

ESD56301D05
1-Line, Uni-directional, Transient Voltage Suppressor
<http://www.sh-willsemi.com>
Descriptions

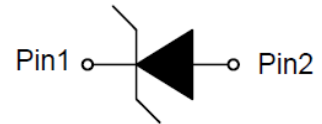
The ESD56301D05 is a transient voltage suppressor designed to protect power interfaces. It is suitable to replace multiple discrete components in portable electronics.

The ESD56301D05 is specifically designed to protect power lines.

The ESD56301D05 is available in DFN1610-2L package. Standard products are Pb-free and Halogen-free.


DFN1610-2L
Features

- Reverse stand-off voltage: 5.0V
- 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



W= Device code

* = Month code

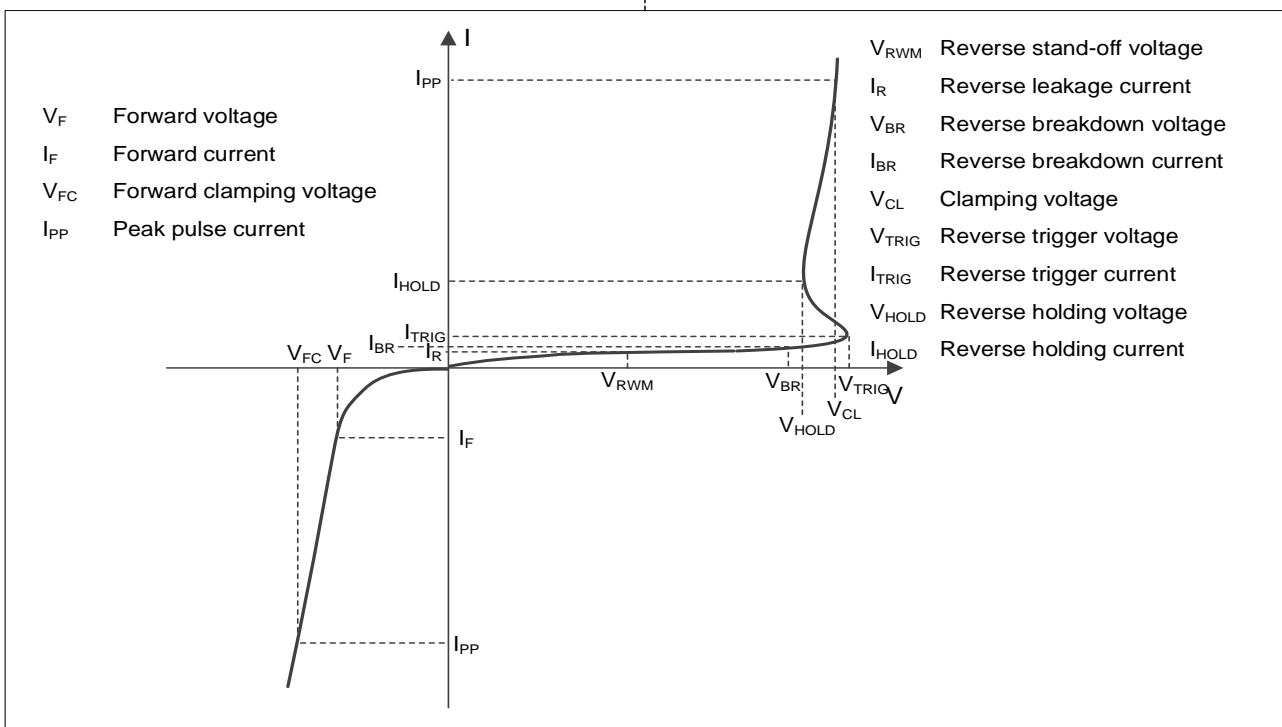
Marking (Top View)
Order information

Table 1.

Device	Package	Shipping	Marking
ESD56301D05-2/TR	DFN1610-2L	10000/Tape&Reel	W*

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

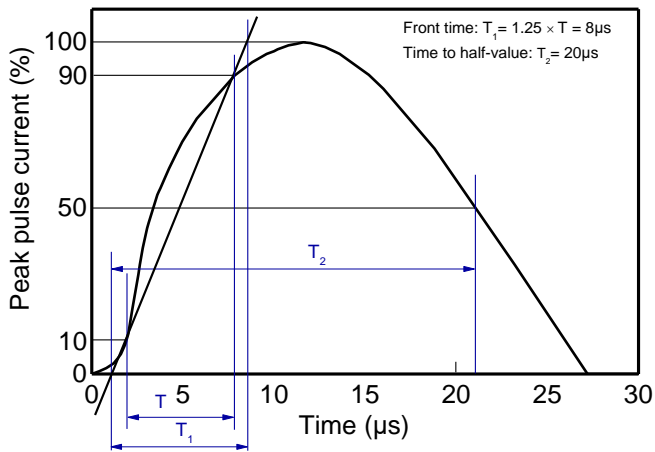
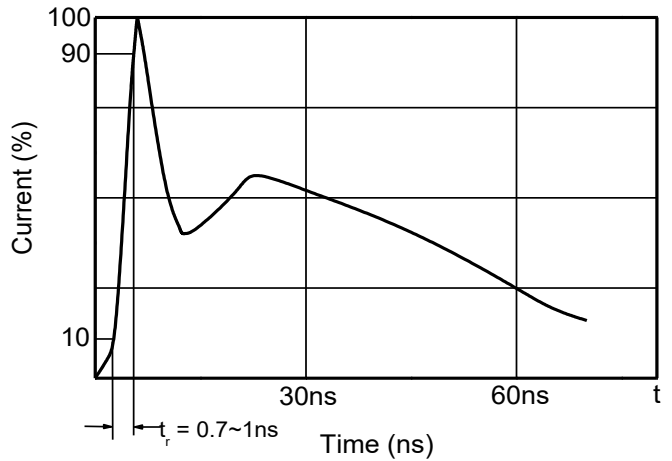
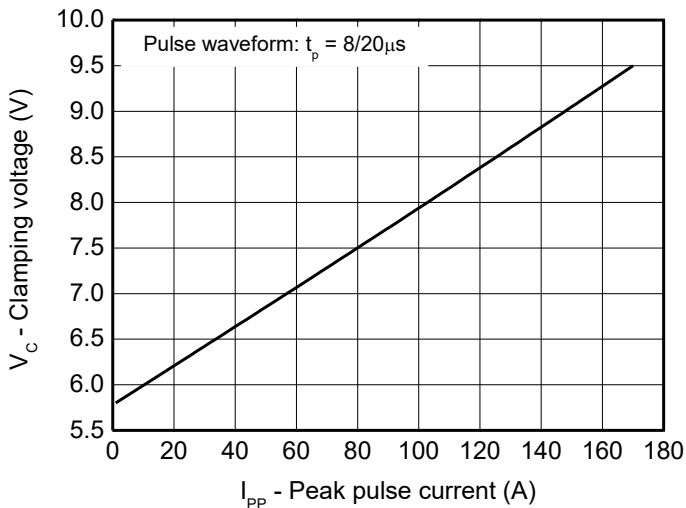
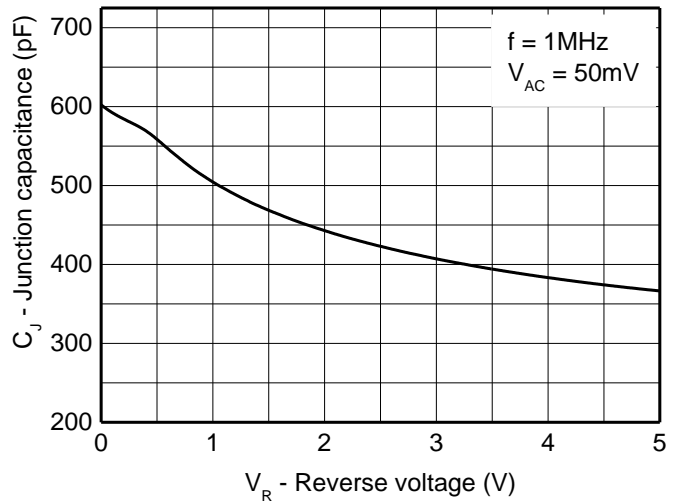
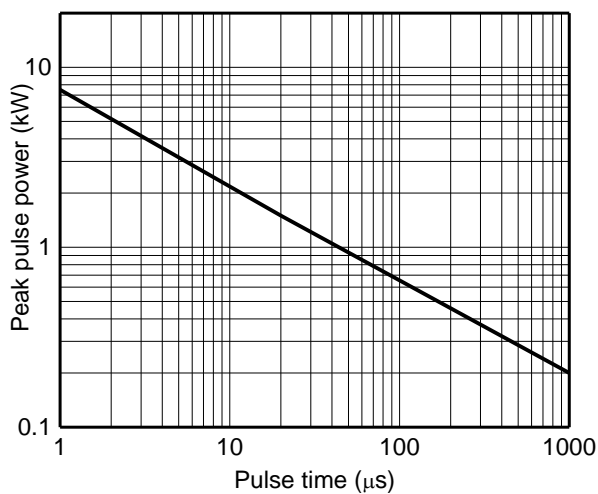
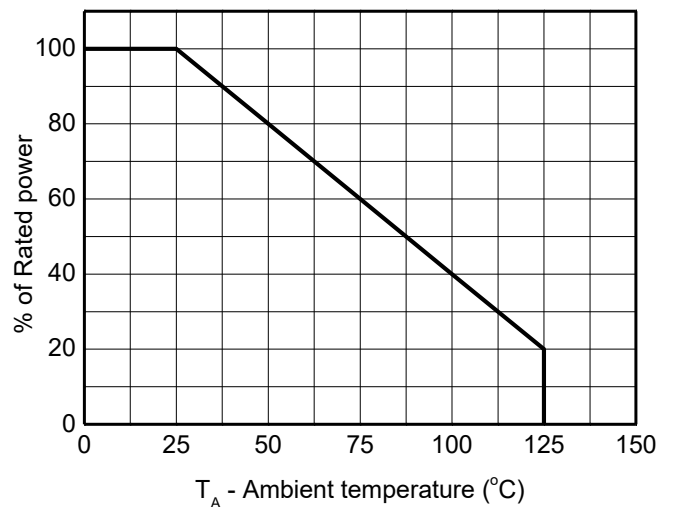
Type number	Reverse Stand-off Voltage V_{RWM} (V)	Breakdown voltage V_{BR} (V) $I_{BR} = 1\text{mA}$			Reverse leakage current I_{RM} (μA) at V_{RWM}		Junction capacitance $F = 1\text{MHz}$, $V_R=0\text{V}$ (pF)	
	Max.	Min.	Typ.	Max.	Typ.	Max.	Typ.	Max.
ESD56301D05	5.0	5.2	6.0	7.0	-	1	600	700

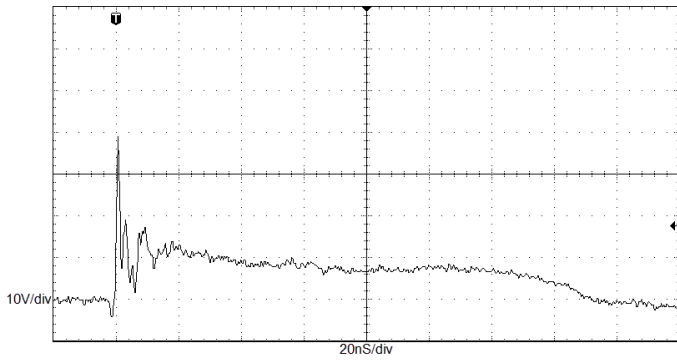
Table 4.

Type number	Rated peak pulse current I_{PP} (A) ¹⁾³⁾	Clamping voltage Typ. V_{CL} (V) at I_{PP} (A) ¹⁾³⁾	Clamping voltage Typ. V_{CL} (V) at $I_{PP} = 16\text{A}$, $t_p = 100\text{ns}$ ²⁾³⁾	Clamping voltage Typ. V_{CL} (V) at $V_{ESD} = 8\text{kV}$ ²⁾³⁾
ESD56301D05	170	9.5	6.5	8.5

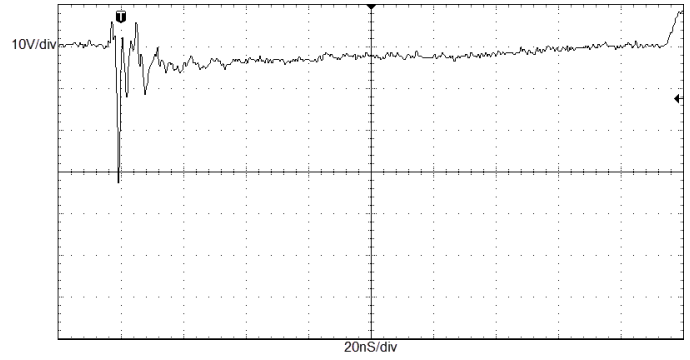
Notes:

- 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.

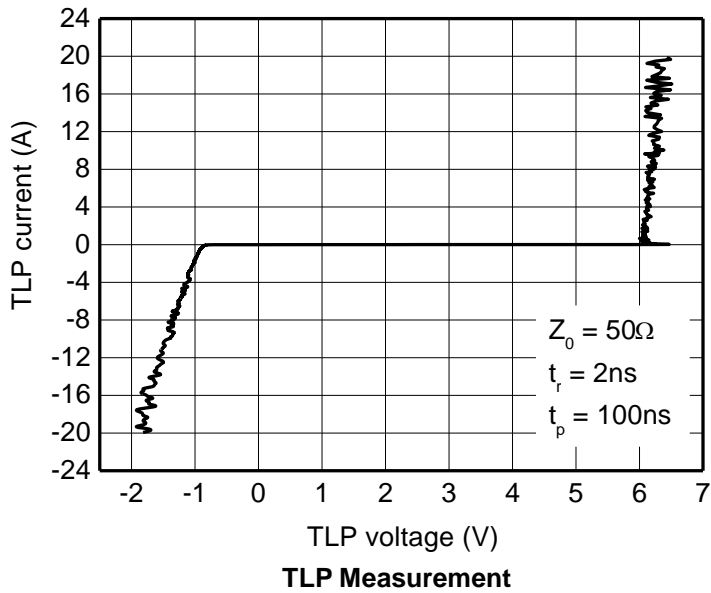
Electrical characteristics ($T_A = 25^\circ\text{C}$, unless otherwise noted)

8/20 μs waveform per IEC61000-4-5

Contact discharge current waveform per IEC61000-4-2

Clamping voltage vs. Peak pulse current

Capacitance vs. Reverse voltage

Non-repetitive peak pulse power vs. Pulse time

Power derating vs. Ambient temperature

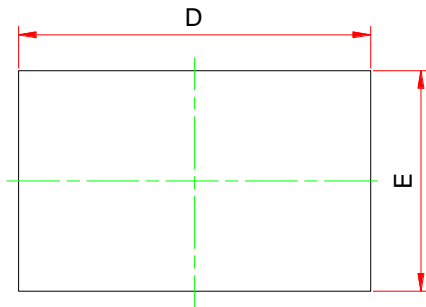
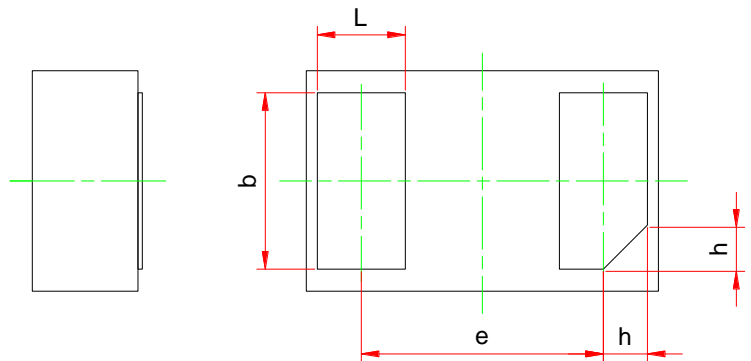
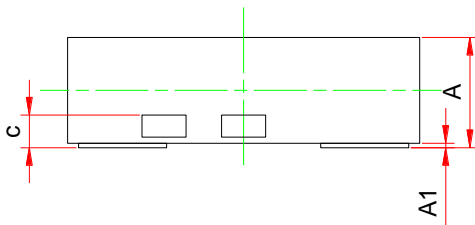
Typical characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)


ESD clamping
 (+8kV contact discharge per IEC61000-4-2)

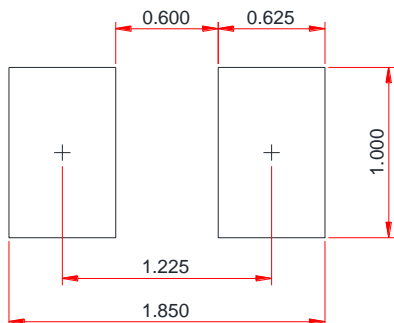


ESD clamping
 (-8kV contact discharge per IEC61000-4-2)

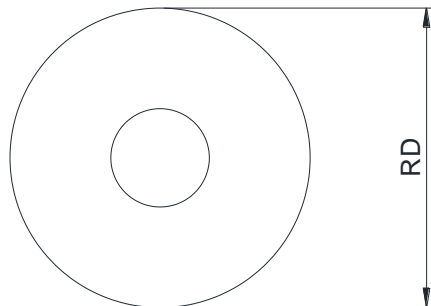
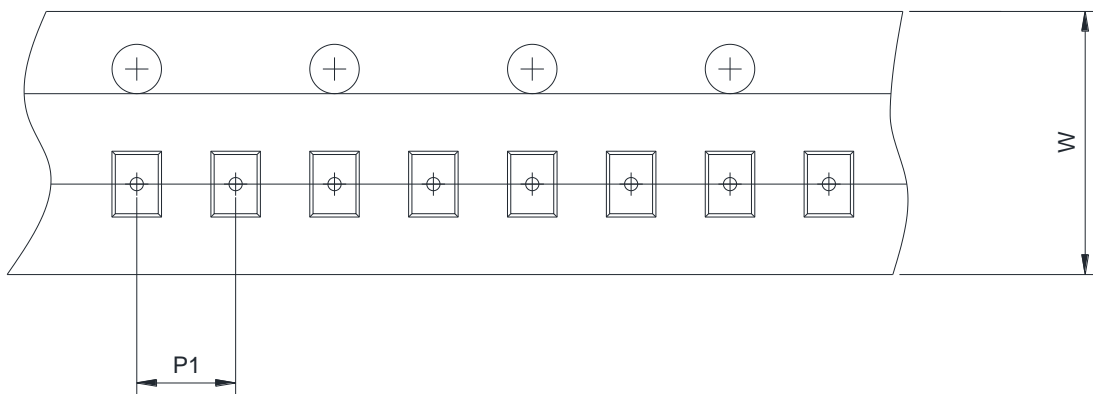
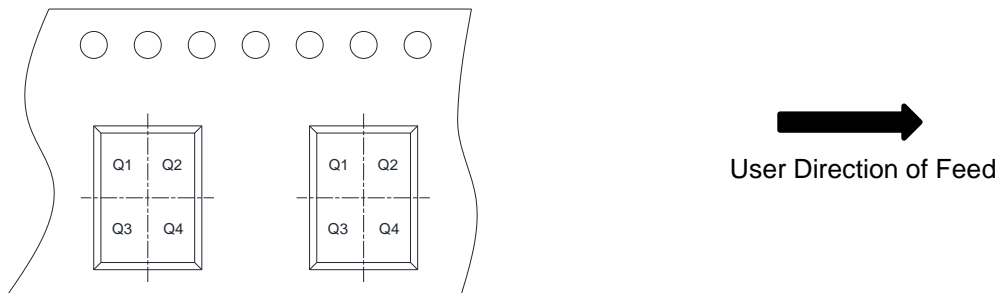


PACKAGE OUTLINE DIMENSIONS
DFN1610-2L

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.		

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.

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
P	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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