

High Voltage Rectifier Diode

Features and Benefits

- High Peak Reverse Voltage, V_{RM} : 3.0 kV
- Low Forward Voltage, V_F : 6.0 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

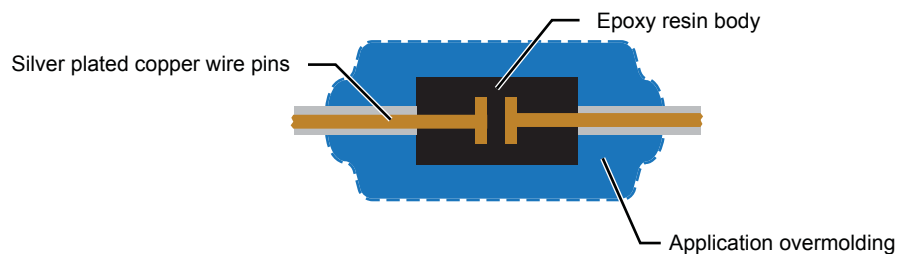
Package: Axial



Description

The SHV-06JN is a 3000 V silicon rectifier diode, which can sustain a high voltage with low loss.

Product Structure



Selection Guide

Part Number	Packing
SHV-06JNV1	5000 pieces per reel

Absolute Maximum Ratings

Characteristic	Symbol	Conditions	Rating	Unit
Peak Reverse Voltage	V_{RM}		3.0	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	°C
Storage Temperature	T_{stg}		-40 to 150	°C

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

Characteristic	Symbol	Test Conditions	Value	Unit
Forward Voltage	V_F	$I_F = 10\text{ mA}$	6.0 (max)	V
Reverse Current	I_R	$V_R = V_{RM}$	10 (max)	μ A
Reverse Breakdown Voltage	V_Z	$I_R = 100\text{ }\mu\text{A}$	3.2 to 6.0	kV

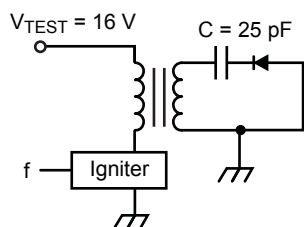
Electrical Operation Tests

Open Operation Test

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

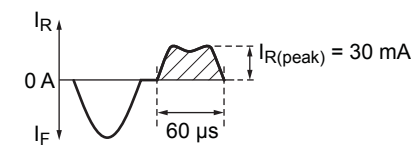
Test Condition

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: 30 mA
 Power per pulse: 9.6 mJ

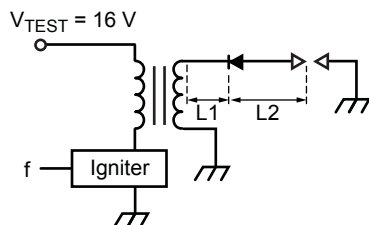


Spark Discharge Test

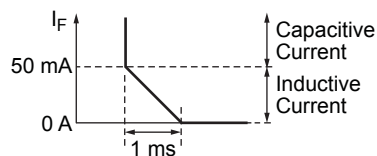
The ratings in the Electrical Characteristics must be satisfied after tests at the following condition

Test Condition

Ambient Temperature, T_A : 130°C
 Secondary Discharge Voltage: 25 $\pm$ 5 kV
 L1: less than 100 mm
 L2: less than 500 mm
 $f = 66.6$ Hz
 $T = 1000$ hours



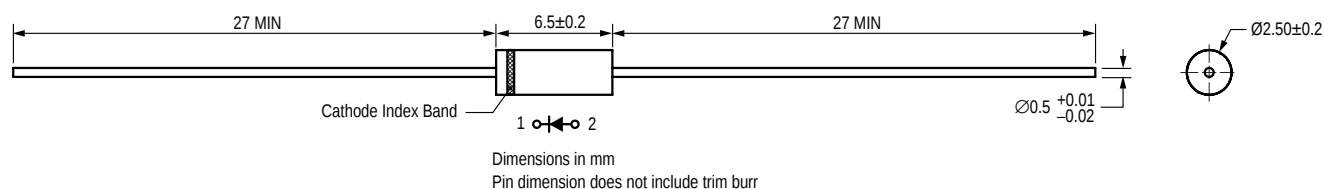
Reverse Current Waveform Through Diode



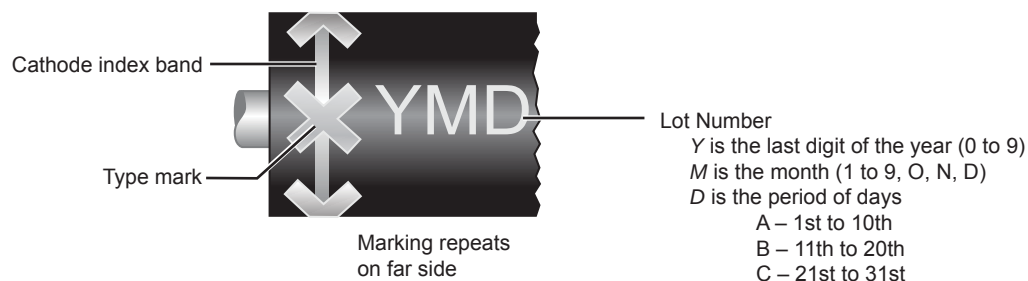
Note: Additional conditions during electrical operation tests in this page

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.

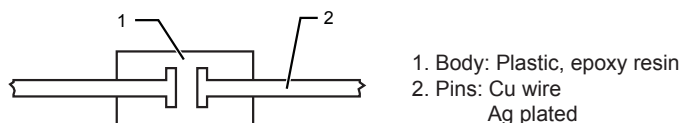
Package Outline



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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