SYT01M12
Low Capacitance TVS Protection

Features

- Transient protection for high-speed data lines
  IEC 61000-4-2 (ESD) ±30kV (Air)
  ±30kV (Contact)
  IEC 61000-4-5 (Surge) 4A (8/20μs)
- 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: 0.01μA @ V_{RWM} (Typical)
- Low clamping voltage
- Each I/O pin can withstand over 1000 ESD strikes for ±8kV 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) (±30kV air, ±30kV contact discharge), IEC61000-4-5 (Surge) (4A, 8/20μs), 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

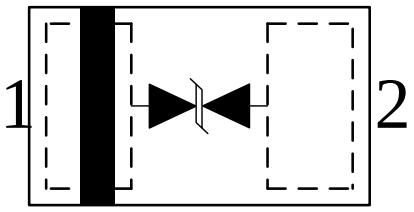
- Portable Electronics
- Desktops, Servers and Notebooks
- Cellular Phones
- MP3 Ports
- Digital Camera Ports

Mechanical Characteristics

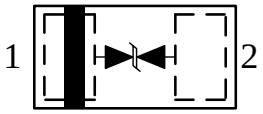
- DFN1.0*0.6-2 & DFN0.6*0.3-2 package
- Flammability Rating: UL 94V-0
- Marking: Device code, date
- Packaging: Tape and Reel

Circuit Diagram

Pin Configuration



DFN1.0*0.6-2 (Top View)



DFN0.6*0.3-2(Top View)

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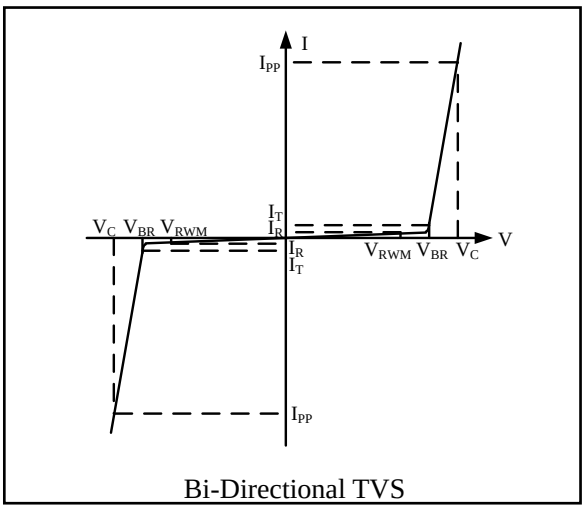
Absolute Maximum Rating

Symbol	Parameter	Value	Units
I_{PP}	Peak Pulse Current (8/20μs)	4	A
P_{PK}	Peak Pulse Power (8/20μs)	90	Watts
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±30 ±30	kV
T_{OPT}	Operating Temperature	-40/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C

Electrical Characteristics (T_A = 25°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



Bi-Directional TVS

Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}				12.5	V
I_R	V_{RWM} = 12V, T_A = 25°C		0.01	0.1	μA
V_{BR}	I_T = 1mA	13.0		17	V
V_C[1]	I_{PP} = 4A, t_p = 8/20μs			23	V
V_C[1]	I_{PP} = 16A, t_p = 10/100ns		22		V
R_{DYN}[1,2]	t_p = 10/100ns		0.5		Ω
C_{ESD}[1]	V_R = 0V, f = 1MHz		4	8	pF

NOTES

[1]Guaranteed 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.

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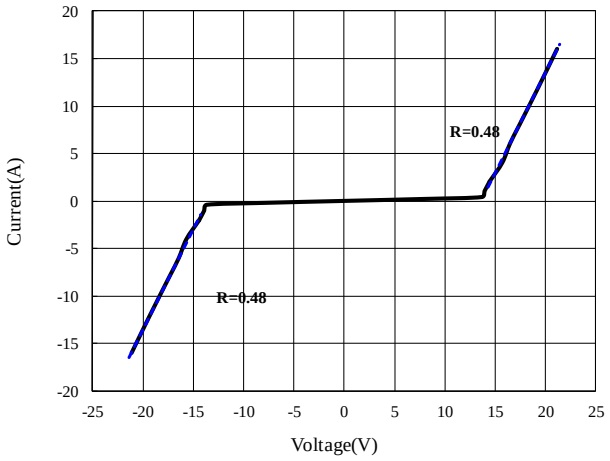
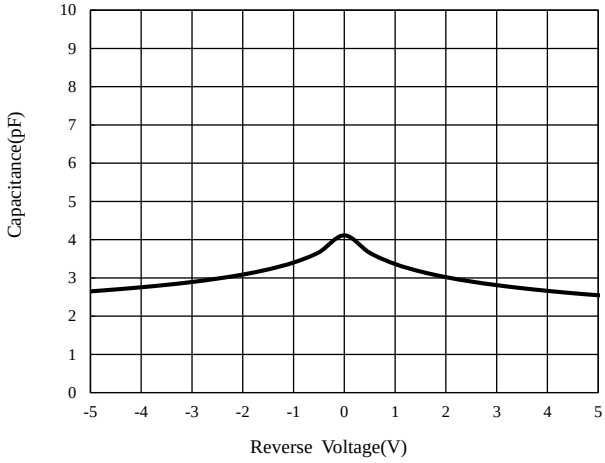
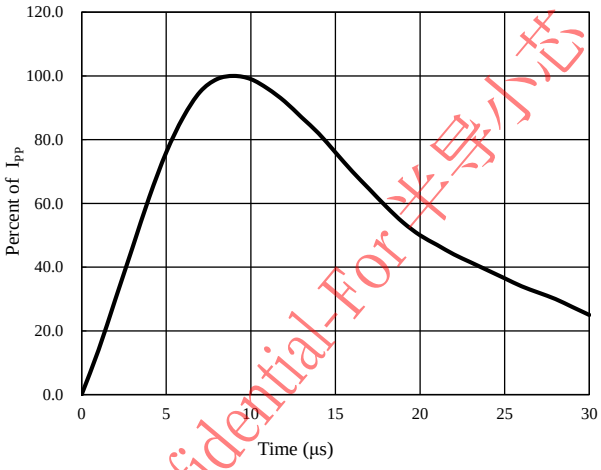
TLP Testing of I/O_1 to I/O_2



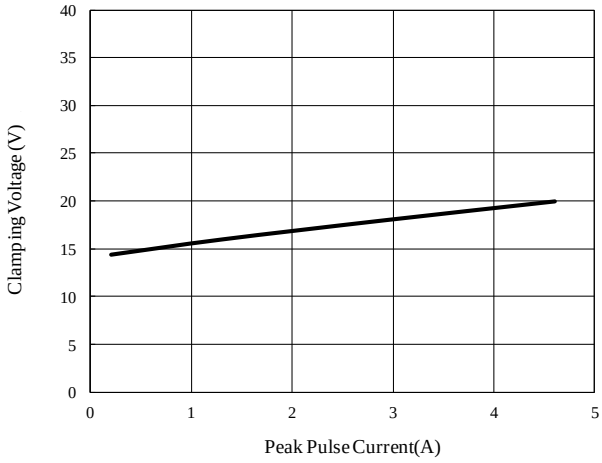
Capacitance vs. Reverse Voltage



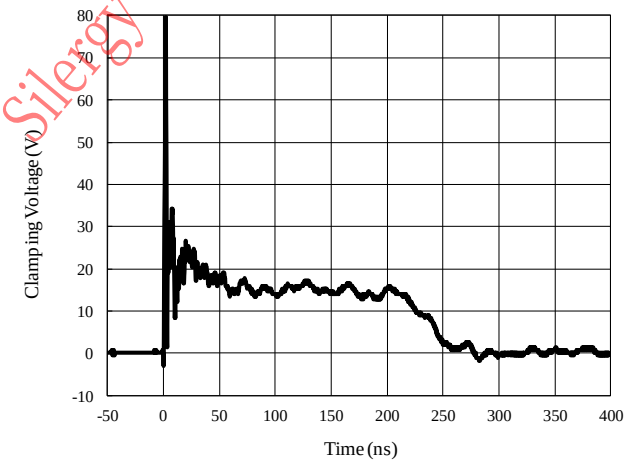
8/20μs Current Pulse Waveform



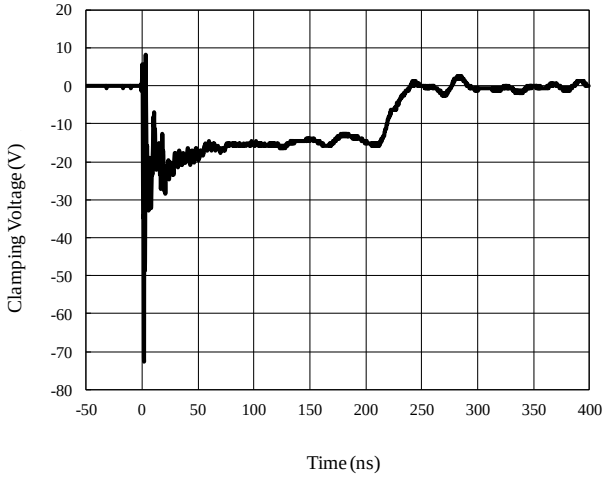
Clamping Voltage vs. Peak Pulse Current



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)



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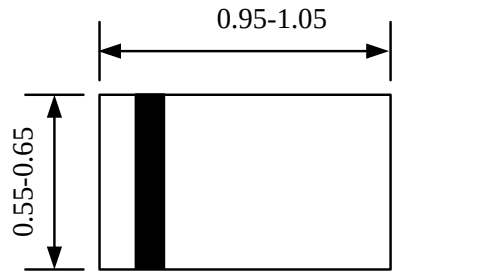
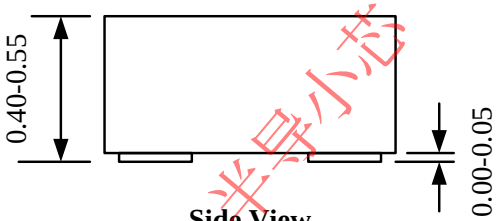
Package Outline

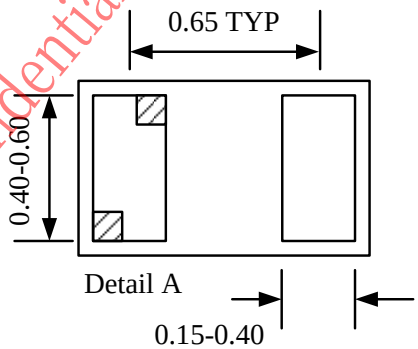
- DFN1.0*0.6-2 package



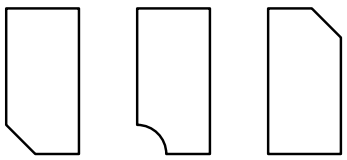
Top View



Side View



Bottom View



Pin1 Identifier: 3 options

Detail A

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

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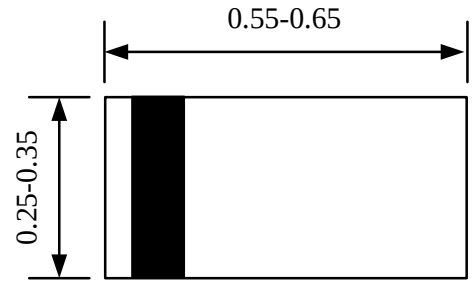
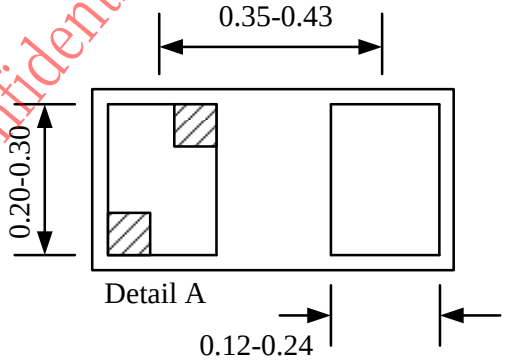
- DFN0.6*0.3-2 package

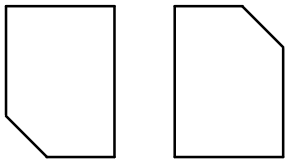


Top View

Side View



Bottom View



Pin1 Indentifier:Two options

Detail A

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

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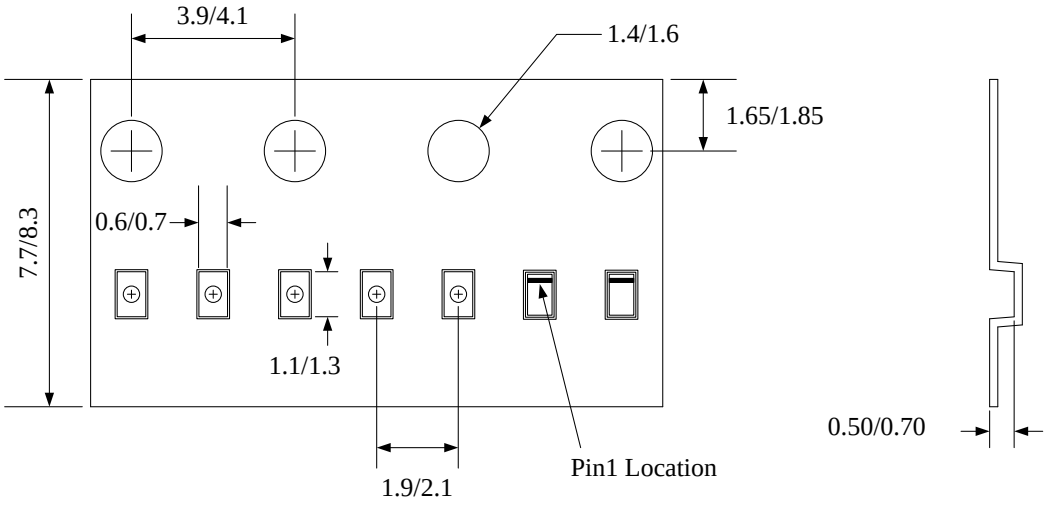
Tape and Reel Specification

- DFN1.0*0.6-2



Dimensions In mm

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

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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

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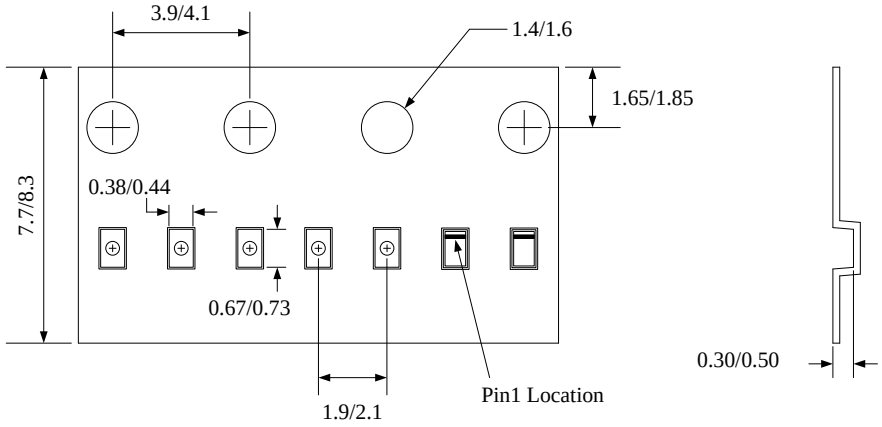
Tape and Reel Specification

- DFN0.6*0.3-2



Dimensions In mm

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

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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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