

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	VGF39N series
Model No.	
管理No.	DS-1220
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 0492		
(対象客先・形名・品名・試験名など)			
題名:			
VG F39N			
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) の順に記載する)													
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 VGF39N series											
2 試料 Item	2-1)	VGF39NCHXT B 100 Ω ↑ B 10 kΩ ↑ B 1 MΩ * VGF39NCHXTをVGF39Nシリーズの代表とする。 VGF39NCHXT is the representation of VGF39N 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	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.
段階 Step	温度 [°C] Temperature												
初期値 Initial	+25±2												
1	-40±3												
2	+25±2												
3	+100±3												
		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±5%以内 Specification : Change in resistance between 1 and 2 is relative to the value before test within ±5%.											

研究調査仕様書	仕様 No. PKS-E 0492
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	<p>3-3) はんだ耐熱性 Resistance to Soldering Heat <u>手はんだ条件 Soldering iron method</u> (初期 Initial→試験後 After) コテ先温度: 400 °C±10°C, 3s +1/-0 s Tip temperature: 400 °C±10 °C. Application time of soldering iron: 3s +1/-0 s.</p> <p>規格: 全抵抗値の変化が初期値に対して±2%以内 著しいガタ及び接触不良を生じないこと Specification: Change in total resistance is relative to the value before test within ±2%. Without distinct looseness or poor contact.</p>
	<p>3-4) はんだ耐熱性 Resistance to Soldering Heat <u>リフロー条件 Re-flow Soldering method</u> (初期 Initial→試験後 After) ピーク: 260°C以内 10秒以内 230°C以上 40秒以内 加熱機は上部加熱付きトンネル炉とし、温度は基板表面温度とする。 Peak temperature Within 260°C 10sec. Application time More than 230°C, whithin 40sec. Heating machine is a tunnel furnace with upper heating. Temperature is the substrate surface temperature.</p> <p>規格: 全抵抗値の変化が初期値に対して±2%以内 Specification: Change in total resistance is relative to the value before test within ±2%. 著しいガタ及び接触不良を生じないこと Without distinct looseness or poor contact.</p>
	<p>3-5) 耐熱性 High Temperature Storage 温度70 °C±2 °Cの恒温槽中にて1 000 h±12 h放置し、取り出して常温常湿中に 1 h~2 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 °C±2 °C without electrical load for 1 000 h±12 h. 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.</p> <p>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%.</p>
	<p>3-6) 負荷耐久性 Load Life 温度70 °C±2 °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 h±12 h繰り返し、取り出し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 70 °C±2 °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 h±12 h. Then the trimmer potentiometer shall be taken out from the chamber and maintained at standard atmospheric conditions for 1 h ~ 2 h without electrical load, after which measurements shall be made.</p> <p>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%.</p>

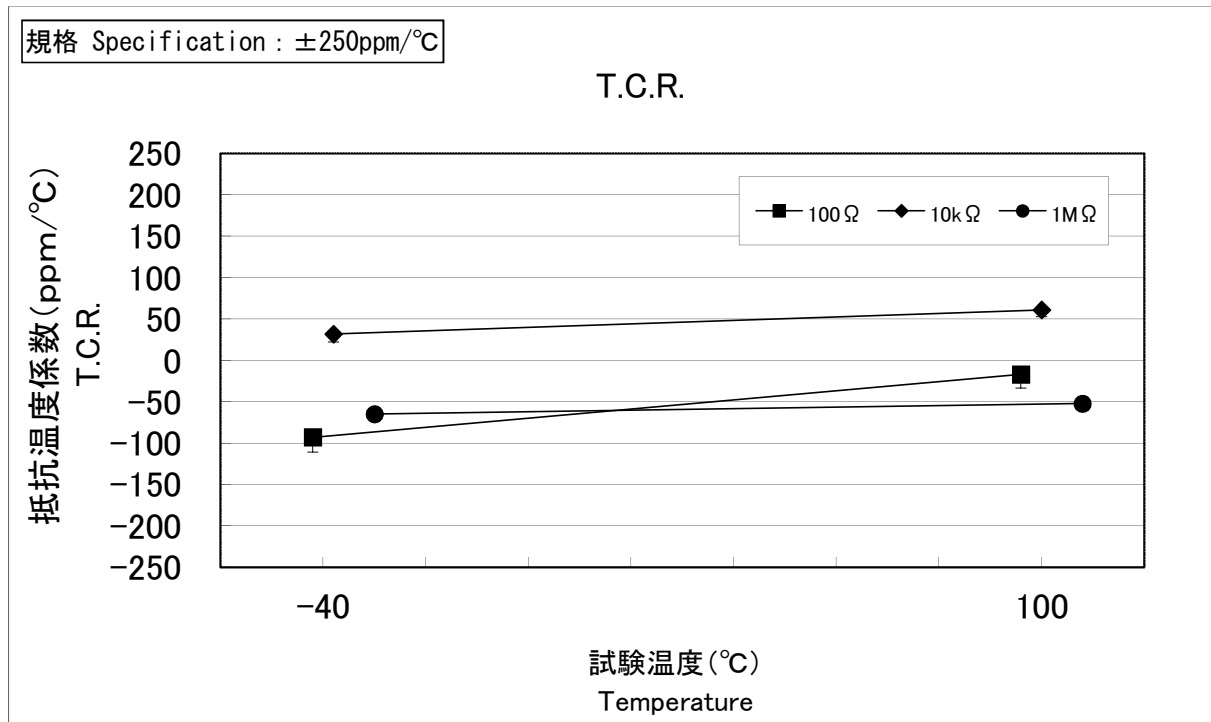
研究調査仕様書		仕様 No.	PKS-E 0492															
項目	内容																	
3-7)	<p>温度サイクル耐久性 Temperature Cycle</p> <p>下表に示した温度サイクル中で放置を連続5回行う。その後、常温常湿中に1 h~2 h放置後測定する。(初期 Initial→試験後 After)</p> <p>The trimmer potentiometer shall be subjected in a thermostatic chamber at 5 successive changes of temperature cycles, each as shown in table below.</p> <p>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.</p> <table border="1"> <thead> <tr> <th>段階 Step</th> <th>温度[°C] Temperature</th> <th>時間[min] Duration</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40±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> </tbody> </table> <p>規格：全抵抗値の変化は初期値に対して±2%以内 著しいガタ及び接触不良を生じないこと Specification: Change in total resistance is relative to the value before test within ±2%. Without distinct looseness or poor contact.</p>			段階 Step	温度[°C] Temperature	時間[min] Duration	1	-40±3	30	2	常温 Standard atmospheric conditions	10~15	3	+100±2	30	4	常温 Standard atmospheric conditions	10~15
段階 Step	温度[°C] Temperature	時間[min] Duration																
1	-40±3	30																
2	常温 Standard atmospheric conditions	10~15																
3	+100±2	30																
4	常温 Standard atmospheric conditions	10~15																
3-8)	<p>耐湿性 Humidity</p> <p>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)</p> <p>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.</p> <p>Then the trimmer potentiometer shall be taken out from the chamber and its surface moisture shall be removed.</p> <p>And then the trimmer potentiometer shall be maintained at standard atmospheric conditions for 1 h ~ 2 h, after which measurement shall be made.</p> <p>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%.</p>																	

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	3-9)	<p>耐湿負荷耐久性 Humidity Load Life</p> <p>温度40 °C±2 °C, 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)</p> <p>The trimmer potentiometer shall be subjected in a thermostatic chamber at a temperature of 40 °C± 2 °C 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.</p> <p>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.</p> <p>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%.</p>	
	3-10)	<p>動作耐久性 Rotational Life</p> <p>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20 回転±2 回転させる。(初期 Initial→試験後 After)</p> <p>The moving contact shall be rotated without electrical load for 20 cycles±2 cycles at a rate of 10 min⁻¹.</p> <p>(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.)</p> <p>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%.</p>	
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)~3-9)
		5-2)	集中接触抵抗 contact resistance...3-2)~3-8)
		5-3)	1-2間抵抗値変化率 between 1 and 2 resistance change...3-2)

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〔抵抗温度係数 T.C.R.〕

1. 抵抗温度係数 T.C.R.

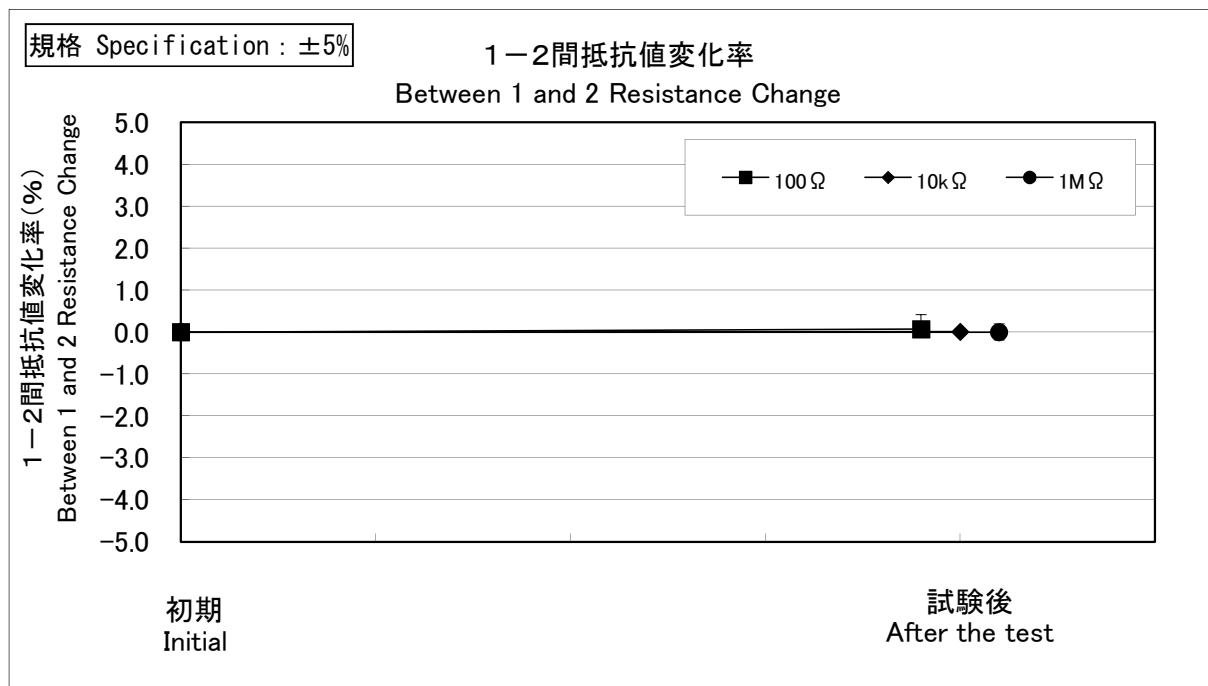


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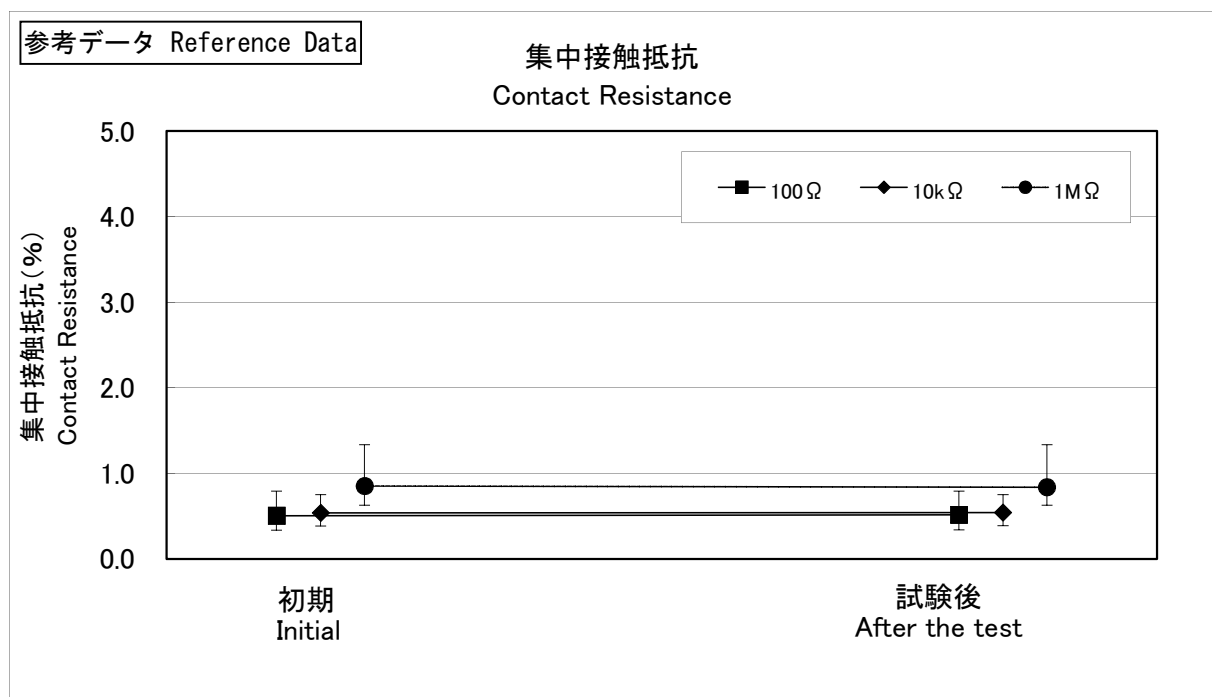
〔耐振性 Vibration〕

1. 1－2間抵抗値変化率

Between 1 and 2 Resistance Change



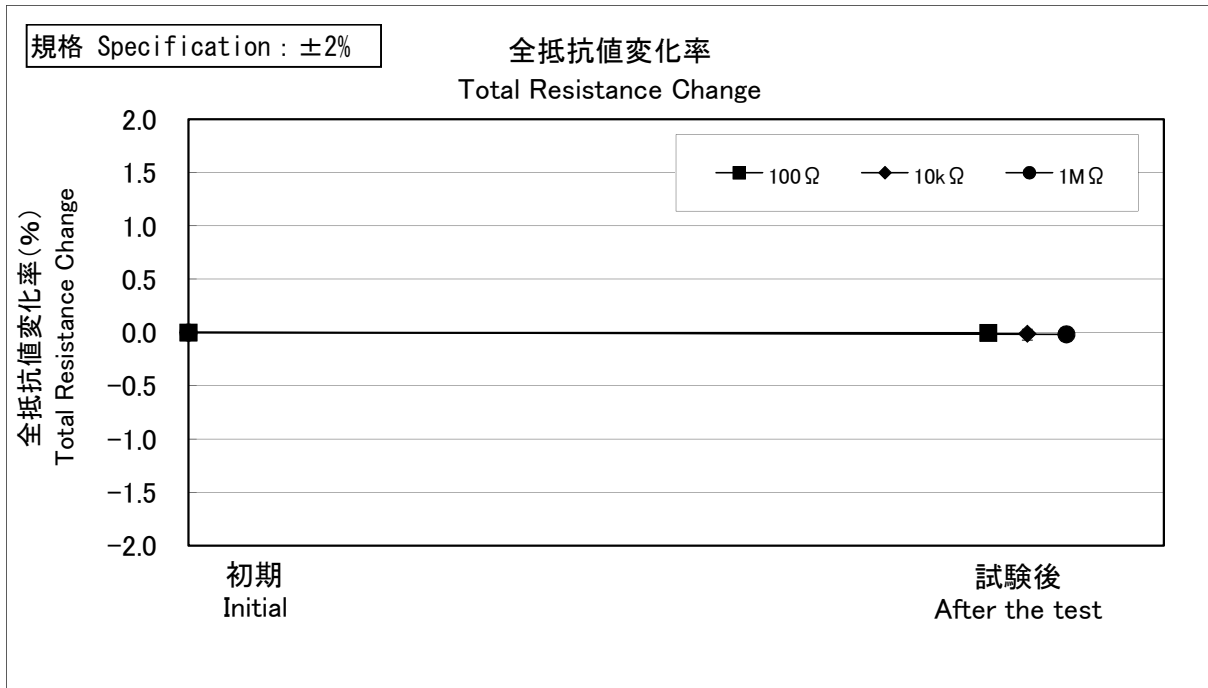
2. 集中接触抵抗 Contact Resistance



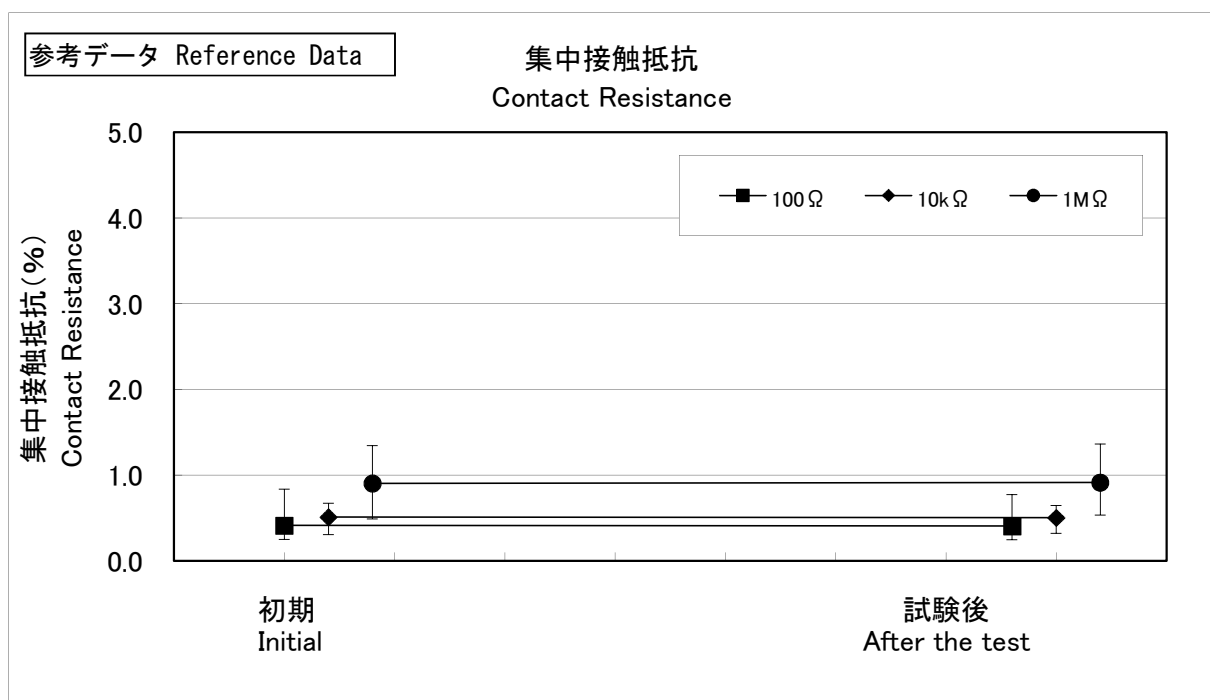
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〔はんだ耐熱性(手はんだ) Resistance to Soldering Heat (Soldering iron)〕

1. 全抵抗値変化率 Total Resistance Change



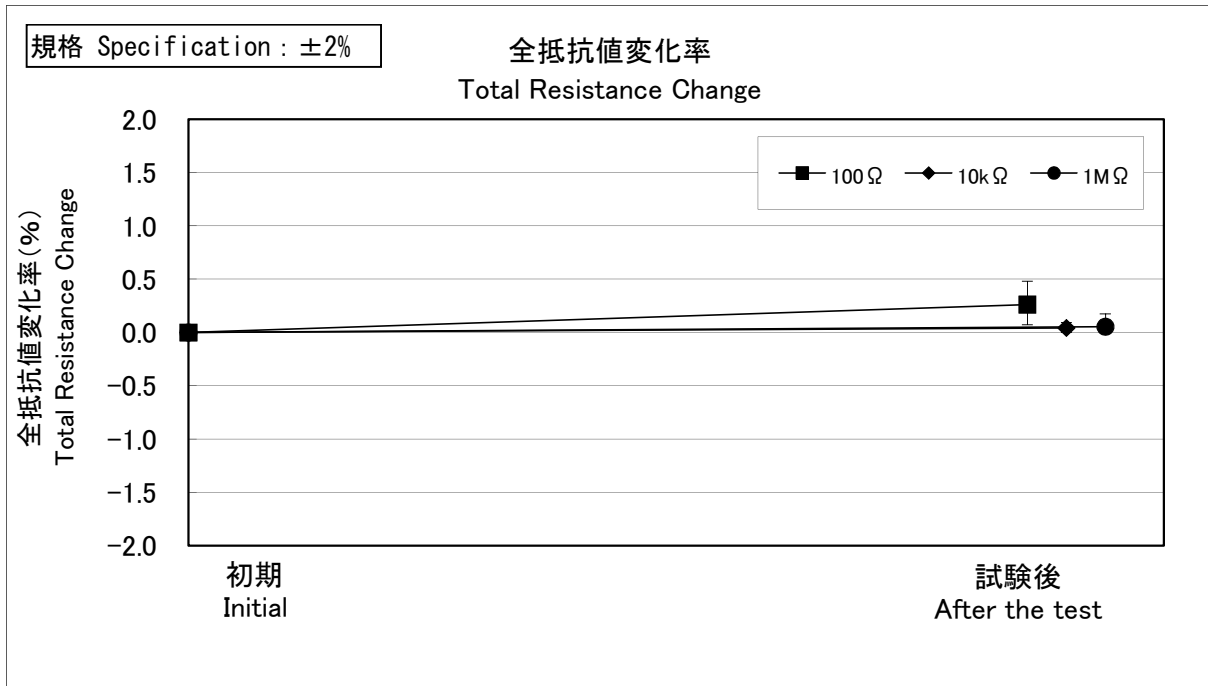
2. 集中接触抵抗 Contact Resistance



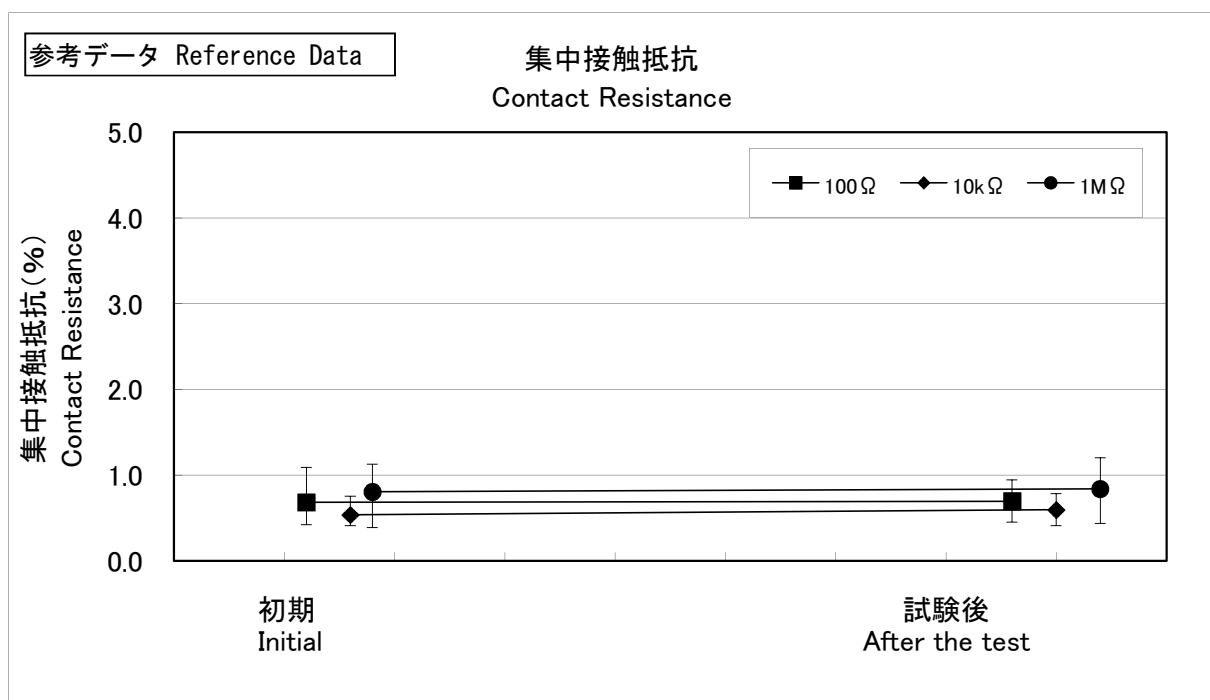
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〔はんだ耐熱性(リフロー) Resistance to Soldering Heat (Re-flow)〕

1. 全抵抗値変化率 Total Resistance Change



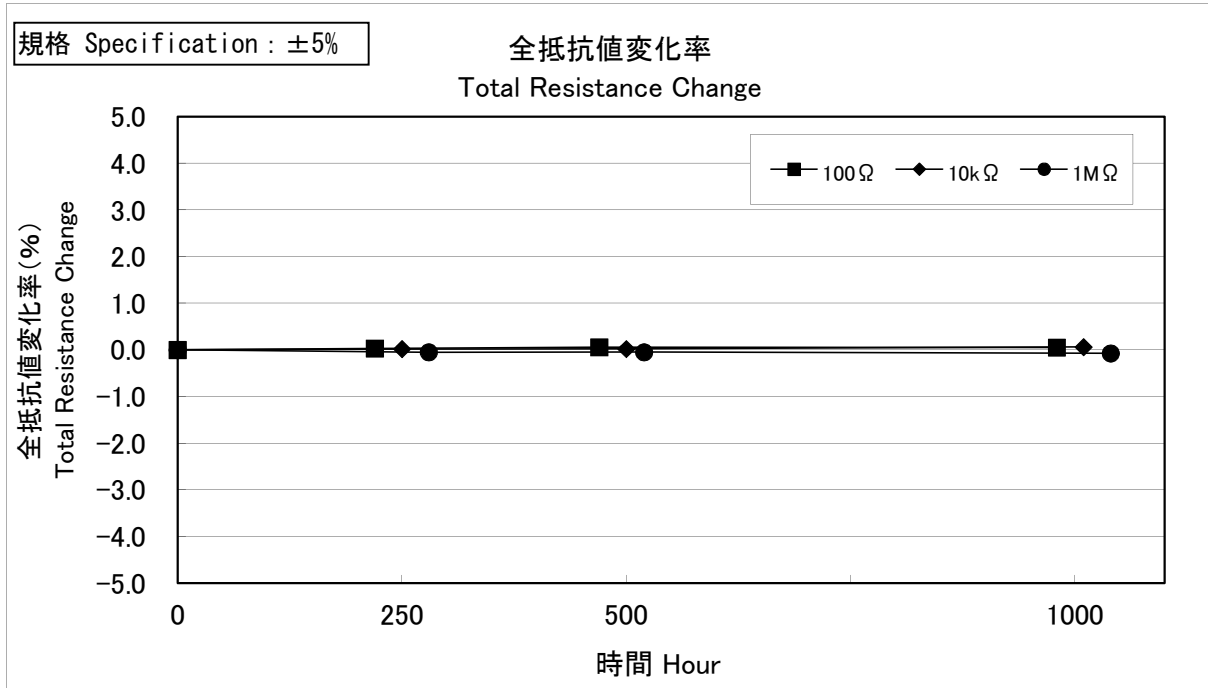
2. 集中接触抵抗 Contact Resistance



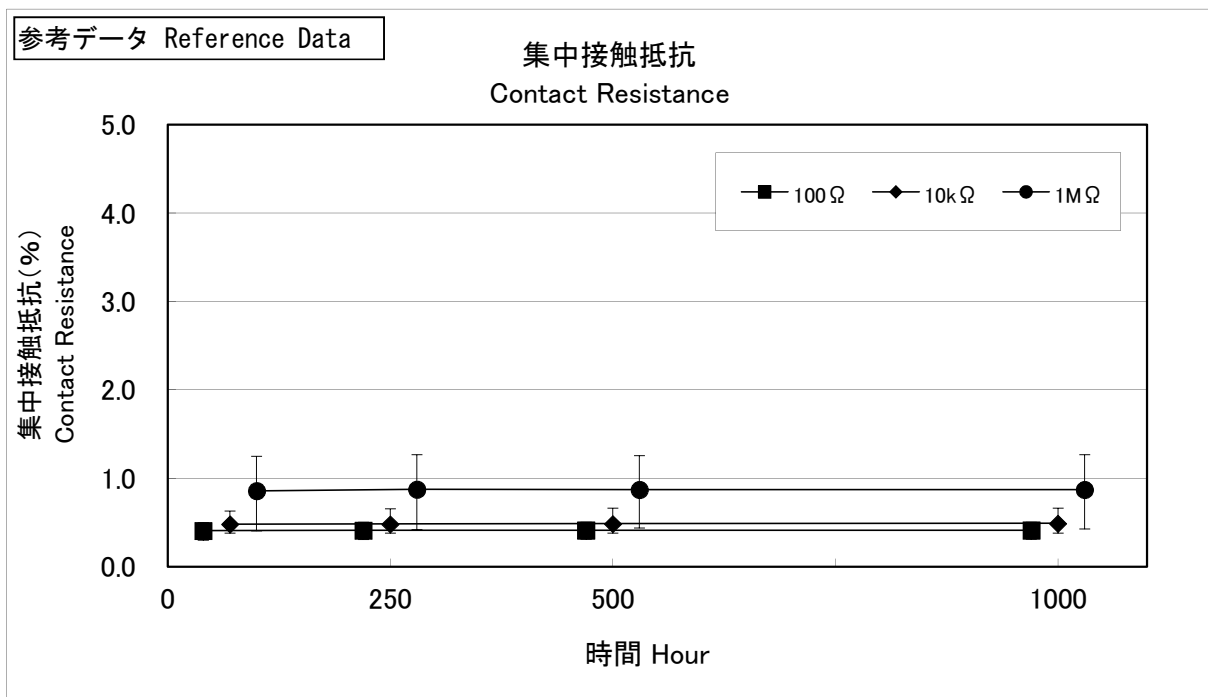
VGF39N

[耐熱性 High Temperature Strage]

1. 全抵抗値変化率 Total Resistance Change



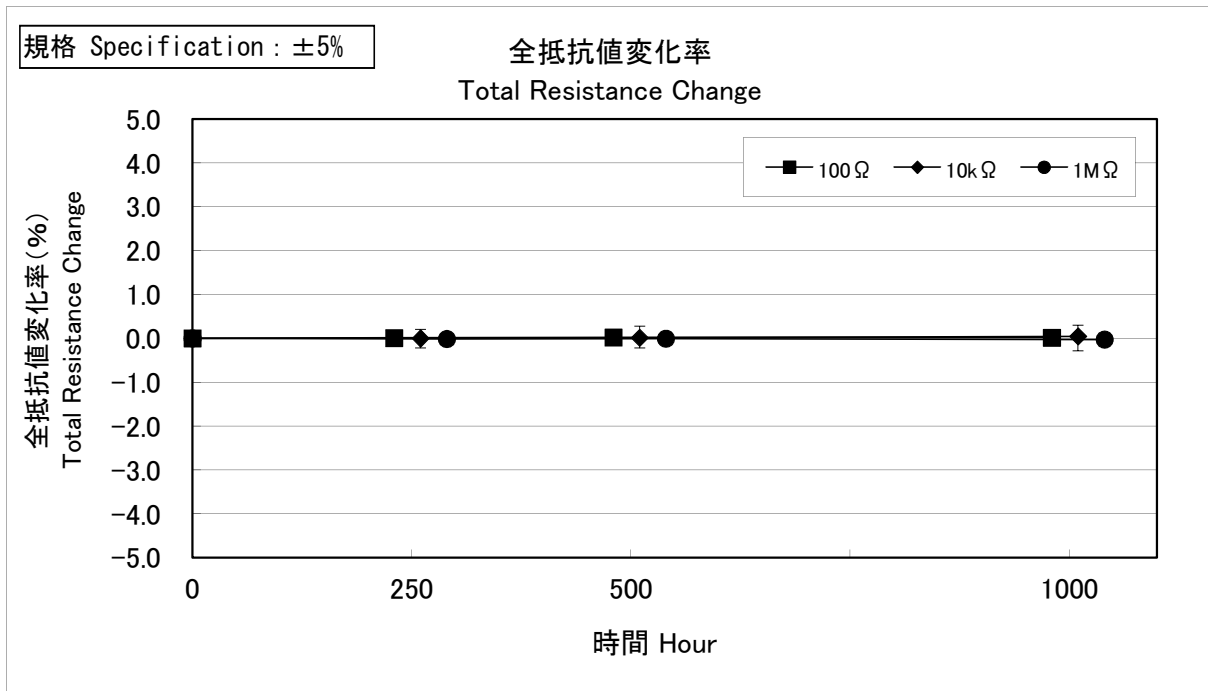
2. 集中接触抵抗 Contact Resistance



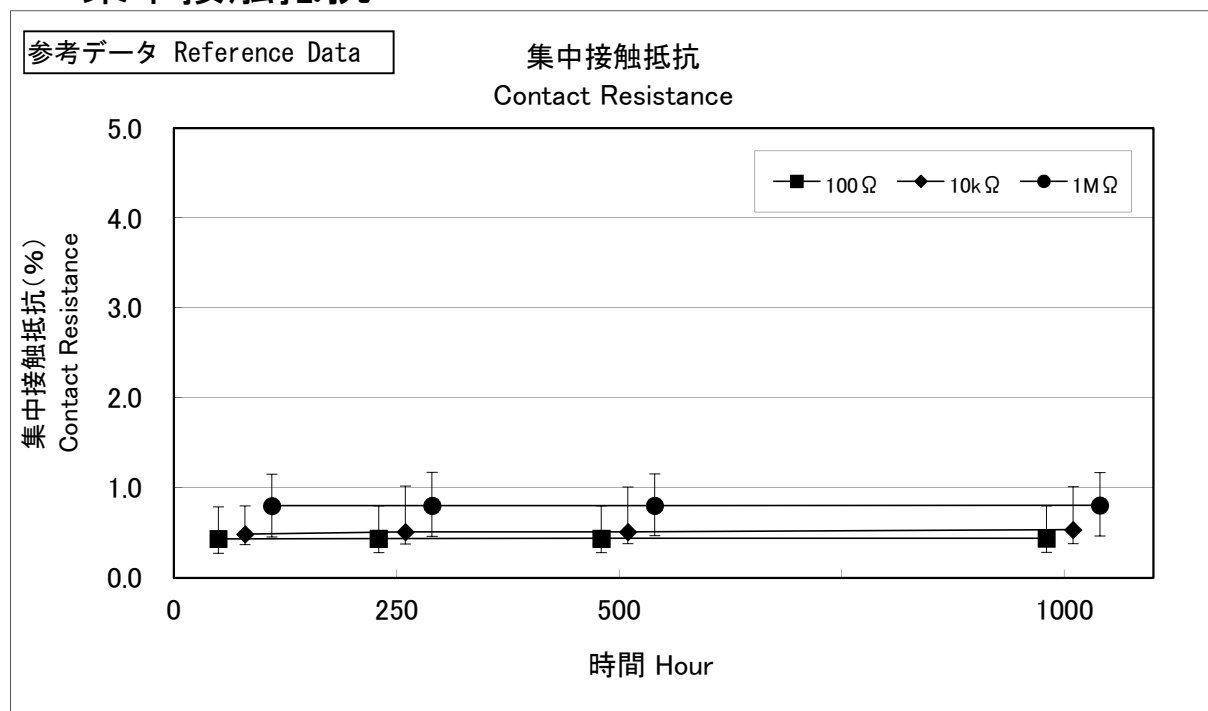
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[負荷耐久性 Load Life]

1. 全抵抗値変化率 Total Resistance Change



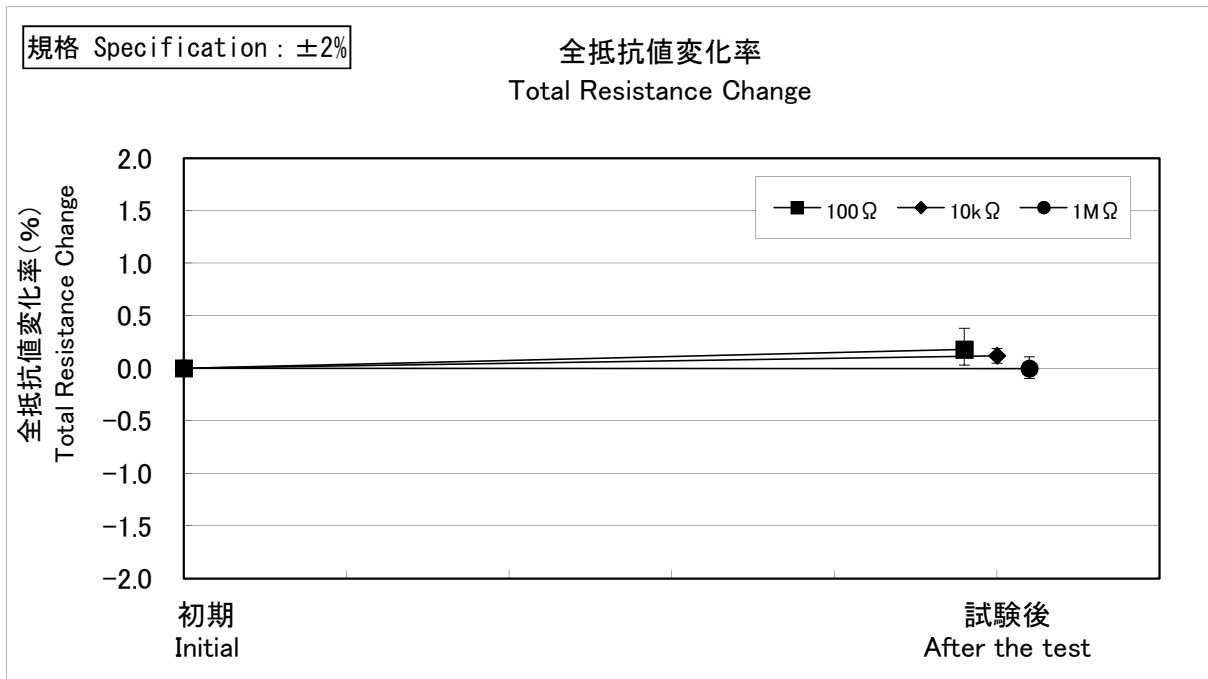
2. 集中接触抵抗 Contact Resistance



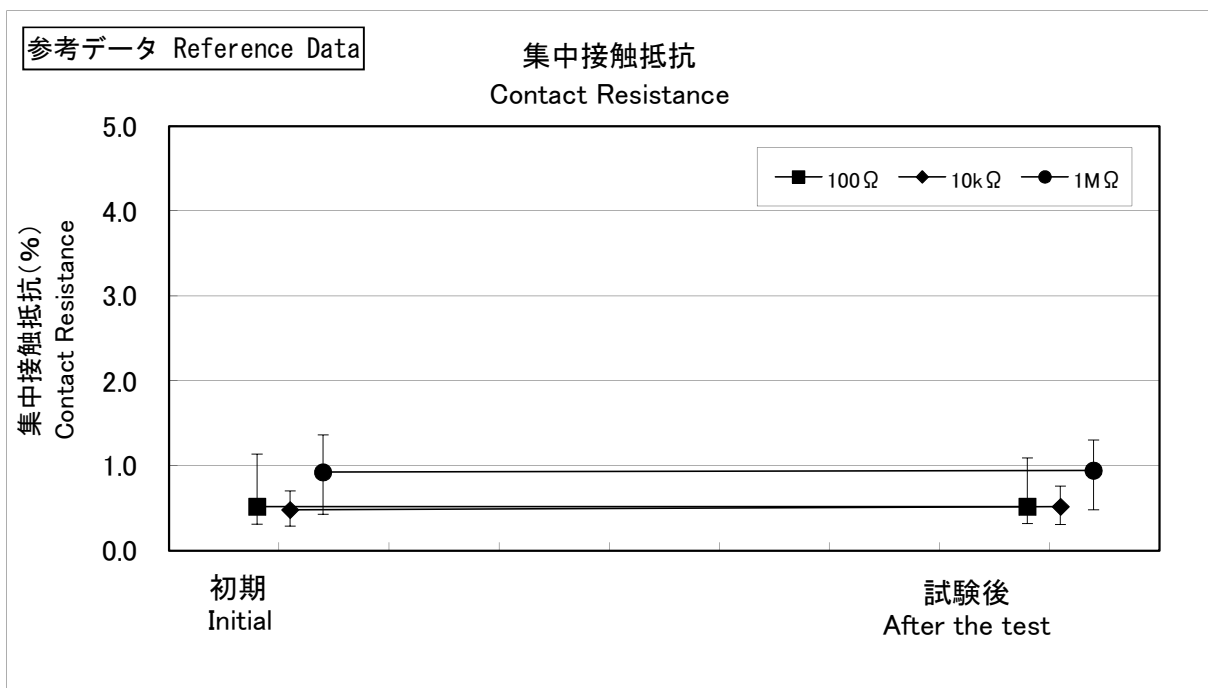
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〔温度サイクル耐久性 Temperature Cycle〕

1. 全抵抗値変化率 Total Resistance Change



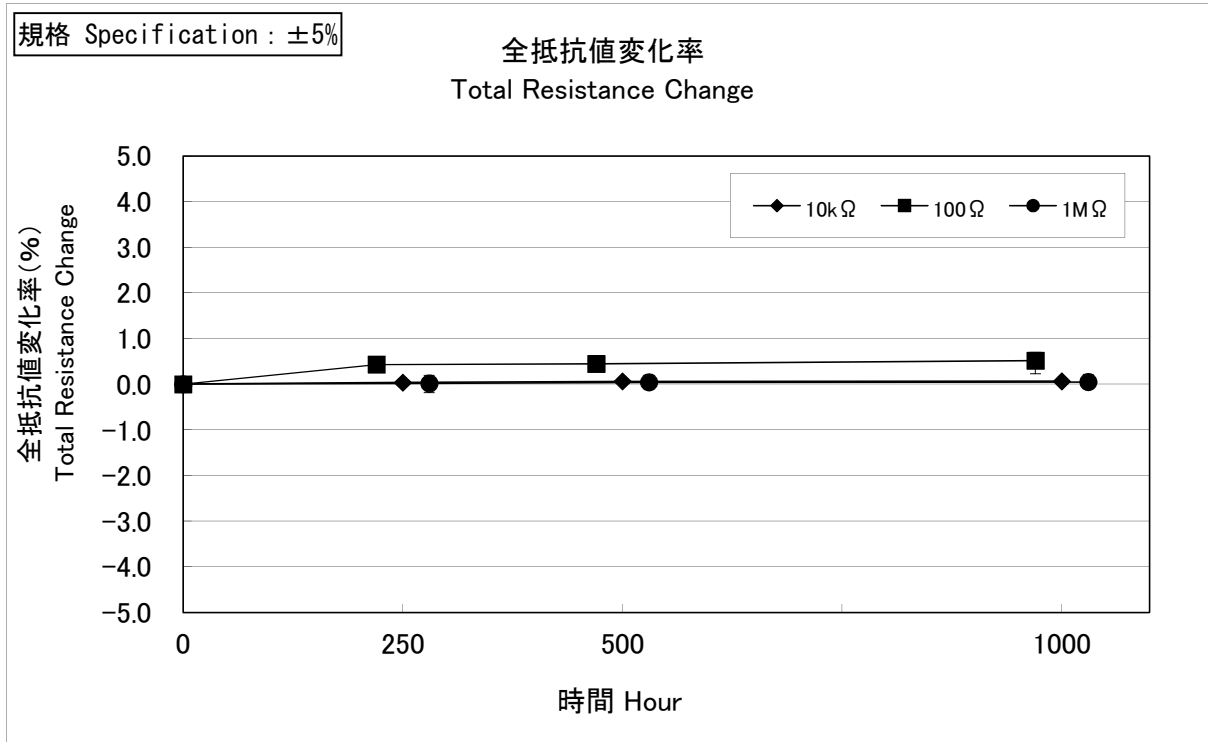
2. 集中接触抵抗 Contact Resistance



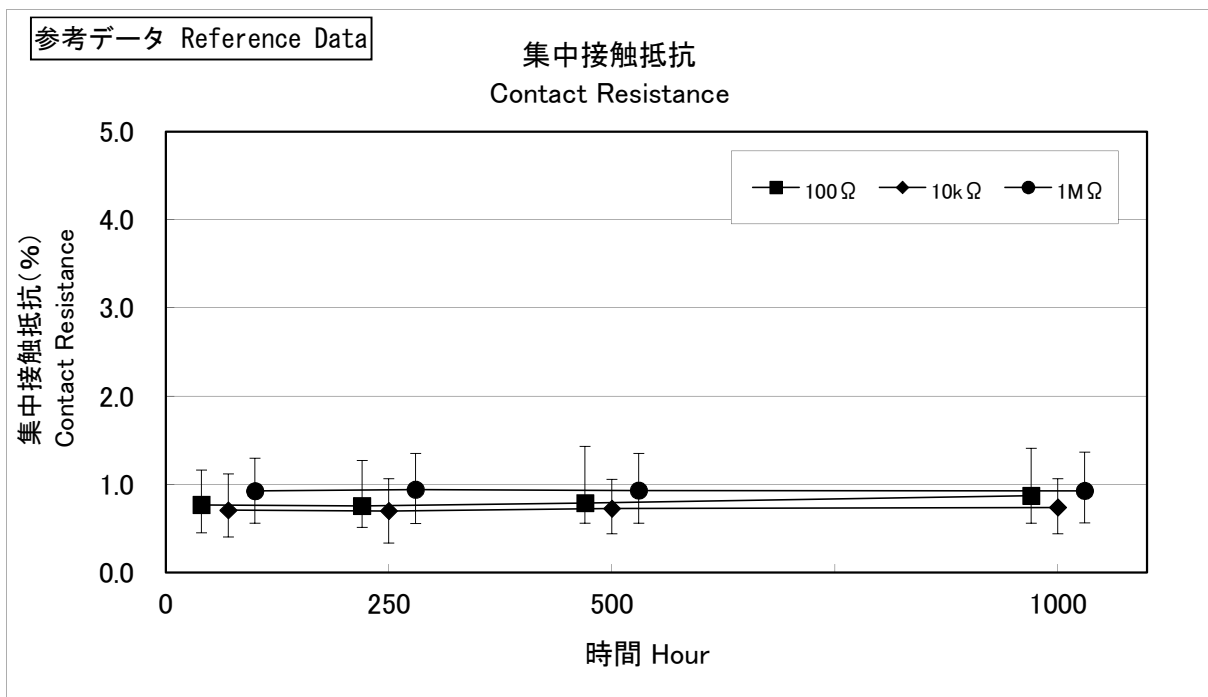
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〔耐湿性 Humidity〕

1. 全抵抗値変化率 Total Resistance Change



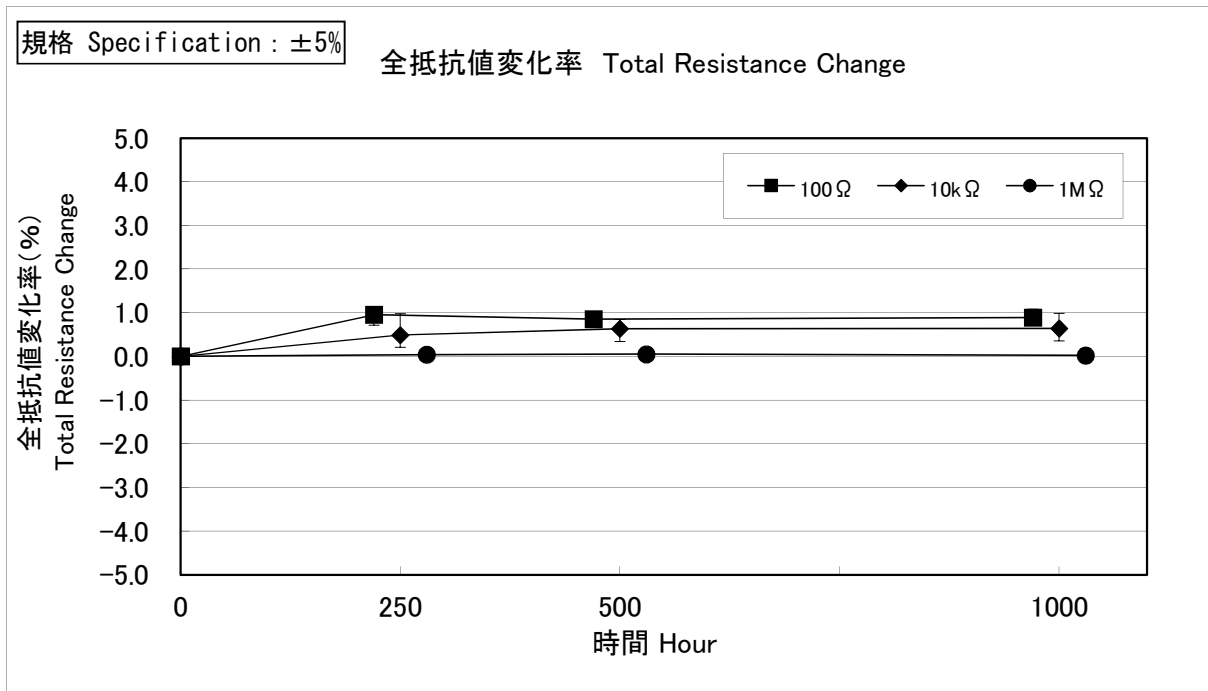
2. 集中接触抵抗 Contact Resistance



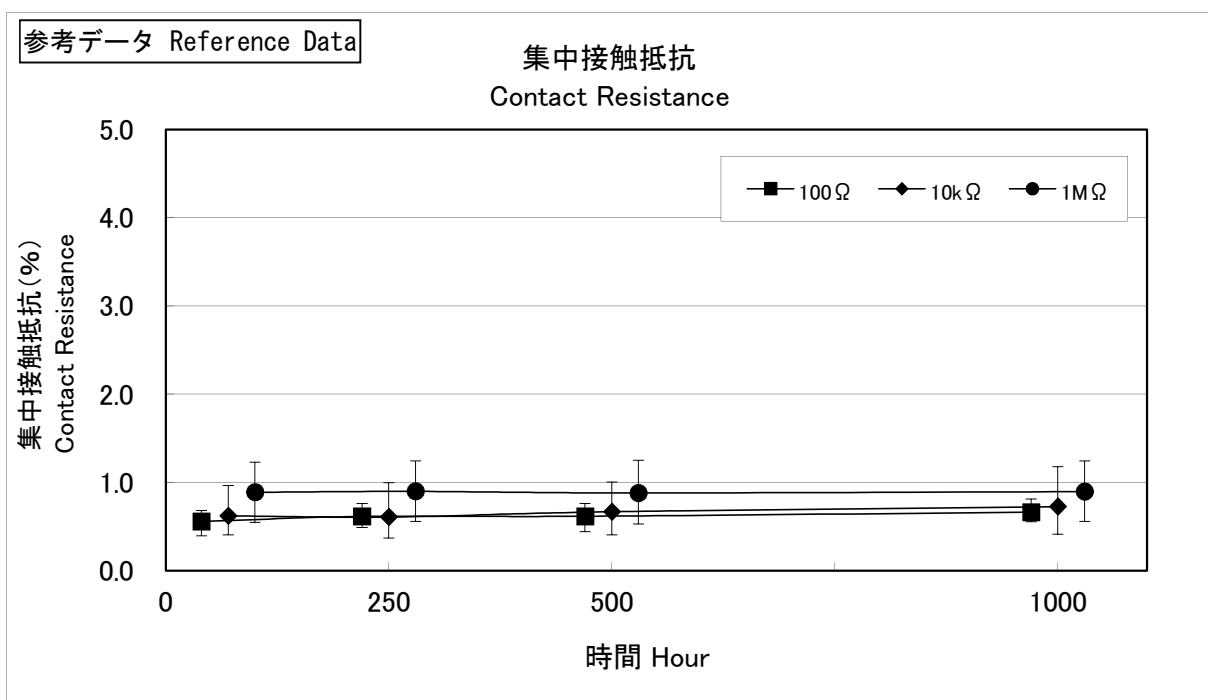
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[耐湿負荷耐久性 Humidity Load Life]

1. 全抵抗値変化率 Total Resistance Change



2. 集中接触抵抗 Contact Resistance



VGF39N

[動作耐久性 Rotational Life]

1. 全抵抗値変化率 Total Resistance Change

