# PTVS36VZ1UPC

## Transient Voltage Suppressor

28 March 2025 Product data sheet

## 1. General description

Transient voltage suppressor in a DFN1610-2 (SOD1610-1) ultra small and leadless Surface-Mounted Device (SMD) package designed to protect one line against high surge currents and other transients.

## 2. Features and benefits

- Unidirectional protection of one line
- Reverse standoff voltage: $V_{RWM}$ = 36 V
- Surge robustness: $I_{PPM}$ = 22 A (8/20 µs)
- Ultra low clamping voltage $V_{CL}$ = 49 V typ. at 10 A; $V_{CL}$ = 57.9 V typ. at 22 A

## 3. Applications

- Portable electronics
- Power supply protection
- Power management

## 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 | | - | - | 36 | V |
| $I_{PPM}$ | rated peak pulse current | $t_p$ = 8/20 µs | [1] | - | - | 22 | A |
| $V_{CL}$ | clamping voltage | $I_{PPM}$ = 22 A; $t_p$ = 8/20 µs; $T_{amb}$ = 25 °C | [1] | - | 57.9 | - | V |
| | | $I_{PPM}$ = 10 A; $t_p$ = 8/20 µs; $T_{amb}$ = 25 °C | [1] | - | 49 | - | V |

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

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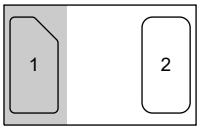
## 5. Pinning information

**Table 2. Pinning information**

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|---|---|---|---|---|
| 1 | K | cathode |  Transparent top view **DFN1610-2 (SOD1610-1)** |  *sym035* |
| 2 | A | anode | | |

## 6. Ordering information

**Table 3. Ordering information**

| Type number | Package | | |
|---|---|---|---|
| | Name | Description | Version |
| PTVS36VZ1UPC | DFN1610-2 | plastic, leadless ultra small package; 2 terminals; body 1.6 x 1 x 0.55 mm | SOD1610-1 |

## 7. Marking

**Table 4. Marking codes**

| Type number | Marking code |
|---|---|
| PTVS36VZ1UPC | 36Z |

# 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] | - | 22 | A |
| $T_j$ | junction temperature | | | - | 150 | °C |
| $T_{amb}$ | ambient temperature | | | -40 | 125 | °C |
| $T_{stg}$ | storage temperature | | | -55 | 150 | °C |
| **ESD maximum ratings** | | | | | | |
| $V_{ESD}$ | electrostatic discharge voltage | IEC 61000-4-2; contact discharge | [2] | - | 30 | kV |
| | | IEC 61000-4-2; air discharge | [2] | - | 30 | 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.

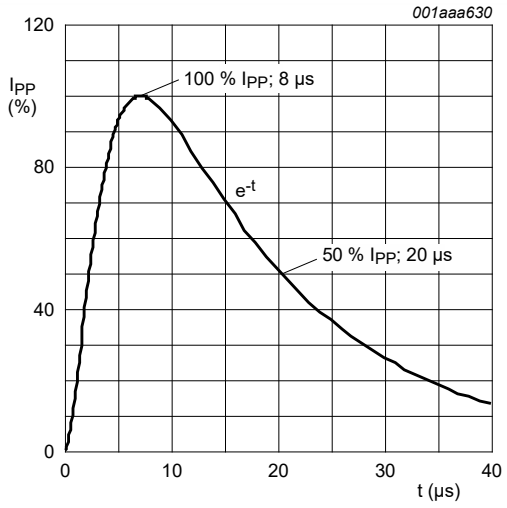



**Fig. 1. 8/20 µs pulse waveform according to IEC 61000-4-5**

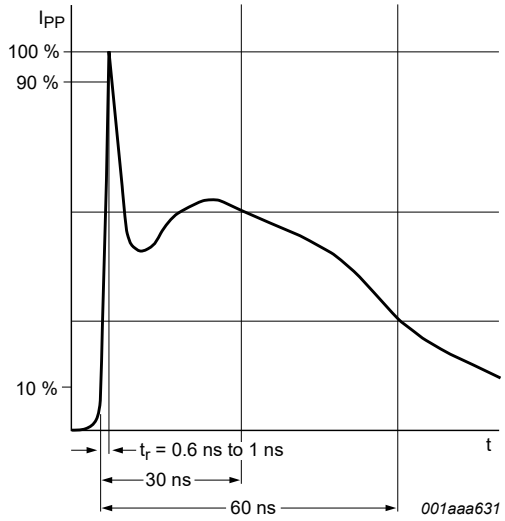



**Fig. 2. ESD pulse waveform according to IEC 61000-4-2**

# 9. Characteristics

**Table 6. Characteristics**

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| $V_{RWM}$ | reverse standoff voltage | $T_{amb}$ = 25 °C | | - | - | 36 | V |
| $V_{BR}$ | breakdown voltage | $I_R$ = 1 mA; $T_{amb}$ = 25 °C | | 40 | - | 45 | V |
| $I_{RM}$ | reverse leakage current | $V_R$ = 36 V; $T_{amb}$ = 25 °C | | - | - | 0.5 | µA |
| $C_d$ | diode capacitance | f = 1 MHz; $V_R$ = 0 V; $T_{amb}$ = 25 °C | | - | 140 | - | pF |
| $V_{CL}$ | clamping voltage | $I_{PPM}$ = 22 A; $t_p$ = 8/20 µs; $T_{amb}$ = 25 °C | [1] | - | 57.9 | - | V |
| | | $I_{PPM}$ = 10 A; $t_p$ = 8/20 µs; $T_{amb}$ = 25 °C | [1] | - | 49 | - | V |

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

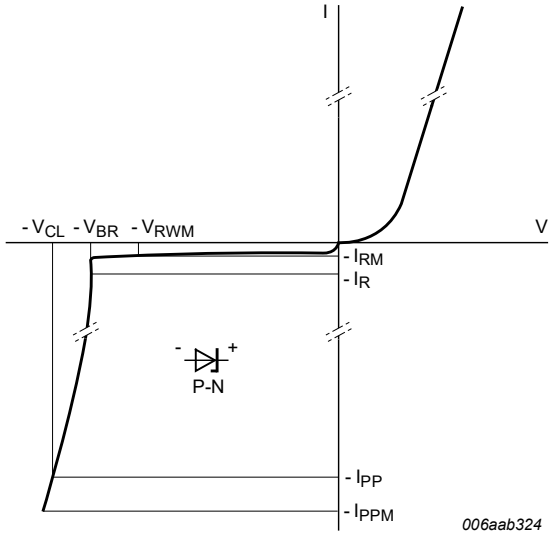
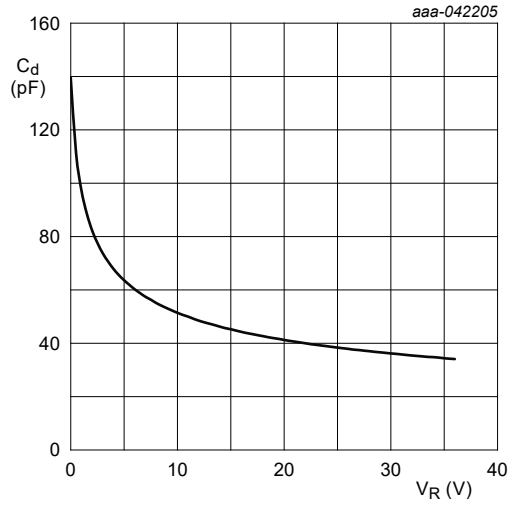
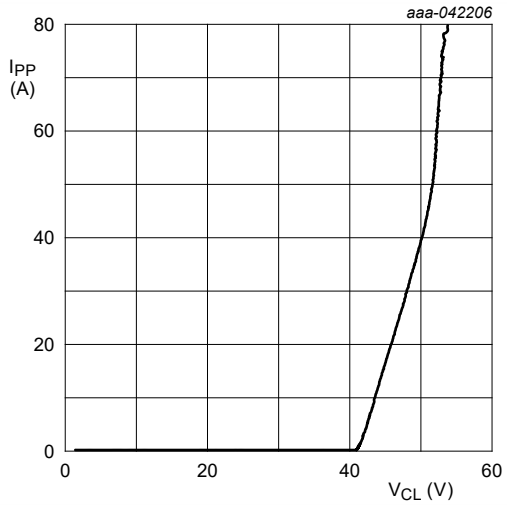



**Fig. 3. V-I characteristics for a unidirectional TVS protection diode**



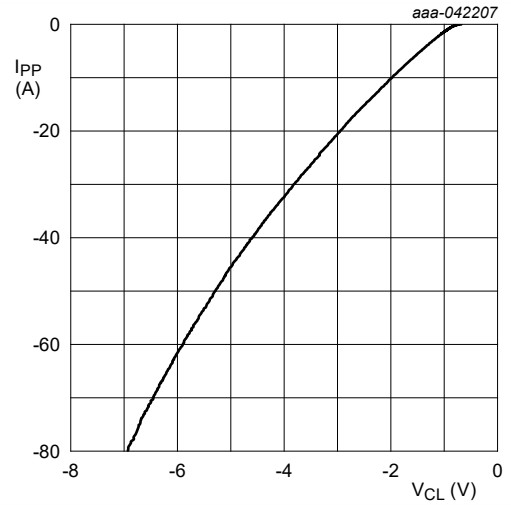

f = 1 MHz; $T_{amb}$ = 25 °C

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



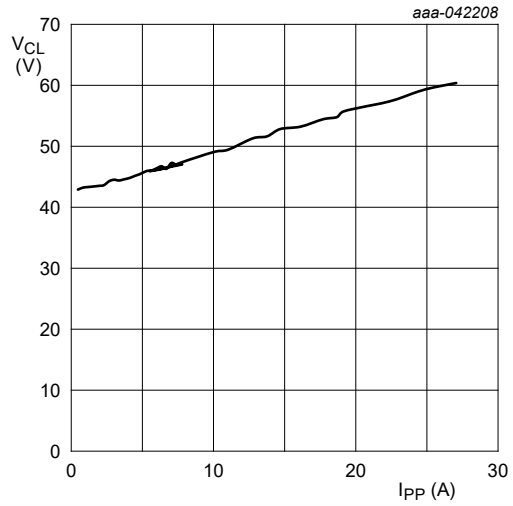

Transmission Line Pulse (TLP);
$t_p$ = 100 ns; $t_r$ = 1 ns

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



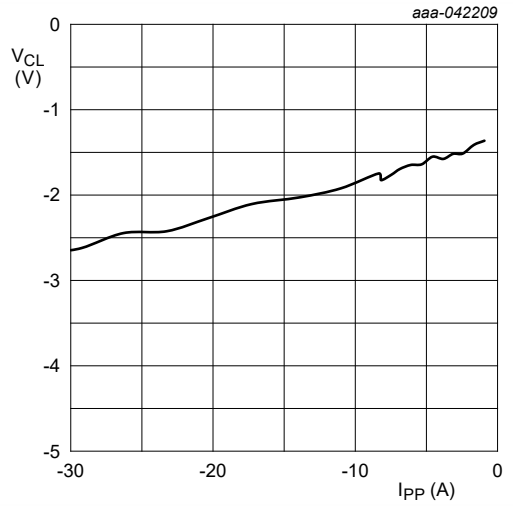

Transmission Line Pulse (TLP);
$t_p$ = 100 ns; $t_r$ = 1 ns

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




IEC 61000-4-5; $t_p$ = 8/20 µs; positive pulse

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




IEC 61000-4-5; $t_p$ = 8/20 µs; 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 power line from surge pulses and ESD damage. The device is suitable on lines where the signal polarities are both positive and negative with respect to ground.

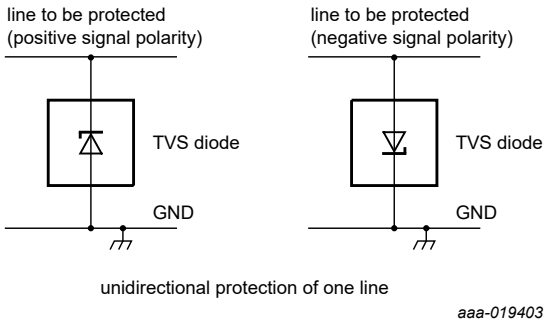
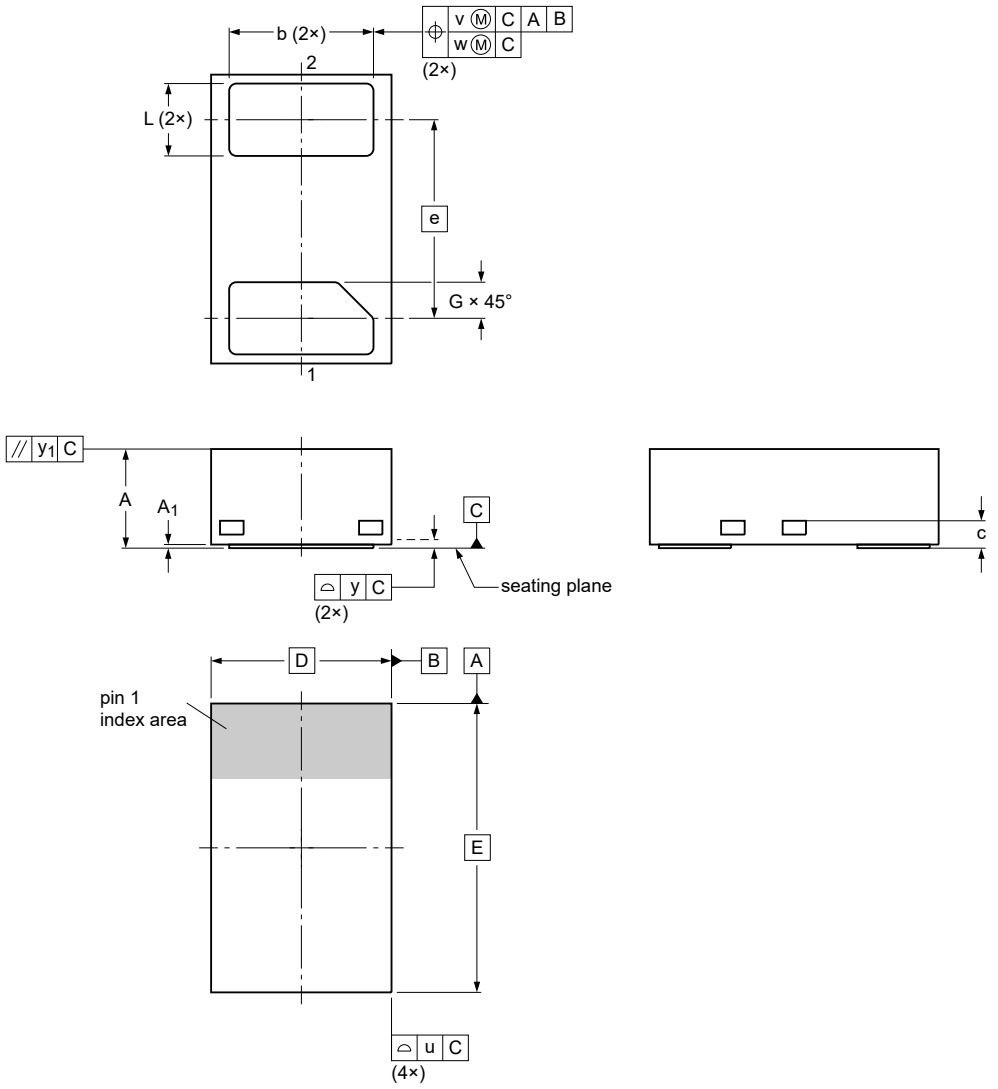



**Fig. 9. Application diagram**

# 11. Package outline

**DFN1610-1: plastic, leadless ultra small package; 2 terminals; body 1.6 x 1 x 0.55 mm** **SOD1610-1**




Dimensions (mm are the original dimensions)

| Unit | | A | $A_1$ | b | c | D | E | e | G | L | u | v | w | y | $y_1$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | max | 0.60 | 0.05 | 0.85 | 0.152 | 1.0 | 1.6 | 1.1 | 0.2 | 0.45 | 0.05 | 0.1 | 0.05 | 0.05 | 0.05 |
| | nom | 0.55 | 0.02 | 0.80 | REF. | BSC | BSC | BSC | REF. | 0.40 | | | | | |
| | min | 0.50 | 0 | 0.75 | | | | | | 0.35 | | | | | |

*sod1610-1_po*

| Outline version | References | | | | European projection | Issue date |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOD1610-1 | | | | | | ~~22-12-20~~ 24-12-03 |

**Fig. 10. Package outline DFN1610-2 (SOD1610-1)**

## 12. Soldering

**Footprint information for reflow soldering of DFN1610-2 package** **SOD1610-1**

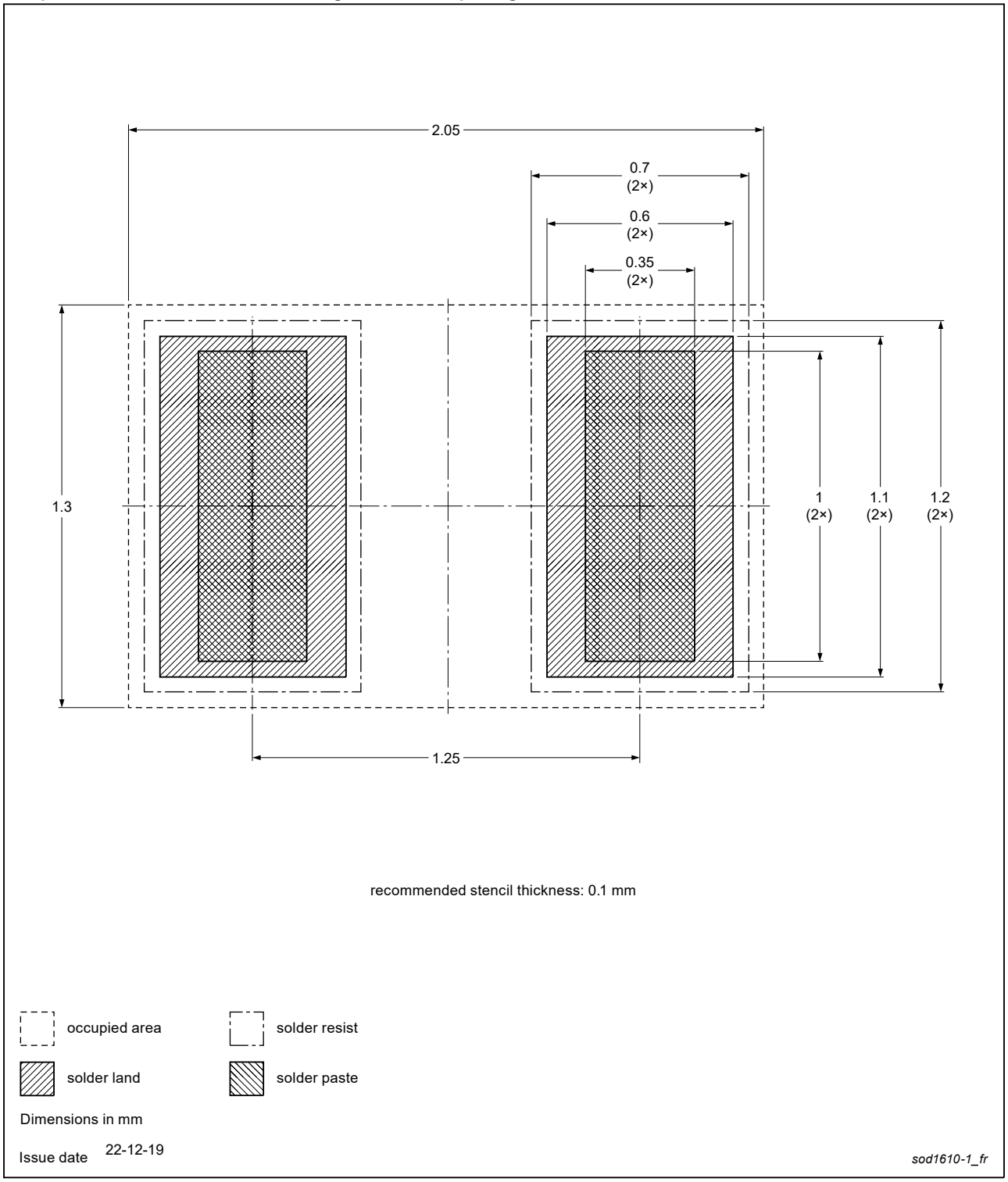



**Fig. 11. Reflow soldering footprint for DFN1610-2 (SOD1610-1)**

# 13. Revision history

**Table 7. Revision history**

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| PTVS36VZ1UPC v.2 | 20250328 | Product data sheet | - | PTVS36VZ1UPC v.1 |
| Modifications: | • Changed document status to "Product data sheet" | | | |
| PTVS36VZ1UPC v.1 | 20250218 | Preliminary 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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**Date of release: 28 March 2025**