

ESD56201DXX
1-Line, Uni-directional, Transient Voltage Suppressor
<http://www.sh-willsemi.com>
Descriptions

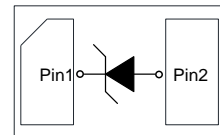
The ESD56201DXX is a transient voltage suppressor designed to protect power interfaces. It is suitable to replace multiple discrete components in portable electronics.

The ESD56201DXX is specifically designed to protect power lines.

The ESD56201DXX is available in DFN1610-2L package. Standard products are Pb-free and Halogen-free.


DFN1610-2L (Bottom View)
Features

- Reverse stand-off voltage: 4.85V ~ 24V
- 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


Circuit diagram
Applications

- Power supply protection
- Power management

Order information
Table 1.

| Device | Package | Shipping | Marking |
|------------------|------------|-----------------|---------|
| ESD56201D04-2/TR | DFN1610-2L | 10000/Tape&Reel | H* |
| ESD56201D05-2/TR | DFN1610-2L | 10000/Tape&Reel | I* |
| ESD56201D10-2/TR | DFN1610-2L | 10000/Tape&Reel | J* |
| ESD56201D12-2/TR | DFN1610-2L | 10000/Tape&Reel | K* |
| ESD56201D15-2/TR | DFN1610-2L | 10000/Tape&Reel | L* |
| ESD56201D18-2/TR | DFN1610-2L | 10000/Tape&Reel | S* |
| ESD56201D20-2/TR | DFN1610-2L | 10000/Tape&Reel | N* |
| ESD56201D24-2/TR | DFN1610-2L | 10000/Tape&Reel | M* |



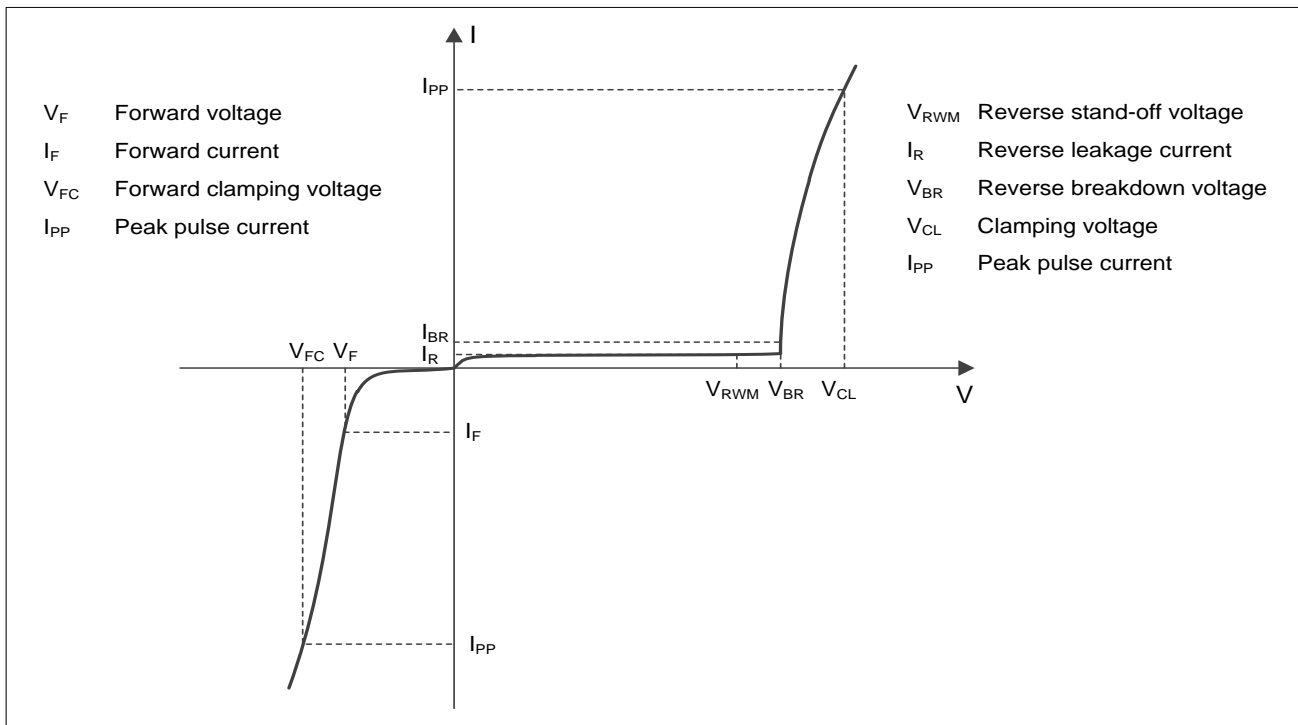
X= Device code (H I J K L S N M)

* = Month code

Marking (Top View)

Absolute maximum ratings
Table 2.

| Parameter | Symbol | Rating | Unit |
|---|-----------|----------|-------------|
| Peak pulse power ($t_p = 8/20\mu s$) | P_{pk} | 1600 | 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 | $^{\circ}C$ |
| Operating temperature | T_{OP} | -40~85 | $^{\circ}C$ |
| Lead temperature | T_L | 260 | $^{\circ}C$ |
| Storage temperature | T_{STG} | -55~150 | $^{\circ}C$ |

Electrical characteristics ($T_A = 25^{\circ}C$, unless otherwise noted)

Definitions of electrical characteristics

Electrical characteristics (T_A = 25°C, unless otherwise noted)
Table 3.

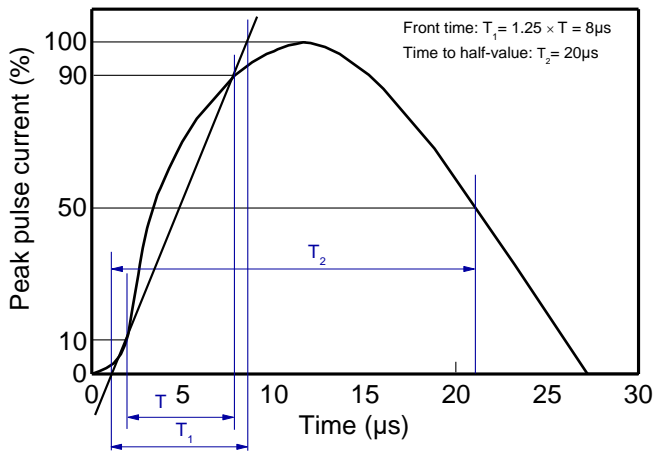
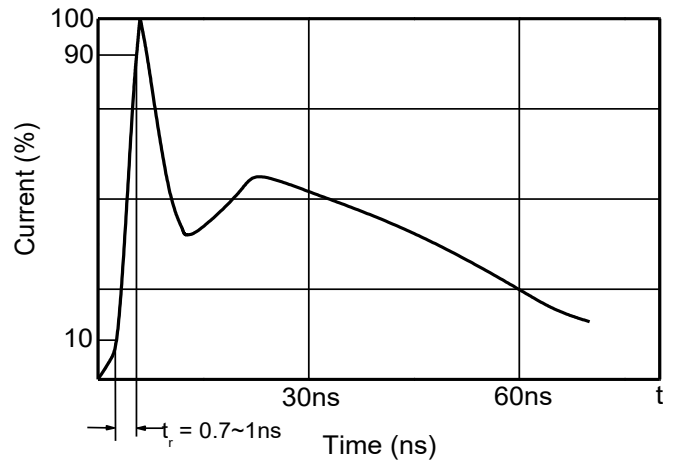
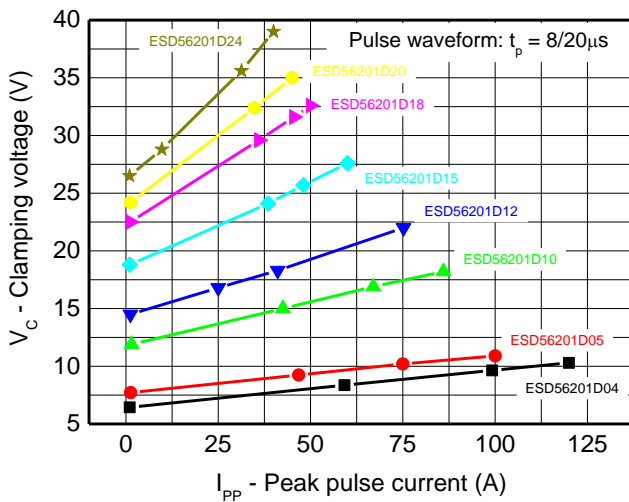
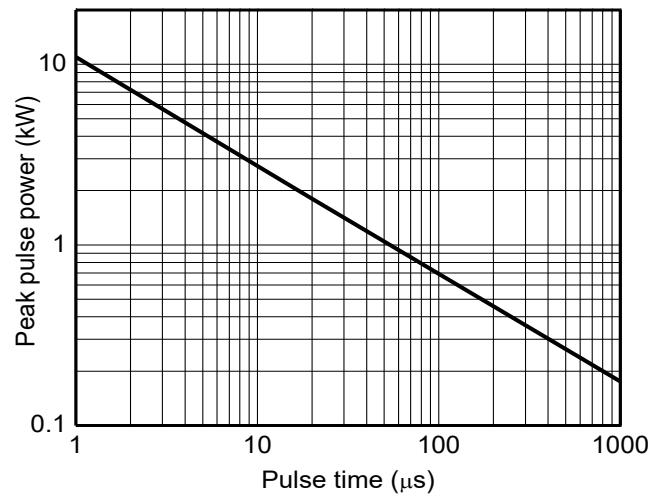
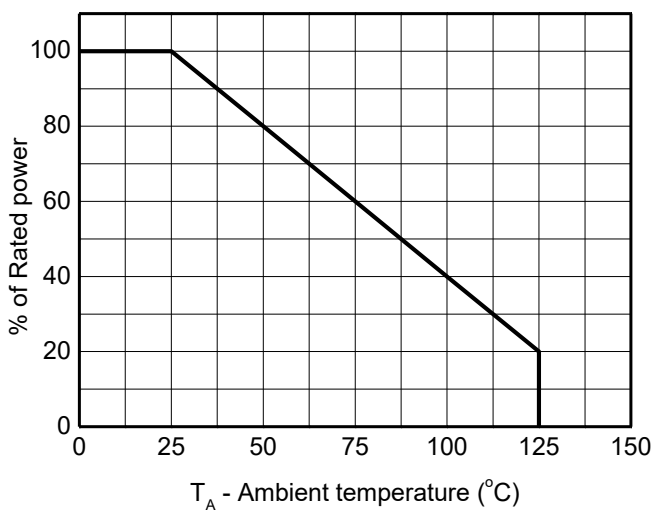
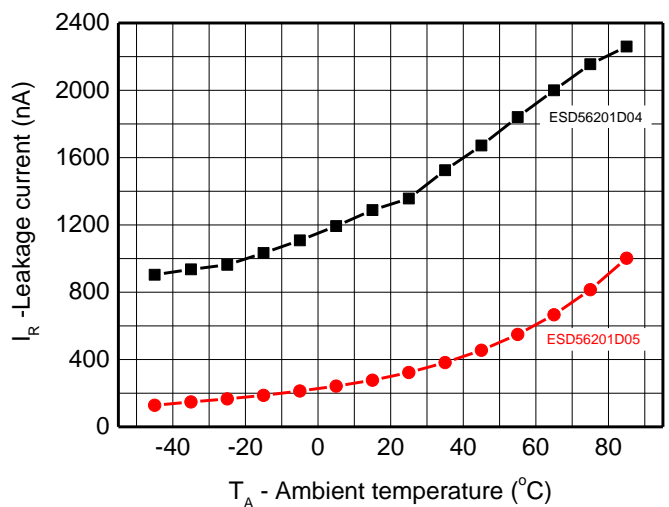
| Type number | Reverse Stand-off Voltage V _{RWM} (V) | Breakdown voltage V _{BR} (V) I _{BR} = 1mA | | | Reverse leakage current I _{RM} (μA) at V _{RWM} | | Forward voltage V _F (V) I _F = 20mA | | Junction capacitance F = 1MHz, V _R =0V (pF) | |
|-------------|--|---|------|------|--|------|--|------|--|------|
| | Max. | Min. | Typ. | Max. | Type. | Max. | Min. | Max. | Typ. | Max. |
| ESD56201D04 | 4.85 | 5.2 | 5.7 | 6.2 | - | 5.0 | 0.45 | 1.25 | 1100 | 1300 |
| ESD56201D05 | 5.0 | 6.6 | 7.1 | 7.6 | - | 2.0 | 0.45 | 1.25 | 1050 | 1250 |
| ESD56201D10 | 10.0 | 10.7 | 11.3 | 12.3 | - | 0.1 | 0.45 | 1.25 | 545 | 650 |
| ESD56201D12 | 12.0 | 12.7 | 13.7 | 14.6 | - | 0.1 | 0.45 | 1.25 | 425 | 510 |
| ESD56201D15 | 15.0 | 16.0 | 17.5 | 19.0 | - | 0.1 | 0.45 | 1.25 | 325 | 350 |
| ESD56201D18 | 18.0 | 19.2 | 21.1 | 23.0 | - | 0.1 | 0.45 | 1.25 | 270 | 300 |
| ESD56201D20 | 20.0 | 21.4 | 23.2 | 25.0 | - | 0.1 | 0.45 | 1.25 | 250 | 275 |
| ESD56201D24 | 24.0 | 25.6 | 27.5 | 30.0 | - | 0.1 | 0.45 | 1.25 | 210 | 250 |

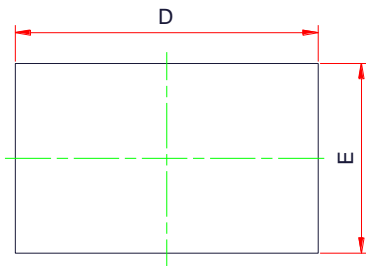
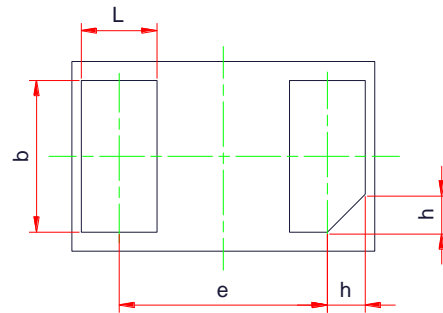
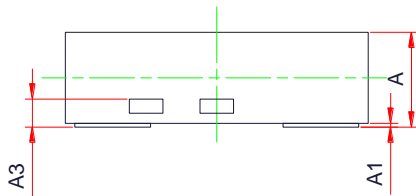
Table 4.

| Type number | Rated peak pulse current I _{PP} (A) ¹⁾²⁾ | Clamping voltage V _{CL} (V) at I _{PP} (A) ¹⁾²⁾ | |
|-------------|--|---|------|
| | Max. | Typ. | Max. |
| ESD56201D04 | 120 | 10.5 | 12.0 |
| ESD56201D05 | 100 | 11.0 | 13.0 |
| ESD56201D10 | 86 | 17.5 | 20.0 |
| ESD56201D12 | 75 | 19.5 | 22.0 |
| ESD56201D15 | 60 | 27.0 | 30.0 |
| ESD56201D18 | 50 | 32.0 | 35.0 |
| ESD56201D20 | 45 | 35.0 | 38.0 |
| ESD56201D24 | 40 | 39.0 | 42.0 |

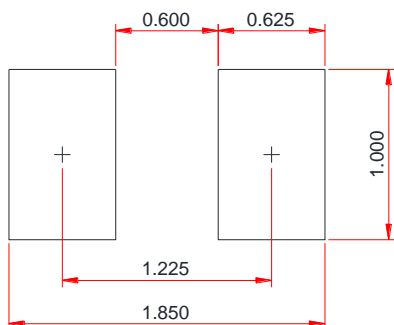
Notes:

- 1) Non-repetitive current pulse, according to IEC61000-4-5. (8/20μs current waveform)
- 2) Measured from pin 1 to pin 2.

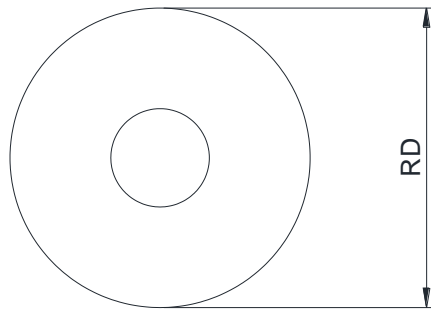
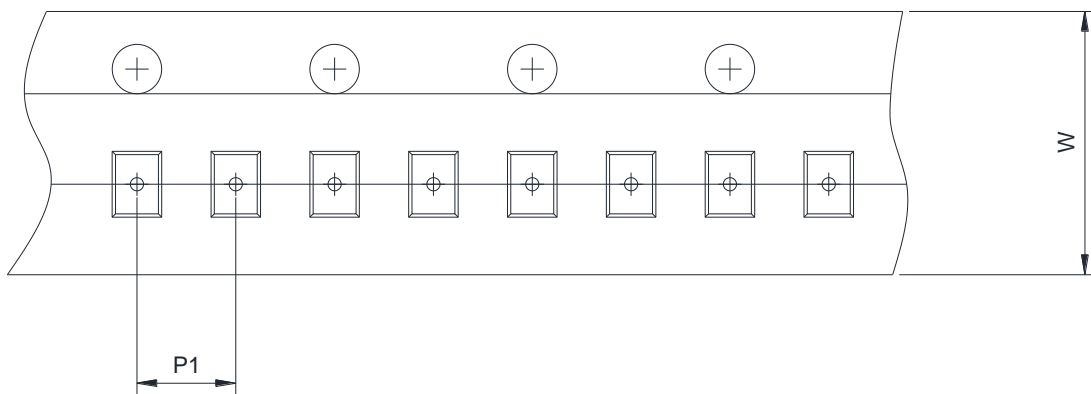
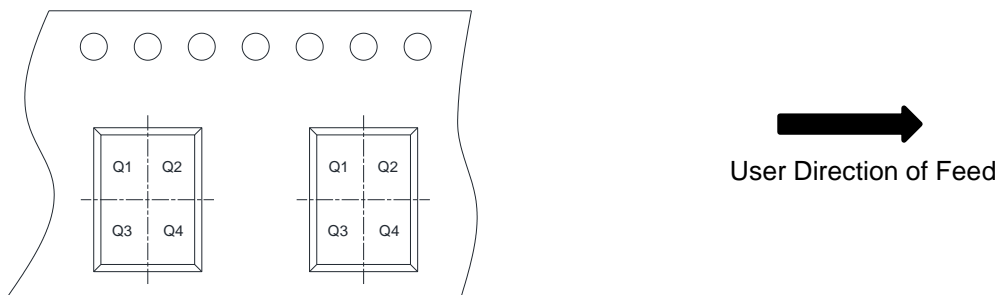
Electrical characteristics ($T_A = 25^\circ\text{C}$, unless otherwise noted)

8/20 μs waveform per IEC61000-4-5

Contact discharge current waveform per IEC61000-4-2

Clamping voltage vs. Peak pulse current

Non-repetitive peak pulse power vs. Pulse time

Power derating vs. Ambient temperature

Leakage current vs. Ambient temperature

PACKAGE OUTLINE DIMENSIONS
DFN1610-2L

TOP VIEW

BOTTOM VIEW

SIDE VIEW

| Symbol | Dimensions in Millimeters | | |
|--------|---------------------------|------|------|
| | Min. | Typ. | Max. |
| A | 0.45 | 0.50 | 0.55 |
| A1 | 0.00 | 0.02 | 0.05 |
| c | 0.15 Ref. | | |
| b | 0.75 | 0.80 | 0.85 |
| L | 0.35 | 0.40 | 0.45 |
| D | 1.55 | 1.60 | 1.65 |
| E | 0.95 | 1.00 | 1.05 |
| e | 1.10 BSC | | |
| h | 0.20 Ref. | | |

Recommended PCB Layout (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.

TAPE AND REEL INFORMATION
Reel Dimensions

Tape Dimensions

Quadrant Assignments For PIN1 Orientation In Tape


| | | | | |
|------|---|---|--|---|
| RD | Reel Dimension | <input checked="" type="checkbox"/> 7inch | <input type="checkbox"/> 13inch | |
| W | Overall width of the carrier tape | <input checked="" type="checkbox"/> 8mm | <input type="checkbox"/> 12mm | <input type="checkbox"/> 16mm |
| P1 | Pitch between successive cavity centers | <input checked="" type="checkbox"/> 2mm | <input type="checkbox"/> 4mm | <input type="checkbox"/> 8mm |
| Pin1 | Pin1 Quadrant | <input checked="" type="checkbox"/> Q1 | <input checked="" type="checkbox"/> Q2 | <input type="checkbox"/> Q3 <input type="checkbox"/> Q4 |

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