



# SSCE3V381N7

## SSCE3V381N7

Ultra Low Capacitance Array for ESD Protection

### ● Description

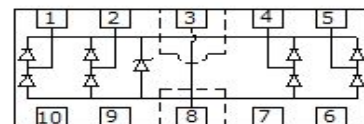
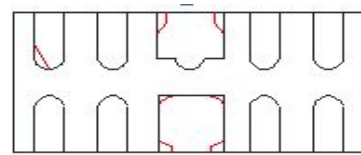
The SSCE3V381N7 is a transient voltage suppressor array designed to protect high speed data lines such as HDMI 1.4/2.0, USB 3.0/3.1, LVDS, and V-by-one from damaging ESD events. This device incorporates a numbers of surge rated, low capacitance steering diodes and a TVS in a single package. During transient 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

- ◇ Ultra low capacitance: 0.15pF typical (I/O to I/O)
- ◇ DFN2510 Package
- ◇ Working voltage: 3.3V
- ◇ Low clamping voltage
- ◇ Low capacitance
- ◇ Complies with following standards:
  - IEC61000-4-2(ESD) ±15KV(contact), ±20KV(air)
  - IEC61000-4-4 (EFT) 40A (5/50ns)

### ● PIN configuration



Top view

### ● Applications

- ◇ DVI & HDMI Port Protection
- ◇ Serial and Parallel Ports
- ◇ Projection TV
- ◇ Notebooks, Desktops, Server
- ◇ USB 1.1/2.0/3.0/3.1/OTG

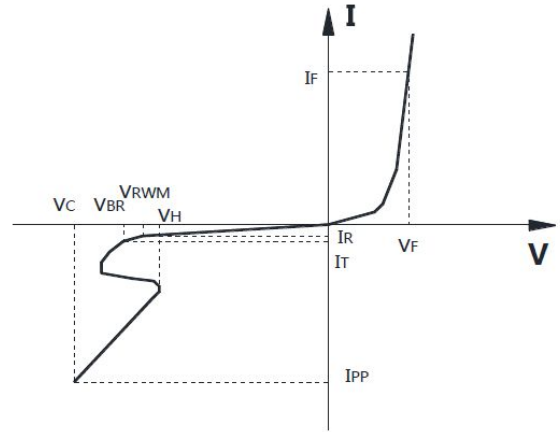
### ● Mechanical data

- ◇ 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
- ◇ Pin flatness: ≤3mil



## ● 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 @ $I_{PP}$ 100ns<br>Transmission Line Pulse(TLP) |
| $P_{PP}$  | Peak Pulse Power  |
| $C_J$     | Junction Capacitance  |



## ● Absolute maximum rating @TA=25°C

| Symbol                       | Parameter             | Value    | Units |
|------------------------------|-----------------------|----------|-------|
| ESD Rating per IEC61000-4-2: | Contact               | 15       | KV    |
|                              | Air                   | 20       |       |
| $T_{STG}$                    | Storage Temperature   | -55/+150 | °C    |
| $T_J$                        | Operating Temperature | -55/+125 | °C    |

## ● Electrical Characteristics @TA=25°C

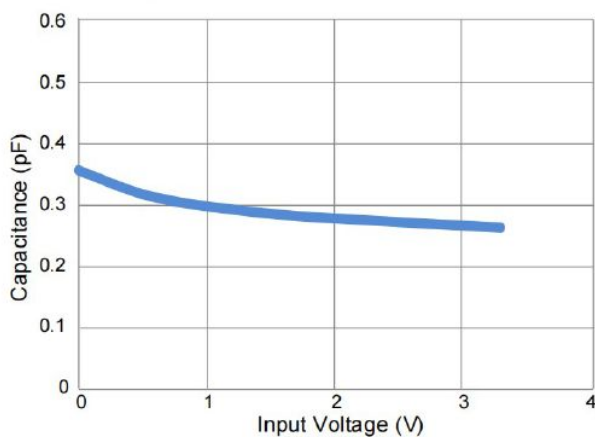
| Parameter  | Symbol    | Conditions  | Min. | Typ. | Max. | Units    |
|--|-----------|---|------|------|------|----------|
| Peak Reverse Working Voltage   | $V_{RWM}$ | Any I/O to Ground                                 |      |      | 3.3  | V        |
| Breakdown Voltage  | $V_{BR}$  | $I_T = 1mA$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



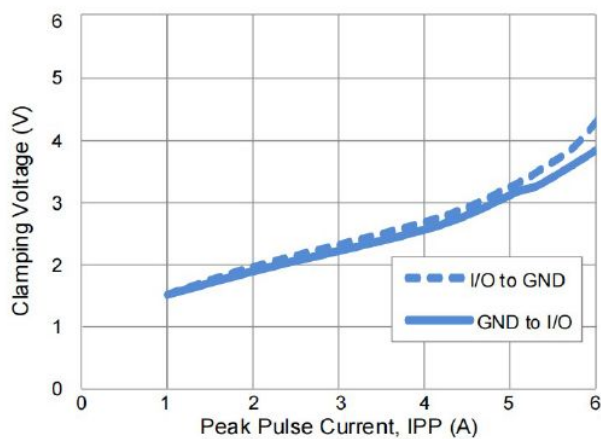
# SSCE3V381N7

- **Typical Performance Characteristics**

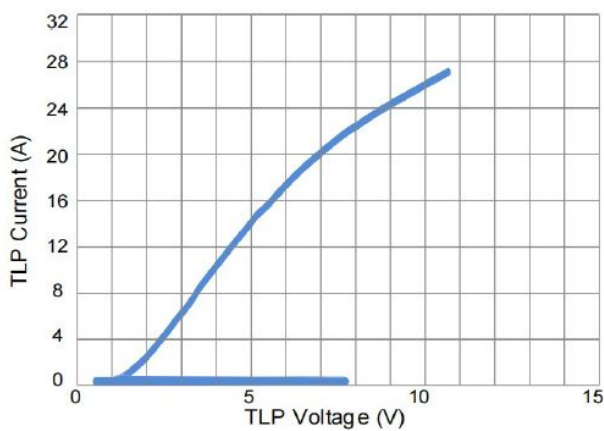
**Typical Variations of CJ vs. Input Voltage**



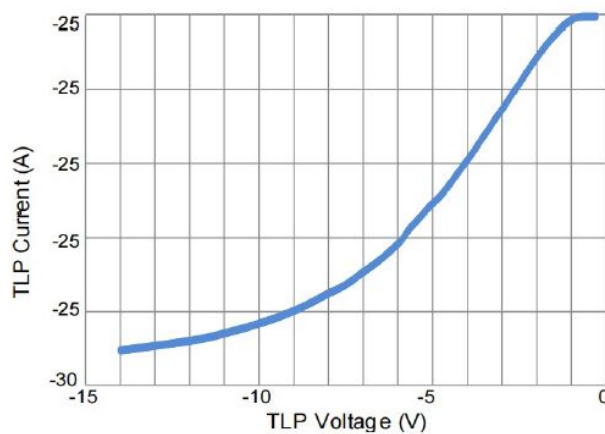
**IEC61000-4-5 Surge 8/20µs**



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



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





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- **Package Information**

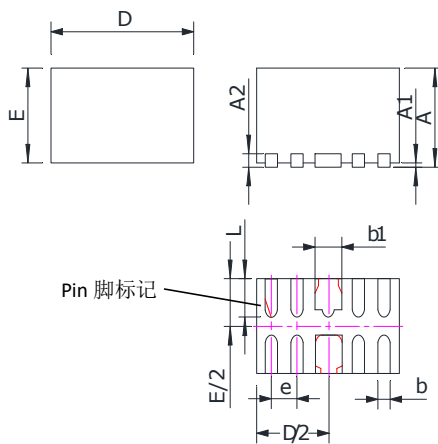
### Ordering Information

| Device      | Package | Marking | Qty per Ree | Reel Size |
|-------------|---------|---------|-------------|-----------|
| SSCE3V381N7 | DFN2510 | U312    | 3000        | 7 Inch    |

### Mechanical Data

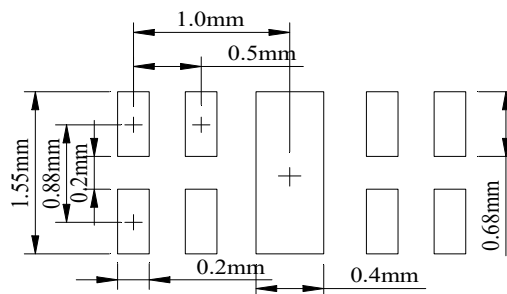
Case:DFN2510

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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