# SSCE5V021S6

2-Line Ultra Low Capacitance TVS Diode

## Description

The SSCE5V021S6 is an uni-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 SSCE5V021S6 has an ultra-low capacitance with a typical value at 0.3pF, and complies with the IEC 61000-4-2 (ESD) standard with ±25kV air and ±20kV contact discharge. It is assembled into a lead-free SOT-23 package. The small size, ultra-low capacitance and high ESD surge protection make SSCE5V021S6 an ideal choice to protect cell phone, digital video interfaces and other high speed ports.

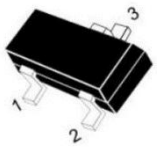
## Feature

- 64W peak pulse power ($t_P$ = 8/20us)
- SOT-23 Package
- Working voltage: 5V
- Ultra low capacitance: 0.3pF typical
- Low clamping voltage
- Low leakage current
- RoHS compliant
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge: ±25kV
    - Contact discharge: ±20kV
  - IEC61000-4-5 (Surge) 4A (8/20us)

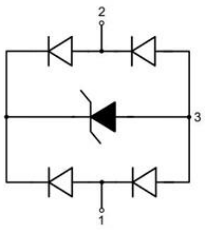
## Mechanical data

- Lead finish:100% matte Sn(Tin)
- Mounting position: Any
- Qualified max reflow temperature:260℃
- Device meets MSL 1 requirements
- Pure tin plating: 7 ~ 17 um

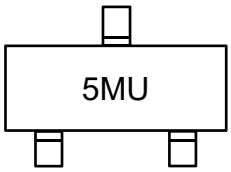
## PIN configuration




**SOT-23**




**Circuit diagram**



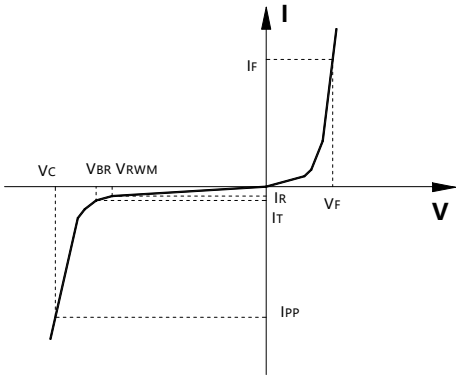

**Marking(Top view)**

## Applications

- Cellular Handsets and Accessories
- Display Ports
- MDDI Ports
- USB 2.0 and 3.0 Ports
- HDMI 1.3 and 1.4
- Digital Visual Interface (DVI)
- PCI Express and Serial SATA Ports
- Notebook Computer

## 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 |



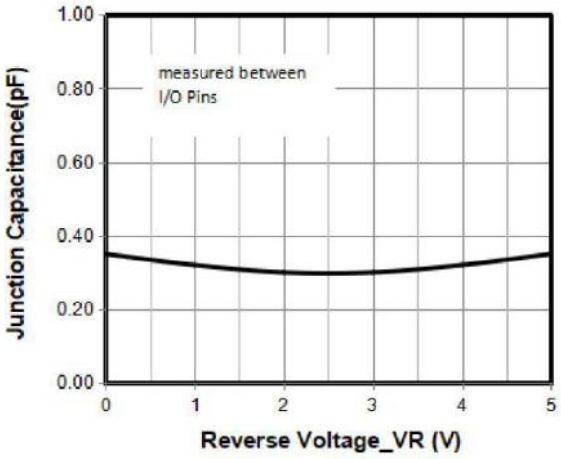

## Absolute maximum rating @$T_A$=25℃

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Peak Pulse Power（8/20us） | $P_{PP}$ | 64 | W |
| Peak Pulse Current（8/20us） | $I_{PP}$ | 4 | A |
| ESD Rating per IEC61000-4-2： Contact<br>Air | $V_{ESD}$ | 20<br>25 | kV |
| Storage Temperature | $T_{STG}$ | -55/+150 | ℃ |
| Operating Temperature | $T_J$ | -55/+125 | ℃ |

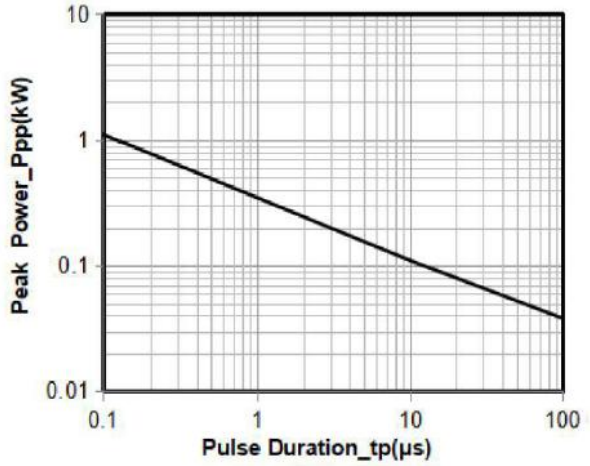
## Electrical Characteristics @$T_A$=25℃

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Peak Reverse Working Voltage | $V_{RWM}$ | | | | 5 | V |
| Breakdown Voltage | $V_{BR}$ | $I_T$ = 1mA | 6 | | | V |
| Reverse Leakage Current | $I_R$ | $V_{RWM}$ =5V | | | 0.5 | uA |
| Clamping Voltage | $V_C$ | $I_{PP}$ = 1A, $t_P$ = 8/20us | | | 9 | V |
| Clamping Voltage | $V_C$ | $I_{PP}$=4A, $t_P$ = 8/20us | | 12 | 16 | V |
| Junction Capacitance | $C_J$ | $V_R$ = 0V, f = 1MHz,between I/O pins,between pin1 and pin2 | | 0.3 | 0.4 | pF |
| Junction Capacitance | $C_J$ | $V_R$ = 0V, f = 1MHz,any I/O pin to GND,between pin1 or pin2 to pin3 | | 0.6 | 0.8 | pF |

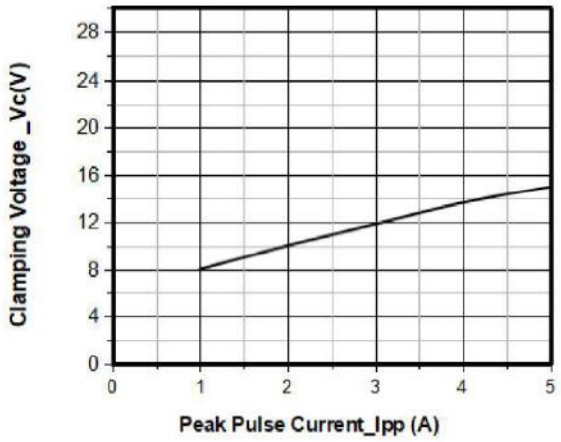
- **Typical Performance Characteristics**



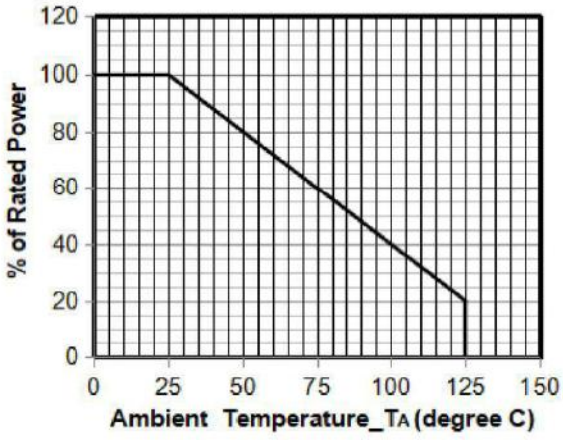

Junction Capacitance vs. Reverse Voltage



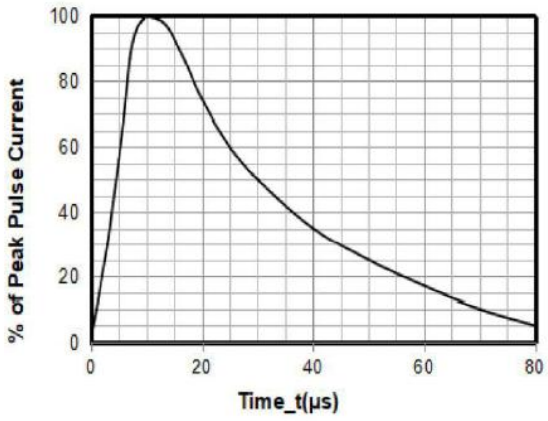

Peak Pulse Power vs. Pulse Time



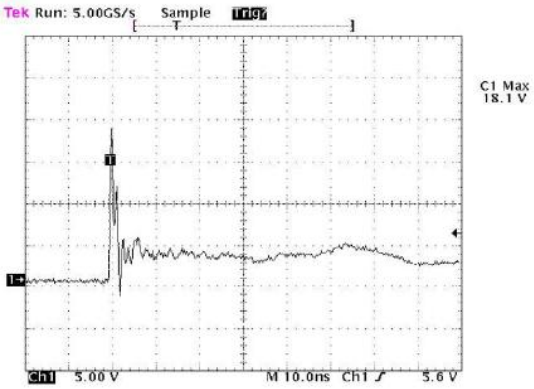

Clamping Voltage vs. Peak Pulse Current




Power Derating Curve




8 X 20μs Pulse Waveform




Note：Data is taken with a 10x attenuator

ESD Clamping Voltage

8 kV Contact per IEC61000-4-2

## ● Package Information

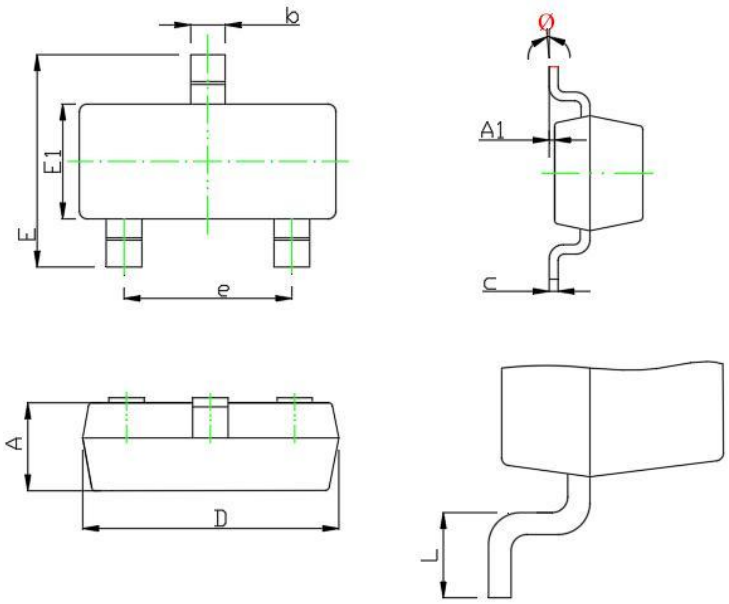
### Ordering Information

| Device | Package | Qty per Reel | Reel Size |
|---|---|---|---|
| SSCE5V021S6 | SOT-23 | 3000 | 7 Inch |

### Mechanical Data

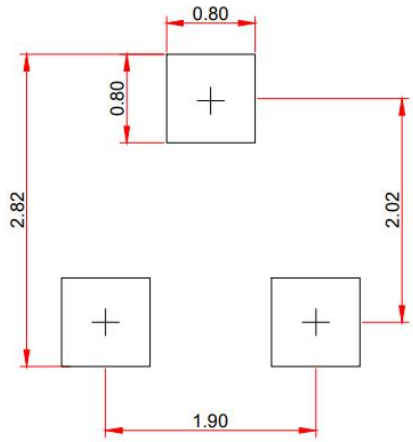
Case: SOT-23

Case Material: Molded Plastic. UL Flammability




| DIM | Millimeters | | |
|---|---|---|---|
| | Min. | Typ. | Max. |
| A | 0.9 | 1.00 | 1.15 |
| A1 | 0.01 | 0.05 | 0.10 |
| b | 0.35 | 0.40 | 0.45 |
| c | 0.08 | 0.11 | 0.16 |
| D | 2.80 | 2.90 | 3.00 |
| E | 2.25 | 2.40 | 2.55 |
| E1 | 1.20 | 1.30 | 1.40 |
| e | 0.80 | 1.90 | 2.00 |
| L | 0.30 | 0.40 | 0.50 |
| θ | 0° | - | 8° |

### Recommended Pad outline (Unit: mm)



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