# ESD5621WXX

**1-Line, Uni-directional, Transient Voltage Suppressor**

**http//:www.sh-willsemi.com**

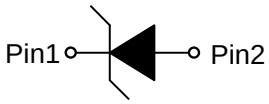
## Descriptions

The ESD5621WXX is a uni-directional TVS (Transient Voltage Suppressor). It is specifically designed to protect sensitive electronic components which are connected to power lines, from over-stress caused by ESD (Electrostatic Discharge), EFT (Electrical Fast Transients) and Lightning.

The ESD5621WXX may be used to provide ESD protection up to ±30kV (contact and air discharge) according to IEC61000-4-2, and with high surge capability used to protect USB voltage bus pin (8/20μs) according to IEC61000-4-5.

The ESD5621WXX is available in SOD-323F package. Standard products are Pb-free and Halogen-free.

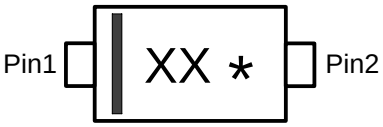
**SOD-323F (Bottom View)**




**Circuit diagram**

## Features

- Reverse stand-off voltage: 4.5V ~ 15V
- Surge protection according to IEC61000-4-5 see Table 4
- ESD protection according to IEC61000-4-2 ±30kV (contact and air discharge)
- Low clamping voltage
- Solid-state silicon technology




XX = Device code

* = Month code

**Marking (Top View)**

## Applications

- Power supply protection
- Power management

## Order information

**Table 1.**

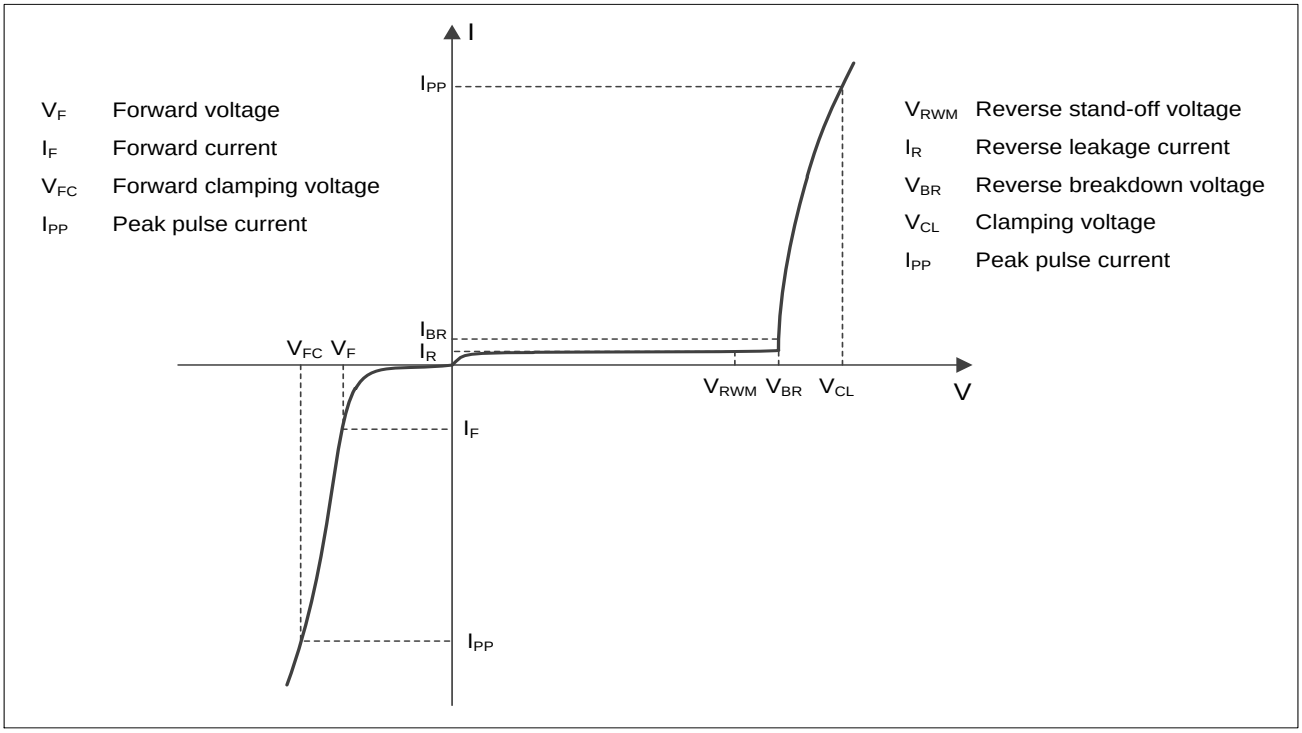
| Device | Package | Shipping | Marking |
|---|---|---|---|
| ESD5621W04-2/TR | SOD-323F | 3000/Tape&Reel | TE* |
| ESD5621W10-2/TR | SOD-323F | 3000/Tape&Reel | TJ* |
| ESD5621W-2/TR | SOD-323F | 3000/Tape&Reel | Q* |
| ESD5621W15-2/TR | SOD-323F | 3000/Tape&Reel | TD* |

## Absolute maximum ratings

**Table 2.**

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Peak pulse power (tp=8/20μs) | Ppk | 1400 | W |
| ESD according to IEC61000-4-2 air discharge | $V_{ESD}$ | ±30 | kV |
| ESD according to IEC61000-4-2 contact discharge | | ±30 | |
| Junction temperature | $T_J$ | 125 | °C |
| Operating temperature | $T_{OP}$ | -40~85 | °C |
| Lead temperature | $T_L$ | 260 | °C |
| Storage temperature | $T_{STG}$ | -55~150 | °C |

## Electrical characteristics ($T_A$ = 25°C, unless otherwise noted)




**Definitions of electrical characteristics**

## Electrical characteristics ($T_A$ = 25°C, unless otherwise noted)

**Table 3.**

| Type number | Reverse Standoff Voltage $V_{RWM}$ (V) | Breakdown voltage $V_{BR}$(V) $I_{BR}$ = 1mA | | | Reverse leakage current $I_{RM}$(μA) at $V_{RWM}$ | | Forward voltage $V_F$(V) $I_F$ = 20mA | | Junction capacitance F = 1MHz, $V_R$ =0V (pF) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Max | Min | Typ | Max | Typ | Max | Min | Max | Typ | Max |
| ESD5621W04 | 4.5 | 5.2 | 6.1 | 7.0 | - | 5.0 | 0.45 | 1.25 | 900 | 1200 |
| ESD5621W10 | 10.0 | 11.5 | 13.2 | 15.0 | | 0.1 | 0.45 | 1.25 | 350 | 500 |
| ESD5621W | 12.0 | 13.0 | 15.0 | 17.0 | - | 0.1 | 0.45 | 1.25 | 300 | 400 |
| ESD5621W15 | 15.0 | 16.0 | 18.0 | 20.0 | - | 0.1 | 0.45 | 1.25 | 270 | 350 |

**Table 4.**

| Type number | Rated peak pulse current $I_{PP}$ （A） 1)3) | Clamping voltage $V_{CL}$(V) at $I_{PP}$（A） 1)3) | Clamping voltage $V_{CL}$(V) at $I_{PP}$ = 16A, $t_p$ = 100ns 2)3) | Clamping voltage $V_{CL}$(V) at $V_{ESD}$ = 8kV 2)3) |
|---|---|---|---|---|
| ESD5621W04 | 95 | 14.5 | 7.0 | 8.0 |
| ESD5621W10 | 60 | 25.0 | 15.0 | 16.0 |
| ESD5621W | 50 | 27.5 | 16.0 | 17.0 |
| ESD5621W15 | 45 | 31.0 | 20.0 | 21.0 |

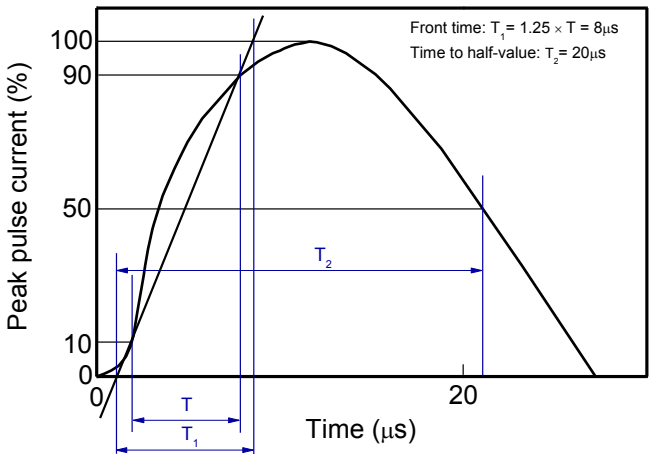
*Notes:*

*1) Non-repetitive current pulse, according to IEC61000-4-5.(8/20μs current waveform)*

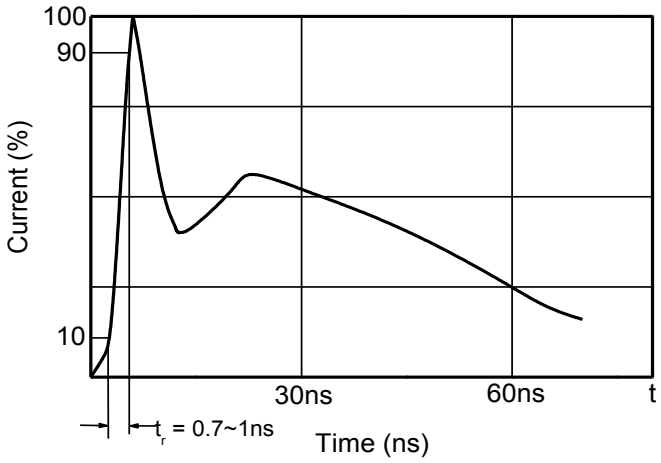
*2) Non-repetitive current pulse, according to IEC61000-4-2.*

*3) Measured from pin 1 to pin 2.*

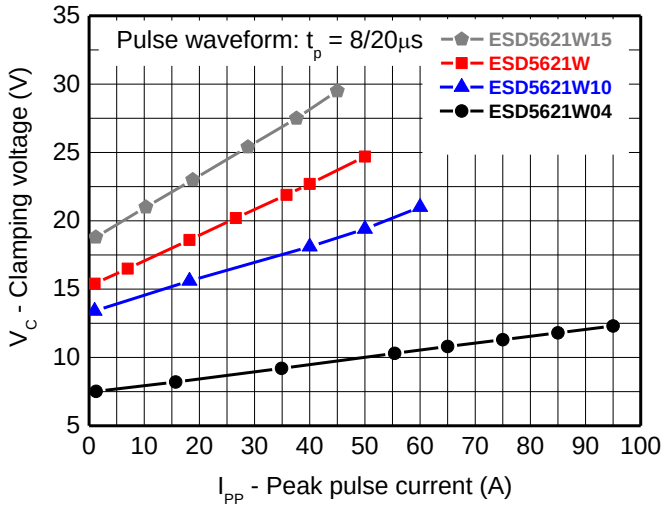
## Typical characteristics ($T_A$ = 25°C, unless otherwise noted)



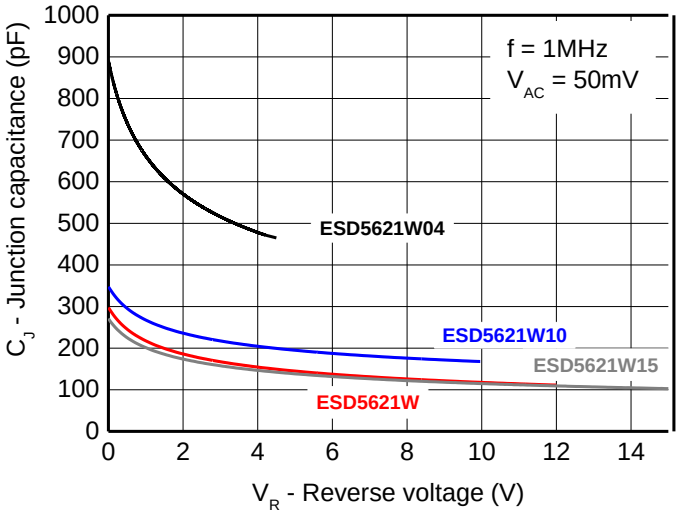

**8/20μs waveform per IEC61000-4-5**



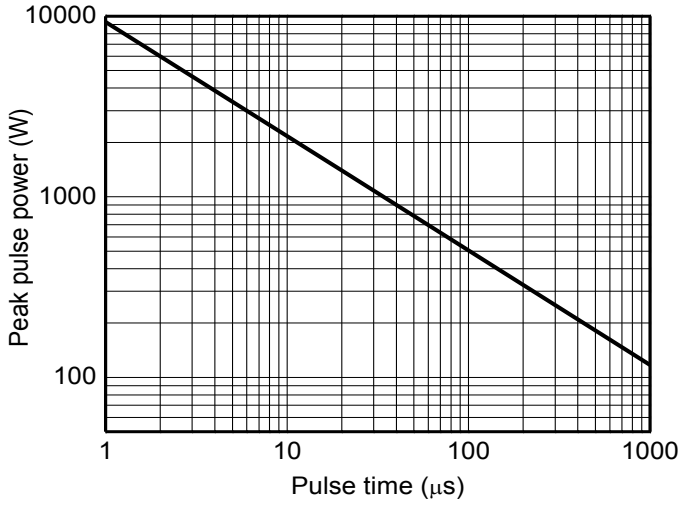

**Contact discharge current waveform per IEC61000-4-2**



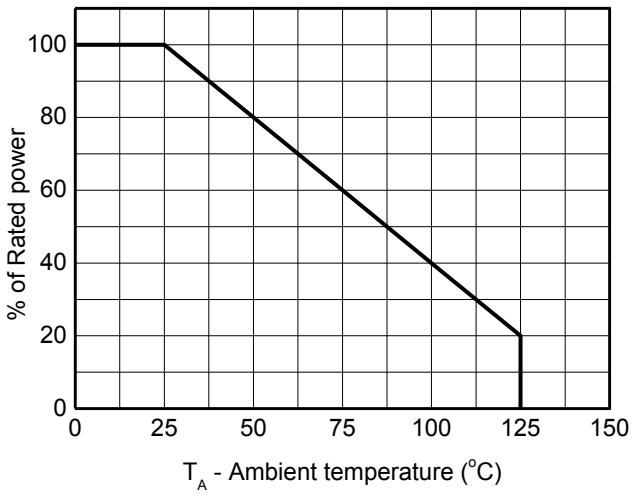

**Clamping voltage vs. Peak pulse current**




**Capacitance vs. Reverse voltage**



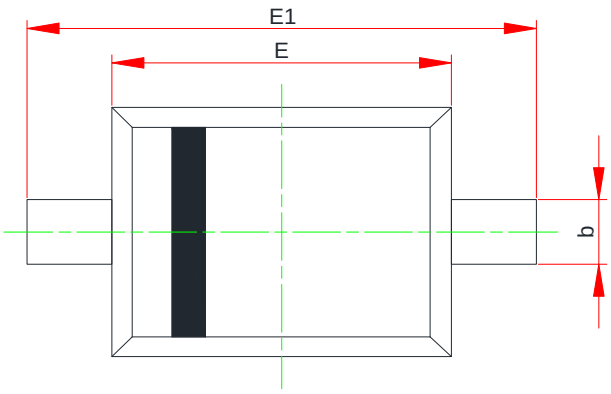

**Non-repetitive peak pulse power vs. Pulse time**



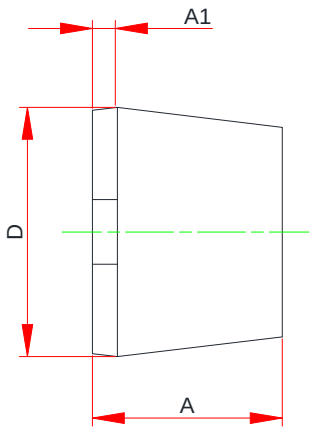

**Power derating vs. Ambient temperature**

## Package outline dimensions

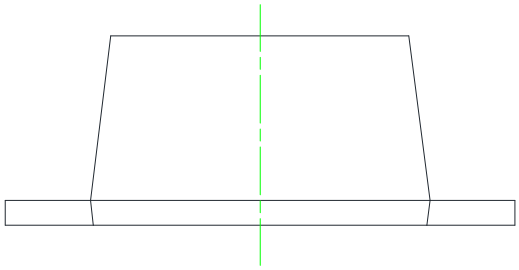
### SOD-323F




Top View



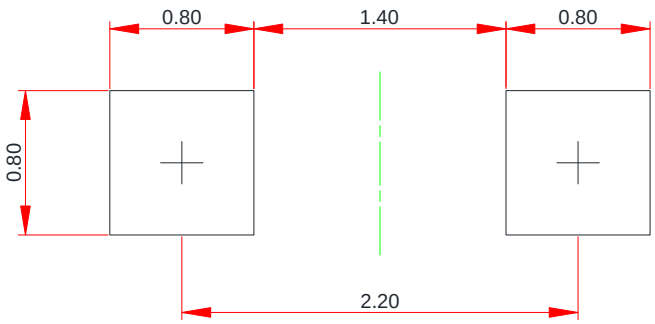

Side View



Side View

| Symbol | Dimensions in Millimeters | | |
|---|---|---|---|
| | Min. | Typ. | Max. |
| A | 0.80 | - | 1.10 |
| A1 | 0.10 | - | 0.15 |
| D | 1.15 | - | 1.35 |
| E | 1.60 | - | 1.80 |
| E1 | 2.30 | - | 2.80 |
| b | 0.25 | - | 0.40 |

## Recommend land pattern (Unit: mm)




Notes:

This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.