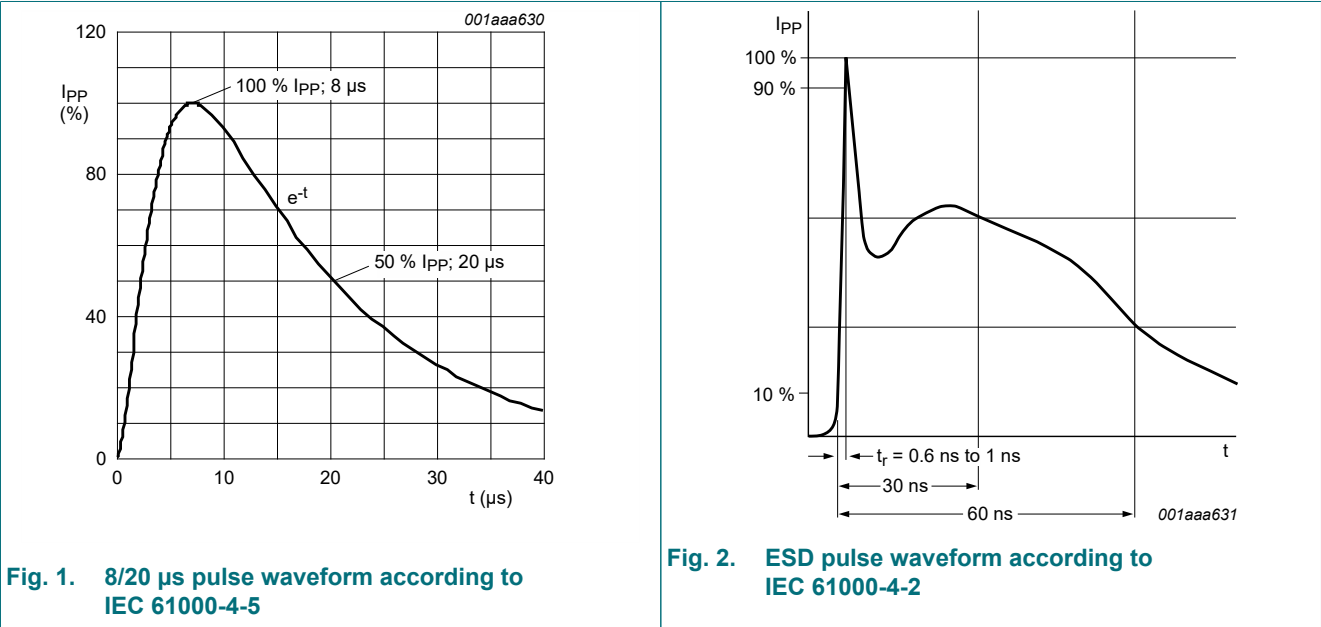
Type number	Marking code
PESD5V0U1USL	1C

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 μs	[1]	-	8	A
T _j	junction temperature			-	125	°C
T _{amb}	ambient temperature			-55	125	°C
T _{stg}	storage temperature			-55	150	°C
ESD maximum ratings						
V _{ESD}	electrostatic discharge voltage	IEC 61000-4-2; contact discharge	[2]	-	20	kV
		IEC 61000-4-2; air discharge	[2]	-	20	kV

- [1] Device stressed with 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	$T_{amb} = 25\text{ }^{\circ}\text{C}$		-	-	5	V
V_{BR}	breakdown voltage	$I_R = 1\text{ mA}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		6	7.5	9	V
I_{RM}	reverse leakage current	$V_{RWM} = 5\text{ V}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		-	-	100	nA
C_d	diode capacitance	$f = 1\text{ MHz}$; $V_R = 0\text{ V}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		-	1.2	1.5	pF
V_{CL}	clamping voltage	$I_{PPM} = 8\text{ A}$; $t_p = 8/20\text{ }\mu\text{s}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$	[1]	-	12	15	V

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

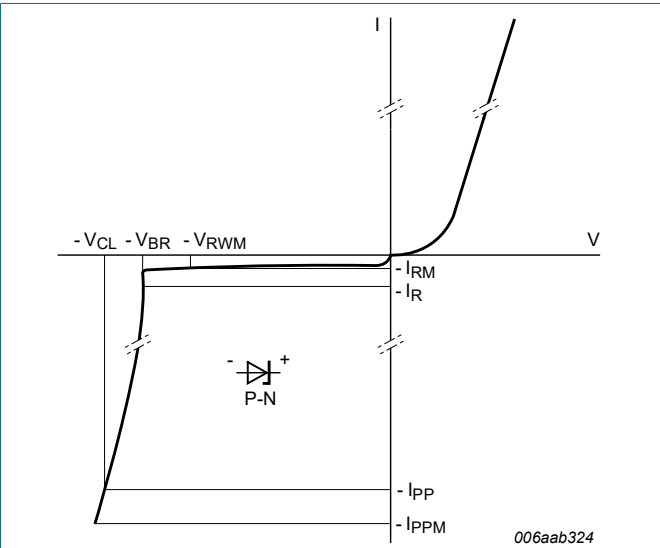


Fig. 3. V-I characteristics for a unidirectional TVS protection diode

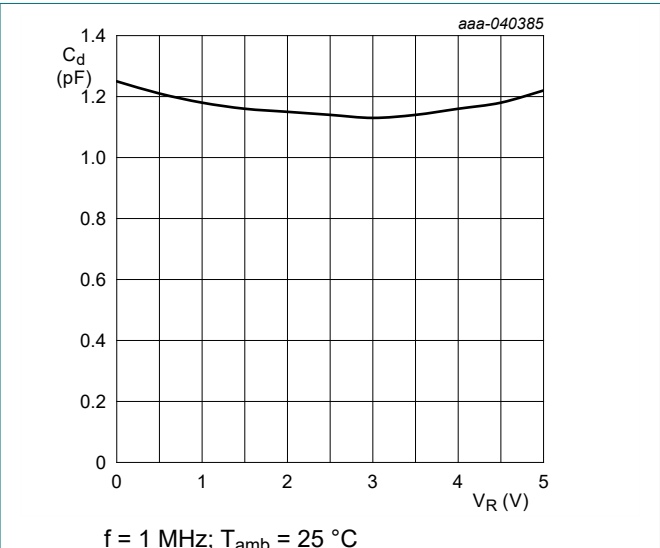


Fig. 4. Diode capacitance as a function of reverse voltage; typical values

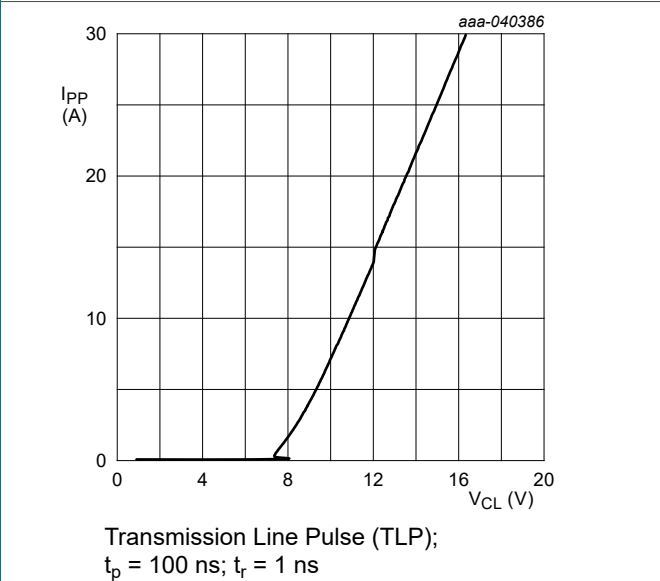


Fig. 5. Positive clamping voltage (TLP); typical values

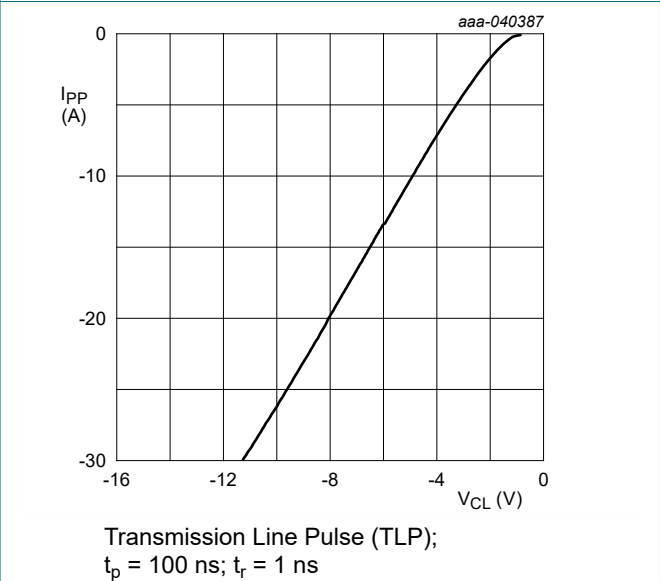
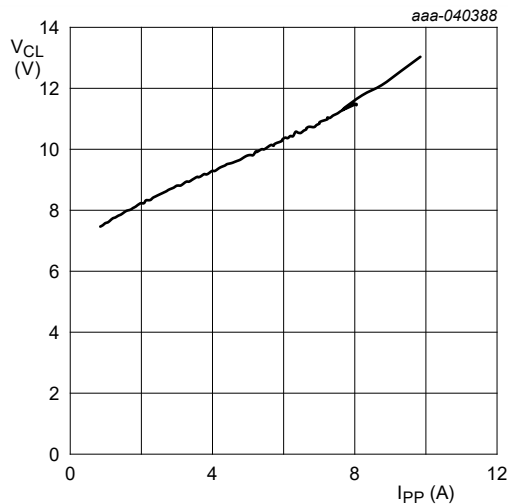
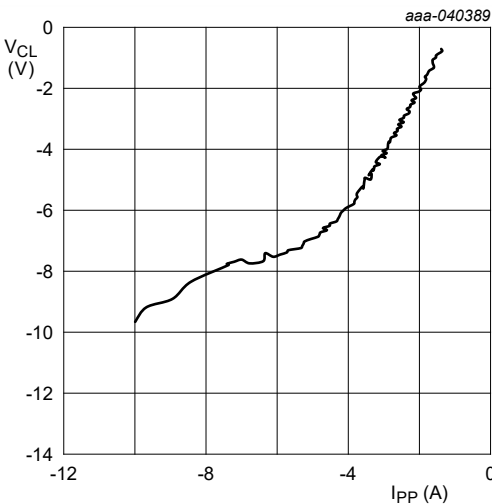


Fig. 6. Negative clamping voltage (TLP); typical values



IEC 61000-4-5; $t_p = 8/20 \mu s$; positive pulse

Fig. 7. Positive clamping voltage (8/20 μs pulse); typical values



IEC 61000-4-5; $t_p = 8/20 \mu s$; negative pulse

Fig. 8. Negative clamping voltage (8/20 μs pulse); typical values

10. Application information

The device is designed for the protection of one unidirectional data 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.

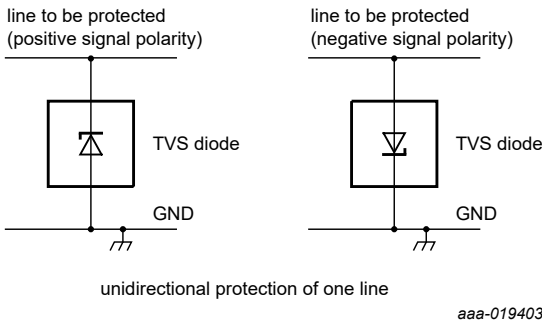
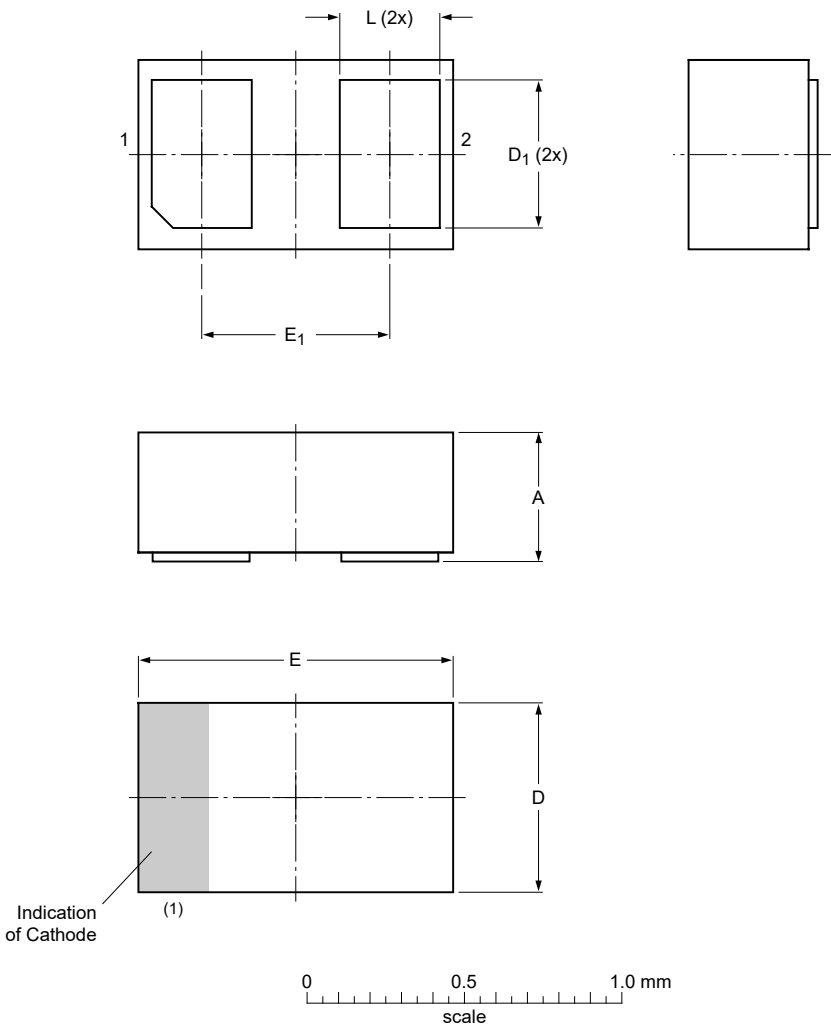


Fig. 9. Application diagram

11. Package outline

DFN1006-2: plastic, leadless ultra small outline package; 2 terminals;
0.60 mm pitch; 1 mm x 0.6 mm x 0.4 mm body

SOD882-S1



Dimensions (mm are the original dimensions)

Unit	A	D	D ₁	E	E ₁	L
max	0.45	0.65	0.52	1.05	0.65	0.37
nom						
min	0.35	0.55	0.42	0.95	0.55	0.27

Note
1. The marking bar indicates the cathode.

sod882-s1_po

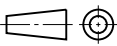
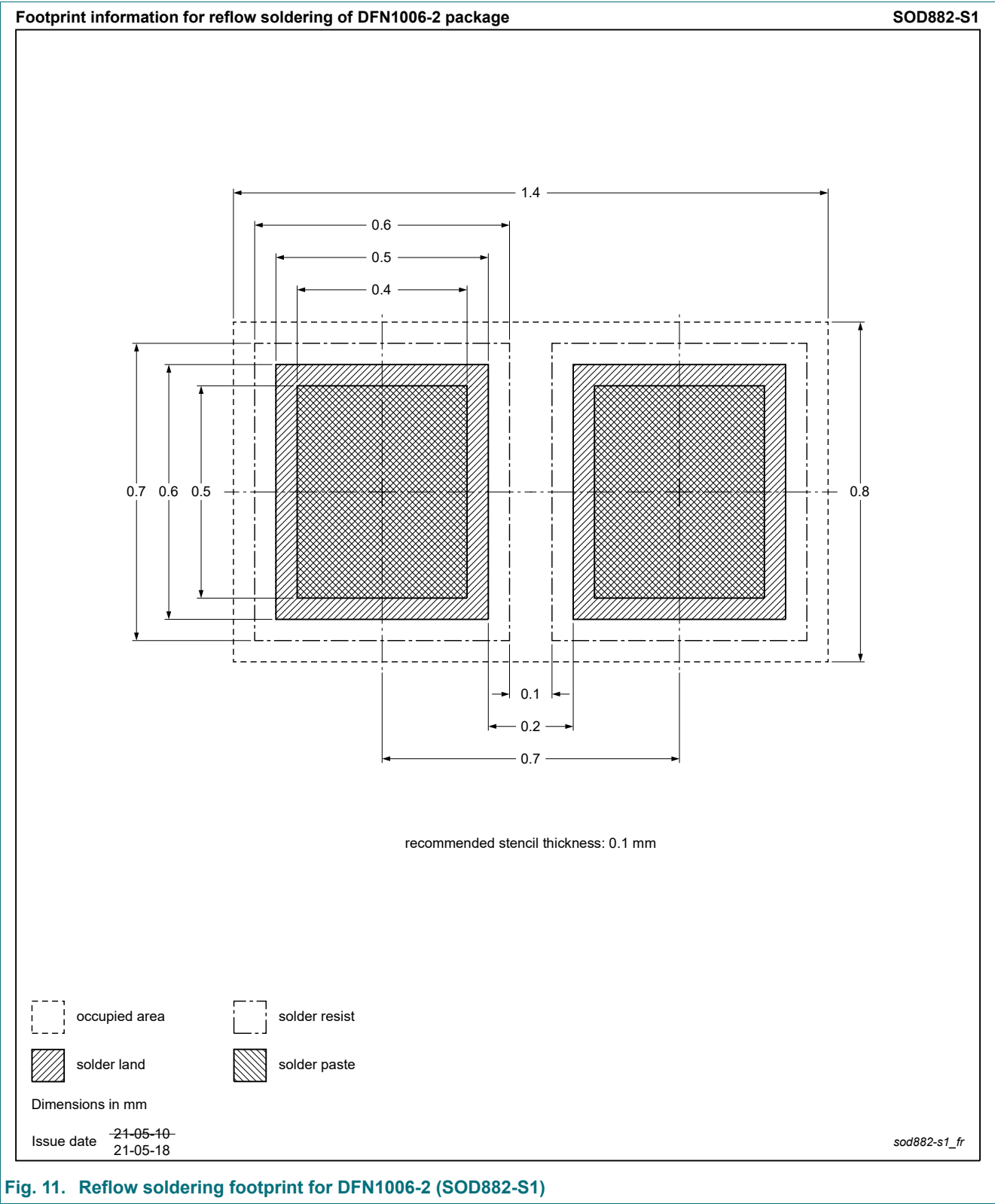
Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOD882-S1		---				21-05-09 21-05-18

Fig. 10. Package outline DFN1006-2 (SOD882-S1)

12. Soldering



13. Revision history

Table 7. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PESD5V0U1USL v.1	20241016	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.

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