

Description

The ST4581S3 is a bi-directional high power 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 data and power line. The ST4581S3 complies with the IEC 61000-4-2 (ESD) with $\pm 30\text{kV}$ air and $\pm 30\text{kV}$ contact discharge. It is assembled into an ultra-small lead-free SOD-323 package. The small size and high ESD surge protection make ST4581S3 an ideal choice to protect cell phone, digital cameras, audio players and many other portable applications.

Mechanical Characteristics

- ◆ Package: SOD-323
- ◆ Lead Finish: Matte Tin
- ◆ Case Material: "Green" Molding Compound.
- ◆ Moisture Sensitivity: Level 3 per J-STD-020
- ◆ Terminal Connections: See Diagram Below
- ◆ Marking Information: See Below

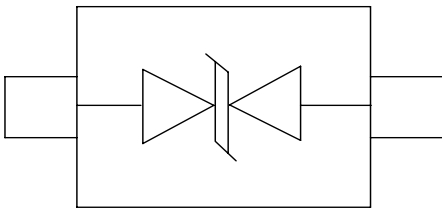
Features

- ◆ Small SOD-323 package
- ◆ Protects one data or power line
- ◆ Operating Voltage: 4.5V
- ◆ High peak pulse current capability
- ◆ Ultra low clamping voltage
- ◆ Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
 - Air discharge: $\pm 30\text{kV}$
 - Contact discharge: $\pm 30\text{kV}$
 - IEC61000-4-5 (Lightning) 160A (8/20 μs)
- ◆ RoHS Compliant

Applications

- ◆ Mobile Phones and Accessories
- ◆ Battery Protection
- ◆ Power Supply Protection
- ◆ Hand Held Portable Applications
- ◆ Peripherals

Schematic and PIN Configuration



Circuit Diagram

Ordering Information

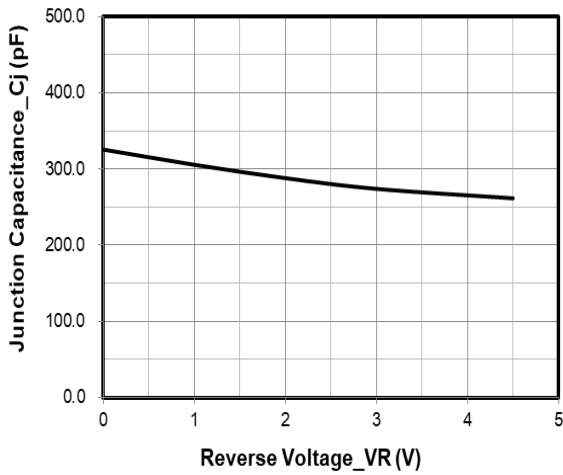
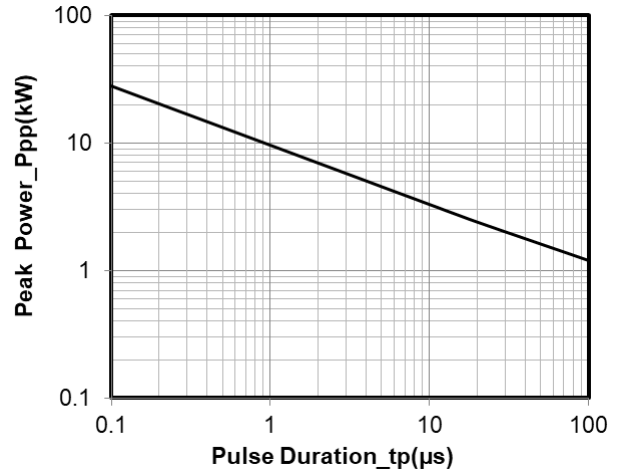
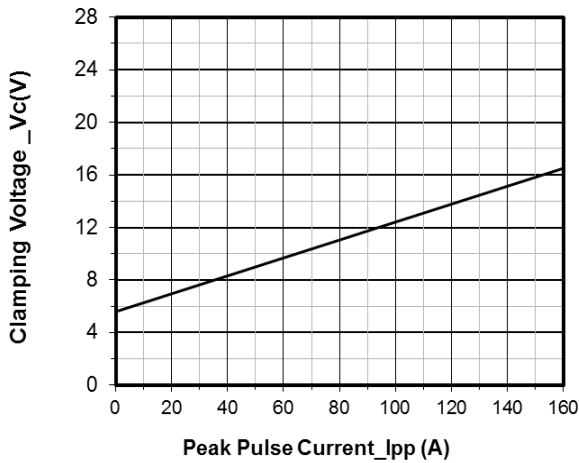
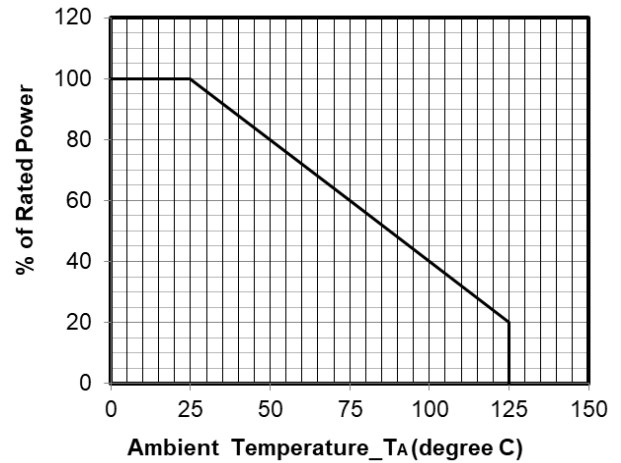
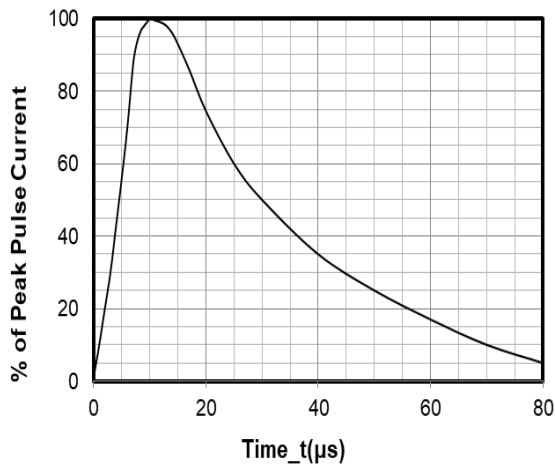
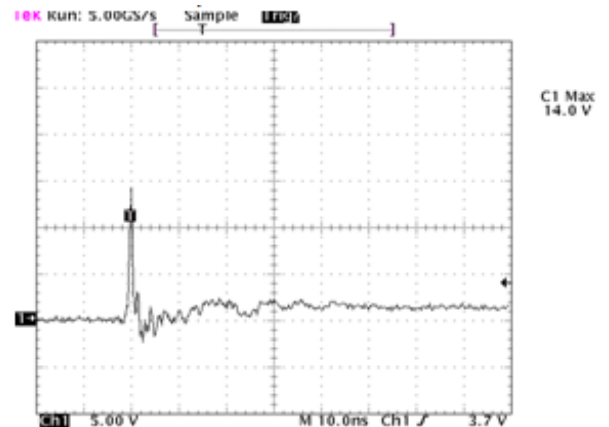
Part Number	Packaging	Reel Size
ST4581S3	3000/Tape & Reel	7 inch

Absolute Maximum Ratings (TA=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	Ppk	2700	W
Peak Pulse Current (8/20μs)	Ipp	160	A
ESD per IEC 61000-4-2 (Air)	VESD	±30	kV
ESD per IEC 61000-4-2 (Contact)		±30	
Operating Temperature Range	TJ	-55 to +125	°C
Storage Temperature Range	Tstg	-55 to +150	°C

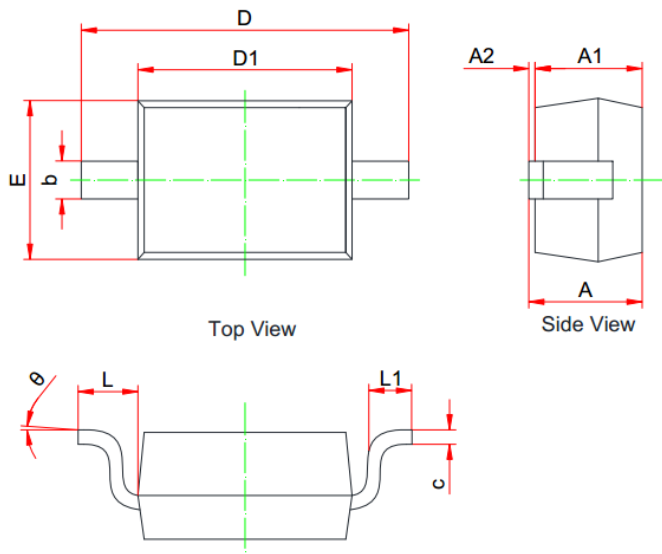
Electrical Characteristics (TA=25°C unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	VRWM			4.5	V	
Breakdown Voltage	VBR	4.7			V	IT = 1mA
Reverse Leakage Current	IR			1.0	μA	VRWM = 4.5V
Clamping Voltage	VC			7.5	V	I _{PP} = 20A (8 x 20μs pulse)
Clamping Voltage	VC			17	V	I _{PP} = 160A (8 x 20μs pulse)
Junction Capacitance	CJ			300	pF	VR = 0V, f = 1MHz

Typical Performance Characteristics (TA=25°C unless otherwise specified)

Junction Capacitance vs. Reverse Voltage

Peak Pulse Power vs. Pulse Time

Clamping Voltage vs. Peak Pulse Current (tp = 8/20μs)

Power Derating Curve

8 X 20μs Pulse Waveform


Note: Data is taken with a 10x attenuator

ESD Clamping Voltage
8 kV Contact per IEC61000-4-2

SOD-323 Package Outline Drawing


SYM	MILLIMETERS		
	MIN	NOM	MAX
A	0.800	--	1.100
A1	0.800	--	0.900
A2	0.000	--	0.100
b	0.250	--	0.400
c	0.080	--	0.177
D1	1.600	1.700	1.800
D	2.300	--	2.800
E	1.150	--	1.400
L	0.475REF		
L1	0.100	--	0.500
Θ	0°	--	8°

Suggested Land Pattern

Unit: mm
Contact Information

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