ESD56131W

1-Line, Bi-directional, Transient Voltage Suppressor

www.omnivision-group.com

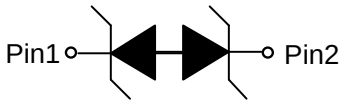
Descriptions

The ESD56131W is a Bi-directional TVS (Transient Voltage Suppressor). It is specifically designed to protect sensitive electronic components which are connected to power lines from over-stress caused by ESD (Electrostatic Discharge), EFT (Electrical Fast Transients) and Lightning.

The ESD56131W may be used to provide ESD protection up to ±30kV (contact and air discharge) according to IEC61000-4-2, and with high surge capability used to protect USB voltage bus pin according to IEC61000-4-5.

The ESD56131W is available in SOD-323F package. Standard products are Pb-free and Halogen-free.

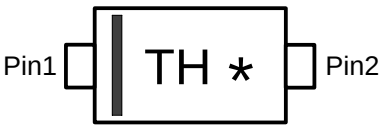
SOD-323F (Bottom View)



Circuit diagram

Features

- Reverse stand-off voltage: ±4.6V
- Transient protection according to
  IEC61000-4-2 (ESD): ±30kV (contact and air discharge)
  IEC61000-4-4 (EFT): 80A (5/50ns)
  IEC61000-4-5 (surge): 100A (8/20μs)
- Capacitance: C_J = 250pF typ.
- Low clamping voltage
- Solid-state silicon technology



TH = Device code
* = Month code

Marking (Top View)

Applications

- Power supply protection
- Power management

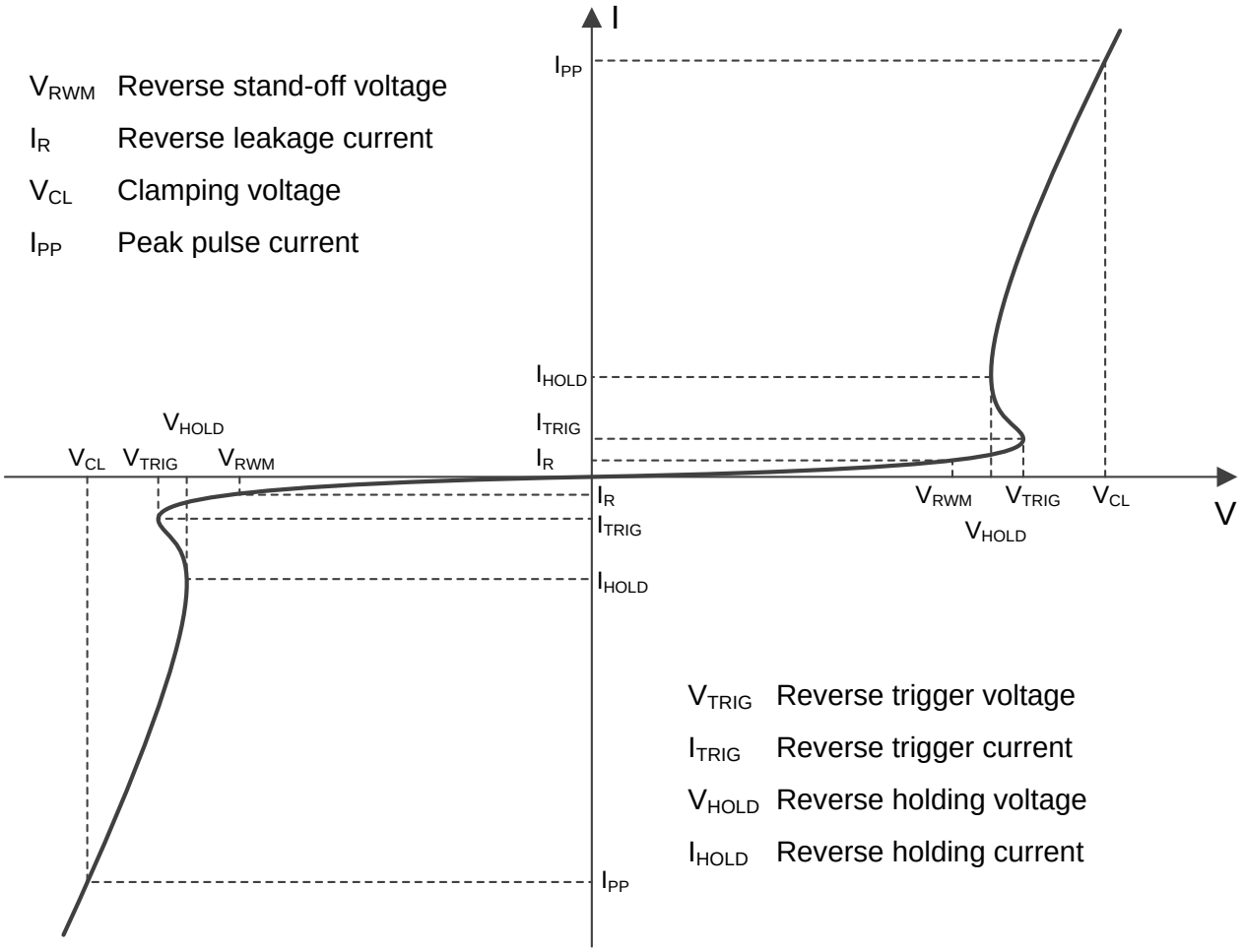
Order information

Device	Package	Shipping
ESD56131W-2/TR	SOD-323F	3000/Tape&Reel

Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse power (tp=8/20μs)	P_{pk}	1400	W
Peak pulse current (t_p = 8/20μs)	I_{PP}	100	A
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)



V_{RWM} Reverse stand-off voltage

I_R Reverse leakage current

V_{CL} Clamping voltage

I_{PP} Peak pulse current

V_{TRIG} Reverse trigger voltage

I_{TRIG} Reverse trigger current

V_{HOLD} Reverse holding voltage

I_{HOLD} Reverse holding current

Definitions of electrical characteristics

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

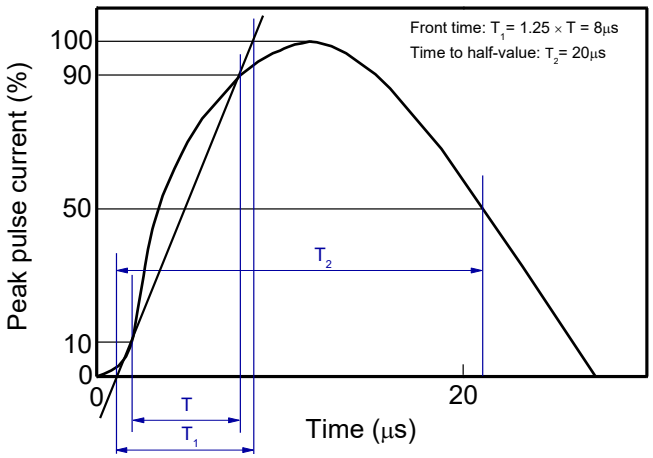
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse maximum working voltage	V_{RWM}				±4.6	V
Reverse leakage current	I_R	V_{RWM} = 4.6V			1	μA
Reverse breakdown voltage	V_{BR}	I_{BR} = 1mA	4.8			V
Reverse holding voltage	V_{HOLD}	I_{HOLD} = 50mA	4.8			V
Clamping voltage *1)*	V_{CL}	V_{ESD} = 8kV		8.0		V
Clamping voltage *2)*	V_{CL}	I_{PP} = 1A, t_p = 8/20μs			6	V
		I_{PP} = 50A, t_p = 8/20μs			10	V
		I_{PP} = 100A, t_p = 8/20μs			14	V
Junction capacitance	C_J	V_R = 0V, f = 1MHz		250	300	pF

Notes:

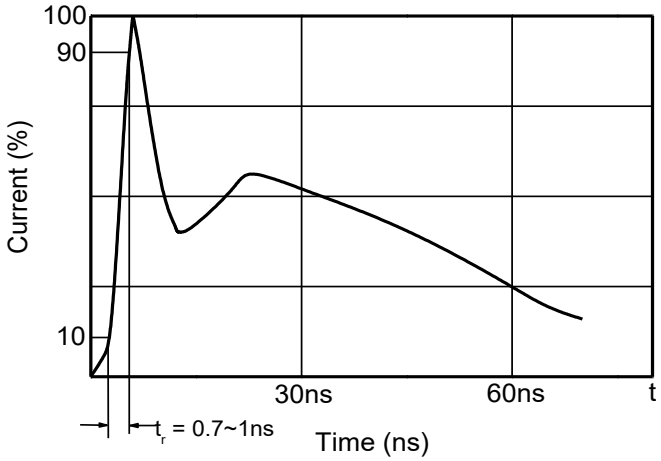
1) Contact discharge mode, according to IEC61000-4-2.

2) Non-repetitive current pulse, according to IEC61000-4-5.

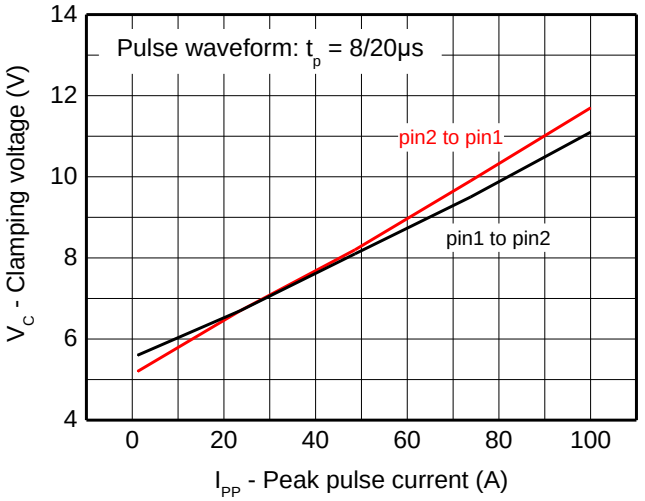
Typical characteristics (T_A = 25°C, unless otherwise noted)



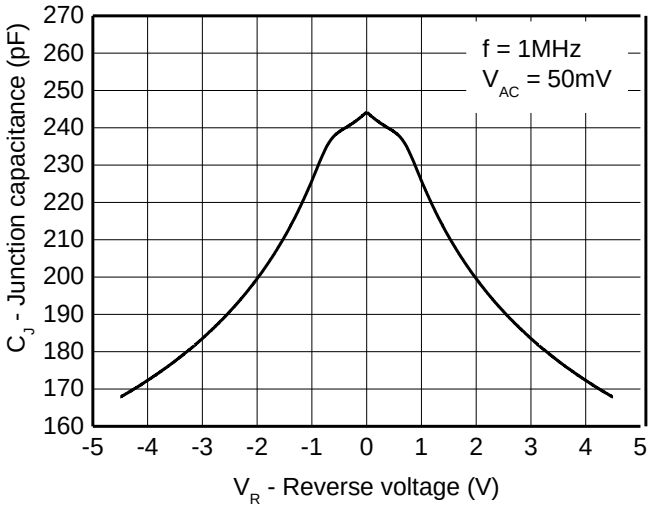
8/20μs waveform per IEC61000-4-5



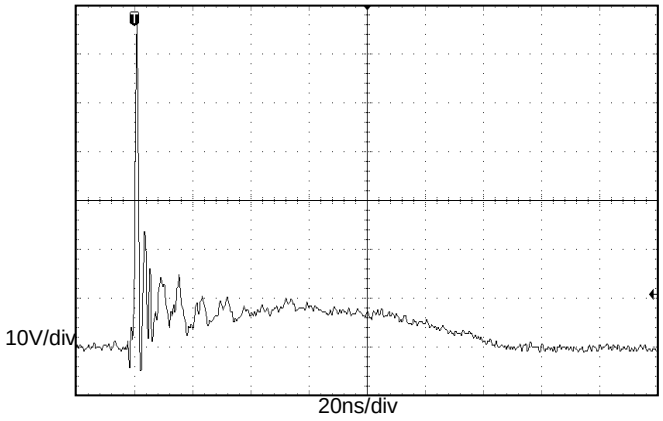
Contact discharge current waveform per IEC61000-4-2



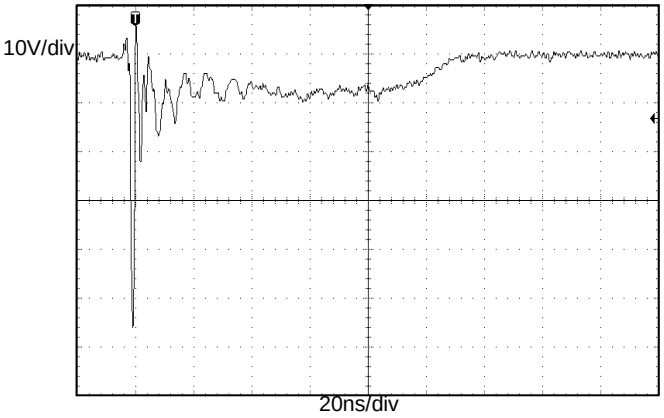
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverse voltage



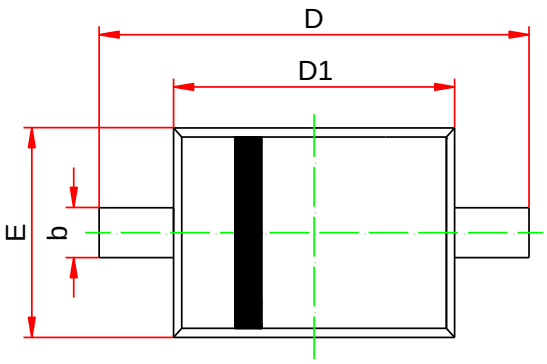
ESD clamping
(+8kV contact discharge per IEC61000-4-2)



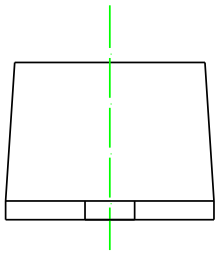
ESD clamping
(-8kV contact discharge per IEC61000-4-2)

PACKAGE OUTLINE DIMENSIONS

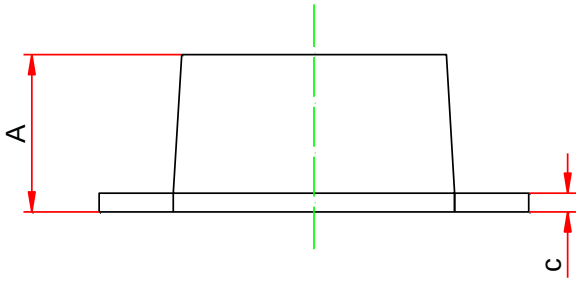
SOD-323F



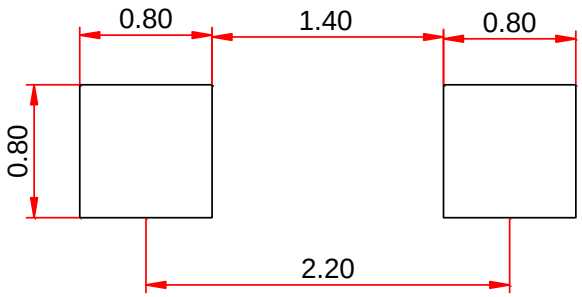
TOP VIEW



SIDE VIEW



SIDE VIEW

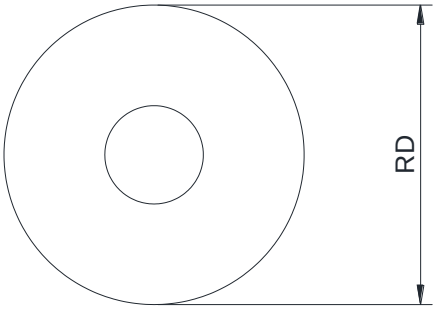


RECOMMEND LAND PATTERN(unit:mm)

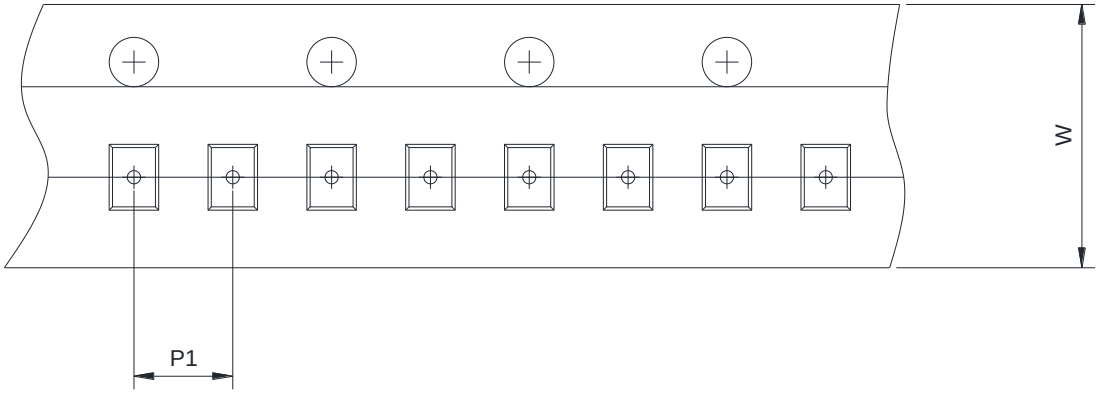
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.60	-	1.10
c	0.08	0.13	0.18
b	0.25	-	0.40
D1	1.60	1.70	1.80
E	1.15	1.25	1.35
D	2.30	2.50	2.80

TAPE AND REEL INFORMATION

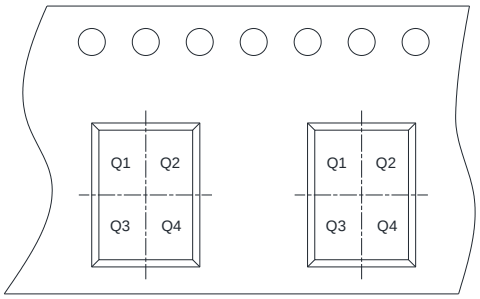
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



User Direction of Feed

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