

### 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<sub>RWM</sub> (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

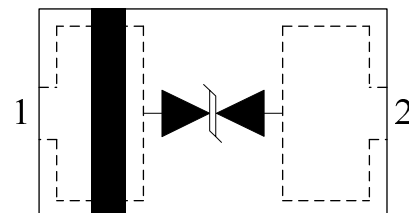
### Mechanical Characteristics

- 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



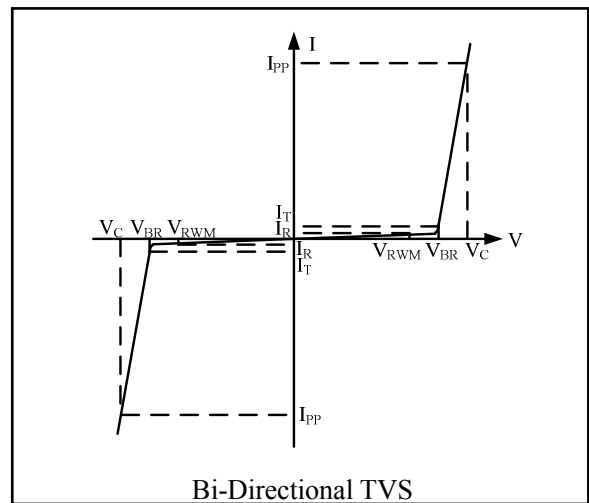
DFN1006  
(Top View)

## Absolute Maximum Rating

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

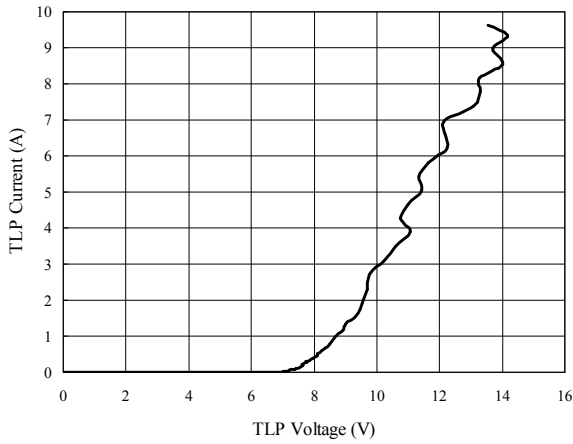
## Electrical Characteristics (T = 25 $^{\circ}C$ )

| 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              |

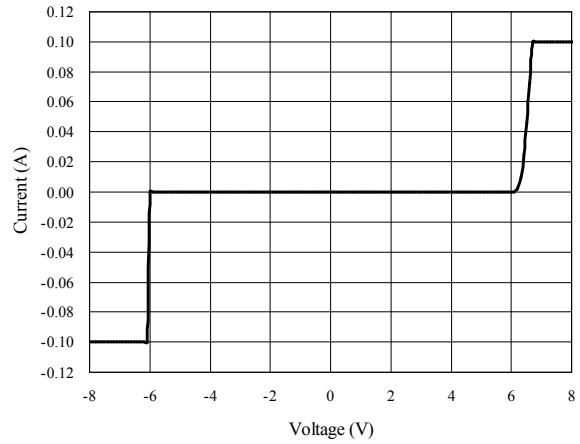


| Symbol    | Test Condition   | Minimum | Typical | Maximum | Units   |
|-----------|--|---------|---------|---------|---------|
| $V_{RWM}$ |  |         |         | 5       | V       |
| $I_R$     | $V_{RWM} = 5V, T = 25^{\circ}C$<br>Between I/O_1 and I/O_2 |         | 0.1     | 1.0     | $\mu A$ |
| $V_{BR}$  | $I_T = 1mA$<br>Between I/O_1 and I/O_2                     | 5.5     |         |         | V       |
| $V_C$     | $I_{PP} = 1A, t_p = 8/20\mu s$<br>Between I/O_1 and I/O_2  |         |         | 10      | V       |
| $C_{ESD}$ | $V_R = 0V, f = 1MHz$<br>Between I/O_1 and I/O_2            |         | 30      |         | pF      |

**TLP Measurement of I/O\_1 to I/O\_2**

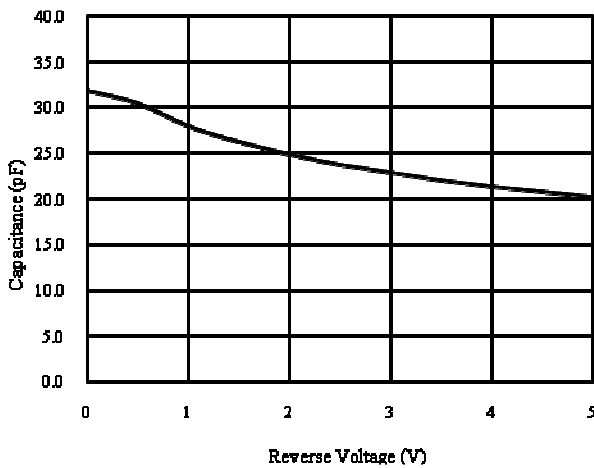


**Voltage Sweeping of I/O\_1 to I/O\_2**

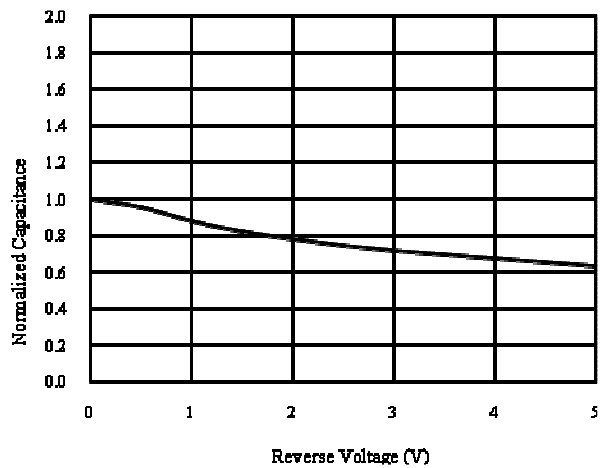


**Capacitance vs. Voltage of I/O\_1 to I/O\_2 (f = 1MHz)**

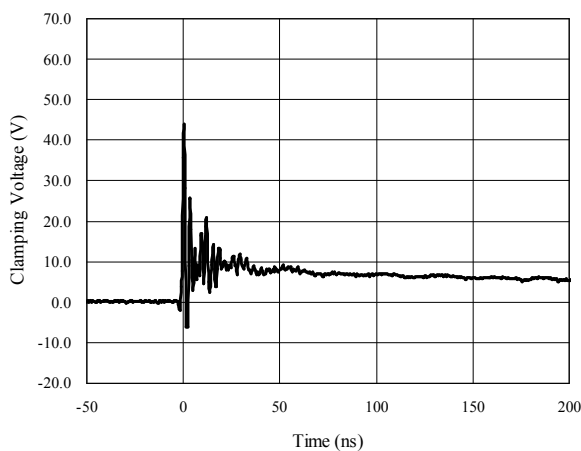
Capacitance vs. Reverse Voltage



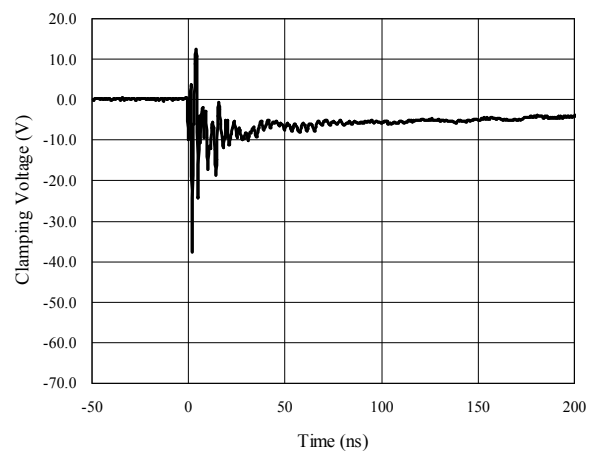
Normalized Capacitance vs. Reverse Voltage



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

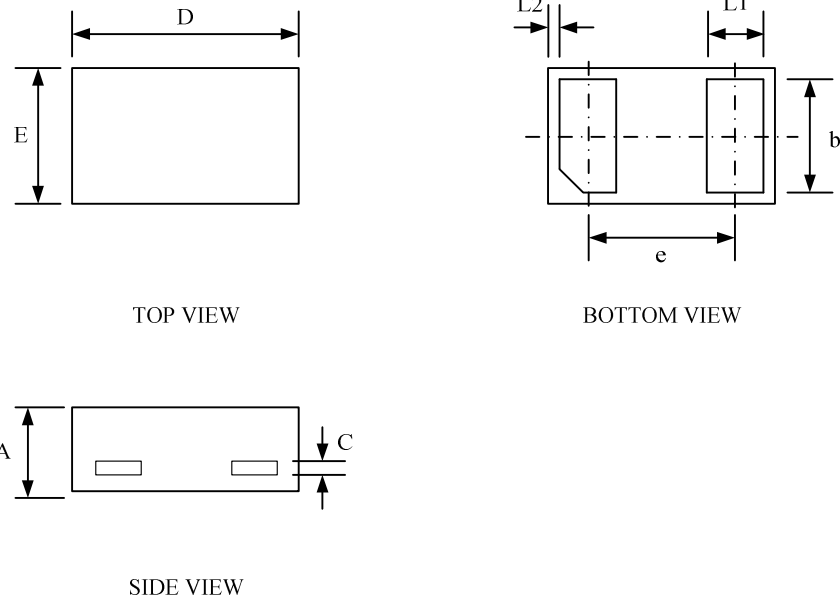


**ESD Clamping of I/O\_1 to I/O\_2 (-8kV Contact per IEC 61000-4-2)**



**Package Outline**

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

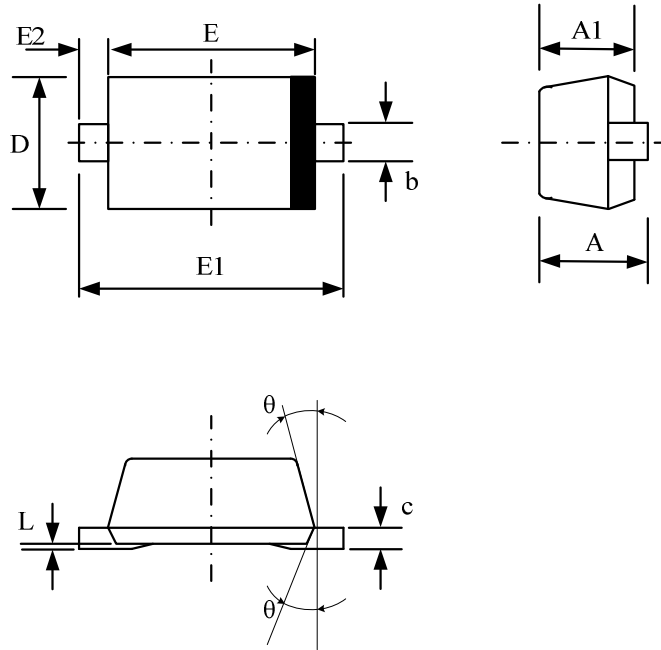


Package Dimensions (Controlling dimensions are in millimeters)

| 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

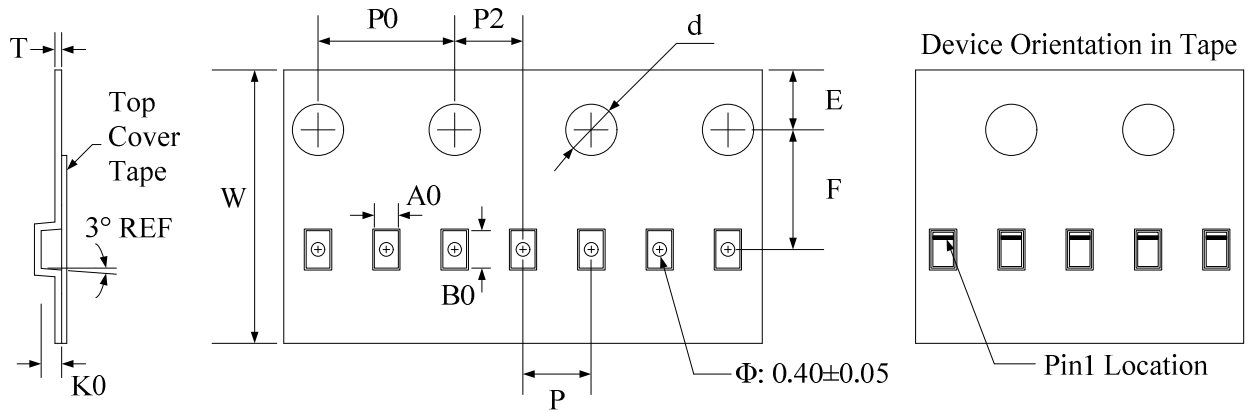


Package Dimensions (Controlling dimensions are in millimeters)

| 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

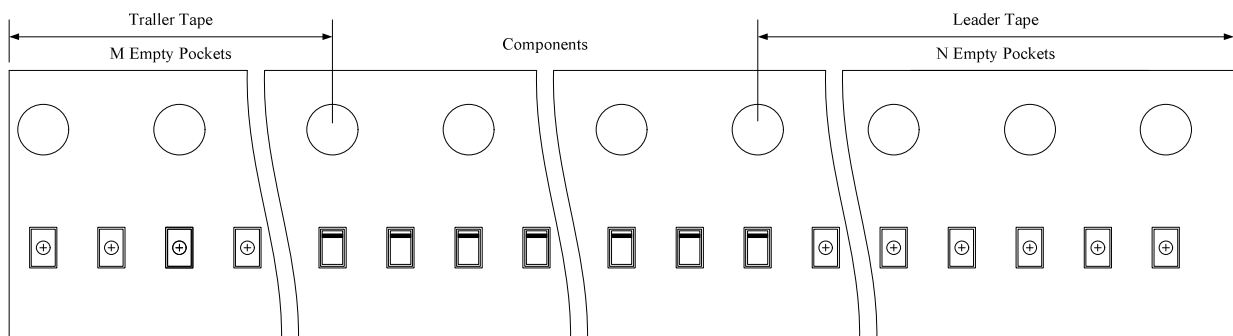
### Carrier Tape Specification



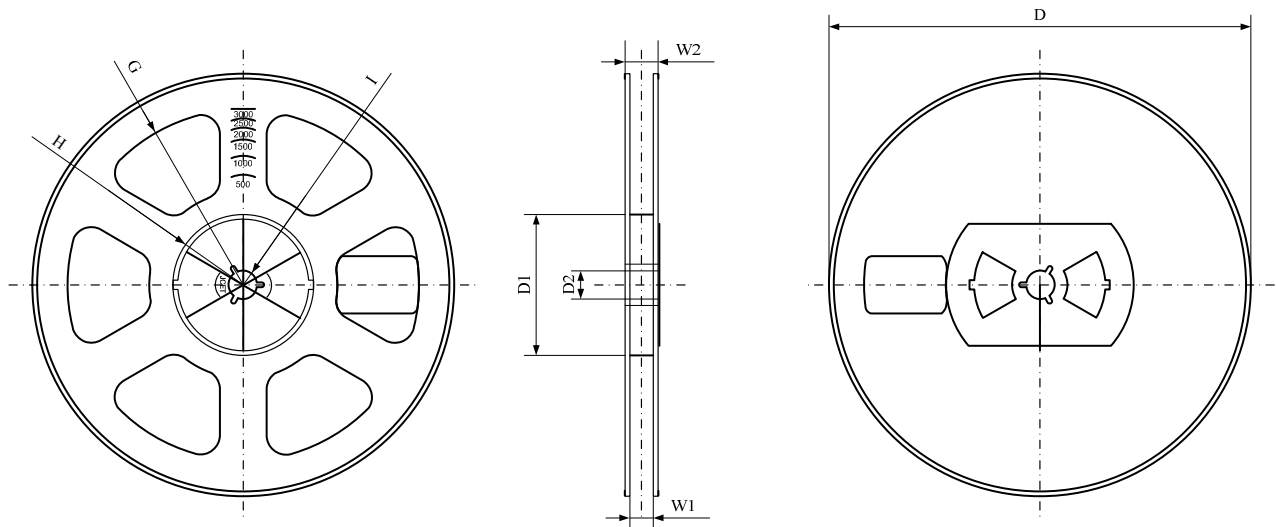
| Pkg Type      | W                | A0        | B0        | K0        | d         | E        | F       | P       | P0      | P2      |
|---------------|------------------|-----------|-----------|-----------|-----------|----------|---------|---------|---------|---------|
| DFN0.6x0.3-2L | 8.00+0.3<br>-0.1 | 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<br>-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<br>-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



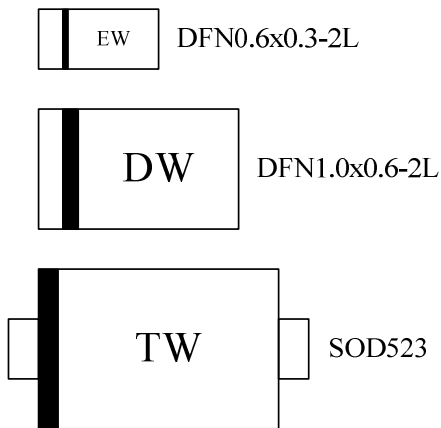
| Pkg Type      | M       | N       |
|---------------|---------|---------|
| DFN0.6x0.3-2L | 50 ± 2  | 100 ± 2 |
| DFN1.0x0.6-2L | 200 ± 8 | 400 ± 8 |
| SOD523        | 100 ± 4 | 200 ± 4 |



| Reel Option | D                   | D1            | D2            | G              | H              | I             | W1           | W2            |
|-------------|---------------------|---------------|---------------|----------------|----------------|---------------|--------------|---------------|
| 7" Dia      | $\Phi 178.00 \pm 2$ | $54.40 \pm 1$ | $13.00 \pm 1$ | $R78.00 \pm 1$ | $R25.60 \pm 1$ | $R6.50 \pm 1$ | $9.50 \pm 1$ | $12.30 \pm 1$ |

Note: Dimensions are in millimeter.

### Marking Codes



### 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    |

**Note:**

- "E", "D", "T" is part number.
- "W" is date code. "W" is the assembly week in a year, from A to Z.

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