ESD5601W

1 Lines, Uni-directional, Transient Voltage Suppressors

http//:www.sh-willsemi.com

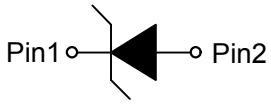
Descriptions

The ESD5601W is a uni-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.

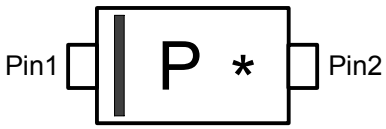
The ESD5601W may be used to provide ESD protection up to ±30kV (contact and air discharge) according to IEC61000-4-2, and withstand peak pulse current up to 80A (8/20μs) according to IEC61000-4-5.

The ESD5601W is available in SOD-323F package. Standard products are Pb-free and Halogen-free.

SOD-323F



Circuit diagram



P= Device code

* = Month code (A~Z)

Marking (Top View)

Features

- Reverse stand-off voltage: 7V Max
- Transient protection for each line according to
  IEC61000-4-2 (ESD): ±30kV (contact and air discharge)
  IEC61000-4-4 (EFT): 80A (5/50ns)
  IEC61000-4-5 (surge): 80A (8/20μs)
- Capacitance: C_J = 300pF typ.
- Low leakage current
- Low clamping voltage: V_{CL} = 17.5V typ. @ I_{PP} = 80A (Surge)
- Solid-state silicon technology

Applications

- Power lines
- Cellular handsets
- Tablets
- Microprocessors
- Portable Electronics

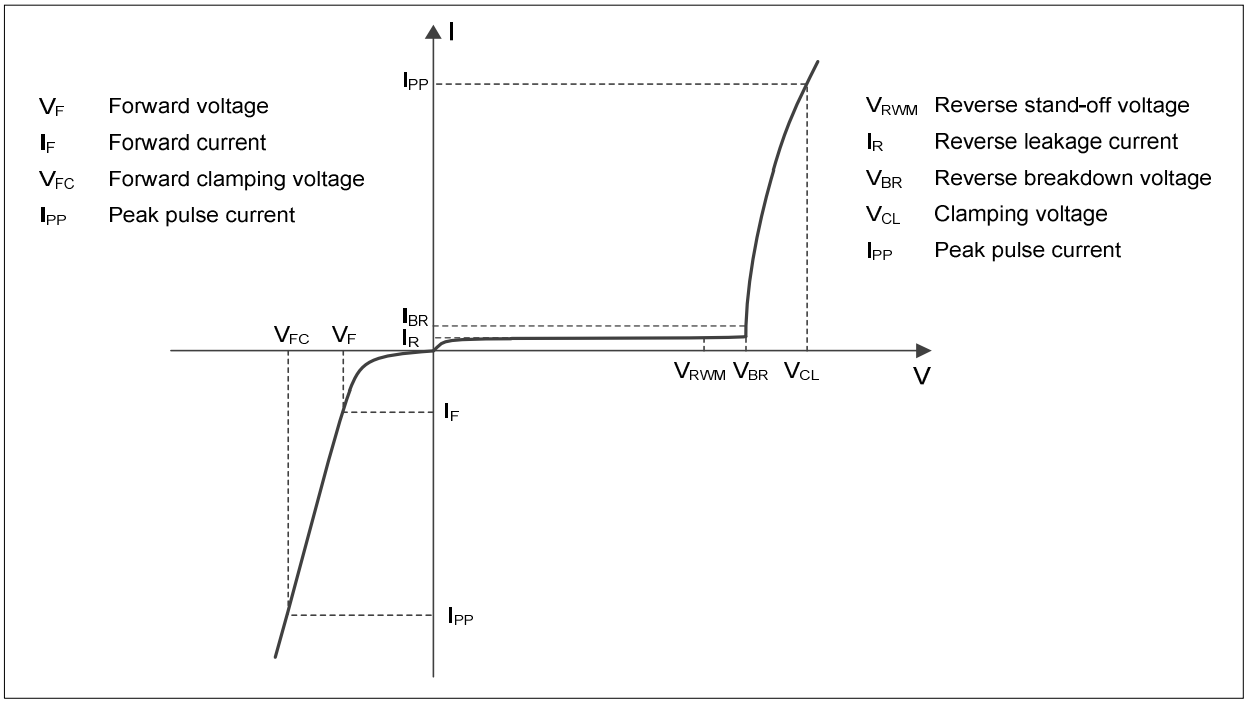
Order information

Device	Package	Shipping
ESD5601W-2/TR	SOD-323F	3000/Tape&Reel

Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse power (t_p = 8/20μs)	P_{pk}	1400	W
Peak pulse current (t_p = 8/20μs)	I_{PP}	80	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)



Definitions of electrical characteristics

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

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				7	V
Reverse leakage current	I_R	V_{RWM} = 7V			1	μA
Reverse breakdown voltage	V_{BR}	I_{BR} = 1mA	7.5	8.6	10	V
Forward voltage	V_F	I_F = 10mA	0.6	0.8	1.2	V
Clamping voltage [1]	V_{CL}	V_{ESD} = 8kV		11		V
Clamping voltage [2]	V_{CL}	I_{PP} = 1A, t_p = 8/20μs		9.7		V
		I_{PP} = 20A, t_p = 8/20μs		11.5		V
		I_{PP} = 80A, t_p = 8/20μs		17.5		V
Dynamic resistance [3]	R_{DYN}			0.09		Ω
Junction capacitance	C_J	V_R = 0V, f = 1MHz		300	400	pF
		V_R = 7V, f = 1MHz		170	220	pF

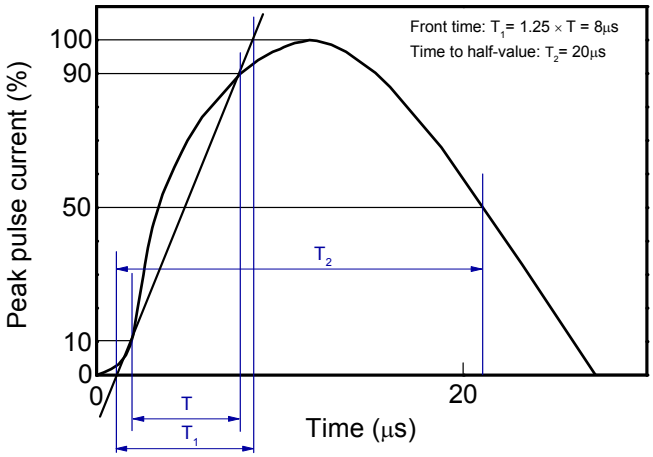
Notes:

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

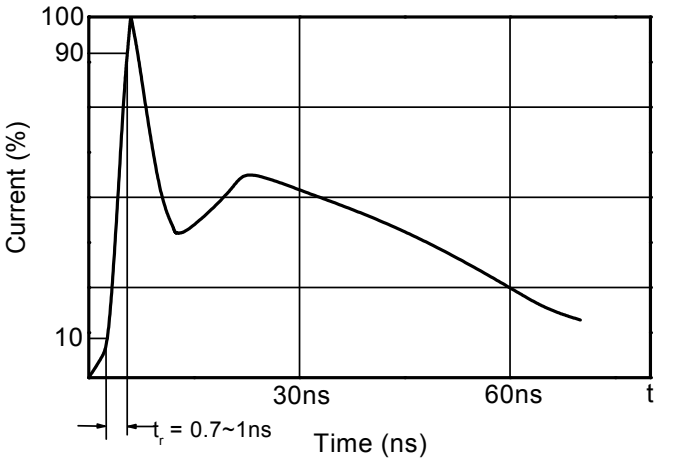
2) Non-repetitive current pulse, according to IEC61000-4-5.

3) Surge parameter: t_p = 8/20μs, R_{DYN} is calculated from 20A to 80A.

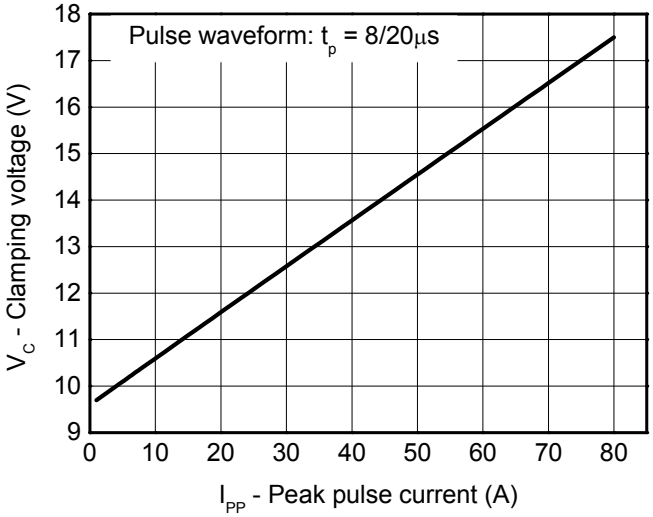
Typical characteristics (T_A=25°C, unless otherwise noted)



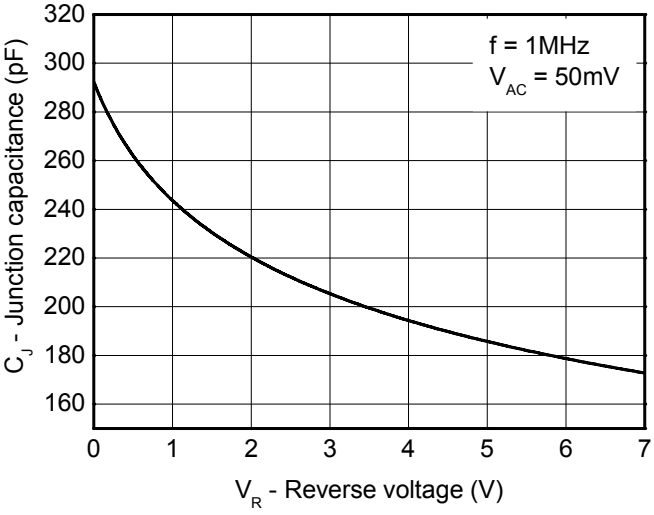
8/20μs waveform per IEC61000-4-5



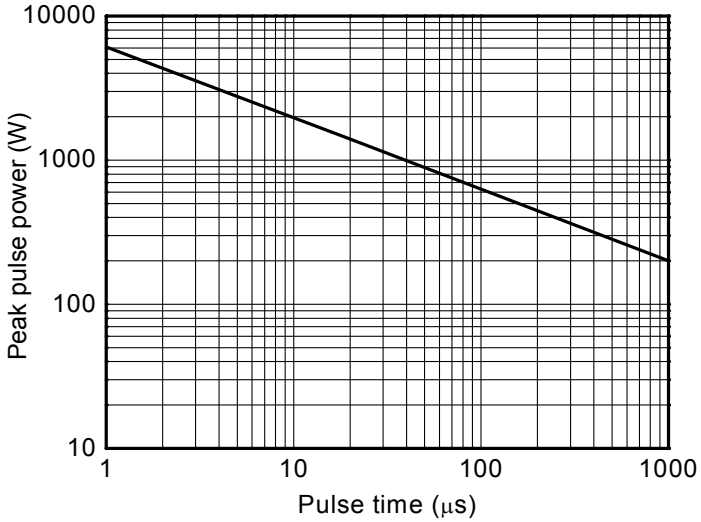
Contact discharge current waveform per IEC61000-4-2



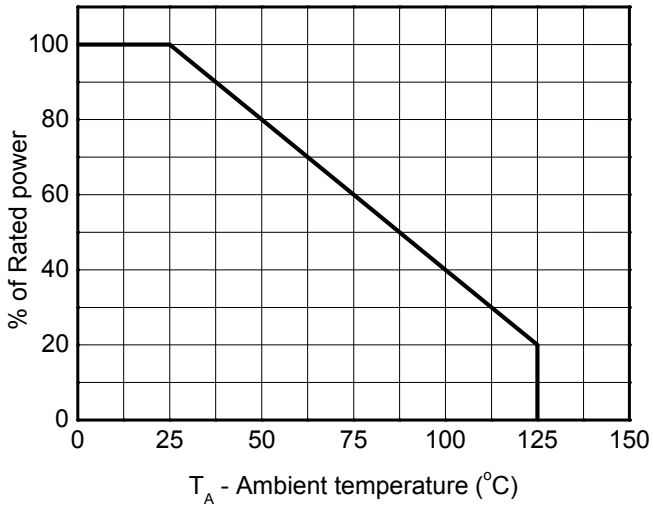
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverse voltage

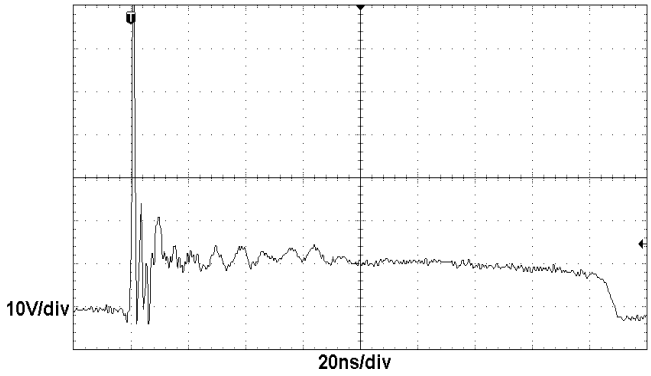


Non-repetitive peak pulse power vs. Pulse time

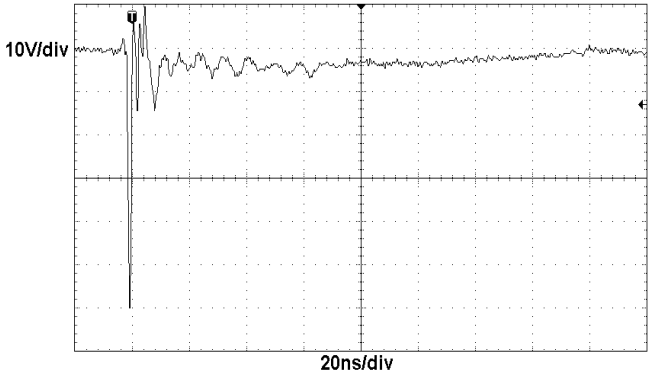


Power derating vs. Ambient temperature

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



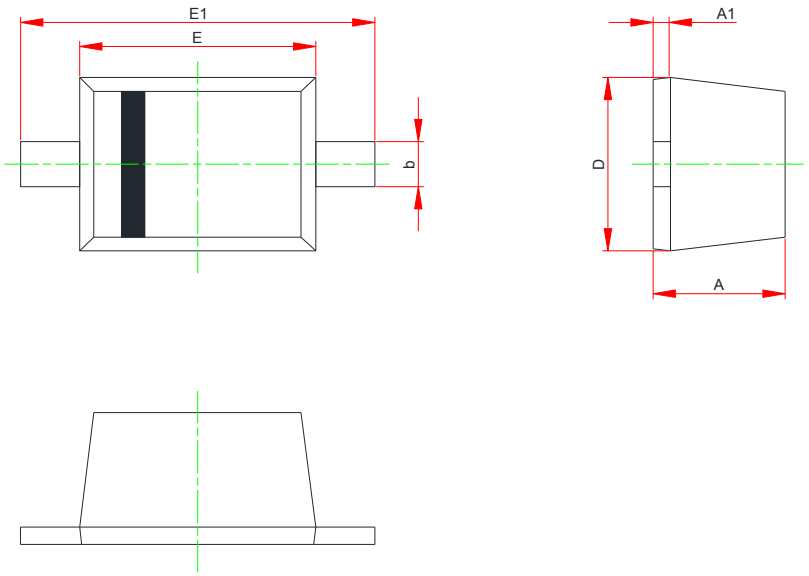
ESD clamping
(+8kV contact discharge per IEC61000-4-2)



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

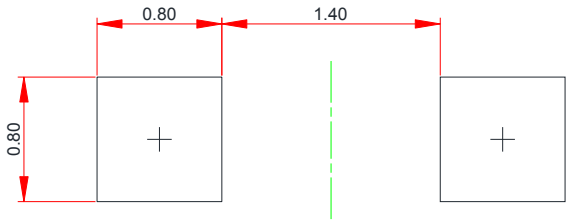
Package outline dimensions

SOD-323F



Symbol	Dimensions in millimeters		
	Min.	Typ.	Max.
A	0.800	-	1.100
A1	0.100	-	0.150
b	0.250	-	0.400
D	1.150	-	1.350
E	1.600	-	1.800
E1	2.300	-	2.800

Recommend 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.