

### Features

- Transient protection for high-speed data lines  
IEC 61000-4-2 (ESD)  $\pm 20\text{kV}$  (Air)  
 $\pm 20\text{kV}$  (Contact)  
IEC 61000-4-5 (Surge) 2A (8/20 $\mu\text{s}$ )
- For 5V and below operating voltage
- Package optimized for high-speed lines
- Ultra-small package (1.0mm $\times$ 0.6mm $\times$ 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  $\pm 8\text{kV}$  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), ( $\pm 20\text{kV}$  air,  $\pm 20\text{kV}$  contact discharge), IEC 61000-4-5 (Surge) (2A, 8/20 $\mu\text{s}$ ), 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.

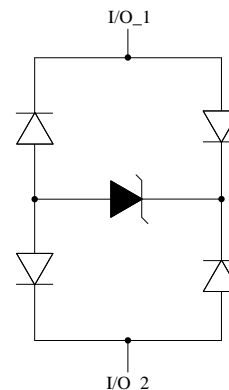
### Applications

- 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)

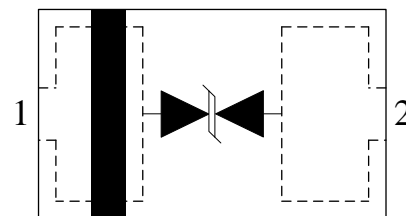
### Mechanical Characteristics

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

### Circuit Diagram



### Pin Configuration



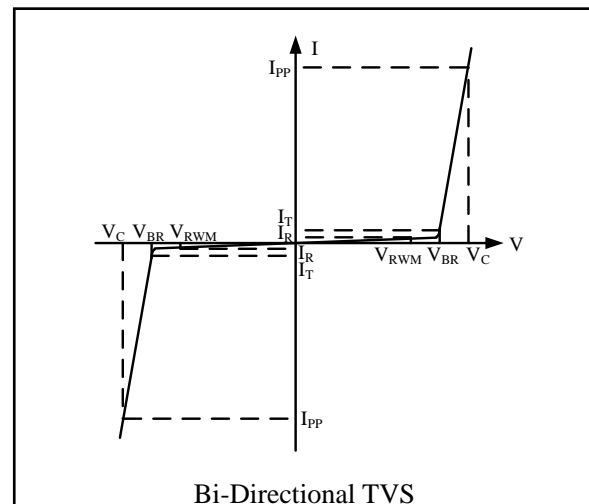
DFN1.0x0.6-2L  
(Top View)

## Absolute Maximum Rating

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

## Electrical Characteristics (T = 25 $^{\circ}$ 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



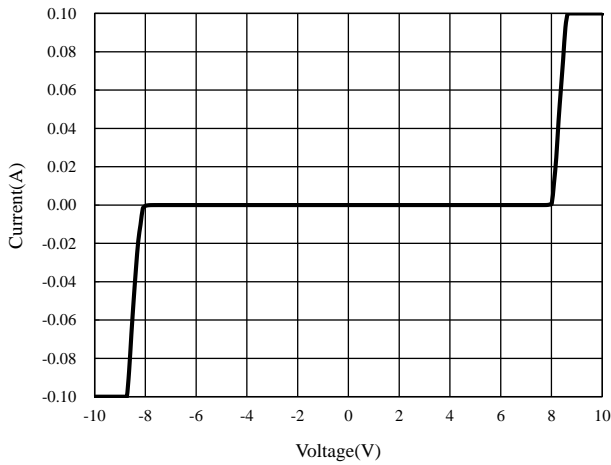
Symbol	Test Condition	Minimum	Typical	Maximum	Units
$V_{RWM}$				5.0	V
$I_R$	$V_{RWM} = 5V, T = 25^{\circ}C$ Between I/O and I/O		0.01	1.0	$\mu$ A
$V_{BR}$	$I_T = 1mA$ Between I/O and I/O	6.0	8.8	11	V
$V_C^1$	$I_{PP} = 2A, t_p = 8/20\mu s$ Between I/O and I/O			15	V
$V_C^1$	$I_{PP} = 16A, t_p = 10/100ns$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

### NOTES

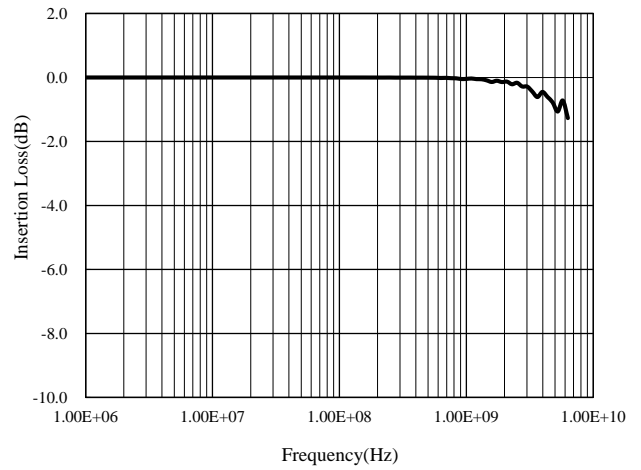
<sup>1</sup>Guaranteed by design and not subject to production test.

<sup>2</sup> $R_{DYN}$  calculated based on  $I_{PP}=8A$  to  $I_{PP}=16A, t_p = 10/100ns$ .

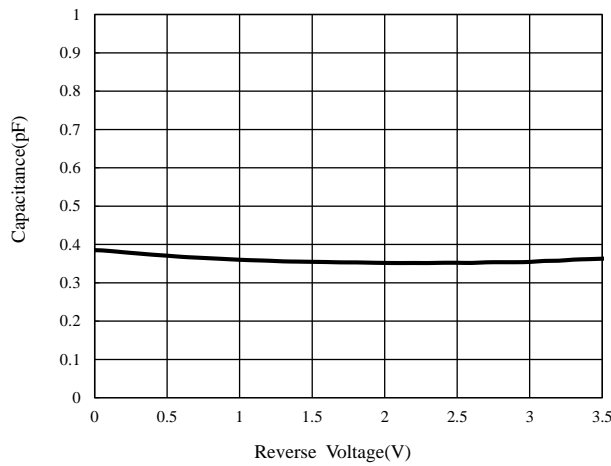
**Voltage Sweeping of I/O to I/O**



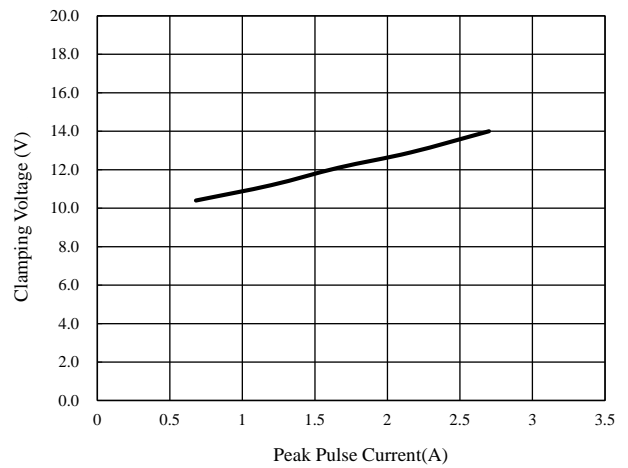
**Insertion Loss S21 of I/O to I/O**



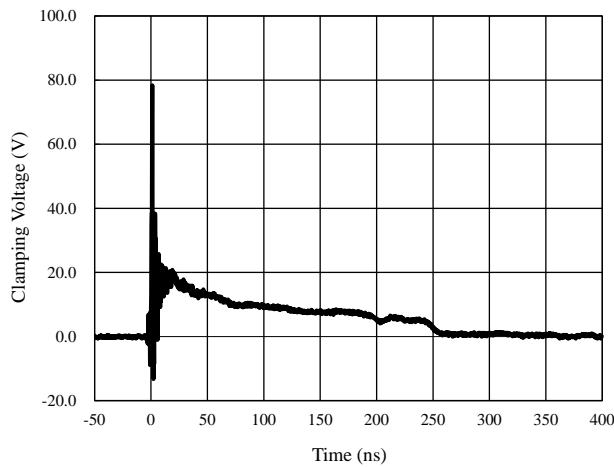
**Capacitance vs. Voltage of I/O to I/O  
(f = 1MHz)**



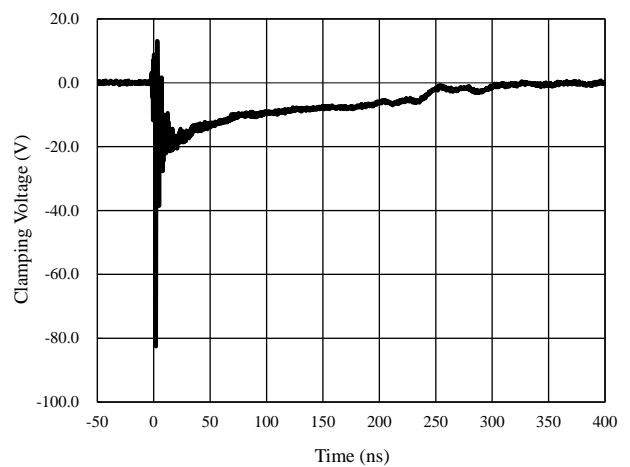
**Clamping Voltage vs. Peak Pulse Current  
(8/20μs)**



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

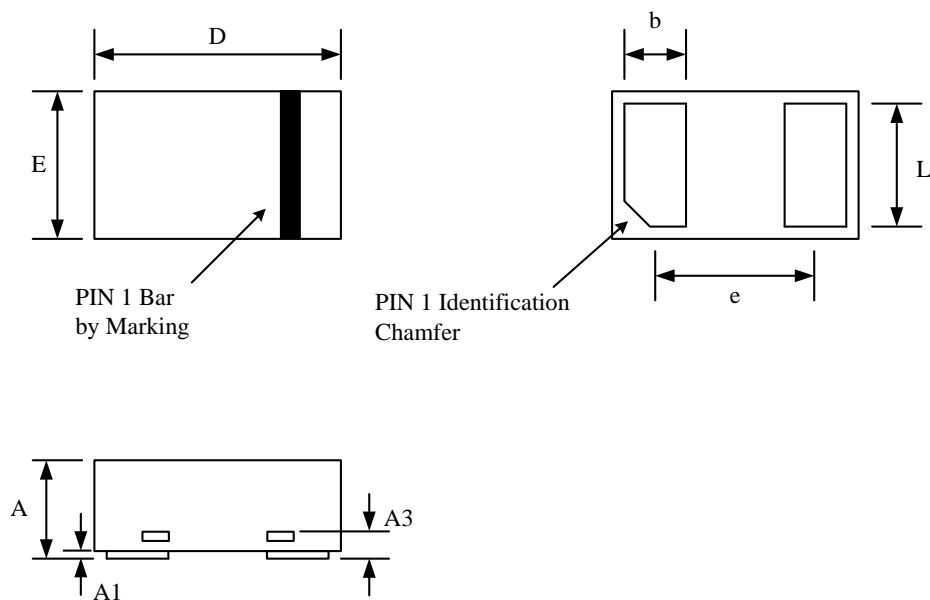


**ESD Clamping of I/O to I/O  
(-8kV Contact per IEC 61000-4-2)**



## Package Outline

□ DFN1.0\*0.6-2L Package

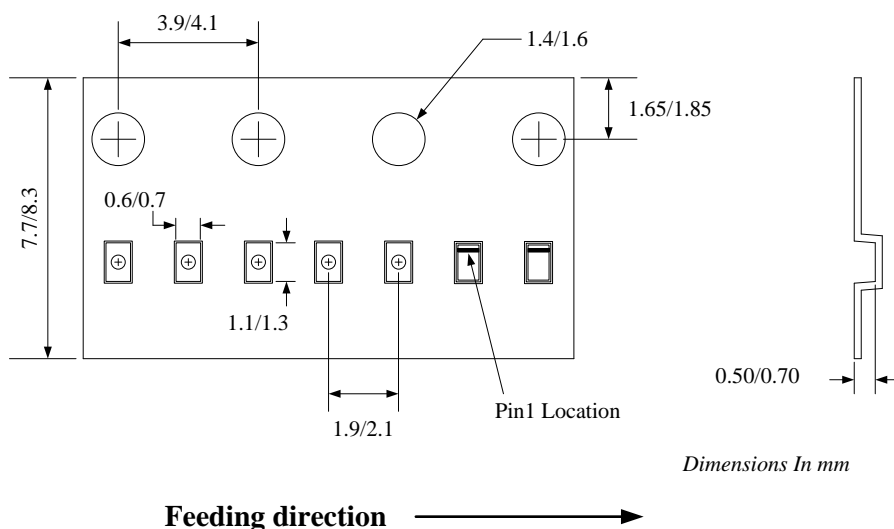


Package Dimensions

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

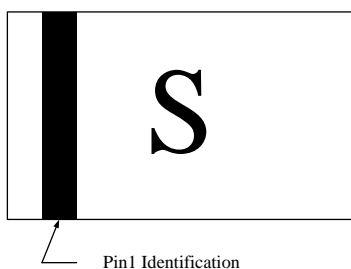
**Notes: All dimension in mm and exclude mold flash & metal burr.**

## 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



## Ordering Information

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

### Note:

(1) "S" is part number.



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