ESD9X5V

1-Line, Uni-directional, Transient Voltage Suppressor

http//:www.sh-willsemi.com

Descriptions

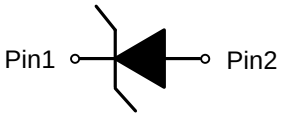
The ESD9X5V is a Uni-directional TVS (Transient Voltage Suppressor) designed to protect sensitive electronic components from damage due to ESD (Electrostatic Discharge), EFT (Electrical Fast Transients) and CDE (Cable Discharge Event). The ESD9X5V has been specifically designed to replace MLV (Multilayer Varistor) in portable application such as cellular handsets, notebook computers, tablets and PADs.

The ESD9X5V is based on solid-state silicon technology and offer unique electrical characteristics like lower clamping voltage and no device degrading compared to MLV.

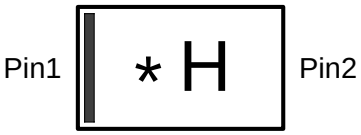
The ESD9X5V may be used to provide ESD protection up to ±30kV (contact discharge) according to IEC61000-4-2, and withstand peak pulse current up to 11A (8/20μs) according to IEC61000-4-5.

The ESD9X5V is available in FBP-02C package. Standard products are Pb-free and Halogen-free.

FBP-02C (Bottom view)



Circuit diagram



*** = Month (A~Z)**
H = Device code
Marking (Top View)

Features

- Stand-off voltage: 5V Max.
- Transient protection for each line according to IEC61000-4-2 (ESD): ±30kV (contact discharge) IEC61000-4-5 (surge): 11A (8/20μs)
- Capacitance: C_J = 60pF typ.
- Low clamping voltage
- Solid-state silicon technology

Applications

- Cellular handsets
- Tablets
- Computers and peripherals
- Notebooks
- Digital camera
- Other electronic equipment

Order information

Device	Package	Shipping
ESD9X5V-2/TR	FBP-02C	10000/Tape&Reel

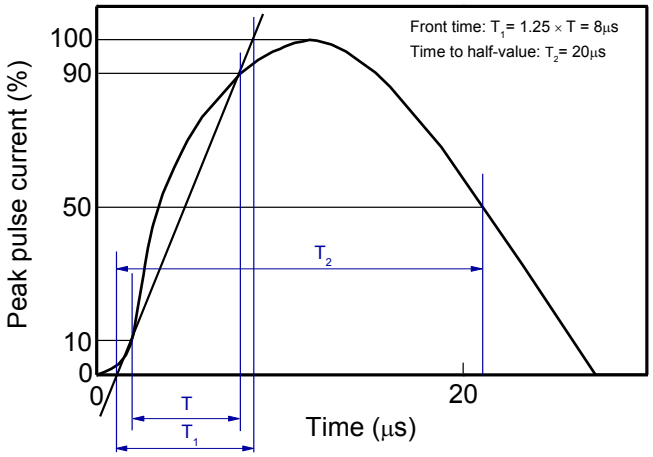
Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse power (t_p = 8/20μs)	P_{pk}	154	W
Peak pulse current (t_p = 8/20μs)	I_{PP}	11	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

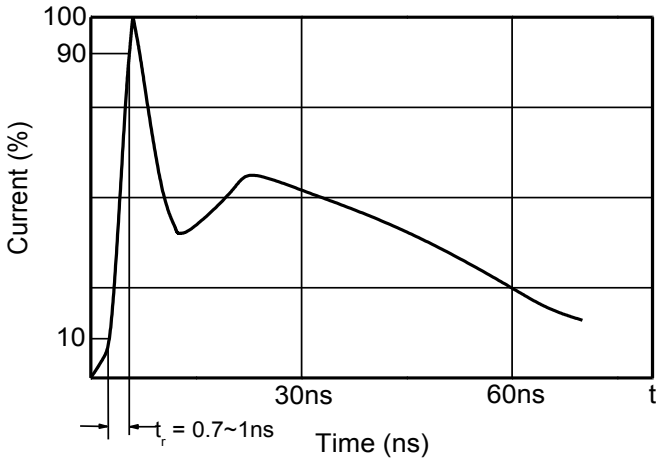
Electronics characteristics (T_A = 25°C, unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				5.0	V
Reverse leakage current	I_R	V_{RWM} = 5V			1.0	μA
Reverse breakdown voltage	V_{BR}	I_T = 1mA	6.2	6.8	7.6	V
Forward voltage	V_F	I_F = 1mA	0.4	0.8	1.3	V
Clamping voltage	V_{CL}	I_{PP} = 1A, t_p = 8/20μs			7.5	V
		I_{PP} = 11A, t_p = 8/20μs			14	V
Junction capacitance	C_J	V_R = 0V, f = 1MHz		60	70	pF

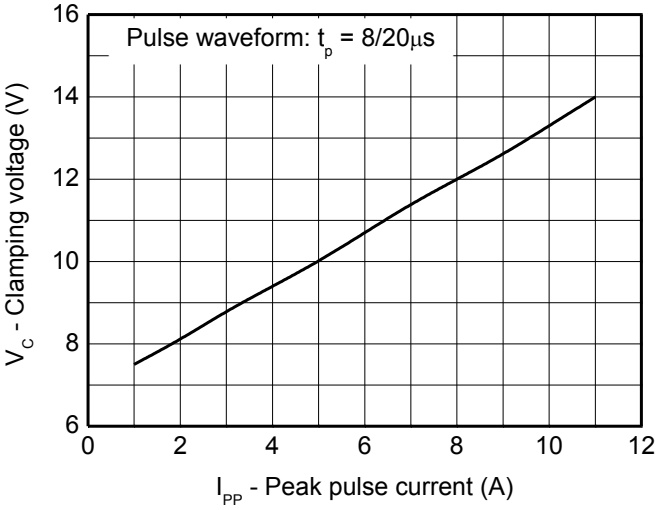
Typical characteristics (T_A = 25°C, unless otherwise noted)



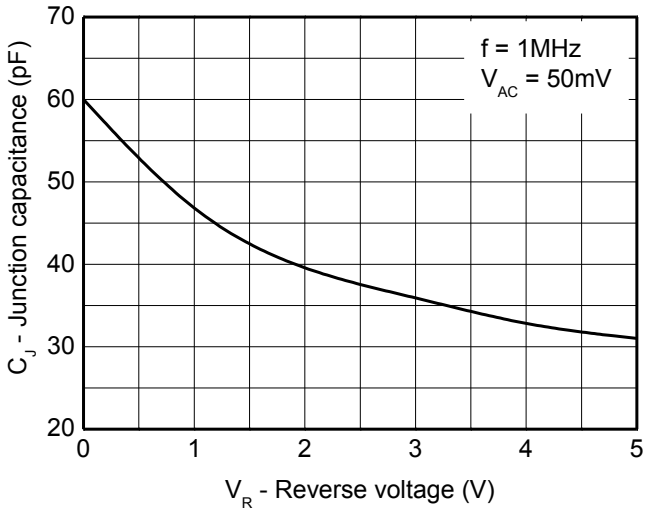
8/20μs waveform per IEC61000-4-5



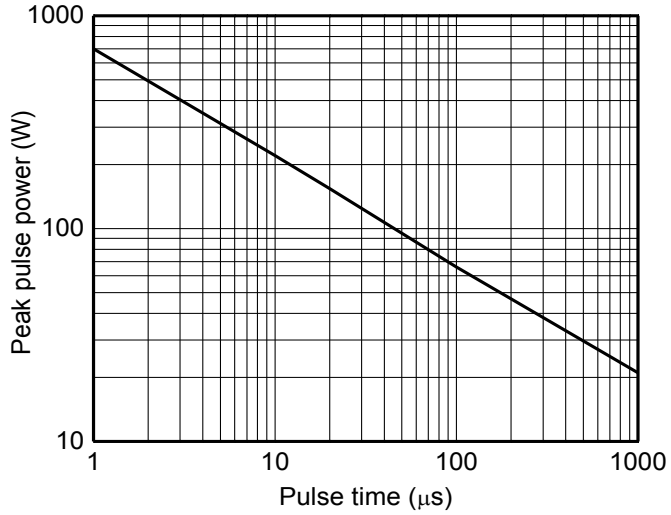
Contact discharge current waveform per IEC61000-4-2



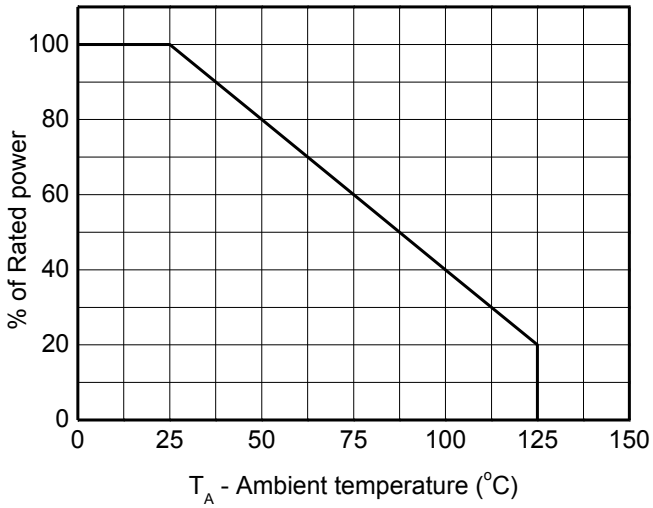
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverse voltage

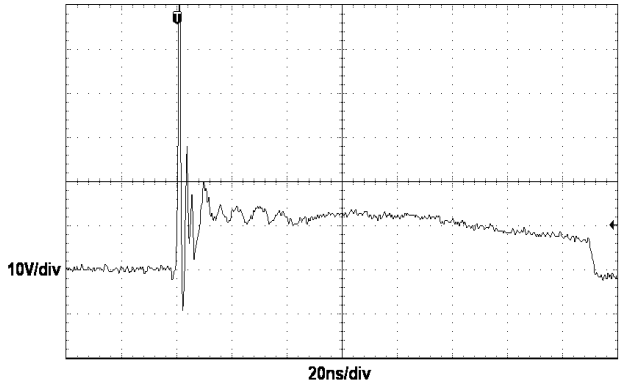


Non-repetitive peak pulse power vs. Pulse time

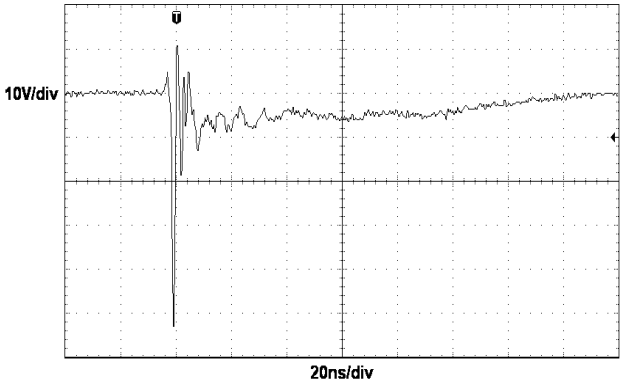


Power derating vs. Ambient temperature

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



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



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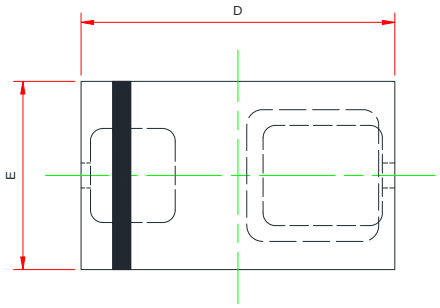
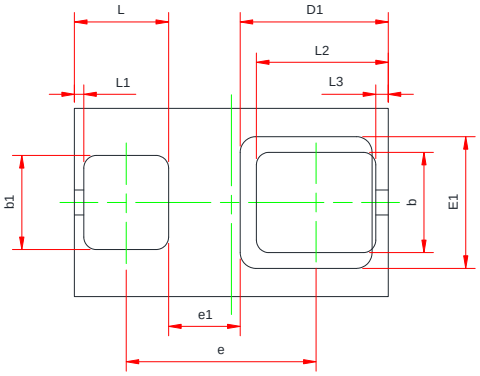
(-8kV contact discharge per IEC61000-4-2)

Package outline dimensions

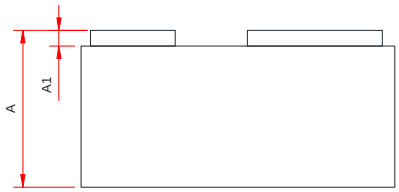
FBP-02C



Top View



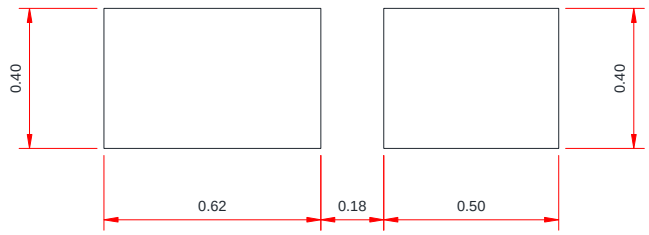
Bottom View



Side View

Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	0.450	0.500	0.550
A1	0.010	--	0.100
D	0.950	1.000	1.050
E	0.550	0.600	0.650
D1	0.470 Ref.		
E1	0.420 Ref.		
b	0.270	0.320	0.370
b1	0.250	0.300	0.350
e	0.555	0.605	0.655
e1	0.230 Ref.		
L	0.250	0.300	0.350
L1	0.030 Ref.		
L2	0.370	0.420	0.470
L3	0.040 Ref.		

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.