

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 μs)
- 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 μA @ V_{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 μs), 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

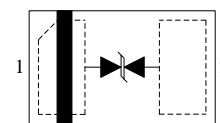
Mechanical Characteristics

- Package: DFN0.6*0.3-2
DFN1.0*0.6-2
- Marking: Device Code, Date Code
- Packaging: Tape and Reel

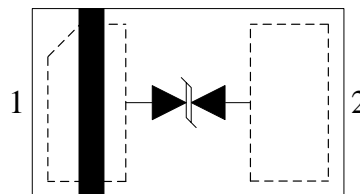
Circuit Diagram



Pin Configuration



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



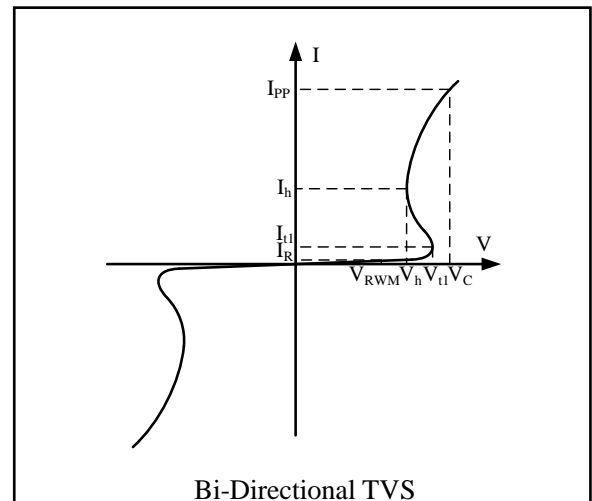
DFN1.0x0.6-2
(Top View)

Absolute Maximum Rating

Symbol	Parameter	Value	Units
V_{ESD}	ESD per IEC 61000-4-2 (Air)	± 30	kV
	ESD per IEC 61000-4-2 (Contact)	± 30	
I_{PP}	Peak Pulse Current (8/20 μ s)	12	A
P_{PK}	Peak Pulse Power (8/20 μ 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



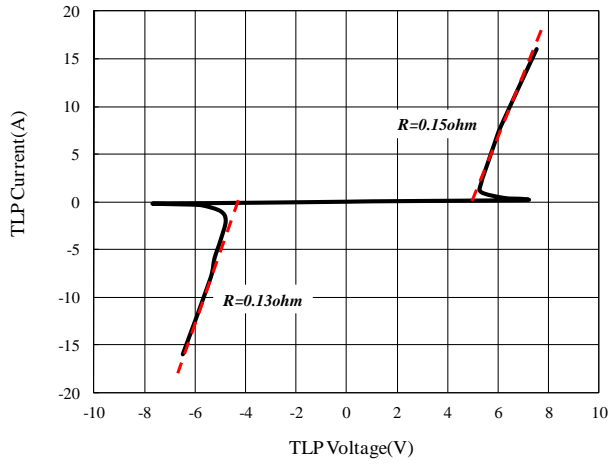
Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}		-3.3		3.3	V
I_R	$V_{RWM} = 3.3V, T = 25^{\circ}C$		0.1	1.0	μ A
V_{t1}	$I_{t1} = 1mA$	3.65			V
V_h	$I_h = 100mA$	3.65		5.6	V
V_C^1	$I_{PP} = 12A, t_p = 8/20\mu s$			10	V
V_C^1	$I_{PP} = 16A, t_p = 10/100ns$		7.5		V
$R_{DYN}^{1,2}$	$t_p = 10/100ns$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

NOTES

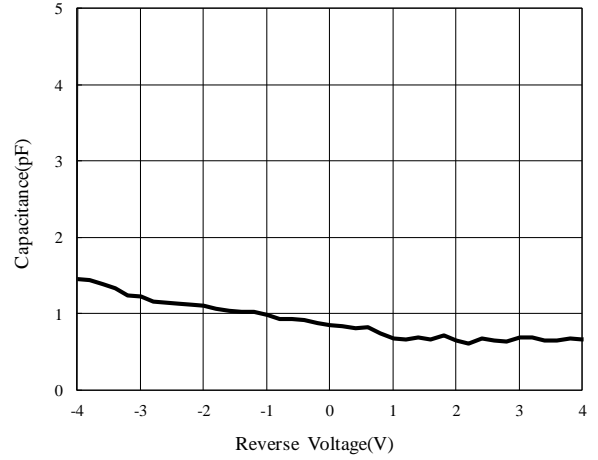
¹Guaranteed by design and not subject to production test.

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

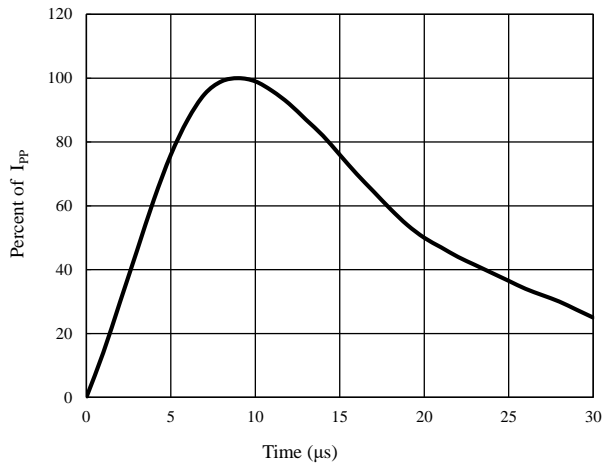
TLP Measurement



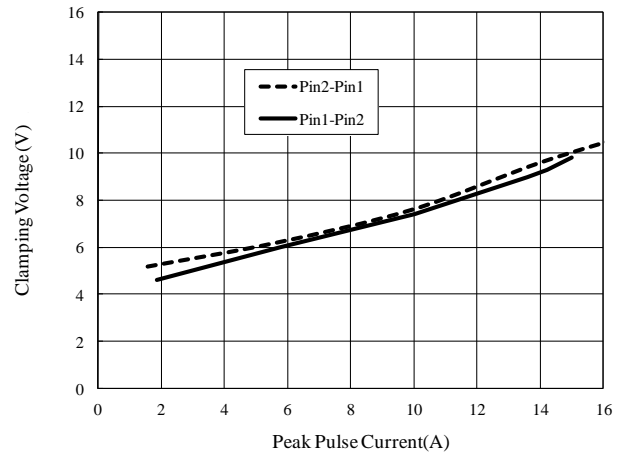
Capacitance vs. Voltage



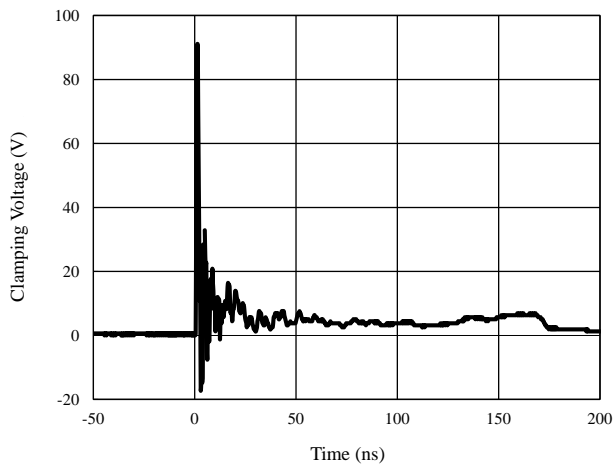
Pulse Waveform



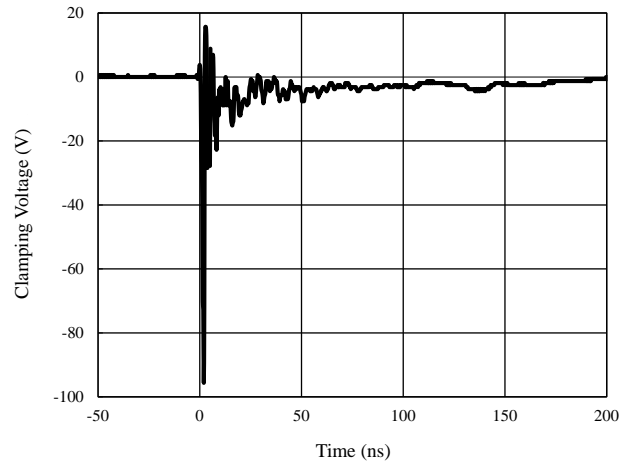
Clamping Voltage vs. Peak Pulse Current



ESD Clamping of I/O_1 to I/O_2 (+8kV Contact per IEC 61000-4-2)

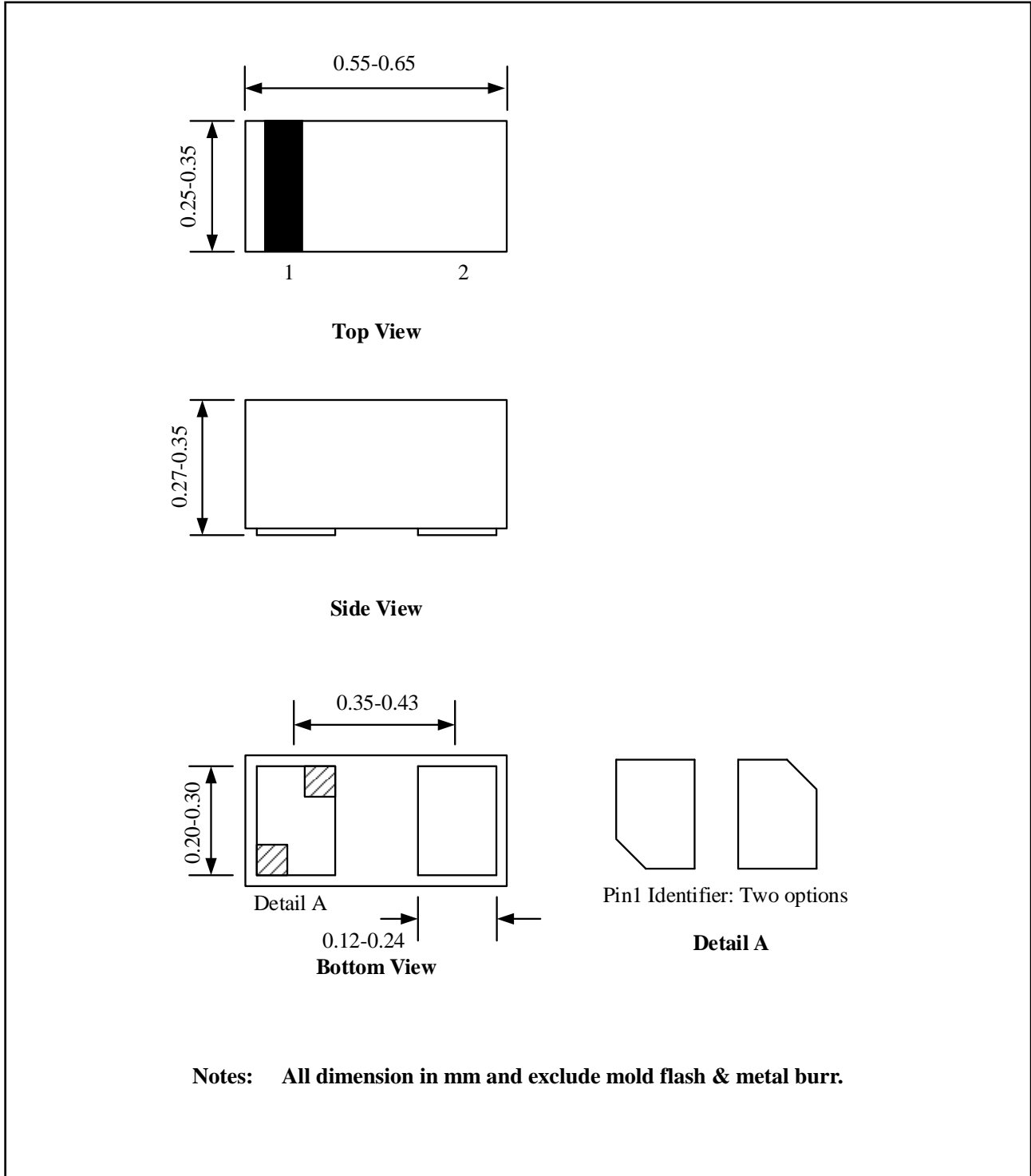


ESD Clamping of I/O_1 to I/O_2 (-8kV Contact per IEC 61000-4-2)



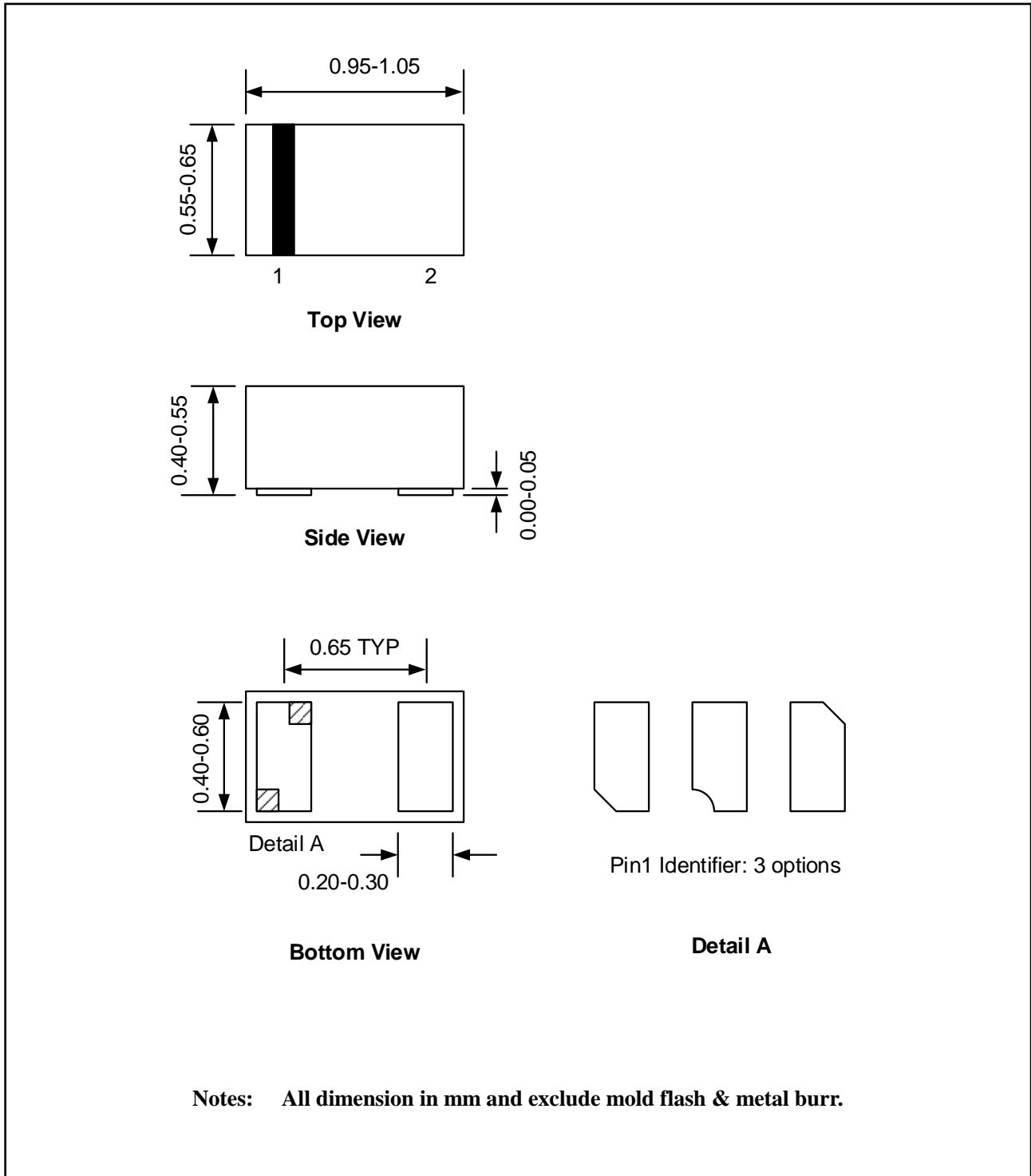
Package Outline

- DFN0.6*0.3-2 Package



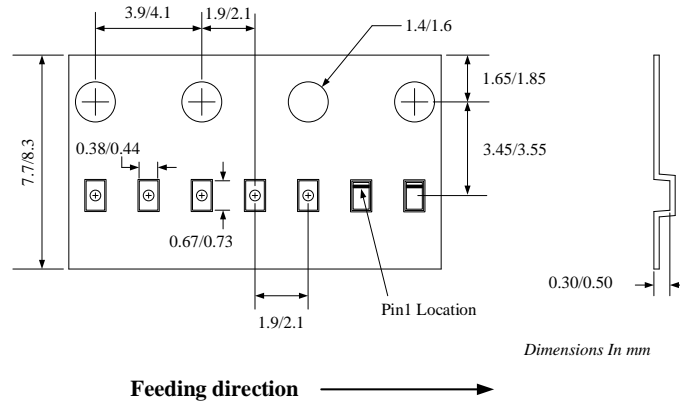
Package Outline

- DFN1.0*0.6-2 Package



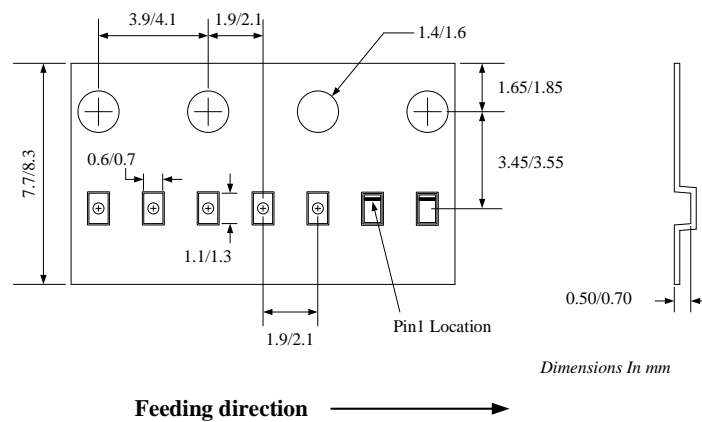
Tape and Reel Specification

- DFN0.6*0.3-2



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



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.



Revision History

The revision history provided is for informational purpose only and is believed to be accurate, however, not warranted. Please make sure that you have the latest revision.

Revision Number	Revision Date	Description	Pages changed
0.9	08/01/2019	Initial Release	
1.0	08/01/2020	Production Release	
1.0A	01/26/2024	Update POD & Tap Reel	1,4,5,6

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