

### Features

- Transient protection for high-speed data lines
  - IEC 61000-4-2 (ESD)  $\pm 30\text{kV}$  (Air)
  - $\pm 30\text{kV}$  (Contact)
  - IEC 61000-4-4 (EFT) 40A (5/50 ns)
  - Cable Discharge Event (CDE)
- Package optimized for high-speed lines
- Ultra-small package (0.6mm×0.3mm×0.3mm)
- Protects one data, control or power line
- Low capacitance: 12pF (Typical)
- Low leakage current: 0.01 $\mu\text{A}$  @  $V_{\text{RWM}}$  (Typical)
- Low clamping voltage
- Each I/O pin can withstand over 1000 ESD strikes for  $\pm 8\text{kV}$  contact discharge

### Description

SYT01M05DXC is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 12pF only, SYT01M05DXC is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4 ( $\pm 15\text{kV}$  air,  $\pm 8\text{kV}$  contact discharge), IEC 61000-4-4 (electrical fast transient - EFT) (40A, 5/50 ns), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

SYT01M05DXC uses ultra-small DFN0603 package. Each SYT01M05DXC device can protect one data line. It offers system designers flexibility to protect single data line where space is a premium concern.

### Applications

- Portable Electronics
- Desktops, Servers and Notebooks
- Cellular Phones
- MP3 Ports
- Digital Camera Ports

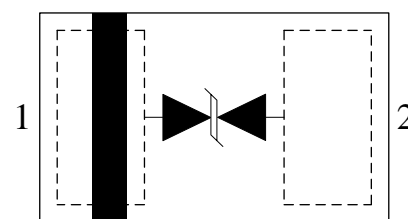
### Mechanical Characteristics

- DFN0.6x0.3-2 package
- Flammability Rating: UL 94V-0
- Marking: Part number
- Packaging: Tape and Reel

### Circuit Diagram



### Pin Configuration



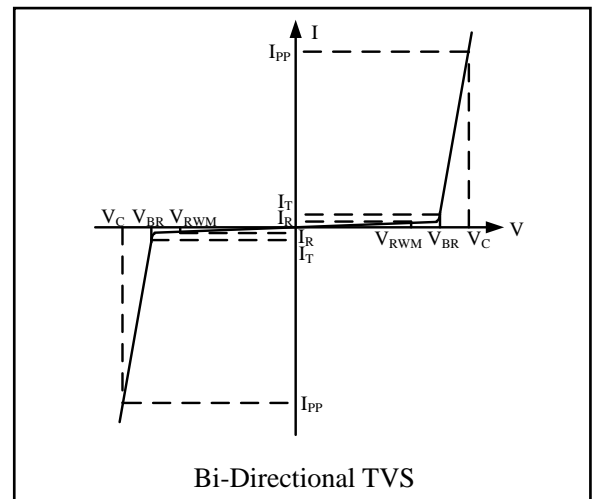
DFN0603  
(Top View)

## Absolute Maximum Rating

Symbol	Parameter	Value	Units
$I_{PP}$	Peak Pulse Current (8/20 $\mu$ s)	4	A
$P_{PK}$	Peak Pulse Power (8/20 $\mu$ s)	50	Watts
$V_{ESD}$	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	$\pm 30$ $\pm 30$	kV
$T_{OPT}$	Operating Temperature	-55/+125	$^{\circ}$ C
$T_{STG}$	Storage Temperature	-55/+150	$^{\circ}$ C

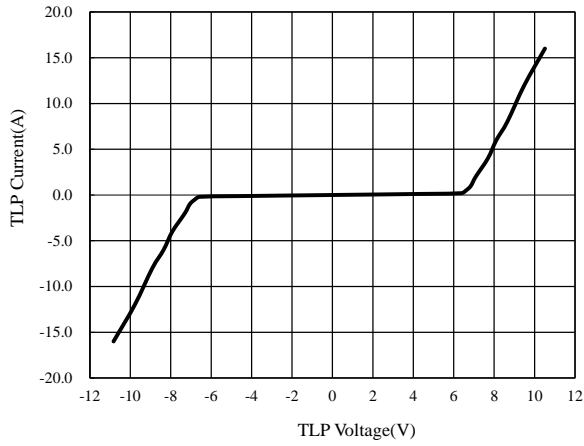
## Electrical Characteristics (T = 25 $^{\circ}$ C)

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 @ $I_{PP}$
$I_{PP}$	Maximum Peak Pulse Current
$C_{ESD}$	Parasitic Capacitance
$V_R$	Reverse Voltage
f	Small Signal Frequency

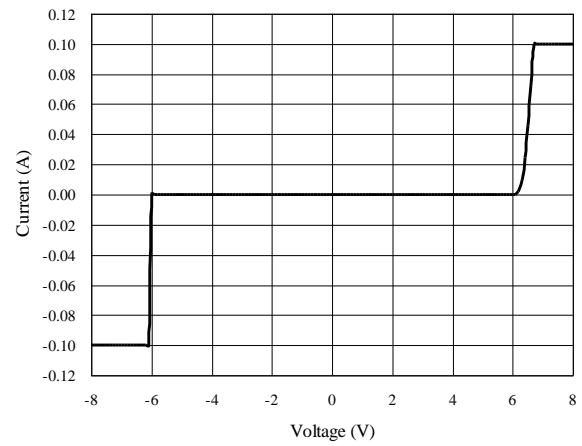


Symbol	Test Condition	Minimum	Typical	Maximum	Units
$V_{RWM}$				5.0	V
$I_R$	$V_{RWM} = 5V, T = 25^{\circ}C$ Between I/O_1 and I/O_2		0.01	1.0	$\mu$ A
$V_{BR}$	$I_T = 1mA$ Between I/O_1 and I/O_2	5.5	6.0		V
$V_C$	$I_{PP} = 1A, t_p = 8/20\mu s$ Between I/O_1 and I/O_2			10	V
$V_C$	$I_{PP} = 4A, t_p = 8/20\mu s$ Between I/O_1 and I/O_2			12.5	V
$R_{DYN}$	Dynamic Resistance		0.4		$\Omega$
$C_{ESD}$	$V_R = 0V, f = 1MHz$ Between I/O_1 and I/O_2		12		pF

## TLP Measurement of I/O\_1 to I/O\_2

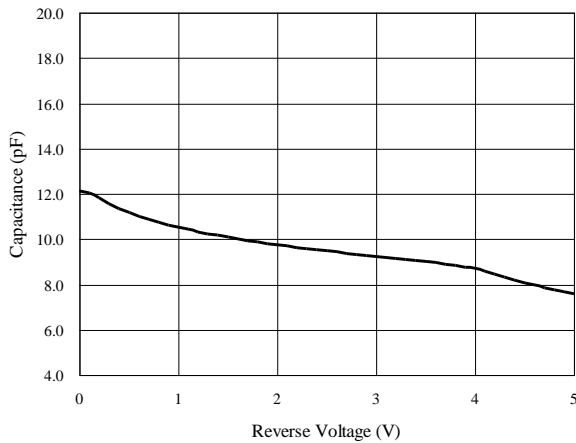


## Voltage Sweeping of I/O\_1 to I/O\_2

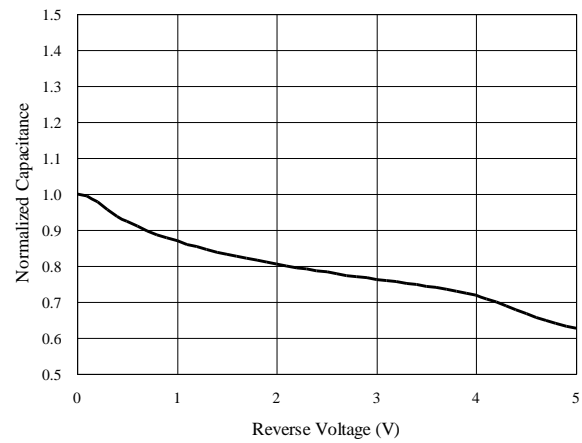


## Capacitance vs. Voltage of I/O\_1 to I/O\_2 (f = 1MHz)

Capacitance vs. Reverse Voltage

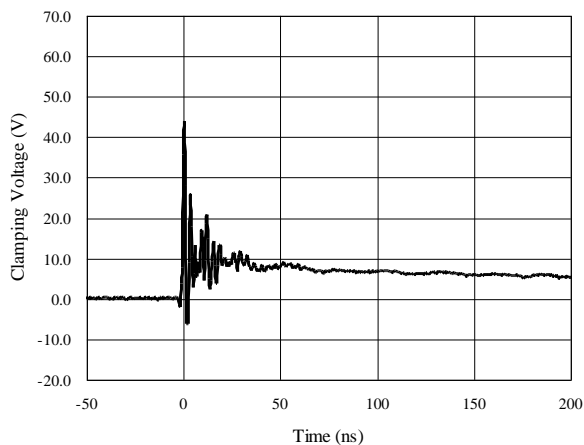


Normalized Capacitance vs. Reverse Voltage



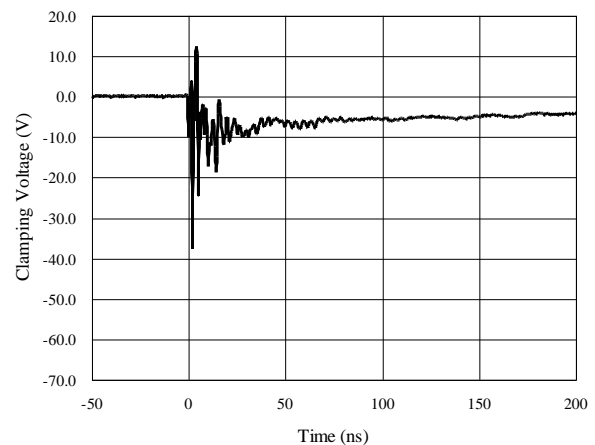
## ESD Clamping of I/O\_1 to I/O\_2

(+8kV Contact per IEC 61000-4-2)



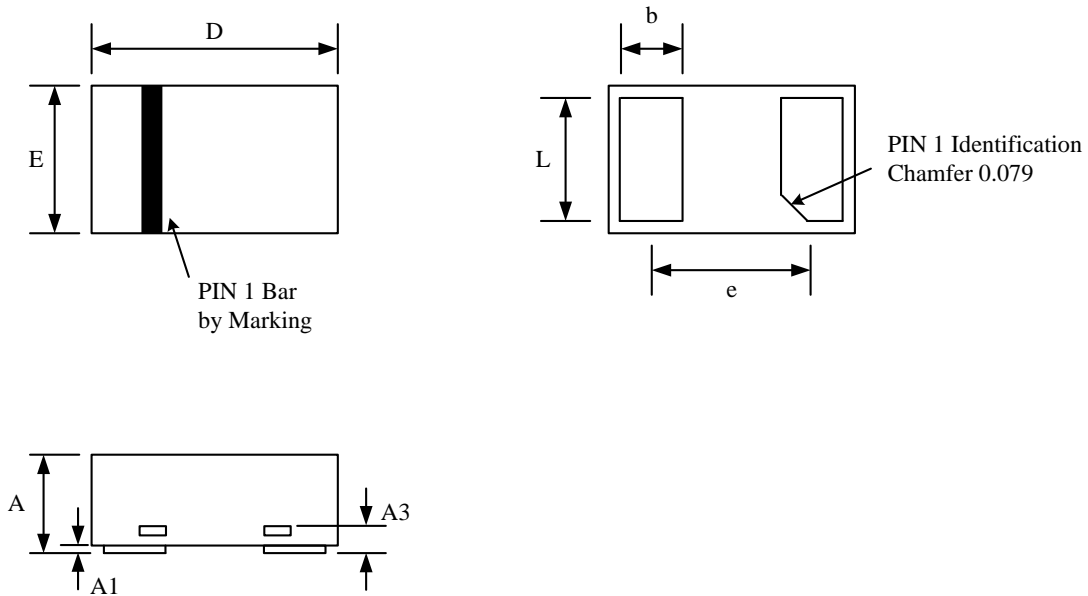
## ESD Clamping of I/O\_1 to I/O\_2

(-8kV Contact per IEC 61000-4-2)



## Package Outline

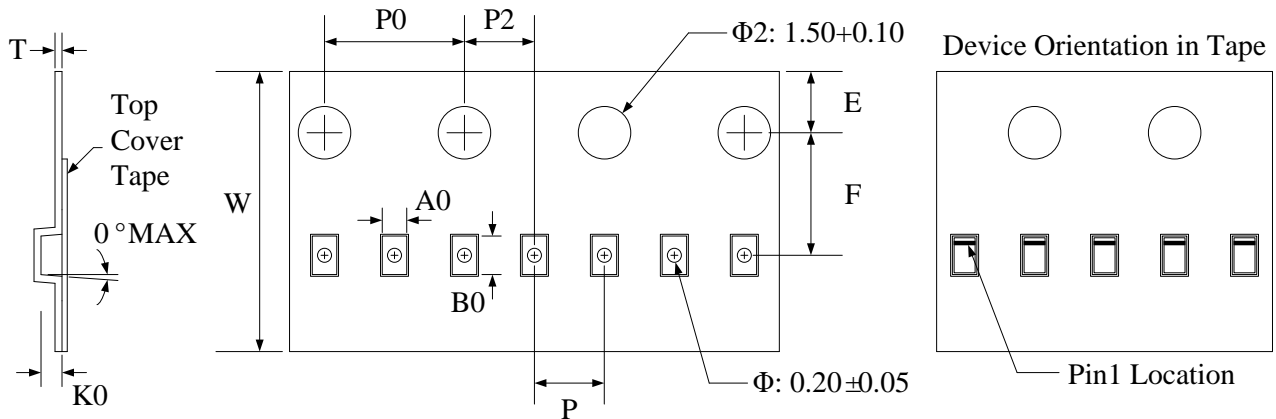
- DFN0.6x0.3-2 package
- MSL-1



Package Dimensions (Controlling dimensions are in millimeters)

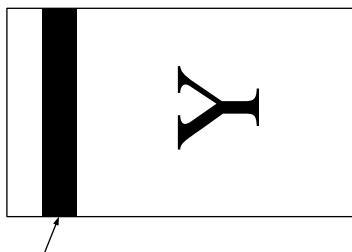
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Minimum	Maximum	Minimum	Maximum
A	0.23	0.33	0.009	0.013
A1	0.00	0.05	0.000	0.002
A3	0.102 REF.		0.004	
D	0.55	0.65	0.022	0.026
E	0.25	0.35	0.010	0.014
b	0.16	0.22	0.006	0.009
e	0.355 BSC		0.014 BSC	
L	0.215	0.275		

## Tape and Reel Specification



Symbol	W	A0	B0	K0	E	F	P	P0	P2	T
Dimensions (mm)	8.00 ± 0.1	0.38 ± 0.03	0.68 ± 0.03	0.36 ± 0.03	1.75 ± 0.1	3.5 ± 0.05	2.0 ± 0.05	4.0 ± 0.1	2.0 ± 0.05	0.2 ± 0.02

## Marking Codes



### Note:

(1) "Y" is part number.

## Ordering Information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
SYT01M05DXC	5V	10,000	7 Inch

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