

### 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) 12A (8/20  $\mu\text{s}$ )
- For 3.3V and below operating voltage
- Package optimized for high-speed lines
- Ultra-small package: DFN0.6\*0.3-2  
DFN1.0\*0.6-2
- Protects one data, control or power line
- Low capacitance: 1.0pF (Typical)
- Low leakage current: 0.1 $\mu\text{A}$  @  $V_{\text{RWM}}$  (Typical)
- Low clamping voltage
- Each I/O pin can withstand over 1000 ESD strikes for  $\pm 8\text{kV}$  contact discharge

### Description

SYT01L03 is a low-capacitance transient voltage suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 1.0pF, SYT01L03 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) (12A, 8/20 $\mu\text{s}$ ), etc.

Each SYT01L03 device can protect one data line. It offers system designers flexibility to protect single data line where space is a premium concern.

### Applications

- USB2.0
- Portable Electronics
- Desktops, Servers and Notebooks
- Cellular Phones
- MP3 Ports
- Digital Camera Ports

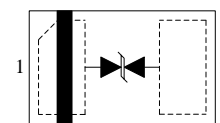
### Mechanical Characteristics

- Package: DFN0.6\*0.3-2  
DFN1.0\*0.6-2
- Marking: Part number
- Packaging: Tape and Reel

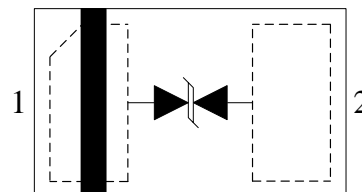
### Circuit Diagram



### Pin Configuration



DFN0.6x0.3-2  
(Top View)



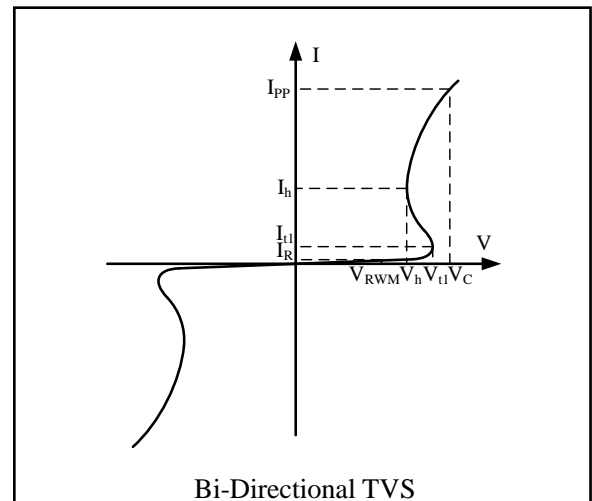
DFN1.0x0.6-2  
(Top View)

### Absolute Maximum Rating

Symbol	Parameter	Value	Units
$V_{ESD}$	ESD per IEC 61000-4-2 (Air)	$\pm 30$	kV
	ESD per IEC 61000-4-2 (Contact)	$\pm 30$	
$I_{PP}$	Peak Pulse Current (8/20 $\mu$ s)	12	A
$P_{PK}$	Peak Pulse Power (8/20 $\mu$ s)	120	W
$T_{OPT}$	Operating Temperature	-40/+125	$^{\circ}$ C
$T_{STG}$	Storage Temperature	-55/+150	$^{\circ}$ C

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

Symbol	Parameter
$V_{RWM}$	Nominal Reverse Working Voltage
$I_R$	Reverse Leakage Current @ $V_{RWM}$
$V_{t1}$	Triggering Voltage @ $I_{t1}$
$I_{t1}$	Test Current for Triggering Voltage
$V_C$	Clamping Voltage @ $I_{PP}$
$I_{PP}$	Maximum Peak Pulse Current
$C_{ESD}$	Parasitic Capacitance
$V_h$	Holding Voltage @ $I_h$
f	Small Signal Frequency



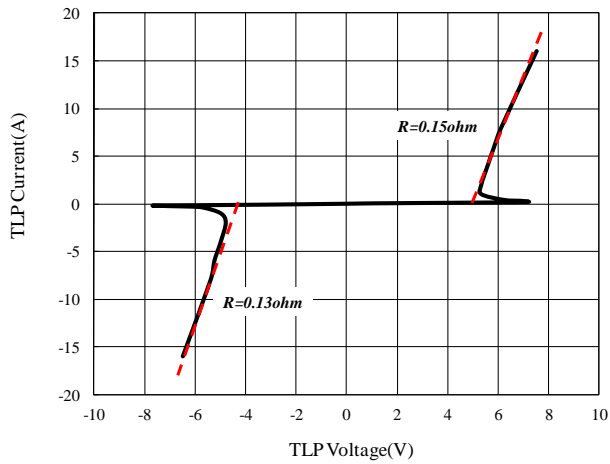
Symbol	Test Condition	Minimum	Typical	Maximum	Units
$V_{RWM}$		-3.3		3.3	V
$I_R$	$V_{RWM} = 3.3V, T = 25^{\circ}C$		0.1	1.0	$\mu$ A
$V_{t1}$	$I_{t1} = 1mA$	3.65			V
$V_h$	$I_h = 100mA$	3.65		5.6	V
$V_C^1$	$I_{PP} = 12A, t_p = 8/20\mu s$			10	V
$V_C^1$	$I_{PP} = 16A, t_p = 10/100ns$		7.5		V
$R_{DYN}^{1,2}$	$t_p = 10/100ns$		0.15		$\Omega$
$C_{ESD}^1$	$V_R = 0V, f = 1MHz$		1.0	3.0	pF

#### NOTES

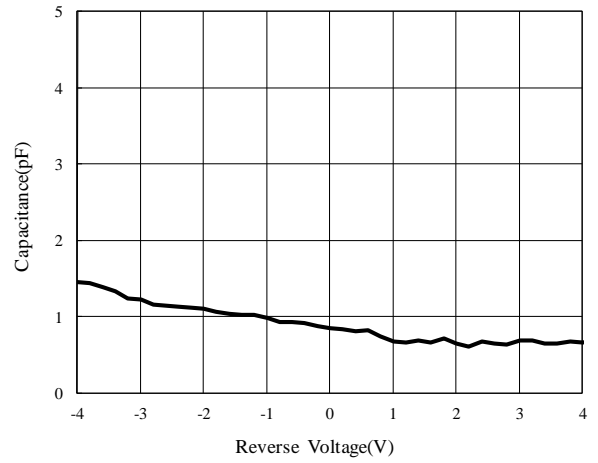
<sup>1</sup>Guaranteed by design and not subject to production test.

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

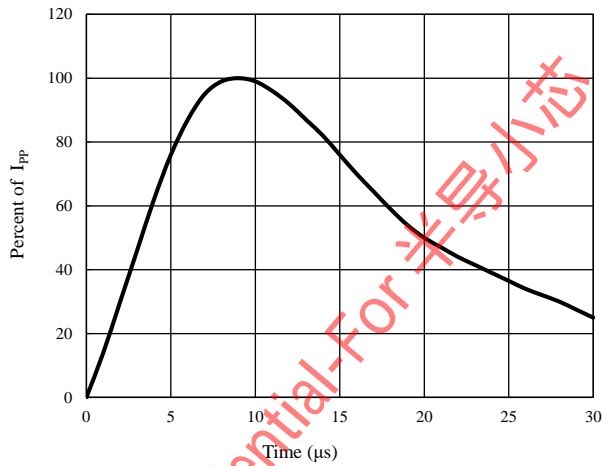
### TLP Measurement



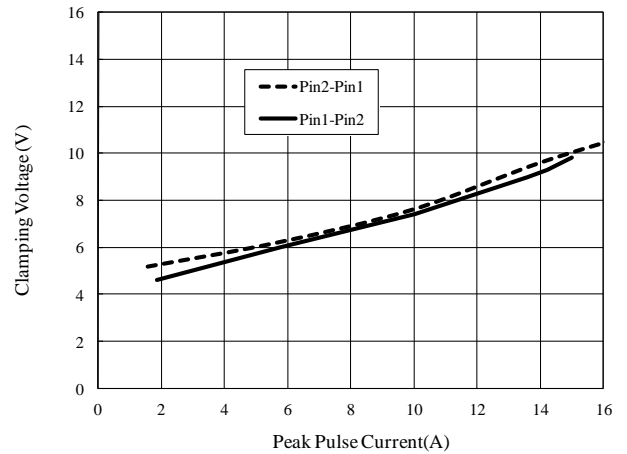
### Capacitance vs. Voltage



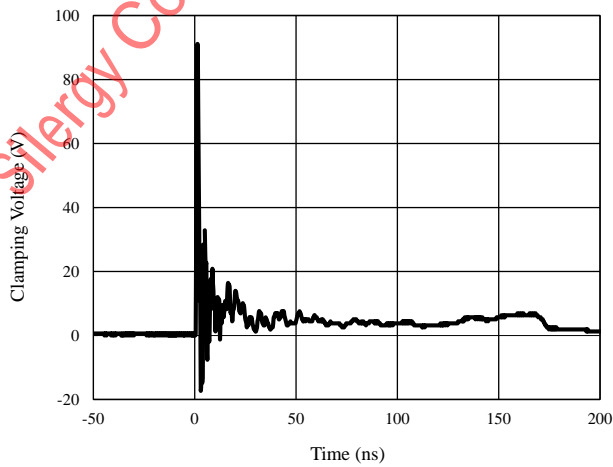
### Pulse Waveform



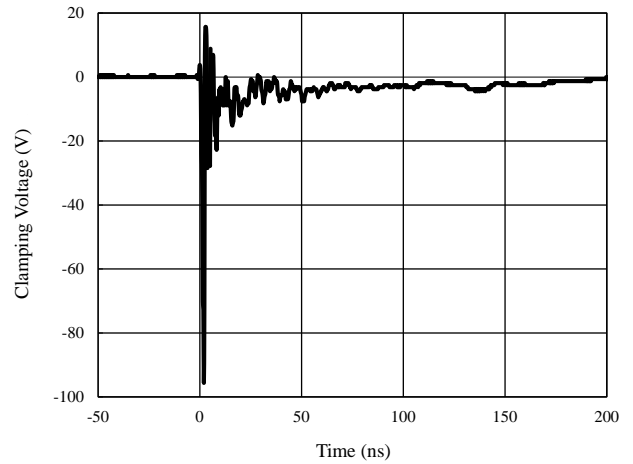
### Clamping Voltage vs. Peak Pulse Current



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

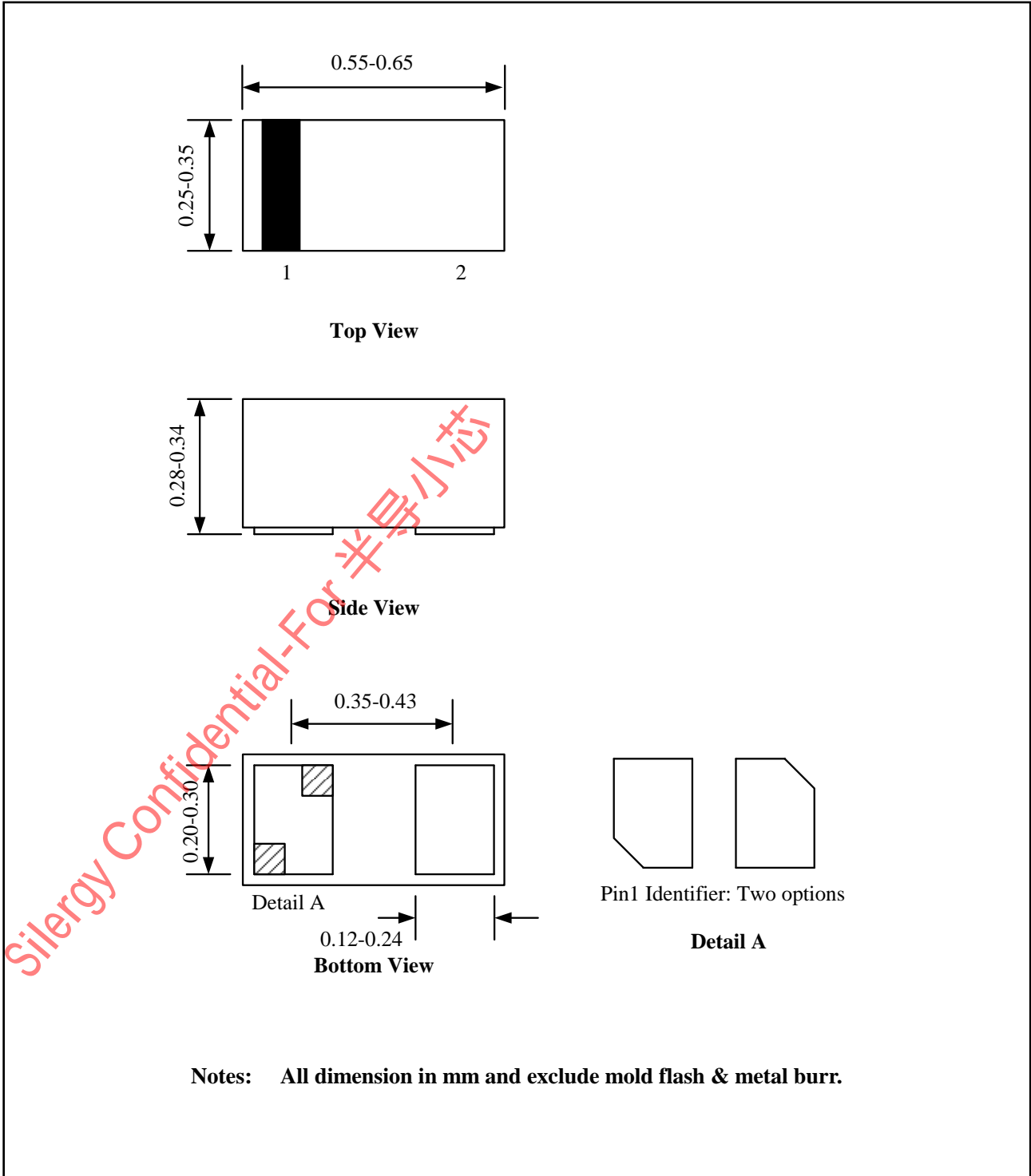


### ESD Clamping of I/O\_1 to I/O\_2 (-8kV Contact per IEC 61000-4-2)



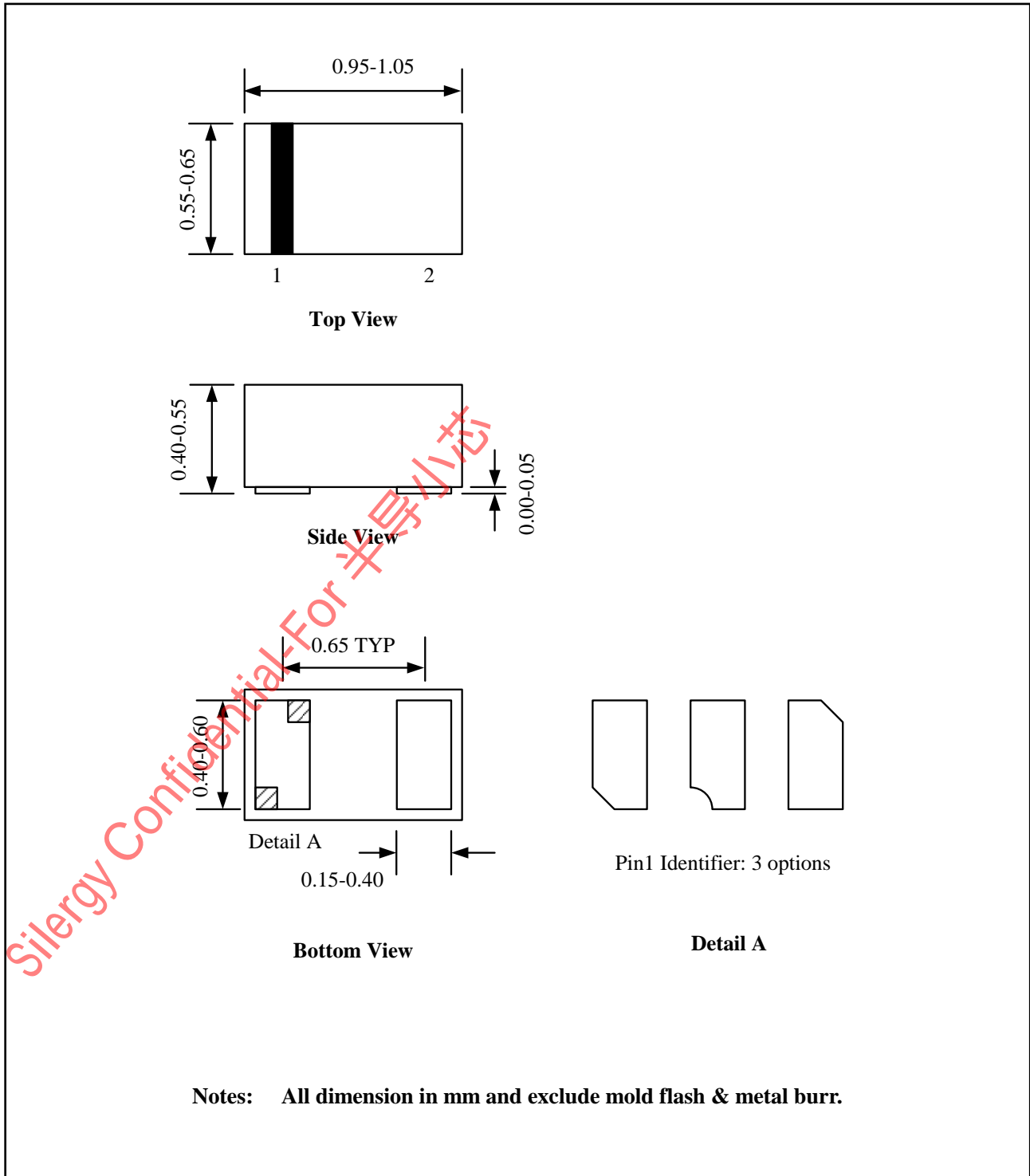
Package Outline

- DFN0.6\*0.3-2 Package



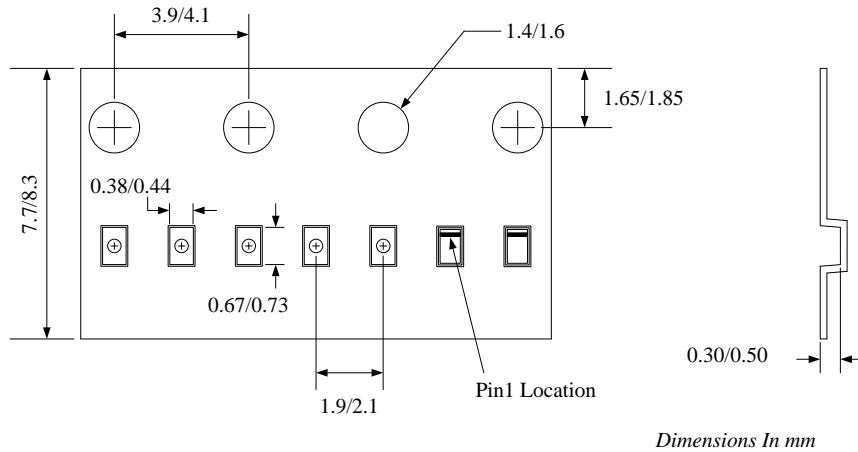
## Package Outline

- DFN1.0\*0.6-2 Package



## Tape and Reel Specification

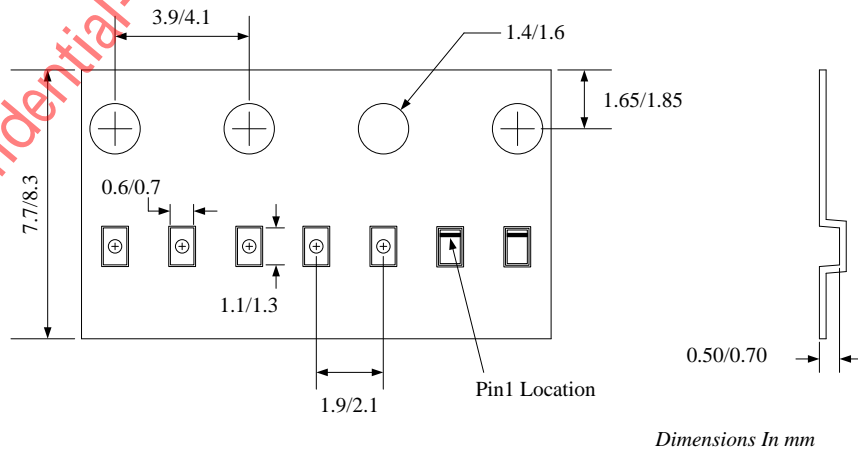
- DFN0.6\*0.3-2



Feeding direction →

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

- 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



DFN0.6\*0.3-2



DFN1.0\*0.6-2

## Ordering Information

Part Number	Package	QTY/Reel
SYT01L03DXC	DFN0.6*0.3-2	10,000
SYT01L03DWC	DFN1.0*0.6-2	10,000

Note:

- (1) "R", "U" is device code, fixed.
- (2) "M" is date code.

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