SYT01S05DWC

Ultra-Low Capacitance TVS/ESD Protection

Features

- Transient protection for high-speed data lines
  IEC 61000-4-2 (ESD) ±20kV (Air)
  ±20kV (Contact)
  IEC 61000-4-5 (Surge) 2A (8/20μs)
- For 5V and below operating voltage
- Package optimized for high-speed lines
- Ultra-small package (1.0mm×0.6mm×0.55mm)
- Protects one data, control or power line
- Low capacitance: 0.35pF (Typical)
- Low leakage current: 10nA @ V_{RWM} (Typical)
- Low clamping voltage
- Each I/O pin can withstand over 1000 ESD strikes for ±8kV contact discharge

Description

SYT01S05DWC is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 0.35pF only, SYT01S05DWC is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), (±20kV air, ±20kV contact discharge), IEC 61000-4-5 (Surge) (2A, 8/20μs), etc.

SYT01S05DWC uses ultra-small DFN1.0*0.6-2L package. Each SYT01S05DWC device can protect one high-speed data line. It offers system designers flexibility to protect single data line where space is a premium concern. The combined features of low capacitance, ultra-small size and high ESD robustness make SYT01S05DWC ideal for high-speed data port and high-frequency line (e.g., USB 2.0 & antenna line) applications, such as cellular phones and HD visual devices.

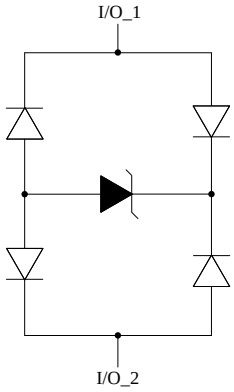
Applications

- Serial ATA
- PCI Express
- Desktops, Servers and Notebooks
- Cellular Phones
- MDDI Ports
- USB2.0 Power and Data Line Protection
- Display Ports
- Digital Visual Interfaces (DVI)

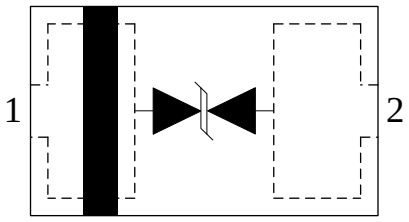
Mechanical Characteristics

- DFN1.0*0.6-2L package
- Flammability Rating: UL 94V-0
- Marking: Part number (S)
- Packaging: Tape and Reel

Circuit Diagram



Pin Configuration



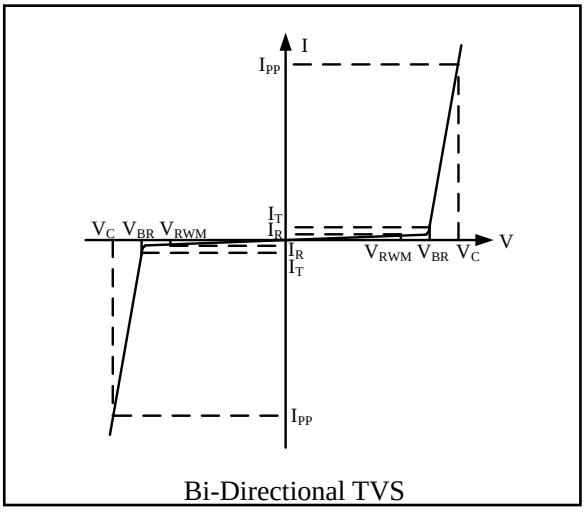
DFN1.0x0.6-2L
(Top View)

Absolute Maximum Rating

Symbol	Parameter	Value	Units
I_{PP}	Peak Pulse Current (8/20μs)	2	A
P_{PK}	Peak Pulse Power (8/20μs)	30	Watts
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±20 ±20	kV
T_{OPT}	Operating Temperature	-40/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C

Electrical Characteristics (T = 25°C)

Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Reverse Breakdown Voltage @ I_T
I_T	Test Current for Reverse Breakdown
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Peak Pulse Current
C_{ESD}	Parasitic Capacitance
V_R	Reverse Voltage
f	Small Signal Frequency



Bi-Directional TVS

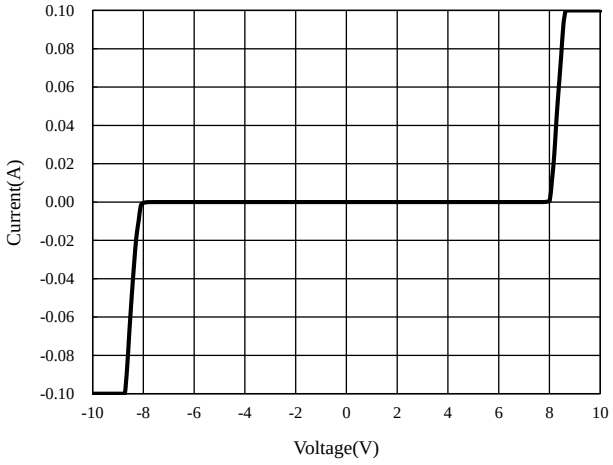
Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}				5.0	V
I_R	V_{RWM} = 5V, T = 25°C Between I/O and I/O		0.01	1.0	μA
V_{BR}	I_T = 1mA Between I/O and I/O	6.0	8.8	11	V
V_C[1]	I_{PP} = 2A, t_p = 8/20μs Between I/O and I/O			15	V
V_C[1]	I_{PP} = 16A, t_p = 10/100ns Between I/O and GND		17		V
R_{DYN}[1,2]	t_p = 10/100ns Between I/O and GND		0.6		Ω
C_{ESD}[1]	V_R = 0V, f = 1MHz Between I/O and I/O		0.35	0.50	pF

NOTES

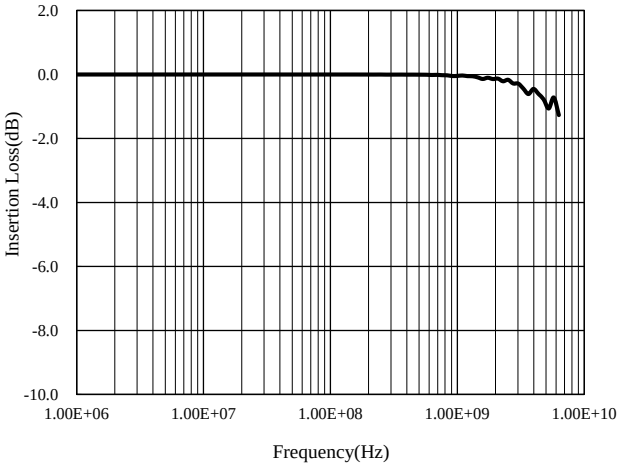
[1]Guaranteed by design and not subject to production test.

[2]R_{DYN} calculated based on I_{PP}=8A to I_{PP}=16A, t_p = 10/100ns.

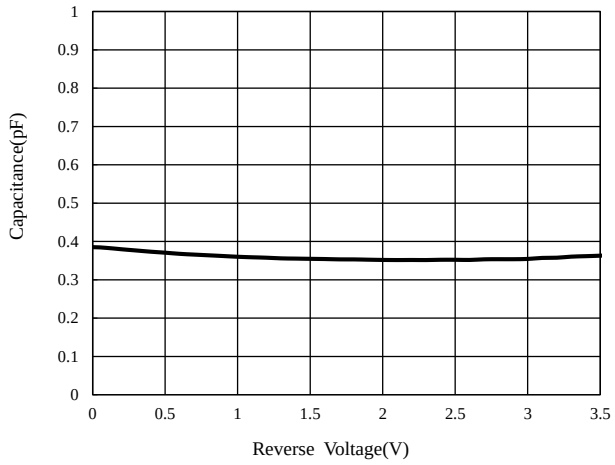
Voltage Sweeping of I/O to I/O



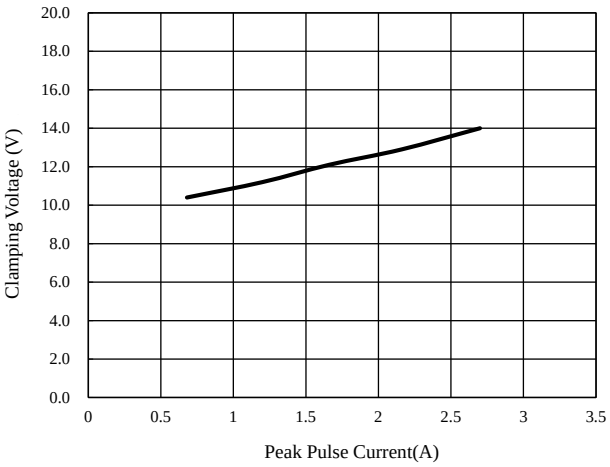
Insertion Loss S21 of I/O to I/O



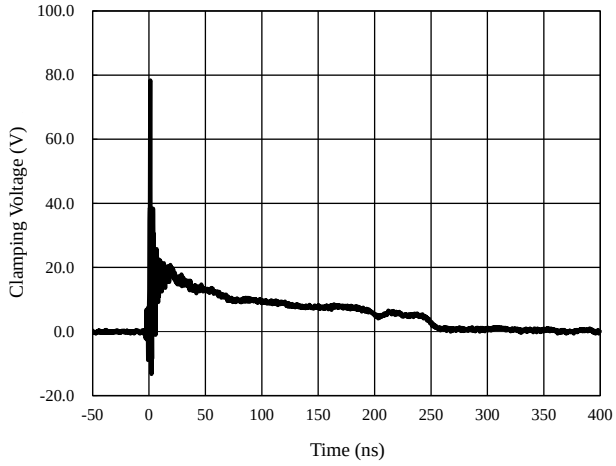
Capacitance vs. Voltage of I/O to I/O (f = 1MHz)



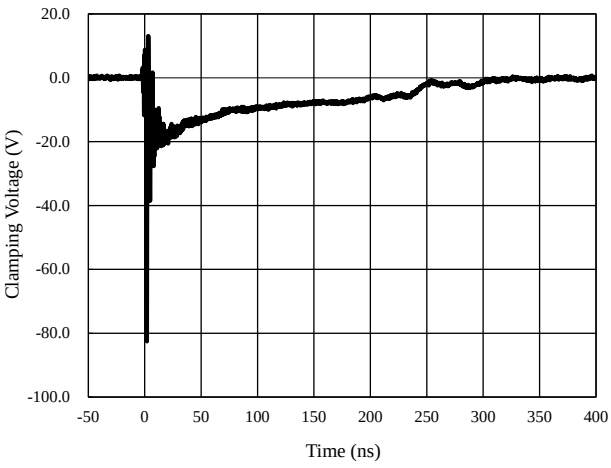
Clamping Voltage vs. Peak Pulse Current (8/20μs)



ESD Clamping of I/O to I/O (+8kV Contact per IEC 61000-4-2)

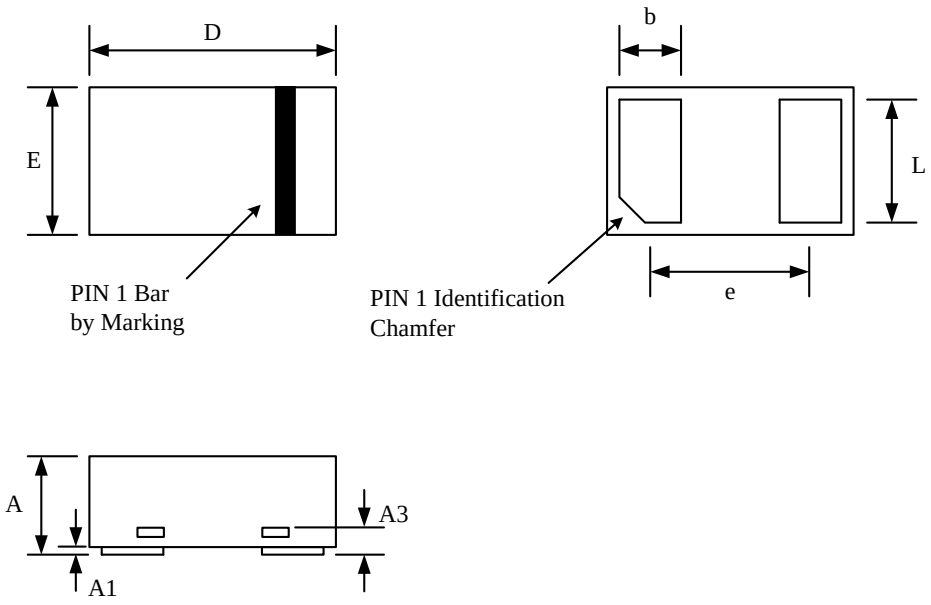


ESD Clamping of I/O to I/O (-8kV Contact per IEC 61000-4-2)



Package Outline

❑ DFN1.0*0.6-2L Package

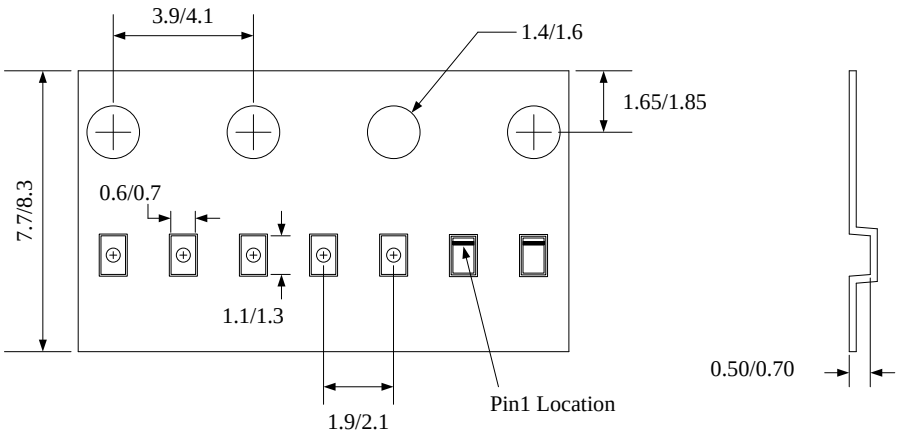


Package Dimensions

Symbol	Dimensions In Millimeters	
	Minimum	Maximum
A	0.400	0.550
A1	0.000	0.050
A3	0.125 REF	
D	0.950	1.050
E	0.550	0.650
b	0.200	0.300
e	0.650 BSC	
L	0.450	0.550

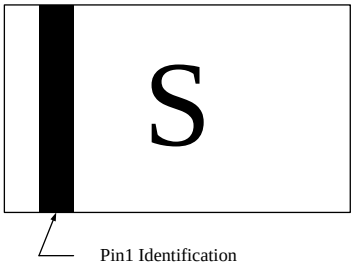
Notes: All dimension in mm and exclude mold flash & metal burr.

Tape and Reel Specification



Package types	Tape width (mm)	Pocket pitch(mm)	Reel size (Inch)	Trailer * length(mm)	Leader * length (mm)	Qty per reel (pcs)
DFN1.0*0.6-2L	8	2	7"	400	400	10000

Marking Codes



Note:
(1) "S" is part number.

Ordering Information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
SYT01S05DWC	5V	10,000	7 Inch

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