SY205247SLC

Single Line TVS Diode for ESD Protection

General Description

SY205247SLC is a single-line transient voltage suppressor (TVS) designed to provide electrostatic discharge (ESD) protection in consumer applications. The SY205247SLC 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) (±30kV air, ±30kV contact discharge), and IEC 61000-4-5 (surge) 200A (8/20μs).

SY205247SLC can protect one unidirectional line in 5V systems and is available in a DFN 1.6mm×1.0mm-2pin package.

Features

- For Operating Voltage of 5V and Below
- Capacitance: 2100pF (Typical)
- Protects One Data, Control, or Power Line
- Low Leakage Current: 1μA @ V_{RWM} (Max)
- Low Clamping Voltage
- Transient Protection for a Single Line
  - IEC 61000-4-2 (ESD) ±30kV (Air)±30kV (Contact)
  - IEC 61000-4-5 (Surge) 200A (8/20μs)

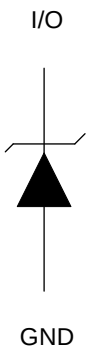
Applications

- Power Supply Protection
- Power Management
- Battery Protection
- Portable Instrumentation
- Pagers Peripherals
- Digital Cameras

Mechanical Characteristics

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

Circuit Diagram



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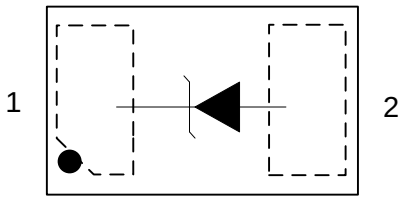
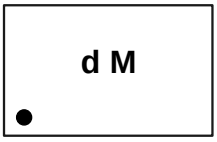
Ordering Information

Part Number	Package Type	Top Mark
SY205247SLC	DFN1.6×1.0-2 RoHS Compliant and Halogen Free	dM

Pinout (Top View)



Marking Codes



Note 1: "d" is device code, fixed.

Note 2: "M" is date code

Absolute Maximum Rating				
Parameter	**Symbol**	**Min**	**Max**	**Unit**
Peak Pulse Power (t_p=8/20μs)	P_{PK}		2100	W
Peak Pulse Current (t_p=8/20μs)	I_{PP}		200	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{ESD}	-30	30	kV
Operating Temperature	T_{OPT}	-40	+125	°C
Storage Temperature	T_{STG}	-55	+150	°C

Electrical Characteristics T_A = 25°C						
Parameter	**Symbol**	**Test Condition**	**Min**	**Typ**	**Max**	**Unit**
Nominal Reverse Working Voltage	V_{RWM}				5	V
Reverse Leakage Current @ V_{RWM}	I_R	V_{RWM} = 5V, T_A = 25°C Pin1 to Pin2		0.1	1	μA
Reverse Breakdown Voltage @ I_T	V_{BR}	I_T = 1mA Pin1 to Pin2	5.6	6.5	7.5	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} =20A, t_p = 8/20μs		7		V
Clamping Voltage @ I_{PP}	V_C(1)	I_{PP} =200A, t_p = 8/20μs		10.5	13	V
Parasitic Capacitance	C_{ESD}(1)	V_R = 0V, f = 1MHz Pin1 to Pin2		2100		pF

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

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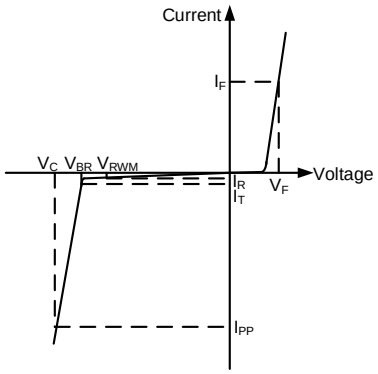

Figure 1. Uni-directional TVS

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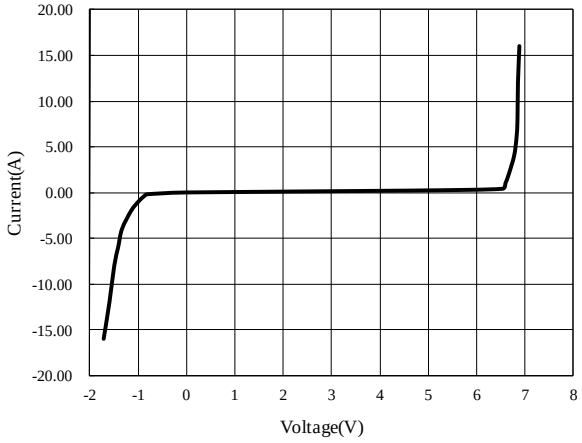
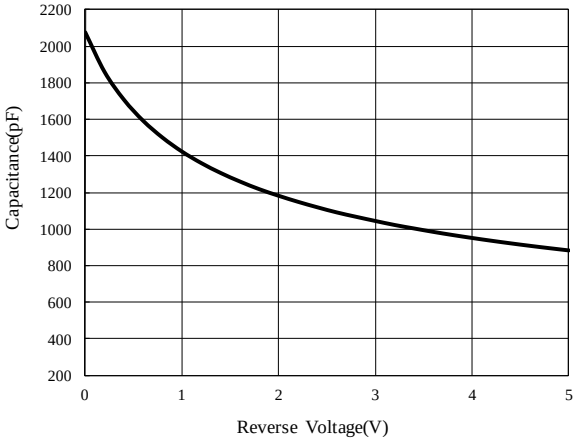
Typical Performance Characteristics

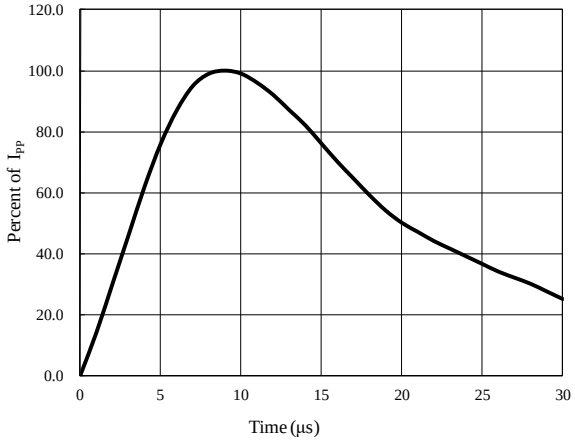
TLP Curve



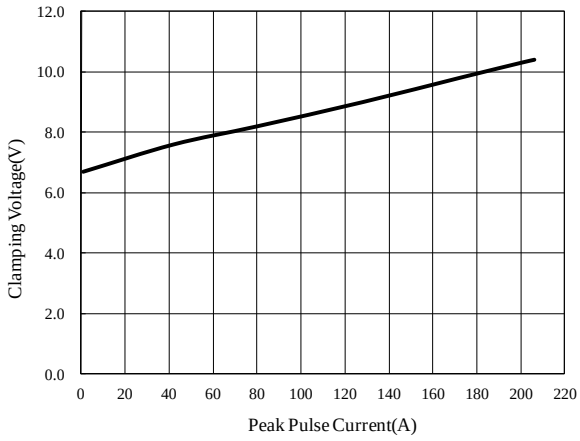
Capacitance vs. Voltage (f = 1MHz)



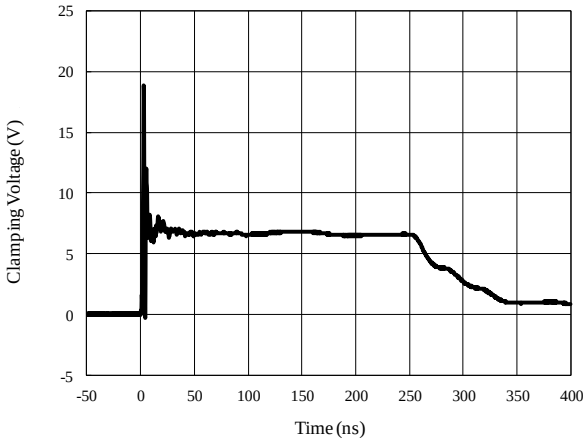
8/20μs Pulse Waveform



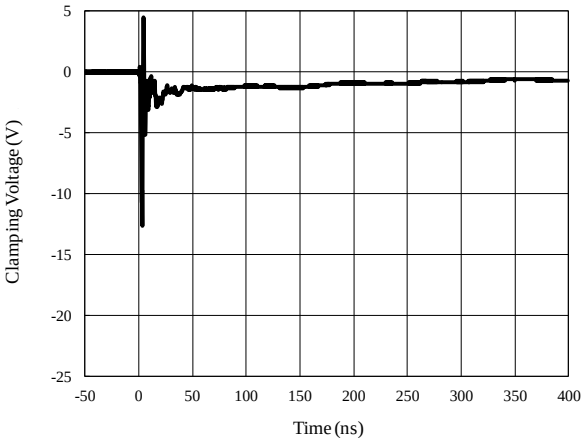
Clamping Voltage vs. Peak Pulse Current



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



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



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Application Information

SY205247SLC is designed to protect one unidirectional line and can be used for control or power lines.

The SY205247SLC 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 connection traces should be as short as possible to minimize the parasitic inductance.

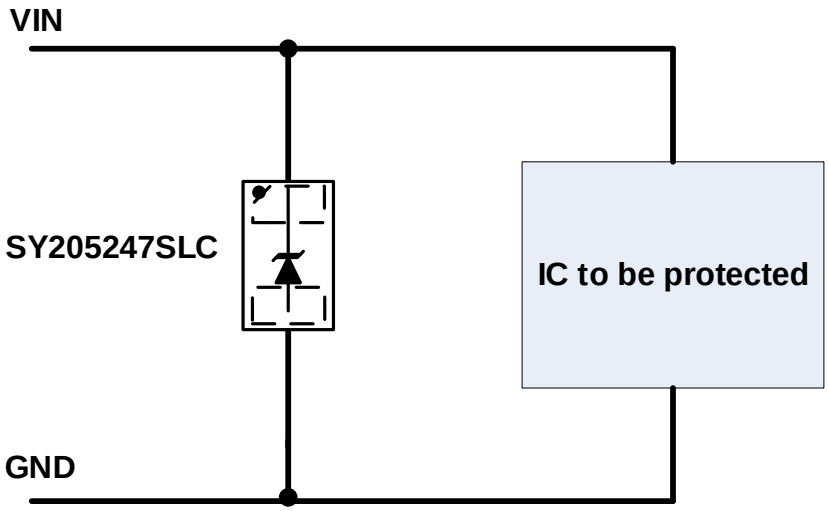

Figure 2. SY20524SLC Pin Connections in PCB

PCB Layout Guidelines

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

- Place SY205247SLC as close to the connector or terminal ports as possible.
- Use a large via to connect the SY205247SLC pin to the ground.
- Avoid running signals near board edges.
- The SY205247SLC should be placed near the protected line.
- The distance between the SY205247SLC ground pin and the GND reference path should be as short as possible.

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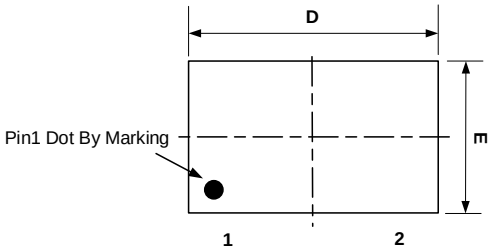
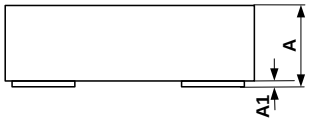
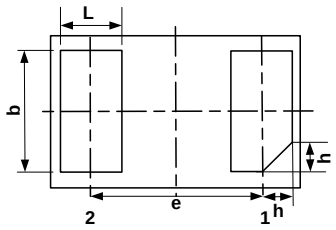
DFN1.6x1.0-2 Package Outline



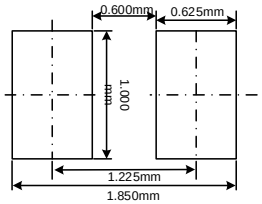
TOP VIEW



SIDE VIEW



BOTTOM VIEW



Recommended PCB Layout
(Reference only)

Package Dimensions

Symbol	Dimensions (mm)		
	MIN	NOM	MAX
A	0.450	0.500	0.550
A1	------	------	0.055
b	0.750	0.800	0.850
D	1.550	1.600	1.650
e	1.100BSC		
E	0.950	1.000	1.050
L	0.350	0.400	0.450
h	0.175BSC		

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

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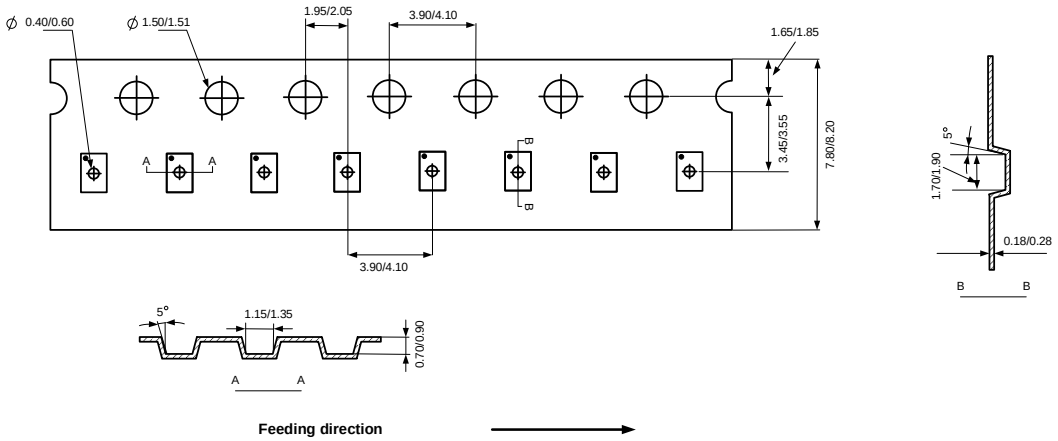
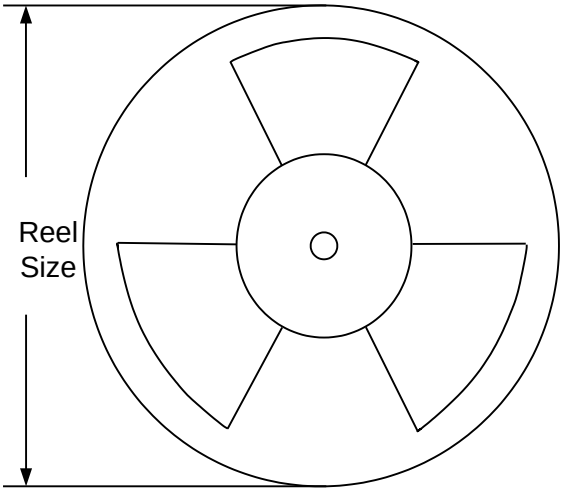
Tape and Reel Specification

DFN1.6×1.0-2 Taping Orientation



Carrier Tape & Reel Specification for Packages



Package Types	Tape Width (mm)	Pocket Pitch(mm)	Reel Size (Inch)	Qty per Reel(pcs)
DFN1.6×1.0-2	8	4	7"	3000

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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.

Revision Number	Revision Date	Description	Pages changed
0.9	12/31/2021	Initial Release	
1.0	12/31/2022	Production Release	

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