



SSCE5V0C2L1

1-Line Bi-directional low Capacitance TVS Diode

● Description

The SSCE5V0C2L1 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 SSCE5V0C2L1 has an ultra-low capacitance with a typical value at 0.15 pF, and complies with the IEC 61000-4-2 (ESD) with $\pm 20\text{kV}$ air and $\pm 15\text{kV}$ contact discharge. It is assembled into an ultra-small 0.6x0.3x0.28mm lead-free DFN package.

Also because of its low capacitance, it is suited for use in high frequency designs such as USB 2.0 high speed, USB 3.0 super speed, VGA, DVI, HDMI, SDI and other high speed line applications.

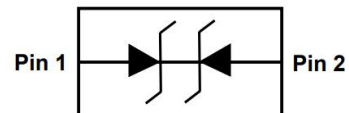
● Features

- ✧ 40W peak pulse power ($t_p = 8/20\mu\text{s}$)
- ✧ DFN0603-2L Package
- ✧ Working voltage: 5V
- ✧ Low Leakage Current
- ✧ Low capacitance
- ✧ Low clamping voltage
- ✧ Response Time is Typically $< 1\text{ns}$
- ✧ Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
 - Air discharge: $\pm 20\text{kV}$
 - Contact discharge: $\pm 15\text{kV}$
 - IEC 61000-4-5 (Lightning) 2.5A (8/20 μs)

● Mechanical Characteristics

- ✧ Package: DFN0603-2L (0.6x0.3x0.28mm)
- ✧ Lead finish: 100% matte Sn (Tin)
- ✧ Device meets MSL 3 requirements
- ✧ Case Material: "Green" Molding Compound.
- ✧ RoHS Compliant

● PIN configuration



Circuit Diagram



Marking (Top View)

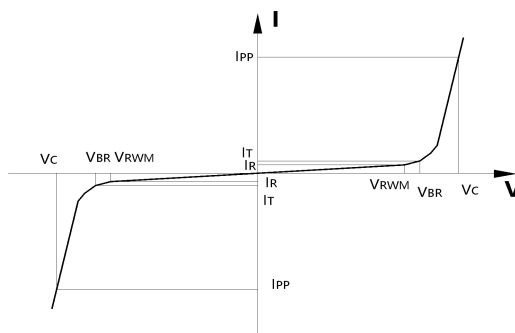
● Applications

- ✧ DVI & HDMI Port Protection
- ✧ USB 2.0 and USB 3.0
- ✧ SATA and eSATA
- ✧ Serial and Parallel Ports
- ✧ Projection TV
- ✧ Notebooks, Desktops, Servers
- ✧ Digital cameras



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

Parameter	Symbol	Value	Units
Peak Pulse Power (8/20 μs)	P_{PP}	45	W
Peak Pulse Current (8/20 μs)	I_{PP}	2.5	A
ESD Rating per IEC61000-4-2: Contact Air	V_{ESD}	± 15 ± 20	kV
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)

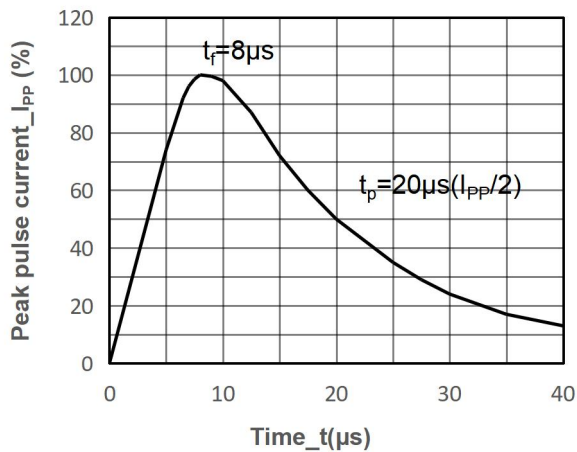
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Peak Reverse Working Voltage	V_{RWM}				5	V
Breakdown Voltage	V_{BR}	$I_T = 1\text{mA}$	6		9	V
Reverse Leakage Current	I_R	$V_{RWM} = 5\text{V}$			0.1	μA
Clamping Voltage	V_C	$I_{PP} = 2.5\text{A}$, $t_P = 8/20\mu\text{s}$		13	18	V
ESD Clamping Voltage(Note1)	V_{CL-ESD}	IEC 61000-4-2+ 8kV($I_{TLP}=16\text{A}$), contact mode, $T=25^{\circ}\text{C}$, pin1 to pin2, pin2 to pin1		15		V
Dynamic resistance	R_{DYN}			0.26		Ω
Junction Capacitance	C_J	$V_R = 0\text{V}$, $f = 1\text{MHz}$		0.15	0.3	pF

Note 1: ESD Clamping Voltage was measured by Transmission Line Pulsing (TLP) System.

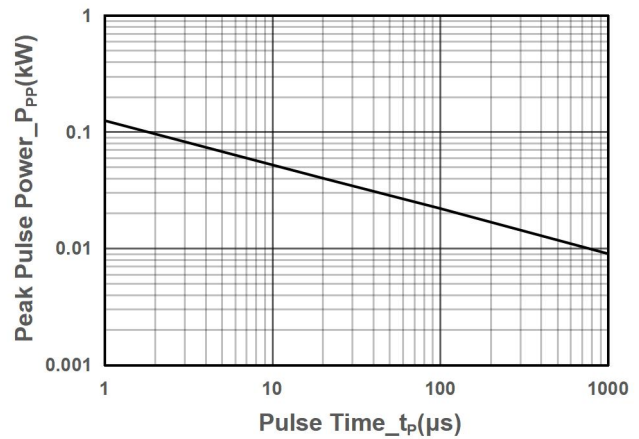
TLP conditions: $Z_0=50\Omega$, $t_p=100\text{ns}$, $t_r=1\text{ns}$.



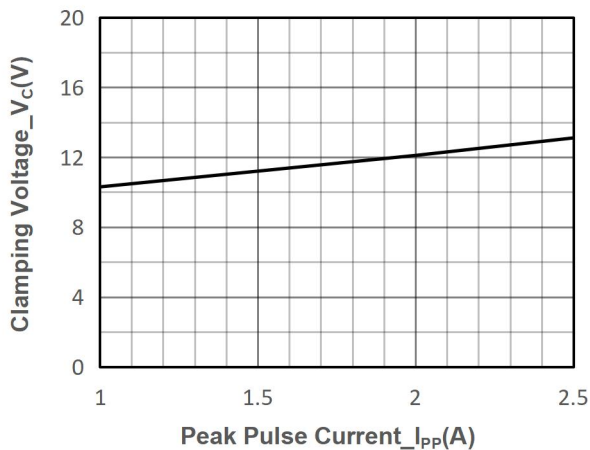
● **Typical Performance Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)**



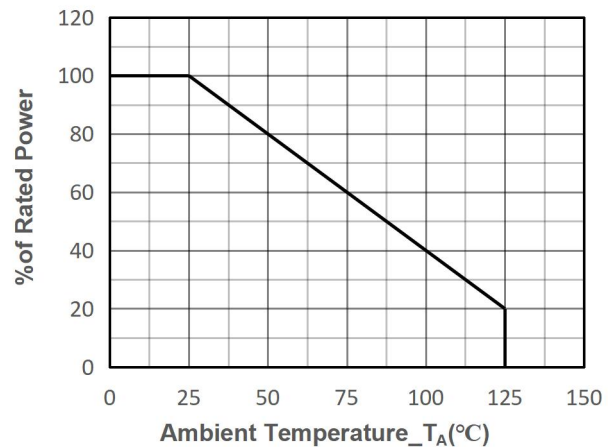
8/20 μs Pulse Waveform



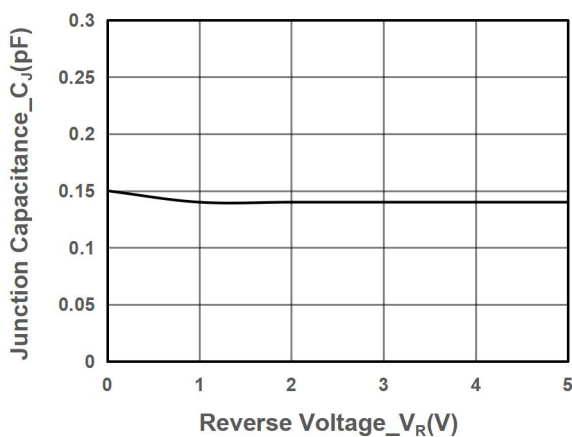
Peak Pulse Power vs. Pulse Time



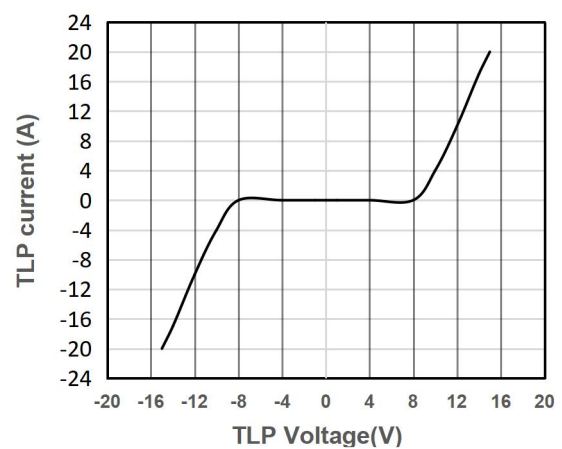
Clamping Voltage vs. Peak Pulse Current



Power derating vs. Ambient temperature



Junction Capacitance vs. Reverse Voltage



TLP Measurement



MS08104 Wed October 18 14:39:04 2023

RIGOL STOP H 20.0ns 100kOhm/2kpts MEASURE STOP/ABORT D 59.912ns T 20.4V N

光标 X

- AX: 30ns
- AY: 13.5V
- BX: 60ns
- BY: 12.66V
- ΔX: 30ns
- ΔY: -433.3mV
- 1/ΔX: 33.33MHz

最大值1 平均值1 最小值1 标准差1

50.154V 8.8779V -1.2232V 5.5189V

1 10.0V -20.8V 2 100mV 0.00V 3 100mV 0.00V 4 100mV 0.00V

1 0.123 4.567 8.91011 12.34567

14:34

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● Package Information

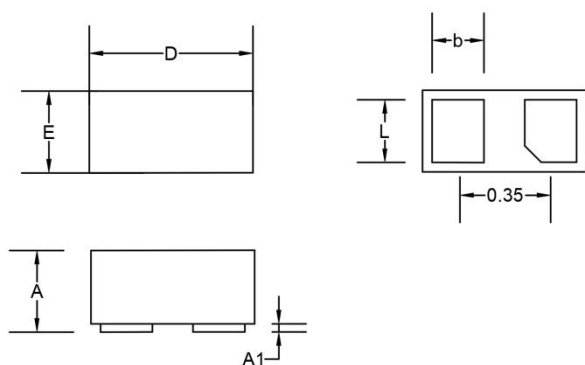
Ordering Information

Device	Package	Qty per Reel	Reel Size
SSCE5V0C2L1	DFN0603-2L	15000	7 Inch

Mechanical Data

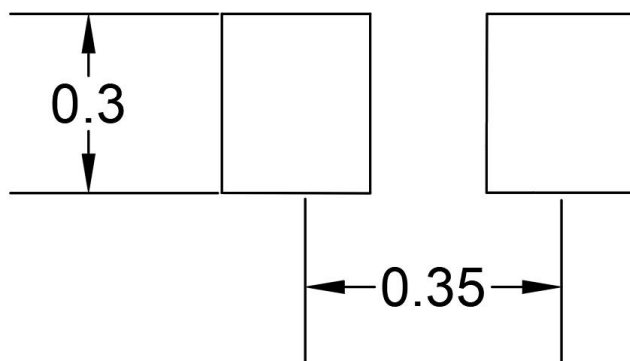
Case: DFN0603-2L

Case Material: Molded Plastic. UL Flammability



DIM	Millimeters		
	Min	Nom	Max
A	0.23	0.30	0.35
A1	0.00	0.03	0.05
b	0.115	0.19	0.25
D	0.55	0.60	0.67
E	0.250	0.30	0.37
L	0.18	0.23	0.30
e	0.35Ref		

Recommended Pad outline (Unit: mm)





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