SYT01N05

Low Capacitance TVS Protection

Features

- Transient protection for high-speed data lines
  - IEC 61000-4-2 (ESD) ±15kV (Air)
    ±8kV (Contact)
  - IEC 61000-4-4 (EFT) 40A (5/50 ns)
  - Cable Discharge Event (CDE)
- Package optimized for high-speed lines
- Ultra-small package: DFN1.0x0.6-2L
  DFN0.6x0.3-2L
  SOD523
- Protects one data, control or power line
- Low capacitance: 30pF (Typical)
- Low leakage current: 0.1μA @ V_{RWM} (Typical)
- Low clamping voltage
- Each I/O pin can withstand over 1000 ESD strikes for ±8kV contact discharge

Description

SYT01N05 is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 30pF, SYT01N05 is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4 (±15kV air, ±8kV contact discharge), IEC 61000-4-4 (electrical fast transient - EFT) (40A, 5/50 ns), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

Each SYT01N05 device can protect one data line. It offers system designers flexibility to protect single data line where space is a premium concern.

Applications

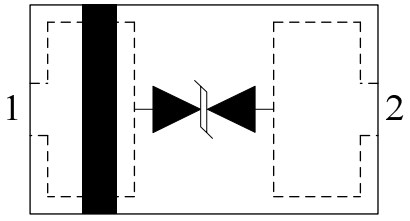
- PCI Express
- Desktops, Servers and Notebooks
- Cellular Phones
- MP3 Ports
- Digital Camera Ports

Mechanical Characteristics

- DFN1.0x0.6-2L / DFN0.6x0.3-2L/SOD523
- Flammability Rating: UL 94V-0
- Marking: Part number
- Packaging: Tape and Reel

Circuit Diagram

Pin Configuration



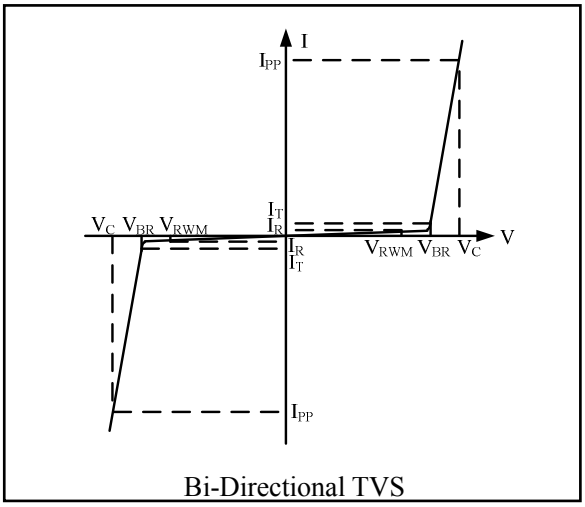
DFN1006
(Top View)

Absolute Maximum Rating

Symbol	Parameter	Value	Units
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±30 ±30	kV
T_{OPT}	Operating Temperature	-55/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C

Electrical Characteristics (T = 25°C)

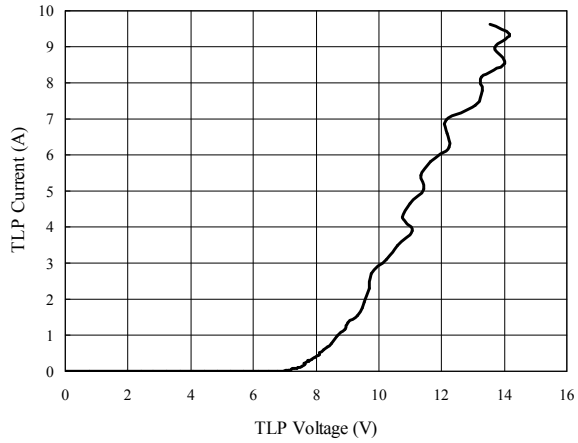
Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Reverse Breakdown Voltage @ I_T
I_T	Test Current for Reverse Breakdown
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Maximum Peak Pulse Current
C_{ESD}	Parasitic Capacitance
V_R	Reverse Voltage
f	Small Signal Frequency



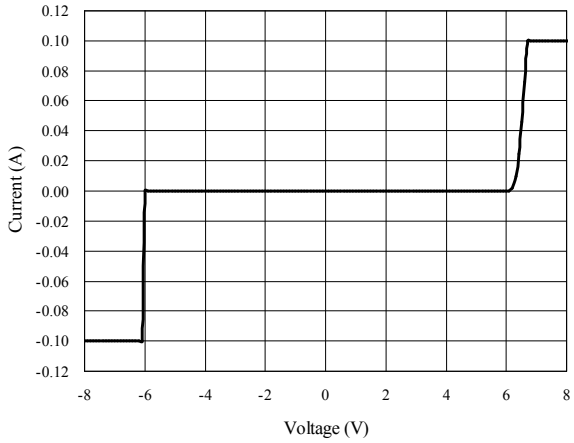
Bi-Directional TVS

Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}				5	V
I_R	V_{RWM} = 5V, T = 25°C Between I/O_1 and I/O_2		0.1	1.0	μA
V_{BR}	I_T = 1mA Between I/O_1 and I/O_2	5.5			V
V_C	I_{PP} = 1A, t_p = 8/20μs Between I/O_1 and I/O_2			10	V
C_{ESD}	V_R = 0V, f = 1MHz Between I/O_1 and I/O_2		30		pF

TLP Measurement of I/O_1 to I/O_2

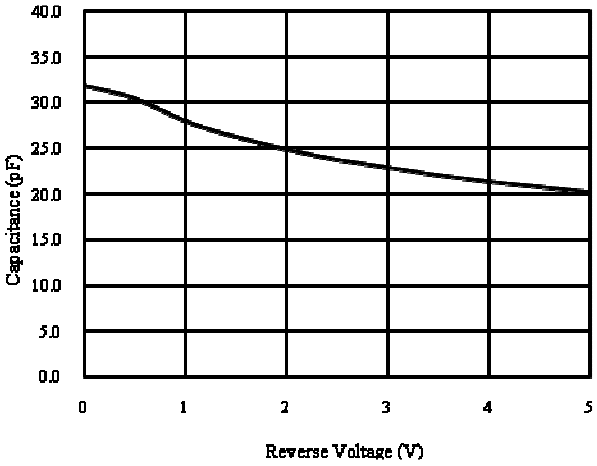


Voltage Sweeping of I/O_1 to I/O_2

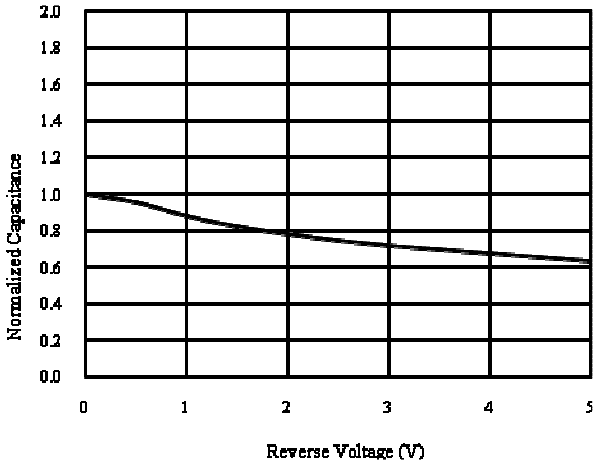


Capacitance vs. Voltage of I/O_1 to I/O_2 (f = 1MHz)

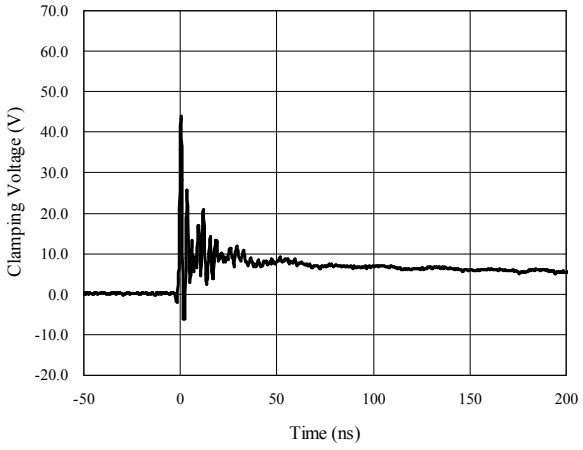
Capacitance *vs.* Reverse Voltage



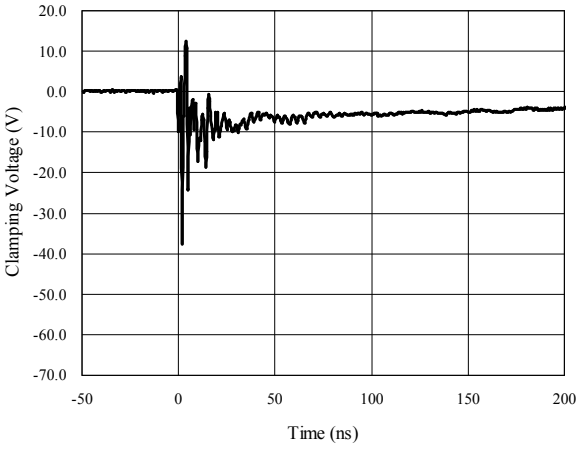
Normalized Capacitance *vs.* Reverse Voltage



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

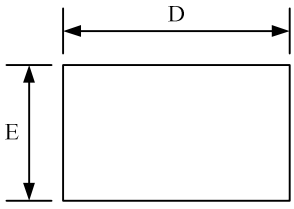


ESD Clamping of I/O_1 to I/O_2 (-8kV Contact per IEC 61000-4-2)

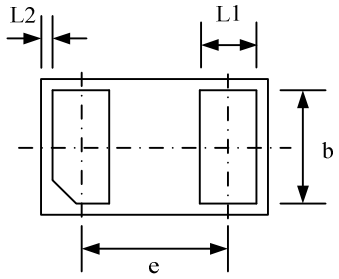


Package Outline

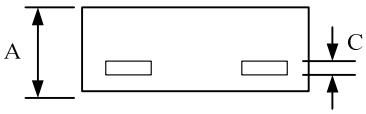
- DFN0.6x0.3-2 package
- MSL-1



TOP VIEW



BOTTOM VIEW



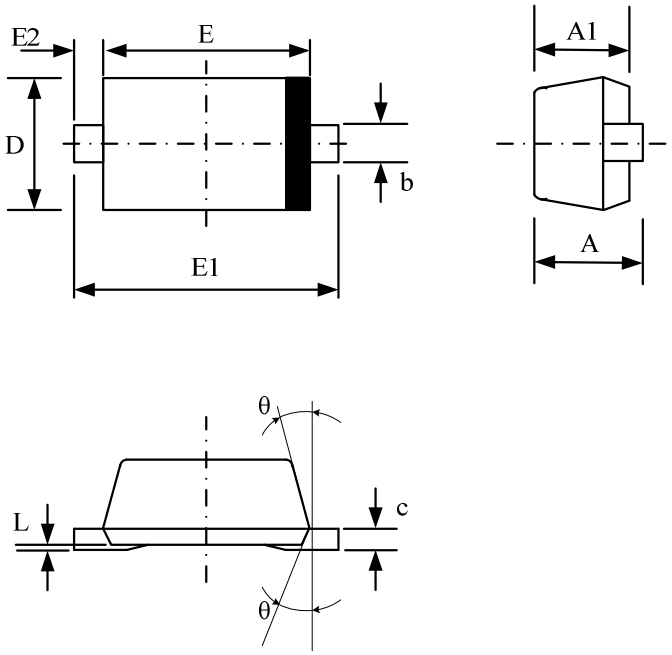
SIDE VIEW

Package Dimensions (Controlling dimensions are in millimeters)

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Minimum	Maximum	Minimum	Maximum
A	0.275	0.340	0.011	0.013
D	0.570	0.670	0.022	0.026
E	0.270	0.370	0.011	0.015
b	0.225	0.295	0.009	0.012
c	0.050 REF.		0.002 REF.	
e	0.365	0.435	0.014	0.017
L1	0.125	0.195	0.005	0.008
L2	0.030 REF.		0.001 REF.	

Package Outline

- SOD523 package
- MSL-1

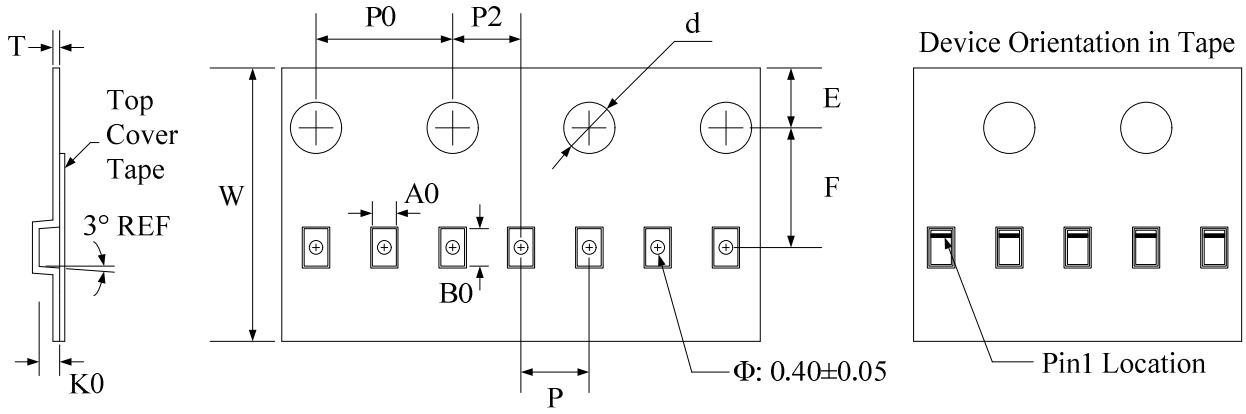


Package Dimensions (Controlling dimensions are in millimeters)

Symbol	Dimensions (mm)		Dimensions (Inches)	
	Minimum	Maximum	Minimum	Maximum
A	0.510	0.770	0.020	0.031
A1	0.500	0.700	0.020	0.028
b	0.250	0.350	0.010	0.014
c	0.080	0.150	0.003	0.006
D	0.750	0.850	0.030	0.033
E	1.100	1.300	0.043	0.051
E1	1.500	1.700	0.059	0.067
E2	0.200 REF		0.008 REF	
L	0.010	0.070	0.001	0.003
θ	7 ° REF		7 ° REF	

Tape and Reel Specification

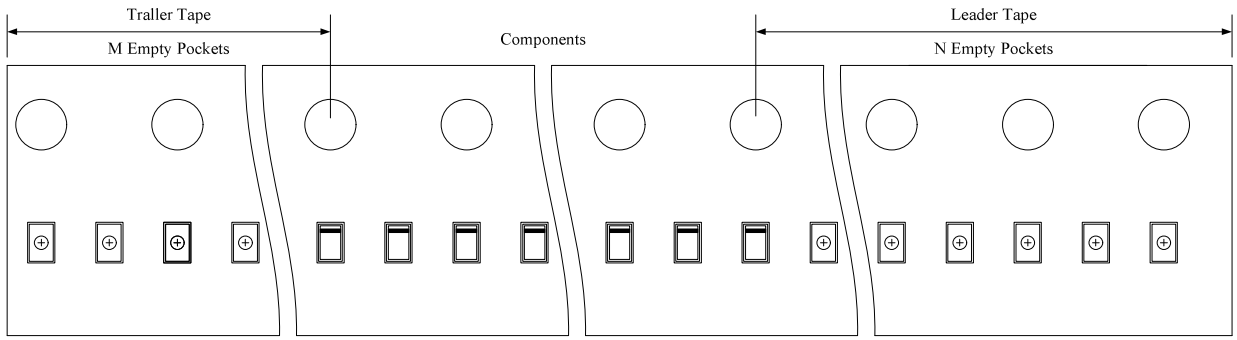
❑ Carrier Tape Specification



Pkg Type	W	A0	B0	K0	d	E	F	P	P0	P2
DFN0.6x0.3-2L	8.00+0.3 -0.1	0.41±0.05	0.70±0.05	0.23±0.02	Φ1.50±0.1	1.75±0.1	3.5±0.1	2.0±0.1	4.0±0.1	2.0±0.1
DFN1.0x0.6-2L	8.00+0.3 -0.1	0.7±0.05	1.15±0.05	0.55±0.05	Φ1.50±0.1	1.75±0.1	3.5±0.1	2.0±0.1	4.0±0.1	2.0±0.1
SOD523	8.00+0.3 -0.1	0.9±0.05	1.94±0.05	0.73±0.05	Φ1.50±0.1	1.75±0.1	3.5±0.1	2.0±0.1	4.0±0.1	2.0±0.1

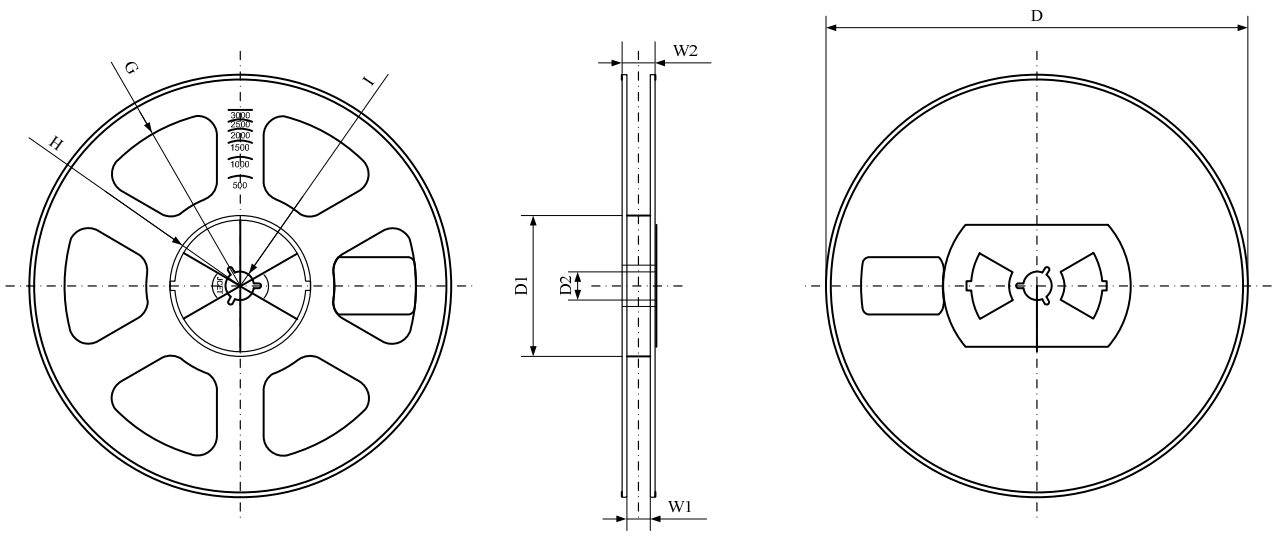
Note: Dimensions are in millimeter.

❑ Tape Leader and Trailer



Pkg Type	M	N
DFN0.6x0.3-2L	50 ± 2	100 ± 2
DFN1.0x0.6-2L	200 ± 8	400 ± 8
SOD523	100 ± 4	200 ± 4

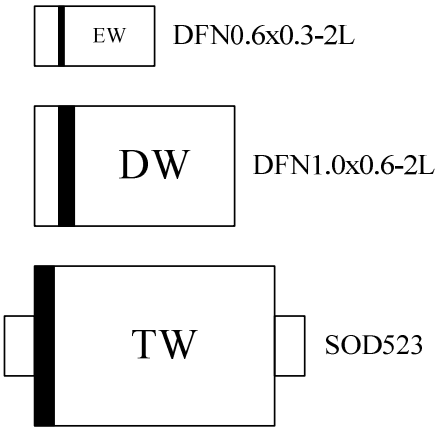
❑ Reel Specification



Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Φ178.00 ± 2	54.40 ± 1	13.00 ± 1	R78.00 ± 1	R25.60 ± 1	R6.50 ± 1	9.50 ± 1	12.30 ± 1

Note: Dimensions are in millimeter.

Marking Codes



Note:
(1) "E", “D”, “T” is part number.
(2) "W" is date code. "W" is the assembly week in a year, from A to Z.

Ordering Information

Part Number	Pkg Type	Quantity Per Reel	Reel Size
SYT01N05DWC	DFN1.0x0.6-2L	10,000	7 Inch
SYT01N05DXC	DFN0.6x0.3-2L	10,000	7 Inch
SYT01N05ANC	SOD523	8,000	7 Inch