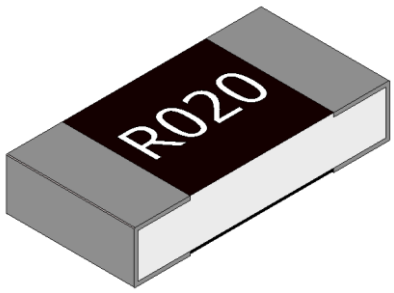
# VSRP1206SD Series Current Sensing Resistor (Lead / Halogen Free)

## Features / Applications :

- Current sensing resistor for power supplies, motor circuits, etc.
- RoHS compliant & AEC-Q200 qualified
- Suitable for reflow soldering

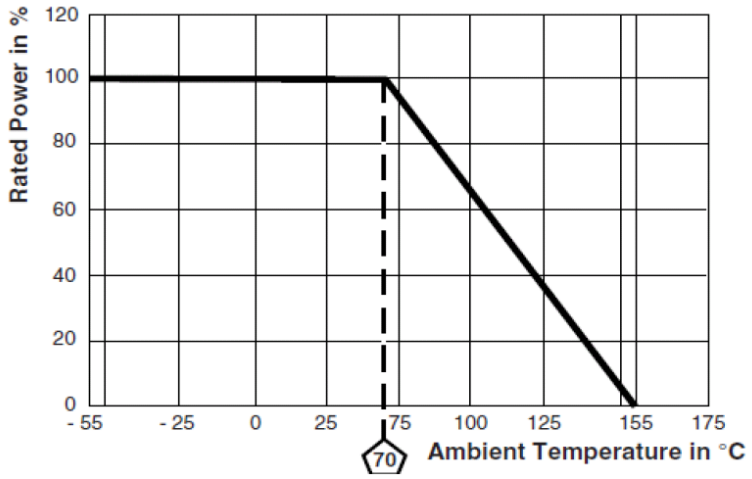



## Electrical Specifications :

| Characteristics | Feature | |
|---|---|---|
| Power Rating* | 1/2 W | |
| Resistance Range | 0.01Ω～0.015Ω | 0.016Ω～1Ω |
| Temperature Coefficient of Resistance(ppm/℃) | ±200 | ±100 |
| Resistance Tolerance | ±1%(F), ±2%(G), ±5%(J) | |
| Operation Temperature Range | -55℃ ～ +155℃ | |

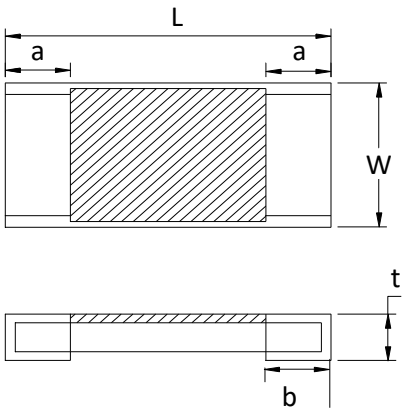
*Note :

For sensor operated at ambient temperature in excess of 70℃, the maximum load shall be derated in accordance with the following curve.



## Outline Drawing :

**Dimensions**




| | |
|---|---|
| L | 3.20 ± 0.20 |
| W | 1.60 ± 0.20 |
| t | 0.65 ± 0.20 |
| a | 0.70 ± 0.30 |
| b | 0.70 ± 0.30 |

Unit: mm

## Type Designation :

V S R P 1 2 0 6 S D - □ □ □ □ □

(1) (2) (3) (4) - (5) (6)

Note :

(1) Series No.

(2) Size

(3) Terminal type : S = Short terminal

(4) Power Rating : D = 1/2W

(5) Resistance value:

The “R” shall be used as a decimal point, For example --

R050 = 0.05Ω;

(6) Tolerance (%)

F=±1%, G=±2%, J=±5%

## Characteristics :

### Electrical

| Item | Specification and Requirement | Test Method |
|---|---|---|
| Temperature Coefficient of Resistance (TCR) | As electrical specifications | JIS-C-5201<br>Room temperature<br>Room temperature+100℃ |
| Short Time Overload | △R: ±0.5%<br>Without damage by flashover, spark, arcing, burning or breakdown | JIS-C-5201-1 4.13<br>2.5 x rated power for 5 seconds. |
| Insulation Resistance | Over 100 MΩ on Overcoat layer face up<br>Over 1,000 MΩ on Substrate side face up | JIS-C-5201-1 4.6<br>$100V_{DC}$ for 60 +10/-0 seconds. |
| Voltage Proof | △R: ± 1.0%<br>Without damage by flashover, spark, arcing, burning or breakdown | JIS-C-5201-1 4.7<br>$400V_{AC}$(rms.) for 60 +10/-0 seconds. |
| ESD | △R: ± 1.0% | AEC-Q200-002<br>Human body, 3KV. |

### Mechanical

| Item | Specification and Requirement | Test Method |
|---|---|---|
| Solderability | The surface of terminal immersed shall be minimum of 95% covered with a new coating of solder | JIS-C-5201-1 4.17<br>245 ± 5℃ for 3 ± 0.5 seconds. |
| Resistance to Solder Heat | △R: ± 1.0%<br>Without distinct deformation in appearance | JIS-C-5201-1 4.18<br>260 ± 5℃ for 10 ± 1 seconds. |
| Bending Test | △R: ± 1.0%<br>Without mechanical damage such as break | AEC-Q200-005<br>Bending value: 2 mm for 60 ± 1 seconds. |
| Resistance to solvent | Without mechanical and distinct damage in appearance | MIL-STD-202 Method 215<br>Add Aqueous wash chemical- OKEM Clean or equivalent.<br>Do not use banned solvents. |

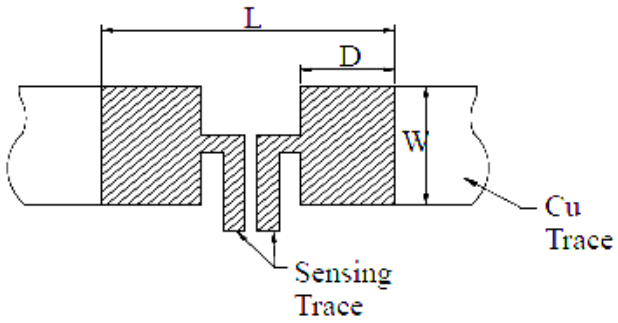
| Item | Specification and Requirement | Test Method |
|---|---|---|
| Vibration | △R: ± 0.5%<br>Without mechanical damage<br>such as break | MIL-STD-202 Method 204<br>5g's for 20 minutes, 12 cycles each of 3<br>orientations. Test from 10-2000Hz. |
| Mechanical Shock | △R: ± 0.5%<br>Without mechanical damage<br>such as break | MIL-STD-202 Method 213<br>100g's peak value, 6ms,<br>Half-sine waveform, 12.3ft/sec. |
| Terminal Strength<br>(SMD) | No visible damage | JIS-C-5201-1<br>Force of 1.8Kg for 60 seconds. |

Endurance

| Item | Specification and Requirement | Test Method |
|---|---|---|
| Temperature Cycling | △R: ± 1.0%<br>Without distinct damage in appearance | MIL-STD-002 Method 107<br>1000 cycles, (-55℃~125℃)<br>30min maximum dwell time at each<br>temperature. |
| Biased Humidity | △R: ± 1.0% | MIL-STD-202 Method 103<br>1000 hours, 85℃/85%R.H,<br>applied for 10% rated power<br>Measurement at 24 ± 4 hours after test<br>conclusion. |
| Damp heat, steady<br>state | △R: ± 1.0% | IEC 60068-2<br>(40 ± 2) °C; (93 ± 3) % RH;56 days. |
| Load Life | △R: ± 2.0%<br>Without distinct<br>damage in appearance | MIL-STD-202 Method 108<br>70℃, applied for 100% rated power<br>1.5 Hour ON, 0.5 Hour OFF For total<br>1000 hours. |
| High Temperature<br>Store | △R: ± 1.0%<br>Without distinct<br>damage in appearance | MIL-STD-202 Method 108<br>155℃ for total 1,000 hours. |

Note : Measurement at 24±4 hours after test conclusion for all reliability tests-parts.

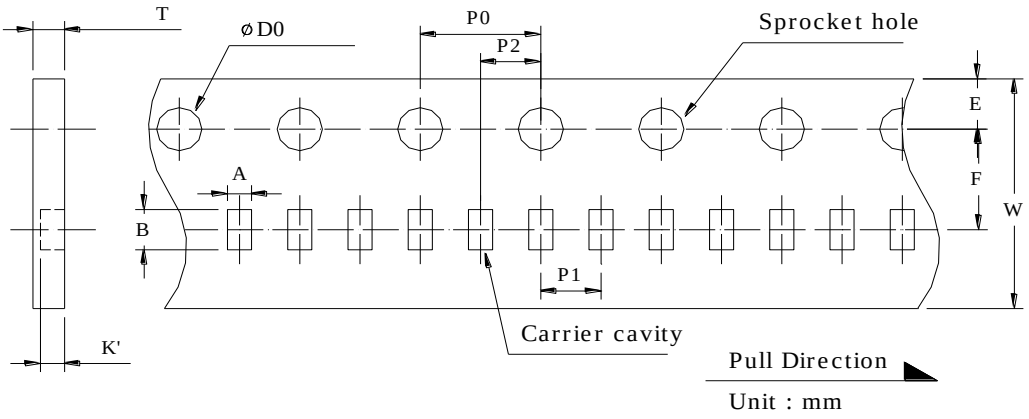
## Recommend Land Pattern Dimensions :




| Size | W (mm) | L (mm) | D (mm) |
|---|---|---|---|
| 1632 | 1.78 | 4.14 | 1.37 |

## Packaging :

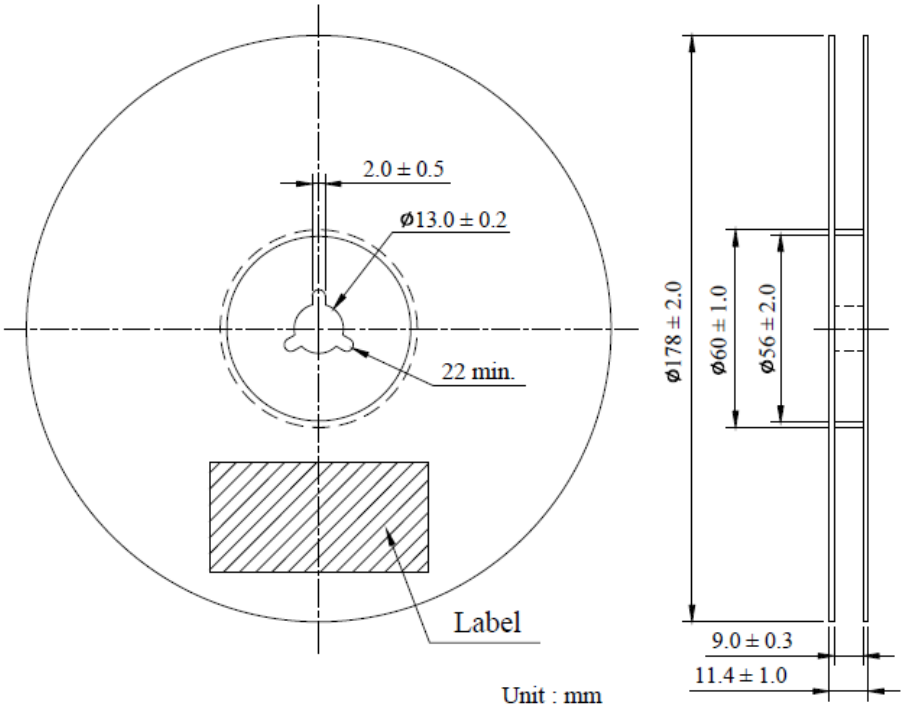
Tape packaging dimensions




| Item | A | B | D0 | E | F | P1 | P2 | P0 | K' | T |
|---|---|---|---|---|---|---|---|---|---|---|
| Spec. | 2.0±0.2 | 3.5±0.2 | 1.5±0.1 | 1.75±0.1 | 3.5±0.1 | 4.0±0.1 | 2.0±0.05 | 4.0±0.1 | R≦0.05Ω: 0.95±0.1<br>R>0.05Ω: 0.75±0.1 | R≦0.05Ω: 1.04±0.1<br>R>0.05Ω: 0.84±0.1 |

Remark: Leader tape length≧30 cm( 150 Hollow carrier cavity)

Reel dimensions




Numbers of Taping : 4,000 pieces /reel

The following items shall be marked on the reel.

(1) Type designation

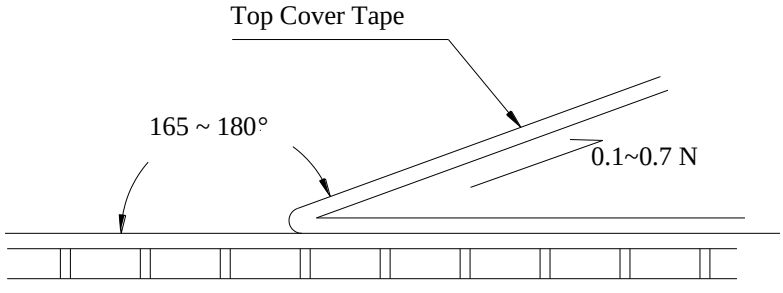
(2) Quantity

(3) Manufacturing date code

(4) Manufacturer's name

Peel force of top cover tape

The peel speed shall be about 300 mm/min. The peel force of top cover tape shall be between 0.1 to 0.7 N.



## Care Note :

Care note for storage

(1) Resistors shall be stored in a room where temperature and humidity must be controlled. (temperature 5 to 35℃, humidity 30 to 80% RH) However, a humidity keep it low, as it is possible..

(2) Resistors shall be stored as direct sunshine doesn't hit on it.

(3) Resistors shall be stored with no moisture, dust, a material that will make solderability inferior, and a harmful gas (chlorine hydride, sulfurous acid gas, and hydrogen sulfide)

Care note for operating and handling

(1) It is necessary to protect the edge and protection coat of resistors from mechanical stress.

(2) Handle with care when printing circuit board (PCB) is divided or fixed on support body, because bending of printing circuit board (PCB) mounting will make mechanical stress for resistors.

(3) Resistors shall be used with in rated range shown in specification. Especially, if voltage more than specified value will be loaded to resistor, there is a case it will make damage for machine because of temperature rise depending on generating of heat, and increase resistance value or breaks.

(4) In case that resistor is loaded a rated voltage, it is necessary to confirms temperature of a resistor and to reduce a load power according to load reduction curve, because a temperature rise of a resistor depends on influence of heat from mounting density and neighboring element.

(5) Observe Limiting element voltage and maximum overload voltage specified in each specification.

(6) If there is possibility that a large voltage (pulse voltage, shock voltage) charge to resistor, it is necessary that operating condition shall be set up before use.