

Description

The ST0541S5A 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 ST0541S5A has a low capacitance with a typical value at 3.5pF, and complies with the IEC 61000-4-2 (ESD) standard with $\pm 15\text{kV}$ air and $\pm 8\text{kV}$ contact discharge. It is assembled into an ultra-small lead-free SOD-523 package. The small size, ultra-low capacitance and high ESD surge protection make ST0541S5A an ideal choice to protect cell phone, digital video interfaces and other high speed ports.

Features

- ◆ Low capacitance: 3.5pF typical
- ◆ Ultra low leakage: nA level
- ◆ Low operating voltage: 5V
- ◆ Low clamping voltage
- ◆ 2-pin leadless package
- ◆ Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
Air discharge: $\pm 30\text{kV}$
Contact discharge: $\pm 30\text{kV}$
 - IEC61000-4-4 (EFT) 40A (5/50ns)
 - IEC61000-4-5 (Lightning) 3.5A (8/20 μs)
- ◆ RoHS Compliant

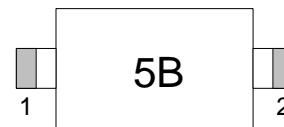
Mechanical Characteristics

- ◆ Package: SOD-523
- ◆ Lead Finish: Matte Tin
- ◆ 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

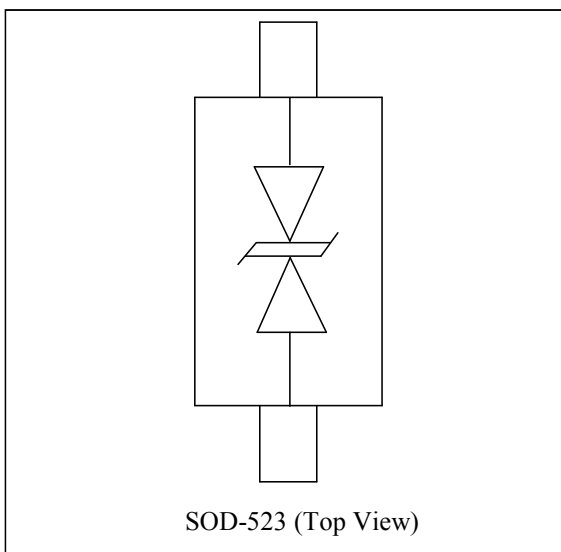
Applications

- ◆ Personal Digital Assistants
- ◆ Peripherals
- ◆ Audio Players
- ◆ USB 2.0
- ◆ Portable Instrumentation
- ◆ Keypads, Side Keys, LCD Displays

Marking Information



Schematic and PIN Configuration



Ordering Information

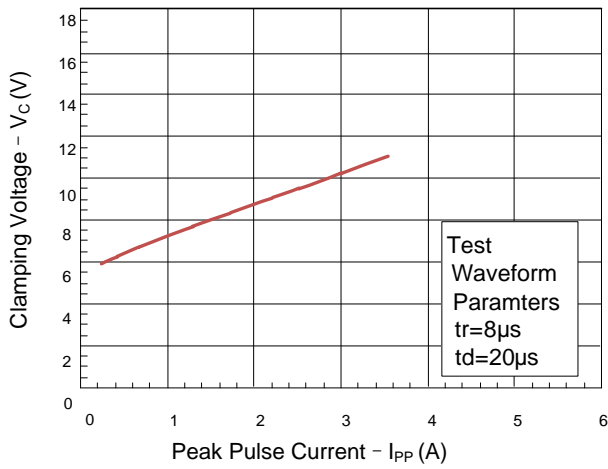
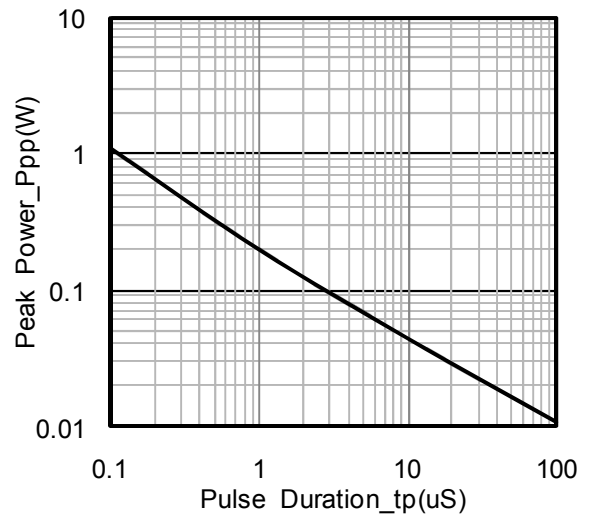
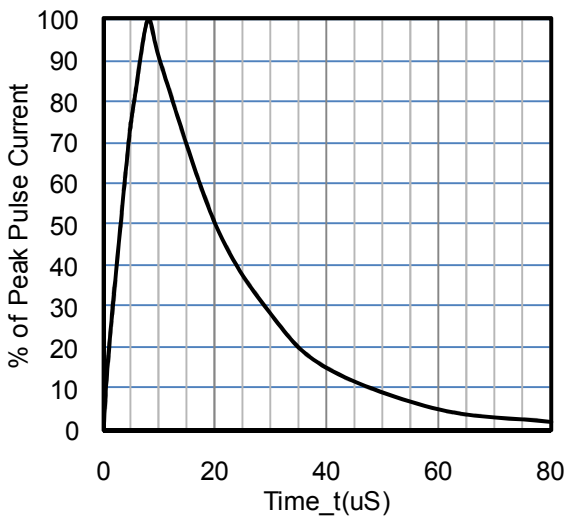
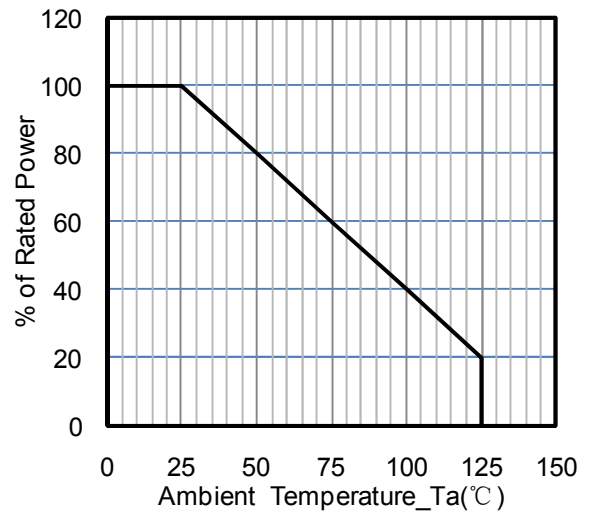
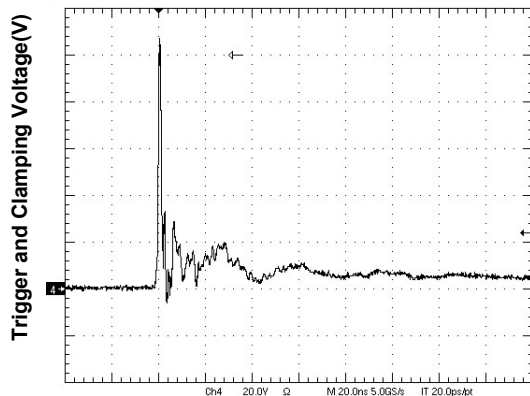
Part Number	Packaging	Reel Size
ST0541S5A	5000/Tape & Reel	7 inch

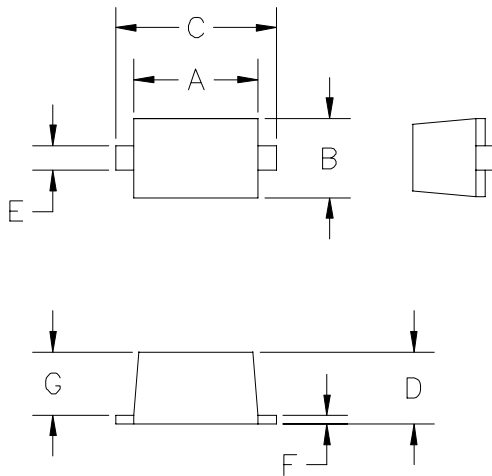
Absolute Maximum Ratings (TA=25°C unless otherwise specified)

Rating	Symbol	Value	Units
Peak Pulse Power ($t_p = 8/20\mu s$)	P_{PP}	38.5	Watts
Peak Pulse Current ($t_p = 8/20\mu s$) (note1)	I_{PP}	3.5	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{ESD}	± 30 ± 30	kV
Lead Soldering Temperature	T_L	260(10seconds)	°C
Junction Temperature	T_J	-55 to + 125	°C
Storage Temperature	T_{stg}	-55 to + 125	°C

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

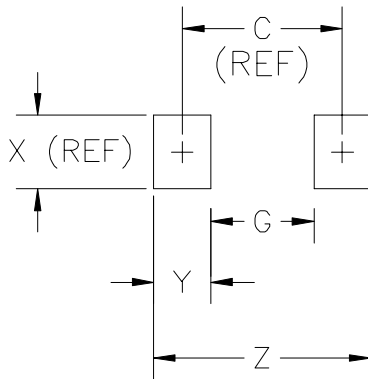
Parameter	Symbol	Conditions	Min	Typical	Max	Units
Reverse Stand-Off Voltage	V_{RWM}				5.0	V
Reverse Breakdown Voltage	V_{BR}	$I_T = 1mA$	6	6.5		V
Reverse Leakage Current	I_R	$V_{RWM} = 5V, T = 25^\circ C$			0.1	μA
Peak Pulse Current	I_{PP}	$t_p = 8/20\mu s$			3.5	A
Clamping Voltage	V_C	$I_{PP} = 3.5A, t_p = 8/20\mu s$			11	V
Junction Capacitance	C_j	$V_R = 0V, f = 1MHz$		3.5		pF

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

Clamping Voltage vs. Peak Pulse Current ($t_p = 8/20\mu s$)

Peak Pulse Power vs. Pulse Time

8 X 20µs Pulse Waveform

Power Derating Curve

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

SOD-523 Package Outline Drawing


DIM ^N	DIMENSIONS				NOTE
	INCHES		MM [1]		
	MIN	MAX	MIN	MAX	
A	.043	.051	1.10	1.30	—
B	.028	.035	0.70	0.90	—
C	.059	.067	1.50	1.70	—
D	.020	.028	0.50	0.70	—
E	.010	.014	0.25	0.35	—
F	.004	.008	0.10	0.20	—
G	.020	.028	0.50	0.70	—

[1] CONTROLLING DIMENSION: MILLIMETERS

Suggested Land Pattern


DIM ^N	DIMENSIONS				NOTE
	INCHES		MM [1]		
	MIN	MAX	MIN	MAX	
C	—	.067	—	1.70	REF
G	—	.043	—	1.10	—
X	—	.031	—	0.80	REF
Y	—	.024	—	0.60	—
Z	—	.091	—	2.30	—

[1] CONTROLLING DIMENSION: MILLIMETERS

Contact Information

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