SYT13U05AOC

Low Capacitance ESD Protection

Features

- Transient protection for high-speed data lines
  - IEC 61000-4-2 (ESD) ±25kV (Air)
    ±25kV (Contact)
  - IEC 61000-4-5 (Surge) 4A (8/20μs)
- Protects two data, control or power lines
- Low capacitance: 0.6pF (Typical)
- Low leakage current: 0.01μA @ V_{RWM} (Typical)
- Low clamping voltage
- Each I/O pin can withstand over 1000 ESD strikes for ±8kV contact discharge

Description

SYT13U05AOC is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for data, control or power lines. With typical capacitance of 0.6pF only, SYT13U05AOC is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD) (±25kV air, ±25kV contact discharge), IEC 61000-4-5 (Surge) (4A, 8/20μs), etc.

SYT13U05AOC uses SOT-23 package. Each SYT13U05AOC device can protect two data lines. It offers system designers flexibility to protect single data line where space is a premium concern.

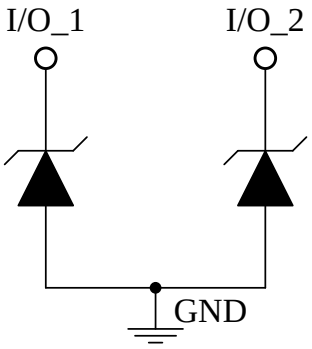
Applications

- Portable Electronics
- Desktops, Servers and Notebooks
- Cellular Phones
- MP3 Ports
- Digital Camera Ports
- Subscriber Identity Module (SIM) card

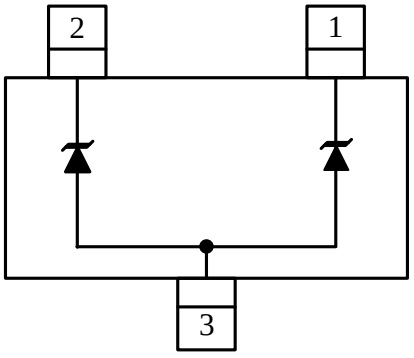
Mechanical Characteristics

- SOT-23 package
- Flammability Rating: UL 94V-0
- Marking: Part number, date code
- Packaging: Tape and Reel

Circuit Diagram



Pin Configuration



SOT-23

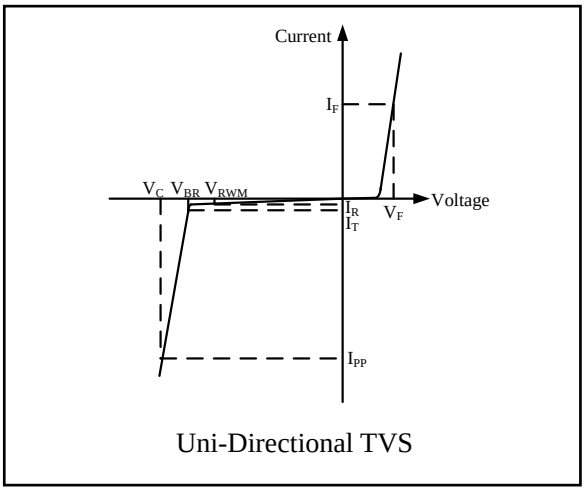
(Top View)

Absolute Maximum Rating

Symbol	Parameter	Value	Units
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±25 ±25	kV
I_{PP}	Peak Pulse Current (8/20μs)	4	A
P_{PK}	Peak Pulse Power (8/20μs)	50	Watts
T_{OPT}	Operating Temperature	-40/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C

Electrical Characteristics (T = 25°C)

Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Reverse Breakdown Voltage @ I_T
I_T	Test Current for Reverse Breakdown
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Maximum Peak Pulse Current
C_{ESD}	Parasitic Capacitance
V_R	Reverse Voltage
f	Small Signal Frequency



Uni-Directional TVS

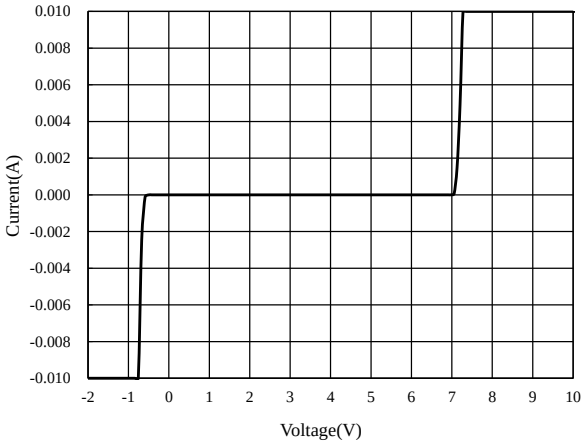
Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}				5	V
I_R	V_R = 5V, T = 25°C Between I/O and GND		0.01	0.1	μA
V_{BR}	I_T = 1mA Between I/O and GND	5.5		10	V
V_F	I_F = 1mA Between I/O and GND	0.4	0.7	1.2	V
V_C[1]	I_{PP} = 4A, t_p = 8/20μs Between I/O and GND			12	V
V_C[1]	I_{PP} = 16A, t_p = 10/100ns Between I/O and GND		12.5		V
R_{DYN}[1,2]	t_p = 10/100ns Between I/O and GND		0.2		Ω
C_{ESD}[1]	V_R = 0V, f = 1MHz Between I/O and GND		0.60	0.80	pF
C_{ESD}[1]	V_R = 0V, f = 1MHz Between I/O and I/O		0.30	0.40	pF

NOTES

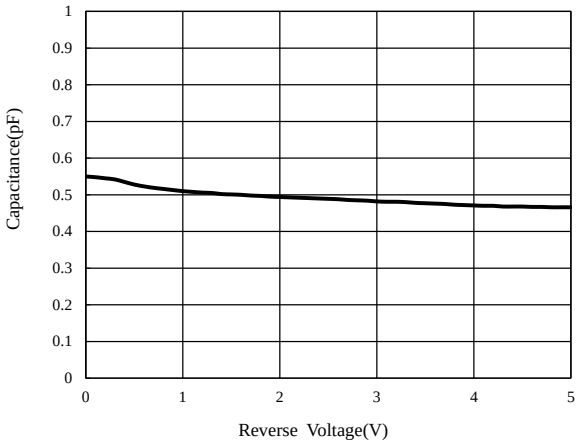
[1]Guaranteed by design and not subject to production test.

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

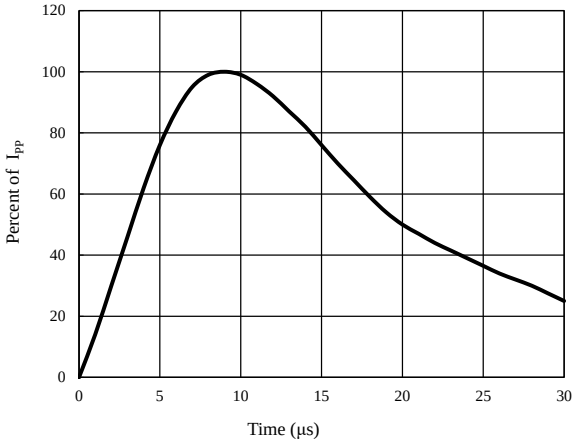
Voltage Sweeping of I/O to GND



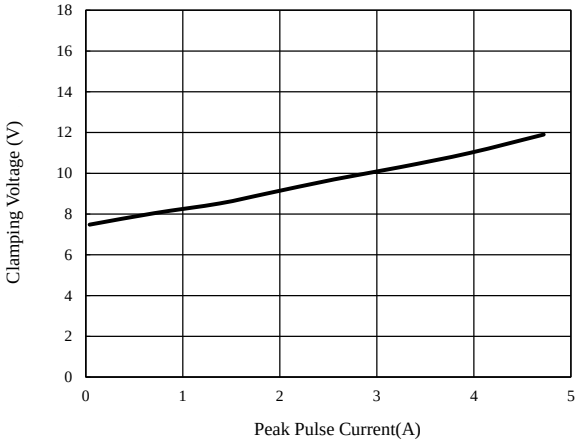
Capacitance vs. Voltage



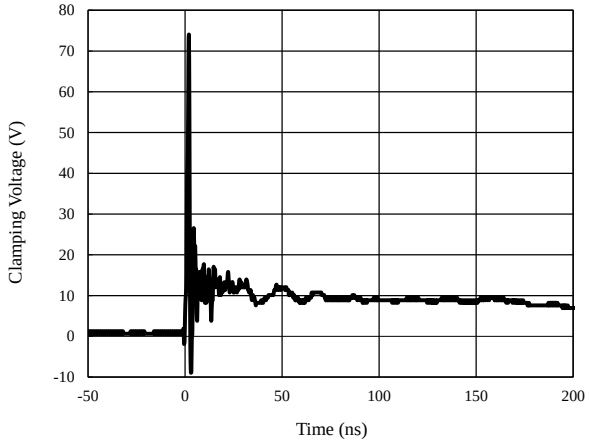
Pulse Waveform



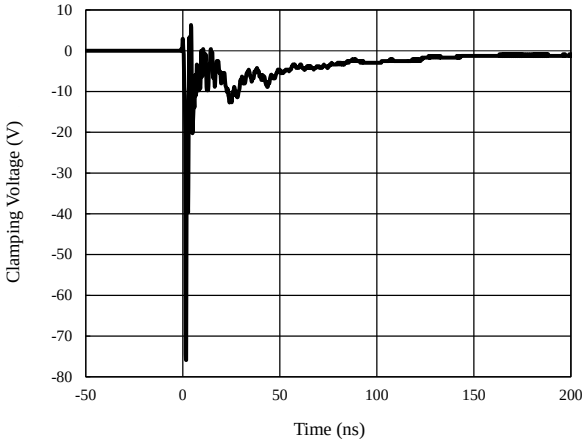
Clamping Voltage vs. Peak Pulse Current



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

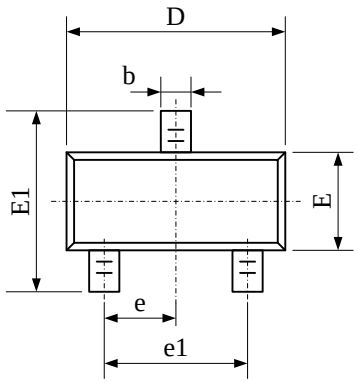


ESD Clamping of I/O to GND (-8kV Contact per IEC 61000-4-2)

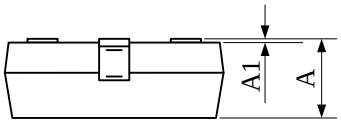


Package Outline

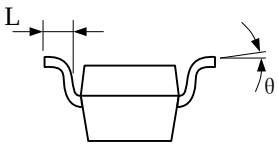
- SOT-23 package



Top View



Side View A



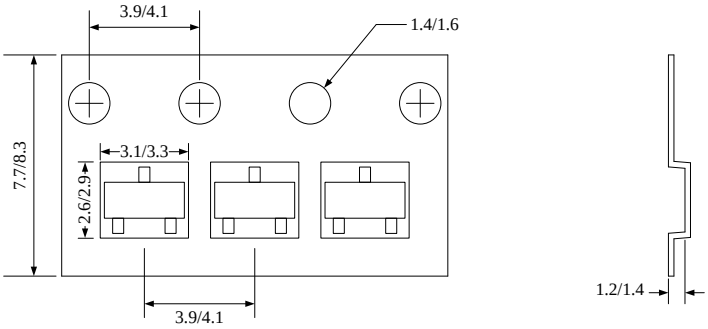
Side View B

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

Tape and Reel Specification

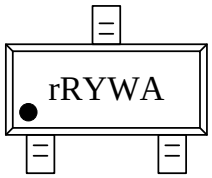


Dimensions In mm

Feeding direction

Package types	Tape width (mm)	Pocket pitch(mm)	Reel size (Inch)	Trailer * length(mm)	Leader * length (mm)	Qty per reel (pcs)
SOT-23	8	4	7"	400	200	3000

Marking Codes



Note:

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

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

Ordering Information

Part Number	Pkg	Qty Per Reel	Reel Size
SYT13U05AOC	SOT-23	3,000	7 Inch

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