



SSCE1V512L1

Ultra-low Capacitance Bidirectional Micro Packaged TVS Diodes for ESD Protection

● Description

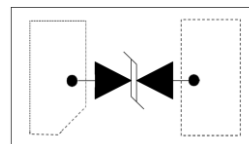
The SSCE1V512L1 is a bi-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines.

The SSCE1V512L1 has an ultra-low capacitance with a typical value at 0.25pF, and complies with the IEC 61000-4-2 (ESD) standard with $\pm 20\text{kV}$ air and $\pm 15\text{kV}$ contact discharge. It is assembled into an ultra-small 0.6x0.3x0.3mm lead-free DFN package. The small size, ultra-low capacitance and high ESD surge protection make SSCE1V512L1 an ideal choice to protect cell phone, digital video interfaces, HDMI, DVI, USB2.0, USB3.0, and other high-speed ports.

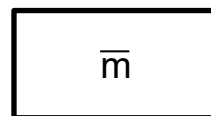
● Feature

- ✧ 20W peak pulse power ($t_P = 8/20\mu\text{s}$)
- ✧ DFN0603-2L Package
- ✧ Working voltage: 1.5V
- ✧ Low clamping voltage
- ✧ Low capacitance: 0.25 typical
- ✧ Low leakage current
- ✧ RoHS compliant
- ✧ Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
 - Air discharge: $\pm 20\text{kV}$
 - Contact discharge: $\pm 15\text{kV}$
 - IEC61000-4-4 (EFT)40A (5/50ns)
 - IEC61000-4-5 (Lightning)4A (8/20 μs)

● PIN configuration



Top View



Marking

● Applications

- ✧ DVI Port Protection
- ✧ HDM1.4 and HDMI 2.0
- ✧ USB 2.0 and USB 3.0
- ✧ SATA and eSATA
- ✧ IEEE 1398
- ✧ PCI Express

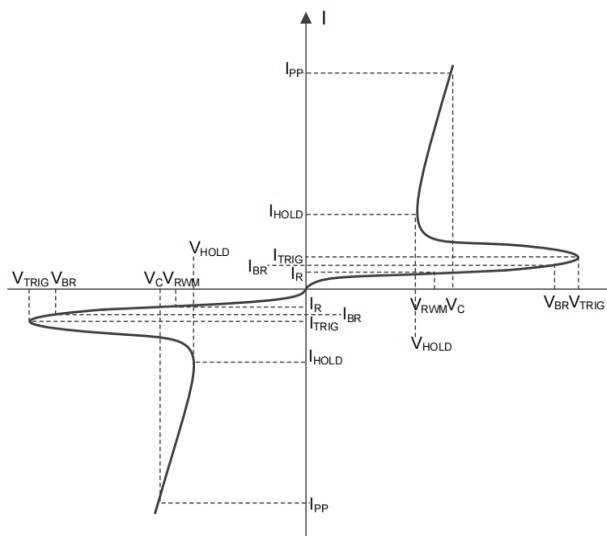
● Mechanical data

- ✧ UL Flammability Classification Rating 94V-0
- ✧ RoHS/WEEE Compliant
- ✧ Packaging: Tape and Reel



● 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
V_{TRIG}	Reverse trigger voltage
I_{TRIG}	Reverse trigger current
V_{HOLD}	Reverse holding voltage
I_{HOLD}	Reverse holding current



● Absolute maximum rating ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

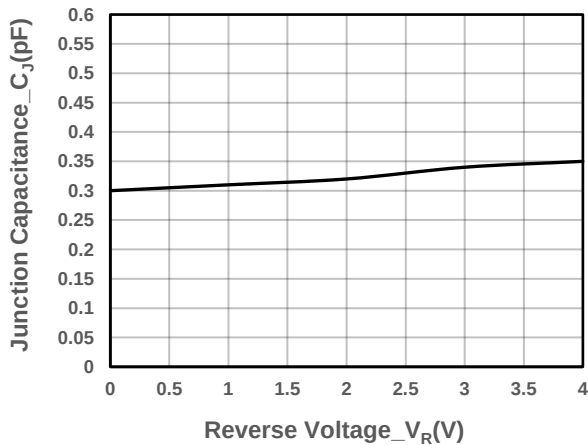
Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 μs)	P_{PP}	20	W
Peak Pulse Current (8/20 μs)	I_{PP}	4	A
ESD Rating per IEC61000-4-2:	V_{ESD}	12	kV
Contact Air		15	
Storage Temperature	T_{STG}	-55/+150	$^{\circ}\text{C}$
Operating Temperature	T_J	-55/+125	$^{\circ}\text{C}$

● Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

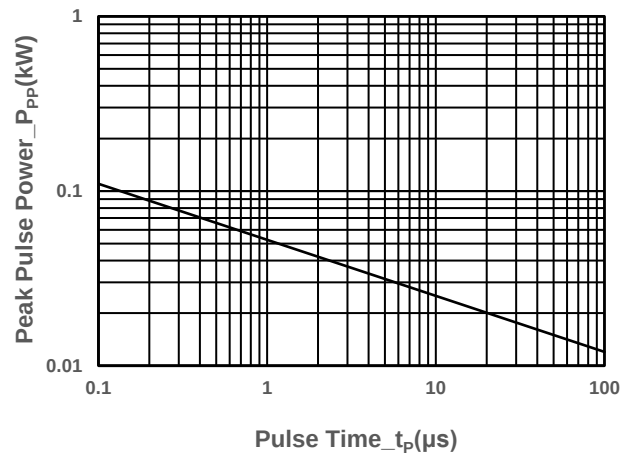
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Peak Reverse Working Voltage	V_{RWM}				1.5	V
Breakdown Voltage	V_{BR}	$I_T = 1\text{mA}$	4.0			V
Reverse Leakage Current	I_R	$V_{RWM} = 1.5\text{V}$			0.1	μA
Clamping Voltage	V_C	$I_{PP} = 1\text{A}$, $t_P = 8/20\mu\text{s}$		1.75		V
Clamping Voltage	V_C	$I_{PP} = 4\text{A}$, $t_P = 8/20\mu\text{s}$		3.0		V
Junction Capacitance	C_J	$V_R = 0\text{V}$, $f = 1\text{MHz}$		0.25		pF



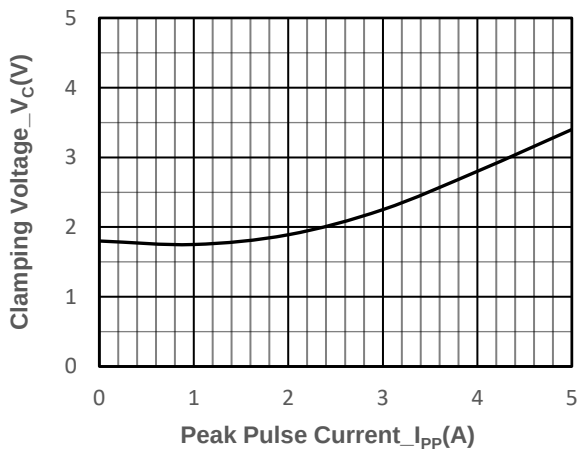
- Typical Performance Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)



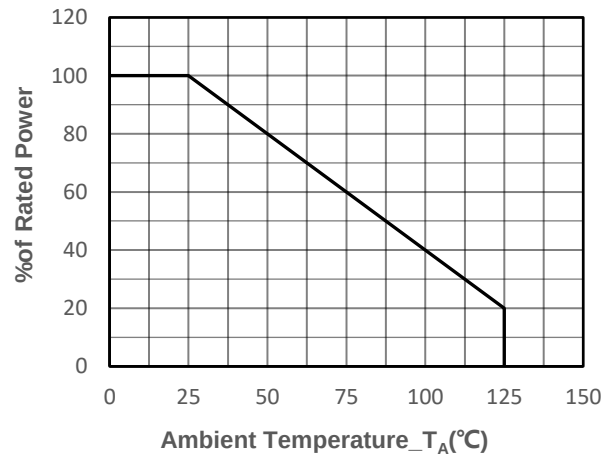
Junction Capacitance vs. Reverse Voltage



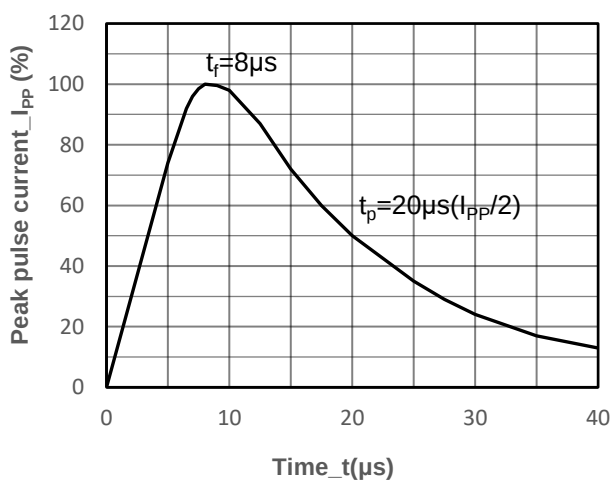
Peak Pulse Power vs. Pulse Time



Clamping Voltage vs. Peak Pulse Current



Power derating vs. Ambient temperature



8/20 μs Pulse Waveform



● Package Information

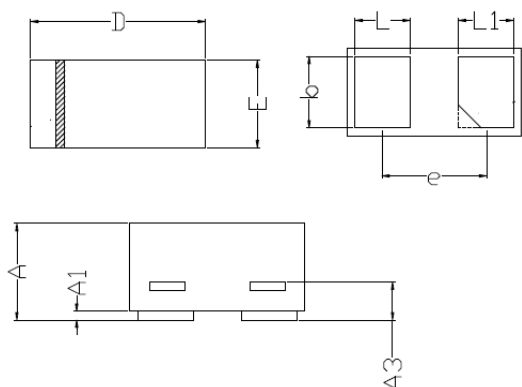
Ordering Information

Device	Package	Qty per Reel	Reel Size
SSCE1V512L1	DFN0603-2L	15000	7 Inch

Mechanical Data

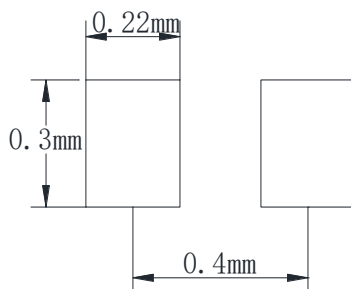
Case: DFN0603-2L

Case Material: Molded Plastic. UL Flammability



DIM	Millimeters	
	Min	Max
A	0.230	0.330
A1	0.000	0.050
A3	0.102REF	
D	0.550	0.650
E	0.250	0.350
b	0.215	0.275
L	0.12	0.23
L1	0.12	0.23
e	0.40BSC	

Recommended Pad outline





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