VSRP0508WD Series Current Sensing Resistor (Lead / Halogen Free)

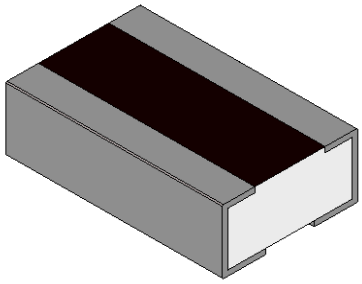
The history of revision change for the specification

Date	Revision	Changes
2017/8/23	A0	New Approval
2018/01/02	A1	Update L&W size
2019/09/05	A2	Update resistance range, TCR, chip Size and Land Pattern
2020/03/11	A3	Update the max of resistance
2020/08/10	A4	Add Resistance Tolerance
2023/08/16	A5	Update Land Pattern and Reliability

VSRP0508WD Series Current Sensing Resistor (Lead / Halogen Free)

Features / Applications :

- High power rating is up to 1/2W
- Low TCR (±200 ppm/℃)
- Current sensing resistor for power supplies, motor circuits, etc.
- RoHS compliant & AEC-Q200 qualified
- Suitable for reflow soldering
- Excellent heat dissipation by wide terminal type

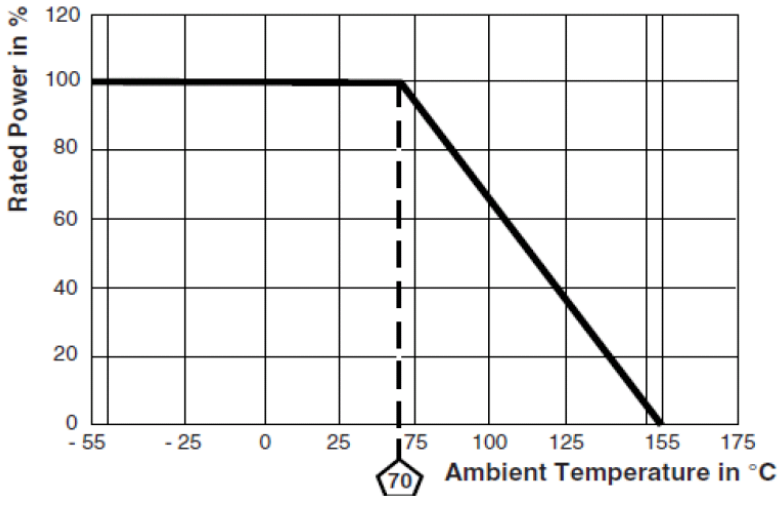


Electrical Specifications :

Characteristics	Feature
Power Rating*	1/2 W
Resistance Range	0.02Ω～0.51Ω
Temperature Coefficient of Resistance(ppm/℃)	±200
Resistance Tolerance	±1%(F), ±2%(G), ±5%(J)
Operation Temperature Range	-55℃ ～ +155℃

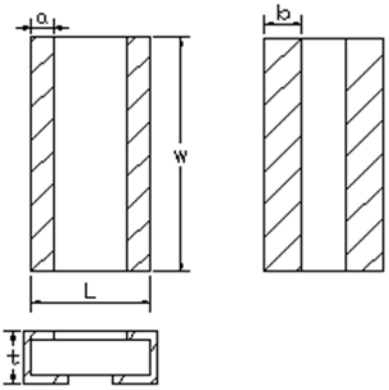
*Note :

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	1.25 ± 0.20
W	2.00 ± 0.20
t	0.60 ± 0.20
a	0.30 ± 0.20
b	0.40 ± 0.20

Unit: mm

Type Designation :

V S R P	0508	W	D	-	□ □ □ □	□
(1)	(2)	(3)	(4)	-	(5)	(6)

Note :

(1) Series No.

(2) Size

(3) Terminal type : W = Wide terminal

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

(5) Resistance value:

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

R020 = 0.02Ω;

(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 Room temperature Room temperature+100℃
Short Time Overload	△R: ± 0.5% Without damage by flashover, spark, arcing, burning or breakdown	JIS-C-5201-1 4.13 2.5 x rated power for 5 seconds.
Insulation Resistance	Over 100 MΩ on Overcoat layer face up Over 1,000 MΩ on Substrate side face up	JIS-C-5201-1 4.6 100V_{DC} for 60 +10/-0 seconds.
Voltage Proof	△R: ± 1.0% Without damage by flashover, spark, arcing, burning or breakdown	JIS-C-5201-1 4.7 400V_{AC}(rms.) for 60 +10/-0 seconds.
ESD	△R: ± 1.0%	AEC-Q200-002 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 4.17 245 ± 5℃ for 3 ± 0.5 seconds.
Resistance to Solder Heat	△R: ± 1.0% Without distinct deformation in appearance	JIS-C-5201-1 4.18 260 ± 5℃ for 10 ± 1 seconds.
Bending Test	△R: ± 1.0% Without mechanical damage such as break	AEC-Q200-005 Bending value: 2 mm for 60 ± 1 seconds.
Resistance to solvent	Without mechanical and distinct damage in appearance	MIL-STD-202 Method 215 Add Aqueous wash chemical- OKEM Clean or equivalent. Do not use banned solvents.

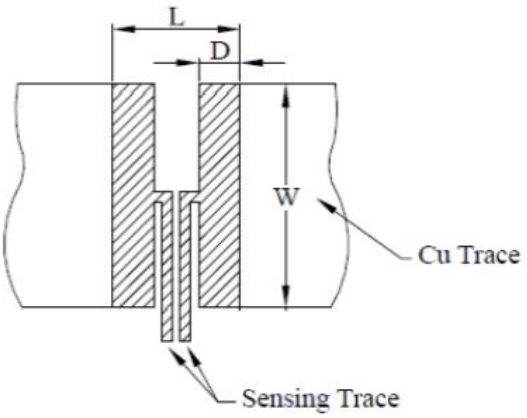
Item	Specification and Requirement	Test Method
Vibration	△R: ± 0.5% Without mechanical damage such as break	MIL-STD-202 Method 204 5g's for 20 minutes, 12 cycles each of 3 orientations. Test from 10-2000Hz.
Mechanical Shock	△R: ± 0.5% Without mechanical damage such as break	MIL-STD-202 Method 213 100g's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

Endurance

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

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

Recommend Land Pattern Dimensions :

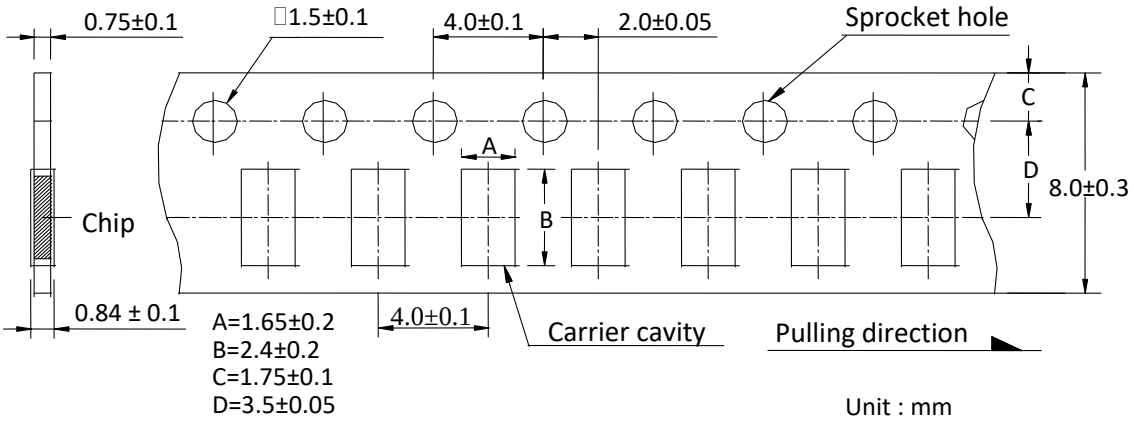


Size	W (mm)	L (mm)	D (mm)	t (mm)
1220W	2.0	2.2	0.8	1.05

t: Copper foil minimum thickness of PCB

Packaging :

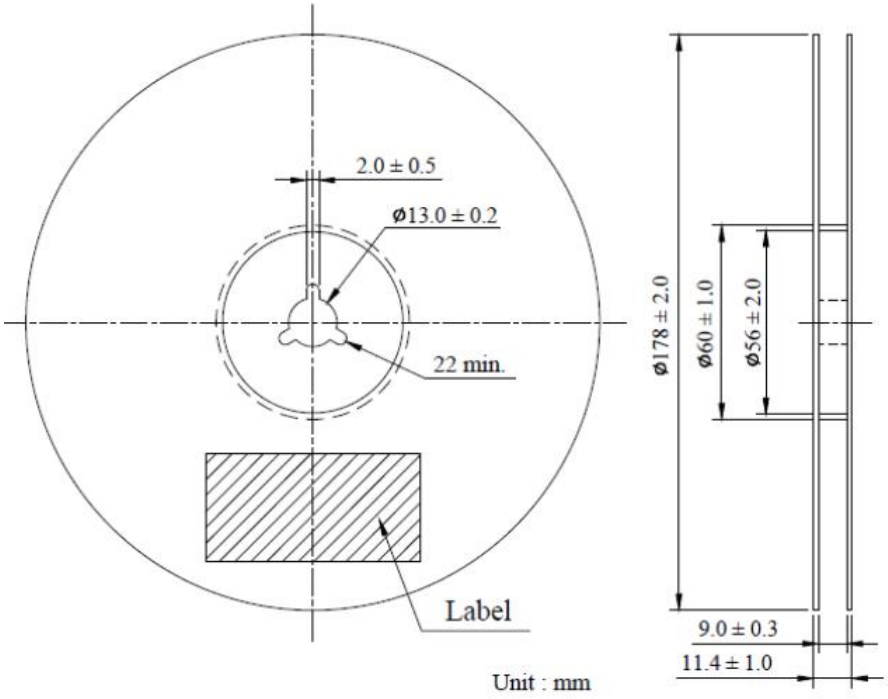
Tape packaging dimensions



Unit : mm

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

Reel dimensions



Numbers of Taping : 5,000 pieces /reel

The following items shall be marked on the reel.

(1) Type designation.

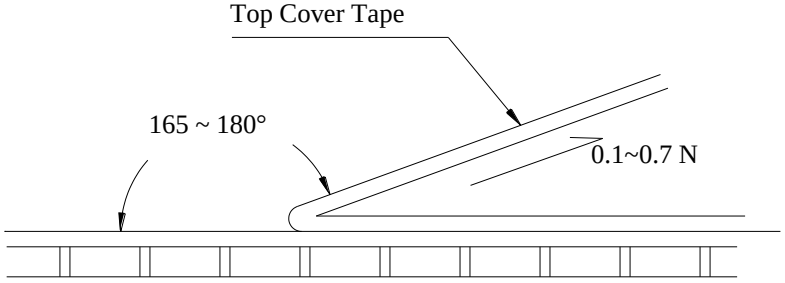
(2) Quantity

(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) Chip resistor shall be stored in a room where temperature and humidity must be controlled. (temperature 5 to 35℃, humidity 45 to 85% RH) However, a humidity keep it low, as it is possible.

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

(3) Chip resistor shall be stored with no moisture, dust, a material that will make solderability inferior, and a harmful gas (Chloridation hydrogen, sulfurous acid gas, and sulfuration hydrogen).

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.