

信 頼 性 試 験 デ ー タ

RELIABILITY TEST DATA

品名	メタルグレース皮膜半固定可変抵抗器
Product Name	VARIABLE RESISTOR
形番	NVGF6 series
Model No.	
管理No.	DS-1219
Control No.	

北 陸 電 気 工 業 株 式 会 社
コ ン ポ ー ネ ント 事 業 本 部
機 構 部 品 工 場
HOKURIKU ELECTRIC INDUSTRY CO., LTD.
COMPONENTS DIVISION
MECHANICAL PARTS FACTORY

本データに記載の内容は予告なく変更する場合がありますので、お問合わせの際には表紙に記載の品名、形番及び管理No. をご連絡戴けますようお願い致します。

The contents of this reliability test data may change without prior notice. For inquiries, please refer product name, model No., and control No. written in the cover sheet of this reliability test data.

研 究 調 査 仕 様 書		仕 様 No. PKS-E 0486													
(対象客先・形名・品名・試験名など)															
題名:															
NVGF6															
信頼性試験仕様書 Reliability Test Specifications															
項 目	内 容														
(目的、試料、試験 (項目・手順・条件) の順で記載する)															
1 目的 Purpose	1-1) 標記VRの信頼性について調査する。 Investigation of the reliability test of NVGF6 series														
2 試料 Item	2-1) NVGF6TLTA B 100 Ω ↑ B 10 kΩ ↑ B 100 kΩ ↑ B 1 MΩ * NVGF6TLTAは、NVGF6シリーズの代表である。 "NVGF6TLTA" is a representative of the "NVGF6 series".														
3 試験 Test method	3-1) 抵抗温度係数 Temperature Coefficient (T.C.R.) 下記の温度条件にて測定する。(初期 Initial→試験後 After) The trimmer potentiometer shall be maintained in a thermostatic chamber at a temperature, according to the table as shown below.														
	<table border="1"> <thead> <tr> <th>段階 Step</th> <th>温度[°C] Temperature</th> </tr> </thead> <tbody> <tr> <td>初期値 Initial</td> <td>+25±2</td> </tr> <tr> <td>1</td> <td>-40±3</td> </tr> <tr> <td>2</td> <td>+25±2</td> </tr> <tr> <td>3</td> <td>+100±3</td> </tr> </tbody> </table>					段階 Step	温度[°C] Temperature	初期値 Initial	+25±2	1	-40±3	2	+25±2	3	+100±3
段階 Step	温度[°C] Temperature														
初期値 Initial	+25±2														
1	-40±3														
2	+25±2														
3	+100±3														
	所定の温度に達してから、30 min~45 min 放置し測定する。 The measurement shall be made, after the thermostatic chamber achieved the mark temperature and maintained for 30 min ~ 45min. 規格 : ±250ppm Specification : ±250ppm.														
	3-2) 耐振性 Vibration 掃引の割合 (10 Hz~55 Hz~10 Hz)/min, 全振幅1.5 mm、X、Y、Z方向に各2 h。 (初期 Initial → 試験後 After) The entire frequency range, from 10 Hz to 55 Hz and return to 10 Hz, shall be transverse in 1 min. Amplitude (total excursion): 1.5 mm This motion shall be applied for a period of 2 h in each of 3 mutually perpendicular directions. (A total of 6 h) 規格 : 端子1-2間抵抗値変化が初期値に対して±2%以内 Specification : Change in resistance between 1 and 2 is relative to the value before test within ±2%.														

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項 目	内 容		
3 試験 Test method	3-3) はんだ耐熱性 Resistance to Soldering Heat <u>ディップ条件 Resistance to Soldering Heat(Dip)</u> (初期 Initial→試験後 After) Mounted on a 1.6mm thick printed circuit board, the trimmer potentiometer is immersed in a pot of molten solder at $260^{\circ}\text{C}\pm 5^{\circ}\text{C}$ for $10\text{s}\pm 1\text{s}$. Then the trimmer potentiometer shall be subjected to standard atmospheric conditions for 1h-2h, after which measurements shall be made. 温度 : $260^{\circ}\text{C}\pm 5^{\circ}\text{C}$ 時間 : $10\text{s}\pm 1\text{s}$ 浸漬深さ : 基板面まで 規格 : 全抵抗値の変化が初期値に対して$\pm 2\%$以内 Specification : Change in total resistance is relative to the value before test within $\pm 2\%$. 3-4) 耐熱性 High Temperature Storage 温度 $70^{\circ}\text{C}\pm 2^{\circ}\text{C}$ の恒温槽中にて $1\,000\text{ h}\pm 12\text{ h}$ 放置し、取り出して常温常湿中に $1\text{ h}\sim 2\text{ h}$ 放置し測定する。(0→250→500→1000h) The trimmer potentiometer shall be subjected in a thermostatic chamber at a temperature of $70^{\circ}\text{C}\pm 2^{\circ}\text{C}$ without electrical load for $1\,000\text{ h}\pm 12\text{ h}$. Then the trimmer potentiometer shall be taken out from the chamber and maintained at standard atmospheric conditions for $1\text{ h}\sim 2\text{ h}$, after which measurements shall be made. 規格 : 全抵抗値の変化は初期値に対して$\pm 5\%$以内 Specification : Change in total resistance is relative to the value before test within $\pm 5\%$. 3-5) 負荷耐久性 Load Life 温度 $70^{\circ}\text{C}\pm 2^{\circ}\text{C}$ の恒温槽中で定格直流電圧を端子1-3間に1.5 h 加え、0.5 h 切るサイクルを $1\,000\text{ h}\pm 12\text{ h}$ 繰り返し、取り出し常温常湿中に無負荷で $1\text{ h}\sim 2\text{ h}$ 放置後測定する。(0→250→500→1000h) The trimmer potentiometer shall be subjected in a thermostatic chamber at a temperature of $70^{\circ}\text{C}\pm 2^{\circ}\text{C}$ with a DC rated voltage for 1.5 h between terminals 1 and 3 followed by a pause of 30 min for $1\,000\text{ h}\pm 12\text{ h}$. Then the trimmer potentiometer shall be taken out from the chamber and maintained at standard atmospheric conditions for $1\text{ h}\sim 2\text{ h}$ without electrical load, after which measurements shall be made. 規格 : 全抵抗値の変化は初期値に対して$\pm 5\%$以内 Specification : Change in total resistance is relative to the value before test within $\pm 5\%$.		

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3 試験 Test method	3-6) 温度サイクル耐久性 Temperature Cycle 下表に示した温度サイクル中で放置を連続5回行う。その後、常温常湿中に1 h~2 h放置後測定する。(初期 Initial→試験後 After) The trimmer potentiometer shall be subjected in a thermostatic chamber at 5 successive changes of temperature cycles, each as shown in table below. Then the trimmer potentiometer shall be taken out from the chamber and maintained at standard atmospheric conditions for 1 h ~ 2 h, after which measurements shall be made.																
	<table><tr><th>段階 Step</th><th>温度[°C] Temperature</th><th>時間[min] Duration</th></tr><tr><td>1</td><td>-25±3</td><td>30</td></tr><tr><td>2</td><td>常温 Standard atmospheric conditions</td><td>10~15</td></tr><tr><td>3</td><td>+100±2</td><td>30</td></tr><tr><td>4</td><td>常温 Standard atmospheric conditions</td><td>10~15</td></tr></table> 規格：全抵抗値の変化は初期値に対して±2%以内 Specification: Change in total resistance is relative to the value before test within ±2%.			段階 Step	温度[°C] Temperature	時間[min] Duration	1	-25±3	30	2	常温 Standard atmospheric conditions	10~15	3	+100±2	30	4	常温 Standard atmospheric conditions
段階 Step	温度[°C] Temperature	時間[min] Duration															
1	-25±3	30															
2	常温 Standard atmospheric conditions	10~15															
3	+100±2	30															
4	常温 Standard atmospheric conditions	10~15															
	3-7) 耐湿性 Humidity 温度40 °C±2 °C, 相対湿度90 %~95 %の恒温恒湿槽中に無負荷で1 000 h±12 h放置し、取り出し表面の水分をふきとり常温常湿中に1 h~2 h放置後測定する。(0→250→500→1000h) The trimmer potentiometer shall be subjected in a thermostatic chamber at a temperature of 40 °C±2 °C with relative humidity of 90% to 95% without electrical load for 1 000 h±12 h. Then the trimmer potentiometer shall be taken out from the chamber and its surface moisture shall be removed. And then the trimmer potentiometer shall be maintained at standard atmospheric conditions for 1 h ~ 2 h, after which measurement shall be made. 規格：全抵抗値の変化は初期値に対して±5%以内 Specification: Change in total resistance is relative to the value before test within ±5%.																

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3 試験 Test method	3-8) 耐湿負荷耐久性 Humidity Load Life 温度40℃±2℃, 相対湿度90%~95%の恒温恒湿槽中で定格直流電圧を端子1-3間に1.5 h加え、0.5 h切るサイクルを1 000 h±12 h繰り返し、取り出し表面の水分をふきとり常温常湿中に無負荷で1 h~2 h放置後測定する。 (0→250→500→1000h) The trimmer potentiometer shall be subjected in a thermostatic chamber at a temperature of 40℃±2℃ and a relative humidity of 90% to 95% with a DC rated voltage for 1.5 hours between terminals 1 and 3 followed by a pause of 30 minutes for 1 000 h ±12 h. Then the trimmer potentiometer shall be taken out from the chamber and its surface moisture shall be removed. And then the trimmer potentiometer shall be maintained at standard atmospheric conditions for 1 h ~ 2 h without electrical load, after which measurement shall be made. 規格：全抵抗値の変化は初期値に対して±5%以内 Specification: Change in total resistance is relative to the value before test within ±5%.		
	3-9) 動作耐久性 Rotational Life 無負荷で軸を10 min ⁻¹ (1往復を1回とする)の速さで全回転角度の90%以上にわたり50 回転±2 回転させる。(初期 Initial→試験後 After) The moving contact shall be rotated without electrical load for 50 cycles±2 cycles at a rate of 10 min ⁻¹ . (A cycle of operation is defined as the travel of the moving contact from one end of the resistance element to the other and back through 90% of the total mechanical rotation.) 規格：全抵抗値の変化は初期値に対して±10%以内 Specification: Change in total resistance is relative to the value before test within ±10%.		
	3-10) 耐硫化性 Resistance to Sulfur Atmosphere 硫化濃度5ppm±1ppmの硫化水素(H ₂ S)ガス雰囲気中に無負荷で500h±12h放置し、取り出し常温常湿の室内に1h~2h放置後測定する。 The trimmer potentiometer shall be subjected in a sulfur atmospheric chamber at a sulfur concentration of 5ppm±1ppm(H ₂ S) without electrical load for 500h±12h. Then the trimmer potentiometer shall be taken out of the chamber and maintained at standard atmospheric conditions for 1~2h, after which measurements shall be made. 規格 Specifications		

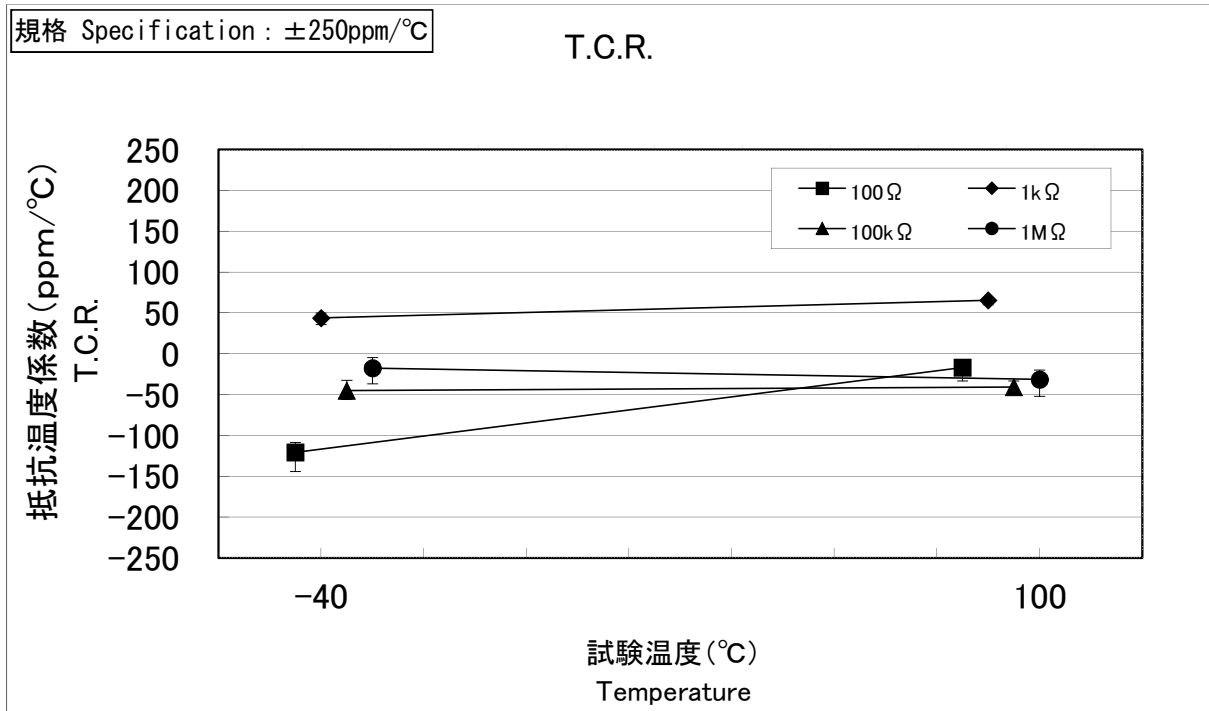
全抵抗 Total Resistance	初期値の10%以内 Change is relative to the value before test. Within ±10%	
残留抵抗値 Residual Resistance	1kΩ未満 Less than 1 kΩ	30Ω以下 30 Ω or less
	1kΩ~100kΩ	公称全抵抗値の1.5%以下 1.5% or less of nominal total resistance.
	100kΩ~	公称全抵抗値の6%以下 6% or less of nominal total resistance.
集中接触抵抗 Contact Resistance	公称全抵抗値の8%以下 8% or less of nominal total resistance.	

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項 目	内 容		
4 測定項目 Measurement	4-1) T. C. R...3-1) 4-2) 1-3間抵抗値 Total resistance 4-3) 1-2間抵抗値 between 1 and 2 resistance 4-4) 2-3間抵抗値 between 2 and 3 resistance		
5 算出項目 Calculation	5-1) 1-3間抵抗値変化率 Total resistance change...3-3) ~3-10) 5-2) 集中接触抵抗 contact resistance...3-2) ~3-8)、3-10) 5-3) 1-2間抵抗値変化率 between 1 and 2 resistance change...3-2)		

NVGF6

[抵抗温度係数 T.C.R.]

1. 抵抗温度係数 T.C.R.

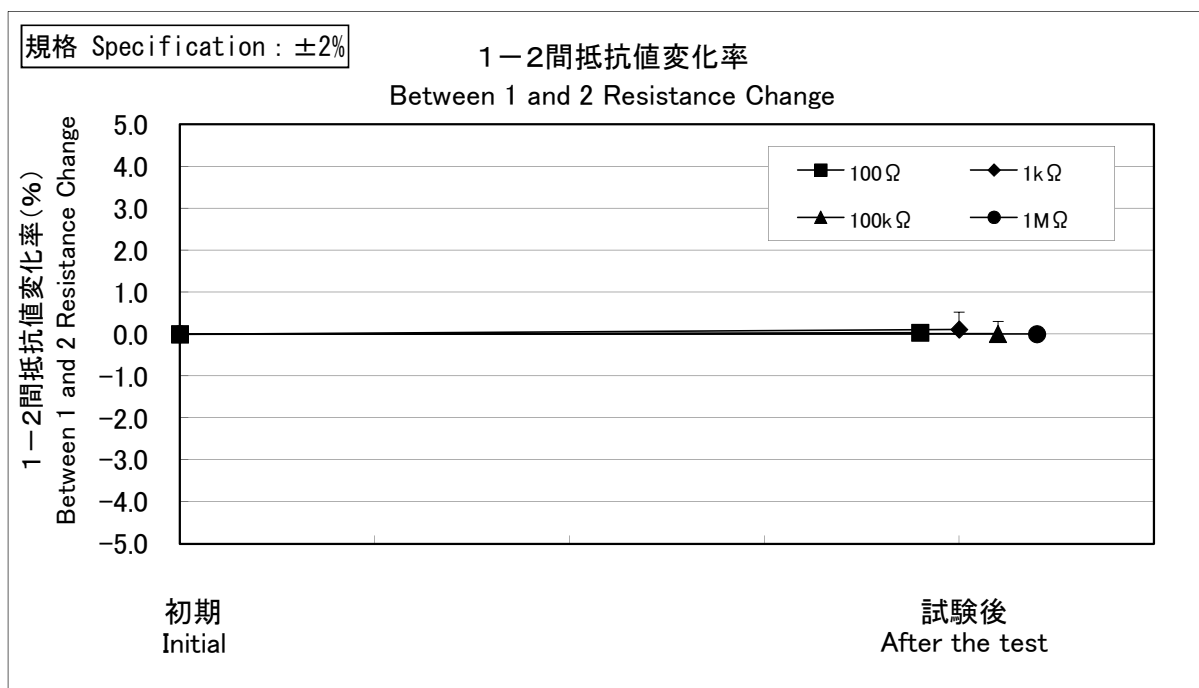


NVGF6

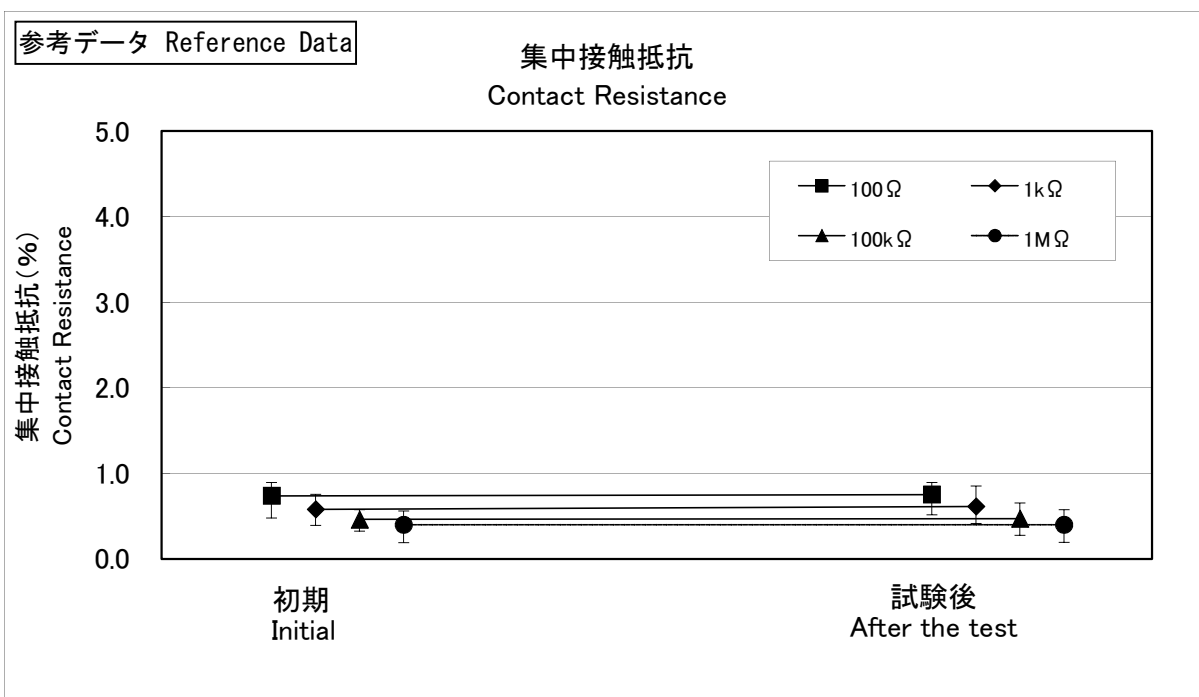
〔耐振性 Vibration〕

1. 1－2間抵抗値変化率

Between 1 and 2 Resistance Change



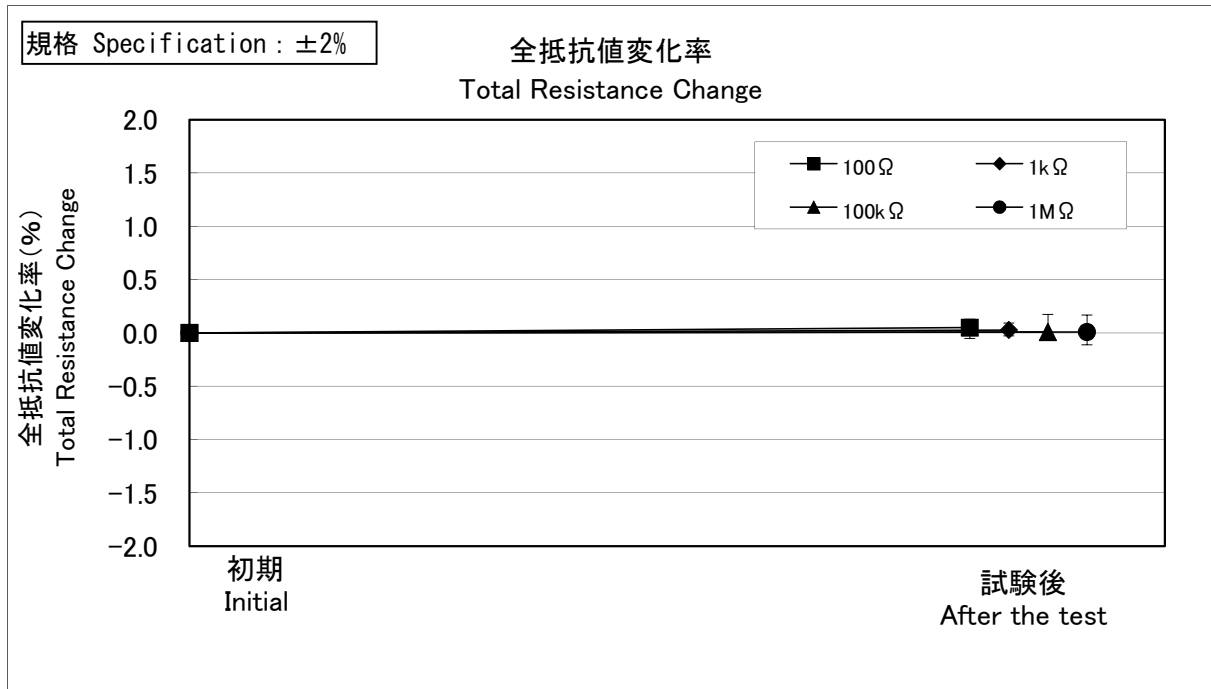
2. 集中接触抵抗 Contact Resistance



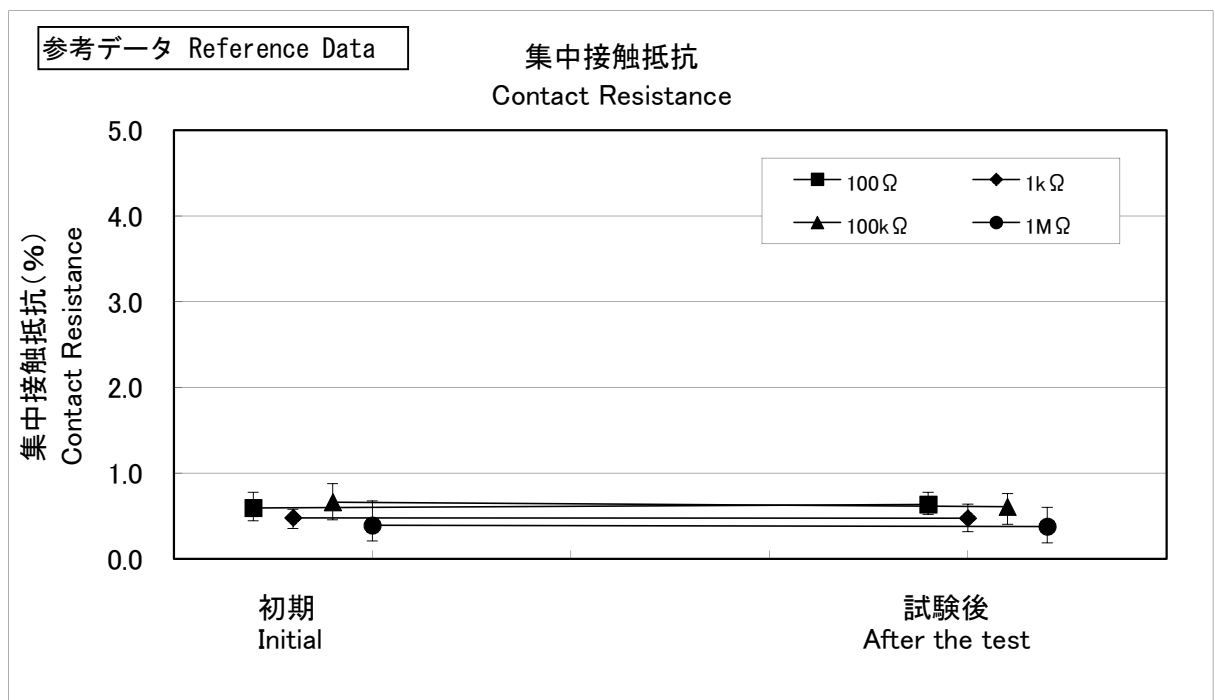
NVGF6

〔はんだ耐熱性(ディップ) Resistance to Soldering Heat(Dip)〕

1. 全抵抗値変化率 Total Resistance Change



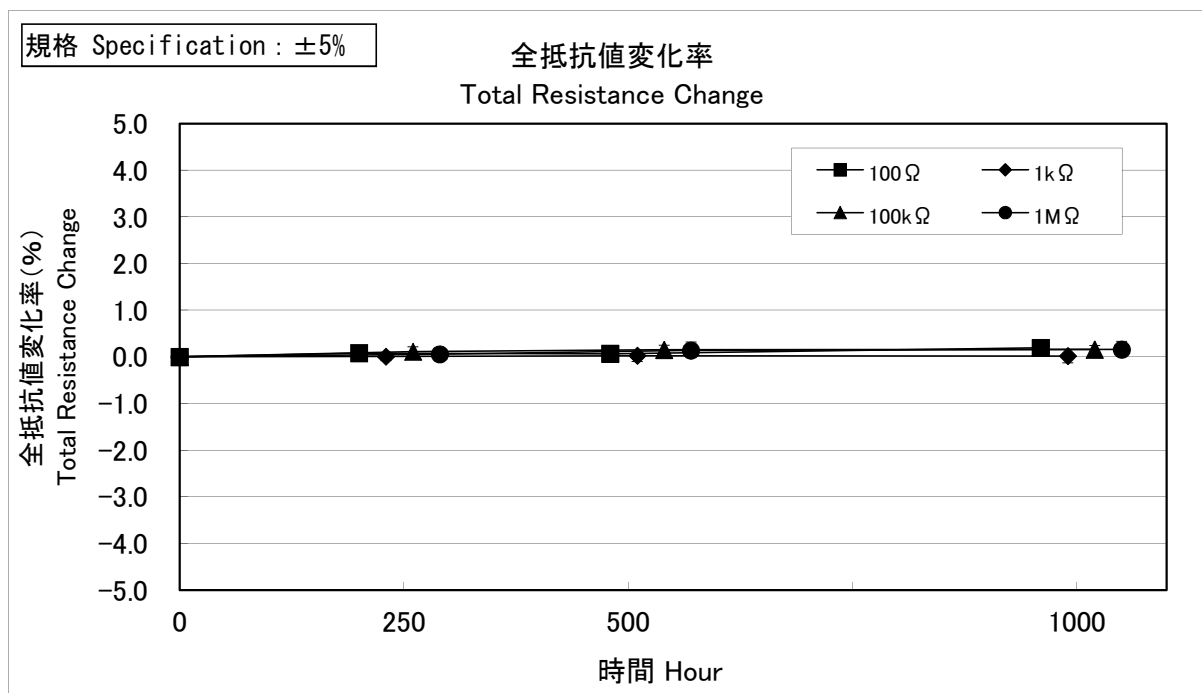
2. 集中接触抵抗 Contact Resistance



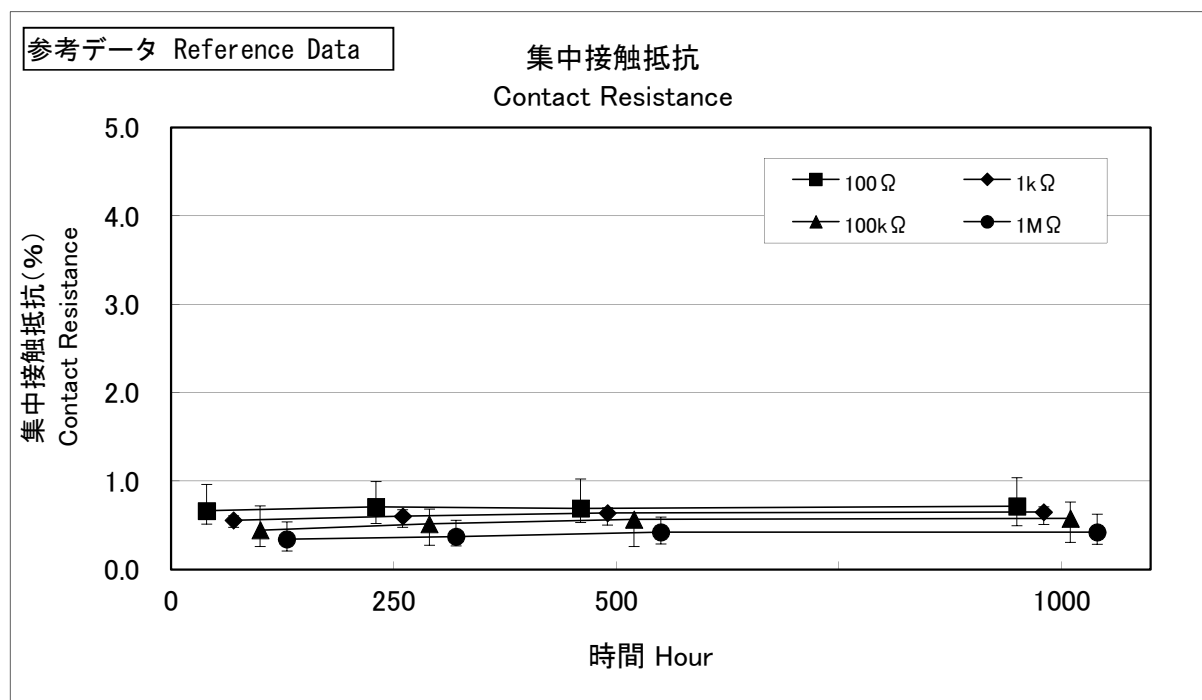
NVGF6

〔耐熱性 High Temperature Strage〕

1. 全抵抗値変化率 Total Resistance Change



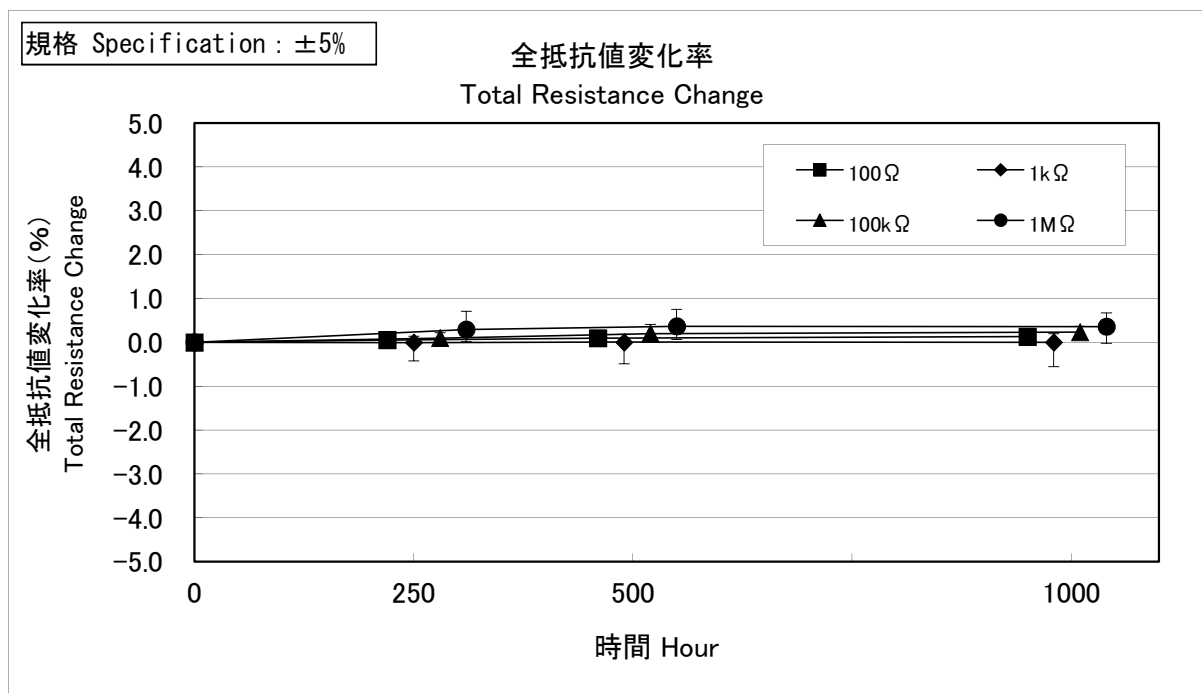
2. 集中接触抵抗 Contact Resistance



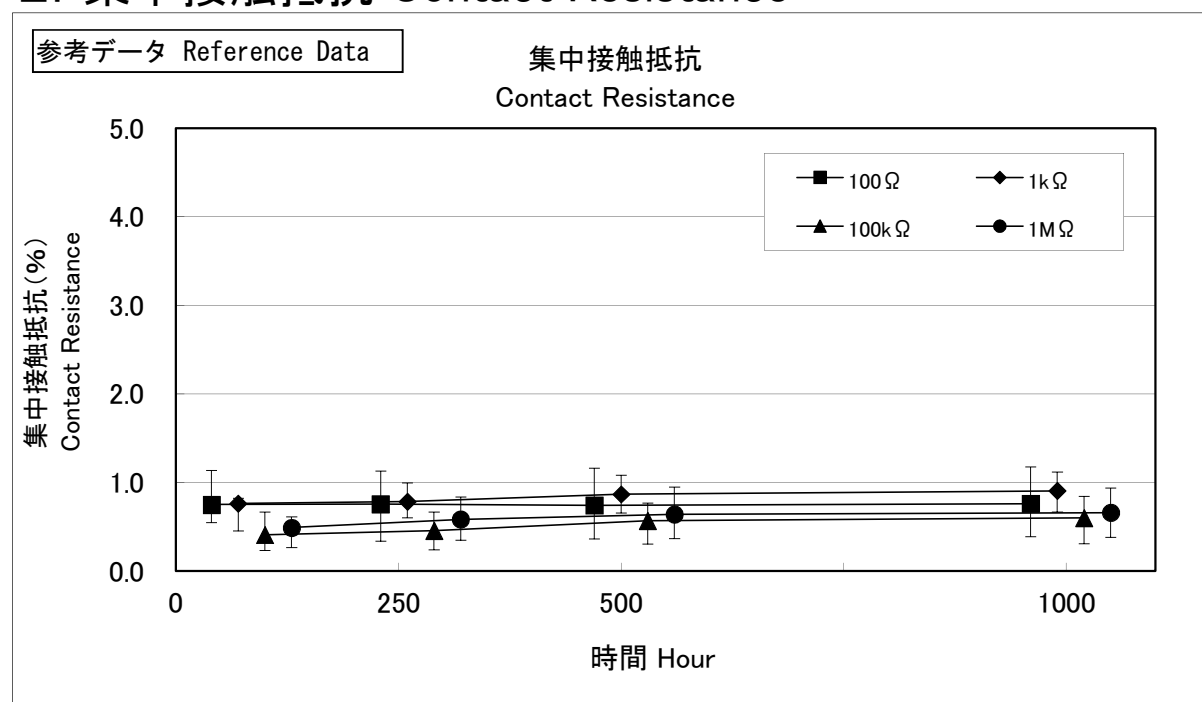
NVGF6

〔負荷耐久性 Load Life〕

1. 全抵抗値変化率 Total Resistance Change



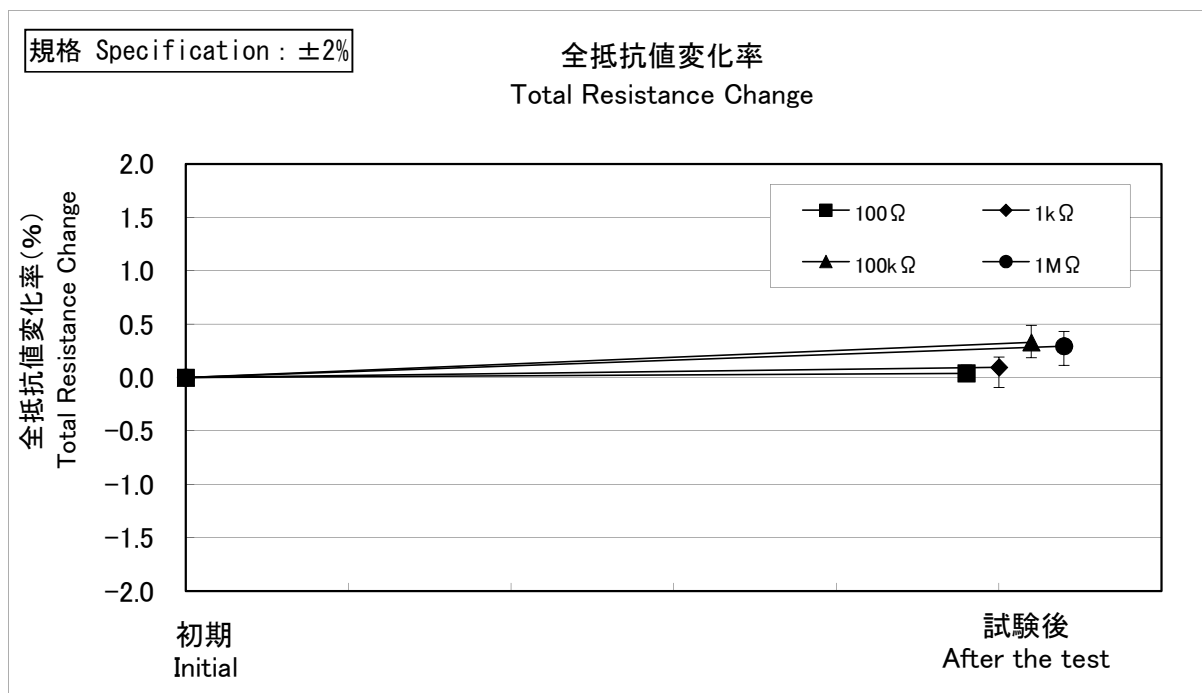
2. 集中接触抵抗 Contact Resistance



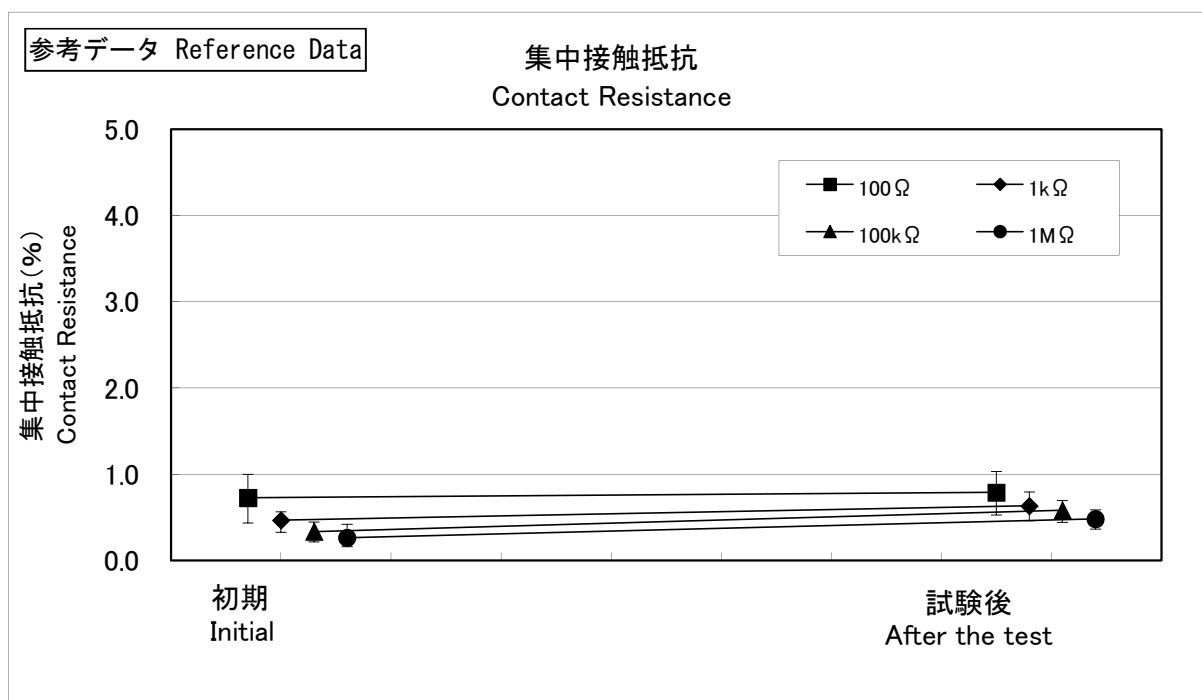
NVGF6

〔温度サイクル耐久性 Temperature Cycle〕

1. 全抵抗値変化率 Total Resistance Change



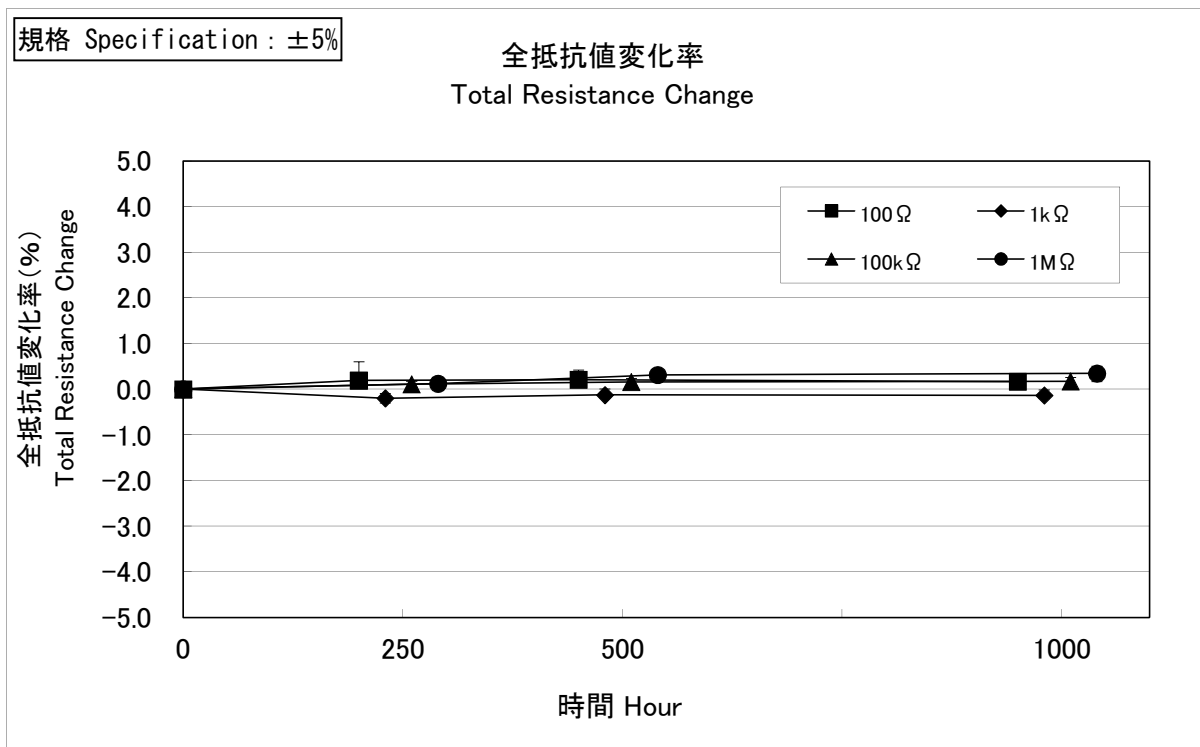
2. 集中接触抵抗 Contact Resistance



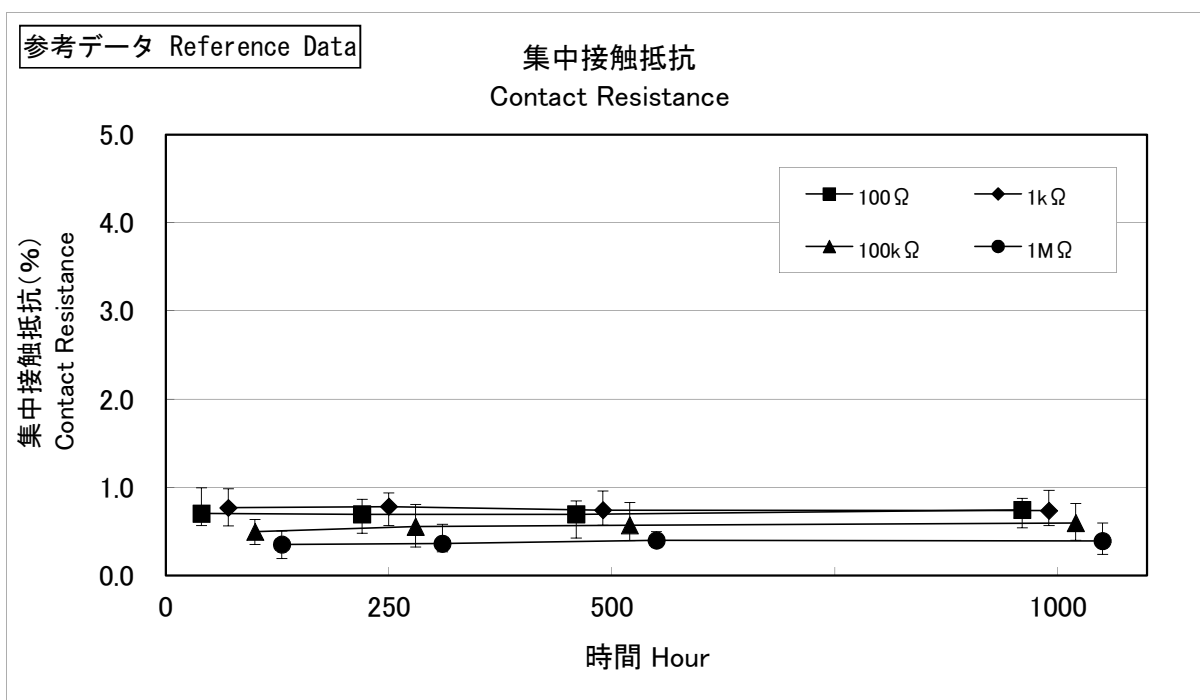
NVGF6

〔耐湿性 Humidity〕

1. 全抵抗値変化率 Total Resistance Change



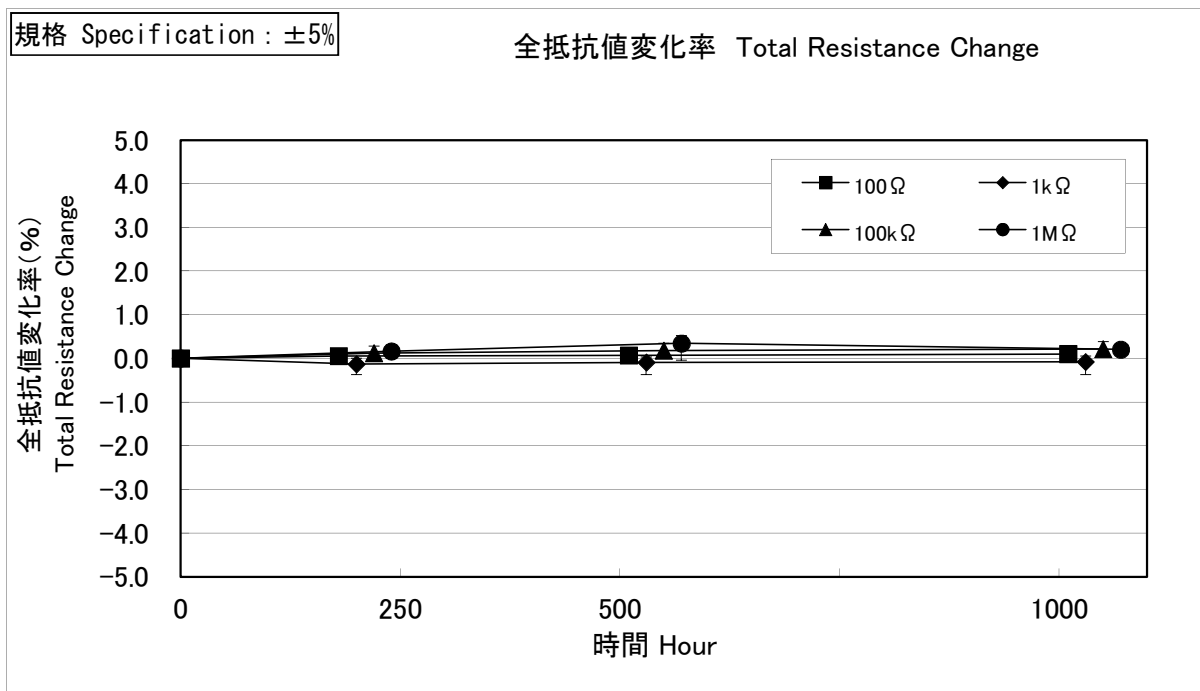
2. 集中接触抵抗 Contact Resistance



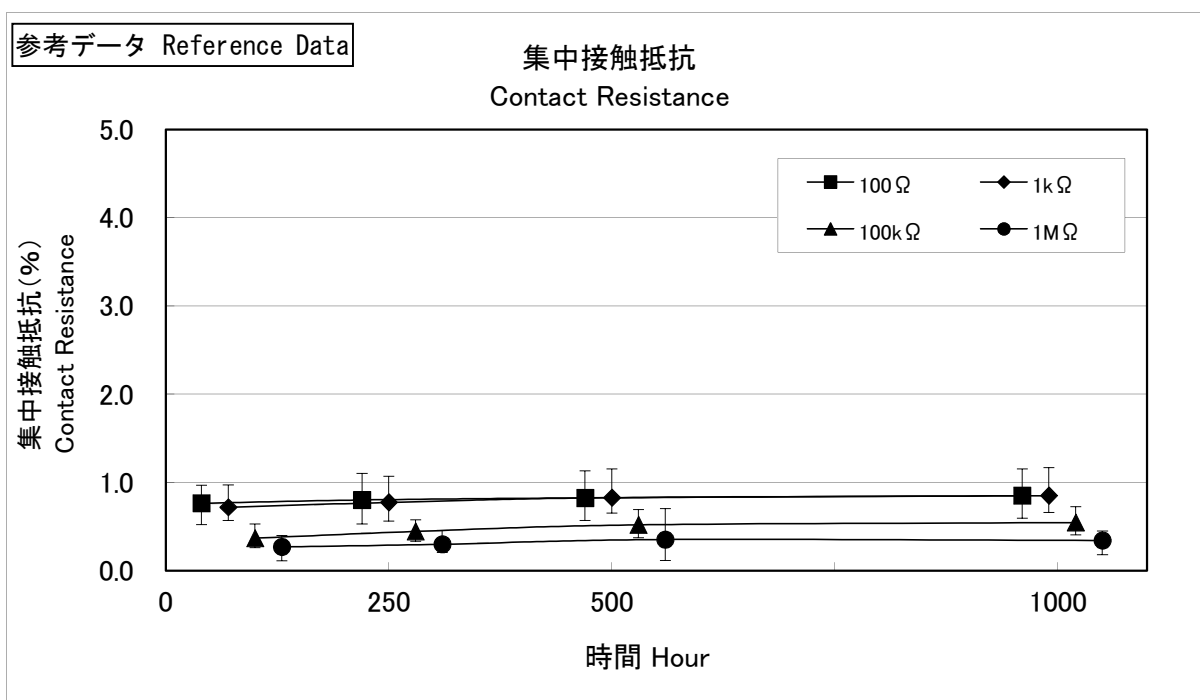
NVGF6

〔耐湿負荷耐久性 Humidity Load Life〕

1. 全抵抗値変化率 Total Resistance Change



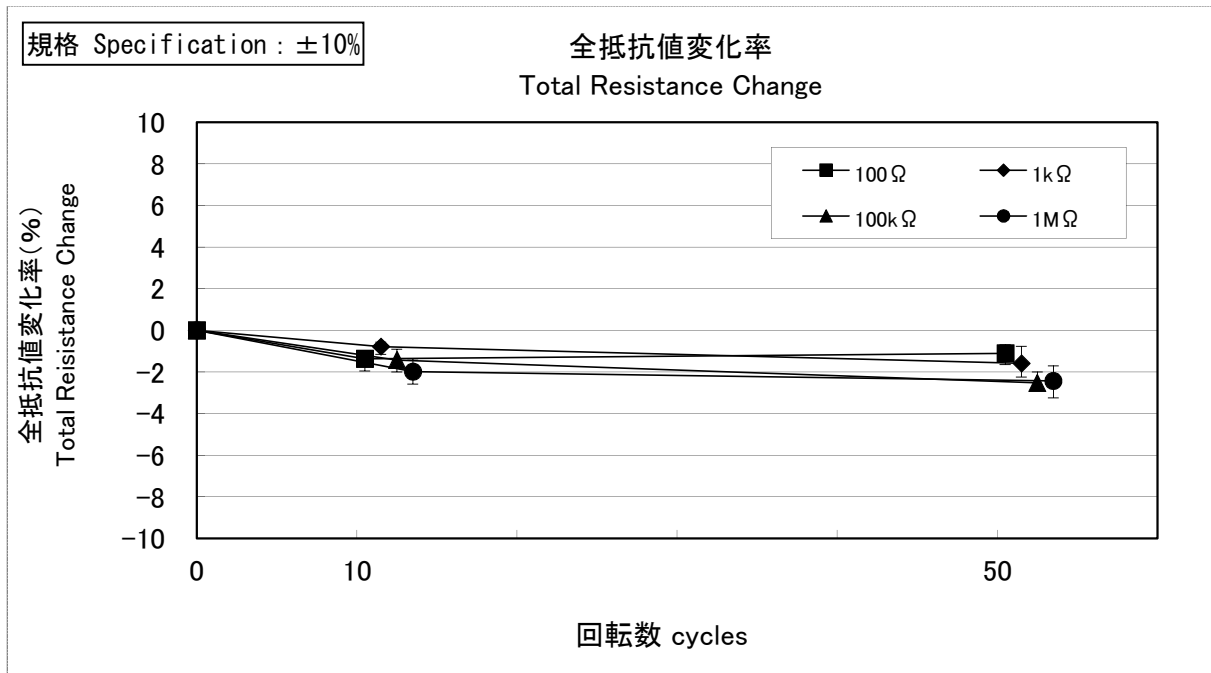
2. 集中接触抵抗 Contact Resistance



NVGF6

〔動作耐久性 Rotational Life〕

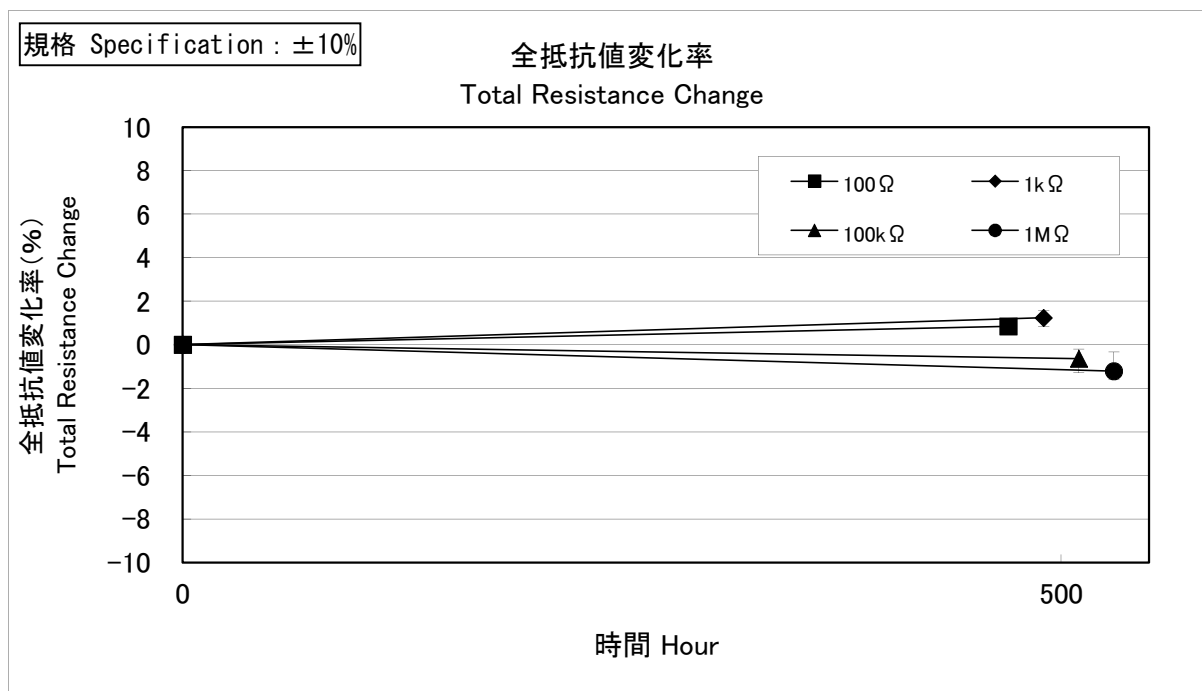
1. 全抵抗値変化率 Total Resistance Change



NVGF6

〔耐硫化性 Sulfurization resistance〕

1. 全抵抗値変化率 Total Resistance Change



2. 集中接触抵抗 Contact Resistance

