

TEST METHODS OF JIS C 5201-1

Temperature coefficient: (JIS C 5201-1 4.8)	Natural resistance change per temperature degree centigrade: $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6$ (PPM/°C) R ₁ : Resistance value at room temperature (t ₁); R ₂ : Resistance value at room temperature plus 100 °C (t ₂) Test pattern: Room temperature (t ₁), Room temperature + 100 °C (t ₂)
Short-time overload (Overload): (JIS C 5201-1 4.13)	Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds.
Insulation resistance: (JIS C 5201-1 4.6)	Apply 500VDC between protective coating and termination for 1 min., then measure. (100V DC specially for Resistor Network)
Dielectric withstanding voltage: (Voltage proof) (JIS C 5201-1 4.7)	Resistors shall be clamped in the trough of a 90°C metallic V-block and shall be tested at AC potential respectively specified in the given list of each product type for 60 - 70 seconds. For Cement Fixed Resistor, the testing voltage is 1,000 Volts. For chip resistor, the testing voltage is 500 Volts.
Pulse overload: (JIS C 5202 5.8)	Resistance change after 10,000 cycles (1 sec. "ON", 25 sec. "OFF") at 4 times of RCWV or maximum overload.
Terminal strength: (JIS C 5201-1 4.16)	Direct Load: Resistance to a 2.5kg. Direct load for 10 sec. In the direction of the longitudinal axis of the terminal leads. Twist Test: Terminal leads shall be bent through 90° at a point of about 6mm from the body of the resistor and shall be rotated through 360° about the original axis of the bent terminal in alternating direction for a total of 3 rotations.
Terminal strength: (JIS C 5201-1 4.16)	(Applicable for Resistor Network) Tensile: 1KG, 30 sec., Bending: 500g, 2 times.
Terminal bending: (JIS C 5201-1 4.33)	(Applicable for CHIP resistors) Twist of Test Board: Y/X = 3/90mm for 10 sec.
Vibration: (JIS C 5201-1 4.22)	X, Y, Z each direction 2 hours, 10 ~ 55 ~ 10Hz/min All amplitude 1.5mm
Soldering heat: (JIS C 5201-1 4.18)	(Applicable for CHIP resistors) Dip the resistor into a solder bath having a temp. of 260 ± 5°C and hold it for 10 ± 1 sec. Lead (Pb) free temp.: 260 ± 3°C, 5 + 1/-0 sec.
Resistance to soldering heat: (JIS C 5201-1 4.18)	Permanent resistance change when leads immersed to a point 2.0 ~ 2.5mm from the body in 350 ± 10°C solder for 3 ~ 4 sec. Lead (Pb) free temp.: 260 ± 3°C, 5 + 1/-0 sec.
Solderability: (JIS C 5201-1 4.17)	The area covered with a new, smooth, clean, shiny and continuous surface free from concentrated pin-holes. Test temperature of solder: 235 ± 5°C; Dwell time in solder: 3 ~ 3.5 sec. Lead (Pb) free temp.: 245 ± 3°C, Dwell time in solder: 2 ~ 3 sec.
Resistance to solvent: (JIS C 5201-1 4.29, 4.30)	Specimens shall be immersed in a bath of alcohol completely for 3 min. using ultrasonic test equipment.
Thermal shock: (JIS C 5201-1 4.21)	(Applicable for Resistor Network) Load V, room temperature, 30 min. Unload, -55°C, 15 min. Over 2 hours in room temperature before measuring.
Rapid change Temperature: (JIS C 5201-1 4.19)	Resistance change after continuous 5 cycles for duty cycle specified below: Step 1: 30 min. at -55 ± 3°C Step 2: 10 ~ 15 min. at room temperature Step 3: 30 min. at 155 ± 2°C Step 4: 10 ~ 15 min. at room temperature
Humidity (Steady state): (JIS C 5201-1 4.24)	Temporary resistance change after 240 hours exposure in a humidity test chamber controlled at 40 ± 2°C and 90 ~ 95% relative humidity.
Load life in humidity: (JIS C 5202 7.9)	Resistance change after 1,000 hours (1.5 hours "ON", 0.5 hour "OFF") at RCWV or max. RCWV whichever is lesser in a humidity test chamber controlled at 40± 2°C and 90 ~ 95% relative humidity.
Load life: (JIS C 5201-1 4.25.1)	Permanent resistance change after 1,000 hours operating at RCWV or max. RCWV whichever is lesser, with duty cycles of 1.5 hours "ON", 0.5 hour "OFF" at 70 ± 2°C ambient.
Flame retardant: (JIS C 5202 7.12)	Resistors shall resist flaming or arcing when overload up to 16 times RCWV or max. RCWV whichever is lesser. Lit burner and adjust to produce a blue flame 38mm in height & a maximum of 127mm flame from the burner tube. Resistor is supported from its lead at 45°C from the horizontal so that the lower end of resistor is on top of blue flame. The resistor is placed on this test flame for 15 secs. Keep cool for 15 secs. Repeat this procedure for 5 times.

$$**RCWV = (\text{Rated Continuous Working Voltage}) = \sqrt{\text{Rated Power} \times \text{Resistance Value}}$$

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JIS C 5202	JIS C 5201-1
Maximum overload voltage	(Not applicable)
Intermittent overload	(Not applicable)
Endurance (under damp and load)	(Not applicable)
Flame resistance-Flame resistance test	(Not applicable)
Flame resistance-over-load burning / Resistance test	(Not applicable)
Highest ambient temperature	2.2.10 Upper category temperature
Lowest ambient temperature	2.2.11 Lower category temperature
Rated power	2.2.13 Rated dissipation
Rated voltage	2.2.15 Rated voltage
	2.2.17 Isolation voltage
Temperature coefficient of resistance	2.2.20.2 Temperature coefficient of resistance
Ratio to rated dissipation	2.2.24 Percentage of the rated dissipation
Nominal resistance value	2.2.7 Rated resistance
Critical resistance value	2.2.8 Critical resistance
Working temperature range	2.2.9 Category temperature range
Nominal resistance range	2.5 Rated resistance range
Tolerance on resistance value	2.6 Tolerance on rated resistance
Stability class	2.8 Stability class
Voltage coefficient	4.11 Voltage coefficient of resistance
Short-time overload	4.13 Overload
Temperature rise	4.14 Temperature rise
Robustness of resistor body	4.15 Robustness of the resistors body
Robustness of terminations bending strength of lead / wire termination	4.16 Robustness of terminations (Bending, Tensile, Torsion)
Solderability	4.17 Solderability
Resistance to soldering heat	4.18 Resistance to soldering heat
Change of temperature	4.19 Rapid change of temperature
Shock	4.21 Shock
Resistance to vibration	4.22 Vibration
Climatic sequence	4.23 Climatic sequence
Resistance to dry heat	4.23.1 Dry heat
Resistance to cold	4.23.4 Cold
Resistance to damp heat (steady state)	4.24 Damp test, steady state
D.C Load	4.24.2.2 D.C Load
Endurance (rated Load)	4.25 Endurance at 70°C
Resistance to solvent / Resistance to solvent of body	4.29 Component solvent resistance
Resistance to solvent / Resistance to solvent of marking	4.30 Solvent resistance of marking
Adhesiveness	4.32 Adhesion
Resistance to base material bending	4.33 Bond strength of the face plating
Resistance	4.5 Resistance
Insulation resistance	4.6 Insulation resistance
Dielectric withstanding voltage (voltage proof)	4.7 Voltage proof
Temperature characteristic of resistance	4.8 Variation of resistance with temperature characteristic of resistance
Derating curve	Derating curve
Resistance to dry heat	Dry heat
Maximum working voltage	Limiting element voltage