

ESD56181WXX

1-Line, Uni-directional, Transient Voltage Suppressor

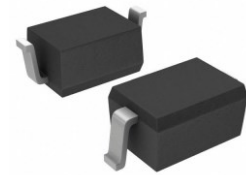
<http://www.sh-willsemi.com>

Descriptions

The ESD56181WXX is a transient voltage suppressor designed to protect power interfaces. It is suitable to replace multiple discrete components in portable electronics.

The ESD56181WXX is specifically designed to protect power lines.

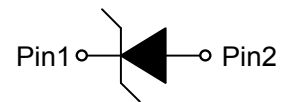
The ESD56181WXX is available in SOD-323 package. Standard products are Pb-free and Halogen-free.



SOD-323

Features

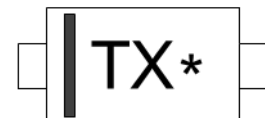
- Reverse stand-off voltage: 4.5V ~ 10V
- Surge protection according to IEC61000-4-5 see [Table 4](#)
- ESD protection according to IEC61000-4-2 ±30kV (contact and air discharge)
- Low clamping voltage
- Solid-state silicon technology



Circuit diagram

Applications

- Power supply protection
- Power management



X= Device code (Q R L S)

* = Month code

Marking (Top View)

Order information

Table 1.

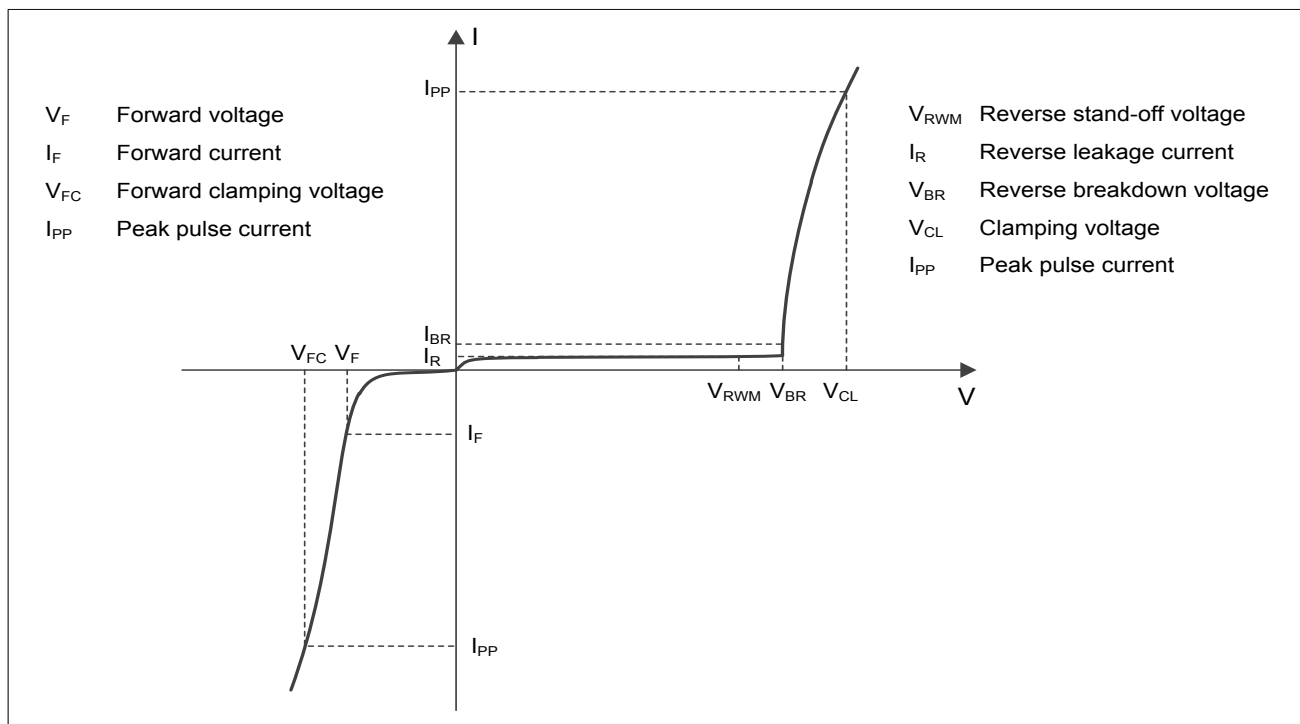
Device	Package	Shipping	Marking
ESD56181W04-2/TR	SOD-323	3000/Tape&Reel	TQ*
ESD56181W05-2/TR	SOD-323	3000/Tape&Reel	TR*
ESD56181W09-2/TR	SOD-323	3000/Tape&Reel	TL*
ESD56181W10-2/TR	SOD-323	3000/Tape&Reel	TS*

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.

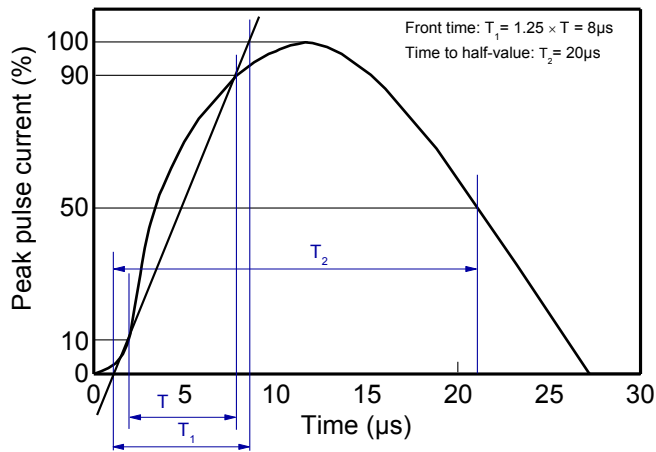
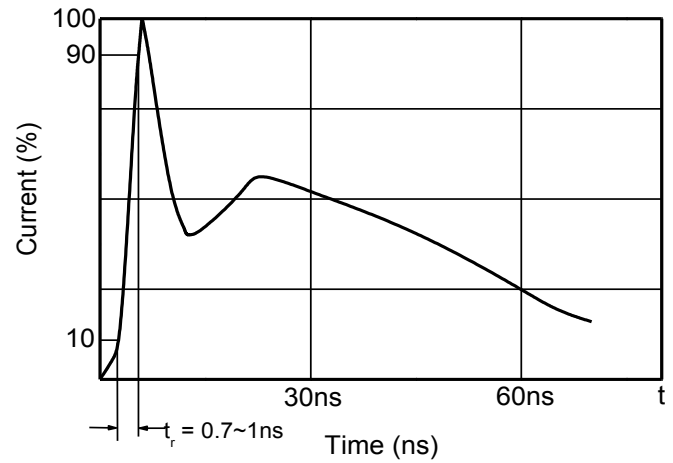
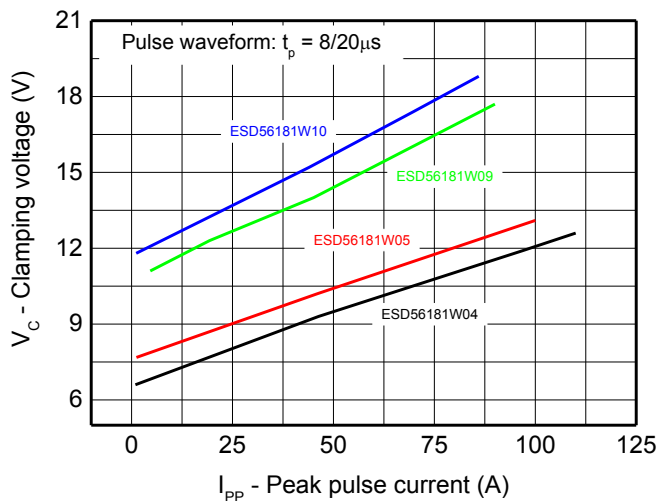
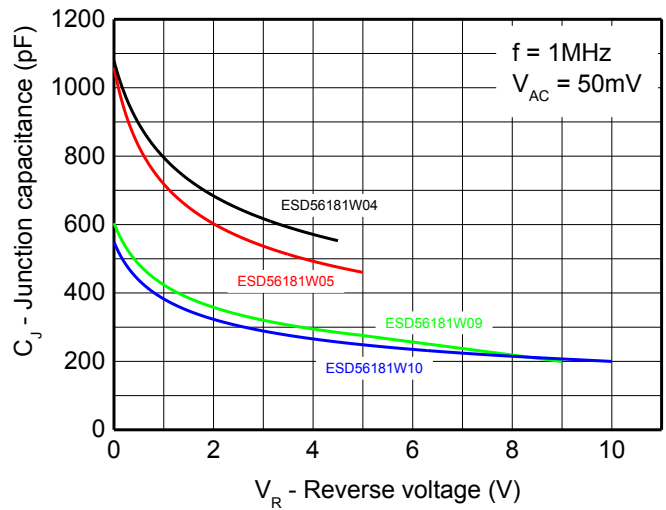
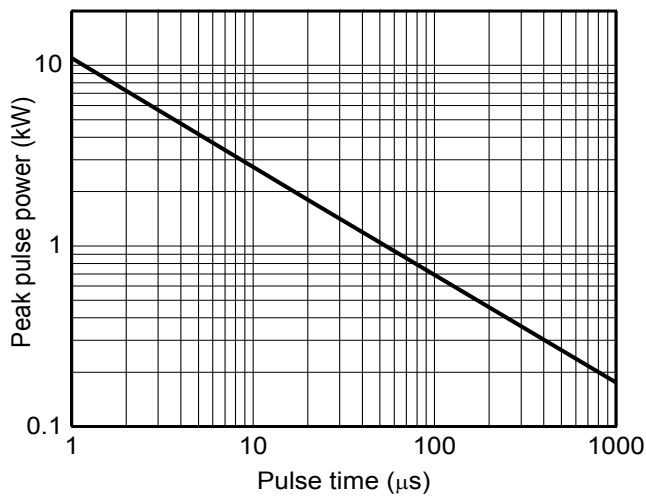
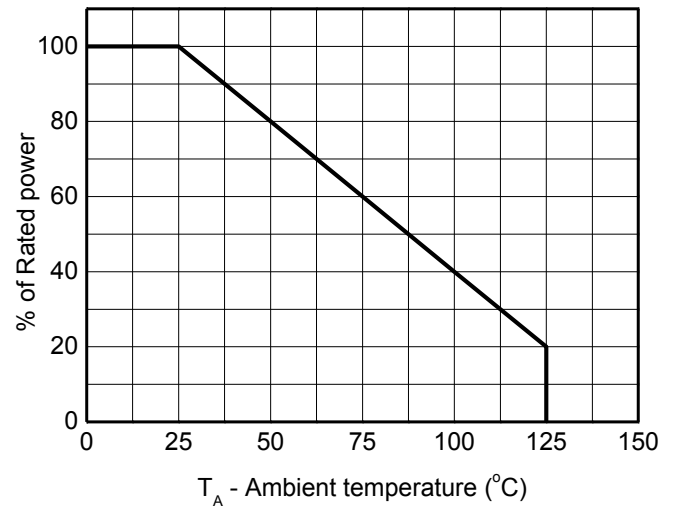
Type number	Reverse Stand-off Voltage V_{RWM} (V)	Breakdown voltage $V_{BR}(V)$ $I_{BR} = 1\text{mA}$			Reverse leakage current $I_{RM}(\mu\text{A})$ at V_{RWM}		Forward voltage $V_F(V)$ $I_F = 20\text{mA}$		Junction capacitance $F = 1\text{MHz}$, $VR=0V$ (pF)	
	Max.	Min.	Typ.	Max.	Typ.	Max.	Min.	Max.	Typ.	Max.
ESD56181W04	4.5	5.2	5.7	6.2	-	2.0	0.60	1.10	1100	1200
ESD56181W05	5.0	6.6	7.1	7.6	-	1.0	0.60	1.10	1050	1150
ESD56181W09	9.0	9.7	10.5	11.3	-	0.1	0.60	1.10	600	700
ESD56181W10	10.0	10.7	11.5	12.3	-	0.1	0.60	1.10	545	650

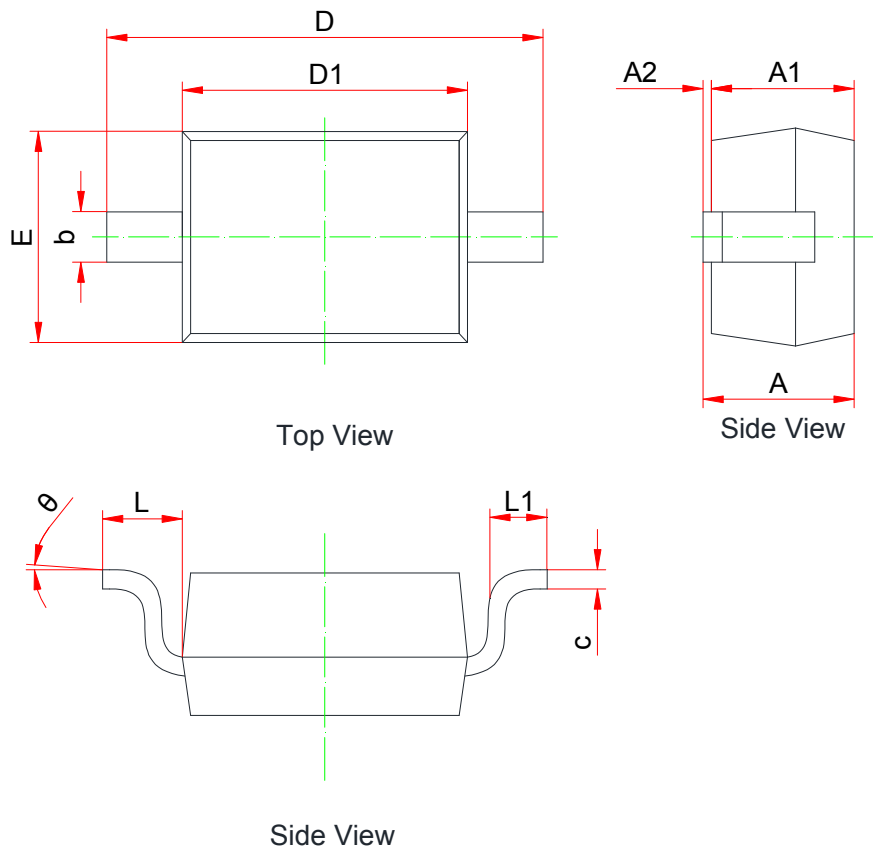
Table 4.

Type number	Rated peak pulse current I_{PP} (A) ¹⁾³⁾	Clamping voltage $V_{CL}(V)$ at $I_{PP}(A)$ ¹⁾³⁾	Clamping voltage $V_{CL}(V)$ at $I_{PP} = 16A$, $t_p = 100\text{ns}$ ²⁾³⁾	Clamping voltage $V_{CL}(V)$ at $V_{ESD} = 8\text{kV}$ ²⁾³⁾
ESD56181W04	110	15	7.0	7.5
ESD56181W05	100	16	8.0	8.5
ESD56181W09	90	20	11	11.5
ESD56181W10	85	21	13	14

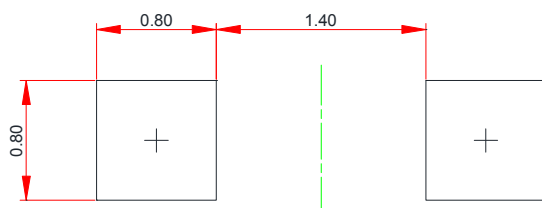
Notes:

- 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.

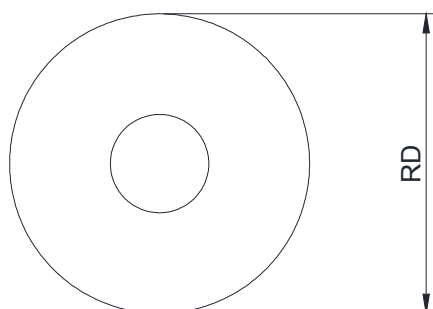
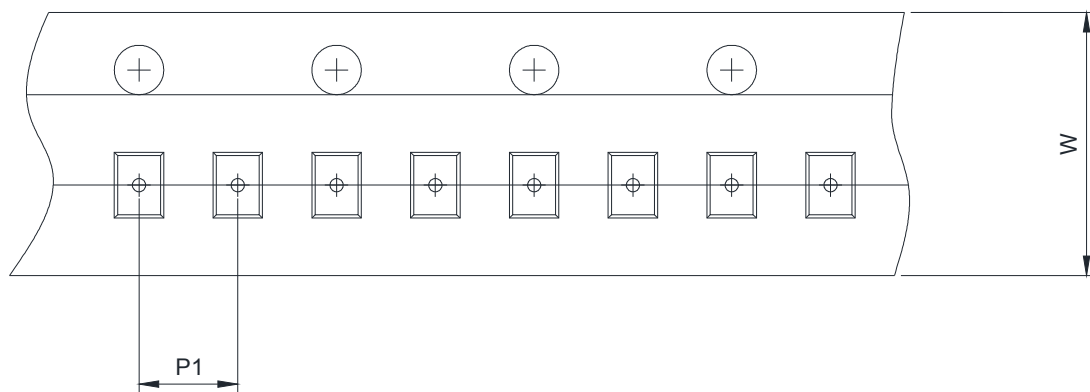
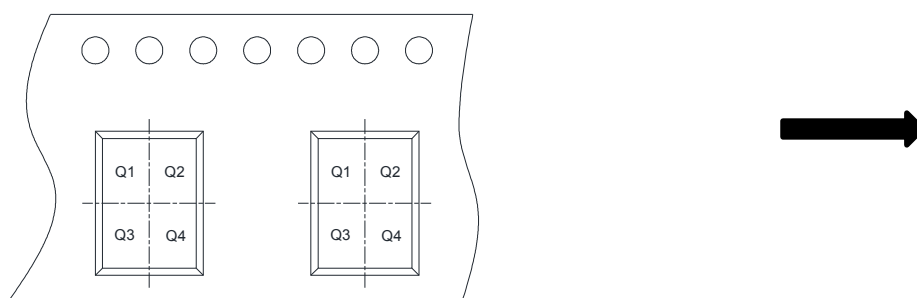
Electrical characteristics ($T_A = 25^\circ\text{C}$, unless otherwise noted)

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

PACKAGE OUTLINE DIMENSIONS
SOD-323


Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.800	-	1.100
A1	0.800	0.850	0.900
A2	0.000	-	0.100
b	0.250	-	0.400
c	0.080	-	0.177
D1	1.600	1.700	1.800
D	2.300	-	2.800
E	1.150	-	1.400
L	0.475 Ref.		
L1	0.100	-	0.500
θ	0°	-	8°

Recommended land pattern (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