

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

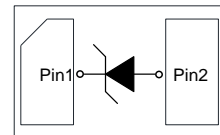
The ESD56201DXX is a transient voltage suppressor designed to protect power interfaces. It is suitable to replace multiple discrete components in portable electronics.

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**

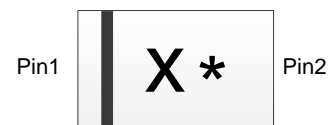
- Reverse stand-off voltage: 4.85V ~ 24V
- Surge protection according to IEC61000-4-5 see [Table 4](#)
- ESD protection according to IEC61000-4-2 ±30kV (contact and air discharge)
- Low clamping voltage
- Solid-state silicon technology


**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*



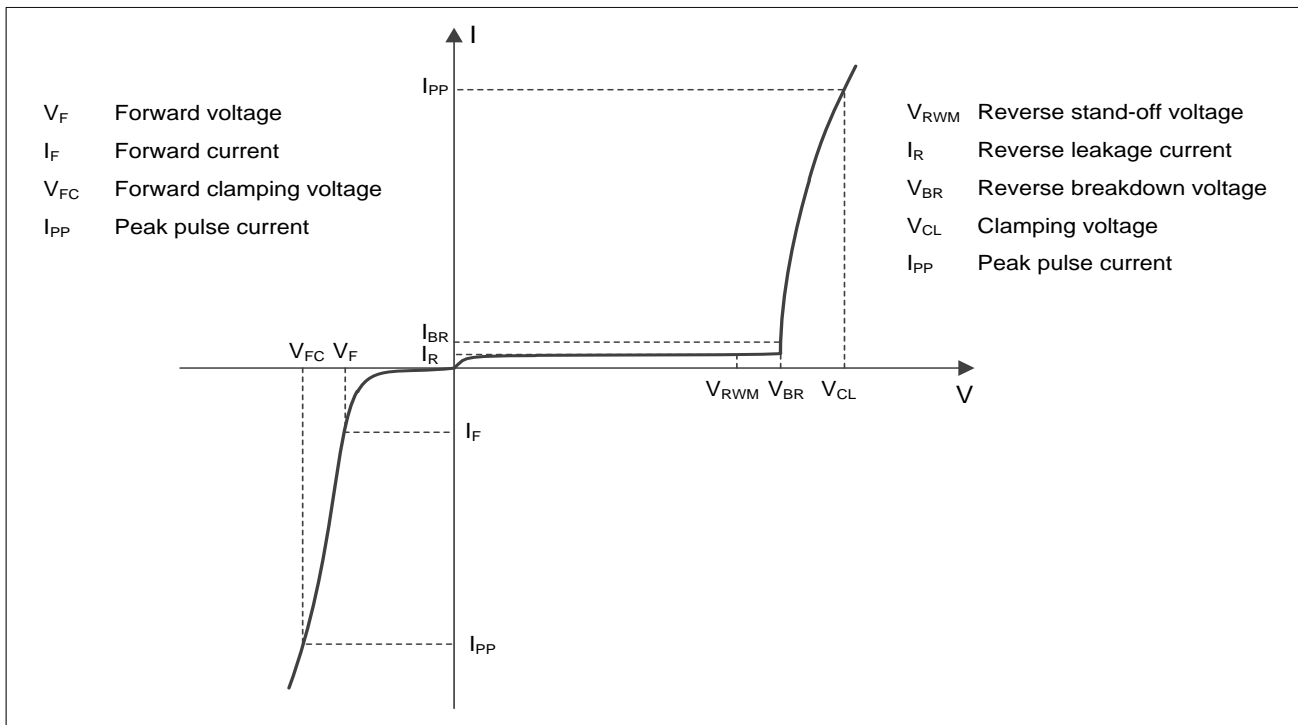
X= Device code (H I J K L S N M)

\* = 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	$V_{ESD}$	$\pm 30$	kV
ESD according to IEC61000-4-2 contact discharge		$\pm 30$	
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<sub>A</sub> = 25°C, unless otherwise noted)**
**Table 3.**

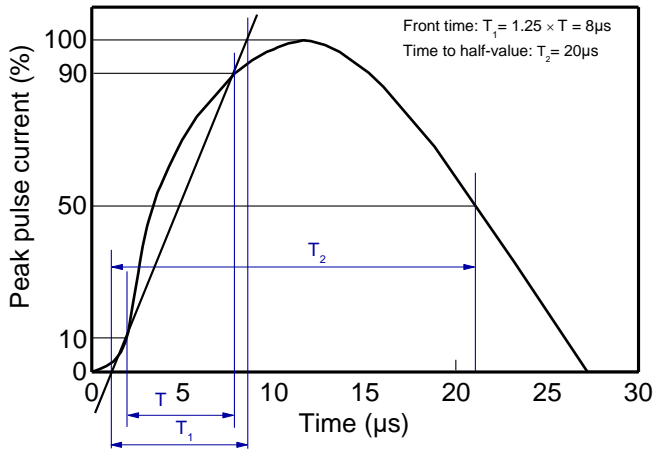
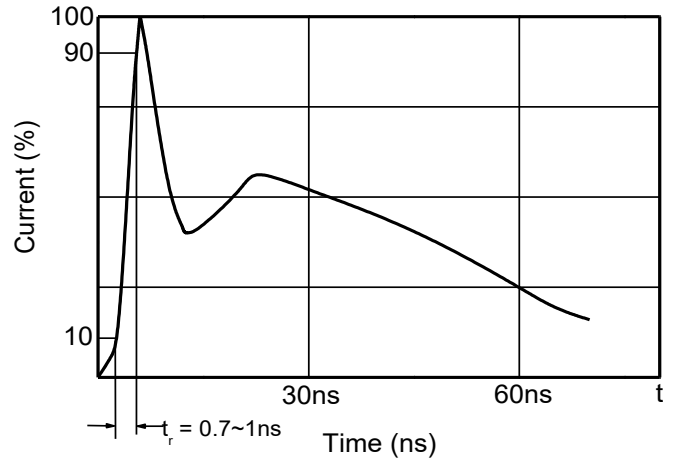
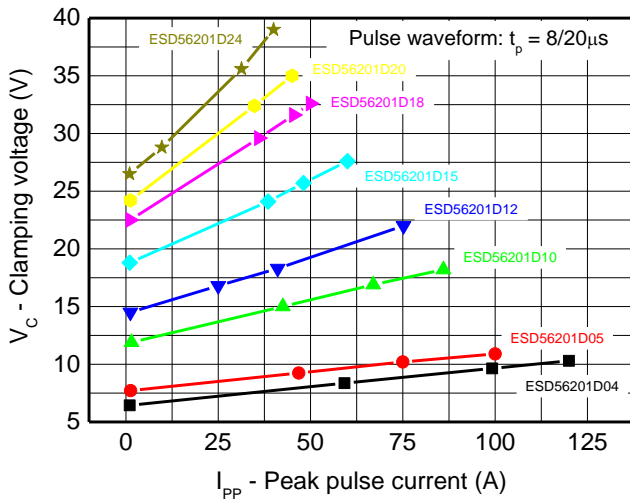
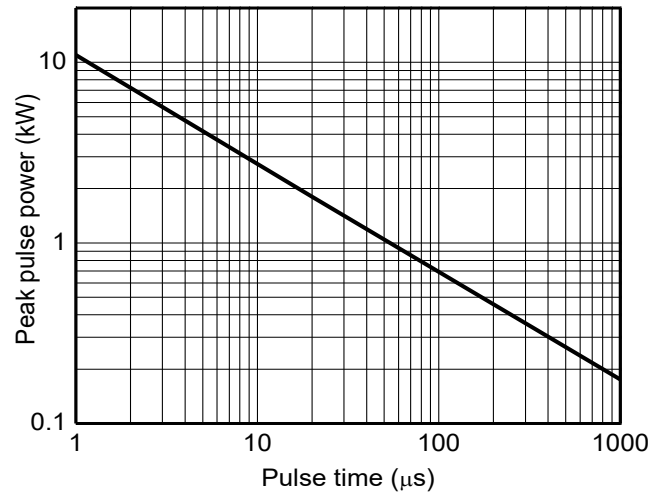
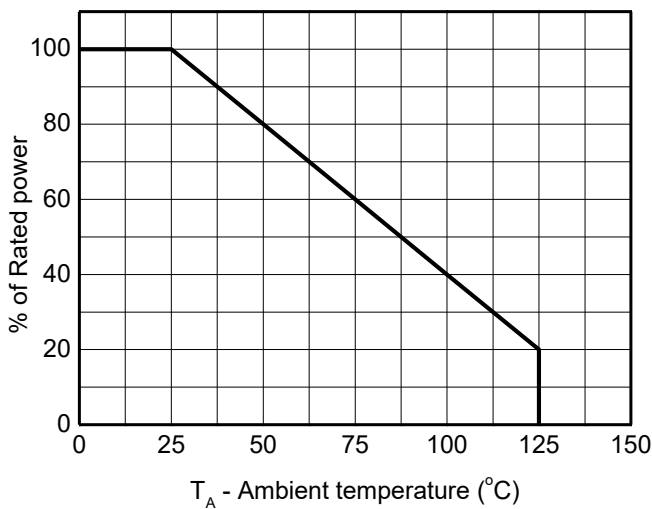
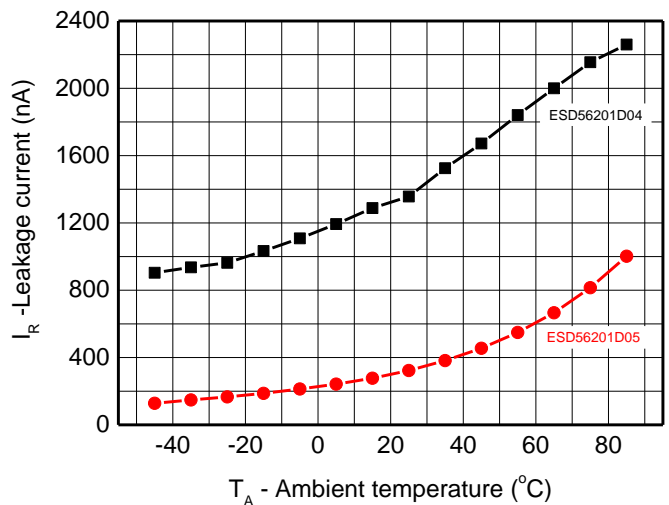
Type number	Reverse Stand-off Voltage V <sub>RWM</sub> (V)	Breakdown voltage V <sub>BR</sub> (V) I <sub>BR</sub> = 1mA			Reverse leakage current I <sub>RM</sub> (μA) at V <sub>RWM</sub>		Forward voltage V <sub>F</sub> (V) I <sub>F</sub> = 20mA		Junction capacitance F = 1MHz, V <sub>R</sub> =0V (pF)	
	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

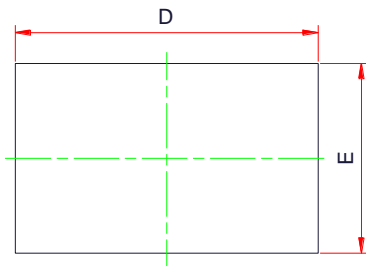
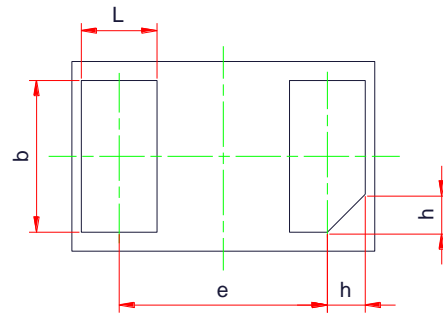
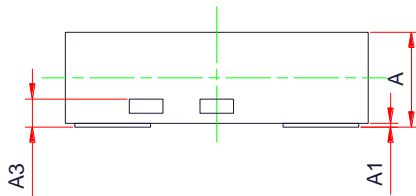
**Table 4.**

Type number	Rated peak pulse current I <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	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

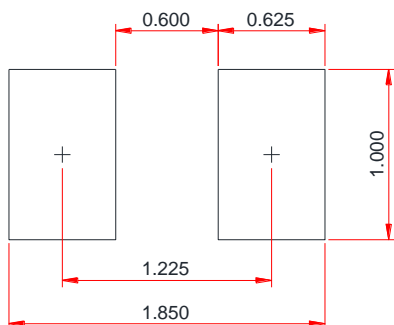
Notes:

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

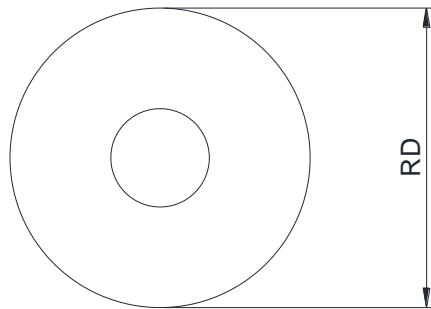
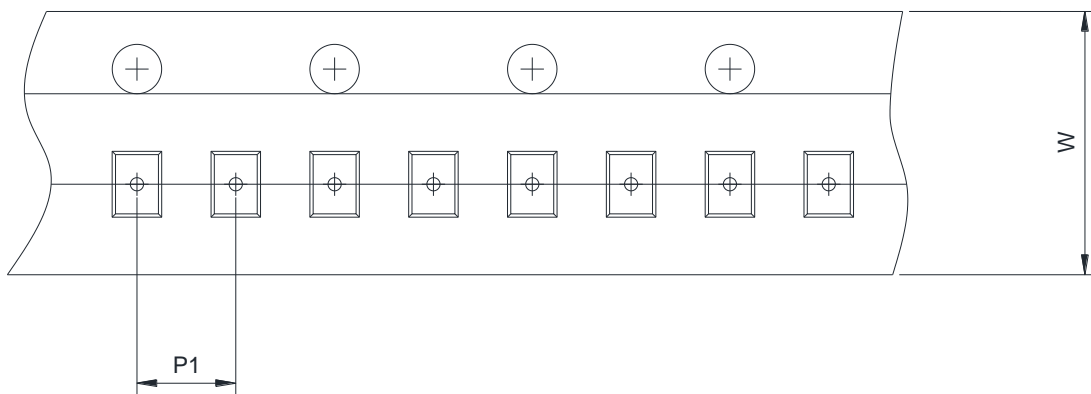
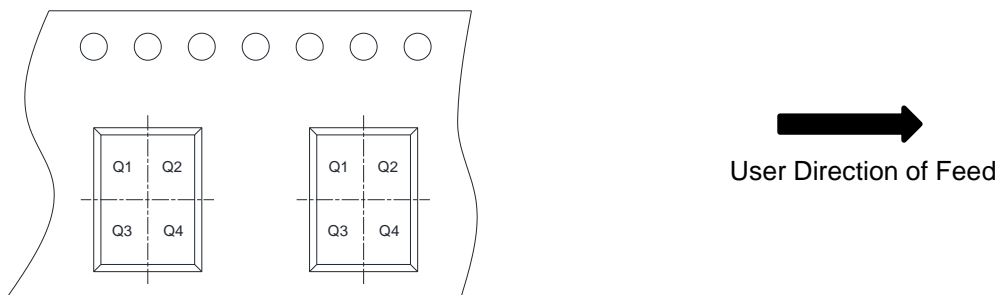
**Electrical characteristics ( $T_A = 25^\circ\text{C}$ , unless otherwise noted)**

**8/20 $\mu\text{s}$  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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