



SSCE5V031SB

Ultra Low Capacitance Array for ESD Protection

● Description

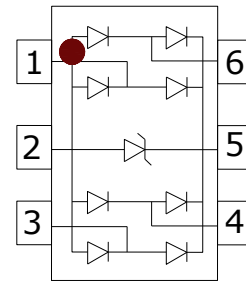
The SSCE5V031SB is a high performance and low cost design which includes surge rated diode arrays to protect high speed data interfaces. The SSCE5V031SB family has been specifically designed to protected sensitive components. Which are connected to data and transmission lines, from over-voltage caused by Electrostatic Discharging(ESD). Electrical Fast Transients(EFT),and lightning.

The SSCE5V031SB is a unique design which includes surge rated, low capacitance steering diodes and a unique design of clamping cell which is an equivalent TVS diodes in a single package. During transient conditions, the steering diodes direct the transient to either the power supply line or to the ground line. The internal unique design of clamping cell prevents over-voltage on the power line, protecting any downstream components. The SSCE5V031SB may be used to meet the ESD immunity requirements of IEC 61000-4-2, level 4($\pm 15\text{KV}$ air, $\pm 8\text{KV}$ contact discharge).

● Feature

- ✧ ESD Protect for 4 high-speed I/O channels
- ✧ Provide ESD Protection for each channel to
IEC 61000-4-2 (ESD) $\pm 25\text{KV}$ (air), $\pm 25\text{KV}$ (contact)
IEC 61000-4-4(EFT) (5/50ns) 40A
IEC 61000-4-5(Lightning) (8/20us) 5.5A
- ✧ For low operating voltage applications:5V
- ✧ Low capacitance:1.0pF typical
- ✧ Fast turn-on and low clamping voltage
- ✧ Array of surge rated diodes with internal equivalent TVS diode
- ✧ Small package saves board space
- ✧ Solid-state silicon-avalanche and active circuit triggering technology

● PIN configuration



Topview

● Applications

- ✧ Video Graphics Cards
- ✧ USB2.0 Power and Data lines protection
- ✧ Notebook and PC Computers
- ✧ Monitors and Flat Panel Displays
- ✧ IEEE 1394 Firewire Ports
- ✧ SIM Ports

● Mechanical data

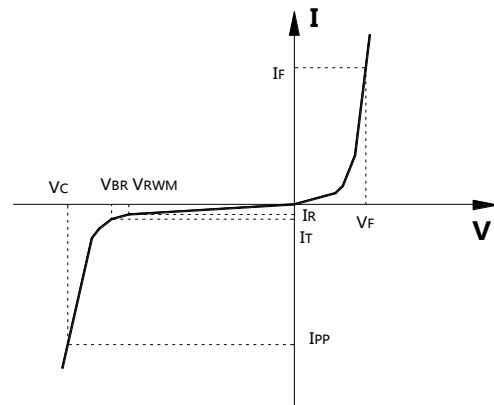
- ✧ Lead finish:100% matte Sn(Tin)
- ✧ Mounting position: Any
- ✧ Qualified max reflow temperature:260 °C
- ✧ Device meets MSL 1 requirements
- ✧ Pure tin plating: 7 ~ 17 um
- ✧ Pin flatness: $\leq 3\text{mil}$



SSCE5V031SB

● Electronic Parameter

Symbol	Parameter
V_{RWM}	Peak Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
P_{PP}	Peak Pulse Power
C	Junction Capacitance



● Absolute maximum rating @TA=25°C

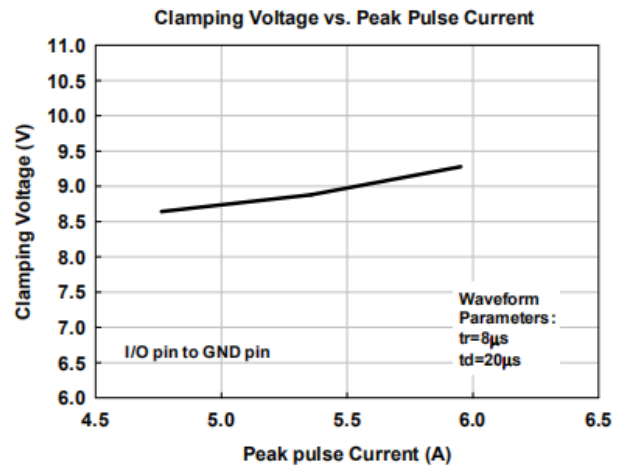
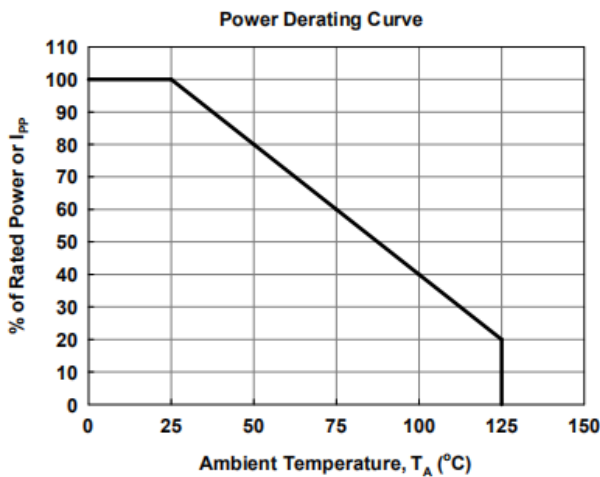
Symbol	Parameter	Value	Units
I_{PP}	Peak Pulse Current (8/20 μ s)	5.5	A
V_{DC}	Operating Supply voltage (VDD-GND)	6	V
V_{ESD}	ESD per IEC 61000-4-2 (air)	25	KV
	ESD per IEC 61000-4-2 (contact)	25	
T_{SOL}	Lead Soldering Temperature	260 (10 sec.)	°C
T_{OP}	Operating Temperature	-55 to +85	°C
T_{STO}	Storage Temperature	-55 to +150	°C
V_{IO}	DC voltage at any I/O pin	(GND-0.5) to (VDD+0.5)	V



● Electrical Characteristics @TA=25°C

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V_{RWM}	Pin 5 to pin 2, T=25°C			5	V
Reverse Leakage Current	I_{Leak}	$V_{RWM}=5V, T=25°C, \text{Pin 5 to pin 2}$			2	uA
Channel Leakage Current	$I_{CH-leak}$	$V_{PIN5}=5V, V_{PIN2}=0V, T=25°C$			1	uA
Reverse Breakdown Voltage	V_{BV}	$I_{BV}=1mA, T=25°C, \text{Pin 5 to pin 2}$	6.2			V
Forward Voltage	V_F	$I_F=15mA, T=25°C, \text{Pin 2 to pin 5}$		0.8	1.2	V
Clamping Voltage	V_{CL}	$I_{pp}=5A, tP=8/20us, T=25°C, \text{Any channel pin to Ground}$		9	10	V
ESD Holding Voltage	V_{hold}	IEC 61000-4-2 +6KV, T=25°C, Contact mode, Any channel pin to Ground		11.5		V
Channel Input Capacitance	C_{IN}	$V_{PIN5}=5V, V_{PIN2}=0V, V_{IN}=2.5V, f=1KHZ, T=25°C, \text{Any channel pin to Ground}$		1.0	1.2	pF
Channel To Channel Input Capacitance	C_{CROSS}	$V_{PIN5}=5V, V_{PIN2}=0V, V_{IN}=2.5V, f=1KHZ, 1KHZ, T=25°C, \text{Between Channel pins}$		0.1	0.12	pF
Variation of Channel Input Capacitance	ΔC_{IN}	$V_{PIN5}=5V, V_{PIN2}=0V, V_{IN}=2.5V, f=1KHZ, T=25°C, \text{Channel-x pin to Ground - Channel-y pin to Ground}$		0.03	0.05	pF

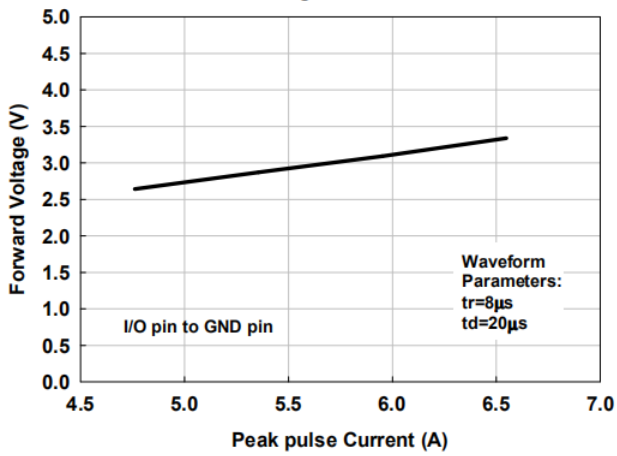
● Typical Performance Characteristics



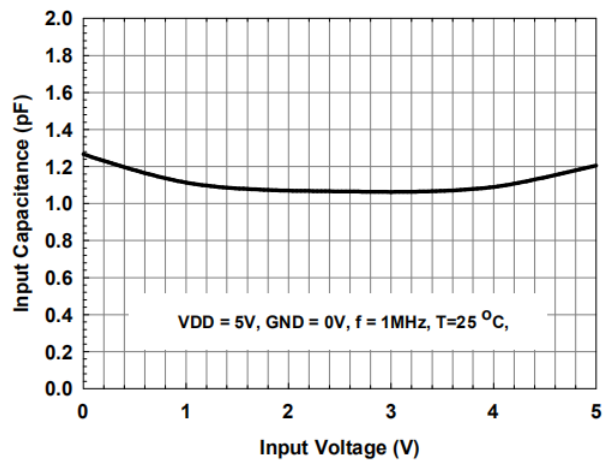


SSCE5V031SB

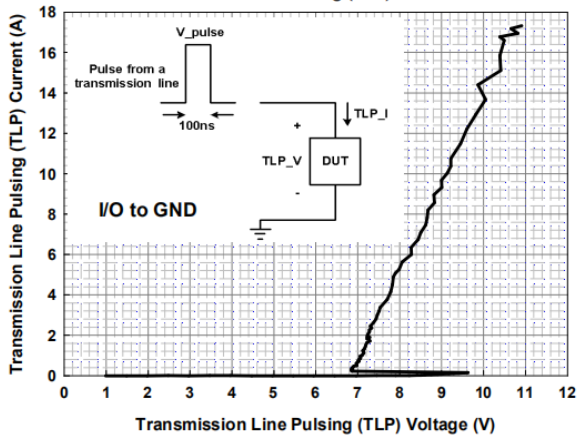
Forward Voltage vs. Forward Current



Typical Variation of C_{IN} vs. V_{IN}



Transmission Line Pulsing (TLP) Measurement

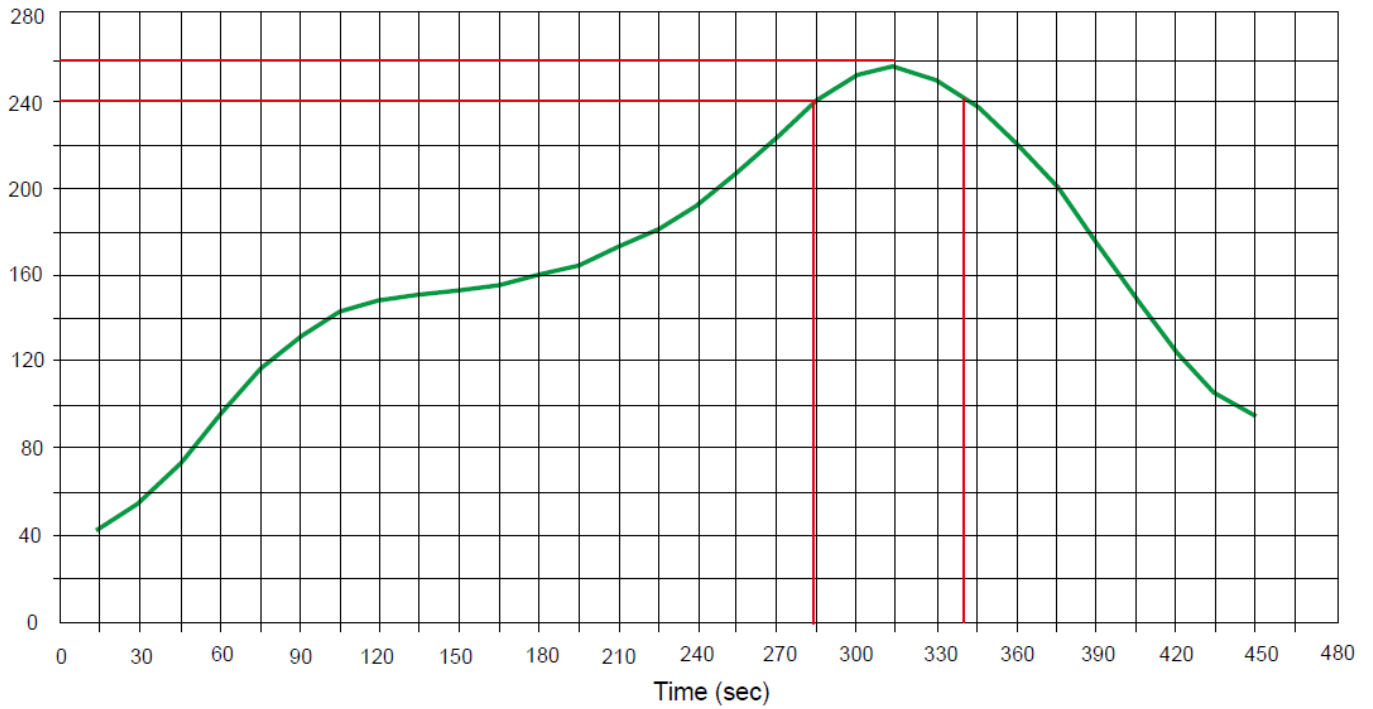




SSCE5V031SB

- **Solder Reflow Recommendation**

Peak Temp=257°C, Ramp Rate=0.802deg. °C/sec





SSCE5V031SB

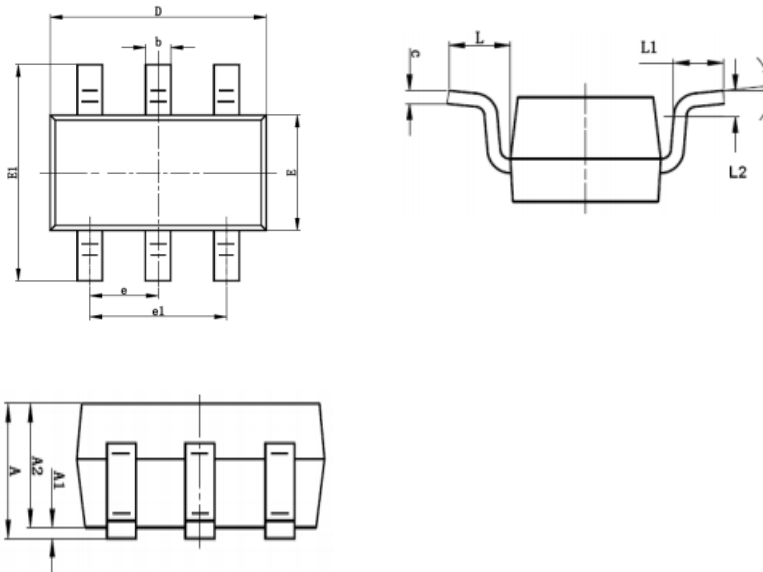
● Package Information

Ordering Information

Device	Package	Qty per Reel	Reel Size
SSCE5V031SB	SOT23-6L	3000	7 Inch

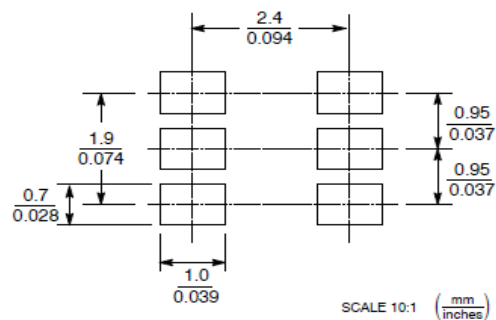
Mechanical Data

- Case: SOT23-6L
- Case Material: Molded Plastic. UL Flammability



DIM	Millimeters	
	Min	Max
A	0.000	1.450
A1	0.000	0.150
A2	0.900	1.300
b	0.300	0.500
c	0.080	0.210
D	2.720	3.120
E	1.400	1.800
E1	2.600	2.300
e	0.950BSC	0.037BSC
e1	1.9BSC	0.075BSC
L1	0.300	0.600
L	0.7REF	
L2	0.25BSC	
θ	0	8

Recommended Pad outline



DISCLAIMER



SSCE5V031SB

AFSEMI RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. AFSEMI DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICIENCE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

THE GRAPHS PROVIDED IN THIS DOCUMENT ARE STATISTICAL SUMMARIES BASED ON A LIMITED NUMBER OF SAMPLES AND ARE PROVIDED FOR INFORMATIONAL PURPOSE ONLY. THE PERFORMANCE CHARACTERISTICS LISTED IN THEM ARE NOT TESTED OR GUARANTEED. IN SOME GRAPHS, THE DATA PRESENTED MAY BE OUTSIDE THE SPECIFIED OPERATING RANGE (E.G., OUTSIDE SPECIFIED POWER SUPPLY RANGE) AND THEREFORE OUTSIDE THE WARRANTED RANGE.