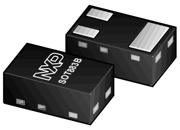

PESD5V0V2BMB

Very low capacitance bidirectional ESD protection diodes

17 August 2015

Product data sheet

1. General description

Two bidirectional ElectroStatic Discharge (ESD) protection diodes designed to protect two signal lines from damage caused by ESD and other transients. The device is housed in a DFN1006B-3 (SOT883B) leadless ultra small Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Bidirectional ESD protection of two lines
- Ultra small SMD plastic package
- ESD protection up to 30 kV; IEC 61000-4-2
- I_{PPM} = 9 A; IEC 61000-4-5 (surge)
- Ultra low leakage current: I_{RM} = 1 nA
- AEC-Q101 qualified

3. Applications

- Computers and peripherals
- Audio and video equipment
- Cellular handsets and accessories
- Communication systems
- Portable electronics

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RWM}	reverse standoff voltage	T_{amb} = 25 °C		-	-	5	V
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; T_{amb} = 25 °C		-	18	20	pF

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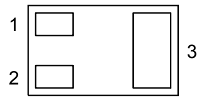
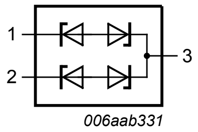
5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K1	cathode	 Transparent top view **DFN1006B-3 (SOT883B)**	
2	K2	cathode		
3	K3	common cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PESD5V0V2BMB	DFN1006B-3	DFN1006B-3: leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.37 mm	SOT883B

7. Marking

Table 4. Marking codes

Type number	Marking code
PESD5V0V2BMB	00 11 01 00

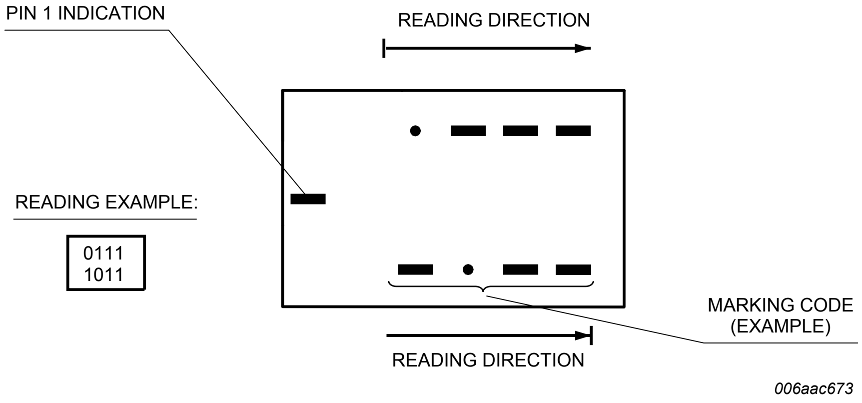


Fig. 1. DFN1006B-3 (SOT883B) binary marking code description

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][2]	-	9	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	[1][3]	-	30	kV
		IEC 61000-4-2; air discharge	[1][3]	-	30	kV
		MIL-STD-883; human body model	[1]	-	10	kV

[1] Measured from pin 1 or 2 to pin 3.

[2] According to IEC 61000-4-5 and IEC 61643-321.

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

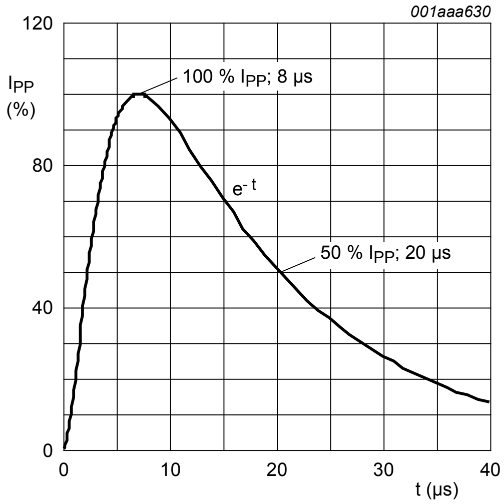


Fig. 2. 8/20 μs pulse waveform according to IEC 61000-4-5 and IEC 61643-321

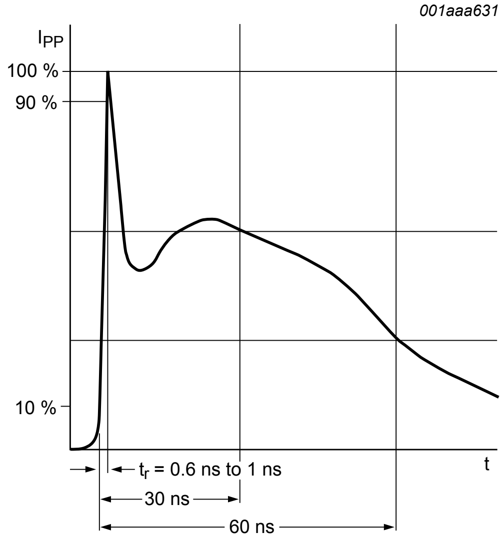


Fig. 3. ESD pulse waveform according to IEC 61000-4-2

9. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RWM}	reverse standoff voltage	T_{amb} = 25 °C		-	-	5	V
I_{RM}	reverse leakage current	V_{RWM} = 5 V; T_{amb} = 25 °C	[1]	-	1	10	nA

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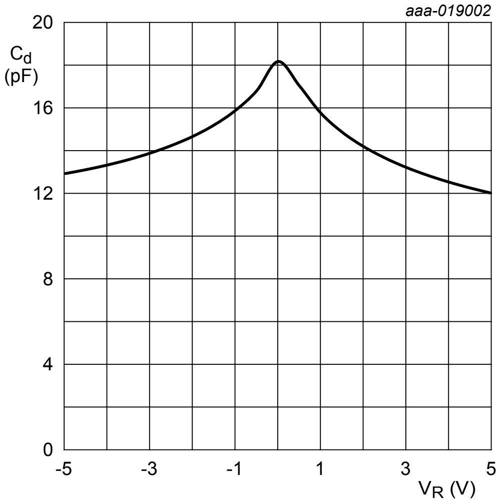
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{BR}	breakdown voltage	I_R = 5 mA; T_{amb} = 25 °C	[1]	5.5	6.8	7.8	V
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; T_{amb} = 25 °C		-	18	20	pF
V_{CL}	clamping voltage	I_{PP} = 1 A; T_{amb} = 25 °C; t_p = 8/20 µs	[1][2]	-	8	9.5	V
		I_{PPM} = 9 A; T_{amb} = 25 °C; t_p = 8/20 µs	[1][2]	-	11	12.5	V
R_{dyn}	dynamic resistance	I_R = 10 A; T_{amb} = 25 °C	[1][3]	-	0.15	-	Ω

[1] Measured from pin 1 or 2 to pin 3.

[2] According to IEC 61000-4-5 and IEC 61643-321.

[3] Non-repetitive current pulse, Transmission Line Pulse (TLP) t_p = 100 ns; square pulse; ANSI / ESD STM5.5.1-2008.



f = 1 MHz; T_{amb} = 25 °C

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

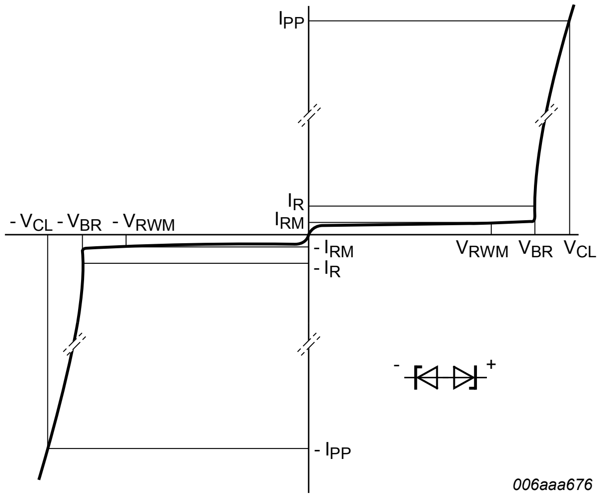
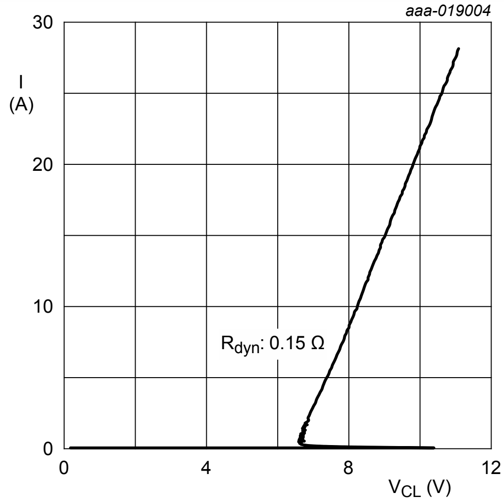
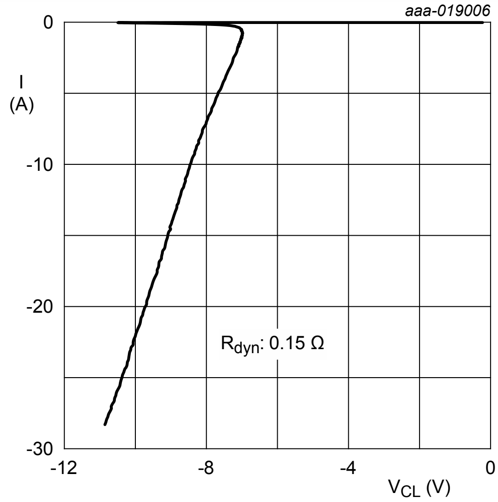


Fig. 5. V-I characteristics for a bidirectional ESD protection diode



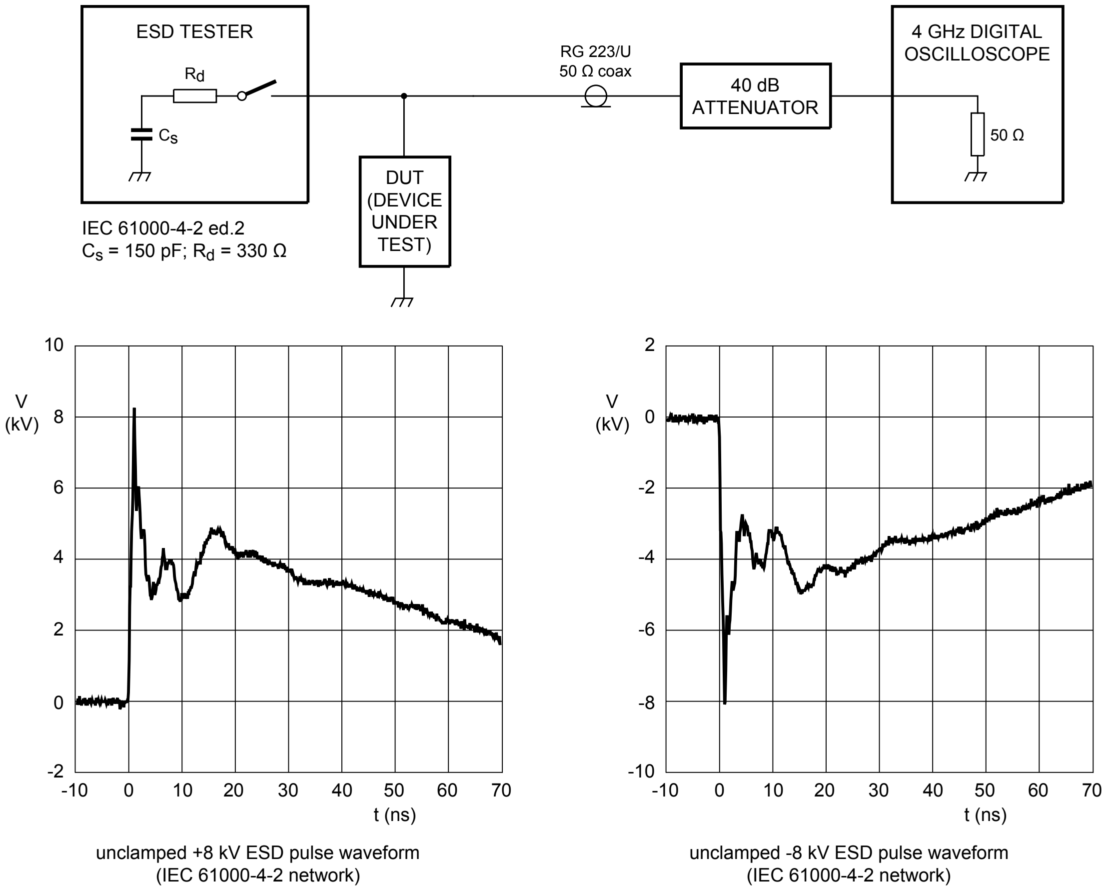
t_p = 100 ns; Transmission Line Pulse (TLP)

Fig. 6. Dynamic resistance



t_p = 100 ns; Transmission Line Pulse (TLP)

Fig. 7. Dynamic resistance



unclamped +8 kV ESD pulse waveform (IEC 61000-4-2 network)

unclamped -8 kV ESD pulse waveform (IEC 61000-4-2 network)

Fig. 8. ESD clamping test setup and waveforms

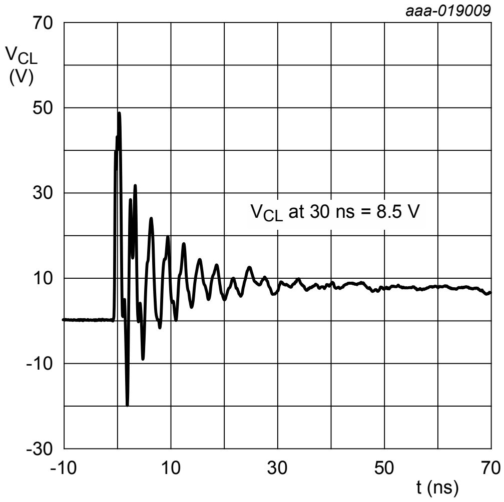


Fig. 9. Clamped +8 kV pulse waveform (IEC 61000-4-2 network)

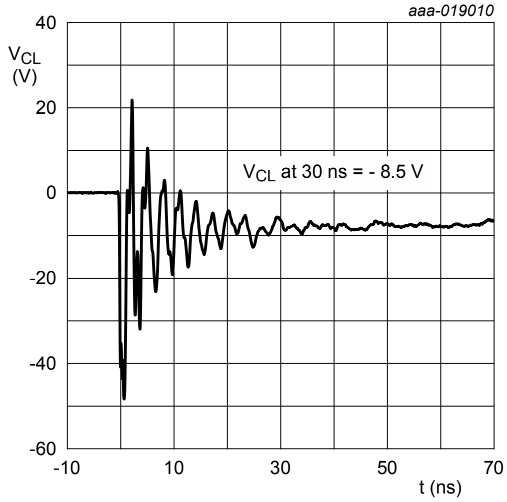
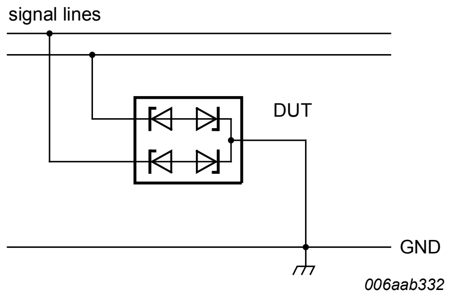


Fig. 10. Clamped -8 kV pulse waveform (IEC 61000-4-2 network)

10. Application information

The device is designed for the protection of up to two bidirectional data lines from surge pulses and ESD damage.

Fig. 11. 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.

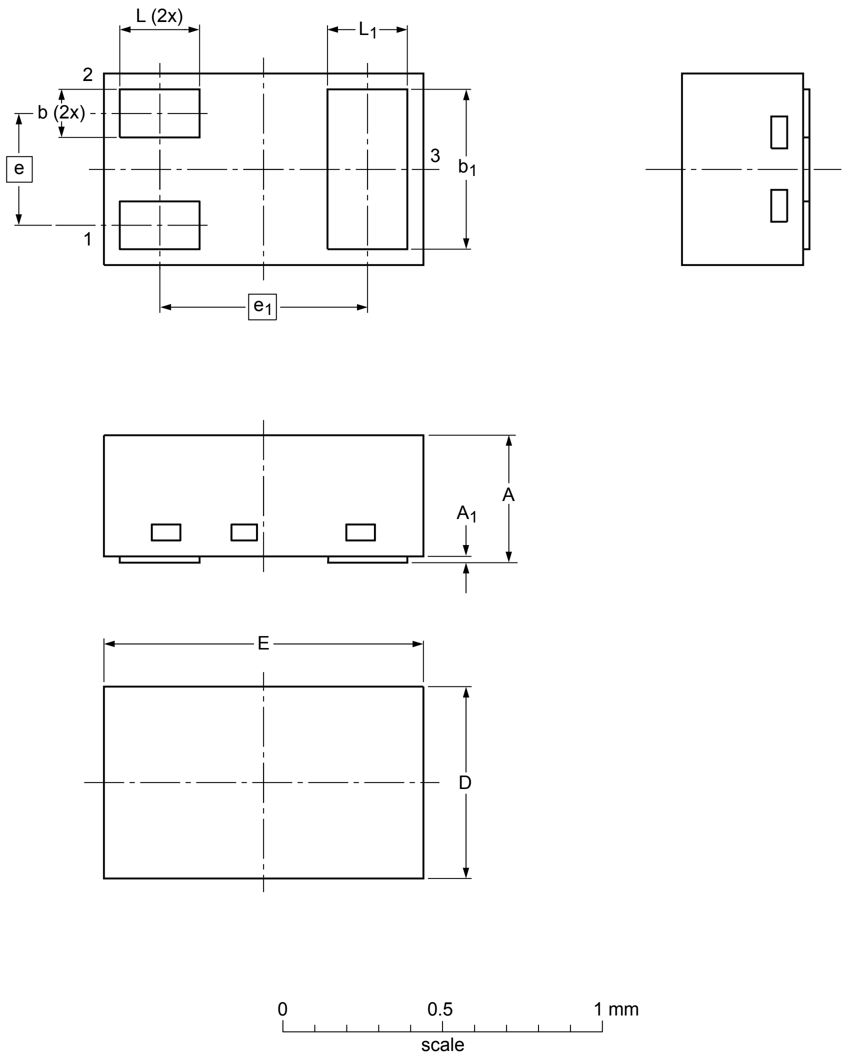
11. Test information

11.1 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

Leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.37 mm **SOT883B**



Dimensions

Unit		$A^{(1)}$	A_1	b	b_1	D	E	e	e_1	L	L_1
mm	max	0.40	0.04	0.20	0.55	0.65	1.05			0.30	0.30
	nom	0.37		0.15	0.50	0.60	1.00	0.35	0.65	0.25	0.25
	min	0.34		0.12	0.47	0.55	0.95			0.22	0.22

Note

1. Including plating thickness

sot883b_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT883B						~~11-11-02~~ 12-01-03

Fig. 12. Package outline DFN1006B-3 (SOT883B)

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13. Soldering

Footprint information for reflow soldering **SOT883B**

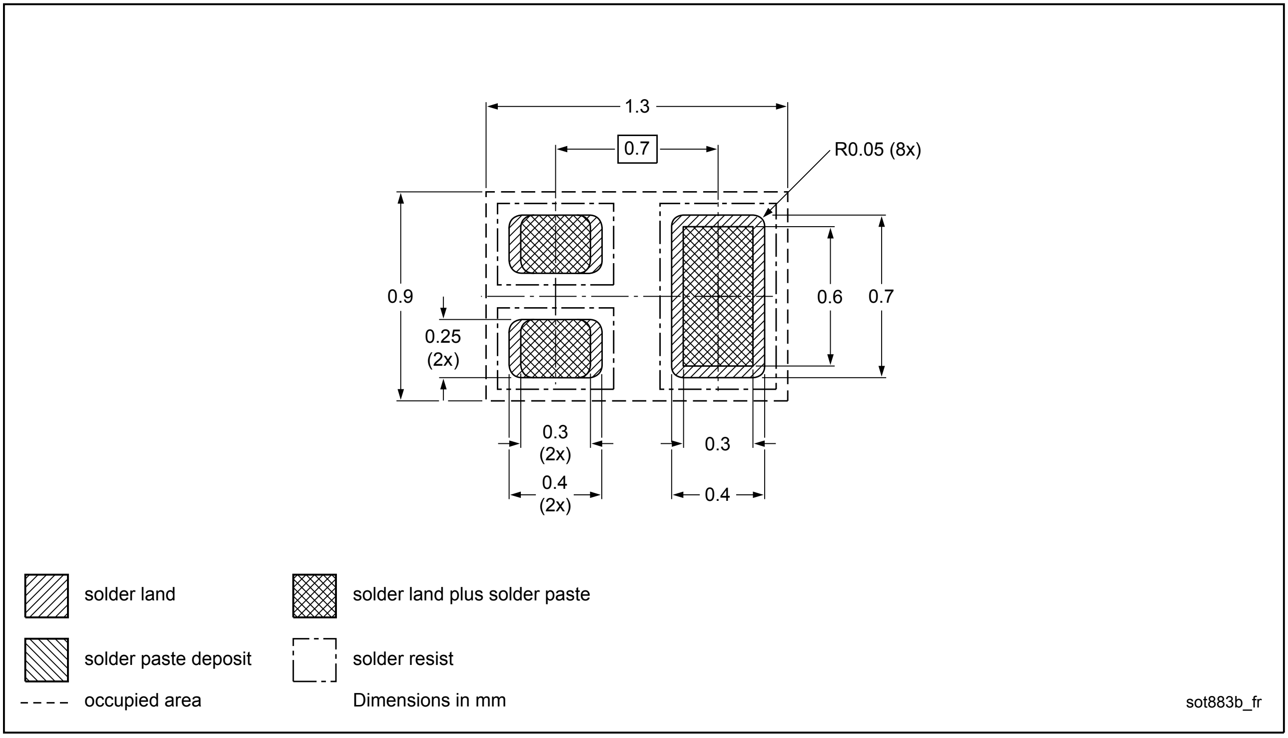

Fig. 13. Reflow soldering footprint for DFN1006B-3 (SOT883B)

14. Revision history

Table 7. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PESD5V0V2BMB v.1	20150817	Product data sheet	-	-

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15. Legal information

15.1 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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