



## SSCEXXX12S6

2-Line Bi-directional TVS Diode

### ● Description

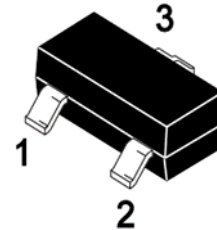
The SSCEXXX12S6 is a bi-directional TVS diode array, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting sensitive semiconductor components from damage. The SSCEXXX12S6 complies with the IEC 61000-4-2 (ESD) standard with  $\pm 30\text{kV}$  air and  $\pm 30\text{kV}$  contact discharge.

It is assembled into a lead-free SOT-23 package. It is designed to protect components which are connected to data and transmission lines from voltage surges.

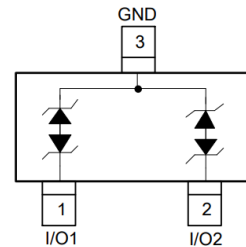
### ● Features

- ◇ 300W peak pulse power (8/20us)
- ◇ Package: SOT-23
- ◇ Protects two uni-directional line(s)
- ◇ Ultra low leakage: nA level
- ◇ Stand-off Voltage: 3.3 V-36V
- ◇ Ultra low clamping voltage
- ◇ Complies with following standards:
  - IEC61000-4-2(ESD)
  - Air discharge:  $\pm 30\text{KV}$
  - Contact discharge:  $\pm 30\text{KV}$
  - IEC61000-4-4 (EFT) 40A (5/50ns)
- ◇ RoHS Compliant

### ● PIN configuration



**SOT-23(Top view)**



**Circuit diagram**

### ● Applications

- ◇ Cellular Handsets and Accessories
- ◇ Personal Digital Assistants
- ◇ Notebooks and Handhelds
- ◇ Portable Instrumentation
- ◇ Set Top Box
- ◇ Industrial Controls
- ◇ Server and Desktop PC

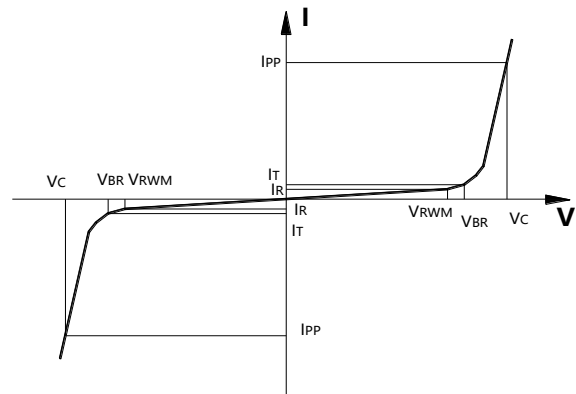
### ● Mechanical Characteristics

- ◇ 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



● **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
$C_J$	Junction Capacitance



● **Absolute maximum rating @TA = 25°C**

SSCE3V312S6			
Symbol	Parameter	Value	Units
$P_{PP}$	Peak Pulse Power (8/20us)	300	W
$I_{PP}$	Peak Pulse Current (8/20us)	25	A
$V_{ESD}$	ESD Rating per IEC61000-4-2:	Contact	KV
		Air	
$T_{STG}$	Storage Temperature	-55/+150	°C
$T_J$	Operating Temperature	-55/+125	°C
SSCE5V012S6			
Symbol	Parameter	Value	Units
$P_{PP}$	Peak Pulse Power (8/20us)	300	W
$I_{PP}$	Peak Pulse Current (8/20us)	18	A
$V_{ESD}$	ESD Rating per IEC61000-4-2:	Contact	KV
		Air	
$T_{STG}$	Storage Temperature	-55/+150	°C
$T_J$	Operating Temperature	-55/+125	°C
SSCE12V12S6			
Symbol	Parameter	Value	Units
$P_{PP}$	Peak Pulse Power (8/20us)	300	W
$I_{PP}$	Peak Pulse Current (8/20us)	10	A
$V_{ESD}$	ESD Rating per IEC61000-4-2:	Contact	KV
		Air	
$T_{STG}$	Storage Temperature	-55/+150	°C
$T_J$	Operating Temperature	-55/+125	°C
SSCE15V12S6			
Symbol	Parameter	Value	Units
$P_{PP}$	Peak Pulse Power (8/20us)	300	W
$I_{PP}$	Peak Pulse Current (8/20us)	8	A



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V <sub>ESD</sub>	ESD Rating per IEC61000-4-2:	Contact	±30	KV
		Air	±30	
T <sub>STG</sub>	Storage Temperature		-55/+150	°C
T <sub>J</sub>	Operating Temperature		-55/+125	°C
<b>SSCE24V12S6</b>				
Symbol	Parameter		Value	Units
P <sub>PP</sub>	Peak Pulse Power (8/20us)		300	W
I <sub>PP</sub>	Peak Pulse Current (8/20us)		5	A
V <sub>ESD</sub>	ESD Rating per IEC61000-4-2:	Contact	±30	KV
		Air	±30	
T <sub>STG</sub>	Storage Temperature		-55/+150	°C
T <sub>J</sub>	Operating Temperature		-55/+125	°C
<b>SSCE36V12S6</b>				
Symbol	Parameter		Value	Units
P <sub>PP</sub>	Peak Pulse Power (8/20us)		300	W
I <sub>PP</sub>	Peak Pulse Current (8/20us)		3	A
V <sub>ESD</sub>	ESD Rating per IEC61000-4-2:	Contact	±30	KV
		Air	±30	
T <sub>STG</sub>	Storage Temperature		-55/+150	°C
T <sub>J</sub>	Operating Temperature		-55/+125	°C

● **Electrical Characteristics @TA = 25°C**

<b>SSCE3V312S6</b>						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Peak Reverse Working Voltage	V <sub>RWM</sub>				3.3	V
Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> =1mA	3.8			V
Reverse Leakage Current	I <sub>R</sub>	V <sub>RWM</sub> =3.3V			1	μA
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> =1A, t <sub>P</sub> = 8/20us		6		V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> =25A, t <sub>P</sub> = 8/20us			12	V
Junction Capacitance	C <sub>J</sub>	V <sub>R</sub> = 0V, f = 1MHz,		100		pF
<b>SSCE5V012S6</b>						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Peak Reverse Working Voltage	V <sub>RWM</sub>				5.0	V
Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> =1mA	6.0			V
Reverse Leakage Current	I <sub>R</sub>	V <sub>RWM</sub> =5V			1	μA
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> =1A, t <sub>P</sub> = 8/20us		9.8		V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> =18A, t <sub>P</sub> = 8/20us			16.7	V
Junction Capacitance	C <sub>J</sub>	V <sub>R</sub> = 0V, f = 1MHz,		100		pF



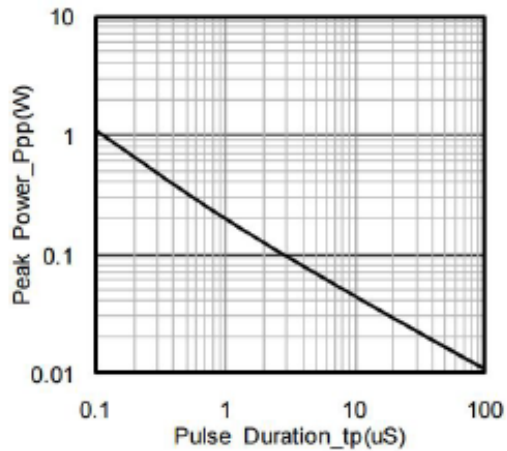
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SSCE12V12S6						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Peak Reverse Working Voltage	$V_{RWM}$				12	V
Breakdown Voltage	$V_{BR}$	$I_T=1mA$	13.3			V
Reverse Leakage Current	$I_R$	$V_{RWM}=12V$			1	$\mu A$
Clamping Voltage	$V_C$	$I_{PP}=1A, tP=8/20us$		19		V
Clamping Voltage	$V_C$	$I_{PP}=10A, tP=8/20us$			30	V
Junction Capacitance	$C_J$	$V_R=0V, f=1MHz,$		60		pF
SSCE15V12S6						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Peak Reverse Working Voltage	$V_{RWM}$				15	V
Breakdown Voltage	$V_{BR}$	$I_T=1mA$	16.7			V
Reverse Leakage Current	$I_R$	$V_{RWM}=15V$			1	$\mu A$
Clamping Voltage	$V_C$	$I_{PP}=1A, tP=8/20us$		24		V
Clamping Voltage	$V_C$	$I_{PP}=8A, tP=8/20us$			38.5	V
Junction Capacitance	$C_J$	$V_R=0V, f=1MHz,$		55		pF
SSCE24V12S6						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Peak Reverse Working Voltage	$V_{RWM}$				24	V
Breakdown Voltage	$V_{BR}$	$I_T=1mA$	26.7			V
Reverse Leakage Current	$I_R$	$V_{RWM}=24V$			1	$\mu A$
Clamping Voltage	$V_C$	$I_{PP}=1A, tP=8/20us$		35		V
Clamping Voltage	$V_C$	$I_{PP}=5A, tP=8/20us$			65	V
Junction Capacitance	$C_J$	$V_R=0V, f=1MHz,$		36		pF
SSCE36V12S6						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Peak Reverse Working Voltage	$V_{RWM}$				36	V
Breakdown Voltage	$V_{BR}$	$I_T=1mA$	40			V
Reverse Leakage Current	$I_R$	$V_{RWM}=36V$			1	$\mu A$
Clamping Voltage	$V_C$	$I_{PP}=1A, tP=8/20us$		60		V
Clamping Voltage	$V_C$	$I_{PP}=3A, tP=8/20us$			75	V
Junction Capacitance	$C_J$	$V_R=0V, f=1MHz,$		30		pF

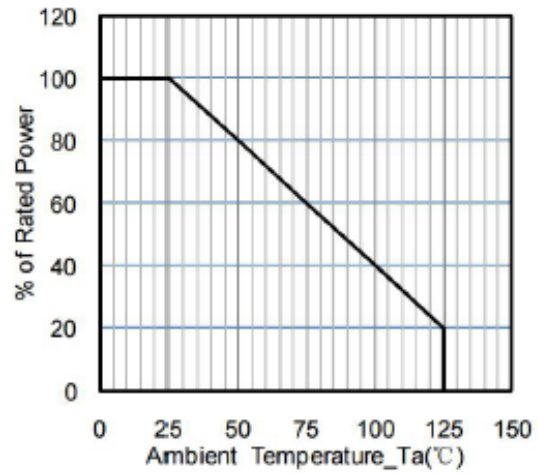


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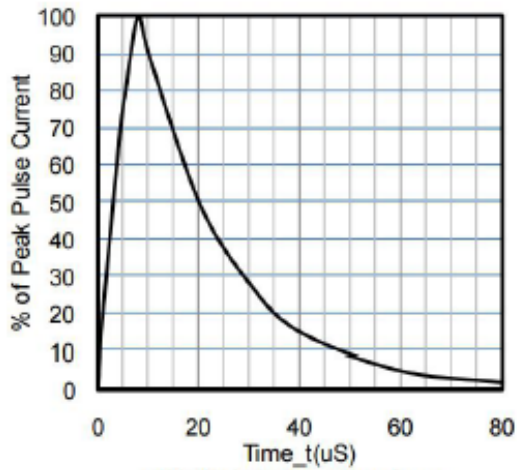
- Typical Performance Characteristics (TA = 25°C unless otherwise Specified)



Peak Pulse Power vs. Pulse Time



Power Derating Curve



8 X 20uS Pulse Waveform



## ● Package Information

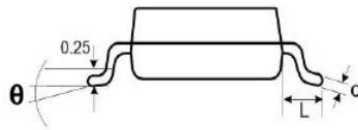
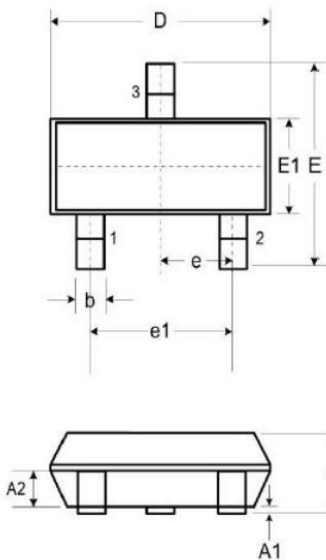
### Ordering Information

Device	Making	Package	Qty per Reel	Reel Size
SSCE3V312S6	LL3	SOT-23	3000	7 Inch
SSCE5V012S6	L3B	SOT-23	3000	7 Inch
SSCE12V12S6	AB2	SOT-23	3000	7 Inch
SSCE15V12S6	BB2	SOT-23	3000	7 Inch
SSCE24V12S6	CB2	SOT-23	3000	7 Inch
SSCE36V12S6	DB2	SOT-23	3000	7 Inch

## Mechanical Data

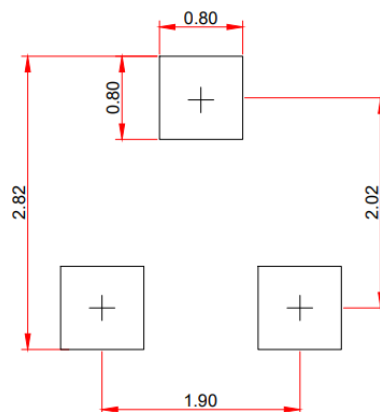
Case: SOT-23

Case Material: Molded Plastic. UL Flammability



DIM	Millimeters		
	Min.	Typ.	Max.
A	0.89	-	1.12
A1	0.01	-	0.10
A2	0.88	0.95	1.02
b	0.30	-	0.51
c	0.08	-	0.18
D	2.80	2.90	3.04
E	2.10	2.37	2.64
E1	1.20	1.30	1.40
e1	1.90		
e	0.95		
L	0.40	0.50	0.60
L1	0.55		
N	3		

### Recommended Pad outline (Unit: mm)





- **History Version**

V1.0	First edition	2021-08-03
V1.1	Add Making	2023-11-22

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