ESD5432E

2-Lines, Bi-directional, Transient Voltage Suppressors

http//:www.sh-willsemi.com

Descriptions

The ESD5432E is a 2-lines bi-directional TVS (Transient Voltage Suppressor). It is specifically designed to protect sensitive electronic components which are connected to power lines, low speed data lines and control lines from over-stress caused by ESD (Electrostatic Discharge), EFT (Electrical Fast Transients) and Lightning.

The ESD5432E may be used to provide ESD protection up to ±30kV (contact discharge) according to IEC61000-4-2, and withstand peak pulse current up to 10A (8/20μs) according to IEC61000-4-5.

The ESD5432E is available in SOT-23 package. Standard products are Pb-free and Halogen-free.

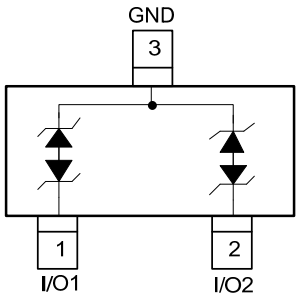
Features

- Stand-off voltage: ±3.3V Max
- Transient protection for each line according to
  IEC61000-4-2 (ESD): ±30kV (contact discharge)
  IEC61000-4-4 (EFT): 40A (5/50ns)
  IEC61000-4-5 (surge): 10A (8/20μs)
- Capacitance: C_J = 17.5pF typ.
- Low leakage current: I_R = 1nA typ.
- Low clamping voltage: V_{CL} = 8V typ. @ I_{PP} = 16A (TLP)
- Solid-state silicon technology

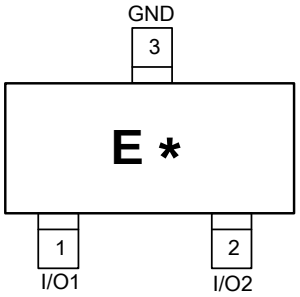
Applications

- Cellular handsets
- Computers and peripherals
- Microprocessors
- Power lines
- Portable Electronics
- Notebooks

SOT-23



Circuit diagram



1 = Device code

* = Month code (A~Z)

Marking (Top View)

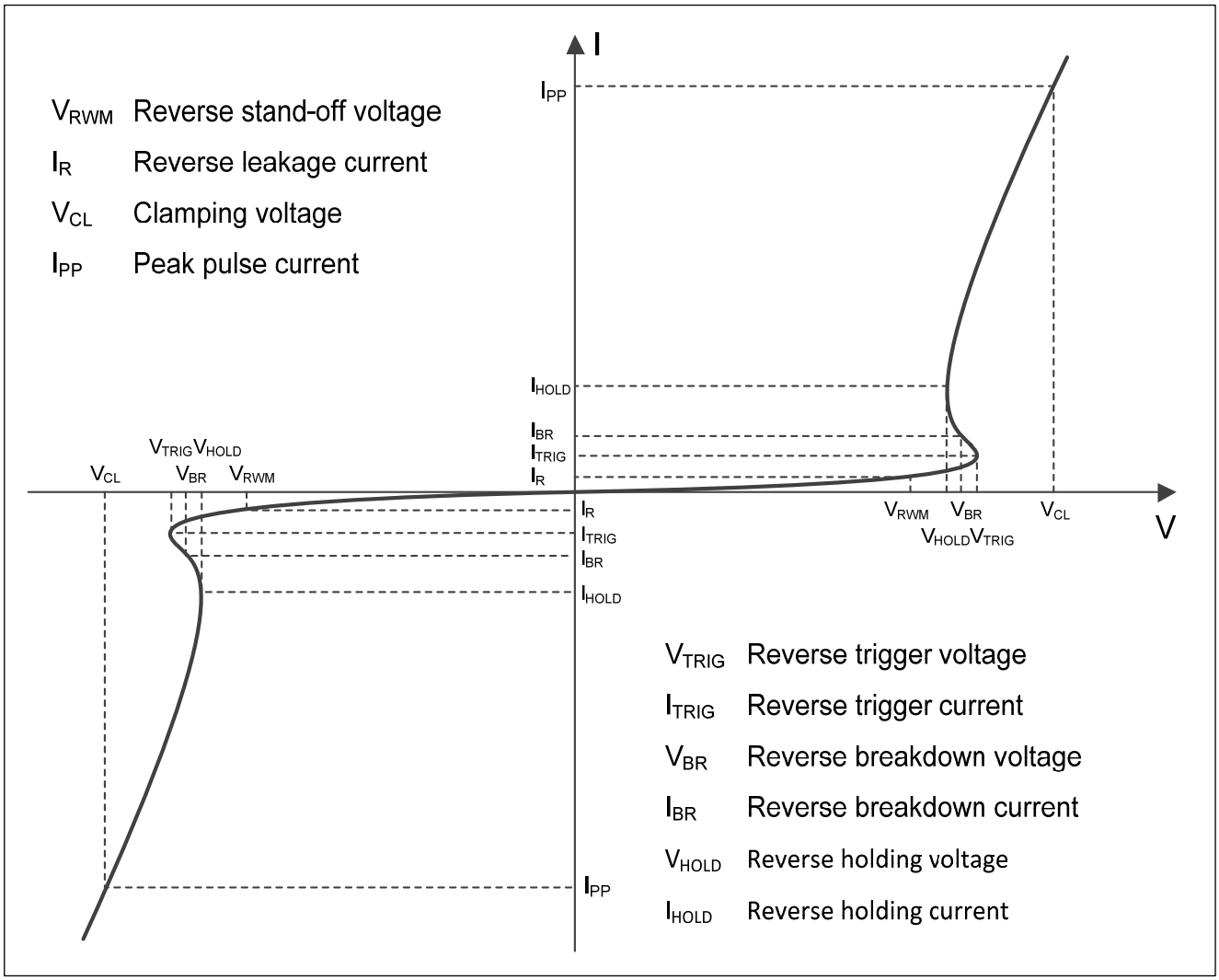
Order information

Device	Package	Shipping
ESD5432E-3/TR	SOT-23	3000/Tape&Reel

Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse power (t_p = 8/20μs)	P_{pk}	100	W
Peak pulse current (t_p = 8/20μs)	I_{PP}	10	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	±30	kV
ESD according to IEC61000-4-2 contact discharge		±30	
Operation junction temperature	T_J	125	°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}				±3.3	V
Reverse leakage current	I_R	V_{RWM} = 3.3V		1	100	nA
Reverse breakdown voltage	V_{BR}	I_{BR} = 1mA	3.4			V
Reverse holding voltage	V_{HOLD}	I_{HOLD} = 50mA	3.4			V
Clamping voltage 1)	V_{CL}	I_{PP} = 16A, t_p = 100ns		8		V
Clamping voltage 2)	V_{CL}	V_{ESD} = 8kV		8		V
Clamping voltage 3)	V_{CL}	I_{PP} = 1A, t_p = 8/20μs			6	V
		I_{PP} = 5A, t_p = 8/20μs			8	V
		I_{PP} = 10A, t_p = 8/20μs			10	V
Dynamic resistance 1)	R_{DYN}			0.20		Ω
Junction capacitance	C_J	V_R = 0V, f = 1MHz Any IO to GND		17.5	22	pF
		V_R = 0V, f = 1MHz Any IO to IO		9	12	pF

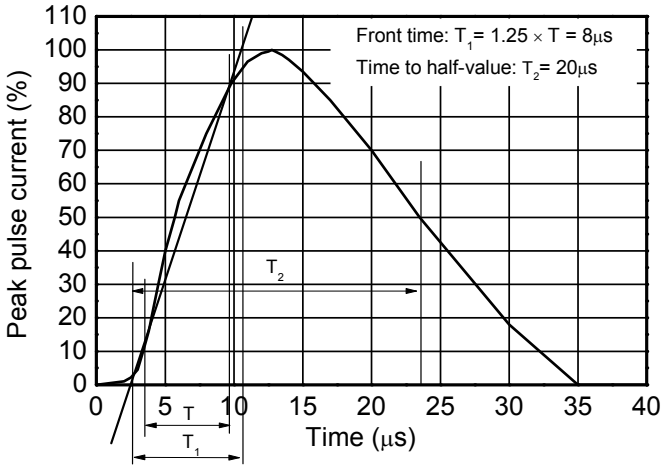
Notes:

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.

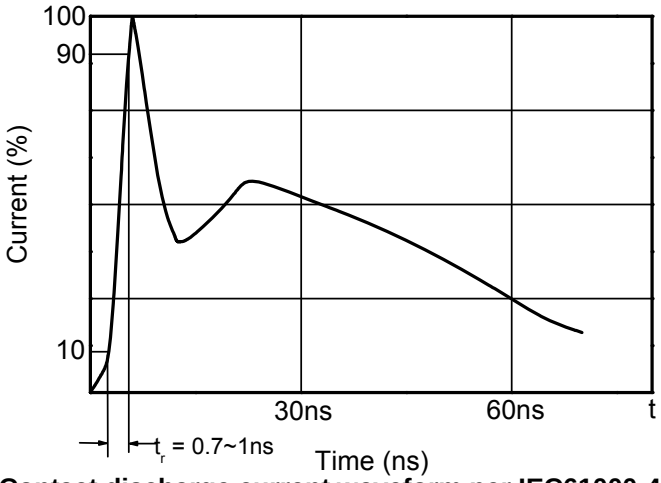
2) Contact discharge mode, according to IEC61000-4-2.

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

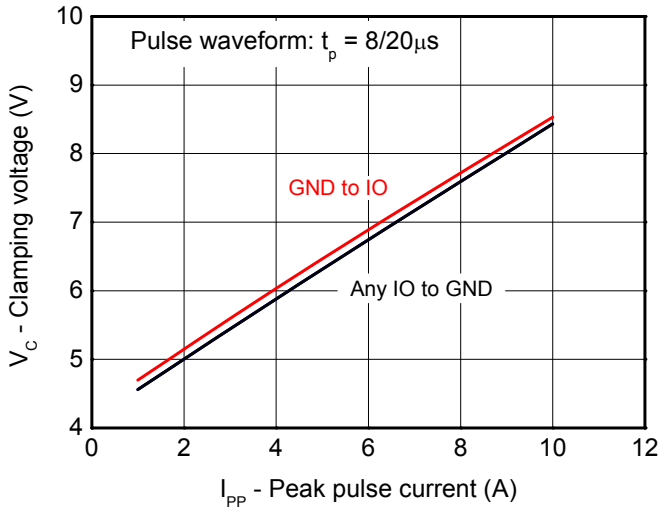
Typical characteristics (T_A = 25°C, unless otherwise noted)



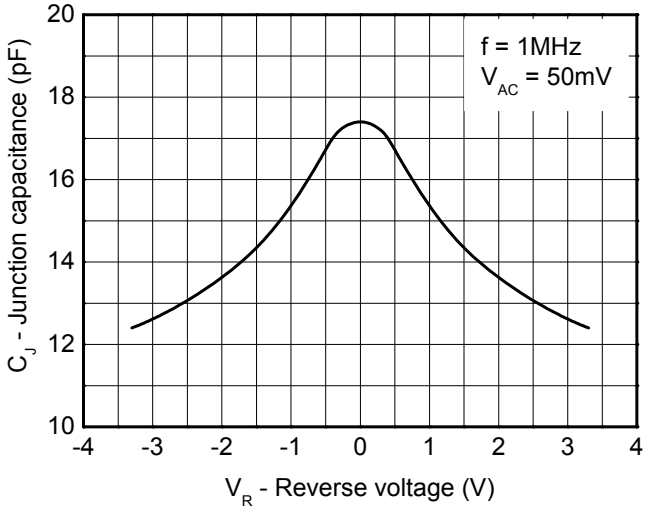
8/20μs waveform per IEC61000-4-5



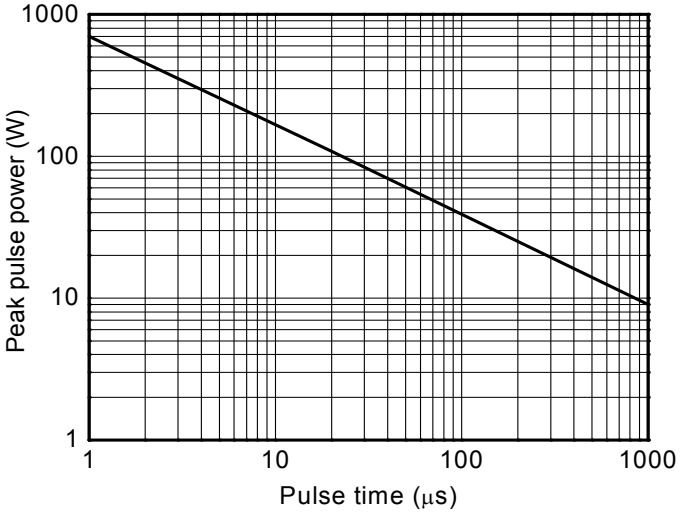
Contact discharge current waveform per IEC61000-4-2



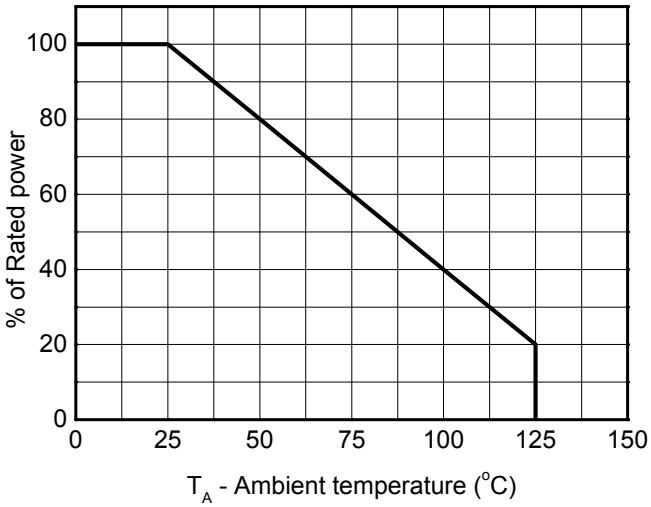
Clamping voltage vs. Peak pulse current



Capacitance vs. Reveres voltage

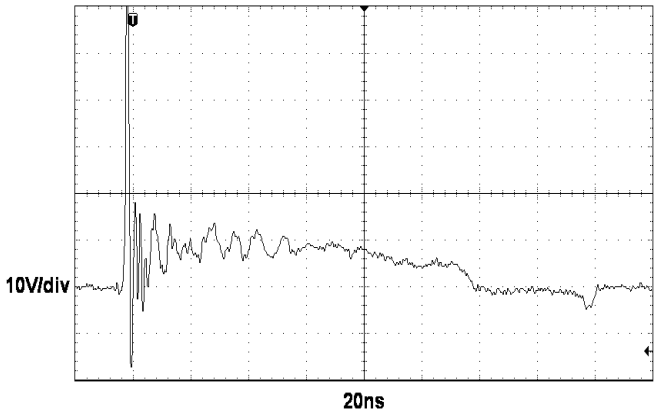


Non-repetitive peak pulse power vs. Pulse time

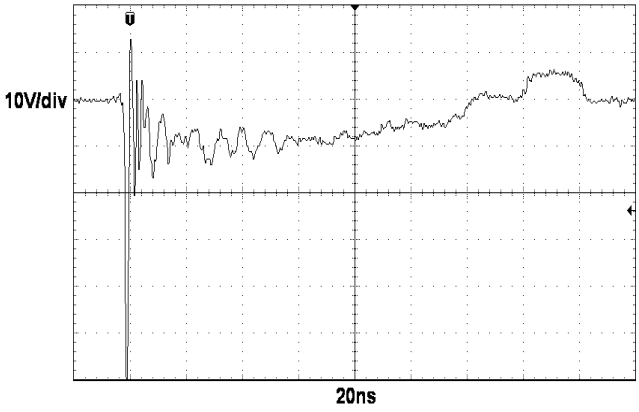


Power derating vs. Ambient temperature

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



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



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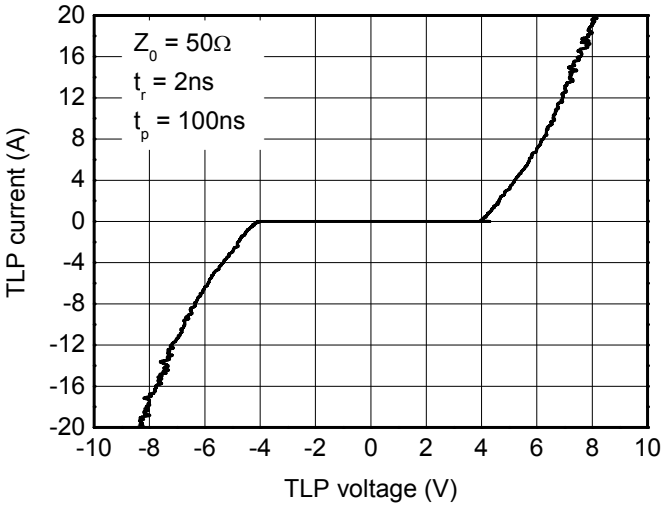
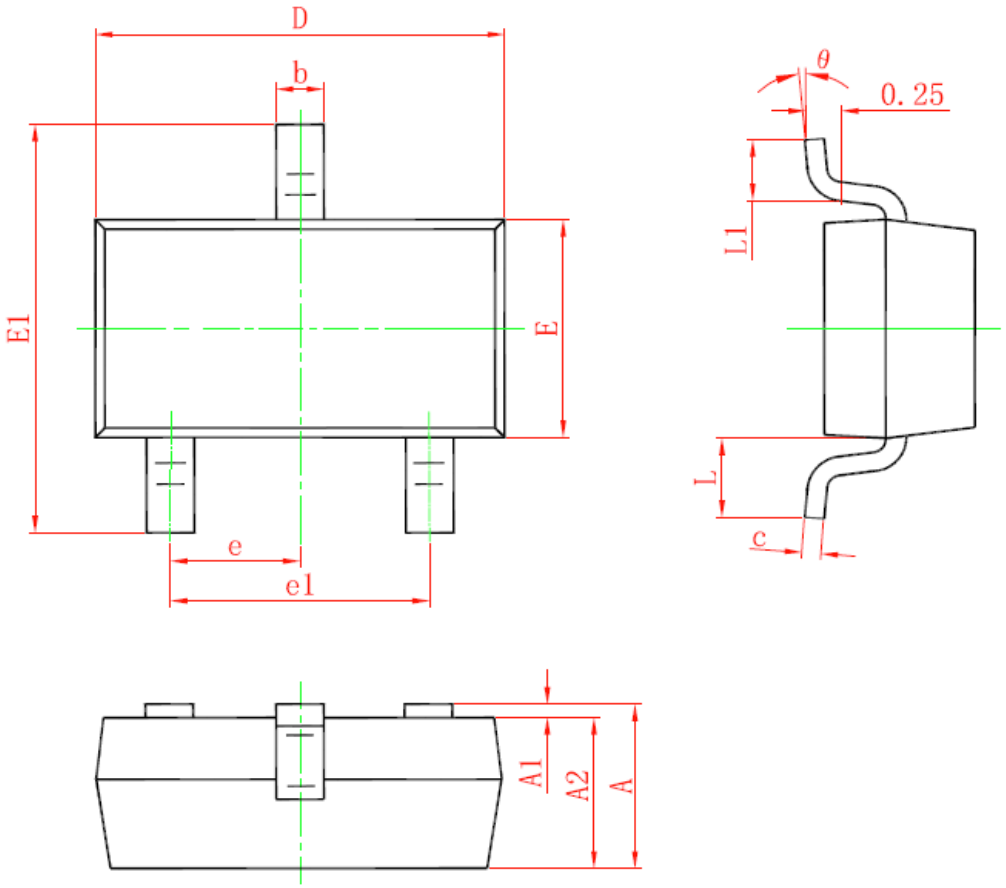


TLP Measurement

Package outline dimensions

SOT-23



Symbol	Dimensions in millimeters		Dimensions in inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.022REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°