

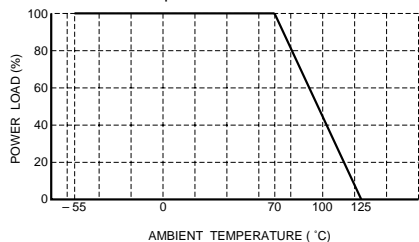
Chip trimmer potentiometers

MVR32

●Features

- 1) Superb solderability thanks to extra soldering electrode.
- 2) Close match between wiper and resistive element reduces wiper noise.
- 3) Mounting can be automated by using a carrier tape.
- 4) Extremely thin dimensions and light weight facilitate miniaturization of equipment.
- 5) Two-digit markings used to indicate resistance.
- 6) Special screwdriver (AD1804) available separately.
- 7) ROHM resistors have approved ISO-9001 certification. Design and specifications are subject to change without notice.
Carefully check the specification sheet before using or ordering it.

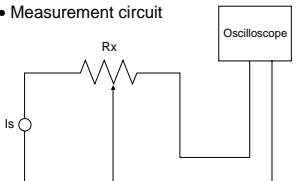
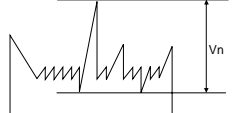
●Ratings

| Item | Conditions | Specifications |
|--------------------------------|--|---|
| Rated power | <p>Power must be derated according to the power derating curve in Figure 1 when ambient temperature exceeds 70°C.</p>  <p style="text-align: center;">Fig.1</p> | 0.1W (1 / 10W) / element at 70°C |
| Rated voltage | <p>The voltage rating is calculated by the following equation. If the value obtained exceeds the maximum operating voltage, the voltage rating is equal to the maximum operating voltage.</p> $E = \sqrt{P \times R}$ <p style="margin-left: 40px;">E : Rated voltage (V) P : Rated power (W) R : Nominal resistance (Ω)</p> | Max. operating voltage : 50V |
| Nominal total resistance range | | 100 ~ 1MΩ <small>(recommended resistance value : E3 series) (applicable resistance value : E3 series)</small> |
| Total resistance tolerance | | ±25% |
| Resistance variation | | B (linear) characteristics |
| Effective rotation angle | | 250±20° |
| Operating temperature | | -55°C ~ +125°C |
| Reactive variable range | Rotational angle, both ends | within 10% (R>150Ω) within 20% (R≤150Ω) |

- Before using components in circuits where they will be exposed to transients such as pulse loads (short-duration, high-level loads), be certain to evaluate the component in the mounted state. In addition, the reliability and performance of this component cannot be guaranteed if it is used with a steady state voltage that is greater than its rated voltage.
- The remainder of flux may negatively affect product performance and reliability. So please make sure to wash and remove flux completely washing.

Resistors

●Characteristics

| Characteristics | Specifications | Test method (JIS C 5261) |
|--|---|---|
| DC total resistance | Within $\pm 25\%$ | JIS C 5261 5.1 |
| Contact resistance rate | 3% or less | JIS C 5261 5.9 |
| Resistance change characteristics | B group OB | JIS C 5261 5.1 Voltage method |
| Residual resistance | $R < 1k\Omega$ 200 Ω or less $R \geq 1k\Omega$ Within 2% of total nominal resistance | JIS C 5261 5.1 |
| Wiper noise | 5% or less of total nominal resistance, within the effective rotational range | JIS C 5261 5.8 B method Rotational speed of approx. 10 cycles per minute (with one cycle defined as one round trip) <ul style="list-style-type: none"> • Measurement circuit  <ul style="list-style-type: none"> • Measurement waveform  <p>Provided that the constant current has been set according to the following: $I_s : I_s = \frac{10}{R_x}$ (When $R_x \leq 1k\Omega$, constant current is defined as $I_s = 10mA$) R_x : Nominal resistance of semi-fixed test resistor. V_n : Noise voltage $\text{Noise rate} = \frac{V_n}{I_s \times R_x} \times 100 (\%)$</p> |
| Resistance temperature characteristics | $\pm 250ppm / ^\circ C$ | JIS C 5261 5.3 +25 / -55 / +25 / +125 $^\circ C$ |
| Resistance to dry heat | Total resistance change rate : $\pm (5.0\%+0.1\Omega)$ Constriction contact resistance rate: 8% or less | JIS C 5261 7.2 125 $^\circ C$ Test time : 1,000 ~ 1,048 hrs. |
| Temperature cycling | Total resistance change rate : $\pm (5.0\%+0.1\Omega)$ Constriction contact resistance rate: 8% or less | JIS C 5261 7.3 Test temperature: -55 $^\circ C$ ~ + 125 $^\circ C$ 100cyc. |
| Resistance to humidity (steady state) | Total resistance change rate : $\pm (5.0\%+0.1\Omega)$ Constriction contact resistance rate: 8% or less | JIS C 5261 7.4 60 $^\circ C$, 95%RH Test time: 1,000 ~ 1,048 hrs. |
| Endurance (under load in damp environment) | Total resistance change rate : $\pm (5.0\%+0.1\Omega)$ Constriction contact resistance rate: 8% or less | JIS C 5261 7.6 Rated voltage (current) , 60 $^\circ C$, 95%RH 1.5h : ON -0.5h : OFF Test time: 1,000 ~ 1,048 hrs. |
| Endurance (steady state) | Total resistance change rate : $\pm (5.0\%+0.1\Omega)$ Constriction contact resistance rate : 8% or less | JIS C 5261 7.7 Rated voltage (current) , 70 $^\circ C$ 1.5h : ON -0.5h : OFF Test time: 1,000 ~ 1,048 hrs. |
| Rotational torque | 1.9 ~ 19.7mN \cdot m (20 ~ 200gf \cdot cm) | JIS C 5261 6.2 |
| Endurance (wiper) | Total resistance change rate : Within $\pm 15\%$ Constriction contact resistance rate : 8% or less | JIS C 5261 7.8 After 20 rotations |

Resistors

| Characteristics | Specifications | Test method (JIS C 5261) |
|---------------------------------|---|---|
| Terminal strength (compression) | Total resistance change rate : $\pm (3.0\%+0.1\Omega)$ There must be no mechanical damage. | JIS C 5261 6.5 Force (4.9N) is applied from three directions upon the middle of the sides of the sample on the surface being tested, as shown in the illustration on the left. |
| Terminal strength (bending) | Total resistance change rate : $\pm (3.0\%+0.1\Omega)$ There must be no mechanical damage. | JIS C 5261 6.5 Duration of pressure : $5\pm 1s$ Amount of bending : 3 mm |
| Resistance to soldering heat | Total resistance change rate: $\pm (3.0\%+0.1\Omega)$ Constriction contact resistance rate: 5% or less | JIS C 5261 6.7 Soldering conditions : $260\pm 5^\circ C$ Soldering time : $10\pm 1s$. |
| Solderability | 95% of terminal surface must be covered by new soldering, and there must be no soldering corrosion. | JIS C 5261 6.8 Flux : Rosin methanol or rosin isopropyl alcohol Solde r: H63A Soldering conditions : $235\pm 5^\circ C$ Soldering time : $2.0\pm 0.5s$. |

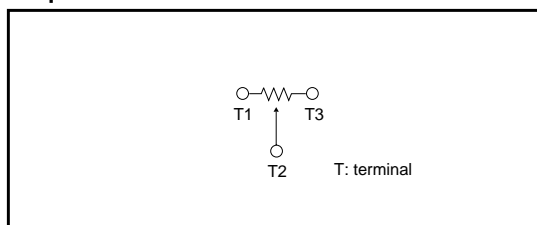
●External dimensions (Units : mm)

(Units : mm)

| A | B | C | D | E | F | G | H | I |
|--------------|---------------|--------------|----------------|---------------|---------------|-----------|---------------|---------------|
| 3.0 ± 0.1 | 1.5 ± 0.1 | 1.5 ± 0.1 | 1.6 ± 0.1 | 1.0 ± 0.15 | 2.6 ± 0.1 | Max. 3.6 | 1.9 ± 0.05 | 0.5 ± 0.05 |
| Max. 1.3 | 1.15 ± 0.1 | 0.7 ± 0.1 | 0.18 ± 0.05 | 0.9 ± 0.1 | 0.35 ± 0.1 | Max. 0.65 | Max. 1.1 | |

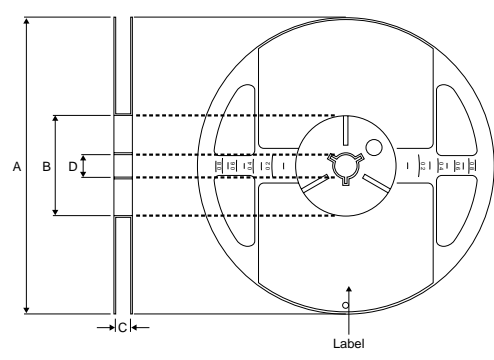
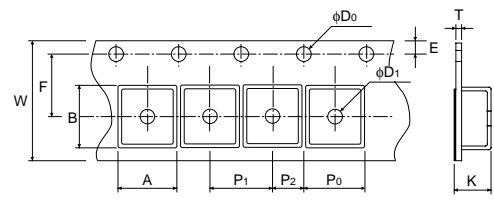
| Part | Material |
|--------------------|--|
| ① Substrate | Alumina substrate (96% alumina or greater) |
| ② Dielectric glaze | oxide dielectric glaze |
| ③ Eyelet | Stainless steel + metal plating |
| ④ Wiper | Stainless steel |
| ⑤ Electrode | (Internal) Primary electrode with thick film of palladium-silver |
| ⑥ Electrode | (External) Soldering tip |
| ⑦ Protective film | Organic film |

●Equivalent circuit



Resistors

●Packaging

| Reel | Taping | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|----------------------------------|----------|-------------------|------------|-----------------------|----------------------|-------|-------------------|--|---|---|---|---|---|----------------|----------------|---------|---------|---------|----------|----------|---------|----------|----------------|------------|---|---|------------|--|--|---------|----------------------------------|----------|----------|----------|--|--|
|  <p style="text-align: center;">EIAJ ET-7001 compliant</p> <p style="text-align: center;">(Units : mm)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">A</td> <td style="text-align: center;">B</td> <td style="text-align: center;">C</td> <td style="text-align: center;">D</td> </tr> <tr> <td style="text-align: center;">$\phi 180$ 0 -3</td> <td style="text-align: center;">$\phi 60$ +1 0</td> <td style="text-align: center;">9±0.3</td> <td style="text-align: center;">$\phi 13 \pm 0.3$</td> </tr> </table> | A | B | C | D | $\phi 180$ 0 -3 | $\phi 60$ +1 0 | 9±0.3 | $\phi 13 \pm 0.3$ |  <p style="text-align: center;">(Units : mm)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">A</td> <td style="text-align: center;">B</td> <td style="text-align: center;">W</td> <td style="text-align: center;">F</td> <td style="text-align: center;">E</td> <td style="text-align: center;">P₁</td> <td style="text-align: center;">P₂</td> </tr> <tr> <td style="text-align: center;">3.3±0.2</td> <td style="text-align: center;">3.8±0.2</td> <td style="text-align: center;">8.0±0.2</td> <td style="text-align: center;">3.5±0.05</td> <td style="text-align: center;">1.75±0.1</td> <td style="text-align: center;">4.0±0.1</td> <td style="text-align: center;">2.0±0.05</td> </tr> <tr> <td style="text-align: center;">P₀</td> <td style="text-align: center;">ϕD_0</td> <td style="text-align: center;">T</td> <td style="text-align: center;">K</td> <td style="text-align: center;">ϕD_1</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">4.0±0.1</td> <td style="text-align: center;">1.5^{+0.1}₀</td> <td style="text-align: center;">Max. 0.6</td> <td style="text-align: center;">Max. 2.5</td> <td style="text-align: center;">Min. 1.0</td> <td></td> <td></td> </tr> </table> | A | B | W | F | E | P ₁ | P ₂ | 3.3±0.2 | 3.8±0.2 | 8.0±0.2 | 3.5±0.05 | 1.75±0.1 | 4.0±0.1 | 2.0±0.05 | P ₀ | ϕD_0 | T | K | ϕD_1 | | | 4.0±0.1 | 1.5 ^{+0.1} ₀ | Max. 0.6 | Max. 2.5 | Min. 1.0 | | |
| A | B | C | D | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\phi 180$ 0 -3 | $\phi 60$ +1 0 | 9±0.3 | $\phi 13 \pm 0.3$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | B | W | F | E | P ₁ | P ₂ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.3±0.2 | 3.8±0.2 | 8.0±0.2 | 3.5±0.05 | 1.75±0.1 | 4.0±0.1 | 2.0±0.05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P ₀ | ϕD_0 | T | K | ϕD_1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4.0±0.1 | 1.5 ^{+0.1} ₀ | Max. 0.6 | Max. 2.5 | Min. 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

●Product designation

Part No.

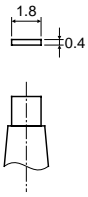
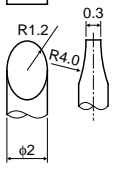
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|--|--|--|
| M | V | R | 3 | 2 | H | X | B | R | N | | | |
|---|---|---|---|---|---|---|---|---|---|--|--|--|

Packaging / Processing specifications
Resistance tolerance
Nominal resistance

| | | | | | | | | |
|------|-----------------|---------------------------|--------------------------|-------------------------|-----------------------------|---|------|---------------------------|
| Code | Part No. | Processing specifications | Packaging specifications | Packaging style | Standard ordering unit(pcs) | N | ±25% | 3-digit IEC coding system |
| HXBR | MVR22 / 32 / 34 | Reflow soldering | Taping | Embossed tape with reel | 2000 | | | |

Resistors

●Recommended screwdriver for adjusting MVR resistors

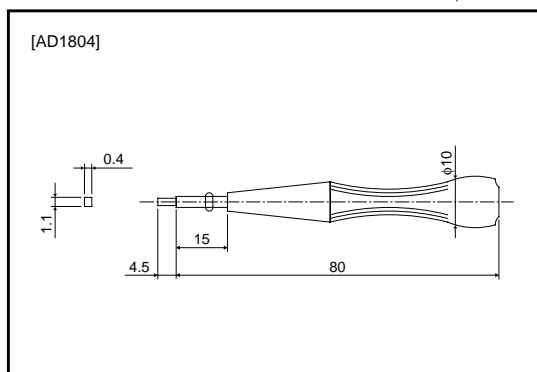
| | | |
|-----------------------------------|---|---|
| Model | Open, type 3 | |
| | MVR | |
| Dimensions, configuration | Manual adjustment | Automatic adjustment |
| |  |  |
| Commercially sold product [Maker] | AD1804 [Rohm] (see note) No.9000 (-) 1.8×30 [Vessel] | - |

Note : Screwdriver specified by ROHM for adjustment of MVR chips (MVR32).

| Product name | Tip size | Tip material | Main body material |
|--------------|----------|--------------|--------------------|
| AD1804 | 1.8×0.4 | Zirconia | ABS resin |

Sold in units of 20. Protective cap included.

(Units : mm)



Resistors

●Dimensions (Units : mm)

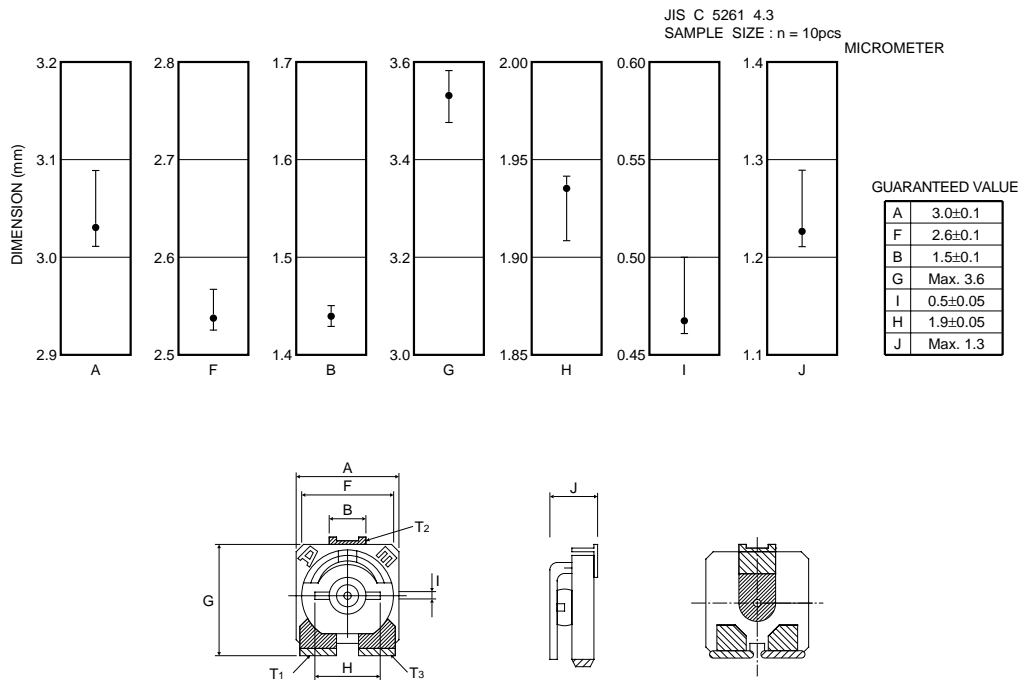


Fig.2 Dimensions

●Electrical characteristics

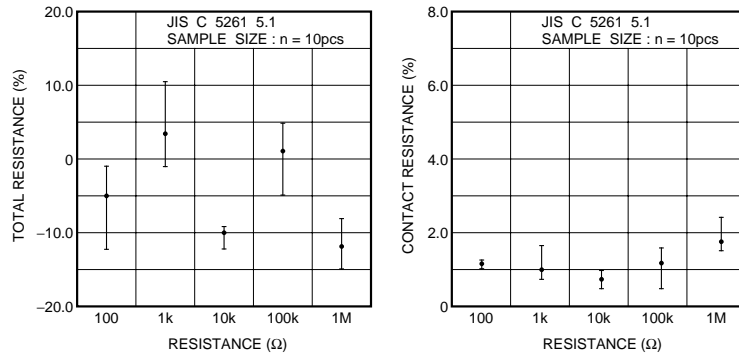


Fig.3 DC resistance : Total and contact

Resistors

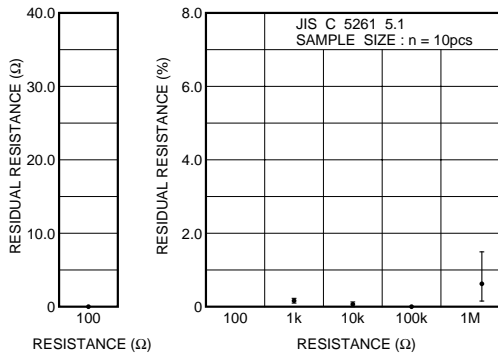


Fig.4 Residual resistance

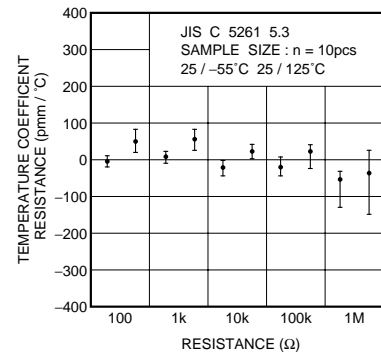


Fig.5 Resistance temperature characteristics

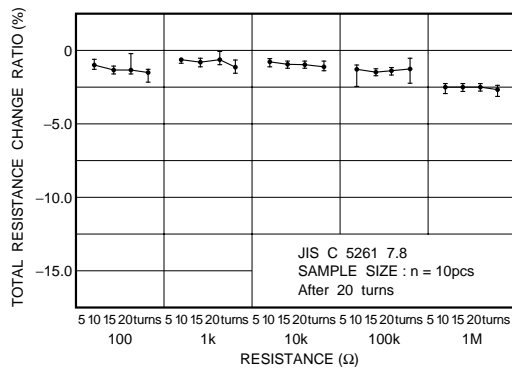


Fig.6-1 Endurance (wiper)

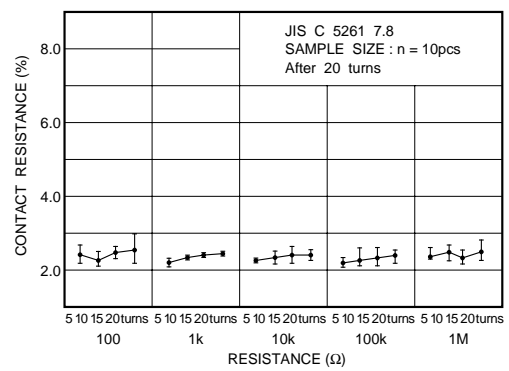


Fig.6-2 Endurance (wiper)

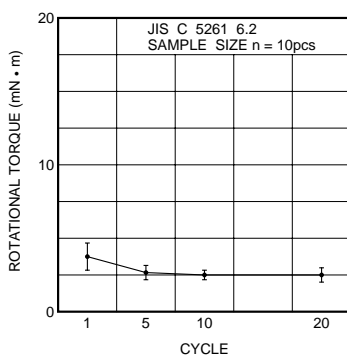


Fig.7 Rotational torque

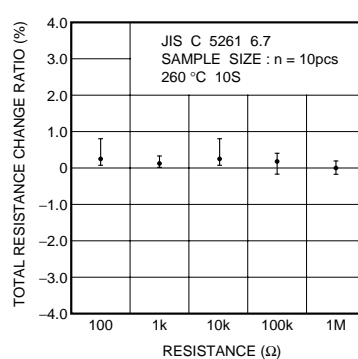
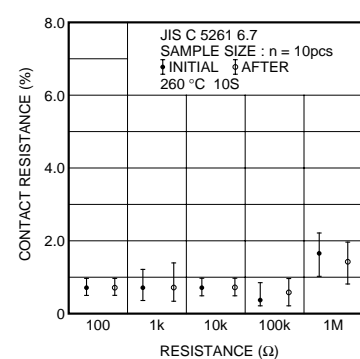


Fig.8 Resistance to soldering heat



Resistors

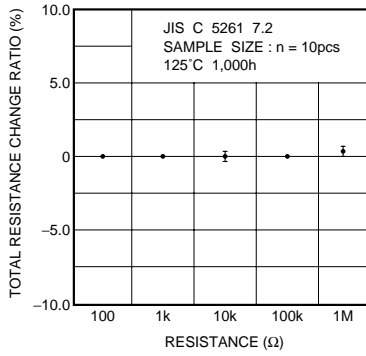


Fig.9 Resistance to dry heat

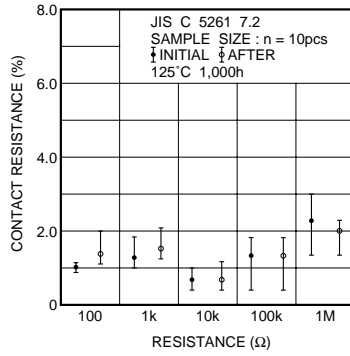


Fig.10-1 Temperature cycling

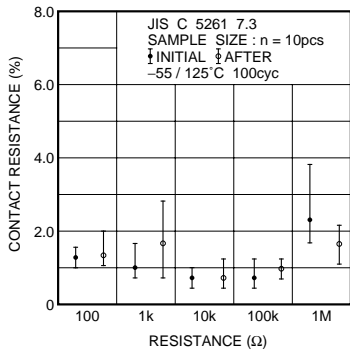
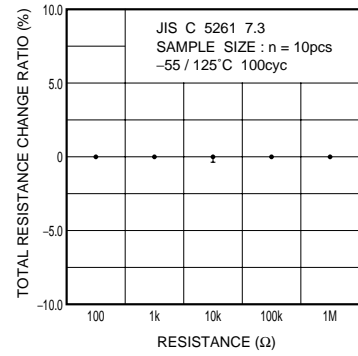


Fig.10-2 Temperature cycling

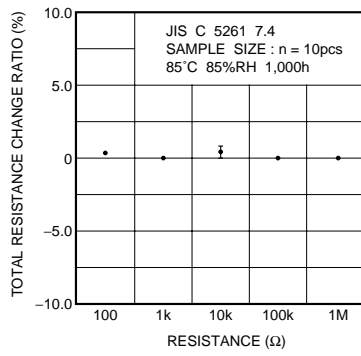


Fig.11 Resistance to humidity (steady state)

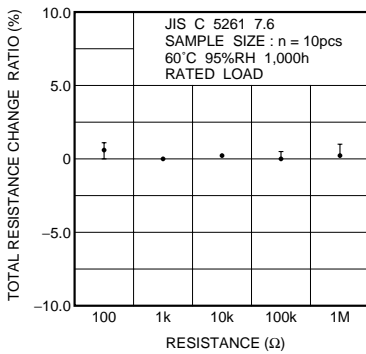
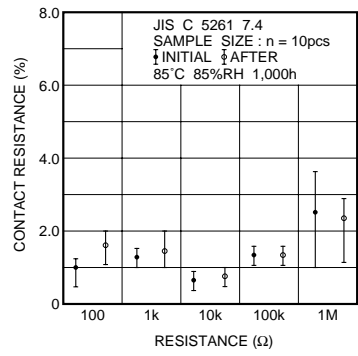


Fig.12 Endurance (Under load in damp environment)

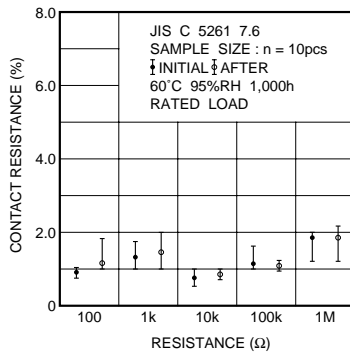
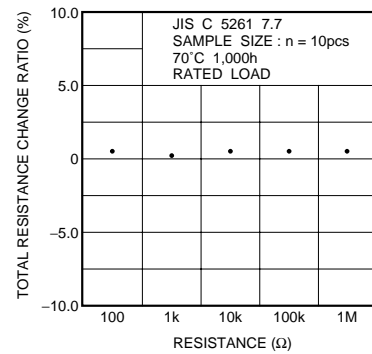


Fig.13-1 Endurance (rated load)



Resistors

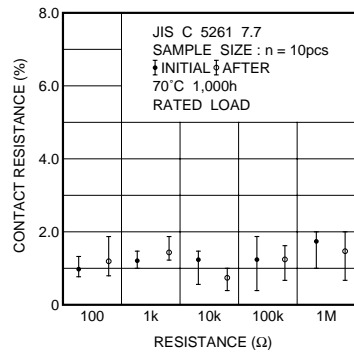


Fig.13-2 Endurance (rated load)

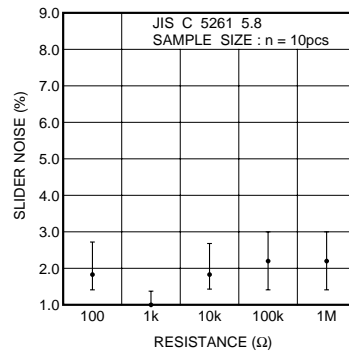


Fig.14 Wiper noise