SY205246AMC

Single Line TVS Diode for ESD Protection

General Description

SY205246AMC is a single-line transient voltage suppressor (TVS) designed to provide electrostatic discharge (ESD) protection in consumer applications. The SY205246AMC 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) 100A (8/20μs).

SY205246AMC can protect one unidirectional line in 5V applications and is available in a SOD-323 package.

Features

- For Operating Voltage of 5V and Below
- Capacitance: 1100pF (Typical)
- Protects One Data, Control, or Power Line
- Low Leakage Current: 0.01μA @ V_{RWM} (Typical)
- Low Clamping Voltage
- Transient Protection for a Single Line
  - IEC 61000-4-2 (ESD) ±30kV (Air)±30kV (Contact)
  - IEC 61000-4-5 (Surge) 100A (8/20μs)

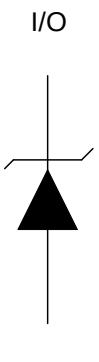
Applications

- Power Supply Protection
- Power Management
- Desktops, Servers, and Notebooks
- Cellular Phones
- Cell Phone Handsets and Accessories
- Microprocessor-Based Equipment
- Personal Digital Assistants (PDAs)
- Portable Instrumentation
- Pagers Peripherals

Mechanical Characteristics

- SOD-323 Package
- Marking: Device Code, Date Code
- Packaging: Tape and Reel

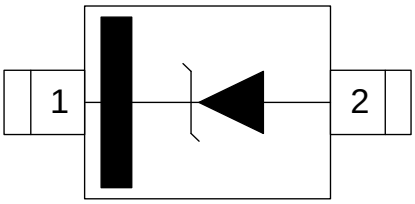
Circuit Diagram



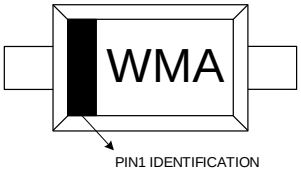
Ordering Information

Part Number	Package Type	Top Mark
SY205246AMC	SOD-323 RoHS Compliant and Halogen Free	WMA

Pinout (Top View)



Marking Codes



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

Note 2: "MA" is date code.

Absolute Maximum Rating				
Parameter	**Symbol**	**Min**	**Max**	**Unit**
Peak Pulse Power (t_p=8/20μs)	P_{PK}		1300	W
Peak Pulse Current (t_p=8/20μs)	I_{PP}		100	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{ESD}	-30	30	kV
Operating Temperature	T_{OPT}	-45	+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}				5.5	V
Reverse Leakage Current @ V_{RWM}	I_R	V_{RWM} = 5V, T_A = 25°C Pin1 to Pin2		0.01	0.1	μA
Reverse Breakdown Voltage @ I_T	V_{BR}	I_T = 1mA Pin1 to Pin2	5.6	6.8	8.5	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} =100A, t_p = 8/20μs		13.5	16	V
Parasitic Capacitance	C_{ESD}(1)	V_R = 0V, f = 1MHz		1100	1300	pF

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

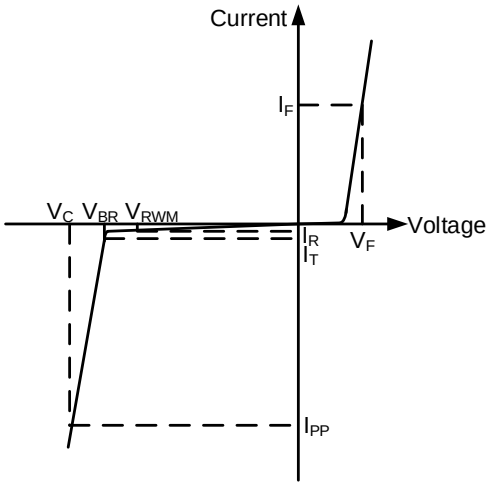
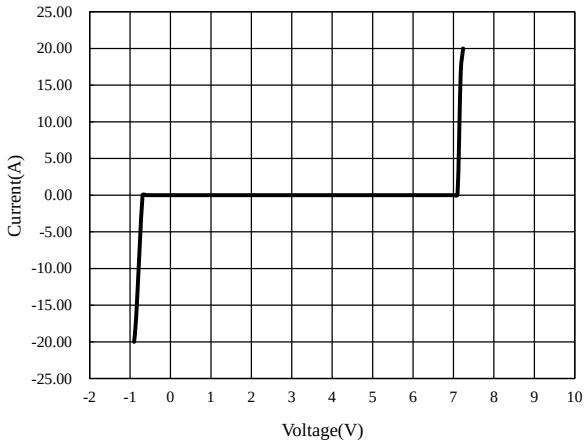


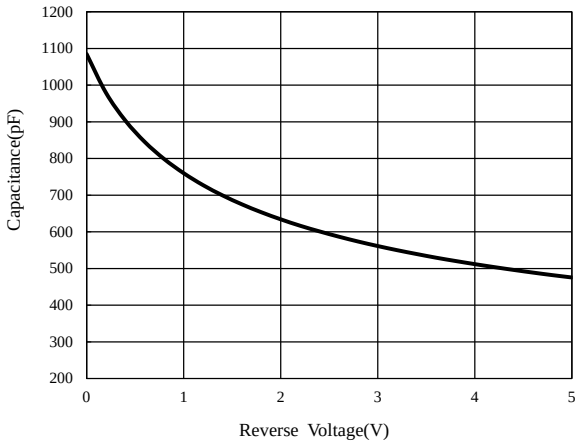
Figure 1. Uni-directional TVS

Typical Performance Characteristics

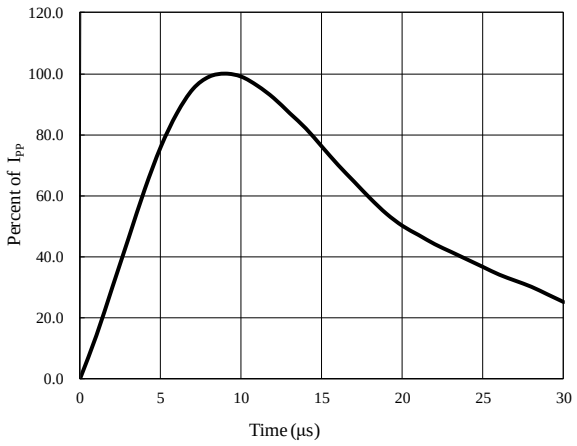
TLP Curve



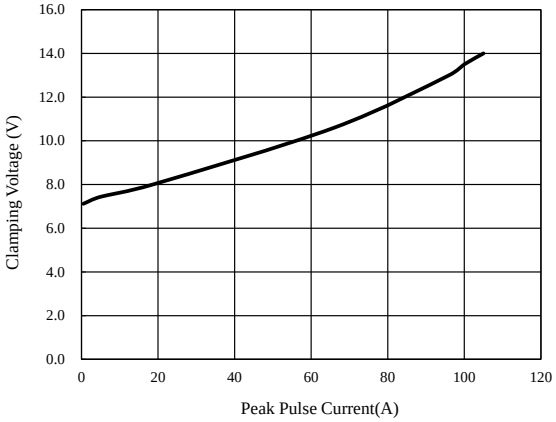
Capacitance vs. Reverse Voltage



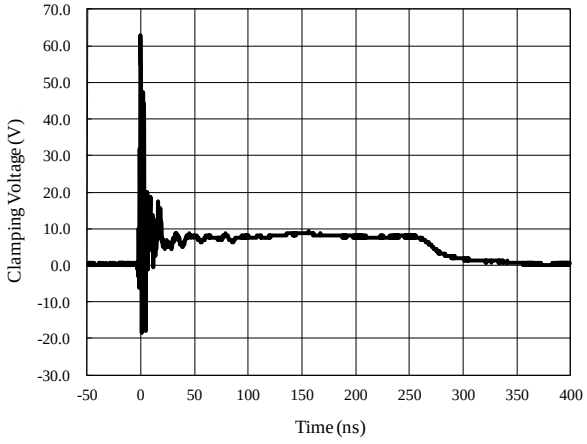
8/20μs Pulse Waveform



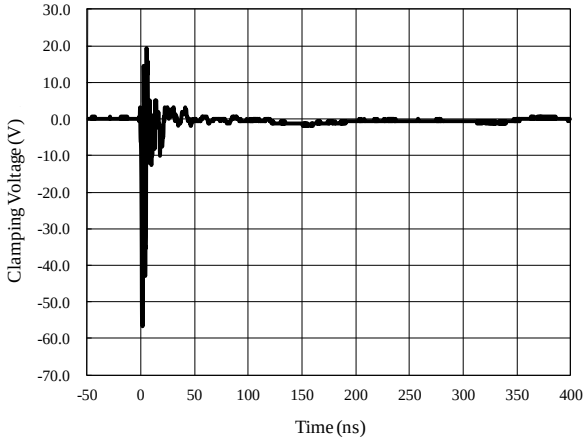
Clamping Voltage vs. Peak Pulse Current



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



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



Application Information

SY205246AMC is designed to protect one unidirectional line and can be used for control or power lines.

The SY205246AMC 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 SY205246AMC peak pulse current (IPP) rating of 100A can provide high current surge protection for the system. The connection traces should be as short as possible to minimize the parasitic inductance.

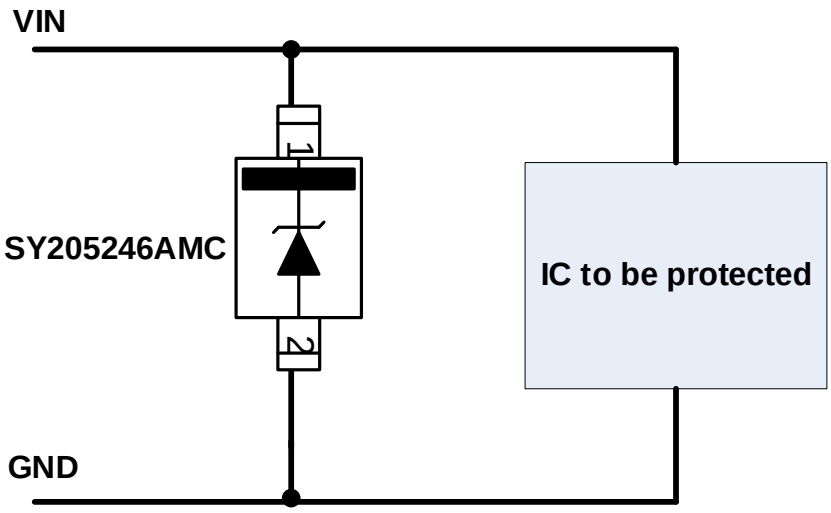


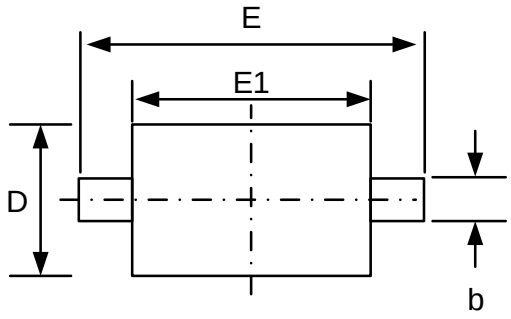
Figure 2. SY205246AMC Pin Connections in PCB

PCB Layout Guidelines

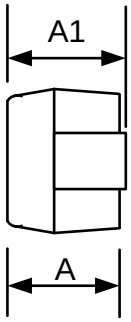
For optimum ESD protection and circuit performance, the following circuit board guidelines are recommended:

- Place SY205246AMC as close to the connector or terminal ports as possible.
- Use a large via to connect the SY205246AMC pin to the ground.
- Avoid running signals near board edges.
- The SY205246AMC should be placed near the protected line.
- The distance between the SY205246AMC ground pin and the GND reference path should be as short as possible.

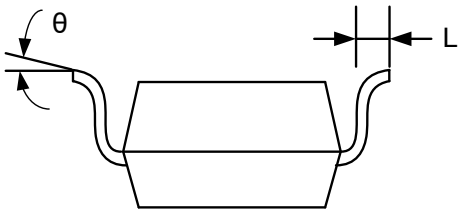
SOD-323 Package Outline



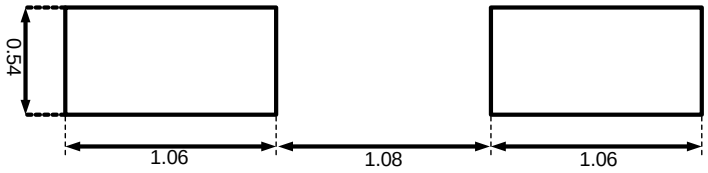
Top View



Side View



Side View



Recommended PCB Layout
(Reference only)

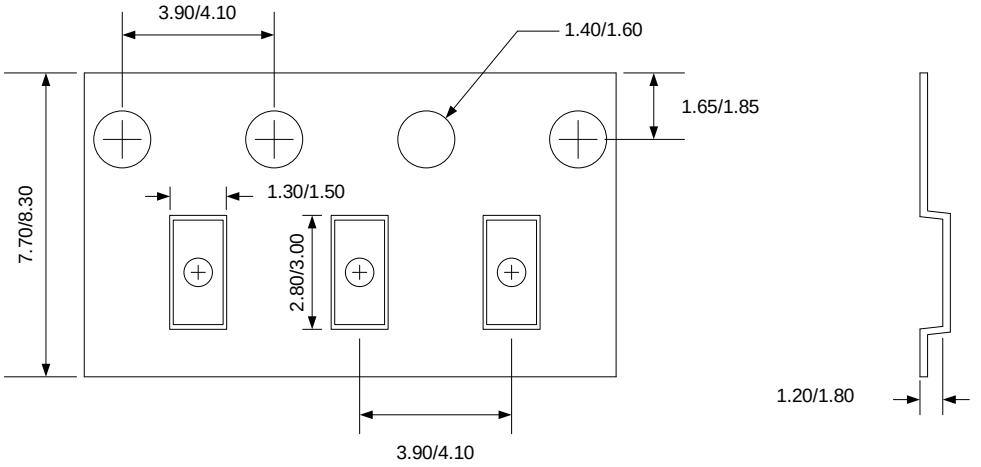
Package Dimensions

Symbol	Dimensions (mm)	
	Minimum	Maximum
A	0.80	0.90
A1	0.90	1.00
b	0.25	0.35
D	1.20	1.40
E	2.50	2.70
E1	1.60	1.80
L	0.25	0.40
θ	0°	8°

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

Tape and Reel Specification

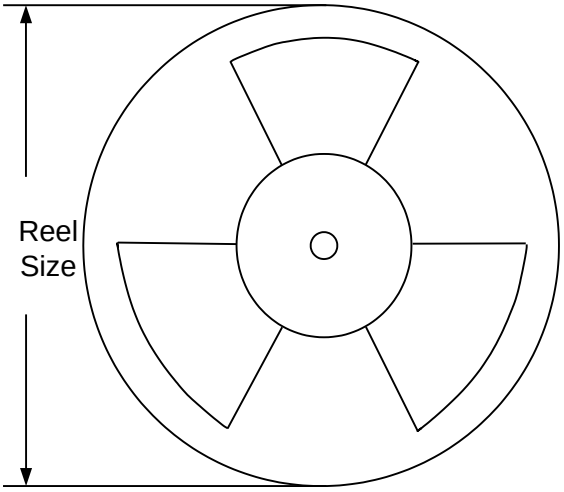
SOD-323 Taping Orientation



Dimensions In mm

Feeding direction ⟶

Carrier Tape & Reel Specification for Packages



Package Types	Tape Width (mm)	Pocket Pitch(mm)	Reel Size (Inch)	Qty per Reel(pcs)
SOD-323	8	4	7"	3000

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	11/20/2020	Initial Release	
1.0	11/20/2021	Production Release	

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