SSCE5V031SB

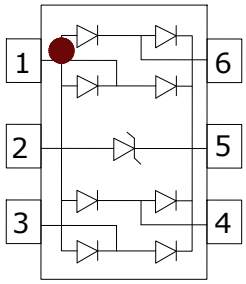
Ultra Low Capacitance Array for ESD Protection

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(±15KV air, ±8KV contact discharge).

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

Feature

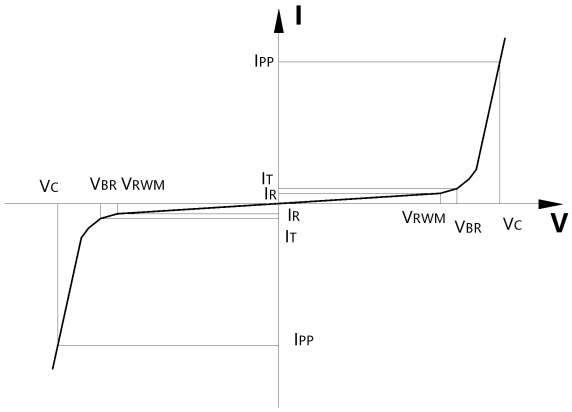
- ESD Protect for 4 high-speed I/O channels
- Provide ESD Protection for each channel to
  IEC 61000-4-2（ESD) ±15KV(air), ±15KV(contact)
  IEC 61000-4-4(EFT) (5/50ns) 40A
  IEC 61000-4-5(Lightning) (8/20us) 5.5A
- For low operating voltage applications:5V
- Low capacitance:1.0pF typical
- Fast turn-on 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

Machanical data

- Lead finish:100% matte Sn(Tin)
- Mounting position: Any
- Qualified max reflow temperature:260℃
- Device meets MSL 1 requirements
- Pure tin plating: 7 ~ 17 um
- Pin flatness:≤3mil

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



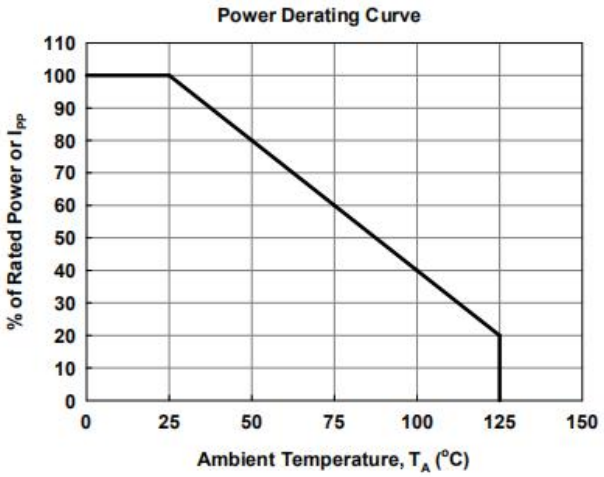
Absolute maximum rating @TA=25℃

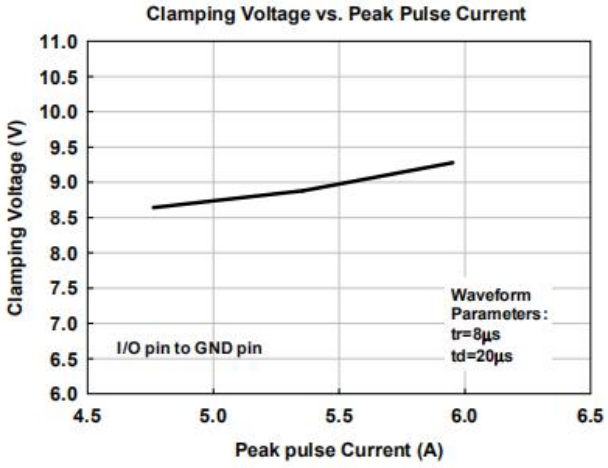
Symbol	Parameter	Value	Units
I_{PP}	Peak Pulse Current（8/20μs）	5.5	A
V_{DC}	Operating Supply voltage (VDD-GND)	6	V
V_{ESD}	ESD per IEC 61000-4-2（air) ESD per IEC 61000-4-2（contact)	15 15	KV
T_{SOL}	Lead Soldering Temperature	260 (10 sec.)	℃
T_{OP}	Operating Temperature	-55 to +85	℃
T_{STO}	Storage Temperature	-55 to +150	℃
V_{IO}	DC voltage at any I/O pin	(GND-0.5) to (VDD+0.5)	V

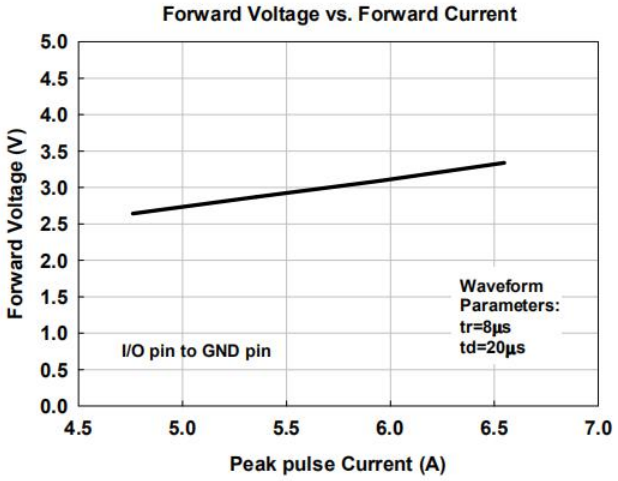
Electrical Characteristics @TA=25℃

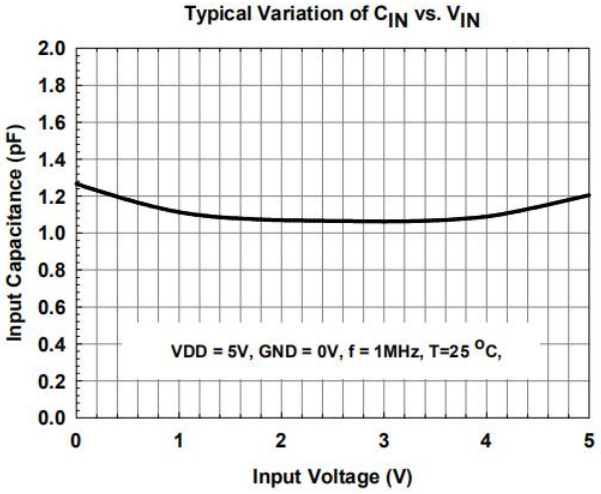
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V_{RWM}	Pin 5 to pin 2, T=25℃			5	V
Reverse Leakage Current	I_{Leak}	V_{RWM} =5V,T=25℃,Pin 5 to pin 2			2	uA
Channel Leakage Current	$I_{CH-leak}$	V_{PIN5} =5V,V_{PIN2} =0V,T=25℃			1	uA
Reverse Breakdown Voltage	V_{BV}	I_{BV}=1mA,T=25℃,Pin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

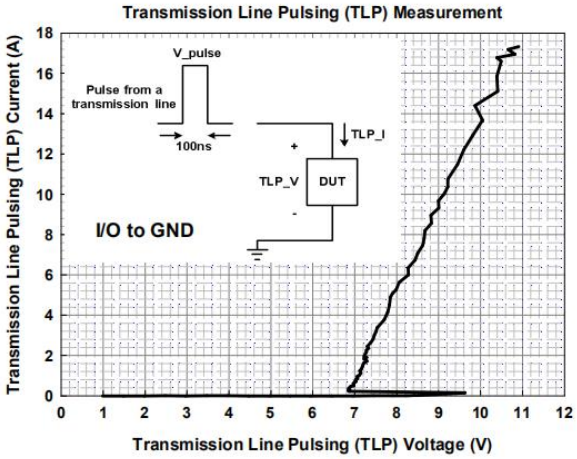
Typical Performance Characteristics





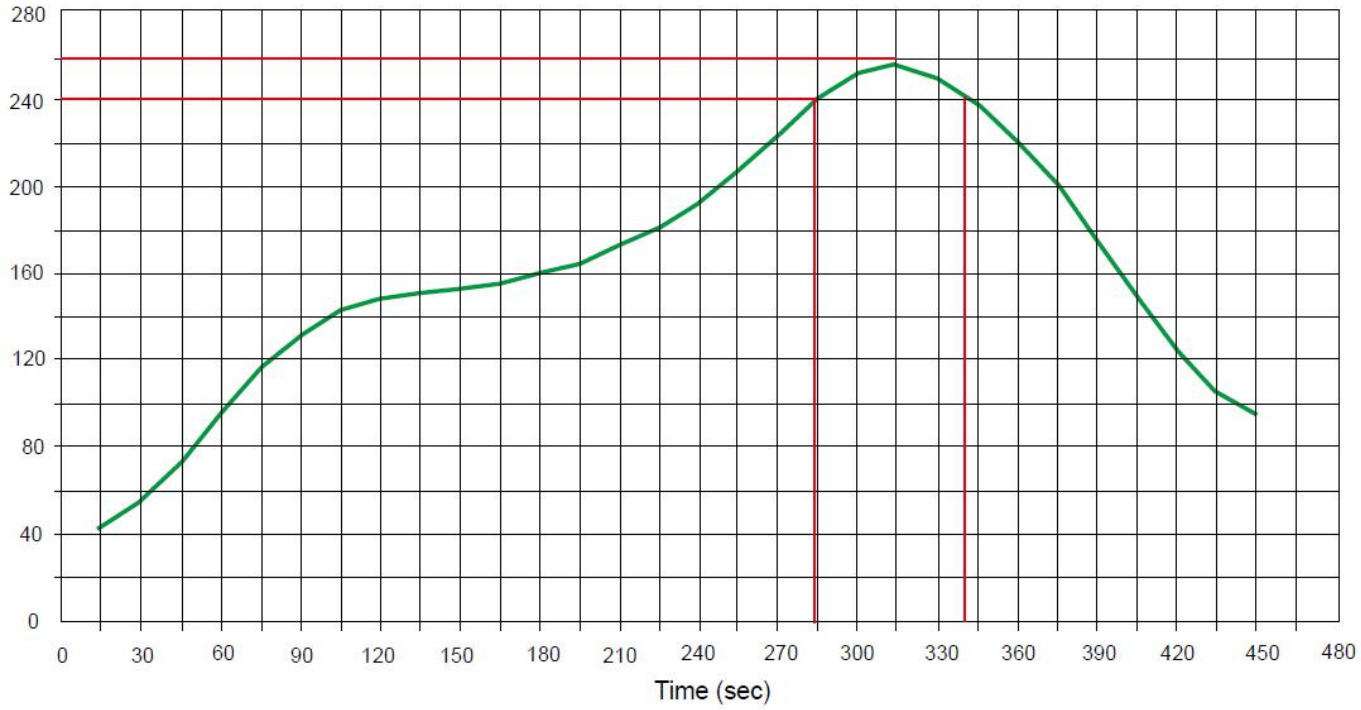

Forward Voltage vs. Forward Current
Forward Voltage (V)
Peak pulse Current (A)
I/O pin to GND pin
Waveform Parameters:
tr=8μs
td=20μs


Typical Variation of C_{IN} vs. V_{IN}
Input Capacitance (pF)
Input Voltage (V)
VDD = 5V, GND = 0V, f = 1MHz, T=25 °C,


Transmission Line Pulsing (TLP) Measurement
Transmission Line Pulsing (TLP) Current (A)
Transmission Line Pulsing (TLP) Voltage (V)
V_pulse
Pulse from a transmission line
100ns
TLP_I
TLP_V
DUT
I/O to GND

- **Solder Reflow Recommendation**

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



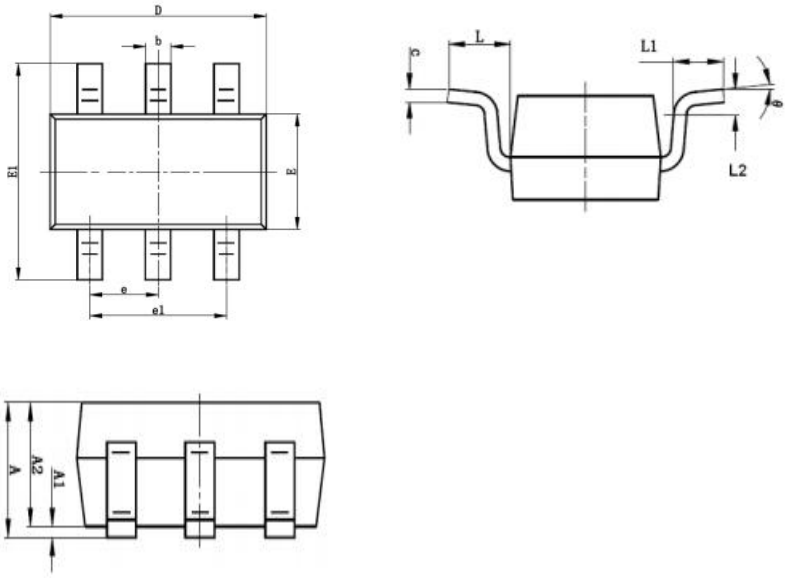
- **Package Information**

Ordering Information

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

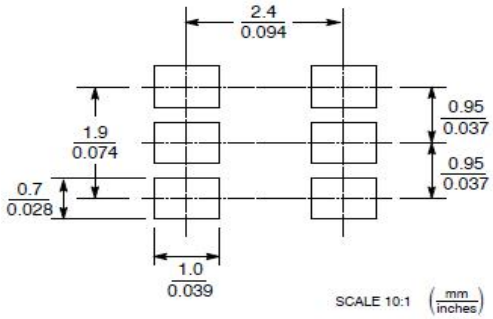
Mechanical Data

- 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



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