ESD5682E24

2-Line, Uni-directional, Transient Voltage Suppressors

http//:www.sh-willsemi.com

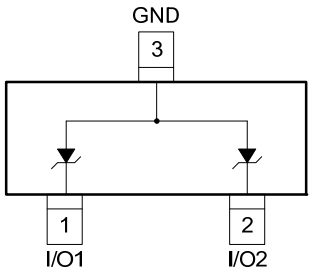
Descriptions

The ESD5682E24 is a transient voltage suppressor designed to protect power interfaces. It is suitable to replace multiple discrete components in portable electronics.

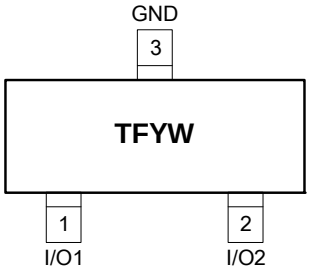
The ESD5682E24 is specifically designed to protect USB Type-C port. TVS diode with high surge capability is used to protect USB Type-C voltage bus pin.

The ESD5682E24 is available in SOT-23 package. Standard products are Pb-free and Halogen-free.

SOT-23 (Top View)



Circuit diagram



TF = Device code

YW = Data code

Marking (Top View)

Features

- Reverse stand-off voltage: 24V Max.
- Surge protection according to IEC61000-4-5
  8/20μs waveform: 8A
- ESD protection according to IEC61000-4-2
  Contact & Air discharge: ±30kV
- Solid-state silicon technology

Applications

- Power supply protection
- Power management

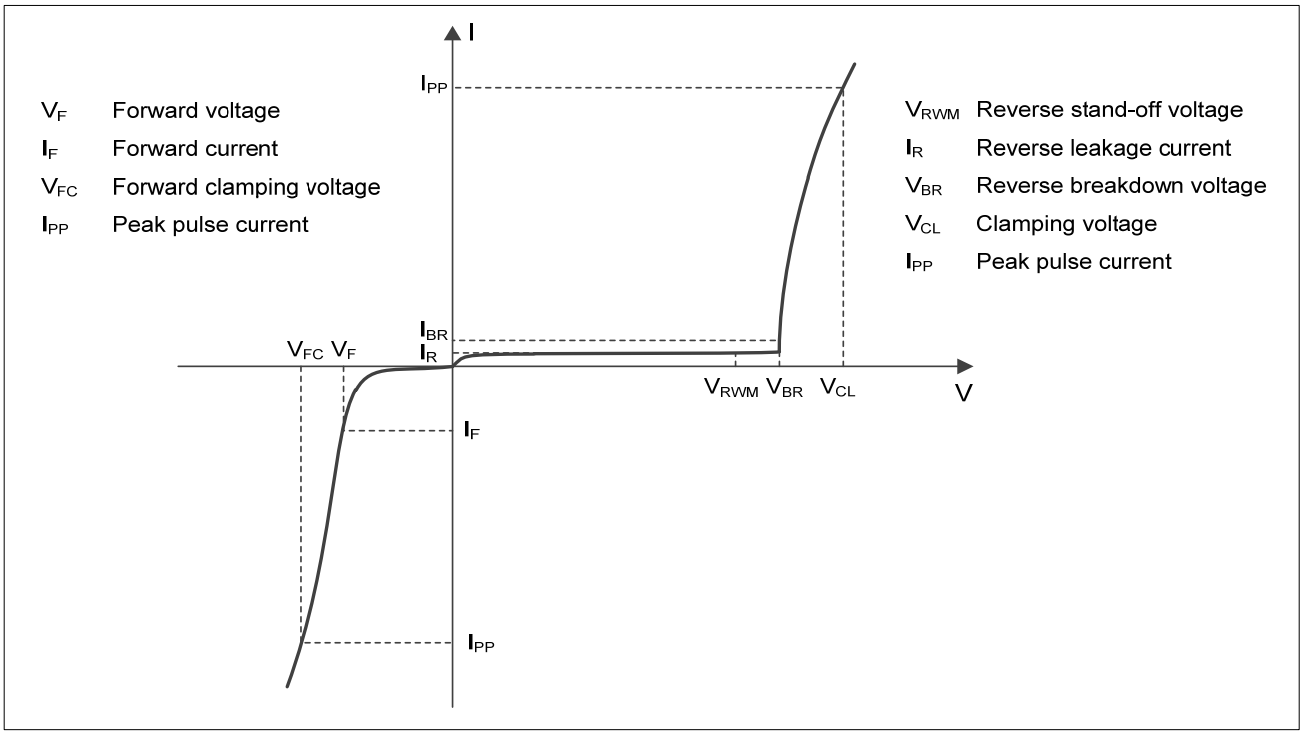
Order information

Device	Package	Shipping
ESD5682E24-3/TR	SOT-23	3000/Tape&Reel

Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse power (tp=8/20μs)	Ppk	360	W
Peak pulse current (t_p = 8/20μs)	I_{PP}	8	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}				24	V
Reverse leakage current	I_R	V_{RWM} = 24V			1	μA
Reverse breakdown voltage	V_{BR}	I_{BR} = 1mA	27	29	33	V
Forward voltage	V_F	I_F = 20mA	0.65	0.83	1.25	V
Clamping voltage 1)	V_{CL}	I_{PP} = 16A, t_p = 100ns		38		V
Clamping voltage 2)	V_{CL}	V_{ESD} = 8kV		39		V
Clamping voltage 3)	V_{CL}	I_{PP} = 1A, t_p = 8/20μs			33	V
		I_{PP} = 8A, t_p = 8/20μs			45	V
Dynamic resistance 1)	R_{DYN}			0.53		Ω
Junction capacitance	C_J	F=1MHz, V_R=0V Any I/O pin to GND		42	50	pF
		F=1MHz, V_R=24V Any I/O pin to GND		12	15	pF

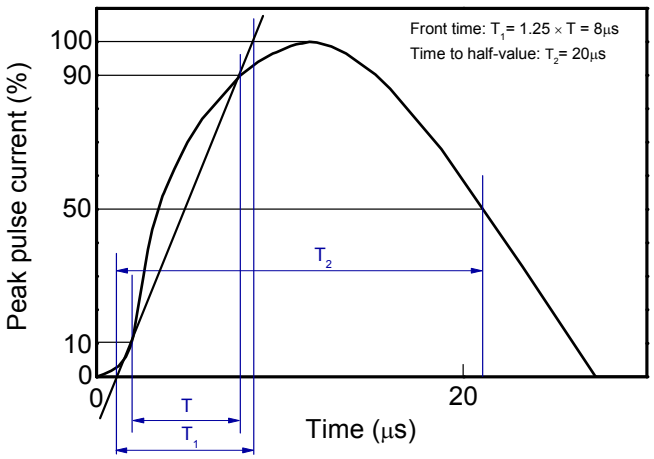
Notes:

1) TLP parameter: Z_0 = 50Ω, t_p = 100ns, t_r = 2ns, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.

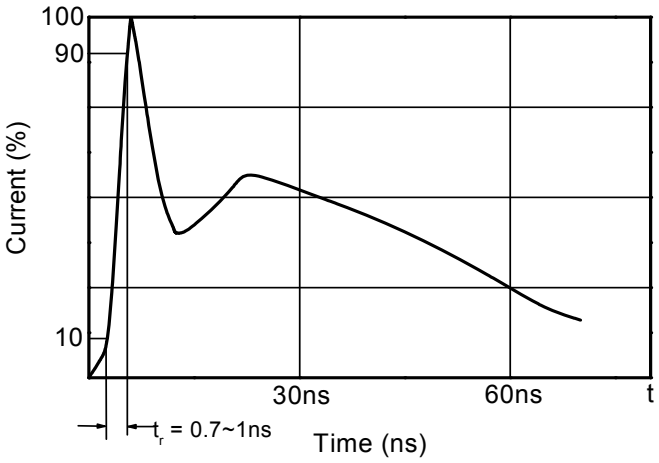
2) Contact discharge mode, according to IEC61000-4-2.

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

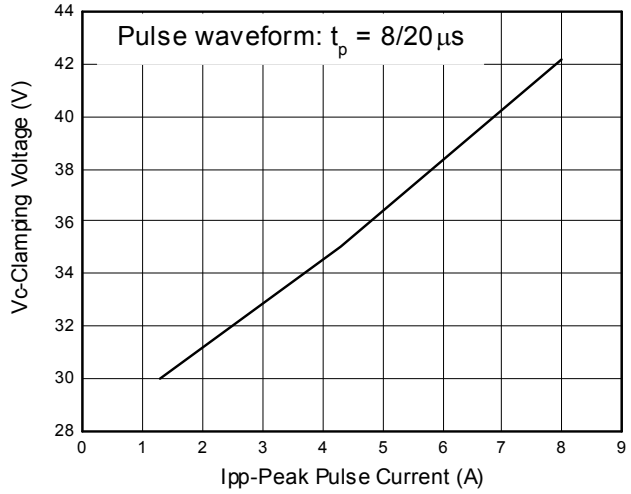
Typical characteristics (T_A = 25°C, unless otherwise noted)



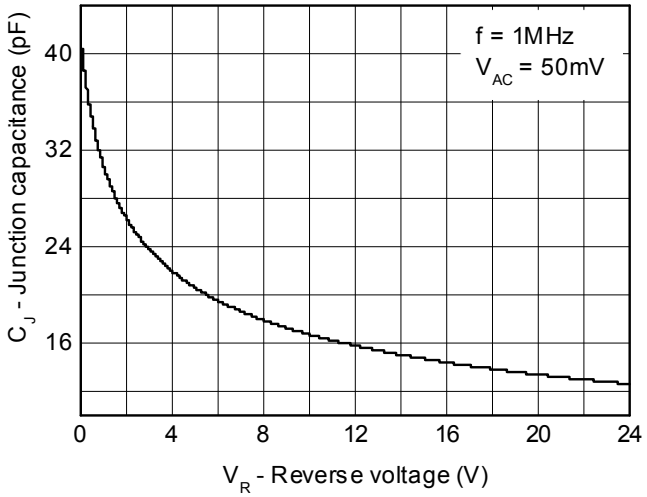
8/20μs waveform per IEC61000-4-5



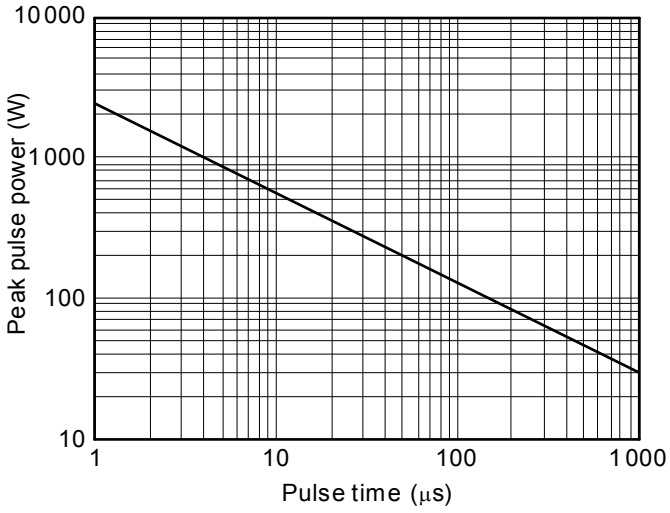
Contact discharge current waveform per IEC61000-4-2



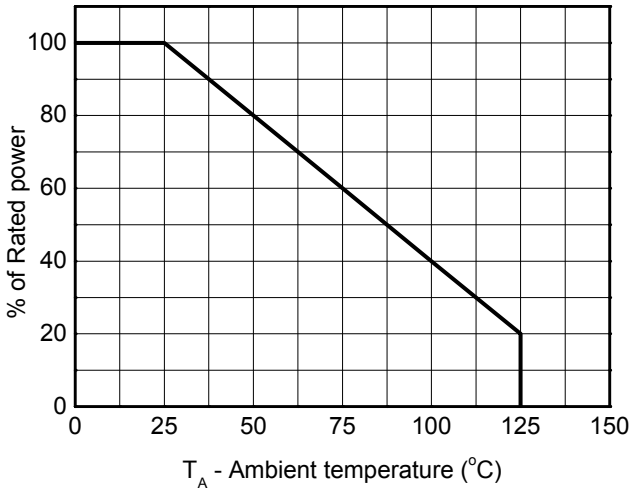
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverse voltage

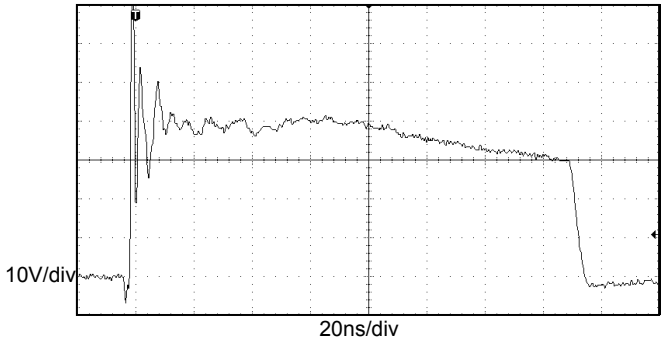


Non-repetitive peak pulse power vs. Pulse time

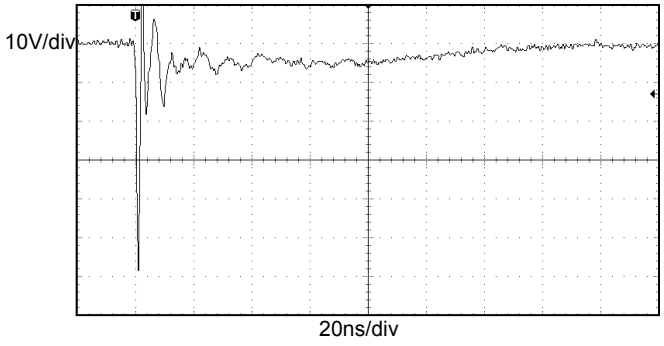


Power derating vs. Ambient temperature

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



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



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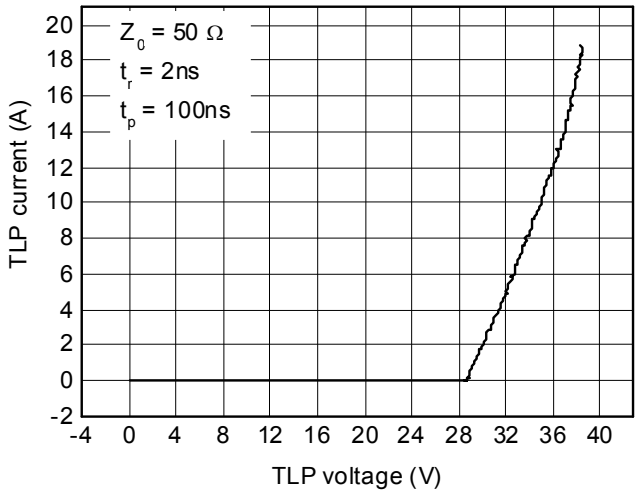
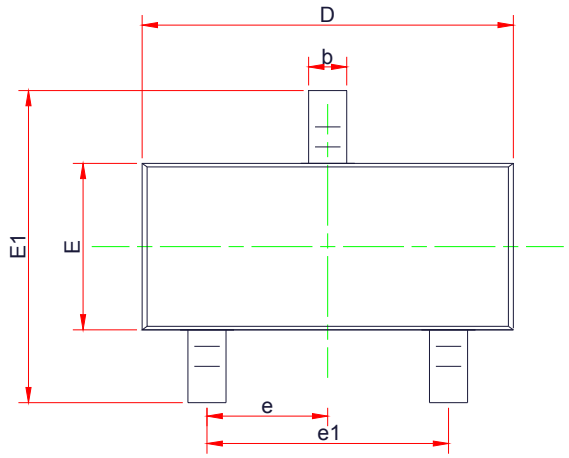


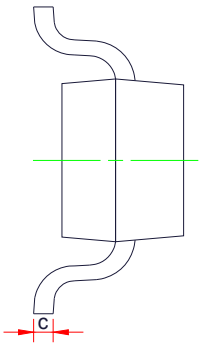
TLP Measurement

PACKAGE OUTLINE DIMENSIONS

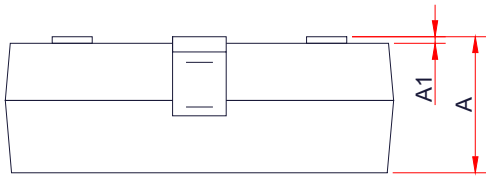
SOT-23



TOP VIEW



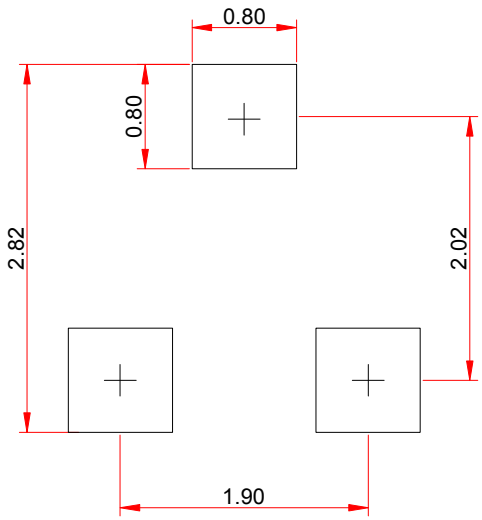
SIDE VIEW



SIDE VIEW

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.89	1.10	1.30
A1	0.00	-	0.10
b	0.30	0.43	0.55
c	0.05	-	0.20
D	2.70	2.90	3.10
E	1.15	1.33	1.50
E1	2.10	2.40	2.70
e	0.95 Typ.		
e1	1.70	1.90	2.10

Recommended land pattern (Unit: mm)

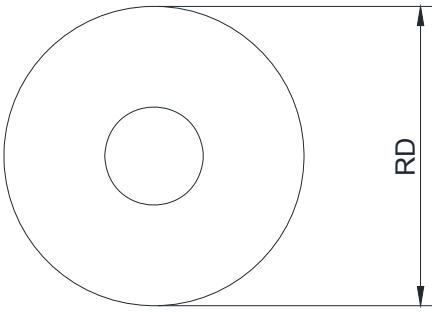


Notes:

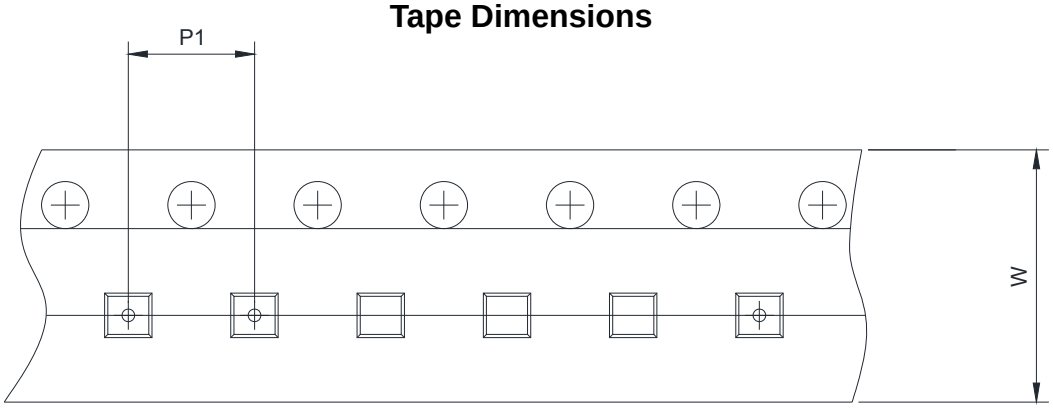
This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.

TAPE AND REEL INFORMATION

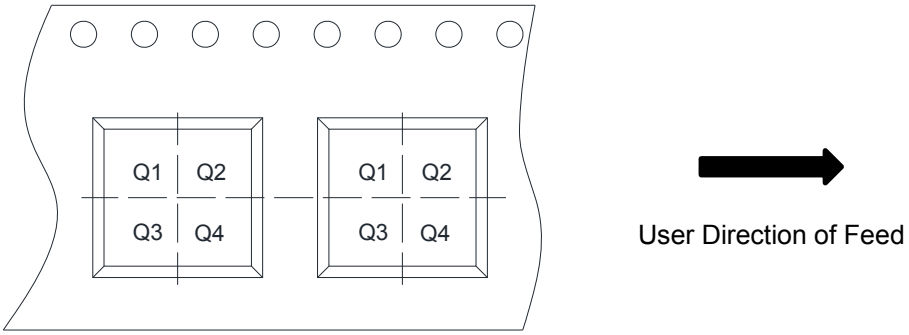
Reel Dimensions



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