



## SSCE5V081N7

4-line Ultra Low Capacitance Array for ESD Protection

### ● Description

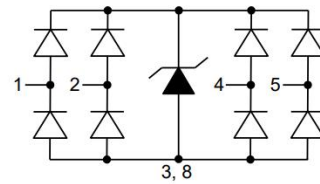
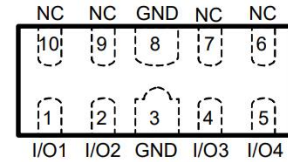
The SSCE5V081N7 is an ultra low capacitance TVS array, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines.

The SSCE5V081N7 has an ultra-low capacitance with a typical value at 0.7pF, and complies with the IEC 61000-4-2 (ESD) with  $\pm 15\text{kV}$  air and  $\pm 15\text{kV}$  contact discharge. It is assembled into a 10-pin 2.5x1.0x0.5mm lead-free DFN package. The flow through style package allows for easy PCB layout and matched trace lengths necessary to maintain consistent impedance between high speed differential lines such as USB 3.0 and HDMI. The small size, ultra-low capacitance and high ESD surge protection make SSCE5V081N7 an ideal choice to protect HDMI, MDDI, USB 3.0 and other high speed ports.

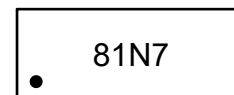
### ● Feature

- ✧ 56W peak pulse power ( $t_P = 8/20\mu\text{s}$ )
- ✧ DFN2510-10L Package
- ✧ Working voltage: 5V
- ✧ Low clamping voltage
- ✧ Low capacitance
- ✧ Low leakage current
- ✧ RoHS compliant
- ✧ Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
  - Air discharge:  $\pm 15\text{kV}$
  - Contact discharge:  $\pm 15\text{kV}$
  - IEC61000-4-5 (Surge) 8A (8/20 $\mu\text{s}$ )

### ● PIN configuration



**Top view(Pin configuration)**



**Marking**

### ● Applications

- ✧ USB 2.0 and USB 3.1
- ✧ SATA and eSATA
- ✧ DVI
- ✧ Portable Electronics and Notebooks
- ✧ HDMI 1.3, HDMI 1.4

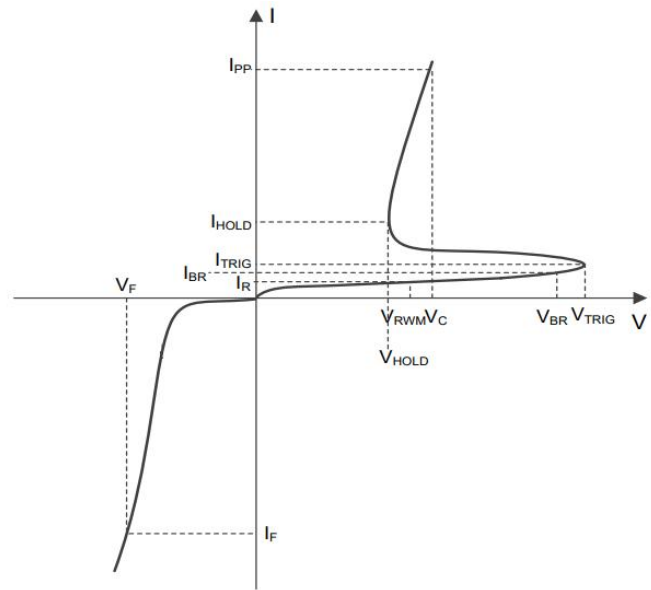
### ● Mechanical data

- ✧ 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  $\mu\text{m}$
- ✧ Pin flatness:  $\leq 3\text{mil}$



- 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                    |
| $V_{TRIG}$ | Reverse Trigger Voltage             |
| $V_{TRIG}$ | Reverse Trigger Current             |
| $V_{HOLD}$ | Reverse Holding Voltage             |
| $I_{HOLD}$ | Reverse Holding Current             |
| $C_J$      | Junction Capacitance                |



- Absolute maximum rating @ $T_A=25^{\circ}\text{C}$**

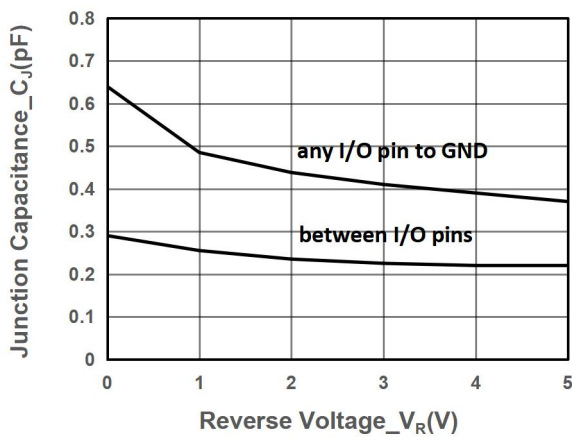
| Parameter                                    | Symbol    | Value    | Units              |
|----------------------------------------------|-----------|----------|--------------------|
| Peak Pulse Power ( $t_p=8/20\mu\text{s}$ )   | $P_{PP}$  | 56       | W                  |
| Peak Pulse Current ( $t_p=8/20\mu\text{s}$ ) | $I_{PP}$  | 8        | A                  |
| ESD Rating per IEC61000-4-2:                 | $V_{ESD}$ | 15       | kV                 |
| Contact                                      |           | 15       |                    |
| Air                                          |           |          |                    |
| Storage Temperature                          | $T_{STG}$ | -55/+150 | $^{\circ}\text{C}$ |
| Operating Temperature                        | $T_J$     | -55/+125 | $^{\circ}\text{C}$ |

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

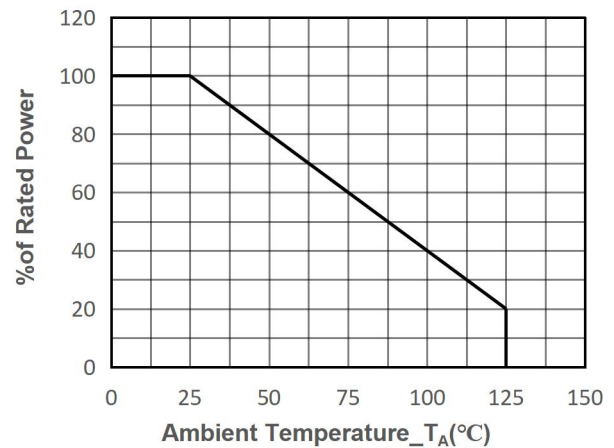
| Parameter                    | Symbol    | Conditions                                                    | Min. | Typ. | Max. | Units         |
|------------------------------|-----------|---------------------------------------------------------------|------|------|------|---------------|
| Peak Reverse Working Voltage | $V_{RWM}$ | Any I/O to GND                                                |      |      | 5    | V             |
| Breakdown Voltage            | $V_{BR}$  | $I_T = 1\text{mA}$<br>Any I/O to GND                          | 6    | 7.5  | 9    | V             |
| Reverse Leakage Current      | $I_R$     | $V_{RWM} = 5\text{V}$                                         |      |      | 0.1  | $\mu\text{A}$ |
| Forward Voltage              | $V_F$     | $I_F = 15\text{mA}$                                           |      | 0.85 | 1.2  | V             |
| Clamping Voltage             | $V_C$     | $I_{PP} = 4\text{A}$ , $t_p = 8/20\mu\text{s}$                |      | 3    |      | V             |
| Clamping Voltage             | $V_C$     | $I_{PP} = 8\text{A}$ , $t_p = 8/20\mu\text{s}$                |      | 4    | 7    | V             |
| Junction Capacitance         | $C_J$     | $V_R = 0\text{V}$ , $f = 1\text{MHz}$ ,<br>between I/O pins   |      | 0.3  | 0.5  | pF            |
|                              |           | $V_R = 0\text{V}$ , $f = 1\text{MHz}$ ,<br>any I/O pin to GND |      | 0.7  | 0.9  | pF            |
|                              |           | $V_R = 2\text{V}$ , $f = 1\text{MHz}$ ,<br>any I/O pin to GND |      | 0.45 | 0.6  | pF            |



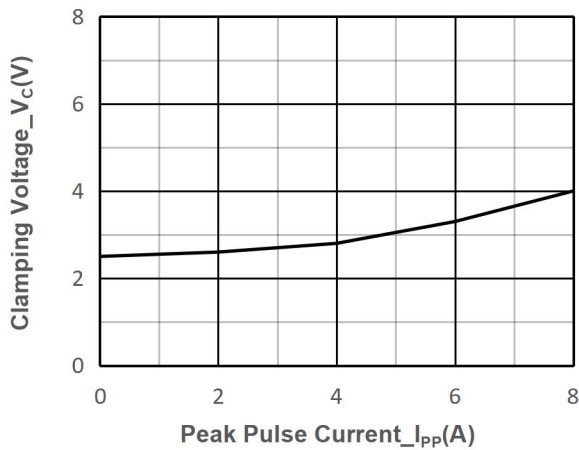
## ● Typical Performance Characteristics



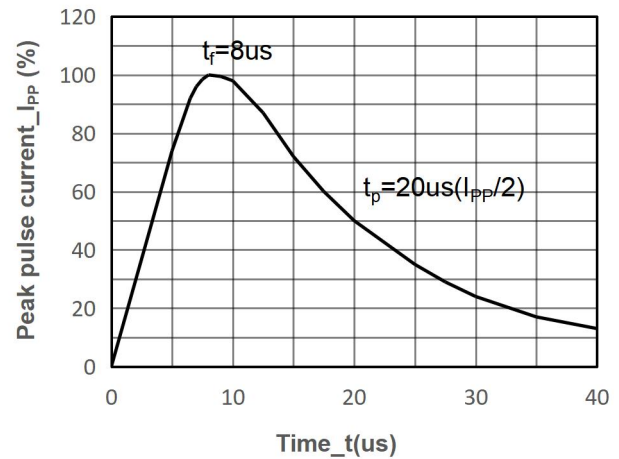
Junction Capacitance vs. Reverse Voltage



Power derating vs. Ambient temperature



Clamping Voltage vs. Peak Pulse Current



8/20us Pulse Waveform



## ● Package Information

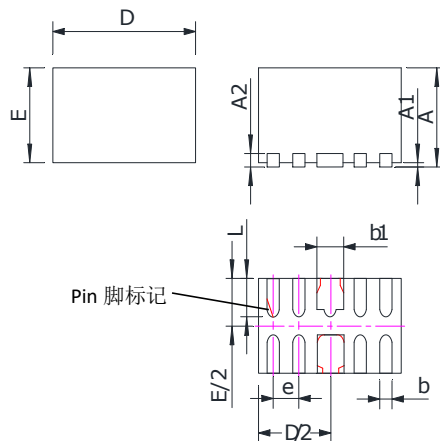
### Ordering Information

| Device      | Package     | Qty per Reel | Reel Size |
|-------------|-------------|--------------|-----------|
| SSCE5V081N7 | DFN2510-10L | 3000         | 7 Inch    |

### Mechanical Data

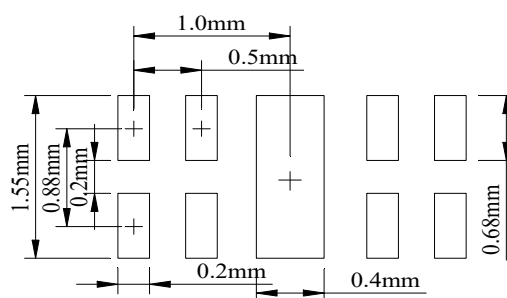
Case:DFN2510-10L

Case Material: Molded Plastic. UL Flammability



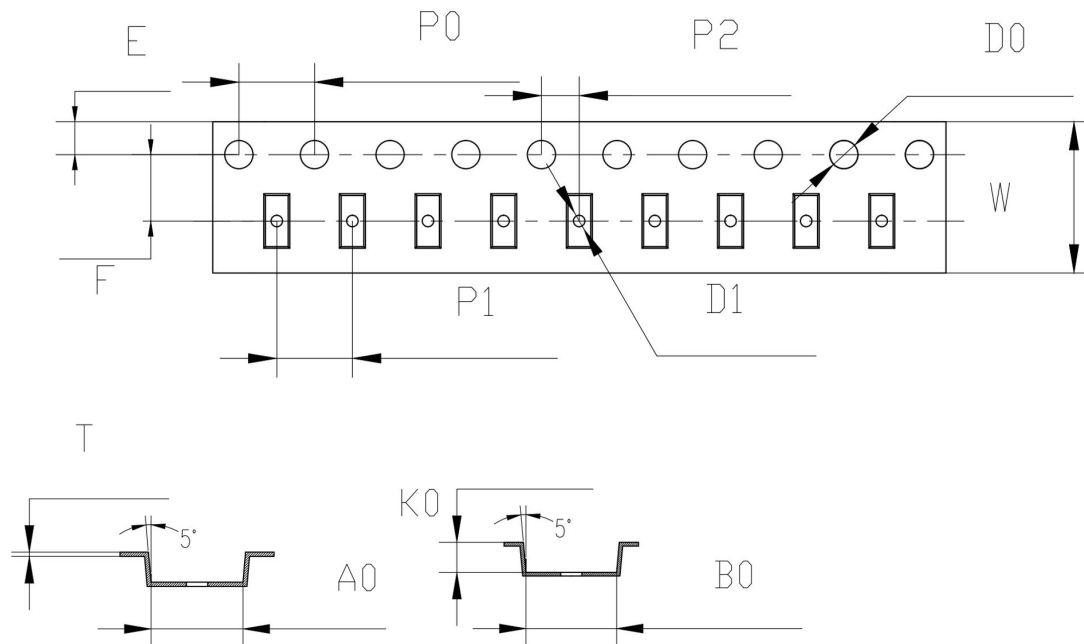
| DIM | Millimeters |       |
|-----|-------------|-------|
|     | Min         | Max   |
| A   | 0.45        | 0.65  |
| A1  | 0.05REF     |       |
| A2  | 0.15REF     |       |
| b   | 0.15        | 0.25  |
| b1  | 0.30        | 0.50  |
| D   | 2.424       | 2.576 |
| E   | 0.924       | 1.076 |
|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

### Recommended Pad outline



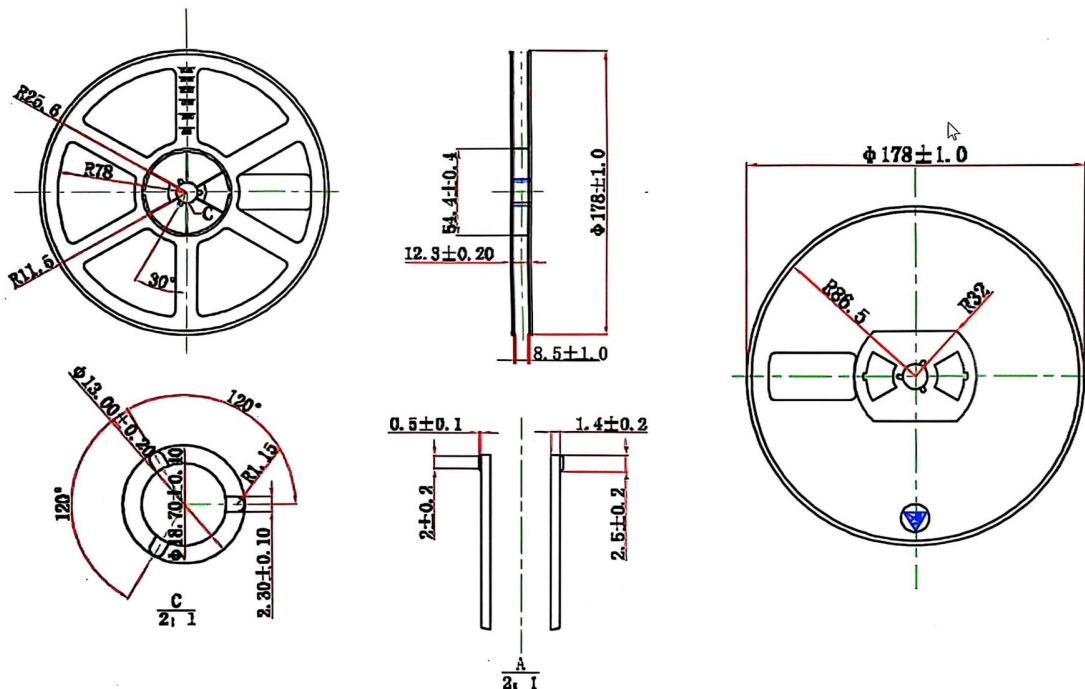


## ● Type and Reel Information-DFN2510-10L



(Unit: mm)

| A0        | B0        | D0         | D1         | E        | F        | K0        | P0        |
|-----------|-----------|------------|------------|----------|----------|-----------|-----------|
| 1.20±0.05 | 2.70±0.05 | Φ1.55±0.05 | Φ0.60±0.10 | 1.75±0.1 | 3.5±0.05 | 0.70±0.05 | 4.00±0.10 |
| P1        | P2        | T          | W          |          |          |           |           |
| 4.00±0.10 | 2.00±0.05 | 0.25±0.05  | 8.00±0.05  |          |          |           |           |





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