ESD5341X

1-Line, Uni-directional, Low Capacitance Transient Voltage Suppressor

http//:www.sh-willsemi.com

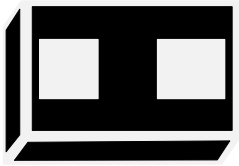
Descriptions

The ESD5341X is a low capacitance TVS (Transient Voltage Suppressor) designed to protect high speed data interfaces. It has been specifically designed to protect sensitive electronic components which are connected to data and transmission lines from over-stress caused by ESD (Electrostatic Discharge).

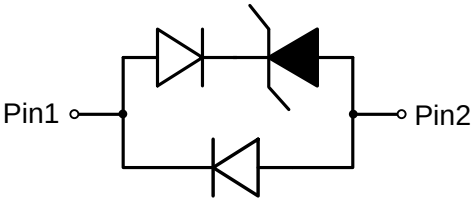
The ESD5341X incorporates one pair of low capacitance steering diodes plus a TVS diode.

The ESD5341X may be used to provide ESD protection up to ±20kV (contact discharge) according to IEC61000-4-2, and withstand peak pulse current up to 4A (8/20μs) according to IEC61000-4-5.

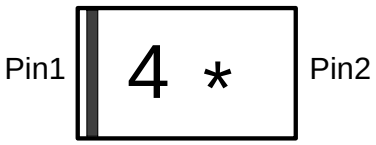
The ESD5341X is available in FBP-02C package. Standard products are Pb-free and Halogen-free.



FBP-02C (Bottom View)



Circuit diagram



4 = Device code
* = Month code (A~Z)

Marking (Top View)

Features

- Stand-off voltage: 5V max.
- Transient protection for each line according to
  IEC61000-4-2 (ESD): ±20kV (contact discharge)
  IEC61000-4-4 (EFT): 40A (5/50ns)
  IEC61000-4-5 (surge): 4A (8/20μs)
- Low capacitance: C_J = 1.0pF typ.
- Ultra-low leakage current: I_R <1nA typ.
- Low clamping voltage: V_{CL} = 18V typ. @ I_{PP} = 16A (TLP)
- Solid-state silicon technology

Applications

- USB Interface
- HDMI Interface
- DVI
- Portable Electronics
- Notebooks

Order information

Device	Package	Shipping
ESD5341X-2/TR	FBP-02C	10000/Tape&Reel

Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse power (t_p = 8/20μs)	P_{pk}	60	W
Peak pulse current (t_p = 8/20μs)	I_{PP}	4	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	±20	kV
ESD according to IEC61000-4-2 contact discharge		±20	
Junction temperature	T_J	125	°C
Operation 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)

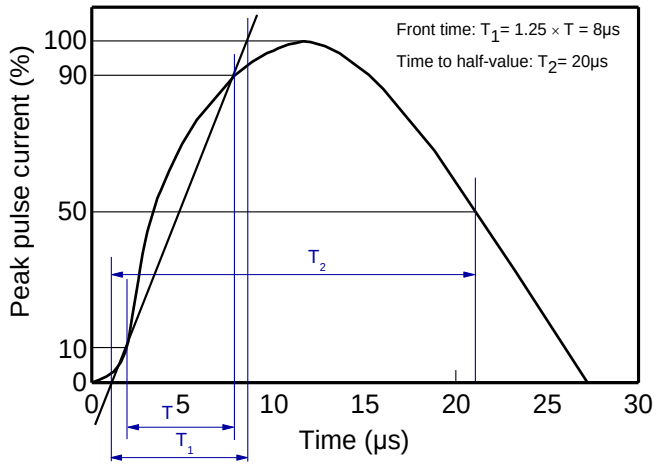
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				5.0	V
Reverse leakage current	I_R	V_{RWM} = 5V		<1	100	nA
Reverse breakdown voltage	V_{BR}	I_T = 1mA	7.0	8.0	9.0	V
Forward voltage	V_F	I_T = 10mA	0.6	0.9	1.2	V
Clamping voltage [1)]	V_{CL}	I_{PP} = 16A, t_p = 100ns		18.0		V
Dynamic resistance [1)]	R_{DYN}			0.6		Ω
Clamping voltage [2)]	V_{CL}	I_{PP} = 1A, t_p = 8/20μs			11	V
		I_{PP} = 4A, t_p = 8/20μs			15	V
Junction capacitance	C_J	V_R = 0V, f = 1MHz		1.0	1.4	pF

Notes:

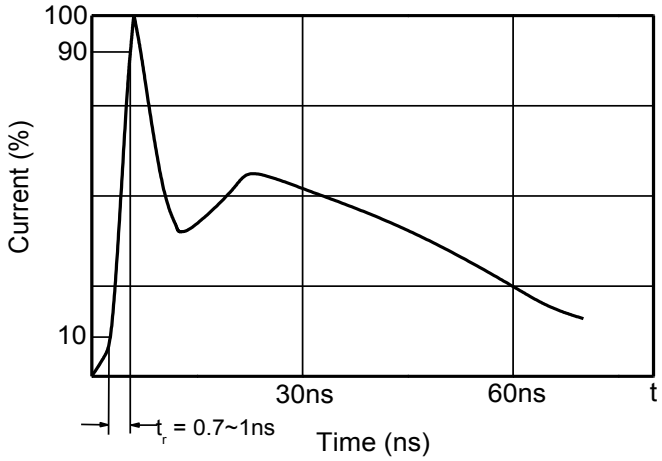
1) *TLP parameter: Z_0 = 50Ω, t_p = 100ns, t_r = 2ns, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.*

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

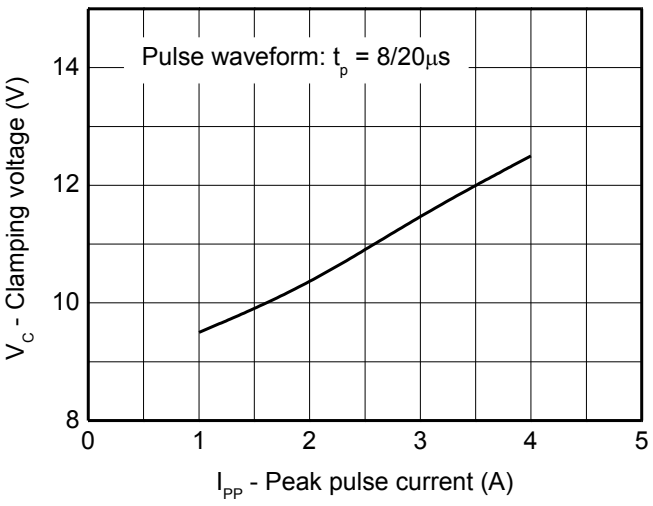
Typical characteristics (T_A = 25°C, unless otherwise noted)



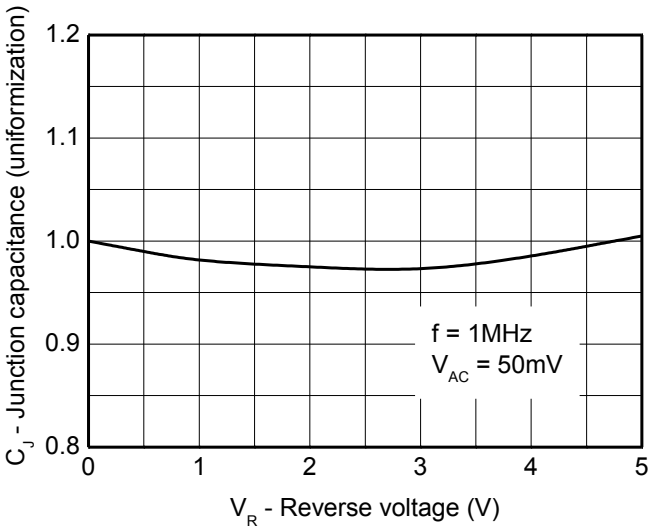
8/20μs waveform per IEC61000-4-5



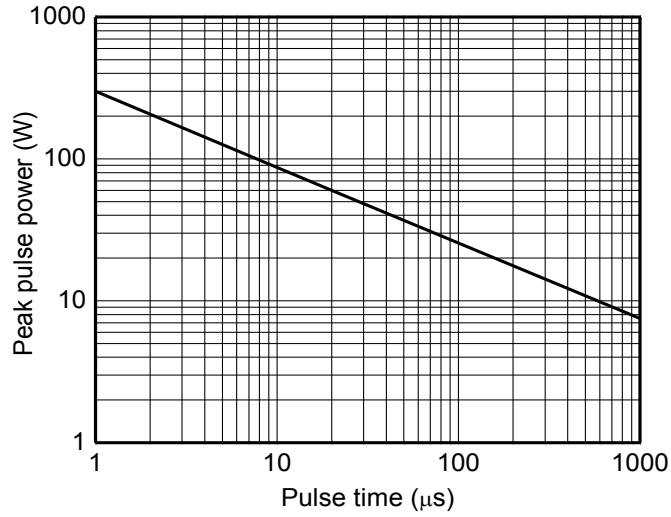
Contact discharge current waveform per IEC61000-4-2



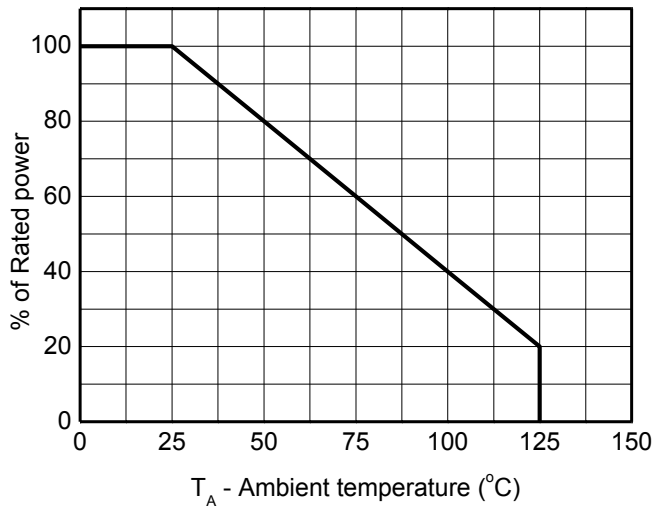
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverse voltage

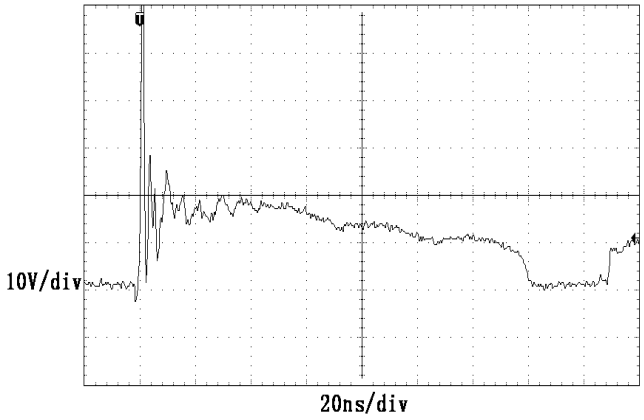


Non-repetitive peak pulse power vs. Pulse time

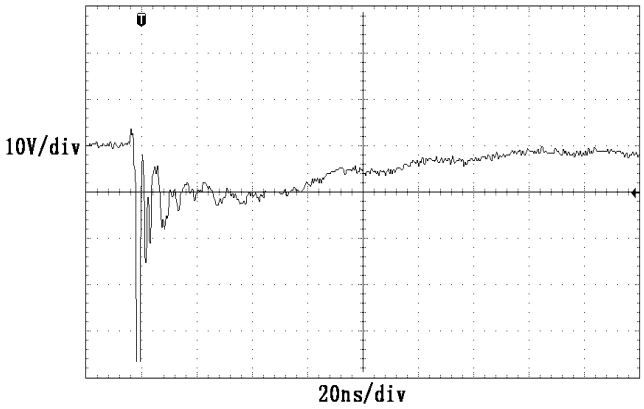


Power derating vs. Ambient temperature

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



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



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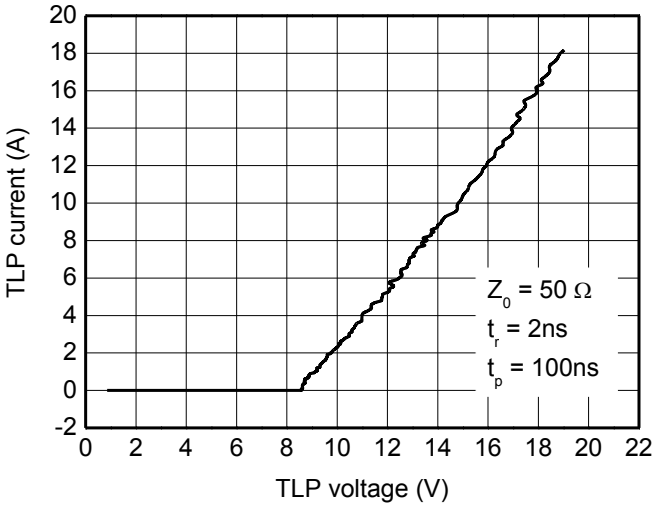
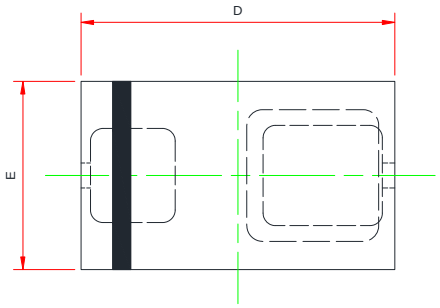


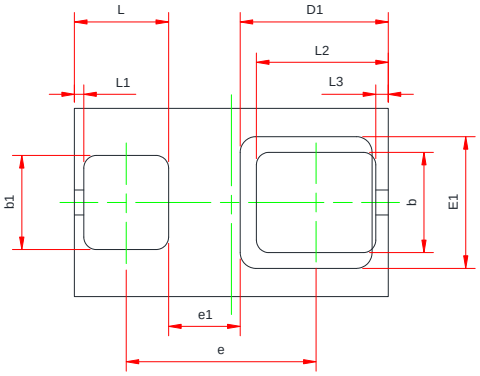
TLP Measurement

Package outline dimensions

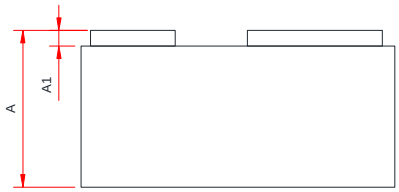
FBP-02C



Top View



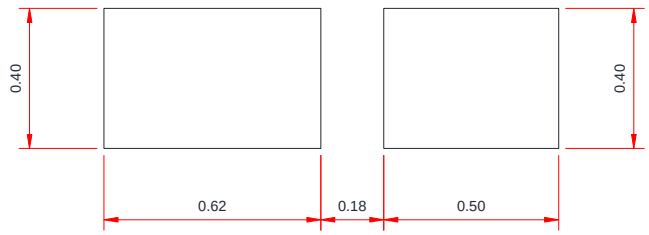
Bottom View



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.