



SSCE5V082P1

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

● Description

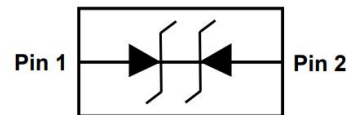
The SSCE5V082P1 is designed with SSC Punch-Through process TVS technology to protect voltage sensitive components from ESD. Excellent clamping capability, low leakage, and fast response time provide best in class protection on designs that are exposed to ESD. Because of its small size, it is suited for use in cellular phones, MP3 players, digital cameras and many other portable applications where board space comes at a premium. 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.

It has been specifically designed to protect sensitive components which are connected to data and transmission lines from overvoltage caused by ESD (electrostatic discharge), and EFT (electrical fast transients).

● Feature

- ✧ 50W peak pulse power ($t_P = 8/20\mu s$)
- ✧ CSP0603-2L Package
- ✧ Working voltage: 5V
- ✧ Low clamping voltage
- ✧ Low capacitance($<0.3pF$) for high-speed interfaces
- ✧ No insertion loss to 10.0GHz
- ✧ RoHS compliant
- ✧ Complies with following standards:
 - IEC61000-4-2(ESD) $\pm 20kV$ (contact), $\pm 20kV$ (air)
 - IEC61000-4-4 (EFT) 40A (5/50ns)
 - IEC61000-4-5 (Lightning) 9A (8/20us)

● PIN configuration



CSP0603-2L



Marking

● Applications

- ✧ High Speed Line: USB1.0/2.0/3.0/4.0, VGA, DVI, SDI
- ✧ High Definition Multi-Media Interface (HDMI1.3/1.4/2.0)
- ✧ Serial and Parallel Ports
- ✧ Notebooks, Desktops, Servers
- ✧ Projection TV
- ✧ Cellular handsets and accessories
- ✧ Portable instrumentation
- ✧ Peripherals

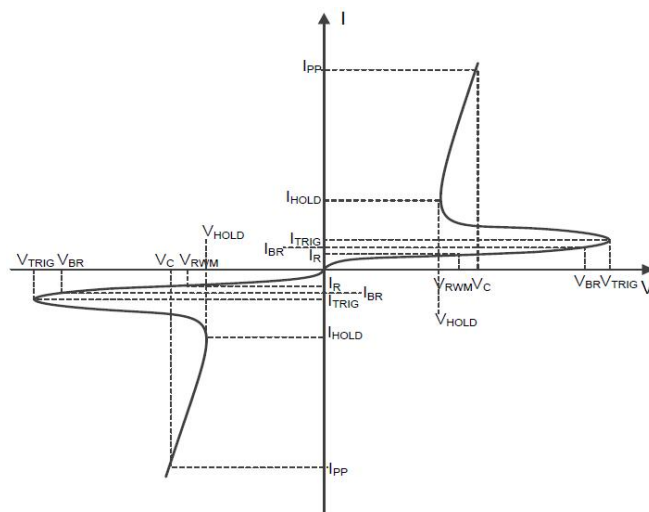
● Mechanical data

- ✧ Lead finish:100% matte Sn (Tin)
- ✧ Mounting position: Any
- ✧ Qualified max reflow temperature:260℃
- ✧ Device meets MSL 1 requirements
- ✧ Pure tin plating: 7 ~ 17 μm
- ✧ Pin flatness: $\leq 3mil$



- 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} |
| 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 @ $T_A=25^{\circ}\text{C}$

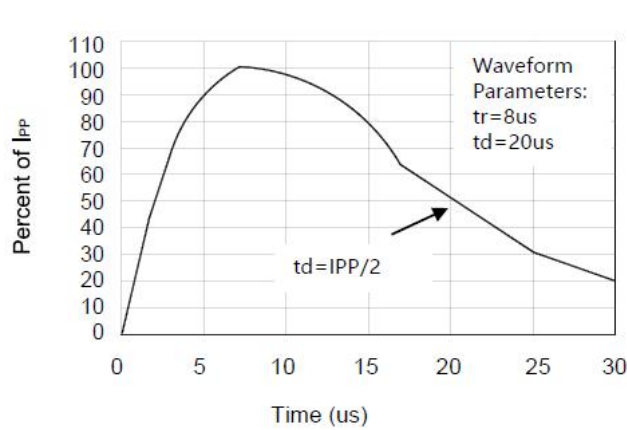
| Parameter | Symbol | Value | Unit |
|--|-----------|----------|--------------------|
| Peak Pulse Power (8/20us) | P_{PP} | 50 | W |
| Peak Pulse Current (8/20us) | I_{PP} | 9 | A |
| ESD Rating per IEC61000-4-2: | V_{ESD} | 20 | kV |
| Contact Air | | 20 | |
| Storage Temperature | T_{STG} | -55/+150 | $^{\circ}\text{C}$ |
| Operating Temperature | T_J | -55/+150 | $^{\circ}\text{C}$ |
| Lead Solder Temperature – Maximum (10 Second Duration) | T_L | 260 | $^{\circ}\text{C}$ |

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

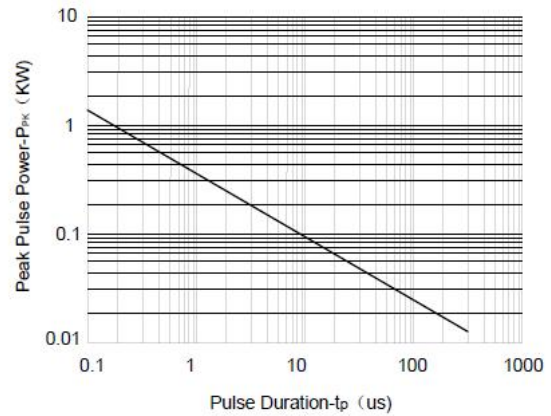
| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|------------------------------|-----------|--|------|------|------|---------------|
| Peak Reverse Working Voltage | V_{RWM} | | | 5 | 5.5 | V |
| Breakdown Voltage | V_{BR} | $I_T = 1\text{mA}$ | 6 | 9.5 | | V |
| Reverse Leakage Current | I_R | $V_{RWM} = 5.5\text{V}$ | | | 1 | μA |
| Clamping Voltage | V_C | $I_{PP} = 1\text{A}$, $t_P = 8/20\mu\text{s}$ | | 3.2 | | V |
| Clamping Voltage | V_C | $I_{PP} = 9\text{A}$, $t_P = 8/20\mu\text{s}$ | | 5.5 | 8 | V |
| Clamping Voltage | V_{C2} | $I_{PP} = 16\text{A}$, $t_P = 100\text{ns}$ | | 6.5 | | V |
| Dynamic resistance | R_{DYN} | | | 0.23 | | Ω |
| Junction Capacitance | C_J | $V_R = 0\text{V}$, $f = 1\text{MHz}$ | | 0.2 | 0.3 | pF |
| | | $V_R = 1.0\text{V}$, $f = 1\text{GHz}$ | | 0.13 | | pF |



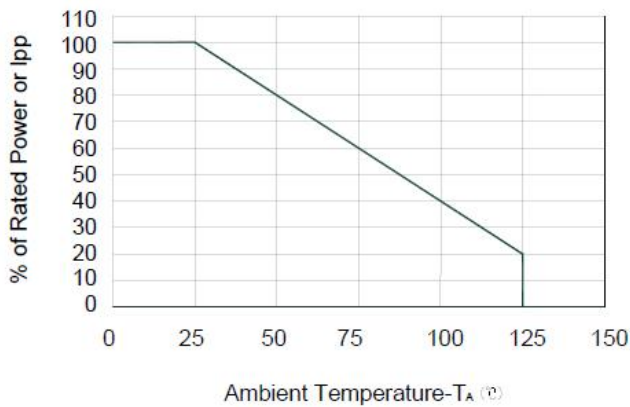
● Typical Performance Characteristics



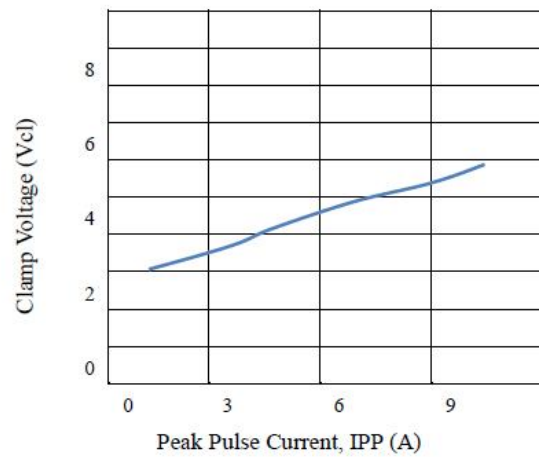
Pulse Waveform



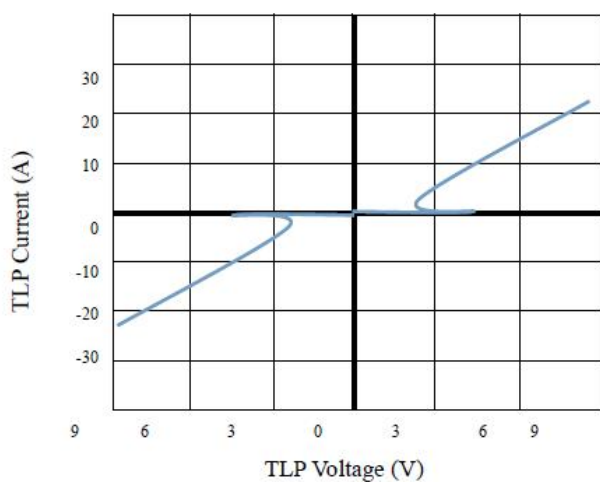
Non-Repetitive Peak Pulse Power vs. Pulse Time



Power Derating Curve



Clamping Voltage Vs Peak PulseCurrent(I_{pp})



Clamping Voltage Vs Peak PulseCurrent(I_{TLP})



● Package Information

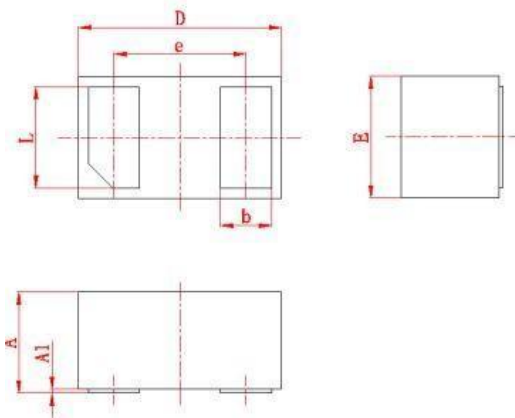
Ordering Information

| Device | Package | Qty per Reel | Reel Size |
|-------------|------------|--------------|-----------|
| SSCE5V082P1 | CSP0603-2L | 10000 | 7 Inch |

Mechanical Data

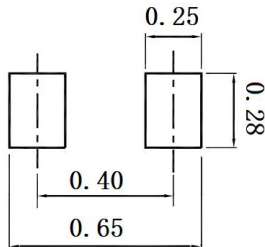
Case: CSP0603-2L

Case Material: Molded Plastic. UL Flammability

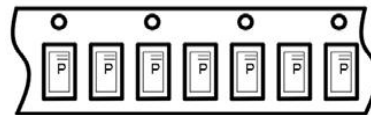


| DIM | Millimeters | |
|-----|-------------|-------|
| | Min | Max |
| A | 0.230 | 0.330 |
| A1 | 0.000 | 0.050 |
| D | 0.550 | 0.650 |
| e | (0.355) | |
| b | 0.120 | 0.220 |
| L | 0.215 | 0.275 |

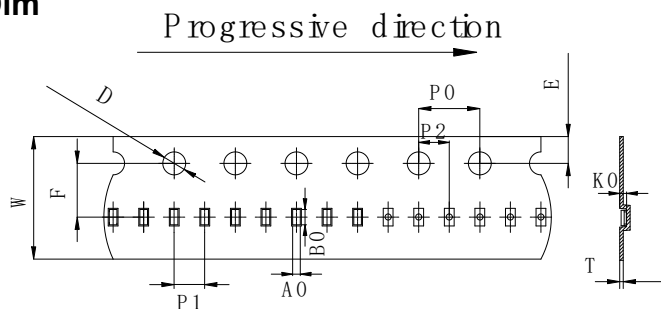
Recommended Pad outline



Device Orientation in Tape



CSP0603 Reel Dim



| PACKAGE | W | E | F | P0 | D | P2 | P1 | T | A0 | B0 | K0 |
|---------|-------------|----------------|----------------|-------------|---------------|--------------|-------------|-----------------|-----------------|-----------------|----------------|
| CSP0603 | 8mm ±0.1 | 1.75mm ±0.1 | 3.5mm ±0.05 | 4mm ±0.1 | 1.5mm ±0.1 | 2mm ±0.05 | 2mm ±0.1 | 0.23mm ±0.02 | 0.34mm ±0.05 | 0.67mm ±0.05 | 0.4mm ±0.05 |



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