

### Features

- Transient protection for high-speed data lines  
IEC 61000-4-2 (ESD)  $\pm 30\text{kV}$  (Air)  
 $\pm 30\text{kV}$  (Contact)  
IEC 61000-4-5 (Surge) 4A (8/20 $\mu\text{s}$ )
- For 12V and below operating voltage
- Package optimized for high-speed lines
- Ultra-small package  
DFN1.0\*0.6-2 & DFN0.6\*0.3-2
- Protects one data, control or power line
- Low capacitance: 4pF (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

SYT01M12 is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 4pF only, SYT01M12 is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC61000-4-2 (ESD) ( $\pm 30\text{kV}$  air,  $\pm 30\text{kV}$  contact discharge), IEC61000-4-5 (Surge) (4A, 8/20 $\mu\text{s}$ ), etc.

SYT01M12 uses ultra-small DFN1.0\*0.6-2 & DFN0.6\*0.3-2 package. Each SYT01M12 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

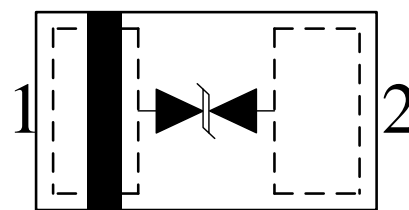
### Mechanical Characteristics

- DFN1.0\*0.6-2 & DFN0.6\*0.3-2 package
- Flammability Rating: UL 94V-0
- Marking: Device code, date
- Packaging: Tape and Reel

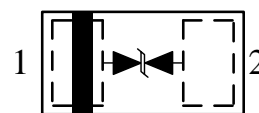
### Circuit Diagram



### Pin Configuration



DFN1.0\*0.6-2 (Top View)



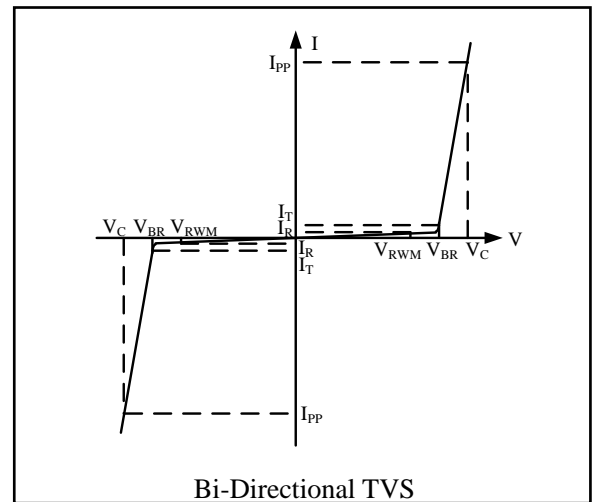
DFN0.6\*0.3-2 (Top View)

### 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)	90	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	-40/+125	$^{\circ}$ C
$T_{STG}$	Storage Temperature	-55/+150	$^{\circ}$ C

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



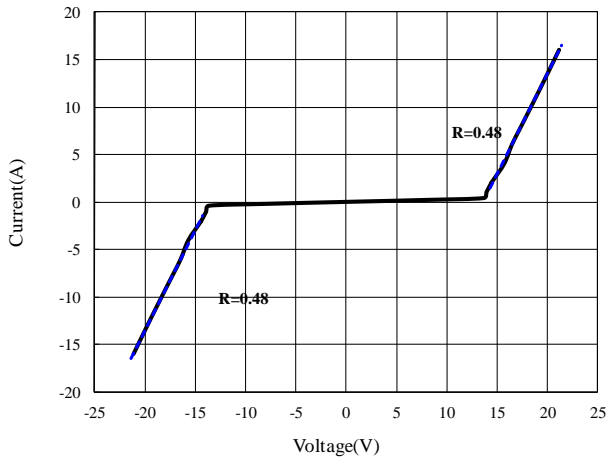
Symbol	Test Condition	Minimum	Typical	Maximum	Units
$V_{RWM}$				12.5	V
$I_R$	$V_{RWM} = 12V, T_A = 25^{\circ}C$		0.01	0.1	$\mu$ A
$V_{BR}$	$I_T = 1mA$	13.0		17	V
$V_C^1$	$I_{PP} = 4A, t_p = 8/20\mu s$			23	V
$V_C^1$	$I_{PP} = 16A, t_p = 10/100ns$		22		V
$R_{DYN}^{1,2}$	$t_p = 10/100ns$		0.5		$\Omega$
$C_{ESD}^1$	$V_R = 0V, f = 1MHz$		4	8	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  $I_{PP}=16A, t_p = 10/100ns$ .

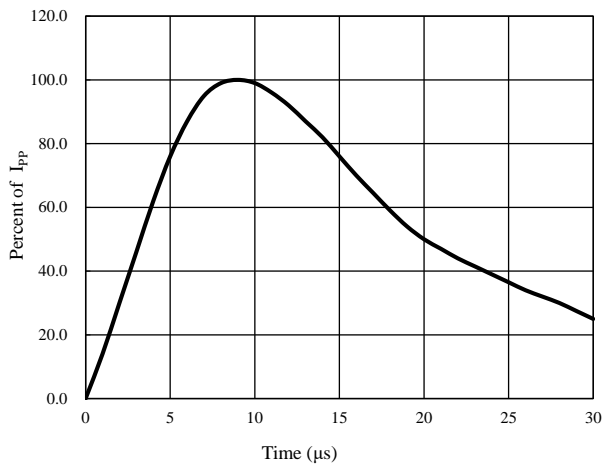
**TLP Testing of I/O\_1 to I/O\_2**



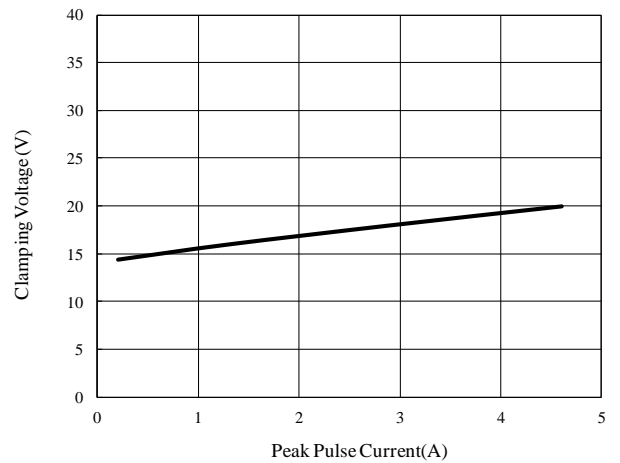
**Capacitance vs. Reverse Voltage**



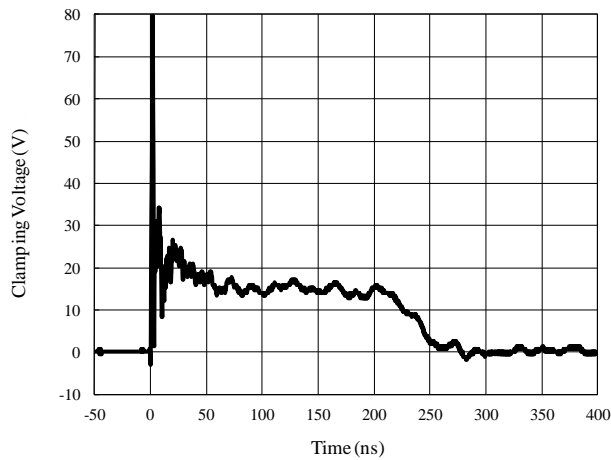
**8/20µs Current Pulse Waveform**



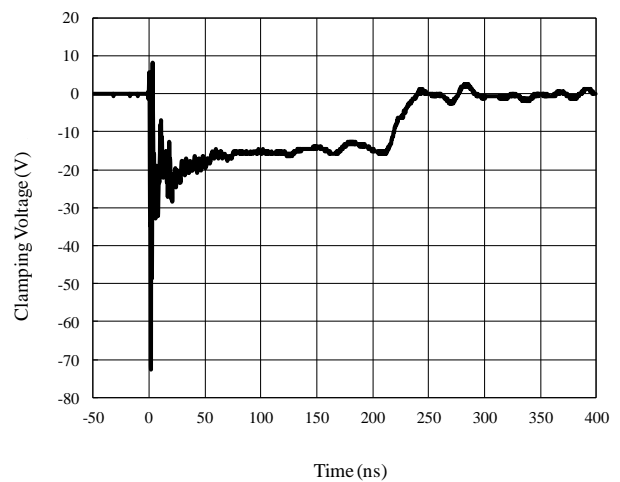
**Clamping Voltage vs. Peak Pulse Current**



**ESD Clamping of I/O\_1 to I/O\_2 (+8kV Contact per IEC 61000-4-2)**

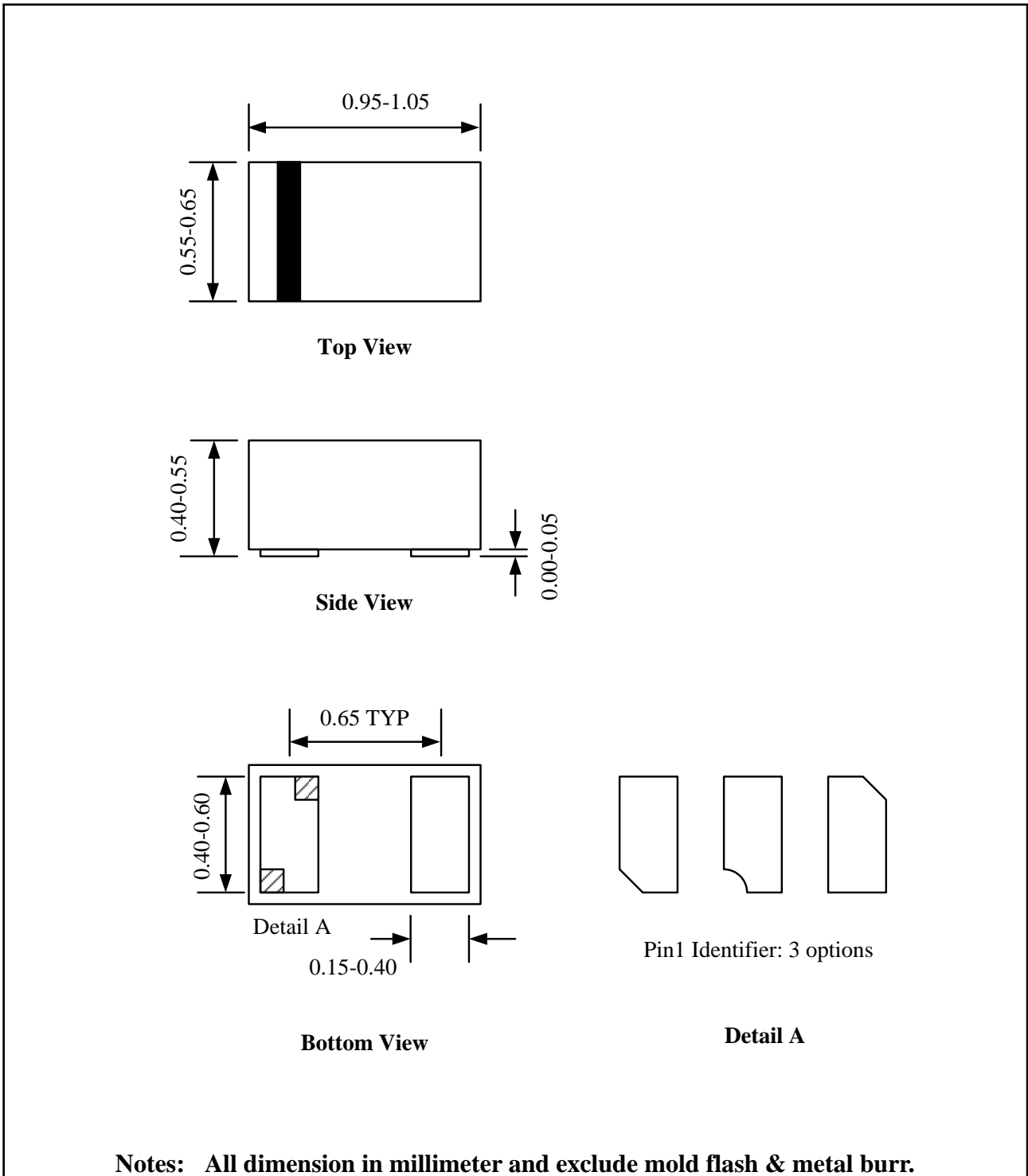


**ESD Clamping of I/O\_1 to I/O\_2 (-8kV Contact per IEC 61000-4-2)**

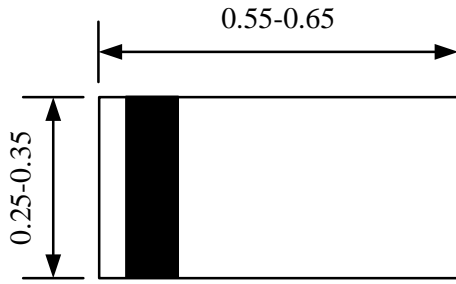


**Package Outline**

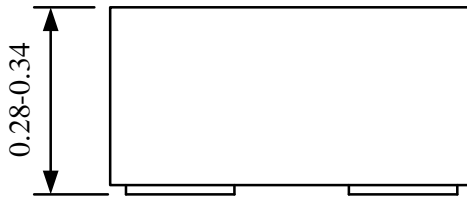
- DFN1.0\*0.6-2 package



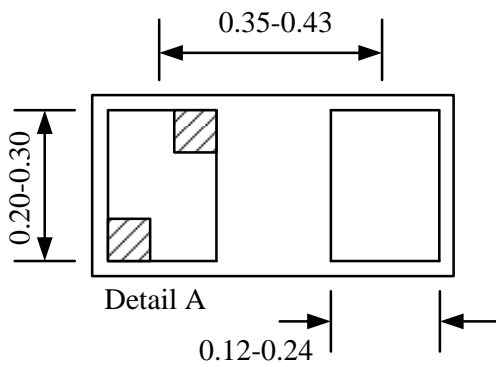
- DFN0.6\*0.3-2 package



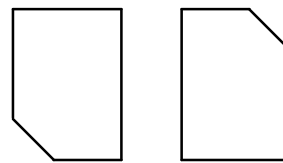
**Top View**



**Side View**



**Bottom View**



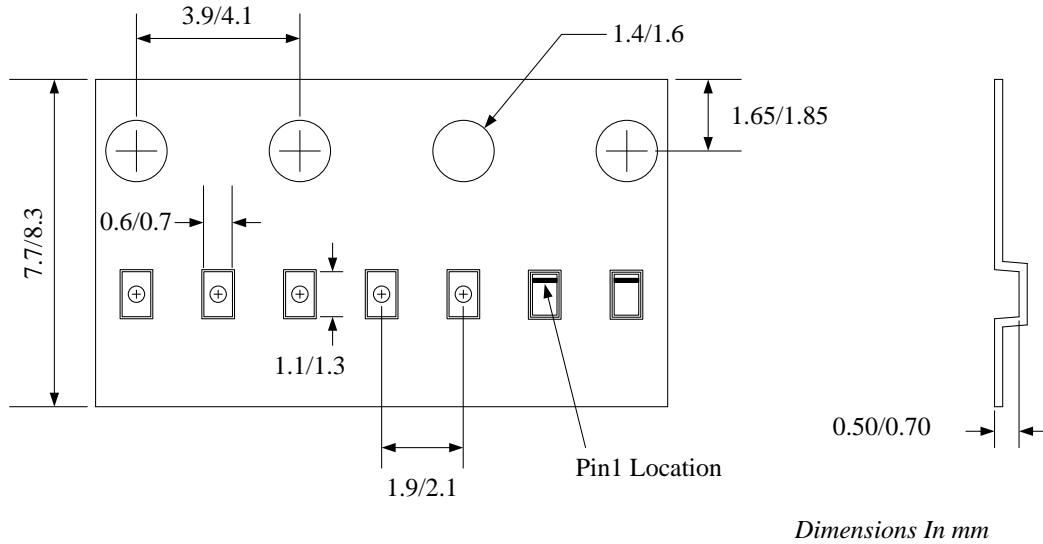
Pin1 Identifier: Two options

**Detail A**

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

## Tape and Reel Specification

- DFN1.0\*0.6-2



Feeding direction →

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

## Marking Codes



### Note:

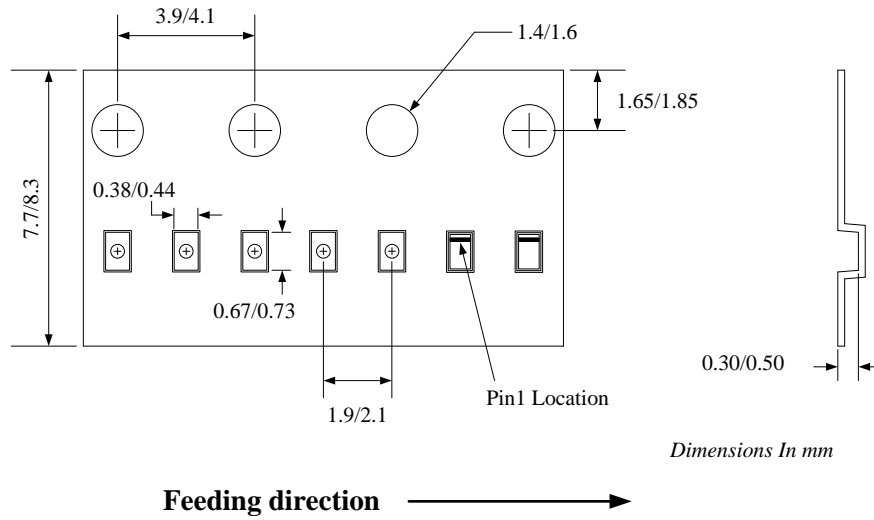
- (1) "M" is the device code.
- (2) "W" is date code.

## Ordering Information

Part Number	Package	Device Marking
SYT01M12DWC	DFN1.0*0.6-2	M

**Tape and Reel Specification**

- DFN0.6\*0.3-2



Package types	Tape width (mm)	Pocket pitch(mm)	Reel size (Inch)	Trailer * length(mm)	Leader * length (mm)	Qty per reel (pcs)
DFN0.6*0.3-2	8	2	7"	400	400	10000

**Marking Codes**



**Note:**

(1) "D" is the device code.

**Ordering Information**

Part Number	Package	Device Marking
SYT01M12DXC	DFN0.6*0.3-2	D



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