

ESD9X7V

1-Line, Uni-directional, Normal capacitance Transient Voltage Suppressor

<http://www.sh-willsemi.com>

Descriptions

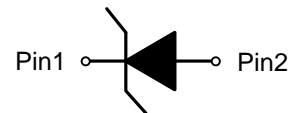
The ESD9X7V is a transient voltage suppressor (TVS) which provides a very high level protection for sensitive electronic components that may be subjected to electrostatic discharge (ESD). It is designed to replace multilayer varistors (MLV) in consumer equipment applications such as mobile phone, notebook, PAD, STB, LCD TV etc.

The ESD9X7V was past ESD transient voltage up to $\pm 30\text{kV}$ (contact) according to IEC61000-4-2 and withstand peak current up to 9.5A for 8/20 μs pulse according to IEC61000-4-5.

The ESD9X7V is available in FBP-02C package. Standard products are Pb-free and Halogen-free.



FBP-02C



Pin configuration (Top view)



* = Month (A~Z)

J = Device code

Marking (Top View)

Features

- Working voltage : 7V
- Peak power (tp=8/20 μs) : 142W
- ESD protection
 - IEC61000-4-2 (Contact) : $\pm 30\text{kV}$
 - IEC61000-4-2 (Air) : $\pm 30\text{kV}$
- Low leakage current
- Small package

Order information

Device	Package	Shipping
ESD9X7V-2/TR	FBP-02C	10000/Tape&Reel

Applications

- Mobile phone
- PAD
- Notebook
- STB
- LCD TV
- Digital camera
- Other electronic equipment

Absolute maximum ratings

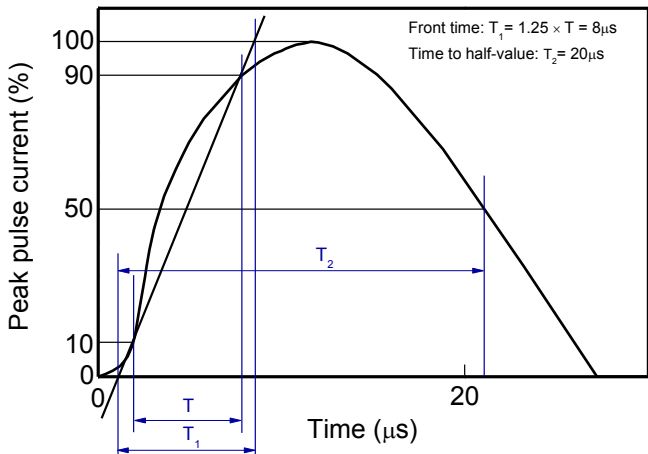
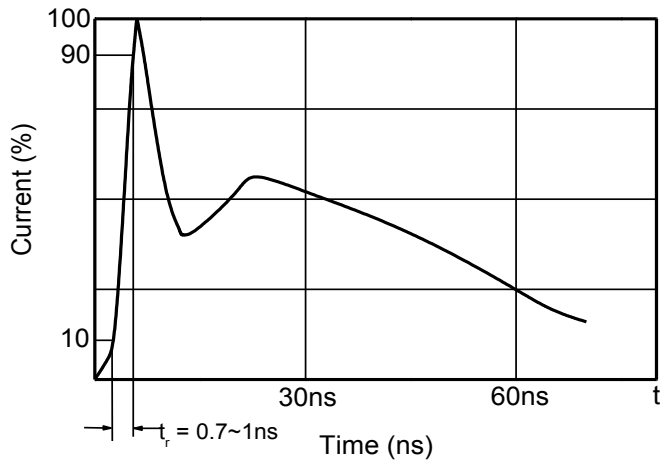
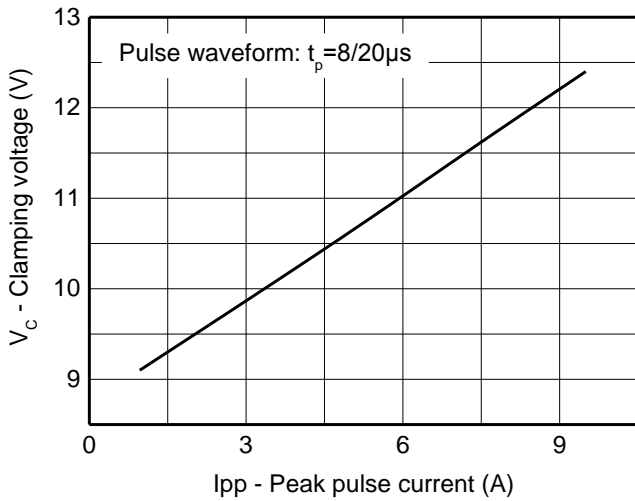
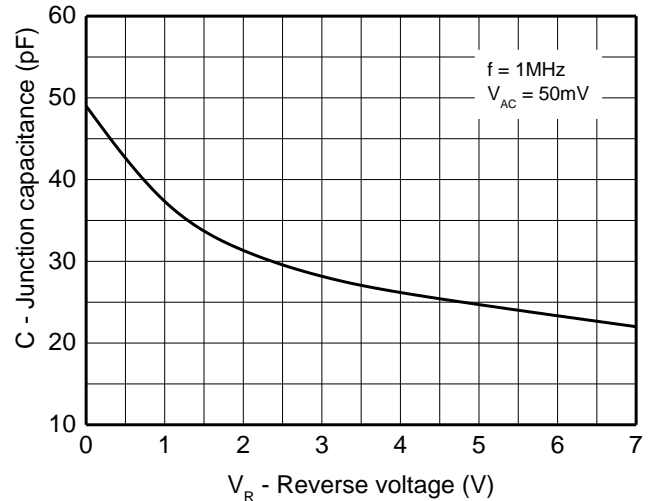
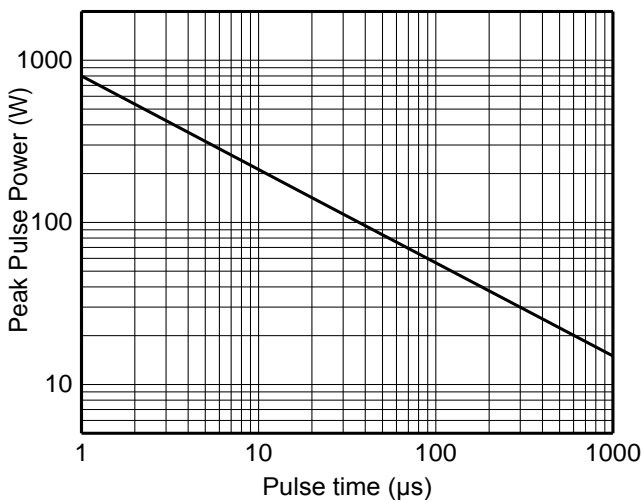
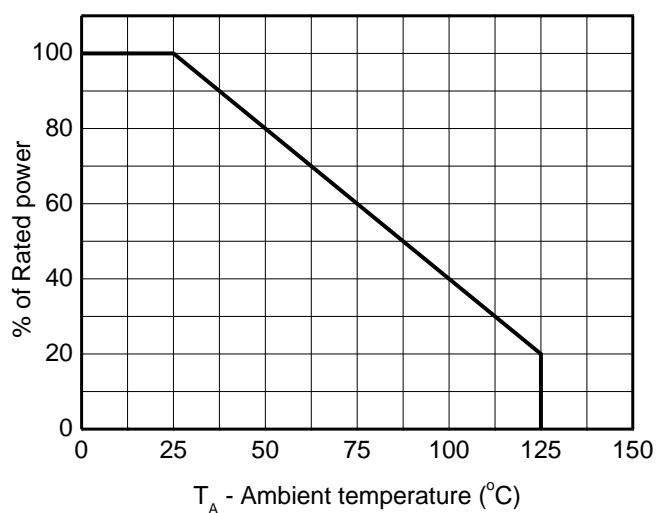
Parameter	Symbol	Rating	Unit
Peak pulse power ($t_p = 8/20\mu s$)	Ppk	142	W
Peak pulse current ($t_p = 8/20\mu s$)	Ipp	9.5	A
ESD according to IEC61000-4-2 air discharge	V _{ESD}	±30	kV
ESD according to IEC61000-4-2 contact discharge		±30	
Junction temperature	T _J	125	°C
Operating temperature	T _{OP}	-40~85	°C
Lead temperature	T _L	260	°C
Storage temperature	T _{STG}	-55~150	°C

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

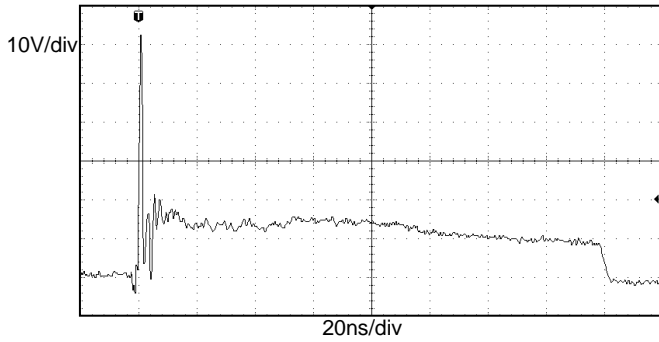
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V _{RWM}				7	V
Reverse leakage current	I _R	V _{RWM} =7V			100	nA
Reverse breakdown voltage	V _{BR}	I _T =1mA	8.0	8.5	10.0	V
Forward voltage	V _F	I _F =10mA	0.55	0.9	1.25	V
Clamping voltage ¹⁾	V _{CL}	I _{PP} = 16A, t _p = 100ns		12		
Dynamic resistance ¹⁾	R _{DYN}	t _p = 100ns		0.24		Ω
Clamping voltage ²⁾	V _{CL}	V _{ESD} = 8kV		12.5		V
Clamping voltage ³⁾	V _C	I _{pp} =1A, t _p =8/20μs			11	V
		I _{pp} =9.5A, t _p =8/20μs			15	V
Junction capacitance	C _J	f=1MHz, V _R =0V		49	65	pF

Notes:

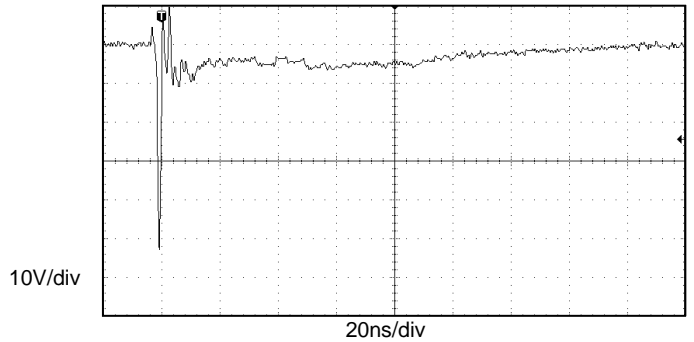
- 1) TLP parameter: Z₀ = 50Ω, t_p = 100ns, t_r = 2ns, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.
- 2) Contact discharge mode, according to IEC61000-4-2.
- 3) Non-repetitive current pulse, according to IEC61000-4-5.

Typical characteristics (Ta=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

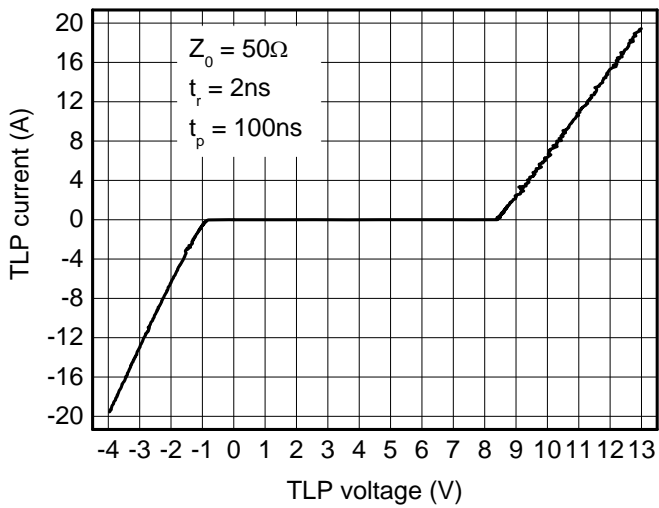
Typical characteristics (Ta=25°C, unless otherwise noted)



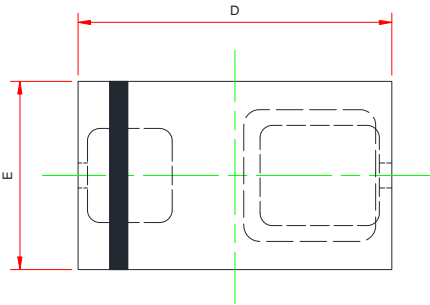
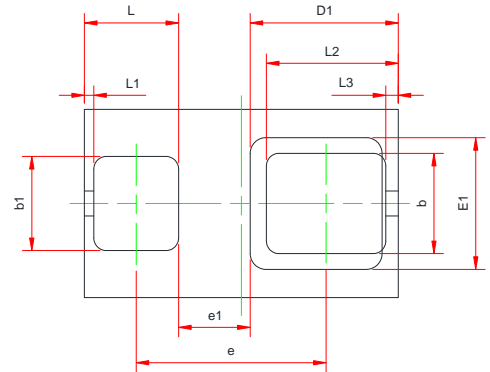
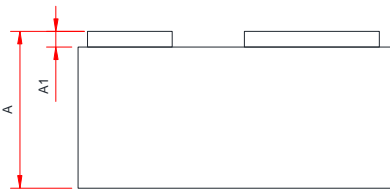
ESD Clamping
(+8kV contact discharge per IEC61000-4-2)



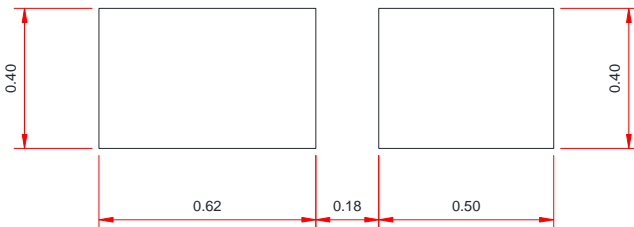
ESD Clamping
(-8kV contact discharge per IEC61000-4-2)



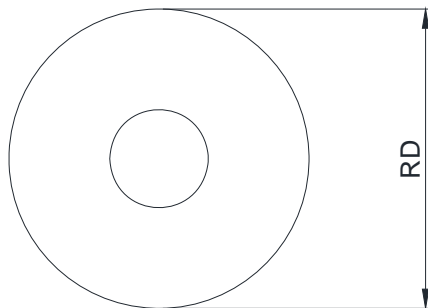
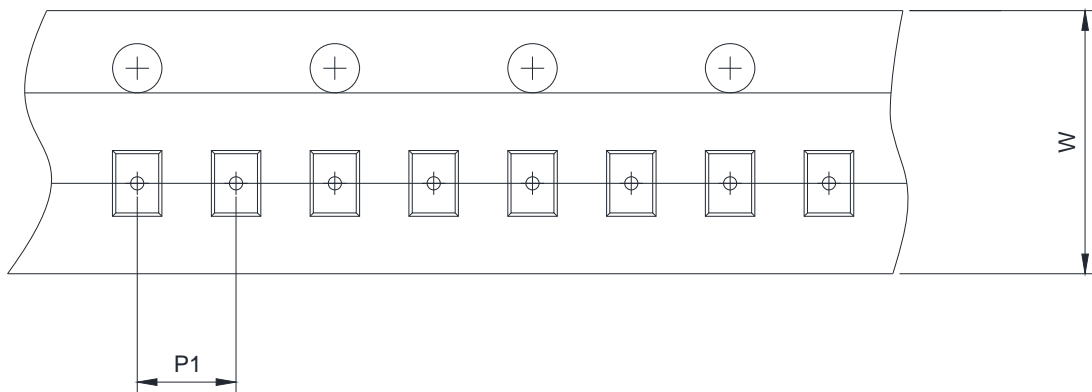
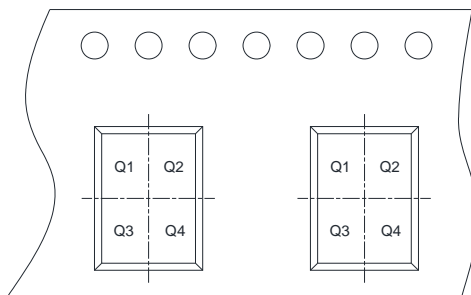
TLP Measurement

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.

TAPE AND REEL INFORMATION
Reel Dimensions

Tape Dimensions

Quadrant Assignments For PIN1 Orientation In Tape



 User Direction of Feed

RD	Reel Dimension	<input checked="" type="checkbox"/> 7inch	<input type="checkbox"/> 13inch
W	Overall width of the carrier tape	<input checked="" type="checkbox"/> 8mm	<input type="checkbox"/> 12mm <input type="checkbox"/> 16mm
P1	Pitch between successive cavity centers	<input checked="" type="checkbox"/> 2mm	<input type="checkbox"/> 4mm <input type="checkbox"/> 8mm
Pin1	Pin1 Quadrant	<input checked="" type="checkbox"/> Q1	<input checked="" type="checkbox"/> Q2 <input type="checkbox"/> Q3 <input type="checkbox"/> Q4