# 22V Automotive TVS Diodes SM8S22AG ISO7637-2 5a/5b ISO 16750 RoHS Compliant

Our Product Introduction

## Basic Information

- Place of Origin: Shenzhen, Guangdong, China
- Brand Name: SOCAY
- Certification: UL,REACH,RoHS,ISO
- Model Number: SM8S22AG
- Minimum Order Quantity: 500PCS
- Price: Negotiable
- Delivery Time: 5-8 work days

## Product Specification

- Product Name: TVS Diodes
- Package Type: DO-218AB
- Vr: 22V
- Ir@Vr @25 : 5μA
- Ir@Vr @175 : 150μA
- Vbr@It (Min.): 24.4V
- Vbr@It (Max.): 26.9V
- It: 5mA
- Vc@Ipp: 35.5V
- Ipp: 186A
- Storage Temperature: -55°C To +175°C
- Highlight: **22V Automotive TVS Diodes**, **RoHS Automotive TVS Diodes**

## Product Description

**22V Automotive Protection TVS SM8S22AG, Meet ISO7637-2 5a/5b and ISO 16750 Load Dump Test**

**DATASHEET: SM8SXXG Series_v2309.1.pdf**

**Features:**

Optimized glass passivated chip.
$T_J$=175  capability suitable for high reliability and automotive requirement.
6600W peak pulse power capability with a 10/1000μs waveform, repetitive rate (duty cycle): 0.01 %.
Meet ISO7637-2 5a/5b and ISO 16750 load dump test (varied by test condition).
Meet AEC-Q101 qualified.
Low leakage current.
Low forward voltage drop.
Excellent clamping capability.
Very fast response time.
RoHS compliant.

**Description:**

The SM8S series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

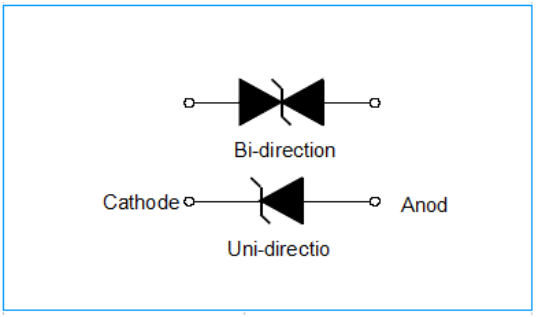
| Part Number | | Working Peak Reverse Voltage $V_{RWM}$ (V) | Breakdown Voltage $V_{BR}$ (V) | | Test Current $I_T$ (mA) | Maximum Reverse Leakage $I_R$ @ $V_{RWM}$ $T_J$=175 (μA) | Maximum $I_R$ @ $V_{RWM}$ $T_J$=175 (μA) | Maximum Reverse Surge Current $I_{PP}$ (A) | Maximum Clamping Voltage $V_C$ @ $I_{PP}$ (V) |
|---|---|---|---|---|---|---|---|---|---|
| **Uni** | **Bi** | | **Min.** | **Max.** | | | | | |
| SM8S22AG | SM8S22CAG | 22.0 | 24.4 | 26.9 | 5.0 | 10 | 150 | 186 | 35.5 |
| SM8S24AG | SM8S24CAG | 24.0 | 26.7 | 29.5 | 5.0 | 10 | 150 | 170 | 38.9 |
| SM8S26AG | SM8S26CAG | 26.0 | 28.9 | 31.9 | 5.0 | 10 | 150 | 157 | 42.1 |
| SM8S28AG | SM8S28CAG | 28.0 | 31.1 | 34.4 | 5.0 | 10 | 150 | 145 | 45.4 |
| SM8S30AG | SM8S30CAG | 30.0 | 33.3 | 36.8 | 5.0 | 10 | 150 | 136 | 48.4 |
| SM8S33AG | SM8S33CAG | 33.0 | 36.7 | 40.6 | 5.0 | 10 | 150 | 124 | 53.3 |
| SM8S36AG | SM8S36CAG | 36.0 | 40.0 | 44.2 | 5.0 | 10 | 150 | 114 | 58.1 |
| SM8S40AG | SM8S40CAG | 40.0 | 44.4 | 49.1 | 5.0 | 10 | 150 | 102 | 64.5 |
| SM8S43AG | SM8S43CAG | 43.0 | 47.8 | 52.8 | 5.0 | 10 | 150 | 95.1 | 69.4 |
| SM8S45AG | SM8S45CAG | 45.0 | 50.0 | 55.3 | 5.0 | 10 | 150 | 90.8 | 72.7 |
| SM8S48AG | SM8S48CAG | 48.0 | 53.3 | 58.9 | 5.0 | 10 | 150 | 85.3 | 77.4 |
| SM8S51AG | SM8S51CAG | 51.0 | 56.7 | 62.7 | 5.0 | 10 | 150 | 80.1 | 82.4 |
| SM8S54AG | SM8S54CAG | 54.0 | 60.0 | 66.3 | 5.0 | 10 | 150 | 75.8 | 87.1 |
| SM8S58AG | SM8S58CAG | 58.0 | 64.4 | 71.2 | 5.0 | 10 | 150 | 70.5 | 93.6 |
| SM8S60AG | SM8S60CAG | 60.0 | 66.7 | 73.7 | 5.0 | 10 | 150 | 68.2 | 96.8 |
| SM8S64AG | SM8S64CAG | 64.0 | 71.1 | 78.6 | 5.0 | 10 | 150 | 64.1 | 103.0 |
| SM8S70AG | SM8S70CAG | 70.0 | 77.8 | 86.0 | 5.0 | 10 | 150 | 58.4 | 113.0 |
| SM8S75AG | SM8S75CAG | 75.0 | 83.3 | 92.1 | 5.0 | 10 | 150 | 54.5 | 121.0 |
| SM8S78AG | SM8S78CAG | 78.0 | 86.7 | 95.8 | 5.0 | 10 | 150 | 52.4 | 126.0 |
| SM8S85AG | SM8S85CAG | 85.0 | 94.4 | 104.0 | 5.0 | 10 | 150 | 48.2 | 137.0 |

***Notes:***

*1. Surge current waveform is defined at 10/1000μS waveform.*

*2. For all types maximum $V_F$ = 1.8 V at $I_F$ = 100 A measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum.*

**Application:**
Automotive Protection.




**Overview of circuit protection**
Harmful electrical phenomena such as transient voltages or electrostatic discharge (ESD) often occur in circuits. In order to accurately protect IC circuits, TVS devices can be used in circuits for overvoltage and electrostatic discharge protection. Transient suppression diode (TVS), also called clamping diode, is a high-efficiency circuit protection device commonly used internationally. It can instantly absorb surge power up to several kilowatts and withstand high-energy large pulses. Generally, TVS tubes are connected in parallel in the circuit. When a large-pulse surge occurs while the car is driving, it can respond within ms level and quickly transform its high-resistance state into a low-resistance state, thus allowing large The current passes through and the voltage is clamped at a predetermined level, thereby achieving the purpose of protecting the electronic circuits of automotive electrical products. The automotive electronics market will undoubtedly become the largest stage in the semiconductor industry, and the Asia-Pacific region, especially the Chinese market, has unlimited growth potential. Protection devices used in automotive electronic circuits are also increasing with the growth of automotive electronics. In recent years, various types of equipment, no matter what field they are in, have tended to be highly integrated and high-frequency designed, which has caused manufacturers to put forward more and more performance requirements for circuit protection solutions such as overvoltage/overcurrent protection and surge suppression. increasingly stringent requirements.

**Precautions for selecting automotive TVS transient suppression diodes in circuit applications**
In the automotive electronic and electrical immunity standard system, ISO10605 and ISO7637-2 are the two most important standards. This article will introduce the parameters that need to be considered when selecting a suitable TVS diode for automotive electronics when meeting these two automotive test standards:
1. Vnom is the normal operating voltage of the circuit
2. Vmax is the maximum withstand voltage of the circuit
3. If the surge waveform is exponential/power type, there are many related indicators.
1) Vs maximum surge voltage
2) Tp surge duration and level
3) Rs simulates the internal resistance of the surge generator
4) Number of waveform cycles (1/f)
4. If the surge is a DC waveform, you need to pay attention
1) Vdc DC surge voltage
2) Tp surge duration
3) Rs simulates the internal resistance of the surge generator
5. Consider the ambient temperature
6. Consider the package size of the protection device to be selected.
7. If the circuit being protected is a digital signal circuit, the following points should be considered:
1) Frequency of signal voltage
2) The rise and fall times of the surge signal waveform
3) The maximum capacitance size allowed by the circuit.

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