



SSCEXXX12S6

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2-Line Bi-directional TVS Diode

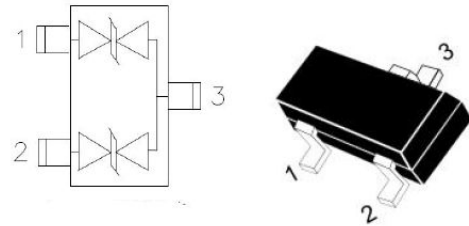
● Description

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)
- ✧ Protects one bi-directional or 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



Top view

● Applications

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

● Mechanical Characteristics

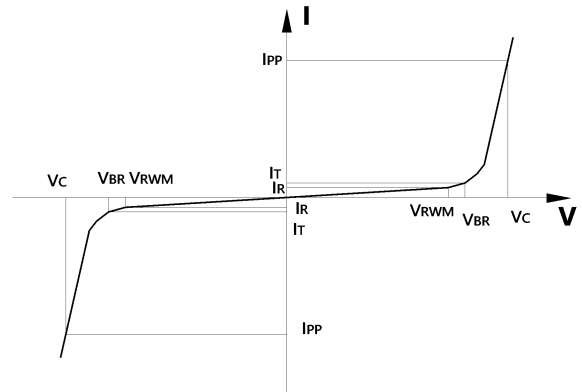
- ✧ Package: SOT-23
- ✧ Lead Finish: Matte Tin
- ✧ Case Material: "Green" Molding Compound.
- ✧ UL Flammability Classification Rating 94V-0
- ✧ Moisture Sensitivity: Level 3 per J-STD-020
- ✧ Terminal Connections: See Diagram Below
- ✧ Marking Information: See Below



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● 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_{PPP}	Peak Pulse Power
C	Junction Capacitance



● Absolute maximum rating @TA=25°C

SSCE3V312S6			
Symbol	Parameter	Value	Units
P_{PPP}	Peak Pulse Power (8/20 μ s)	300	W
I_{PP}	Peak Pulse Current (8/20 μ s)	25	A
V_{ESD}	ESD Rating per IEC61000-4-2:Contact Air	± 30 ± 30	KV
T_{STG}	Storage Temperature	-55/+150	°C
T_J	Operating Temperature	-55/+125	°C
SSCE5V012S6			
Symbol	Parameter	Value	Units
P_{PPP}	Peak Pulse Power (8/20 μ s)	300	W
I_{PP}	Peak Pulse Current (8/20 μ s)	18	A
V_{ESD}	ESD Rating per IEC61000-4-2:Contact Air	± 30 ± 30	KV
T_{STG}	Storage Temperature	-55/+150	°C
T_J	Operating Temperature	-55/+125	°C
SSCE12V12S6			
Symbol	Parameter	Value	Units
P_{PPP}	Peak Pulse Power (8/20 μ s)	300	W
I_{PP}	Peak Pulse Current (8/20 μ s)	10	A
V_{ESD}	ESD Rating per IEC61000-4-2:Contact Air	± 30 ± 30	KV
T_{STG}	Storage Temperature	-55/+150	°C
T_J	Operating Temperature	-55/+125	°C



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SSCE15V12S6			
Symbol	Parameter	Value	Units
P _{PPP}	Peak Pulse Power (8/20μs)	300	W
I _{PP}	Peak Pulse Current (8/20μs)	8	A
VESD	ESD Rating per IEC61000-4-2:Contact Air	±30 ±30	KV
T _{STG}	Storage Temperature	-55/+150	°C
T _J	Operating Temperature	-55/+125	°C
SSCE24V12S6			
Symbol	Parameter	Value	Units
P _{PPP}	Peak Pulse Power (8/20μs)	300	W
I _{PP}	Peak Pulse Current (8/20μs)	5	A
VESD	ESD Rating per IEC61000-4-2:Contact Air	±30 ±30	KV
T _{STG}	Storage Temperature	-55/+150	°C
T _J	Operating Temperature	-55/+125	°C
SSCE36V12S6			
Symbol	Parameter	Value	Units
P _{PPP}	Peak Pulse Power (8/20μs)	300	W
I _{PP}	Peak Pulse Current (8/20μs)	3	A
VESD	ESD Rating per IEC61000-4-2:Contact Air	±30 ±30	KV
T _{STG}	Storage Temperature	-55/+150	°C
T _J	Operating Temperature	-55/+125	°C

- **Electrical Characteristics @T_A=25°C**

SSCE3V312S6						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Peak Reverse Working Voltage	V _{RWM}				3.3	V
Breakdown Voltage	V _{BR}	I _T = 1mA	3.8			V
Reverse Leakage Current	I _R	V _{RWM} = 3.3V,			1	μA
Clamping Voltage	V _C	I _{PP} = 1A, t _P = 8/20μs		6		V
Clamping Voltage	V _C	I _{PP} = 25A, t _P = 8/20μs			12	V
Junction Capacitance	C _J	V _R = 0V, f = 1MHz,		100		pF



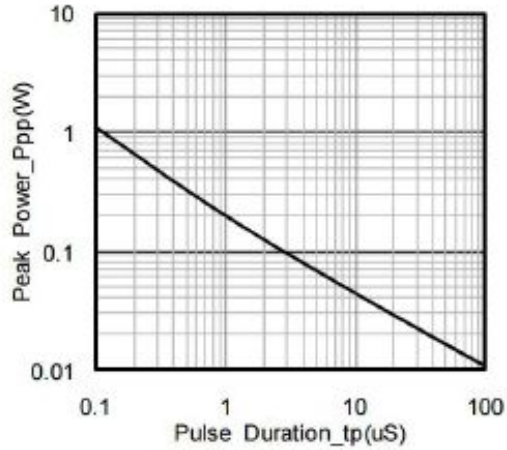
SSCEXX12S6

SSCE5V012S6						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Peak Reverse Working Voltage	V_{RWM}				5	V
Breakdown Voltage	V_{BR}	$I_T = 1\text{mA}$	6.0			V
Reverse Leakage Current	I_R	$VRWM = 5\text{V}$,			1	μA
Clamping Voltage	V_C	$IPP = 1\text{A}$, $t_P = 8/20\mu\text{s}$		9.8		V
Clamping Voltage	V_C	$IPP = 18\text{A}$, $t_P = 8/20\mu\text{s}$			16.7	V
Junction Capacitance	C_J	$VR = 0\text{V}$, $f = 1\text{MHz}$,		100		pF
SSCE12V12S6						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Peak Reverse Working Voltage	V_{RWM}				12	V
Breakdown Voltage	V_{BR}	$I_T = 1\text{mA}$	13.3			V
Reverse Leakage Current	I_R	$VRWM = 12\text{V}$,			1	μA
Clamping Voltage	V_C	$IPP = 1\text{A}$, $t_P = 8/20\mu\text{s}$		19		V
Clamping Voltage	V_C	$IPP = 10\text{A}$, $t_P = 8/20\mu\text{s}$			30	V
Junction Capacitance	C_J	$VR = 0\text{V}$, $f = 1\text{MHz}$,		60		pF
SSCE15V12S6						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Peak Reverse Working Voltage	V_{RWM}				15	V
Breakdown Voltage	V_{BR}	$I_T = 1\text{mA}$	16.7			V
Reverse Leakage Current	I_R	$VRWM = 15\text{V}$,			1	μA
Clamping Voltage	V_C	$IPP = 1\text{A}$, $t_P = 8/20\mu\text{s}$		24		V
Clamping Voltage	V_C	$IPP = 8\text{A}$, $t_P = 8/20\mu\text{s}$			38.5	V
Junction Capacitance	C_J	$VR = 0\text{V}$, $f = 1\text{MHz}$,		55		pF
SSCE24V12S6						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Peak Reverse Working Voltage	V_{RWM}				24	V
Breakdown Voltage	V_{BR}	$I_T = 1\text{mA}$	26.7			V
Reverse Leakage Current	I_R	$VRWM = 24\text{V}$,			1	μA
Clamping Voltage	V_C	$IPP = 1\text{A}$, $t_P = 8/20\mu\text{s}$		35		V
Clamping Voltage	V_C	$IPP = 5\text{A}$, $t_P = 8/20\mu\text{s}$			65	V
Junction Capacitance	C_J	$VR = 0\text{V}$, $f = 1\text{MHz}$,		36		pF
SSCE36V12S6						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Peak Reverse Working Voltage	V_{RWM}				36	V
Breakdown Voltage	V_{BR}	$I_T = 1\text{mA}$	40			V
Reverse Leakage Current	I_R	$VRWM = 36\text{V}$,			1	μA
Clamping Voltage	V_C	$IPP = 1\text{A}$, $t_P = 8/20\mu\text{s}$		60		V
Clamping Voltage	V_C	$IPP = 3\text{A}$, $t_P = 8/20\mu\text{s}$			75	V
Junction Capacitance	C_J	$VR = 0\text{V}$, $f = 1\text{MHz}$,		30		pF

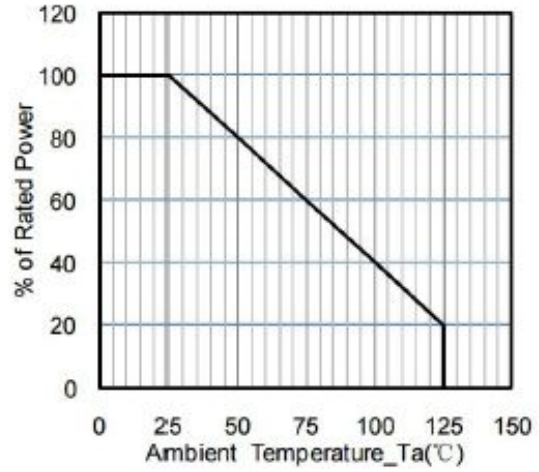


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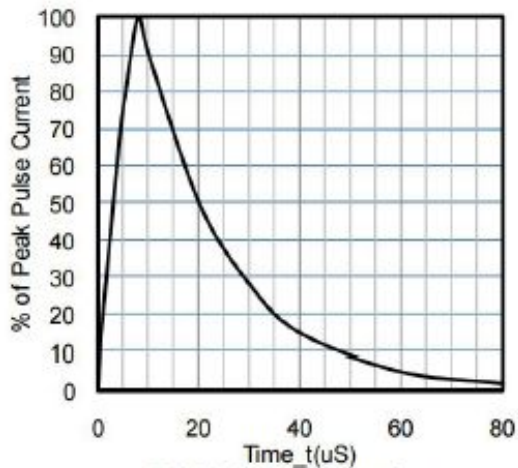
- Typical Performance Characteristics($T_A=25^{\circ}\text{C}$ unless otherwise Specified)



Peak Pulse Power vs. Pulse Time



Power Derating Curve

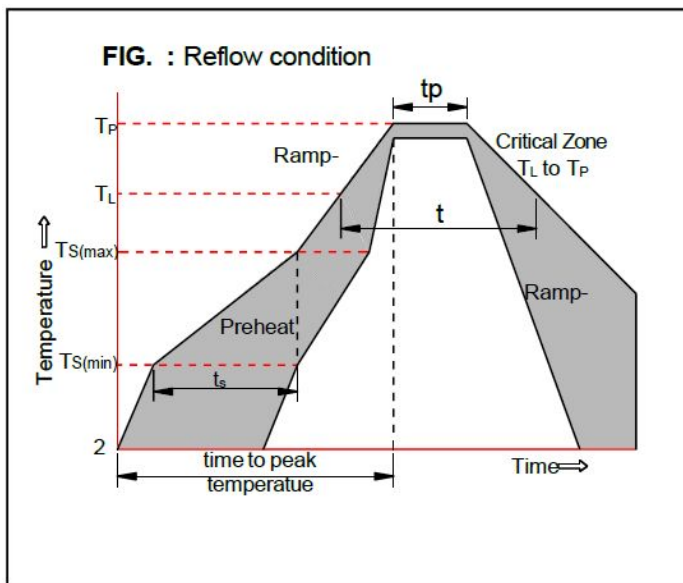


8 X 20 μs Pulse Waveform



- Soldering Parameters**

Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min (Ts(min))	+150°C
	-Temperature Max(Ts(max))	+200°C
	-Time (Min to Max) (ts)	60-190 secs.
Average ramp up rate (Liquid us Temp (TL) to peak)		5°C/sec. Max
Ts(max) to TL - Ramp-up Rate		5°C/sec. Max
Reflow	-Temperature(TL)(Liquid us)	+217°C
	-Temperature(TL)	60-150 secs.
Peak Temp (Tp)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (tp)		40 secs. Max
Ramp-down Rate		5°C/sec. Max
Time 25°C to Peak Temp (TP)		8 min. Max
Do not exceed		+280°C





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● Package Information

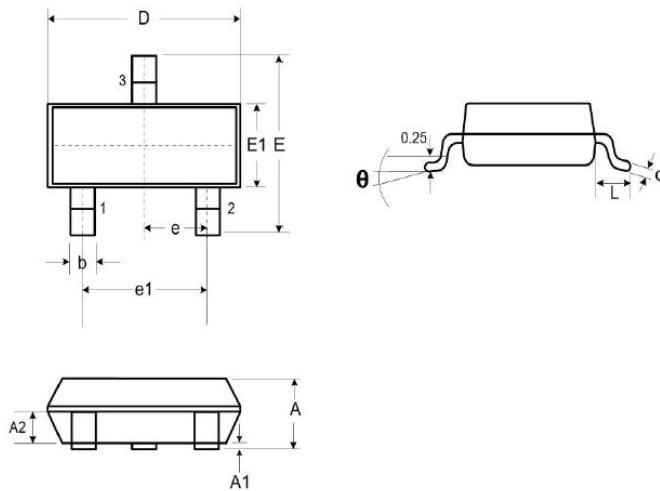
Ordering Information

Device	Package	Qty per Reel	Reel Size
SSCEXXX12S6	SOT-23	3000	7 Inch

Mechanical Data

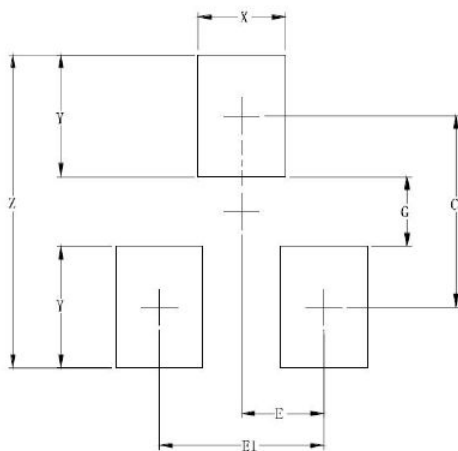
Case: SOT-23

Case Material: Molded Plastic. UL Flammability



SYM	DIMENSIONS					
	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	.035	-	.044	0.89	-	1.12
A1	.000	-	.004	0.01	-	0.10
A2	.035	.037	.040	0.88	0.95	1.02
b	0.012	-	.020	0.30	-	0.51
c	0.03	-	.007	0.08	-	0.18
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			1.90		
e1	.037			0.95		
L	.015	.020	.024	0.40	0.50	0.60
L1	.022			0.55		
N	3			3		
θ	0°	-	8°	0°	-	8°

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	.087	2.20
E	.037	0.95
E1	.075	1.90
G	.031	0.80
X1	.039	1.00
Y	.055	1.40
Z	.141	3.60



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