

Description

The ST0512S-143 is 2-line ultra-low capacitance TVS diode array, 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 highspeed data lines. The ST0512S-143 has a very low capacitance with a typical value at 0.3pF, 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 a 4-pin SOT-143 lead-free package. The small size, very low capacitance and high ESD surge protection make ST0512S-143 ideal choice to protect cell phone, digital video interfaces, high speed data ports, and many other portable applications.

Features

- ◆ Ultra low capacitance: 0.3pF typical
- ◆ Ultra low leakage: nA level
- ◆ Low operating voltage: 5V
- ◆ Low clamping voltage
- ◆ 4-pin SOT-143 package
- ◆ Protects two data lines and one power line
- ◆ Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
 - Air discharge: $\pm 30\text{kV}$
 - Contact discharge: $\pm 25\text{kV}$
 - IEC61000-4-4 (EFT) 40A (5/50ns)
 - IEC61000-4-5 (Lightning) 5A (8/20 μs)
- ◆ RoHS Compliant

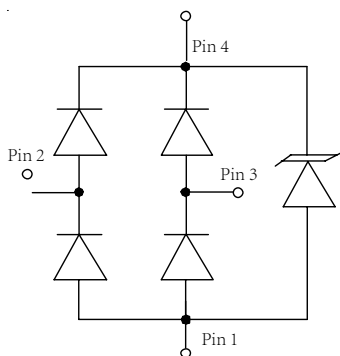
Mechanical Characteristics

- ◆ Package: SOT-143
- ◆ 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

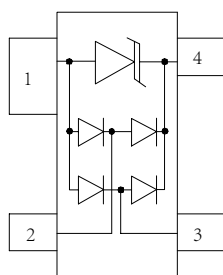
Applications

- ◆ Cellular Handsets and Accessories
- ◆ Notebooks and Handhelds
- ◆ Personal Digital Assistants
- ◆ Portable Instrumentation
- ◆ Digital Cameras
- ◆ Peripherals
- ◆ Audio Players, Keypads, Side Keys, LCD
- ◆ USB 2.0

PIN Identification and Configuration



Circuit Diagram



Pin Schematic

Ordering Information

Part Number	Packaging	Reel Size
ST0512S-143	3000/Tape & Reel	7 inch

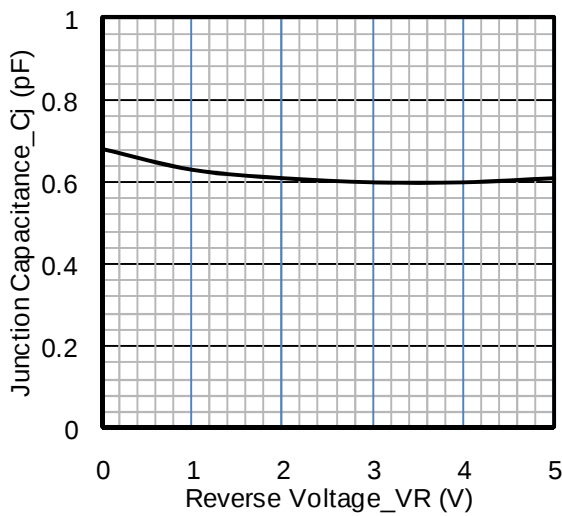
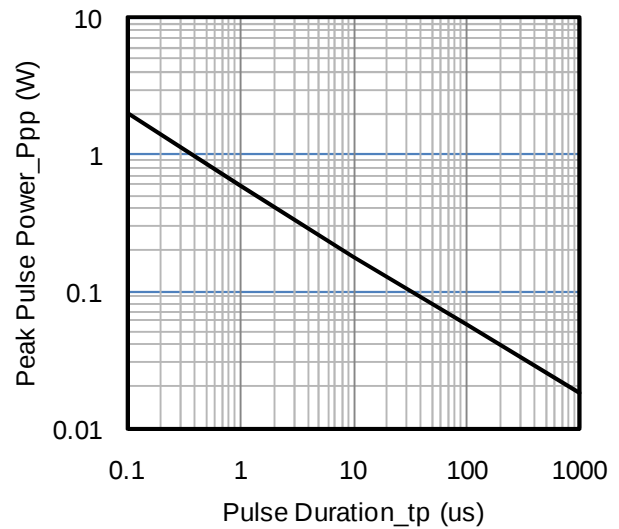
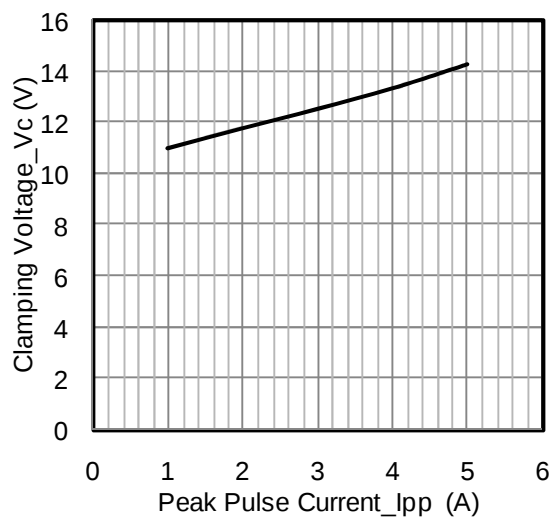
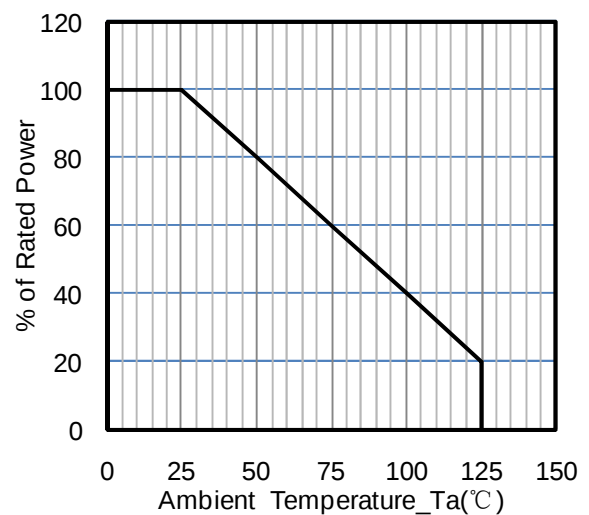
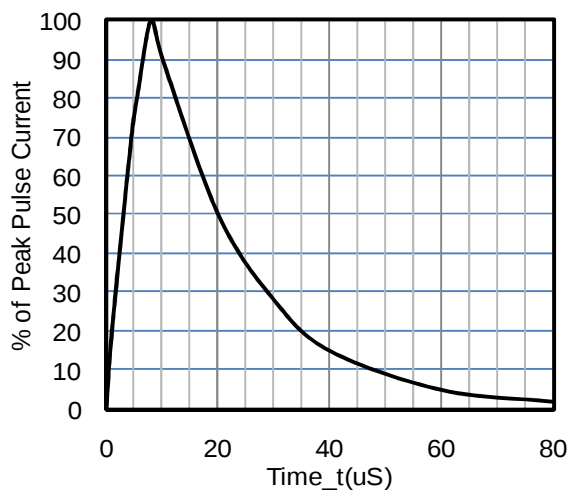
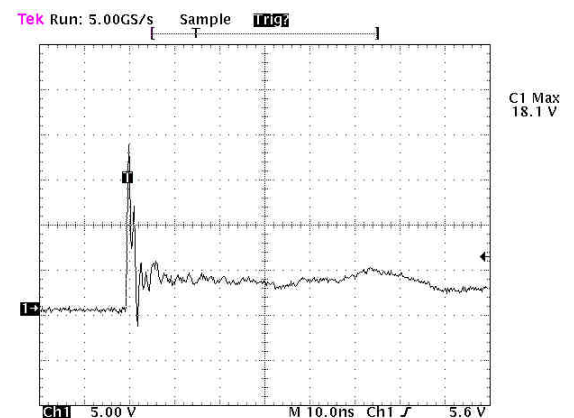
Absolute Maximum Ratings (TA=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	Ppk	90	W
Peak Pulse Current (8/20μs)	I _{PP}	5	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V _{ESD}	±30 ±25	kV
Operating Temperature Range	T _J	-55 to +125	°C
Storage Temperature Range	T _{stg}	-55 to +150	°C

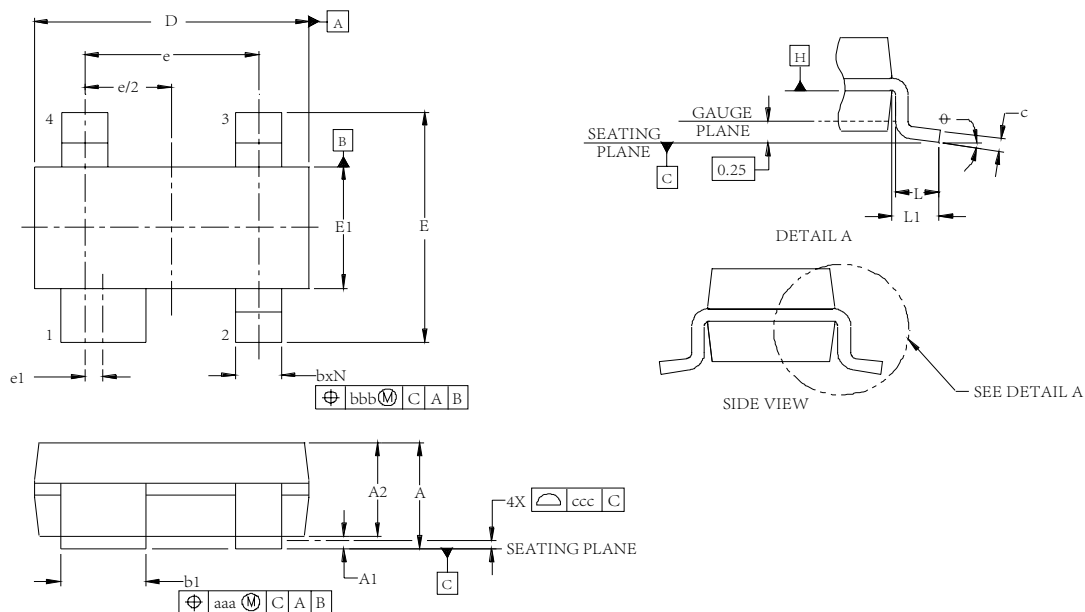
Electrical Characteristics (TA=25°C unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V _{RWM}			5	V	Any I/O pin to ground
Breakdown Voltage	V _{BR}	6			V	I _T = 1mA, any I/O pin to ground
Reverse Leakage Current	I _R			0.5	μA	V _{RWM} = 5V, any I/O pin to ground
Clamping Voltage	V _C			15	V	I _{PP} = 1A (8 x 20μs pulse), any I/O pin to ground
Clamping Voltage	V _C			18	V	I _{PP} = 5A (8 x 20μs pulse), any I/O pin to ground
Junction Capacitance	C _J		0.3	0.4	pF	V _R = 0V, f = 1MHz, between I/O pins
Junction Capacitance	C _J			0.8	pF	V _R = 0V, f = 1MHz, any I/O pin to ground

Note 1: I/O pins are pin 2 & 3

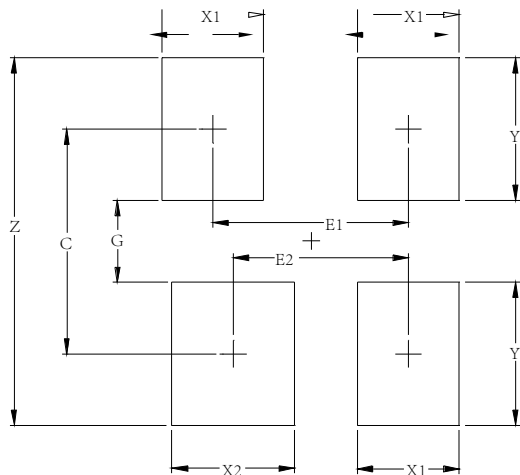
Typical Performance Characteristics (TA=25°C unless otherwise specified)

Junction Capacitance vs. Reverse Voltage

Peak Pulse Power vs. Pulse Time

Clamping Voltage vs. Peak Pulse Current

Power Derating Curve

8 X 20uS Pulse Waveform

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

SOT-143 Package Outline Drawing



DIM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	.031	-	.048	0.80	-	1.22
A1	.000	-	.006	0.013	-	0.15
A2	.029	.035	.042	0.75	0.90	1.07
b	.011	-	.020	0.30	-	0.51
b1	.029	-	.037	0.76	-	0.94
c	.003	-	.008	0.08	-	0.20
D	.110	.114	.120	2.80	2.90	3.04
E	.082	.093	.104	2.10	2.37	2.64
E1	.047	.051	.055	1.20	1.30	1.40
e	.075	-	-	1.92 BSC	-	-
e1	.008	-	-	0.20 BSC	-	-
L	.015	.020	.024	0.40	0.50	0.60
L1	(.021)	-	-	(0.54)	-	-
N	4	-	-	4	-	-
θ	0°	-	8°	0°	-	8°
aaa	.006	-	-	0.15	-	-
bbb	.008	-	-	0.20	-	-
ccc	.004	-	-	0.10	-	-

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	2.20	0.087
E1	1.92	0.076
E2	1.72	0.068
G	0.80	0.031
X1	1.00	0.039
X2	1.20	0.047
Y	1.40	0.055
Z	3.60	0.141

Contact Information

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