

General Description

The SY205268TPD is a single, unidirectional line transient voltage suppressor (TVS) designed to provide electrical overstress (EOS) protection for cellphones and notebook computers. The SY205268TPD offers an operating voltage of 24V and it is designed to protect sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other overcurrent 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) 200A (8/20 μs).

The SY205268TPD is available in a DFN2.0x2.0-3.

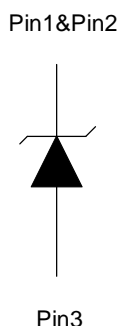
Features

- Maximum Operating Voltage: 24V
- 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) 200A (8/20 μs)
- Protects One Power Line
- Capacitance: 900pF (Typical)
- Low Leakage Current: 1 μA at V_{RWM} (Max)
- Low Clamping Voltage

Applications

- Cell Phone Handsets and Accessories
- Power Supply Protection
- Power Management
- Portable Instrumentation
- Digital Cameras

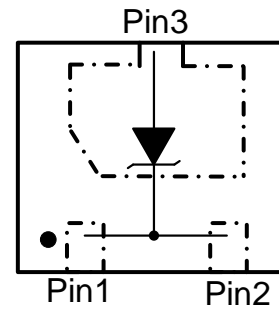
Circuit Diagram



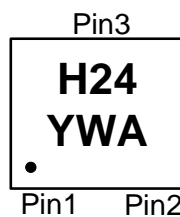
Ordering Information

Part Number	Package Type	Top Mark
SY205268TPD	DFN2.0x2.0-3	H24 YWA

Pinout (Top View)



Marking Codes



Note 1: "H24" is device code, fixed.

Note 2: "YWA" is date code.

Absolute Maximum Rating				
Parameter	Symbol	Min	Max	Unit
Peak Pulse Power ($t_p=8/20\mu s$)	P_{PK}		6400	Watts
Peak Pulse Current ($t_p=8/20\mu s$)	I_{PP}		200	A
ESD per IEC 61000-4-2 (Air)	V_{ESD}	-30	30	kV
ESD per IEC 61000-4-2 (Contact)		-30	30	
Junction Temperature	T_J	-55	+125	$^{\circ}C$
Storage Temperature	T_{STG}	-55	+150	$^{\circ}C$

Electrical Characteristics $T_A = 25^{\circ}C$						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Nominal Reverse Working Voltage	V_{RWM}				24	V
Reverse Leakage Current @ V_{RWM}	I_R	$V_{RWM} = 24V, T_A = 25^{\circ}C$ Pin1 or Pin2 to Pin3			1	μA
Reverse Breakdown Voltage @ I_T	V_{BR}	$I_T = 1mA$ Pin1 or Pin2 to Pin3	26		30	V
Forward Voltage @ I_F	V_F	$I_F = 10mA$ Pin3 to Pin1 or Pin2			1.2	V
Clamping Voltage @ I_{PP}	V_C^1	$I_{PP} = 100A, t_p = 8/20\mu s$ Pin1&2 to Pin3			30	V
Clamping Voltage @ I_{PP}	V_C^1	$I_{PP} = 200A, t_p = 8/20\mu s$ Pin1&2 to Pin3		28	34	V
Clamping Voltage @ I_{PP}	V_C^1	$I_{PP} = 16A, t_p = 10/100ns$		31		V
Parasitic Capacitance	C_{ESD}^1	$V_R = 0V, f = 1MHz$ Pin1 to Pin3		900		pF

Note 1: Guaranteed by design and not subject to production test.

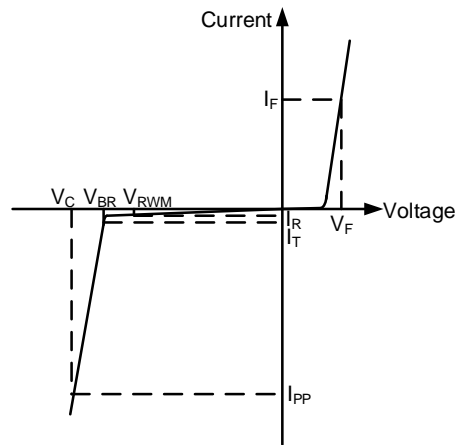
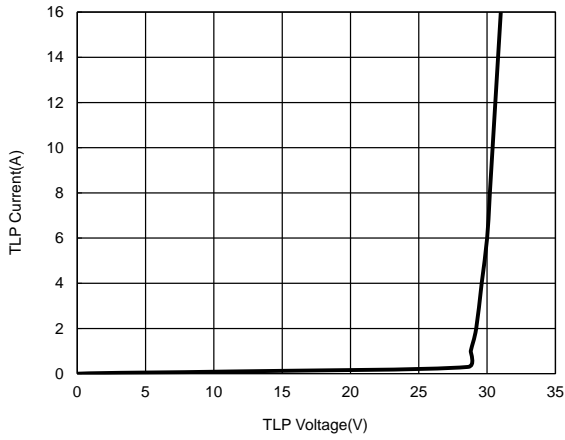


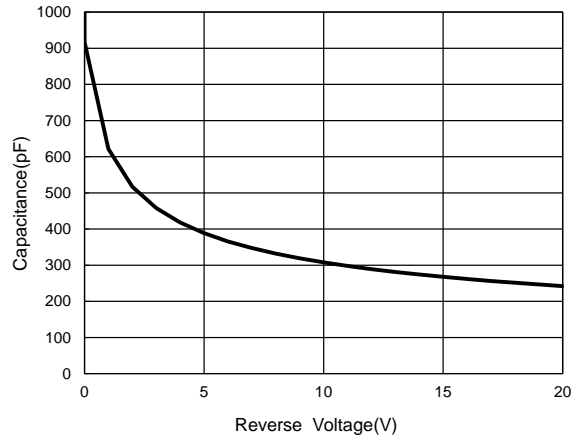
Figure 1. Uni-directional TVS

Typical Characteristics

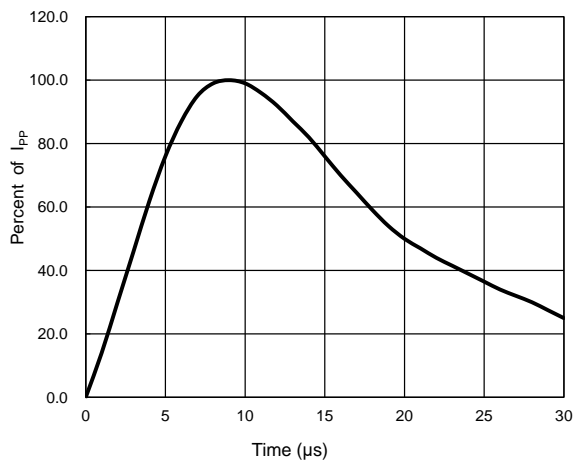
TLP Testing of Pin1&Pin2 to Pin3



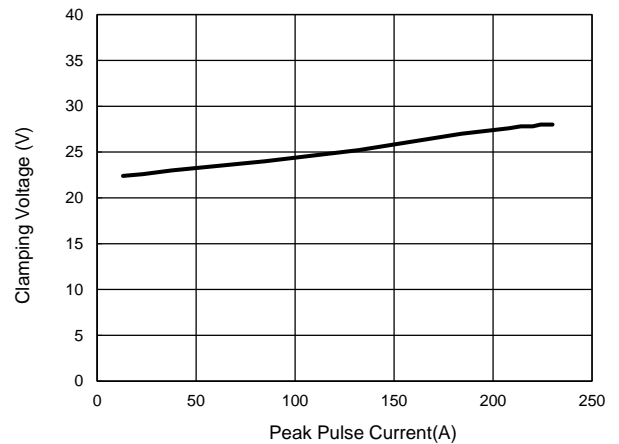
Capacitance vs. Voltage (f = 1MHz)



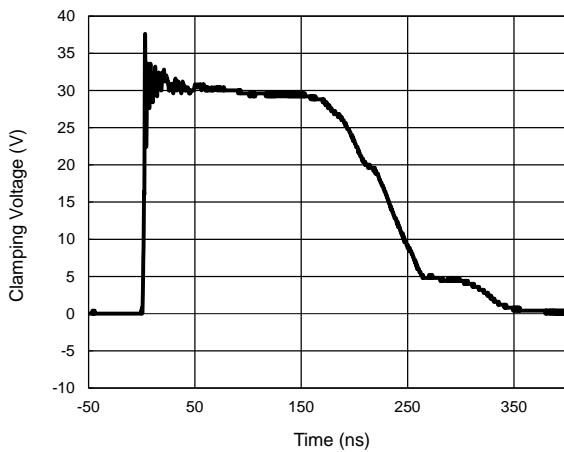
8/20 μ s Pulse Waveform



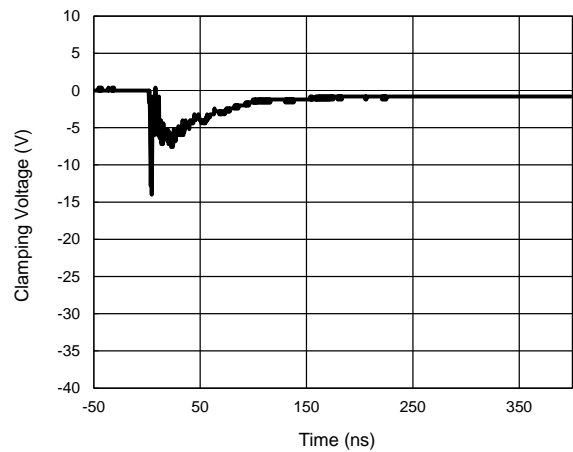
Clamping Voltage vs. Peak Pulse Current



ESD Clamping of Pin1&Pin2 to Pin3 (+8kV Contact per IEC 61000-4-2)



ESD Clamping of Pin1&Pin2 to Pin3 (-8kV Contact per IEC 61000-4-2)



Application Information

Pin Connection in PCB

The SY205268TPD can protect one unidirectional line. It offers system designers flexibility to protect a single control or power line.

A single control or power line can be connected directly to pin1 and pin2. Pin3 of SY205268TPD is the negative reference pin, which should connect to the GND. The connection wires should be as short as possible to minimize the parasitic inductance.

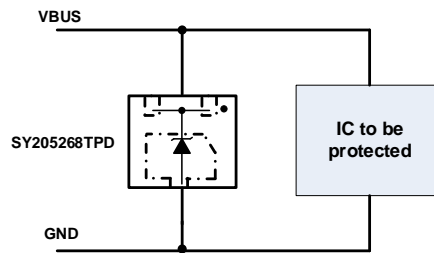
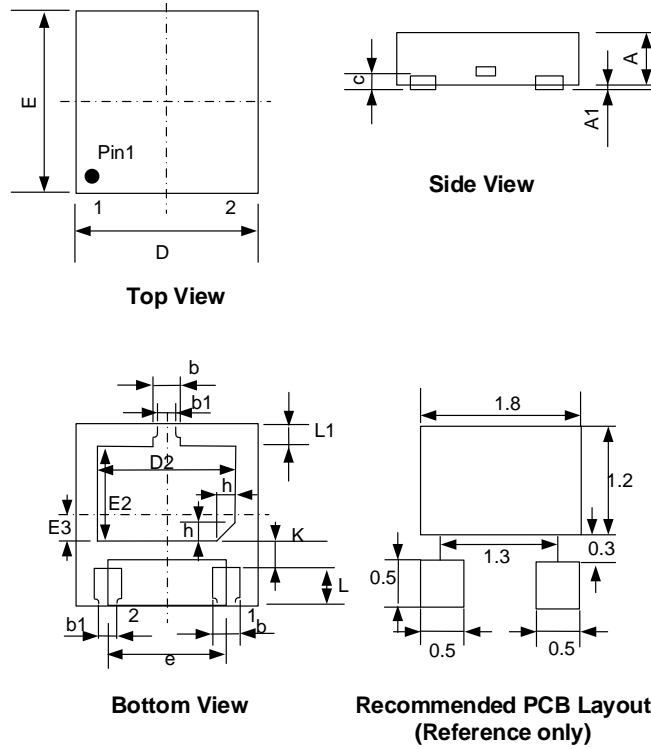


Figure 2. SY205268TPD Pin Connection in PCB

PCB Layout Guidelines

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

- The distance between pin3 and the PCB GND rail path should be as short as possible to reduce the ESD transient return path to the GND.
- Use large vias to connect pin1/2 and pin3 to the PCB VCC and GND.
- Place the SY205268TPD as close to the connector port as possible to reduce parasitic inductance and restrict ESD coupling into adjacent traces.

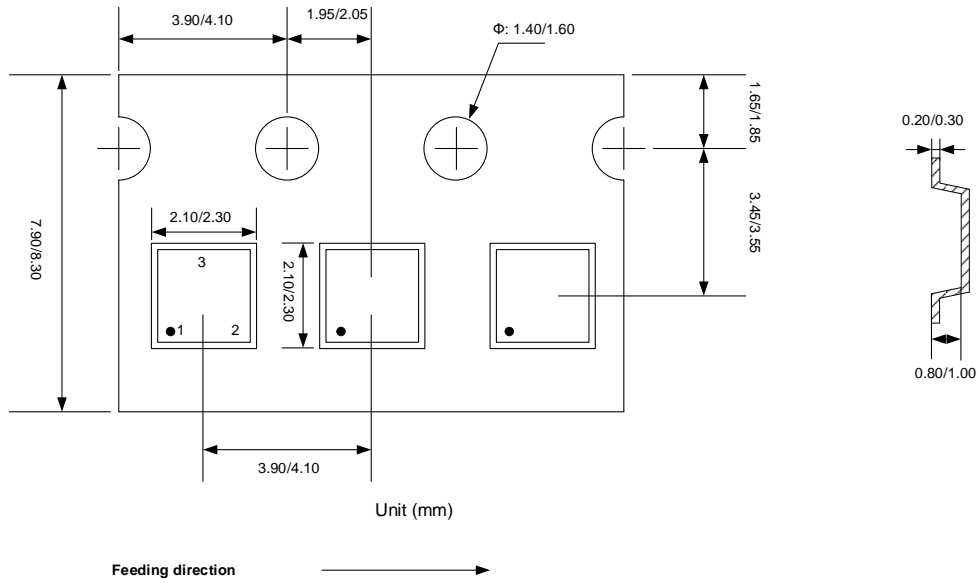
DFN2.0x2.0-3 Package Outline

Package Dimensions

Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
A	0.50	0.55	0.60
A1	0.00	0.02	0.05
b	0.25	0.30	0.35
b1	0.20 REF		
c	0.152 REF		
D	1.90	2.00	2.10
D2	1.40	1.50	1.60
e	1.30BSC		
E	1.90	2.00	2.10
E2	0.95	1.05	1.15
E3	0.20	0.30	0.40
L	0.35	0.40	0.45
L1	0.20	0.25	0.30
h	0.20 REF		
K	0.20	0.30	0.40

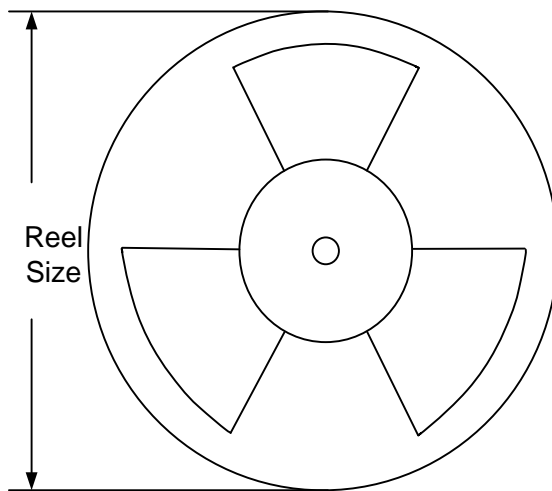
Note: All dimensions are in millimeters and exclude mold flash and metal burr.

Taping & Reel Specification

DFN2.0x2.0-3 Taping Orientation



Carrier Tape & Reel Specification for Packages



Package Types	Tape Width (mm)	Pocket Pitch(mm)	Reel Size (Inch)	Qty per Reel
				(pcs)
DFN2x2-3	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
1.0	Jan 15, 2024	Initial Release	

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