SYT13L03AOC

Low Capacitance TVS Protection

Features

- Transient protection for high-speed data lines
  IEC 61000-4-2 (ESD) ±30kV(Air)
  ±30kV(Contact)
  IEC 61000-4-5 (Surge) 12A (8/20 μs)
- For 3.3V and below operating voltage
- Package optimized for high-speed lines
- Protects two data, control or power lines
- Low capacitance: 1.0pF (Typical)
- Low leakage current: 0.1μA @ V_{RWM} (Typical)
- Low clamping voltage
- Each I/O pin can withstand over 1000 ESD strikes for ±8kV contact discharge

Description

SYT13L03AOC is a low-capacitance transient voltage suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 1.0pF, SYT13L03AOC is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC61000-4-2 (ESD) (±30kV air, ±30kV contact discharge), IEC61000-4-5 (Surge) (12A, 8/20μs), etc.

Each SYT13L03AOC device can protect two data lines. It offers system designers flexibility to protect two data lines.

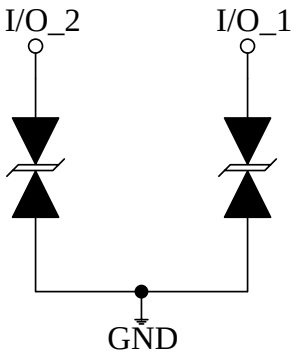
Applications

- USB2.0
- Portable Electronics
- Desktops, Servers and Notebooks
- Cellular Phones
- MP3 Ports
- Digital Camera Ports

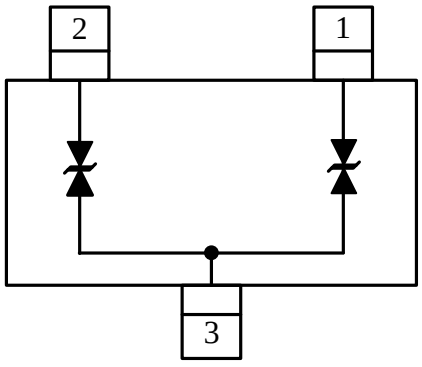
Mechanical Characteristics

- Package: SOT-23
- Marking: Device code, date code
- Packaging: Tape and Reel

Circuit Diagram



Pin Configuration



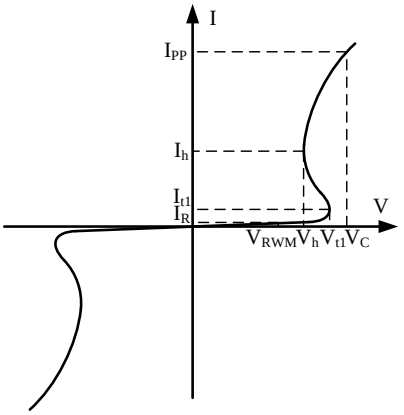
SOT-23
(Top View)

Absolute Maximum Rating

Symbol	Parameter	Value	Units
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±30 ±30	kV
I_{PP}	Peak Pulse Current (8/20μs)	12	A
P_{PK}	Peak Pulse Power (8/20μs)	120	W
T_{OPT}	Operating Temperature	-40 to +125	°C
T_{STG}	Storage Temperature	-55 to +150	°C

Electrical Characteristics (T_A = 25°C)

Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{t1}	Triggering Voltage @ I_{t1}
I_{t1}	Test Current for Triggering Voltage
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Maximum Peak Pulse Current
C_{ESD}	Parasitic Capacitance
V_h	Holding Voltage @ I_h
f	Small Signal Frequency



Bi-Directional TVS

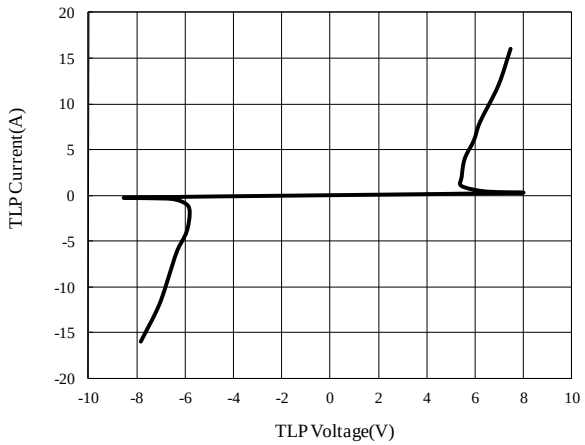
Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}		-3.6		3.6	V
I_R	V_{RWM} = 3.6V, T_A = 25°C Between I/O and GND		0.1	1.0	μA
V_{t1}	I_{t1} = 1mA, Between I/O and GND	3.65			V
V_h	I_h = 100mA, Between I/O and GND	3.65		5.75	V
V_C[1]	I_{PP} = 12A, t_p = 8/20μs, Between I/O and GND		7.0	10	V
V_C[1]	I_{PP} = 16A, t_p = 10/100ns, Between I/O and GND		7.5		V
R_{DYN}[1,2]	t_p = 10/100ns		0.15		Ω
C_{ESD}[1]	V_R = 3.3V, f = 1MHz, Between I/O and GND		1.0	3.0	pF

NOTES

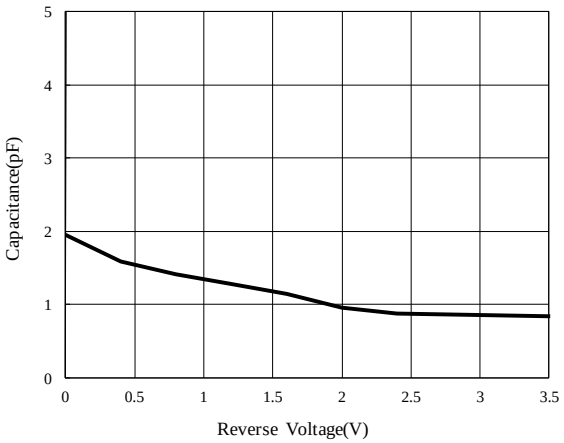
[1]Guaranteed by design and not subject to production test.

[2]R_{DYN} calculated based on I_{PP}=8A to I_{PP}=16A, t_p = 10/100ns.

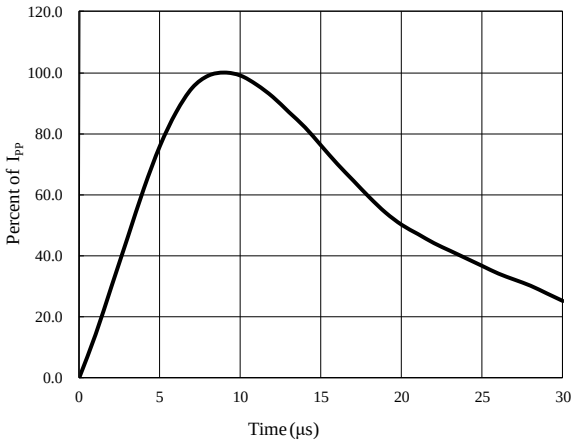
TLP Measurement of I/O to GND



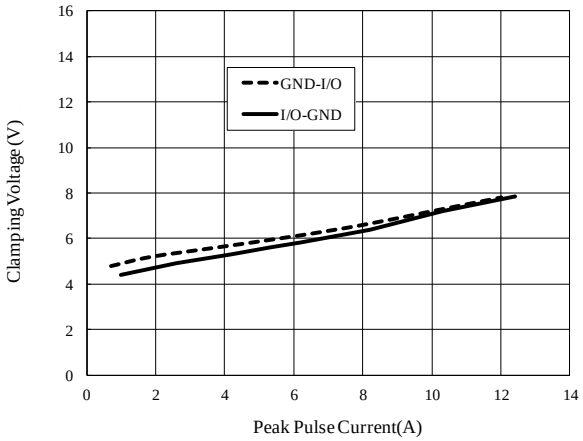
Capacitance vs. Voltage



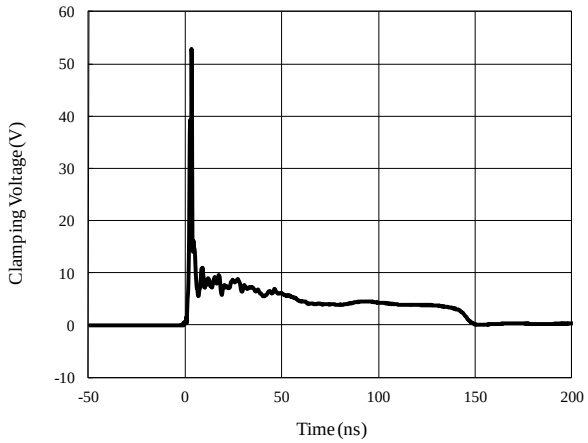
Pulse Waveform



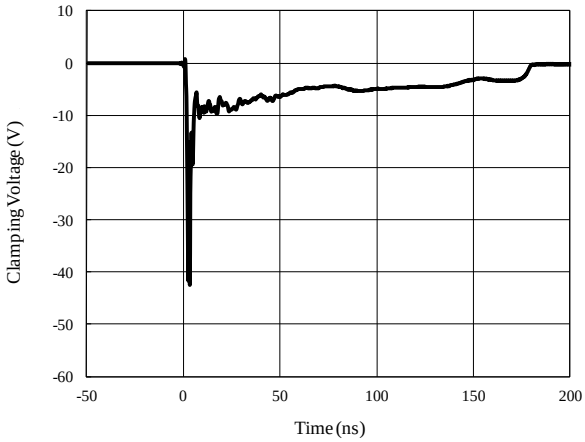
Clamping Voltage vs. Peak Pulse Current



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

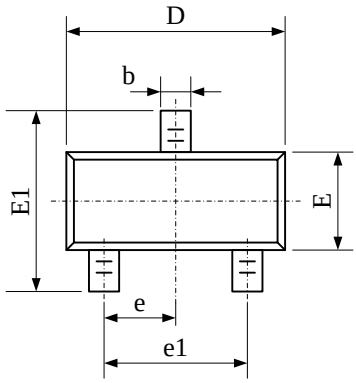


ESD Clamping of I/O to GND (-8kV Contact per IEC 61000-4-2)

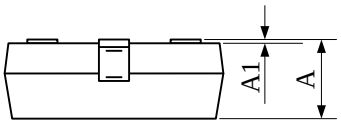


Package Outline

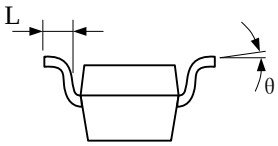
- SOT-23 package



Top View



Side View A



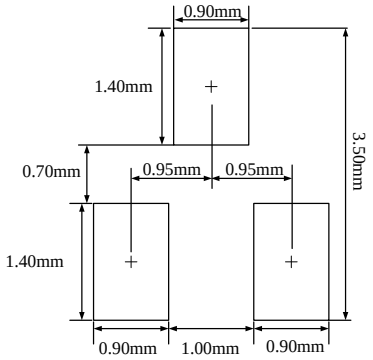
Side View B

Package Dimensions

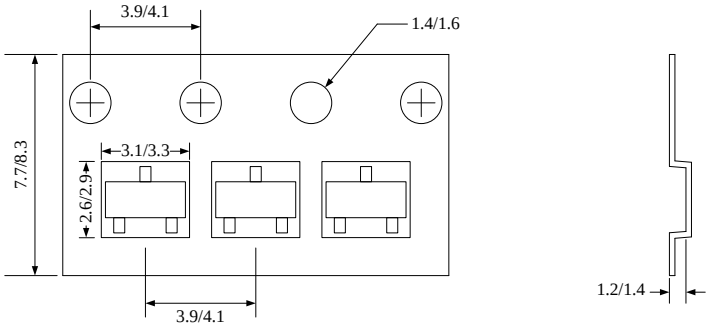
Symbol	Dimensions In Millimeters	
	Minimum	Maximum
A	—	1.20
A1	0.00	0.15
b	0.28	0.52
D	2.70	3.10
e	0.95 BSC	
e1	1.90 BSC	
E	1.15	1.45
E1	2.20	2.60
L	0.25	0.55
θ	0°	8°

Notes: All dimension in mm and exclude mold flash & metal burr

PCB Layout Pattern



Tape and Reel Specification

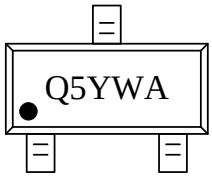


Dimensions In mm

Feeding direction →

Package types	Tape width (mm)	Pocket pitch(mm)	Reel size (Inch)	Qty per reel (pcs)
SOT-23	8	4	7"	3000

Marking Codes



Note:

(1) "Q5" is the device code, fixed.

(2) "YWA" is the assembly date code.

Ordering Information

Part Number	Pkg	Qty Per Reel	Reel Size
SYT13L03AOC	SOT-23	3,000	7 Inch

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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