

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

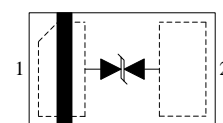
Mechanical Characteristics

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

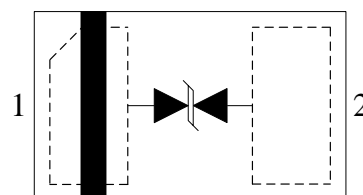
Circuit Diagram



Pin Configuration



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



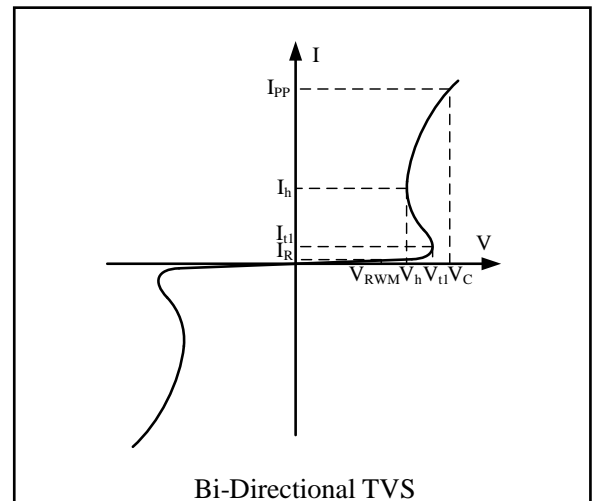
DFN1.0x0.6-2
(Top View)

Absolute Maximum Rating

Symbol	Parameter	Value	Units
V_{ESD}	ESD per IEC 61000-4-2 (Air)	± 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 ($T_A = 25^{\circ}$ 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



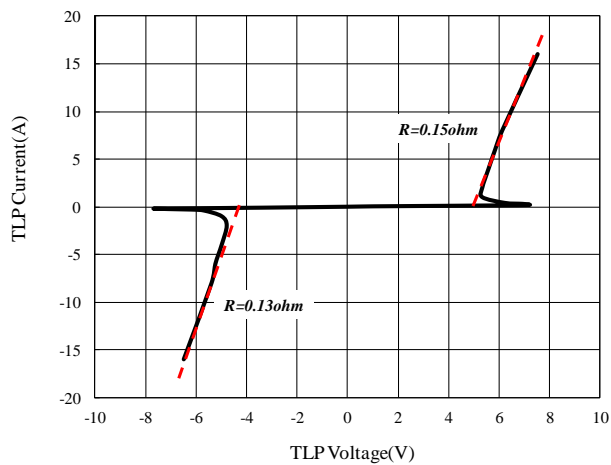
Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}		-3.3		3.3	V
I_R	$V_{RWM} = 3.3V, T = 25^{\circ}C$		0.1	1.0	μ A
V_{t1}	$I_{t1} = 1mA$	3.65			V
V_h	$I_h = 100mA$	3.65		5.6	V
V_C^1	$I_{PP} = 12A, t_p = 8/20\mu s$			10	V
V_C^1	$I_{PP} = 16A, t_p = 10/100ns$		7.5		V
$R_{DYN}^{1,2}$	$t_p = 10/100ns$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

NOTES

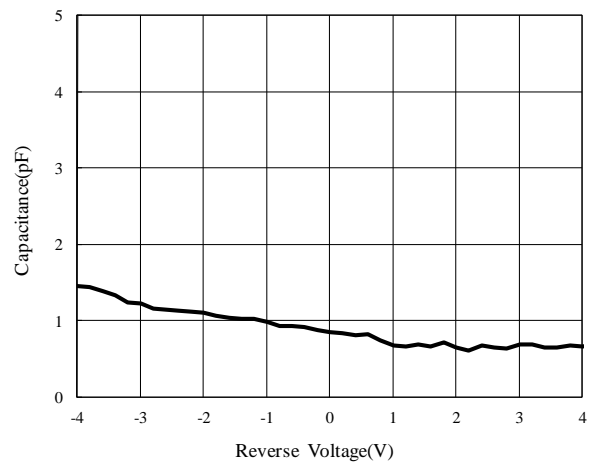
¹Guaranteed by design and not subject to production test.

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

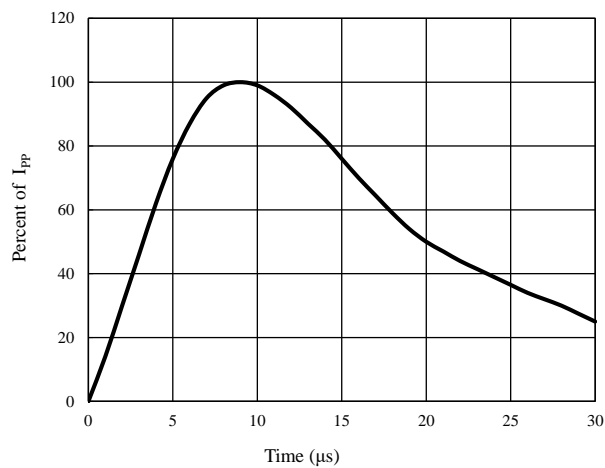
TLP Measurement



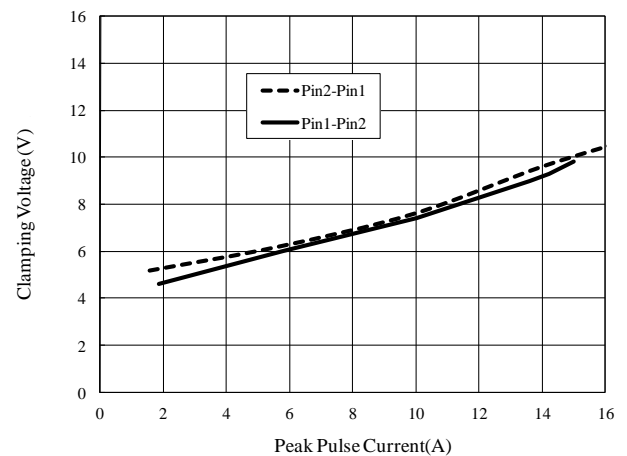
Capacitance vs. Voltage



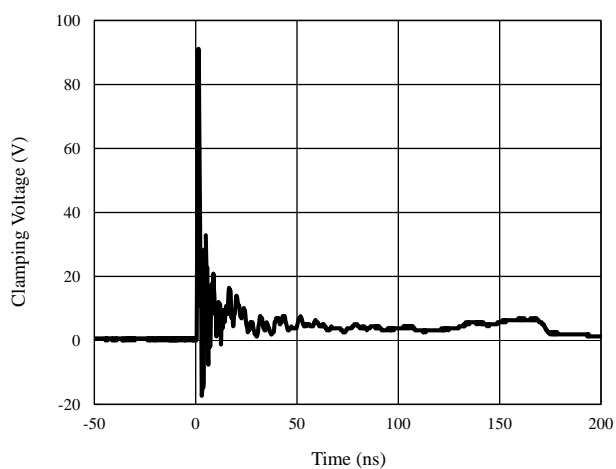
Pulse Waveform



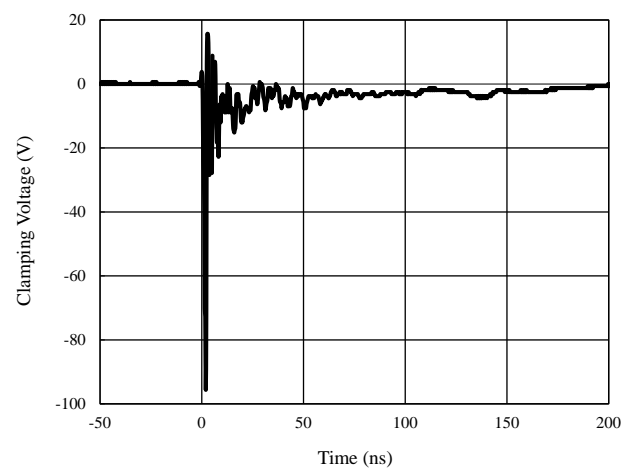
Clamping Voltage vs. Peak Pulse Current



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

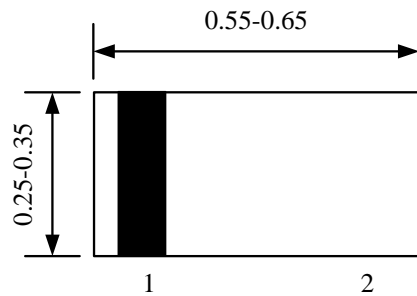


ESD Clamping of I/O_1 to I/O_2 (-8kV Contact per IEC 61000-4-2)

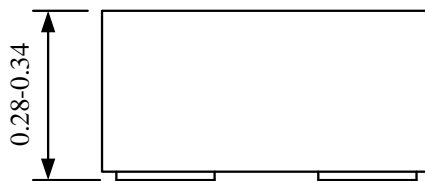


Package Outline

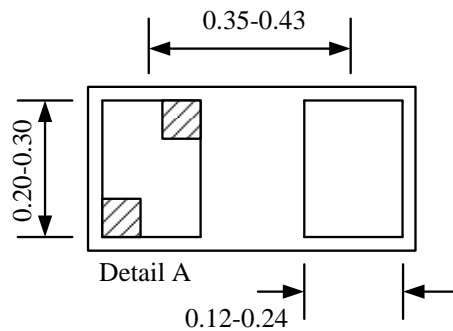
- DFN0.6*0.3-2 Package



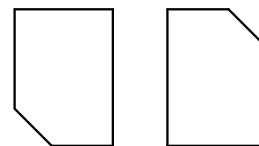
Top View



Side View



Bottom View



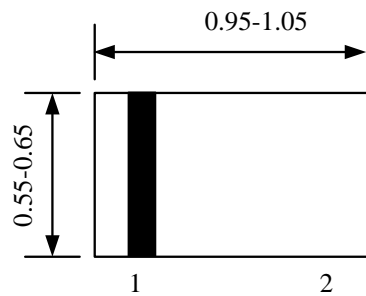
Pin1 Identifier: Two options

Detail A

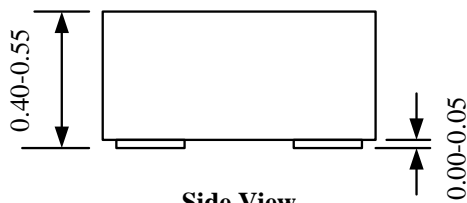
Notes: All dimension in mm and exclude mold flash & metal burr.

Package Outline

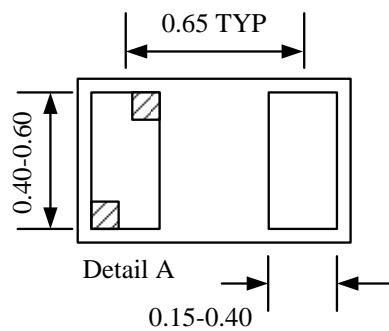
- DFN1.0*0.6-2 Package



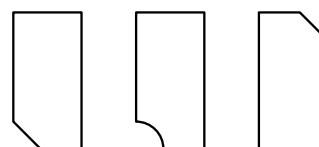
Top View



Side View



Bottom View



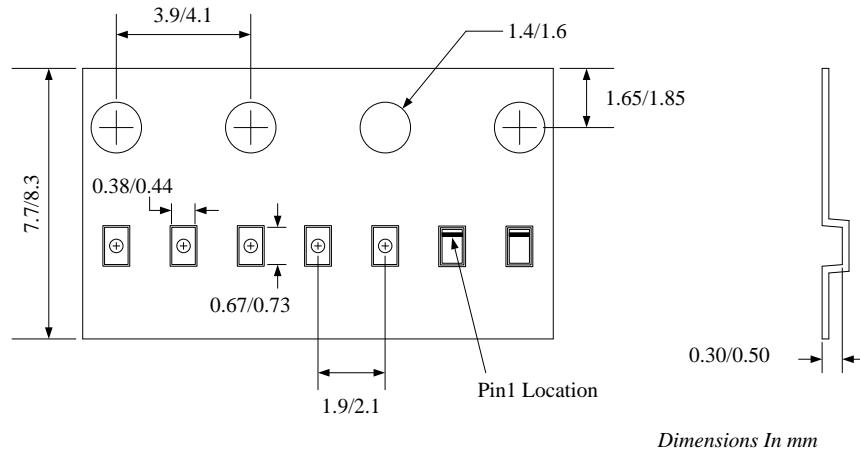
Pin1 Identifier: 3 options

Detail A

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

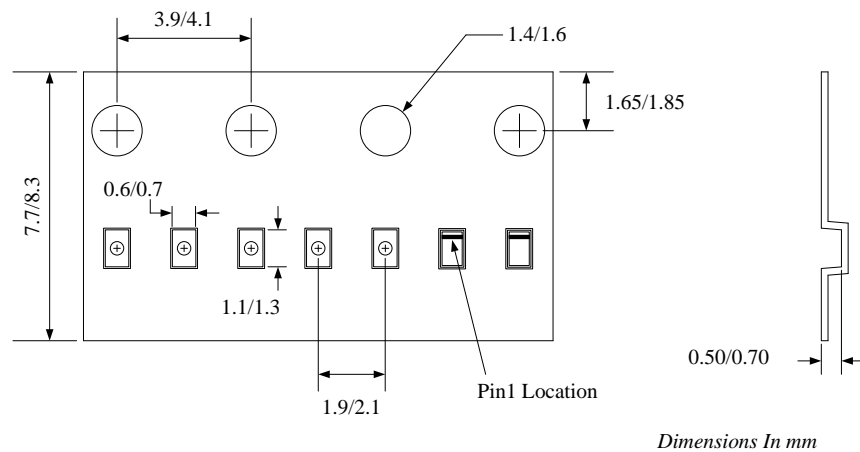
Tape and Reel Specification

- 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.

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