ESD56181WXX

1-Line, Uni-directional, Transient Voltage Suppressor

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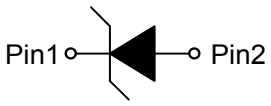
Descriptions

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



Circuit diagram

X= Device code
* = Month code
Marking (Top View)

Features

- Reverse stand-off voltage: 4.5V ~ 20V
- 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.

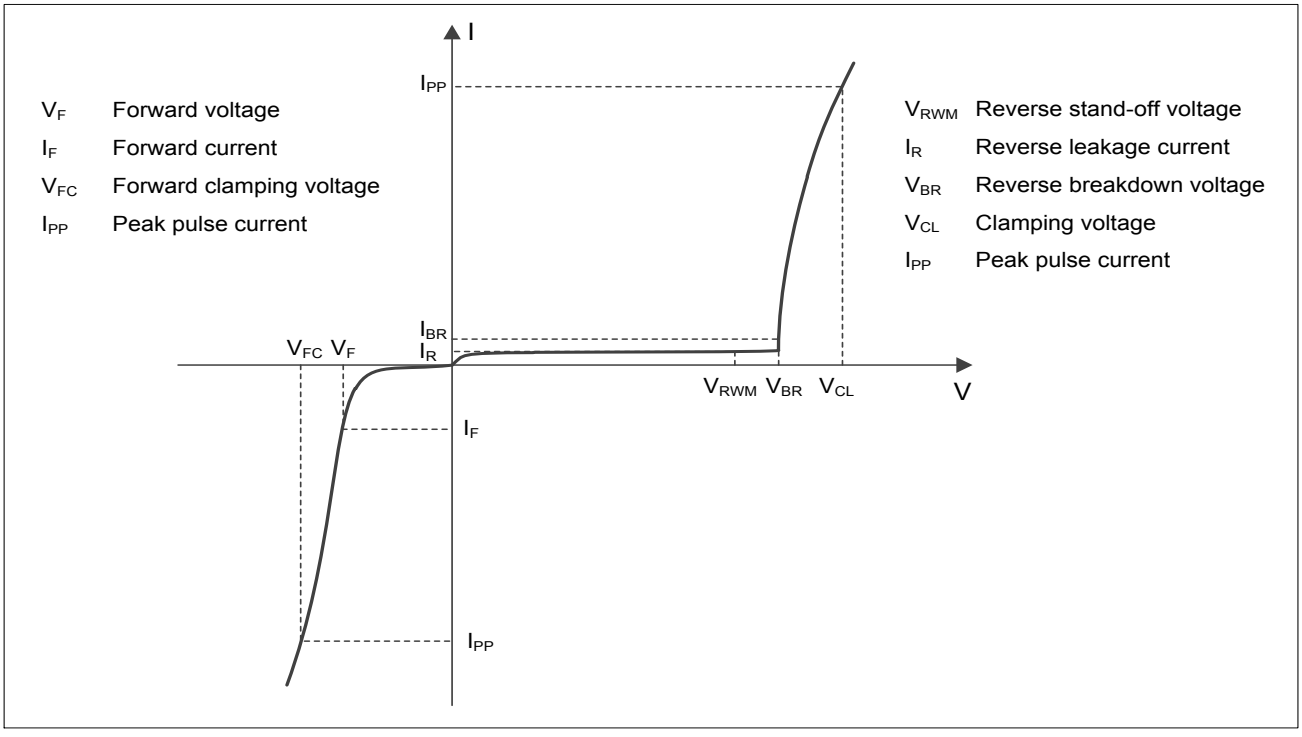
Device	Package	Shipping	Marking
ESD56181W04-2/TR	SOD-323	3000/Tape&Reel	TQ*
ESD56181W05-2/TR	SOD-323	3000/Tape&Reel	TR*
ESD56181W09-2/TR	SOD-323	3000/Tape&Reel	TL*
ESD56181W10-2/TR	SOD-323	3000/Tape&Reel	TS*
ESD56181W12-2/TR	SOD-323	3000/Tape&Reel	TM*
ESD56181W15-2/TR	SOD-323	3000/Tape&Reel	TN*
ESD56181W18-2/TR	SOD-323	3000/Tape&Reel	TT*
ESD56181W20-2/TR	SOD-323	3000/Tape&Reel	TU*

Absolute maximum ratings

Table 2.

Parameter	Symbol	Rating	Unit
Peak pulse power (tp = 8/20μs)	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	°C
Operating temperature	T_{OP}	-40~85	°C
Lead temperature	T_L	260	°C
Storage temperature	T_{STG}	-55~150	°C

Electrical characteristics (T_A = 25°C, unless otherwise noted)



Definitions of electrical characteristics

Electrical characteristics (T_A = 25°C, unless otherwise noted)

Table 3.

Type number	Reverse Stand-off Voltage V_{RWM} (V)	Breakdown voltage V_{BR}(V) I_{BR} = 1mA			Reverse leakage current I_{RM}(μA) at V_{RWM}		Forward voltage V_F(V) I_F = 20mA		Junction capacitance F = 1MHz, 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
ESD56181W12	12.0	12.8	13.6	14.5	-	0.1	0.60	1.10	425	500
ESD56181W15	15.0	16.0	17.5	19.0	-	0.1	0.60	1.10	320	350
ESD56181W18	18.0	19.2	21.1	23.0	-	0.1	0.60	1.10	260	300
ESD56181W20	20.0	21.4	23.2	25.0	-	0.1	0.60	1.10	240	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.
ESD56181W04	110	12.5	15
ESD56181W05	100	13.5	16
ESD56181W09	90	17.0	20
ESD56181W10	85	19.0	21
ESD56181W12	75	21.5	24
ESD56181W15	55	27.5	30
ESD56181W18	45	33.0	35
ESD56181W20	40	34.5	37

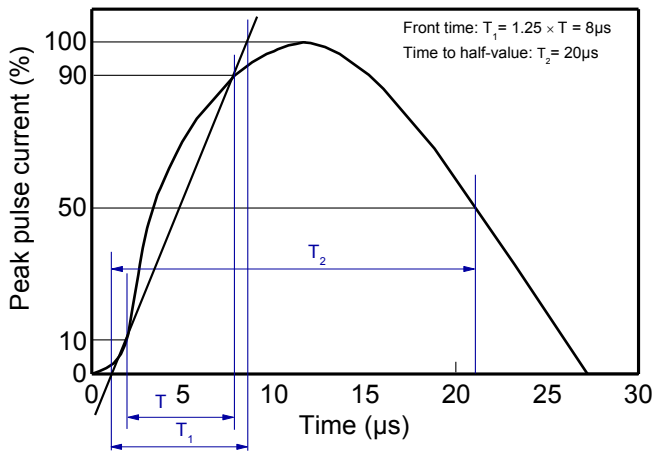
Notes:

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

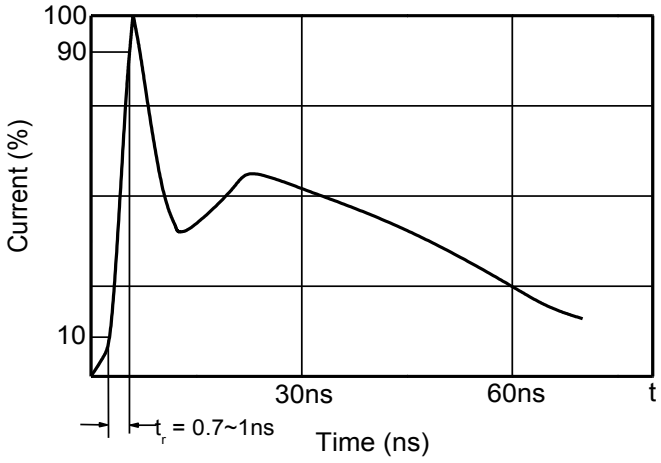
2) Non-repetitive current pulse, according to IEC61000-4-2.

3) Measured from pin 1 to pin 2.

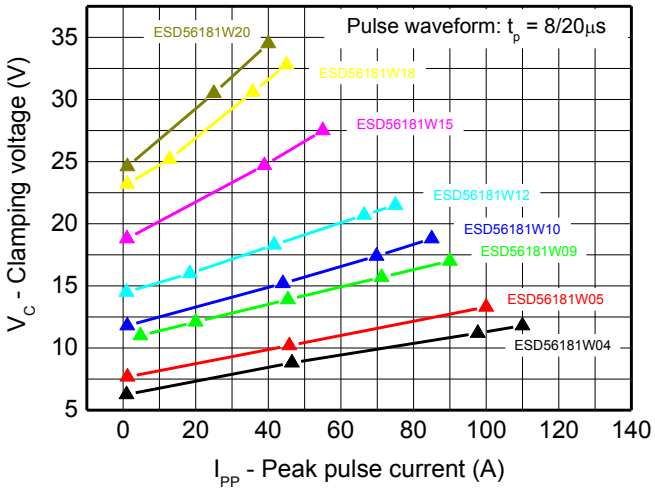
Electrical characteristics (T_A = 25°C, unless otherwise noted)



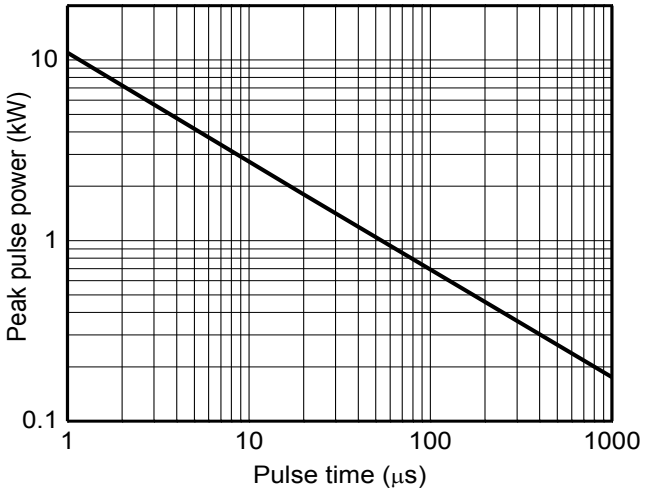
8/20μs waveform per IEC61000-4-5



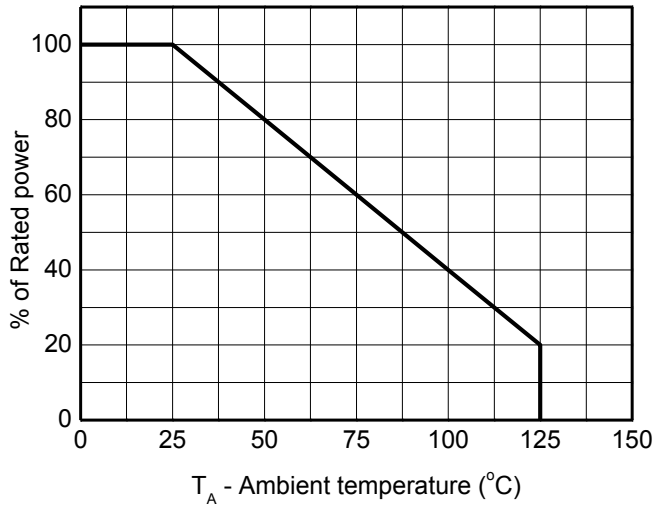
Contact discharge current waveform per IEC61000-4-2



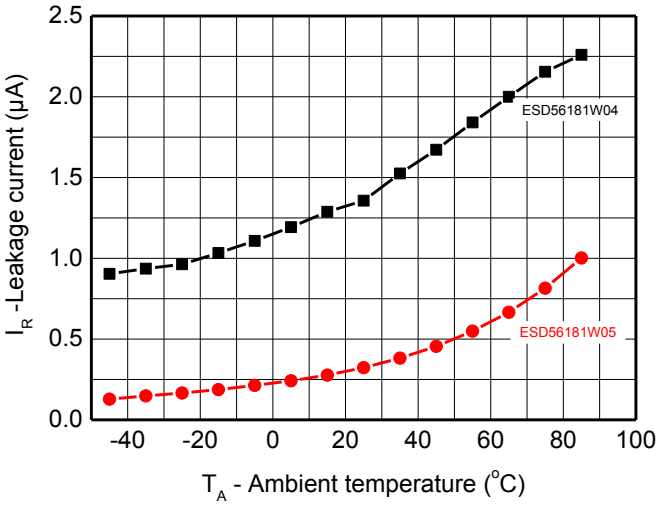
Clamping voltage vs. Peak pulse current



Non-repetitive peak pulse power vs. Pulse time



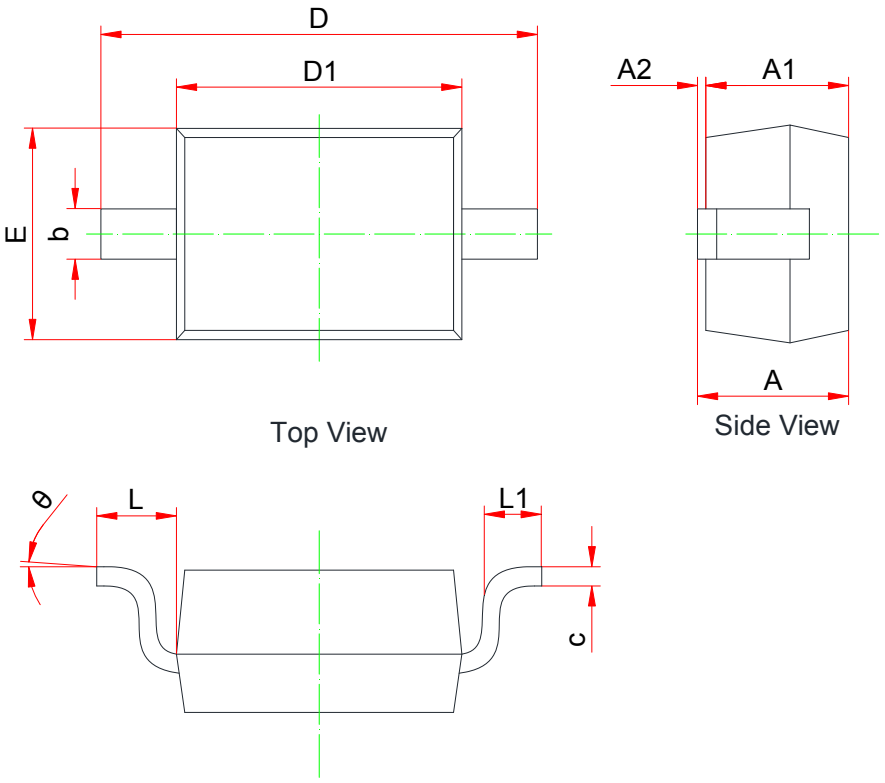
Power derating vs. Ambient temperature



Leakage current vs. Ambient temperature

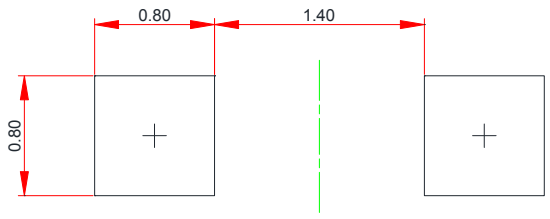
PACKAGE OUTLINE DIMENSIONS

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)

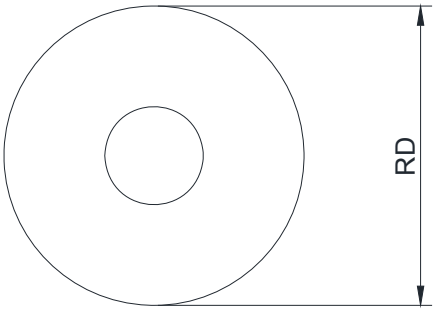


Notes:

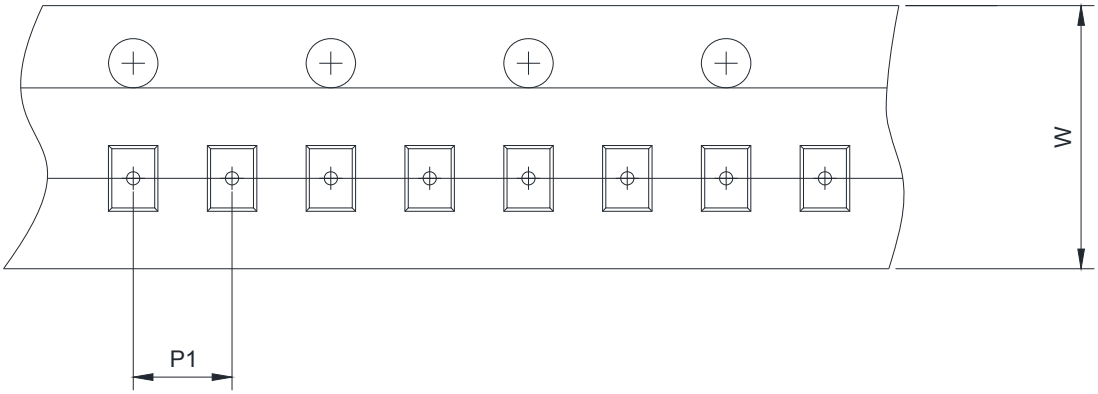
This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.

TAPE AND REEL INFORMATION

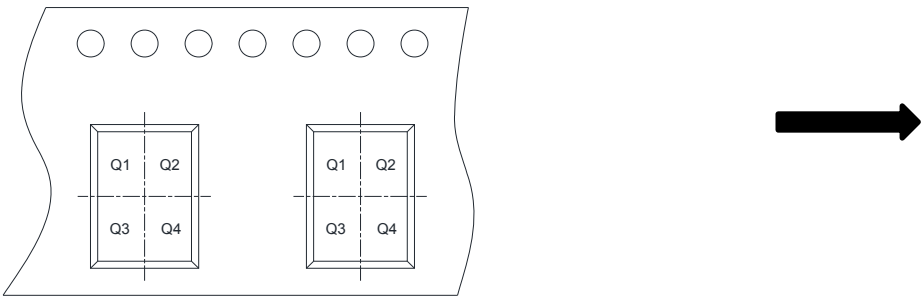
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



RD	Reel Dimension	☑ 7inch ☐ 13inch
W	Overall width of the carrier tape	☑ 8mm ☐ 12mm ☐ 16mm
P1	Pitch between successive cavity centers	☐ 2mm ☑ 4mm ☐ 8mm
Pin1	Pin1 Quadrant	☑ Q1 ☑ Q2 ☐ Q3 ☐ Q4

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