

High Voltage Rectifier Diode

Features and Benefits

- High Peak Reverse Voltage, V_{RM} : 1.0 kV
- Low Forward Voltage, V_F : 2.0 V (max.) at $I_F = 10$ mA
- Peak Forward Surge Current, I_{FSM} : 3 A
- Average Forward Current, $I_{F(AV)}$: 30 mA
- Flammability rating UL94V-0 (Equivalent)
- Pins Pb (lead) free

Application

- Automobile ignition coil start-up voltage surge arrester

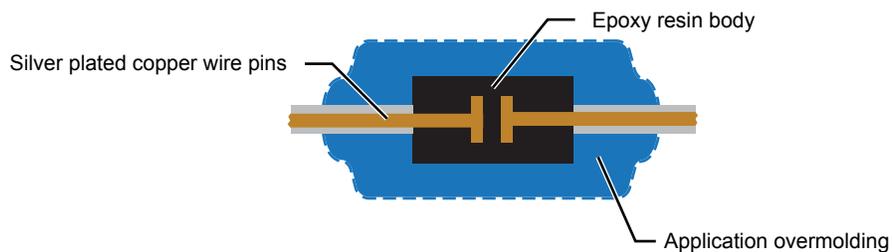
Package: Axial



Description

The SHV-02JN is a 1000 V silicon rectifier diode, which can sustain a high voltage with low loss.

Product Structure



Selection Guide

| Part Number | Packing |
|-------------|----------------------|
| SHV-02JNV1 | 5000 pieces per reel |

Absolute Maximum Ratings

| Characteristic | Symbol | Conditions | Rating | Unit |
|----------------------------|-------------|--|------------|--------------|
| Peak Reverse Voltage | V_{RM} | | 1.0 | kV |
| Peak Reverse Surge Current | I_{RSM} | Half value width: 100 μ s Triangular wave, peak value, one shot | 30 | mA |
| Average Forward Current | $I_{F(AV)}$ | 50 Hz, half sine wave, average value | 30 | mA |
| Peak Forward Surge Current | I_{FSM} | 50 Hz, half sine wave, one shot | 3 | A |
| Junction Temperature | T_j | | -40 to 150 | $^{\circ}$ C |
| Storage Temperature | T_{stg} | | -40 to 150 | $^{\circ}$ C |

Electrical Characteristics valid at $T_A = 25^{\circ}$ C, unless otherwise specified

| Characteristic | Symbol | Test Conditions | Value | Unit |
|---------------------------|--------|---------------------|------------|---------|
| Forward Voltage | V_F | $I_F = 10$ mA | 2.0 (max) | V |
| Reverse Current | I_R | $V_R = V_{RM}$ | 10 (max) | μ A |
| Reverse Breakdown Voltage | V_Z | $I_R = 100$ μ A | 1.1 to 2.0 | kV |

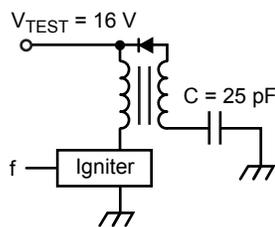
Electrical Operation Tests

Open Operation Test

The ratings in the Electrical Characteristics must be satisfied after tests at the following condition

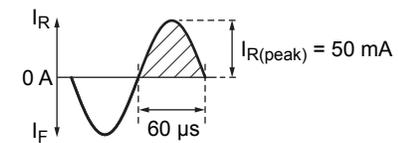
Test Condition

Ambient Temperature, T_A : 130°C
 Capacitance: C: 25 pF
 1) $f = 66$ Hz for 3 minutes
 2) $f = 33.3$ Hz for 20 hours



Reverse Current Waveform Through Diode

Pulse Width: 60 μ s
 Peak Value: 50 mA
 Power per pulse: 5.4 mJ

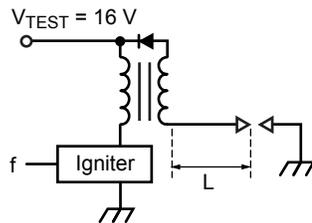


Spark Discharge Test

The ratings in the Electrical Characteristics must be satisfied after tests at the following condition

Test Condition

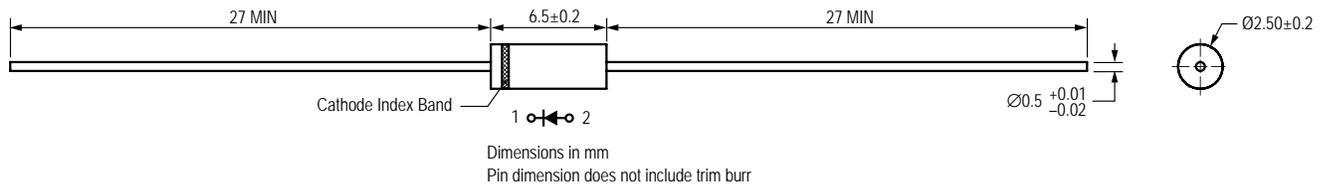
Ambient Temperature, T_A : 130°C
 Secondary Discharge Voltage: 25 \pm 5 kV
 L: 600 mm maximum
 $f = 66.6$ Hz
 T = 1000 hours



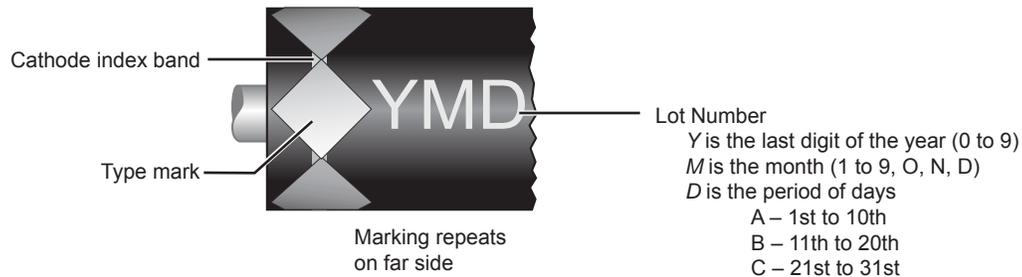
Note: Additional conditions during electrical operation tests in this page

1. Sample diode should be overmolded with more than 10 mm \times 10 mm \times 30 mm of epoxy resin, but thermal resistance, $R_{th(j-a)}$, at 1 W dissipation less than 65°/W.
2. If product high-voltage code is not specified, no line noise resistance is specified.

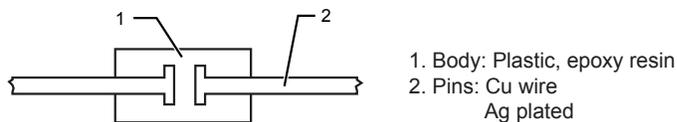
Package Outline



Package Marking



Material Composition and Internal Structure



Caution for Use

The body is intentionally small, with the expectation that the product will be overmolded in the application where used. For this reason, the use of the diode is not recommended unless it is overmolded. Overmolding is required to insure insulation against voltage at the surface, heat dissipation, and to protect against penetration of moisture.

An epoxy resin should be used for the overmolding. It must have superior adhesion to the surface of the product body, thermal conduction, protection against penetration of moisture, and must have low distortion when expanding and contracting while the product is being used in the application.



Pin treatment Pb-free. Device composition compliant with the RoHS directive.

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In addition, it should be noted that since power devices or IC's including power devices have large self-heating value, the degree of derating of junction temperature affects the reliability significantly.

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