

# MSKSEMI

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT

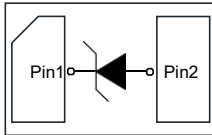


PLED

Product data sheet



**DFN1610-2L**



**Circuit diagram**

## Descriptions

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

The ESD56201DXX-MS is specifically designed to protect power lines.

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

## 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

## Applications

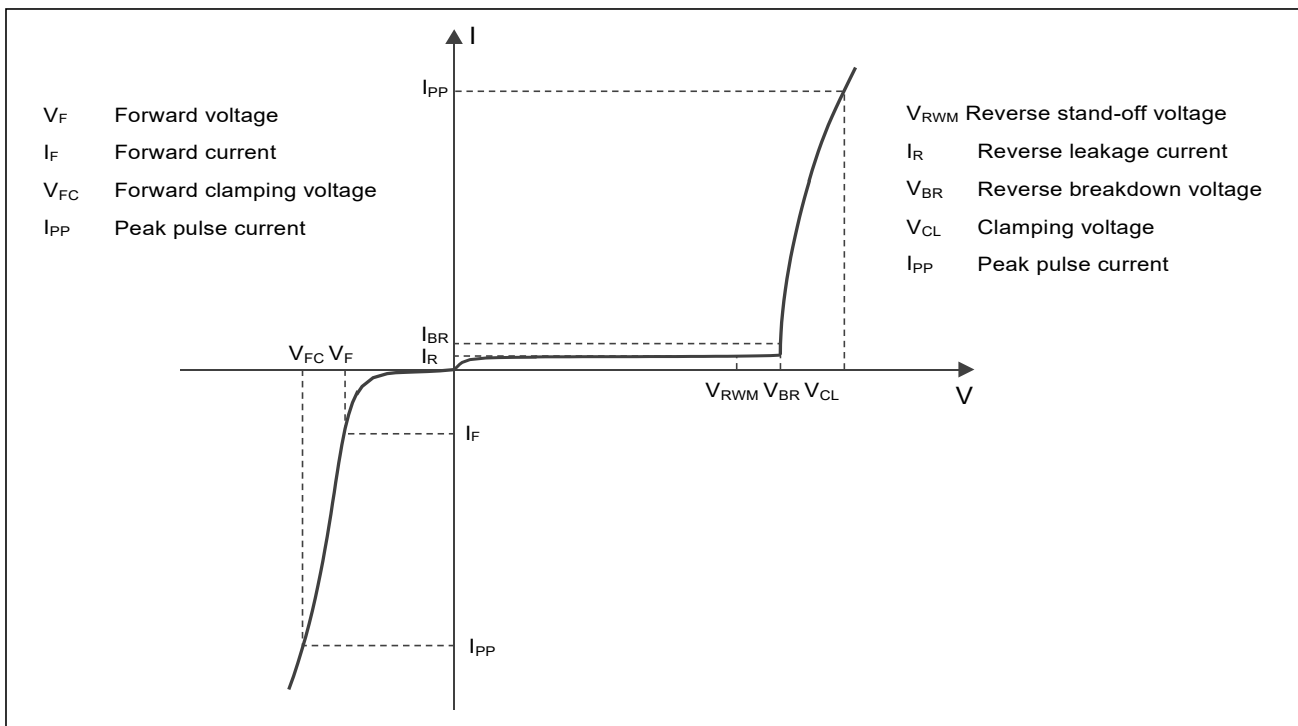
- Power supply protection
- Power management

## Order information

| Device         | Package    | Shipping       | Marking |
|----------------|------------|----------------|---------|
| ESD56201D04-MS | DFN1610-2L | 3000/Tape&Reel | D4*     |
| ESD56201D05-MS | DFN1610-2L | 3000/Tape&Reel | I*      |
| ESD56201D10-MS | DFN1610-2L | 3000/Tape&Reel | J*      |
| ESD56201D12-MS | DFN1610-2L | 3000/Tape&Reel | K*      |
| ESD56201D15-MS | DFN1610-2L | 3000/Tape&Reel | L*      |
| ESD56201D18-MS | DFN1610-2L | 3000/Tape&Reel | S*      |
| ESD56201D20-MS | DFN1610-2L | 3000/Tape&Reel | N*      |

| Parameter                                       | Symbol           | Rating  | Unit |
|---|------------------|---------|------|
| Peak pulse power (tp = 8/20μs)                  | P <sub>pk</sub>  | 1800    | W    |
| ESD according to IEC61000-4-2 air discharge     | V <sub>ESD</sub> | ±30     | kV   |
| ESD according to IEC61000-4-2 contact discharge |                  | ±30     |      |
| Junction temperature                            | T <sub>J</sub>   | 125     | °C   |
| Operating temperature                           | T <sub>OP</sub>  | -40~85  | °C   |
| Lead temperature                                | T <sub>L</sub>   | 260     | °C   |
| Storage temperature                             | T <sub>STG</sub> | -55~150 | °C   |

**Electrical characteristics (T<sub>A</sub> = 25°C, unless otherwise noted)**



**Definitions of electrical characteristics**

**Electrical characteristics (T<sub>A</sub> = 25°C, unless otherwise noted)**

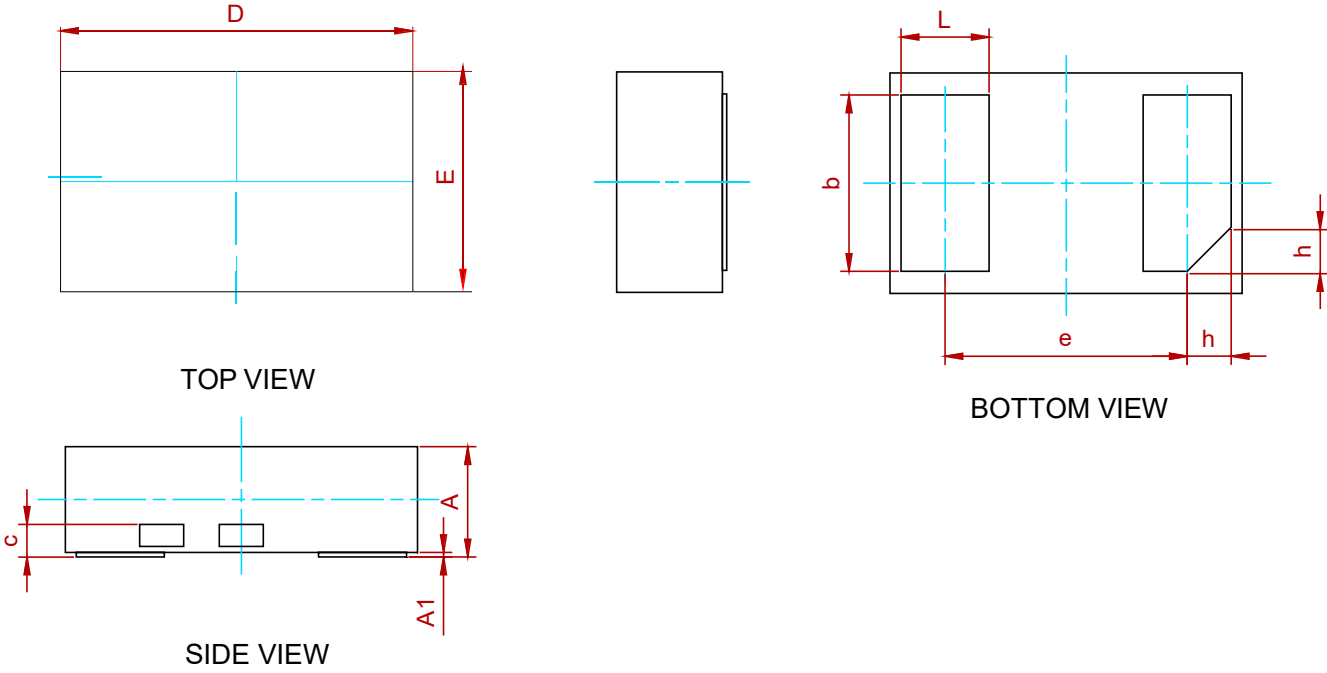
| P/N            | Reverse Stand-off Voltage V <sub>RWM</sub> (V) | Breakdown voltage V <sub>BR</sub> (V) I <sub>BR</sub> = 1mA |      |      | Reverse leakage current I <sub>RM</sub> (μA) at V <sub>RWM</sub> |     | Forward voltage V <sub>F</sub> (V) I <sub>F</sub> = 20mA |      | Junction capacitance F = 1MHz, VR=0V (pF) |      |
|----------------|--|---|------|------|--|-----|--|------|---|------|
|                | Max  | Min   | Typ  | Max  | Typ  | Max | Min  | Max  | Typ                                       | Max  |
| ESD56201D04-MS | 4.85   | 5.2   | 5.7  | 6.2  | -  | 5.0 | 0.45   | 1.25 | 1100                                      | 1300 |
| ESD56201D05-MS | 5.0  | 6.6   | 7.1  | 7.6  | -  | 2.0 | 0.45   | 1.25 | 1050                                      | 1250 |
| ESD56201D10-MS | 10.0   | 10.7  | 11.3 | 12.3 | -  | 0.1 | 0.45   | 1.25 | 545                                       | 650  |
| ESD56201D12-MS | 12.0   | 12.7  | 13.7 | 14.6 | -  | 0.1 | 0.45   | 1.25 | 425                                       | 510  |
| ESD56201D15-MS | 15.0   | 16.0  | 17.5 | 19.0 | -  | 0.1 | 0.45   | 1.25 | 325                                       | 350  |
| ESD56201D18-MS | 18.0   | 19.2  | 21.1 | 23.0 | -  | 0.1 | 0.45   | 1.25 | 270                                       | 300  |
| ESD56201D20-MS | 20.0   | 21.4  | 23.2 | 25.0 | -  | 0.1 | 0.45   | 1.25 | 250                                       | 275  |

| P/N            | Rated peak pulse current I <sub>PP</sub> (A) <sup>1)2)</sup> | Clamping voltage V <sub>CL</sub> (V) at I <sub>PP</sub> (A) <sup>1)2)</sup> |      |
|----------------|--|---|------|
|                | Max.   | Typ.  | Max. |
| ESD56201D04-MS | 120  | 10.5  | 12.0 |
| ESD56201D05-MS | 100  | 11.0  | 13.0 |
| ESD56201D10-MS | 86   | 17.5  | 20.0 |
| ESD56201D12-MS | 75   | 19.5  | 22.0 |
| ESD56201D15-MS | 60   | 27.0  | 30.0 |
| ESD56201D18-MS | 50   | 32.0  | 35.0 |
| ESD56201D20-MS | 45   | 35.0  | 38.0 |

**Notes:**

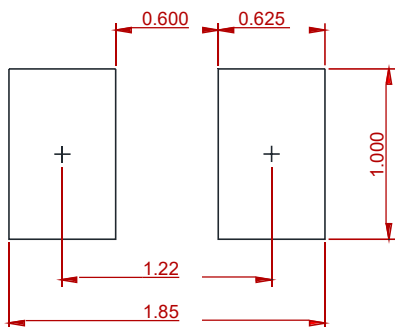
- 1 Non-repetitive current pulse, according to IEC61000-4-5. (8/20μs current waveform)
- 2 Non-repetitive current pulse, according to IEC61000-4-2.
- 3 Measured from pin 1 to pin 2.

**PACKAGE MECHANICAL DATA**



| 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.                 |      |      |

**Recommend 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.

**REEL SPECIFICATION**

| P/N            | PKG        | QTY  |
|----------------|------------|------|
| ESD56201DXX-MS | DFN1610-2L | 3000 |

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