

## SuperESD - SENC3Dxx1U

### 1. Description

The SENC3Dxx1U is a Transient Voltage Suppressor that designed to protect components which are connected to data and transmission lines against electrostatic discharge (ESD), electrical fast Transients (EFT), and lightning. All pins are rated to withstand 30kV ESD pulses using the IEC61000-4-2 air discharge method.

### 2. Features

- IEC 61000-4-2 Level 4 ESD Protection
  - ±30kV Contact Discharge
  - ±30kV Air Discharge
- IEC 61000-4-4 EFT Protection
  - 40A (5/50ns)
- 350W Peak pulse Power (8/20us)
- RoHS compliance
- Unidirectional configuration
- Low clamping voltage
- Working voltage: 3.3V/5V/7V/12V/15V/24V/36V

### 3. Applications

- Interfaces
  - USB 2.0/1.1
  - GPIO
  - Ethernet 10/100/1000 Mbps
  - Audio
  - Pushbuttons
- End Equipment
  - Industrial and Serve Robots
  - Laptops and Desktops
  - TV and Monitors
  - Wearables
  - Handheld-wireless Systems

### 4. Ordering Information

Part Number	Package	Material	Packing	Quantity per reel	Flammability Rating	Reel Size	
SENC3Dxx1U	SOD323	Halogen free	Tape & Reel	3,000 PCS	UL 94V-0	7 inches	
Marking for the SENC3Dxx1U series							
V <sub>RWM</sub>	3.3V	5V	7V	12V	15V	24V	36V
Marking	03W	D05	07W	12W	15W	24W	36W

Table-1 Ordering information

## 5. Pin Configuration and Functions


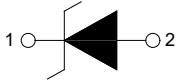
Pin	Name	Description	Outline	Circuit Diagram
1	IO	Connect to IO		
2	GND	Connect to GND		

Table-2 Pin configuration

## 6. Specification

### 6.1. Absolute Maximum rating

Over operating free-air temperature range (unless otherwise noted)

Parameters	Symbol	Min.	Max.	Unit
Peak pulse power (tp=8/20us)@25°C	P <sub>pk</sub>	-	350	W
Peak pulse current (tp=8/20us)@25°C	I <sub>PP</sub>		Refer to Table-5	A
ESD (IEC61000-4-2 air discharge) @25°C	V <sub>ESD</sub>	-	± 30	kV
ESD (IEC61000-4-2 contact discharge) @25°C	V <sub>ESD</sub>	-	± 30	kV
Junction temperature	T <sub>J</sub>	-	125	°C
Operating temperature	T <sub>OP</sub>	-40	85	°C
Storage temperature	T <sub>STG</sub>	-55	150	°C
Lead temperature	T <sub>L</sub>	-	260	°C

Table-3 Absolute Maximum rating

**6.2. Electrical Characteristics**

Symbol	Description
$V_{RWM}$	Rated reverse stand-off voltage
$V_{BR}$	Minimum breakdown voltage @ $I_T = 1mA$
$V_{CL}$	Clamping voltage
$I_{PP}$	Maximum peak pulse current
$I_R$	Reverse leakage current @ $V_{RWM}$
$C_O$	Typical line capacitance ( $V_{IO}=0V$ , $V_{P-P} = 30mV$ , $f = 1MHz$ )

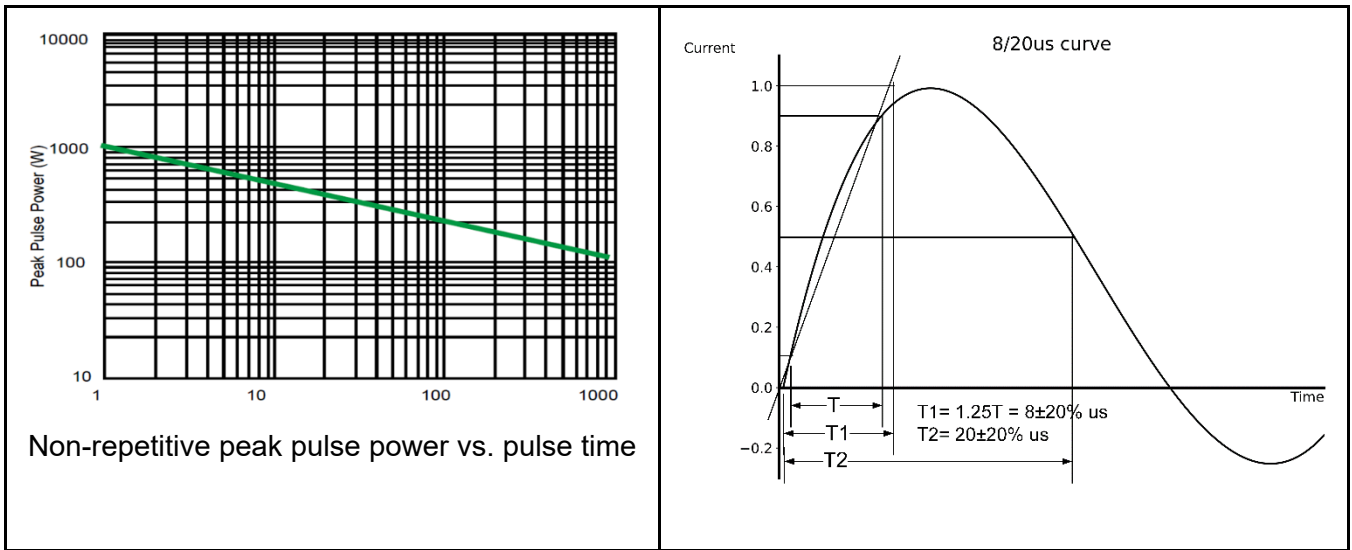
Table-4 Parameters Description

At TA = 25°C unless otherwise noted

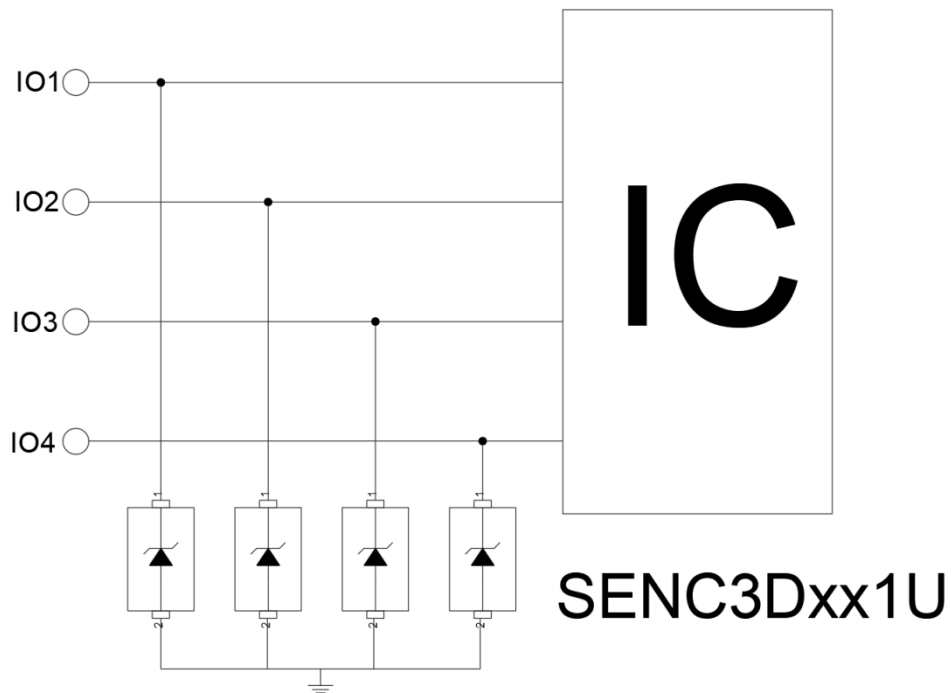
Part Number	$V_{RWM}$	$V_{BR}$	$V_{CL}@I=1A$	$I_{PP}$	$V_{CL}@I=I_{PP}$	$I_R$	$C_O$
	(V)	(V)	(V)	(A)	(V)	(uA)	(pF)
SENC3D3V1U	3.3	4.5	8.0	24.0	19.0	1.0	300
SENC3D5V1U	5.0	6.5	9.0	20.0	20.0	1.0	300
SENC3D7V1U	7.0	7.5	10.0	15.0	23.0	1.0	200
SENC3D12V1U	12.0	13.3	19.0	12.0	33	1.0	150
SENC3D15V1U	15.0	16.5	24	9.0	50	1.0	120
SENC3D24V1U	24.0	26.0	38	6.0	60	1.0	80
SENC3D36V1U	36.0	38.0	55	4.0	70	1.0	50

Table-5 Electrical Characteristics for All Series

### 7. Typical Characteristic

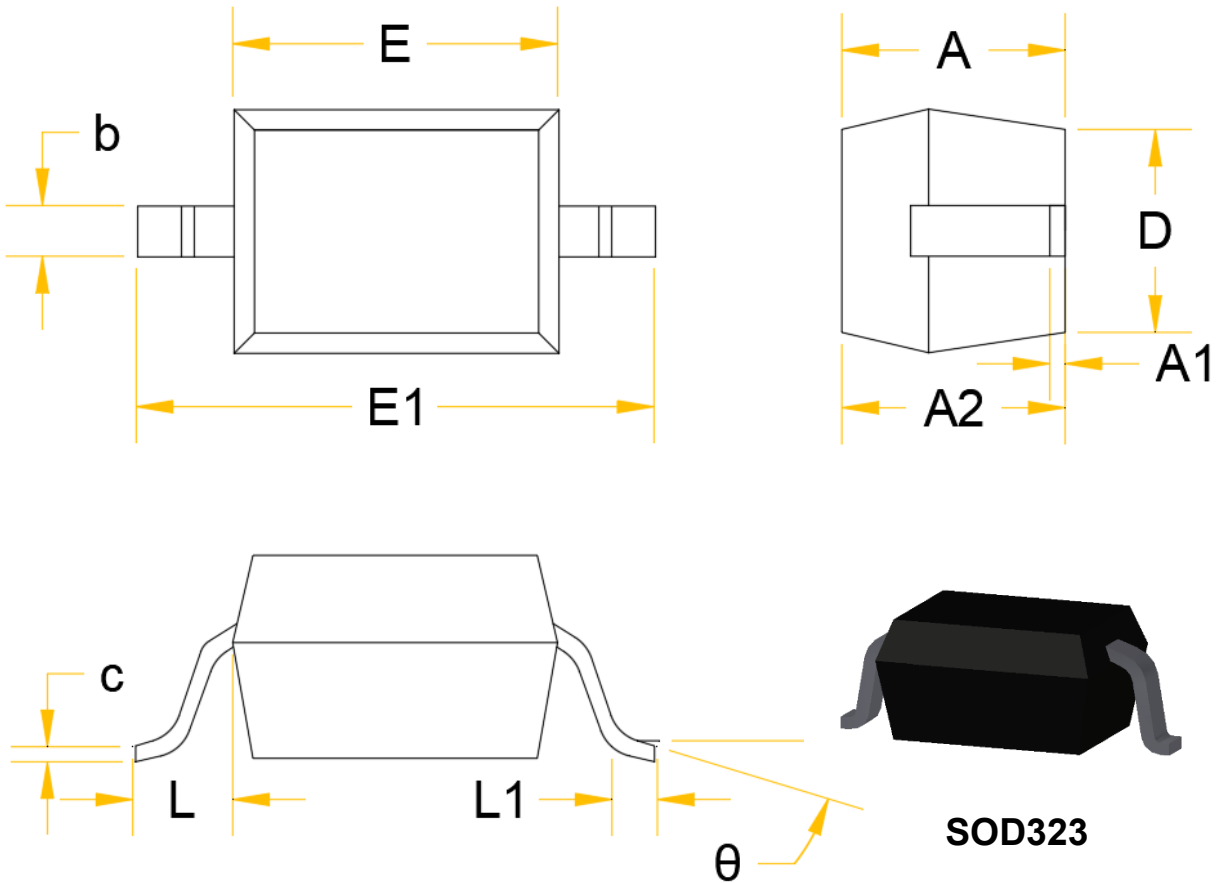


### 8. Typical Application



Pic-3 Typical Internet 1G Interface Application

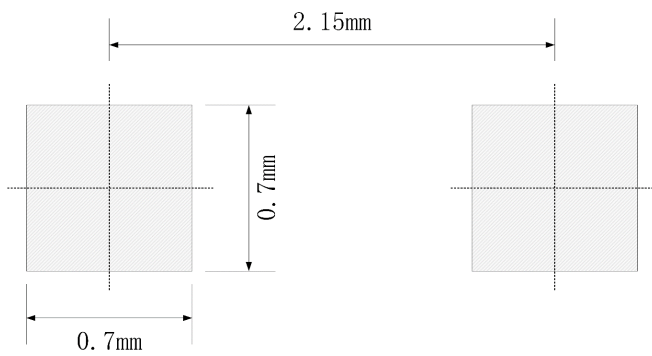
9. Dimension



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min.	Max.	Min.	Max.
A		1.000		0.039
A1	0.000	0.100	0.000	0.004
A2	0.800	0.900	0.031	0.035
b	0.250	0.350	0.010	0.014
C	0.080	0.150	0.003	0.006
D	1.200	1.400	0.047	0.055
E	1.600	1.800	0.063	0.071
E1	2.550	2.750	0.100	0.108
L	0.475REF		0.019REF	
L1	0.250	0.400	0.010	0.016
θ	0°	8°	0°	8°

Table-6 product dimensions

## 10. Recommended Land Pattern

**Note:**

1. Controlling dimension: in millimeters
2. General tolerance:  $\pm 0.05\text{mm}$
3. The pad layout is for reference only
4. Unit: mm

**DISCLAIMER**

ELECSUPER SUPERESD PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with ElecSuper SuperESD products. You are solely responsible for

- (1) selecting the appropriate ElecSuper SuperESD products for your application,
- (2) designing, validating and testing your application
- (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. ElecSuper SuperESD grants you permission to use these resources only for development of an application that uses the ElecSuper SuperESD products described in the resource. Other reproduction and display of these resources are prohibited. No license is granted to any other ElecSuper SuperESD intellectual property right or to any third party intellectual property right. ElecSuper SuperESD disclaims responsibility for, and you will fully indemnify ElecSuper SuperESD and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources. ElecSuper SuperESD's products are provided subject to ElecSuper SuperESD's Terms of Sale or other applicable terms available either on [www.elecsuper.com](http://www.elecsuper.com) or provided in conjunction with such ElecSuper SuperESD products. ElecSuper SuperESD's provision of these resources does not expand or otherwise alter ElecSuper SuperESD's applicable warranties or warranty disclaimers for ElecSuper SuperESD products