

### General Description

SY205246SLC is a single-line transient voltage suppressor (TVS) designed to provide electrostatic discharge (ESD) protection in consumer applications. The SY205246SLC is designed to protect sensitive semiconductor components from damage or upset due to ESD and other over-current transient events. It complies with IEC 61000-4-2 (ESD) ( $\pm 30\text{kV}$  air,  $\pm 30\text{kV}$  contact discharge), and IEC 61000-4-5 (surge) 100A (8/20 $\mu\text{s}$ ).

SY205246SLC can protect one unidirectional line in 5V systems and is available in a DFN 1.6mm $\times$ 1.0mm-2 pin package.

### Features

- For Operating Voltage of 5V and Below
- Capacitance: 1100pF (Typical)
- Protects One Data, Control, or Power Line
- Low Leakage Current: 0.1 $\mu\text{A}$  @  $V_{\text{RWM}}$  (Max)
- Low Clamping Voltage
- Transient Protection for a Single Line
  - IEC 61000-4-2 (ESD)  $\pm 30\text{kV}$  (Air) $\pm 30\text{kV}$  (Contact)
  - IEC 61000-4-5 (Surge) 100A (8/20 $\mu\text{s}$ )

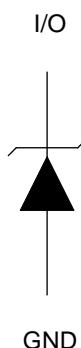
### Applications

- USB VBUS Protection
- Power Supply Protection
- Desktops, Servers, and Notebooks
- Cellular Phones
- Portable Instrumentation
- Pagers Peripherals
- Digital Cameras

### Mechanical Characteristics

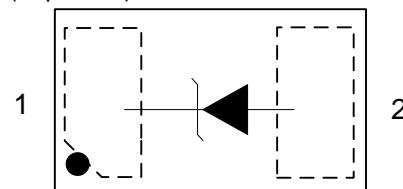
- DFN1.6 $\times$ 1.0-2 Package
- Marking: Device Code, Date Code
- Packaging: Tape and Reel

### Circuit Diagram



**Ordering Information**

Part Number	Package Type	Top Mark
SY205246SLC	DFN1.6x1.0-2 RoHS Compliant and Halogen Free	SYWA

**Pinout (Top View)**

**Marking Codes**


**Note 1:** "S" is device code, fixed.

**Note 2:** "YWA" is date code.

Absolute Maximum Rating					
Parameter	Symbol	Test Condition	Min	Max	Unit
Peak Pulse Power ( $t_p=8/20\mu s$ )	$P_{PK}$			1300	W
Peak Pulse Current ( $t_p=8/20\mu s$ )	$I_{PP}$			100	A
ESD per IEC 61000-4-2 (Air)	$V_{ESD}$		-30	30	kV
ESD per IEC 61000-4-2 (Contact)					
Operating Temperature	$T_{OPT}$		-40	+125	°C
Storage Temperature	$T_{STG}$		-55	+150	°C

Electrical Characteristics $T_A = 25^\circ C$						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Nominal Reverse Working Voltage	$V_{RWM}$				5.5	V
Reverse Leakage Current @ $V_{RWM}$	$I_R$	$V_{RWM} = 5V, T = 25^\circ C$ Pin1 to Pin2		0.01	0.1	µA
Reverse Breakdown Voltage @ $I_T$	$V_{BR}$	$I_T = 1mA$ Pin1 to Pin2	5.6	7	9	V
Forward Voltage @ $I_F$	$V_F$	$I_F = 1mA$ Pin2 to Pin1	0.4		1.2	V
Clamping Voltage @ $I_{PP}$	$V_c(1)$	$I_{PP} = 5A, t_p = 8/20\mu s$ Pin1 to Pin2		7.5	9	V
Clamping Voltage @ $I_{PP}$	$V_c(1)$	$I_{PP} = 100A, t_p = 8/20\mu s$ Pin1 to Pin2		13.5	16	V
Parasitic Capacitance	$C_{ESD}(1)$	$V_R = 0V, f = 1MHz$ Pin1 to Pin2		1100	1300	pF

**Note:** Guaranteed by design and not subject to production test.

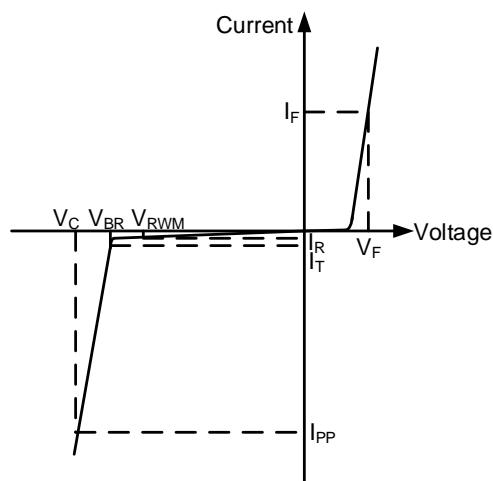
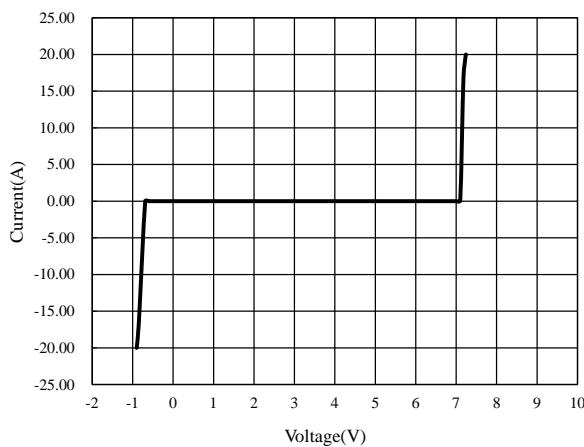


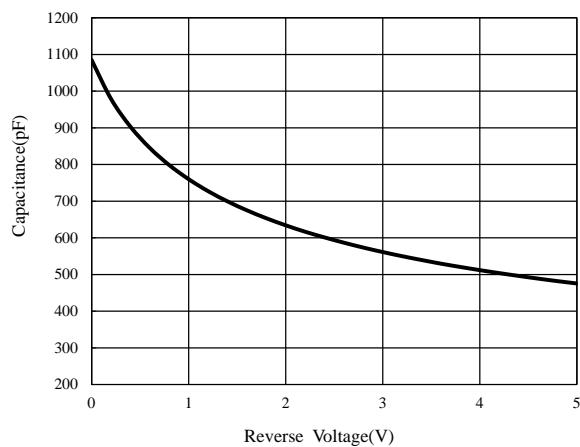
Figure 1. Uni-directional TVS

## Typical Performance Characteristics

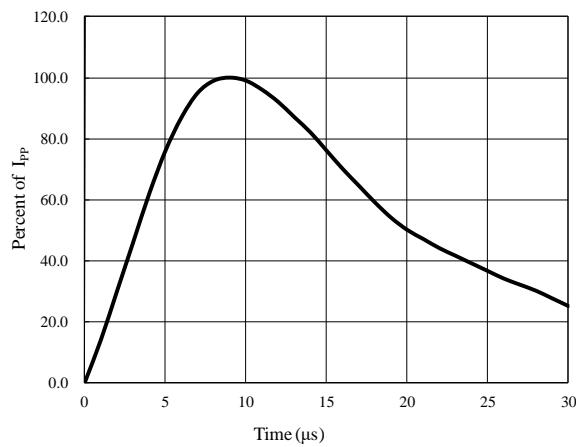
**TLP Curve**



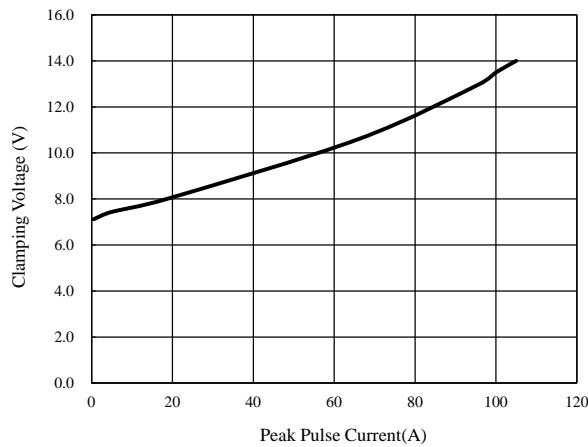
**Capacitance vs. Voltage (f = 1MHz)**



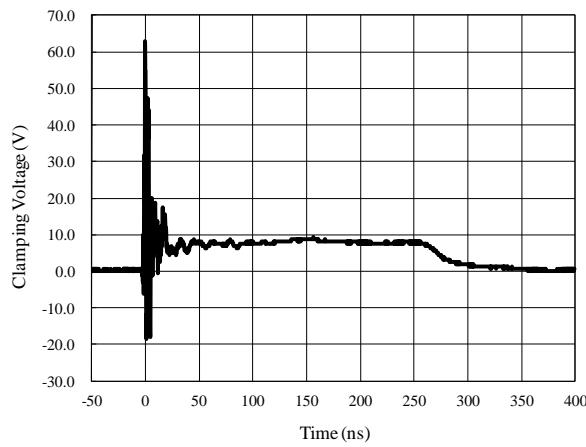
**8/20 $\mu$ s Pulse Waveform**



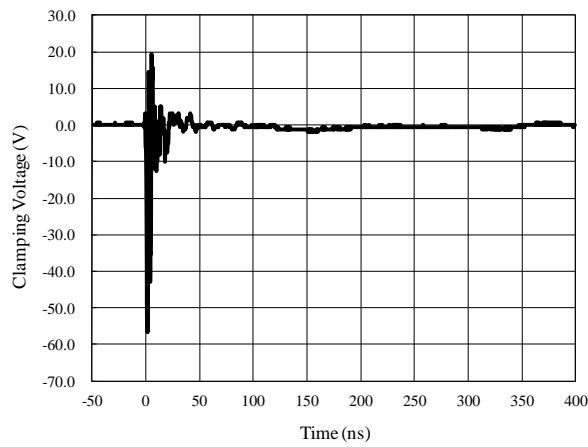
**Clamping Voltage vs. Peak Pulse Current**



**ESD Clamping  
(+8kV Contact per IEC 61000-4-2)**



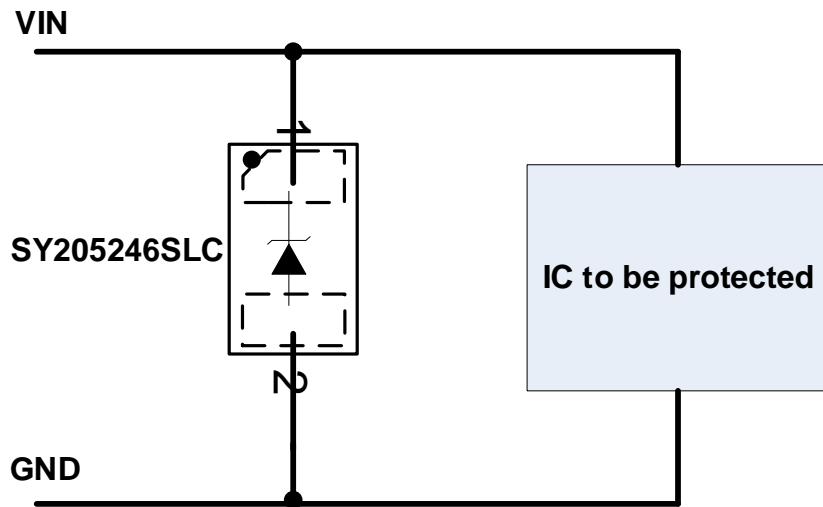
**ESD Clamping  
(-8kV Contact per IEC 61000-4-2)**



## Application Information

SY205246SLC is designed to protect one unidirectional line and can be used for control or power lines.

The SY205246SLC pin connections are shown in Figure 2. The control or power line is connected to Pin1. Pin2 is connected to the GND, which should connect to a ground plane on the board. The peak pulse current (IPP) rating of 100A can provide high surge protection for the system. The connection traces should be as short as possible to minimize the parasitic inductance.

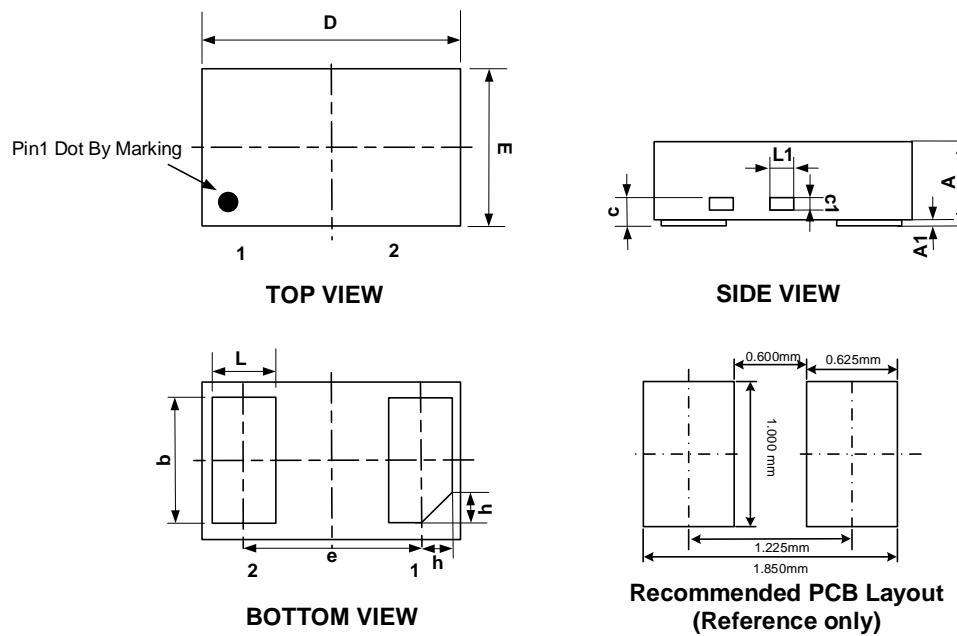


**Figure 2. SY205246SLC Pin Connections in PCB**

# PCB Layout Guidelines

For optimum ESD protection and circuit performance, the following circuit board guidelines are recommended:

- Place SY205246SLC as close to the connector or terminal ports as possible.
- Use a large via to connect the SY205246SLC pin to the ground.
- Avoid running signals near board edges.
- The SY205246SLC should be placed near the protected line.
- The distance between the SY205246SLC ground pin and the GND reference path should be as short as possible.

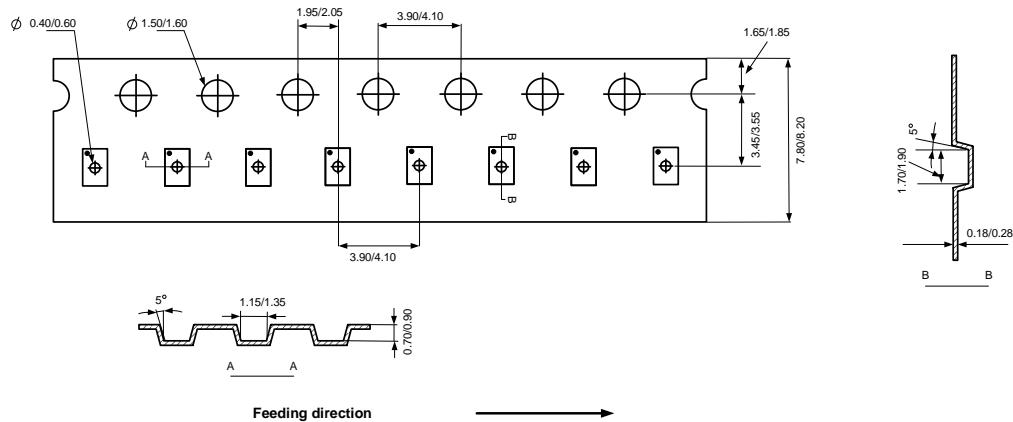
**DFN1.6x1.0-2 Package Outline**

**Package Dimensions**

Symbol	Dimensions (mm)		
	MIN	NOM	MAX
A	0.45	0.50	0.55
A1	-----	0.02	0.05
b	0.75	0.80	0.85
c	0.10	0.15	0.20
c1	0.075REF		
D	1.55	1.60	1.65
e	1.10BSC		
E	0.95	1.00	1.05
L	0.35	0.40	0.45
L1	0.10	0.15	0.20
h	0.15	0.20	0.25

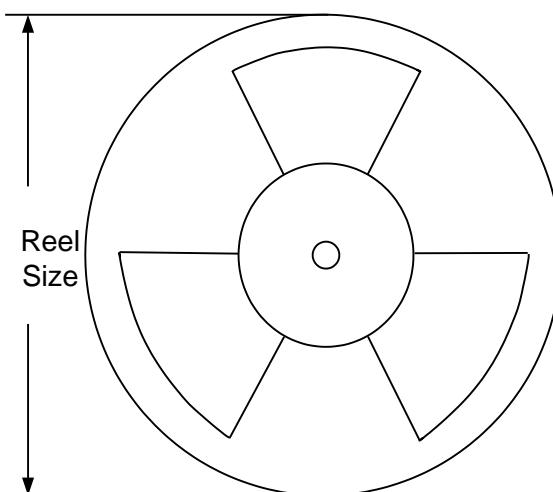
**Note:** All dimensions are in millimeters and exclude mold flash and metal burr.

## Tape and Reel Specification

### DFN1.6x1.0-2 Taping Orientation



### Carrier Tape & Reel Specification for Packages



Package Types	Tape Width (mm)	Pocket Pitch(mm)	Reel Size (Inch)	Qty per Reel(pcs)
DFN1.6x1.0-2	8	4	7"	3000



**SY205246SLC**

### **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.

<b>Revision Number</b>	<b>Revision Date</b>	<b>Description</b>	<b>Pages changed</b>
0.9	12/27/2017	Initial Release	
1.0	18/27/2018	Production Release	

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