



## 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**



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## 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 10/1000 $\mu$ s 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.

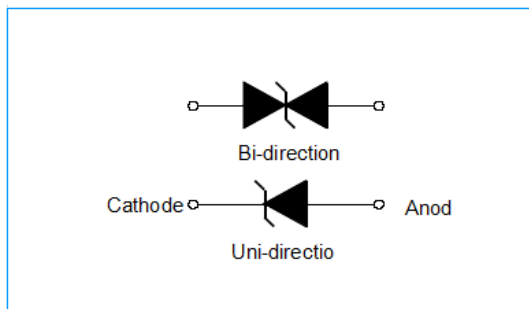
Part Number		Working Peak Reverse Voltage $V_{RWM}$ (V)	Breakdown Voltage $V_{BR}$ (V)		Test Current $I_T$ (mA)	Maximum Reverse Leakage $I_R$ @ $V_{RWM}$ ( $\mu$ A)	Maximum $I_R$ @ $V_{RWM}$ ( $\mu$ A)	Maximum Reverse Surge Current $I_{PP}$ (A)	Maximum Clamping Voltage $V_C$ @ $I_{PP}$ (V)
Uni	Bi		Min.	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 10/1000 $\mu$ s 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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