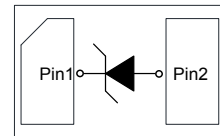


ESD56201DXX
1-Line, Uni-directional, Transient Voltage Suppressor
<http://www.sh-willsemi.com>
Descriptions

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)

Circuit diagram
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
Table 1.

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



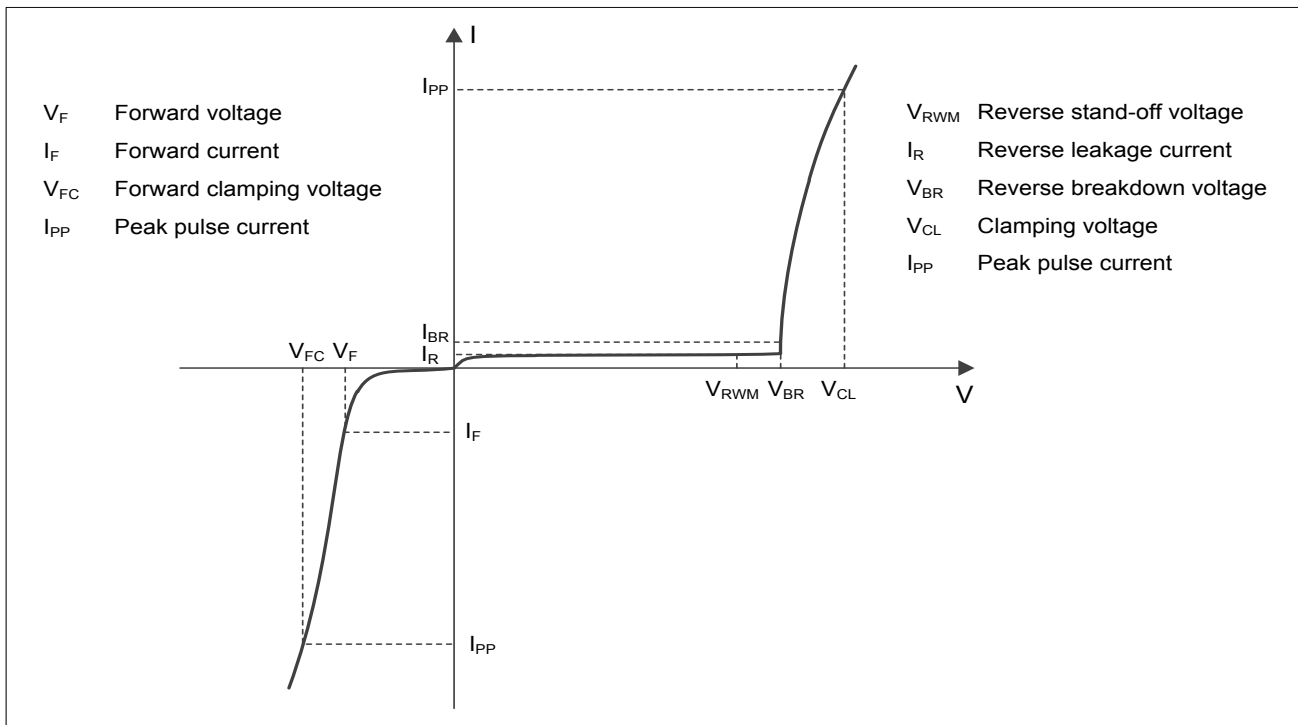
X= Device code (H I J K L S N)

* = 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}	1800	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 ($T_A = 25^\circ\text{C}$, unless otherwise noted)
Table 3.

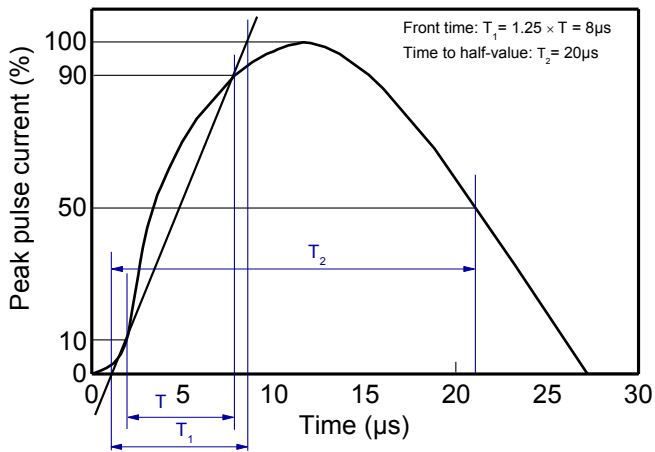
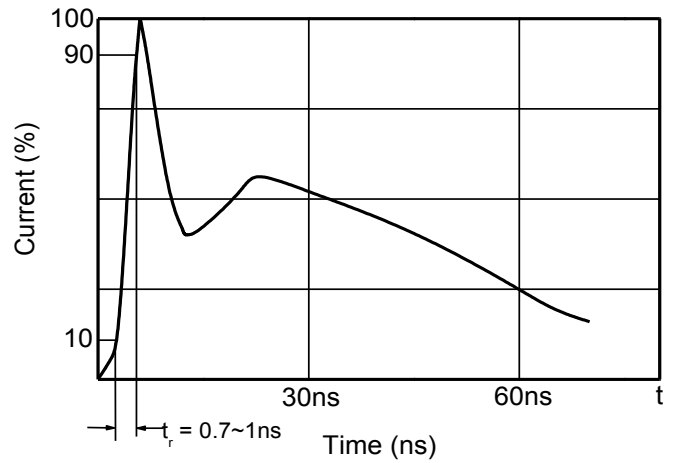
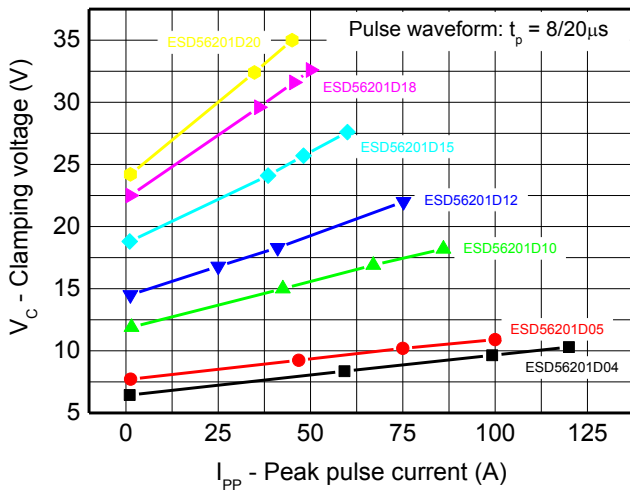
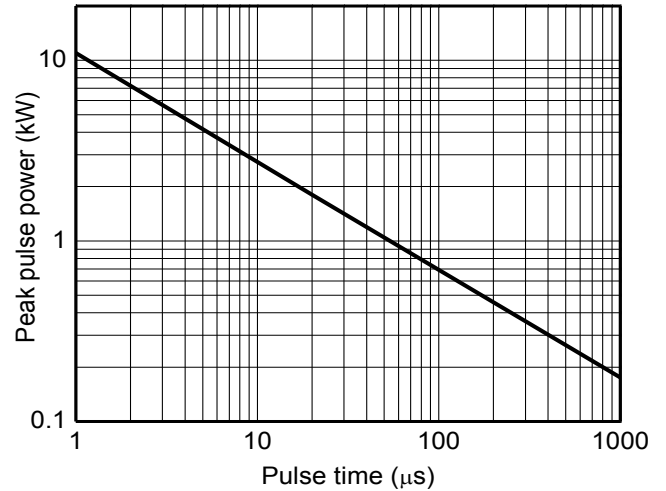
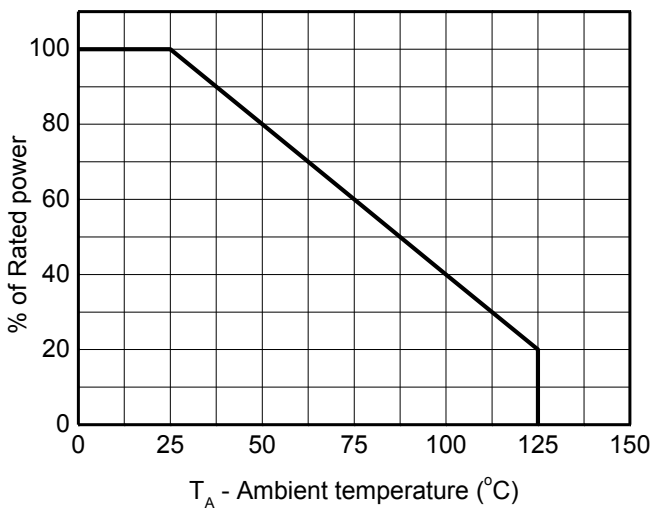
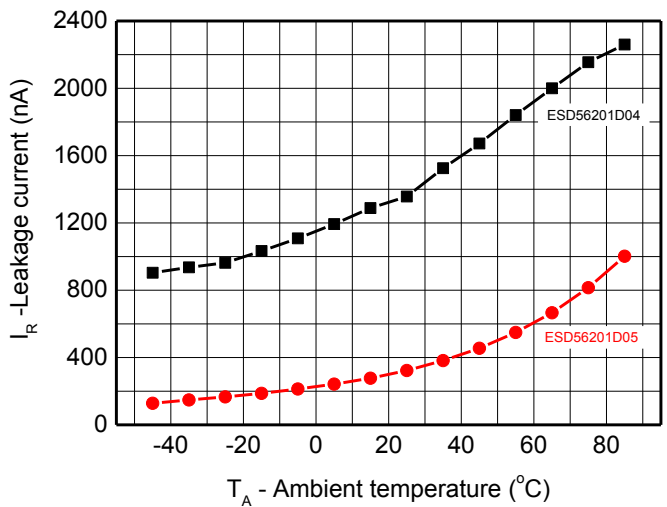
Type number	Reverse Stand-off Voltage V_{RWM} (V)	Breakdown voltage V_{BR} (V) $I_{BR} = 1\text{mA}$			Reverse leakage current I_{RM} (μA) at V_{RWM}		Forward voltage V_F (V) $I_F = 20\text{mA}$		Junction capacitance $F = 1\text{MHz}$, $VR=0\text{V}$ (pF)	
	Max.	Min.	Typ.	Max.	Type.	Max.	Min.	Max.	Typ.	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

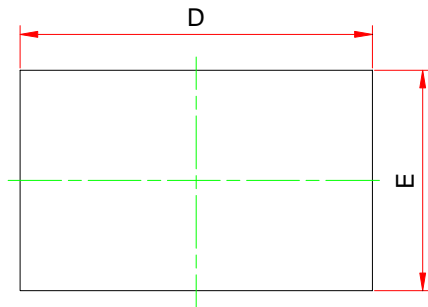
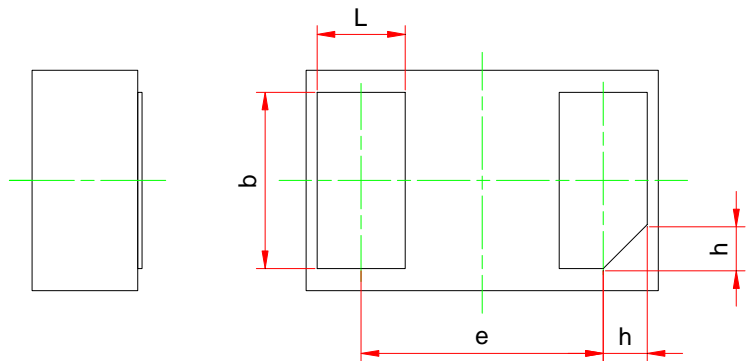
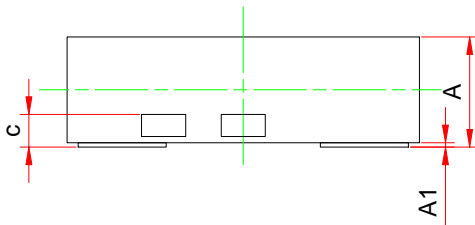
Table 4.

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

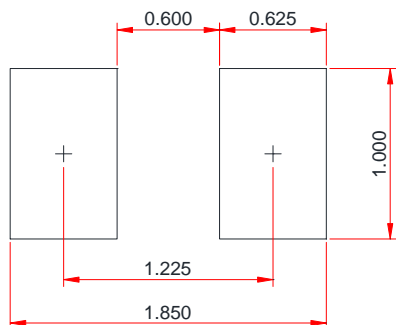
Notes:

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

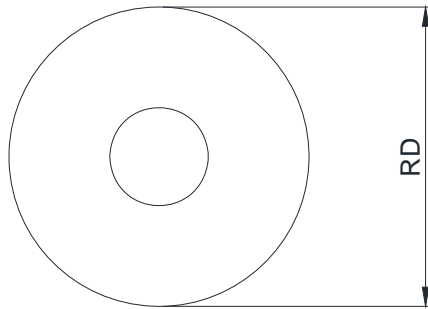
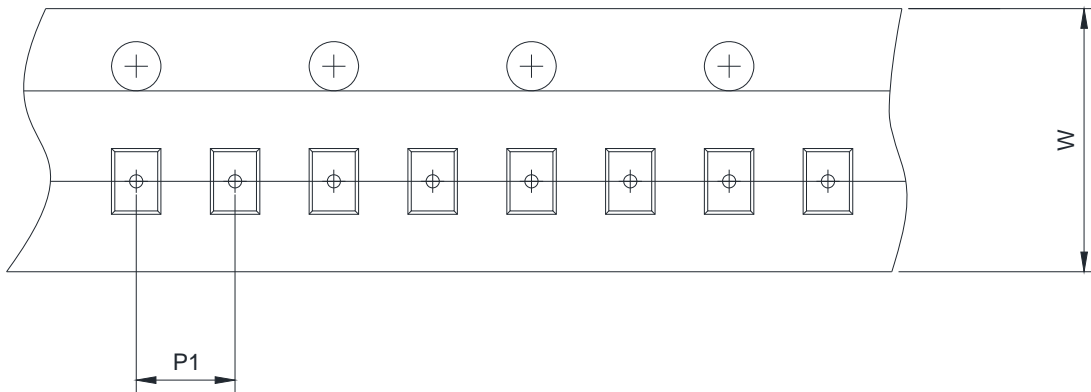
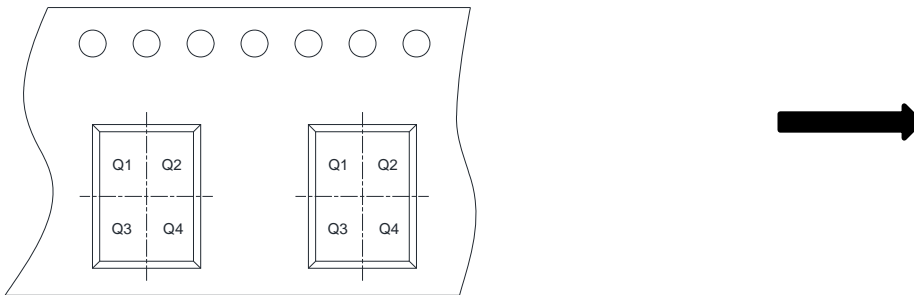
Electrical characteristics ($T_A = 25^\circ\text{C}$, unless otherwise noted)

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 type="checkbox"/> 2mm	<input checked="" 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