SENXX01D3

3.3V~24V Ultra Low Capacitance bi-directional TVS Diode

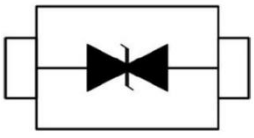
Description

The SENXX01D3 is a bi-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The SENXX01D3 has a low capacitance with a typical value at 1pF, and complies with the IEC 61000-4-2 (ESD) standard with ±30kV air and ±30kV contact discharge. It is assembled into a leadfree SOD-323 package. The small size, low capacitance and high ESD surge protection make SENXX01D3 an ideal choice to protect cell phone, wireless systems, and communication equipment. .

Features

- 350W peak pulse power (8/20us)
- Protects one data or power line
- Ultra low leakage: nA level
- Stand−off Voltage: 3.3 V ~ 36 V
- Ultra low clamping voltage
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge: ±30kV
    - Contact discharge: ±30kV
  - IEC61000-4-4 (EFT) 40A (5/50ns)
- RoHS Compliant

Dimensions & Symbol



Mechanical Characteristics

- Package: SOD-323
- Case Material: “Green” Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Below

Applications

- Cell Phone Handsets and Accessories
- Microprocessor based equipment
- Personal Digital Assistants (PDA’s)
- Notebooks, Desktops, and Servers
- Portable Instrumentation
- Networking and Telecom
- Serial and Parallel Ports.
- Peripherals

Marking Information

Details marking code reference customer approval list

Ordering Information

Part Number	Packaging	Reel Size
SEN3301D3	3000/Tape & Reel	7 inch
SEN0501D3	3000/Tape & Reel	7 inch
SEN1201D3	3000/Tape & Reel	7 inch
SEN1501D3	3000/Tape & Reel	7 inch
SEN2401D3	3000/Tape & Reel	7 inch
SEN3601D3	3000/Tape & Reel	7 inch

Absolute Maximum Ratings (T_A=25ºC, RH=45%-75%, unless otherwise noted)

SEN3301D3			
Parameter	**Symbol**	**Value**	**Unit**
Peak Pulse Power (8/20μs)	Ppk	350	W
Peak Pulse Current (8/20μs)	Ipp	20	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	VESD	±30 ±30	kV
Operating Temperature Range	TJ	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

SEN0501D3			
Parameter	**Symbol**	**Value**	**Unit**
Peak Pulse Power (8/20μs)	Ppk	350	W
Peak Pulse Current (8/20μs)	Ipp	17	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	VESD	±30 ±30	kV
Operating Temperature Range	TJ	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

SEN1201D3			
Parameter	**Symbol**	**Value**	**Unit**
Peak Pulse Power (8/20μs)	Ppk	350	W
Peak Pulse Current (8/20μs)	Ipp	11	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	VESD	±30 ±30	kV
Operating Temperature Range	TJ	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

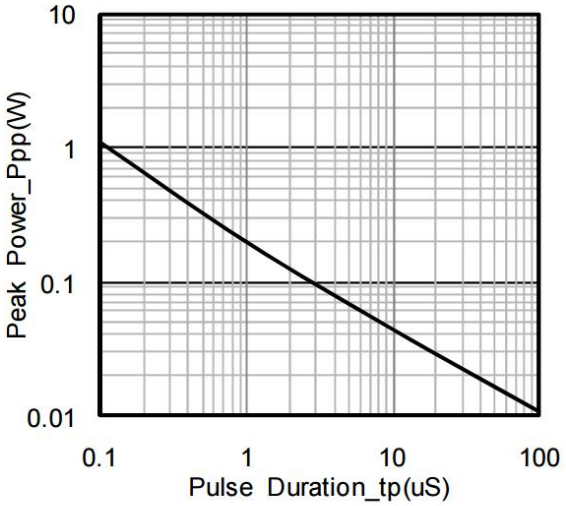
SEN1501D3			
Parameter	**Symbol**	**Value**	**Unit**
Peak Pulse Power (8/20μs)	Ppk	350	W
Peak Pulse Current (8/20μs)	Ipp	10	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	VESD	±30 ±30	kV
Operating Temperature Range	TJ	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C
SEN2401D3			
Parameter	**Symbol**	**Value**	**Unit**
Peak Pulse Power (8/20μs)	Ppk	350	W
Peak Pulse Current (8/20μs)	Ipp	7	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	VESD	±30 ±30	kV
Operating Temperature Range	TJ	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C
SEN3601D3			
Parameter	**Symbol**	**Value**	**Unit**
Peak Pulse Power (8/20μs)	Ppk	350	W
Peak Pulse Current (8/20μs)	Ipp	5	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	VESD	±30 ±30	kV
Operating Temperature Range	TJ	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

Electrical Characteristics (T_A=25℃)

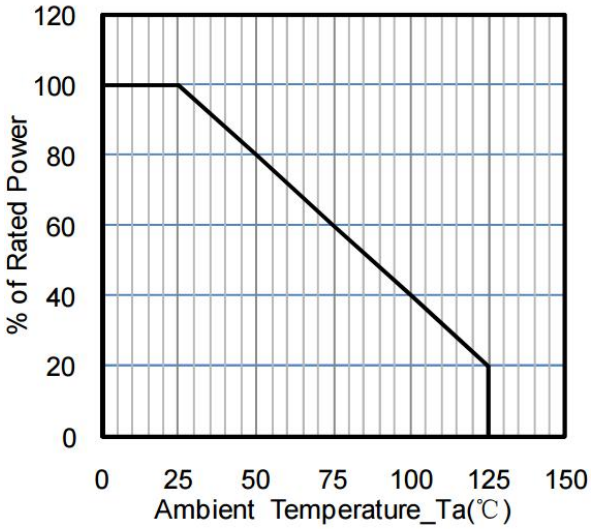
SEN3301D3						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			3.3	V	
Breakdown Voltage	V_{BR}	4.0			V	IT = 1mA
Reverse Leakage Current	I_R			40	uA	VRWM = 3.3V
Clamping Voltage	V_C		7		V	IPP = 1A (8 x 20uS pulse)
Clamping Voltage	V_C			19	V	IPP = 20A (8 x 20uS pulse)
Junction Capacitance	C_J		450		pF	VR = 0V, f = 1MHz
SEN0501D3						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			5	V	
Breakdown Voltage	V_{BR}	6.2			V	IT = 1mA
Reverse Leakage Current	I_R			10	uA	VRWM = 5V
Clamping Voltage	V_C		9.8		V	IPP = 1A (8 x 20uS pulse)
Clamping Voltage	V_C			21	V	IPP = 17A (8 x 20uS pulse)
Junction Capacitance	C_J		200		pF	VR = 0V, f = 1MHz
SEN1201D3						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			12	V	
Breakdown Voltage	V_{BR}	13.3			V	IT = 1mA
Reverse Leakage Current	I_R			1	uA	VRWM = 12V
Clamping Voltage	V_C		19		V	IPP = 1A (8 x 20uS pulse)
Clamping Voltage	V_C			32	V	IPP =11A (8 x 20uS pulse)
Junction Capacitance	C_J		75		pF	VR = 0V, f = 1MHz

SEN1501D3						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			15	V	
Breakdown Voltage	V_{BR}	16.7			V	IT = 1mA
Reverse Leakage Current	I_R			1	uA	VRWM =15V
Clamping Voltage	V_C		24		V	IPP = 1A (8 x 20uS pulse)
Clamping Voltage	V_C			38	V	IPP = 10A (8 x 20uS pulse)
Junction Capacitance	C_J		68		pF	VR = 0V, f = 1MHz
SEN2401D3						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			24	V	
Breakdown Voltage	V_{BR}	26.7			V	IT = 1mA
Reverse Leakage Current	I_R			1	uA	VRWM = 24V
Clamping Voltage	V_C		43		V	IPP = 1A (8 x 20uS pulse)
Clamping Voltage	V_C			52	V	IPP =7A (8 x 20uS pulse)
Junction Capacitance	C_J		57		pF	VR = 0V, f = 1MHz
SEN3601D3						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Condition**
Reverse Working Voltage	V_{RWM}			36	V	
Breakdown Voltage	V_{BR}	40			V	IT = 1mA
Reverse Leakage Current	I_R			1	uA	VRWM =36V
Clamping Voltage	V_C		63		V	IPP = 1A (8 x 20uS pulse)
Clamping Voltage	V_C			80	V	IPP = 5A (8 x 20uS pulse)
Junction Capacitance	C_J		35		pF	VR = 0V, f = 1MHz

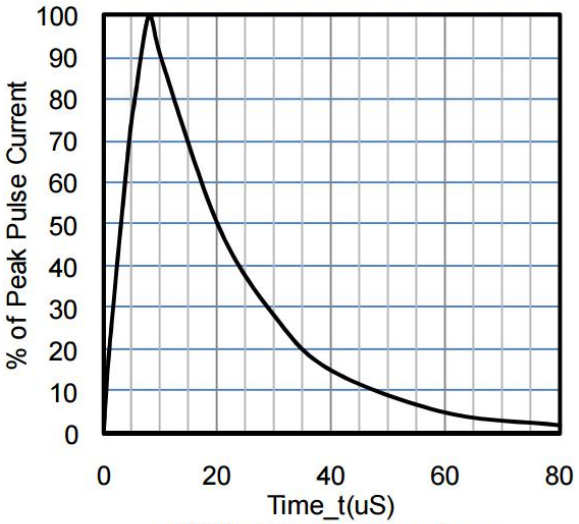
Typical Performance Characteristics (T_A=25°C unless otherwise Specified)



Peak Pulse Power vs. Pulse Time



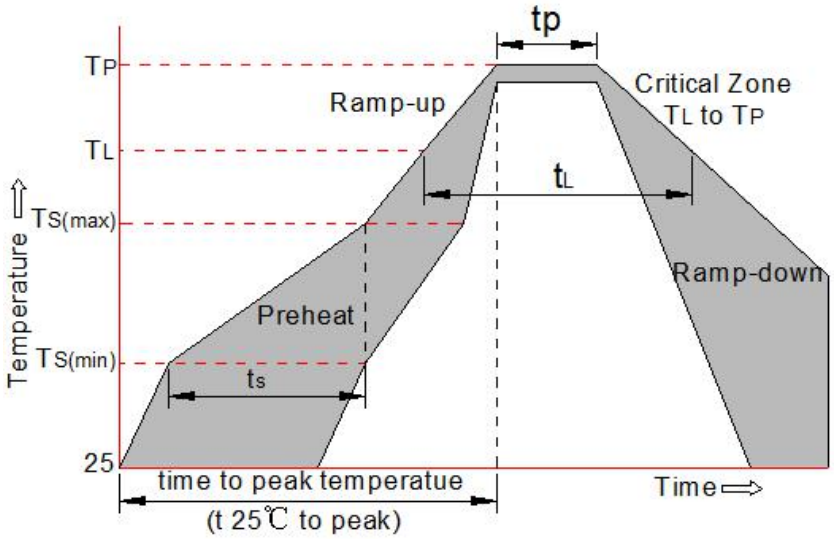
Power Derating Curve



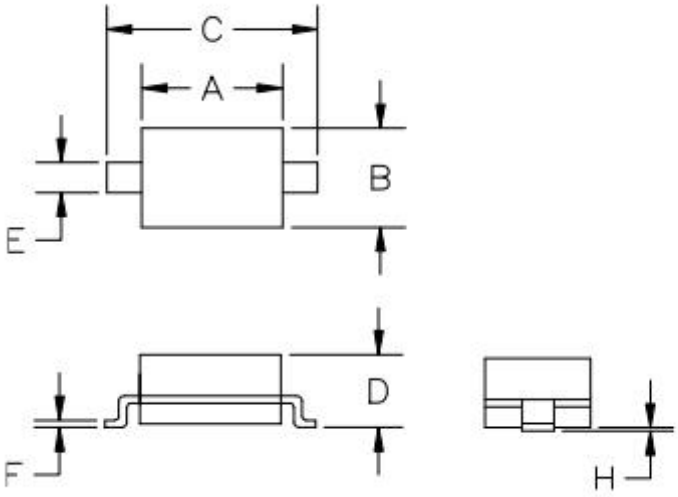
8 X 20uS Pulse Waveform

Soldering Parameters

Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L) (Liquid us)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

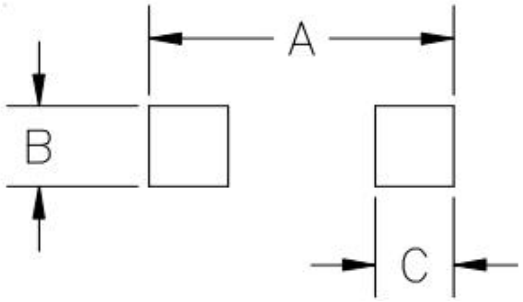


Package Mechanical Data



SYM	DIMENSIONS			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.50	1.80	0.060	0.071
B	1.20	1.40	0.045	0.054
C	2.30	2.70	0.090	0.107
D	-	1.10	-	0.043
E	0.30	0.40	0.012	0.016
F	0.10	0.25	0.004	0.010
H	-	0.10	-	0.004

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
A	3.15	0.120
B	0.80	0.031
C	0.80	0.031

Contact Information

SalltechMicroelectronics(shanghai)Co.,Ltd.

Area10.No.8.HuangduRoad.PudongDistrict.Shanghai.P.R.China.

TEL：+86-021-58131219
FAX：+86-021-58131183