



SSCE3V381N7

Ultra Low Capacitance Array for ESD Protection

● Description

The SSCE3V381N7 is a transient voltage suppressor array designed to protect high speed data lines such as HDMI 1.4/2.0, USB 3.0/3.1, LVDS, and V-by-one from damaging ESD events. This device incorporates a number of surge rated, low capacitance steering diodes and a TVS in a single package. During transient conditions, the steering diodes direct the transient to either the positive side of the power supply line or to ground.

The SSCE3V381N7 provides a typical line-to-line capacitance of 0.15 pF and low insertion loss providing greater signal integrity making it ideally suited for HDMI 1.4/2.0 or USB 3.0/3.1 applications, such as Digital TVs, DVD players, computing, set-top boxes and MDDI applications in mobile computing devices.

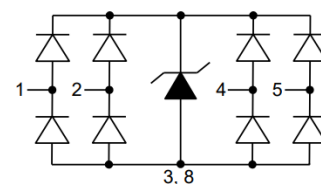
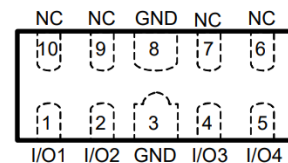
● Feature

- ✧ Low capacitance: 0.15pF typical (I/O to I/O)
- ✧ DFN2510-10L Package
- ✧ Working voltage: 3.3V
- ✧ Low clamping voltage
- ✧ Low capacitance
- ✧ Complies with following standards:
 - IEC61000-4-2(ESD) $\pm 15\text{kV}$ (contact),
 $\pm 20\text{kV}$ (air)
 - IEC61000-4-4 (EFT) 40A (5/50ns)

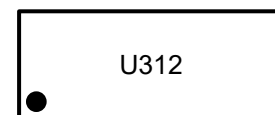
● Mechanical data

- ✧ Lead finish: 100% matte Sn (Tin)
- ✧ Mounting position: Any
- ✧ Qualified max reflow temperature: 260°C
- ✧ Device meets MSL 3 requirements
- ✧ Pure tin plating: 7 ~ 17 μm
- ✧ Pin flatness: $\leq 3\text{mil}$

● PIN configuration



Top View



Marking

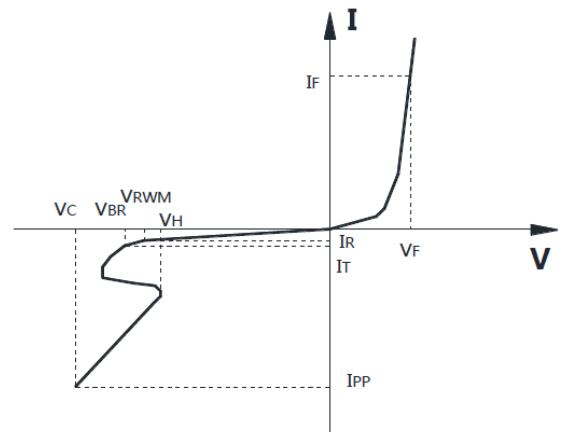
● Applications

- ✧ DVI & HDMI Port Protection
- ✧ Serial and Parallel Ports
- ✧ Projection TV
- ✧ Notebooks, Desktops, Server
- ✧ USB 1.1/2.0/3.0/4.0/OTG
- ✧ HDMI 1.3, HDMI 1.4 and HDMI 2.0



● 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 @ $T_A=25^{\circ}\text{C}$

Parameter	Symbol	Value	Units
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	$^{\circ}\text{C}$

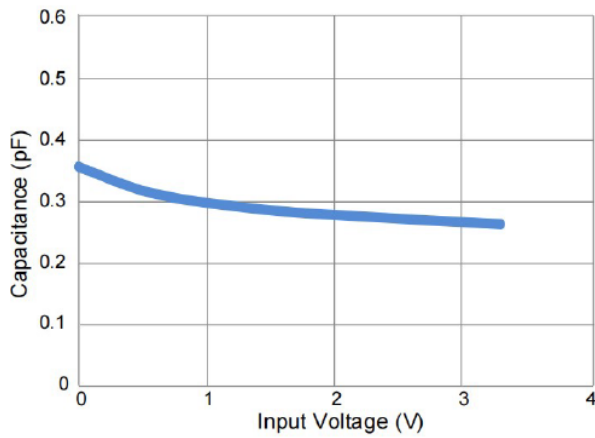
● Electrical Characteristics @ $T_A=25^{\circ}\text{C}$

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Peak Reverse Working Voltage	V_{RWM}	Any I/O to Ground			3.3	V
Breakdown Voltage	V_{BR}	$I_T = 1\text{mA}$, Any I/O to Ground	5	7.5		V
Reverse Leakage Current	I_R	$V_{RWM} = 3.3\text{V}$		1	50	nA
Clamping Voltage (100ns Transmission Line Pulse, I/O Pin to GND)	V_{CL}	$I_{TLP} = 1\text{A}$		1.3	2	V
		$I_{TLP} = -1\text{A}$		-1.3	-2	
		$I_{TLP} = 16\text{A}$		5.5	7	
		$I_{TLP} = -16\text{A}$		-5	-6	
Dynamic resistance	R_{DYN}	$I_{TLP} = 8\text{A to } 16\text{A}$		0.3		Ω
Junction Capacitance	C_J	$V_R = 1.65\text{V}$, $f = 1\text{MHz}$, between I/O pins		0.15		pF
		$V_R = 1.65\text{V}$, $f = 1\text{MHz}$, any I/O pin to Ground		0.25	0.34	pF

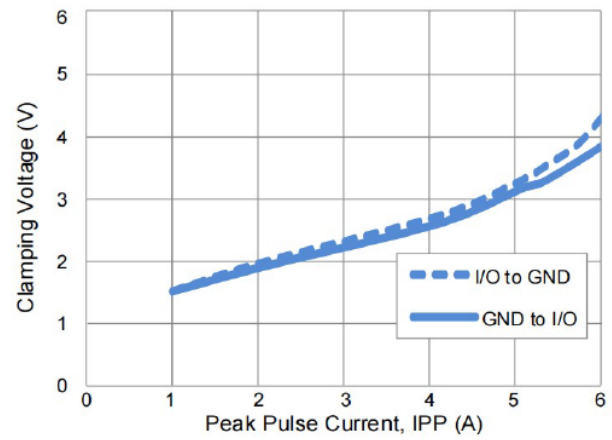


● Typical Performance Characteristics

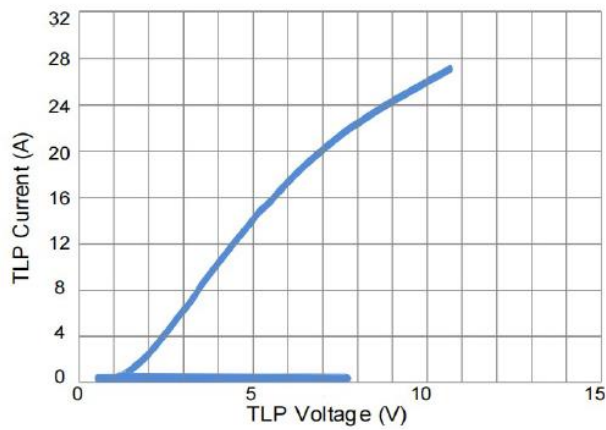
Typical Variations of CJ vs. Input Voltage



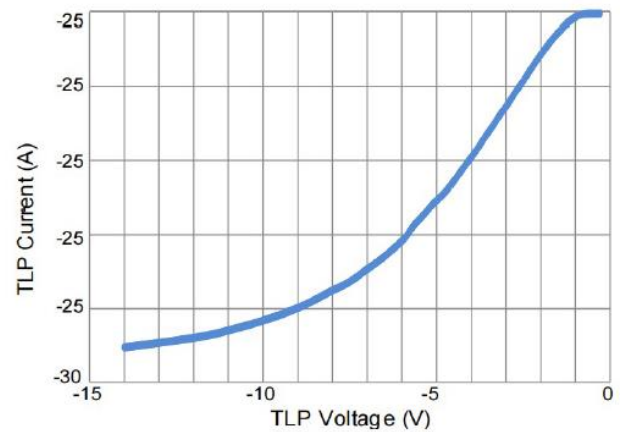
IEC61000-4-5 Surge 8/20μs



Positive Transmission Line Pulse
(TP=100ns, TR= 0.2ns)



Negative Transmission Line Pulse
(TP=100ns, TR= 0.2ns)





● Package Information

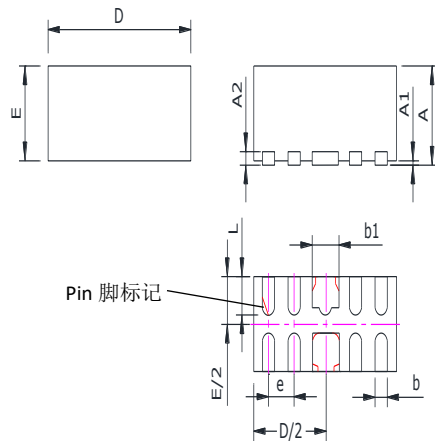
Ordering Information

Device	Package	Qty per Reel	Reel Size
SSCE3V381N7	DFN2510-10L	3000	7 Inch

Mechanical Data

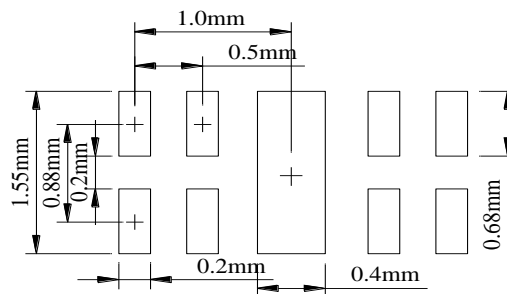
Case: DFN2510-10L

Case Material: Molded Plastic. UL Flammability



DIM	Millimeters	
	Min	Max
A	0.45	0.65
A1	0.05REF	
A2	0.15REF	
b	0.15	0.25
b1	0.30	0.50
D	2.424	2.576
E	0.924	1.076
e	0.50REF	
L	0.30	0.45

Recommended Pad outline





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