

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 VG067TH1
Model No. VG067TL1

管理No. DS-1161
Control No. DS-1161

日付 2020/11/30
Date 2020/11/30

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コンポーネント事業本部
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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. M-VR- 453	
(対象客先・形名・品名・試験名など)		作成年月日 2020 年 4 月 10 日	
題名 : VG067			
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の仕様変更に伴う信頼性試験を行うことを目的とする。 It is intended to perform the reliability test with the specifications change of VR.		
2. 試料 Item	2-1) VG067TL1 B100 Ω , B1 kΩ , B10 kΩ , B100 kΩ , B1 MΩ 各N=10pcs / Ten pieces each examination ※ VG067TL1は、VG067シリーズの代表である。 "VG067TL1" is a representative of the "VG067 series".		
3. 試験 Test Method	3-1) 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。 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. 3-2) 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。 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. 3-3) 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。 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.		

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3-4) 耐湿負荷耐久性 / Humidity Load Life

温度 $40\text{ }^{\circ}\text{C}\pm 2\text{ }^{\circ}\text{C}$ 、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 \pm 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。

The trimmer potentiometer shall be subjected in a thermostatic chamber at a temperature of $40\text{ }^{\circ}\text{C}\pm 2\text{ }^{\circ}\text{C}$ 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 \pm 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.

3-5) 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。

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.

段階 Step	温度[$^{\circ}\text{C}$] Temperature	時間[min] Duration
1	-25 ± 3	30
2	常温 / Standard atmospheric conditions	10~15
3	$+100\pm 2$	30
4	常温 / Standard atmospheric conditions	10~15

3-6) 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。

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.)

3-7) 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(合計6 h)。

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)

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3-8) はんだ耐熱性 / Resistance to Soldering Heat

ディップの場合

温度: 260 °C ± 5 °C

時間: 10 s ± 1 s

浸漬深さ: 基板面まで

熱遮蔽板(プリント基板)の厚さ: 1.6 mm

端子穴はゲージ寸法による。

手はんだの場合

温度: 350 °C ± 10 °C

時間: 3 s +1/-0s

Mounted on a 1.6 mm thick printed circuit board, the trimmer potentiometer is immersed in a pot of molten solder at 260 °C ± 5 °C for 10 s ± 1 s, or at 350 °C ± 10 °C for 3 s +1/-0 s.

Then the trimmer potentiometer shall be subjected to standard atmospheric conditions for 1 h ~ 2 h, after which measurements shall be made.

3-9) 耐硫化性 / Resistance to Sulfur Atmosphere

硫化濃度 5 ppm ± 1 ppm の硫化水素 (H₂S) ガス雰囲気中に無負荷で 500 h ± 12 h 放置し、取り出し常温常湿の室内に 1 h ~ 2 h 放置後測定する。

The trimmer potentiometer shall be subjected in a sulfur atmospheric chamber at a sulfur concentration of 5 ppm ± 1 ppm (H₂S, 5 ppm ± 1 ppm) without electrical load for 500 h ± 12 h. Then the trimmer potentiometer shall be taken out of the chamber and maintained at standard atmospheric conditions for 1 h ~ 2 h, after which measurements shall be made.

3-10) 抵抗温度特性 / Temperature Coefficient (T.C.R.)

下記の温度条件にて測定する。

The trimmer potentiometer shall be maintained in a thermostatic chamber at a temperature, according to the table as shown below.

段階 Step	温度 [°C] Temperature
初期値 Initial	+25 ± 2
1	-25 ± 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 ~ 45 min.

4. 測定項目
Measurement

- 4-1) 1-3間抵抗値 / Total resistance
4-2) 1-2間抵抗値 / Between 1 and 2 resistance
4-3) 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 ……3-1) ~ 3-6), 3-8) ~ 3-10)
5-2) 1-2間抵抗値変化率……3-7)のみ / Between 1 and 2 resistance change
5-3) 集中接触抵抗……3-1) ~ 3-10) 但し、3-6)は除く /
Contact resistance……3-1) ~ 3-10). Except for 3-6)

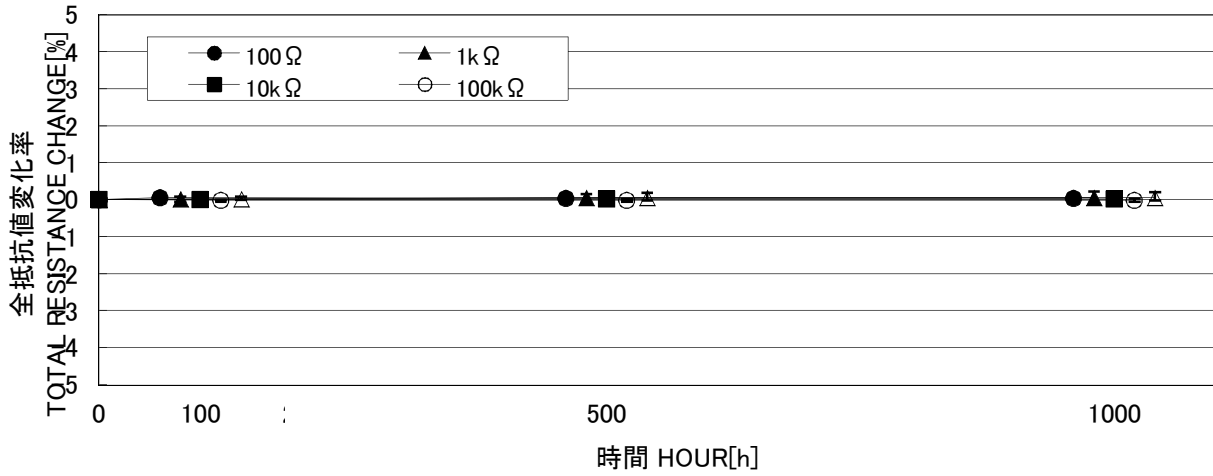
6. 試験結果
Test Result

試験結果は次項以降の通りであり、全て規格内でありました。
Test results are following page. All test results were in the specification.

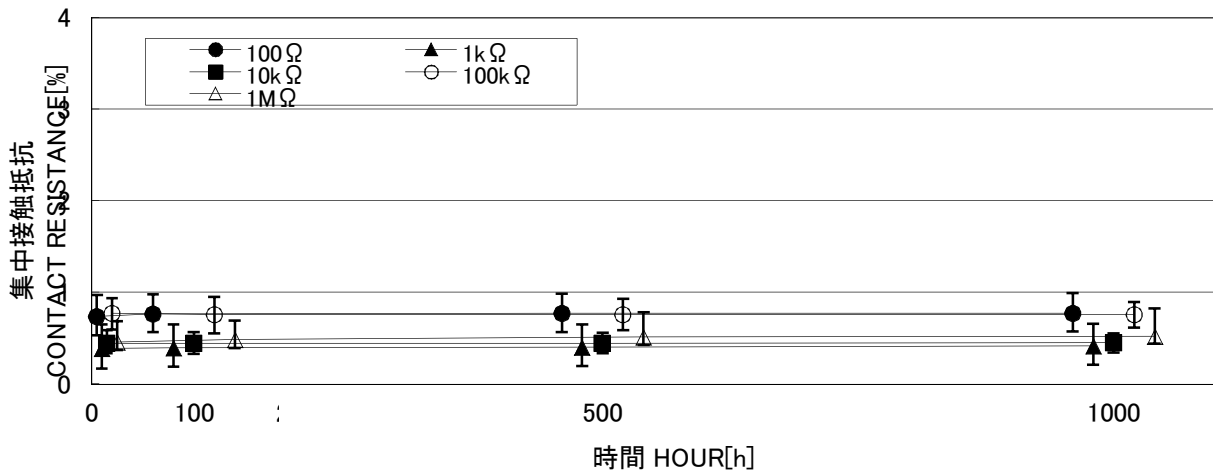
VG067 Pb(F)

〈耐熱性〉
〈HIGH TEMPERATURE STORAGE〉

全抵抗値変化率 TOTAL RESISTANCE CHANGE



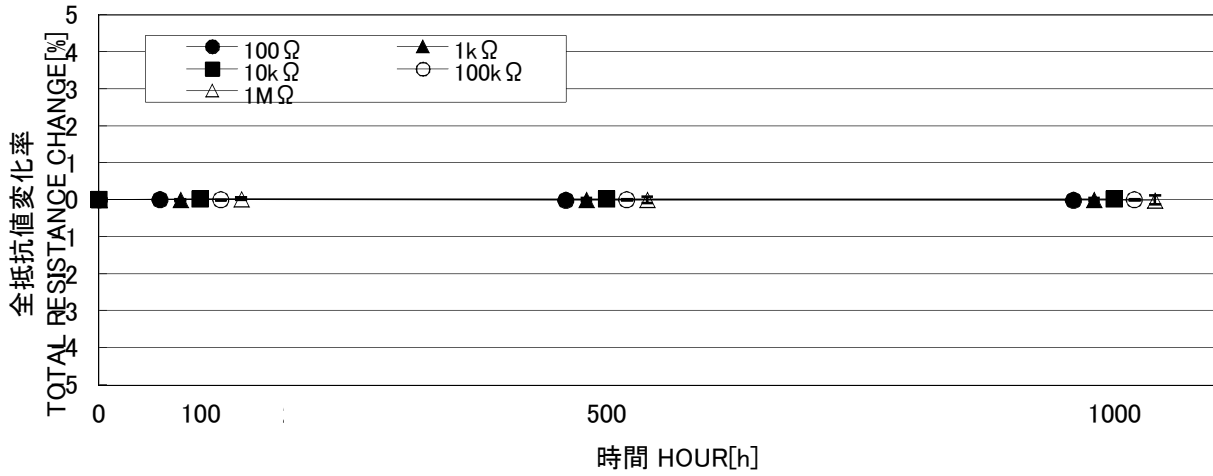
集中接触抵抗 CONTACT RESISTANCE



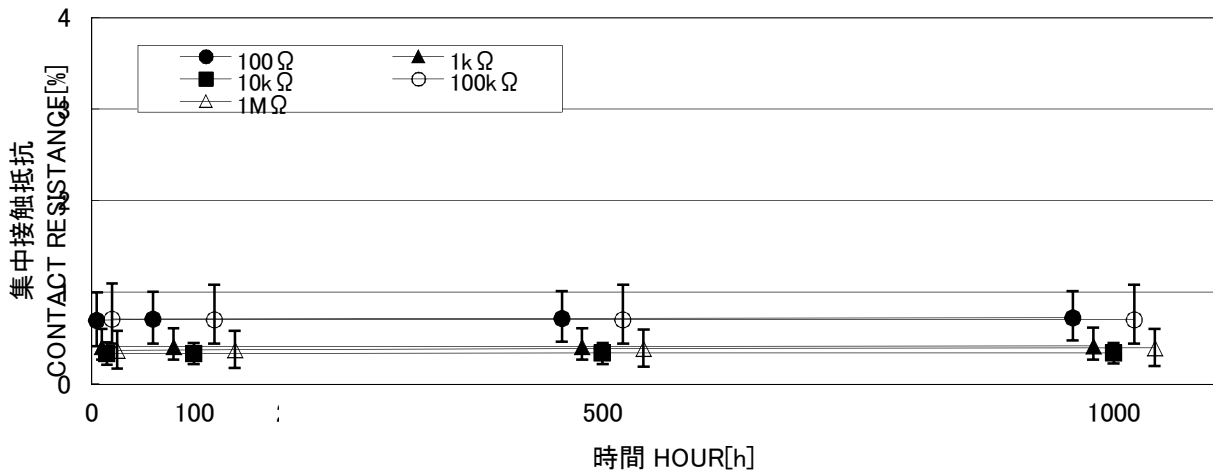
VG067 Pb(F)

〈耐湿性〉
〈HUMIDITY〉

全抵抗値変化率 TOTAL RESISTANCE CHANGE



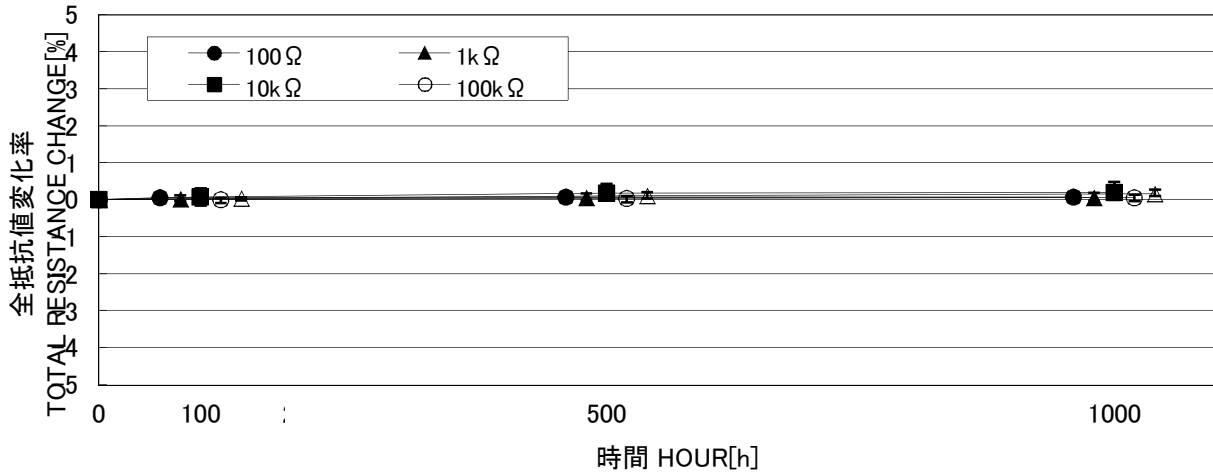
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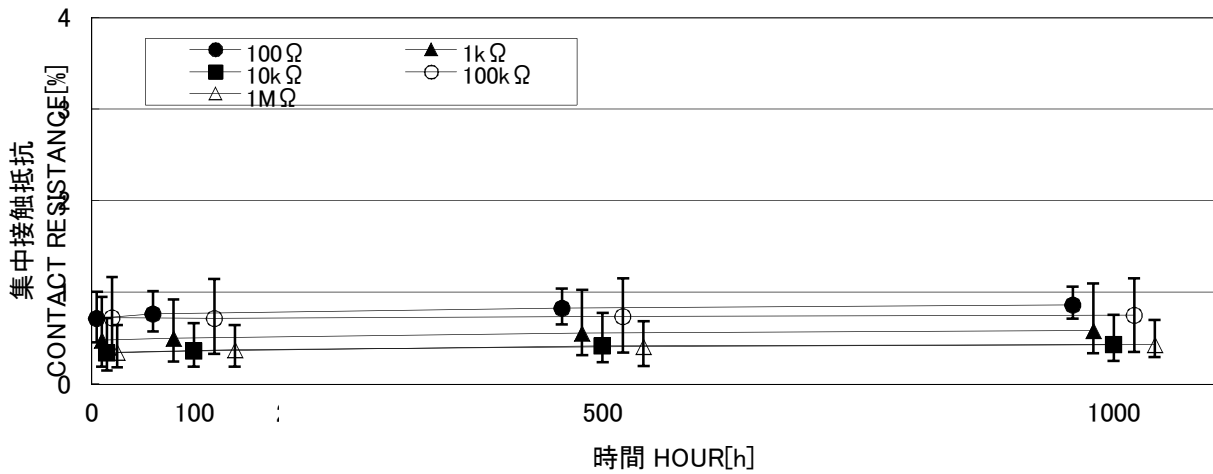
VG067 Pb(F)

〈負荷耐久性〉
〈LOAD LIFE〉

全抵抗値変化率 TOTAL RESISTANCE CHANGE



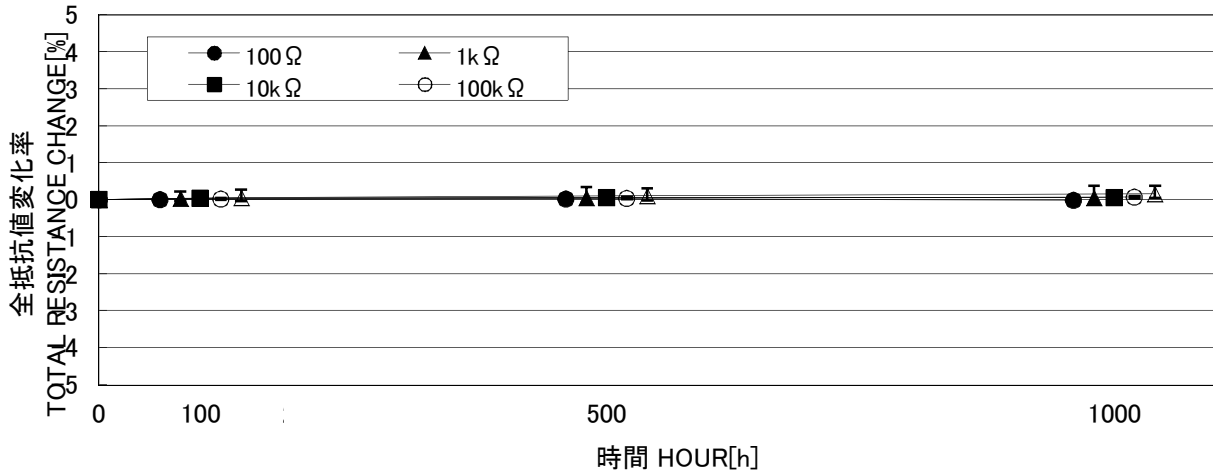
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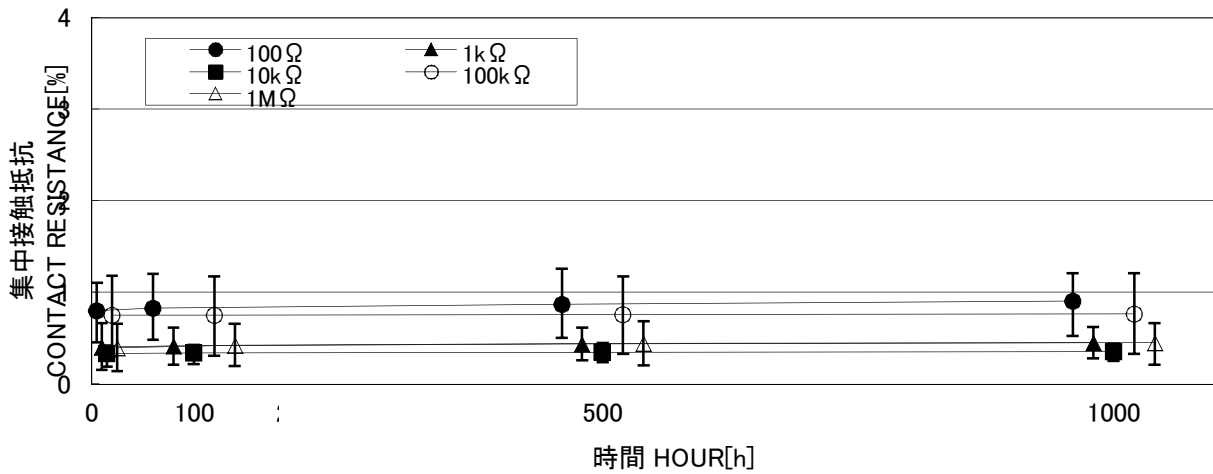
VG067 Pb(F)

〈耐湿負荷耐久性〉
〈HUMIDITY LOAD LIFE〉

全抵抗値変化率 TOTAL RESISTANCE CHANGE



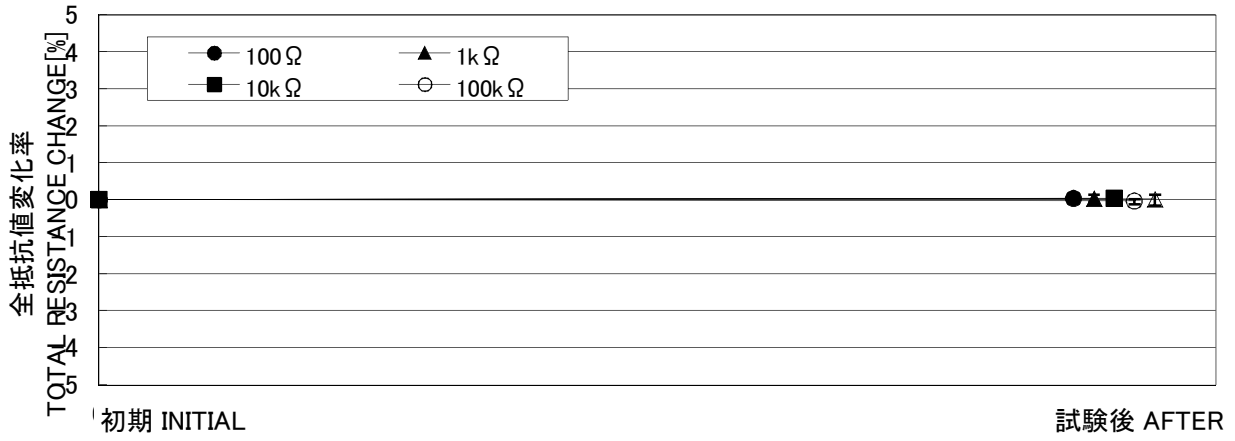
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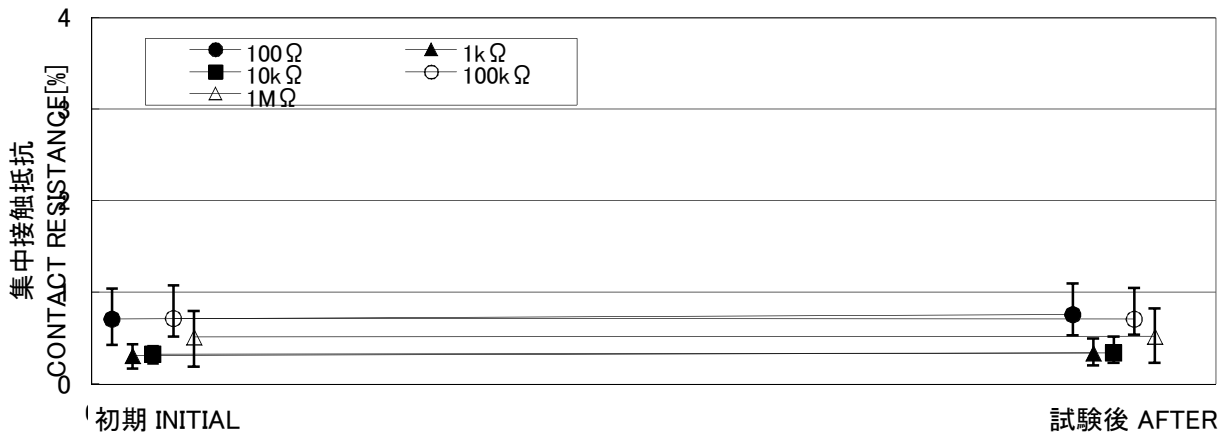
VG067 Pb(F)

〈温度サイクル耐久性〉
〈TEMPERATURE CYCLE〉

全抵抗値変化率 TOTAL RESISTANCE CHANGE



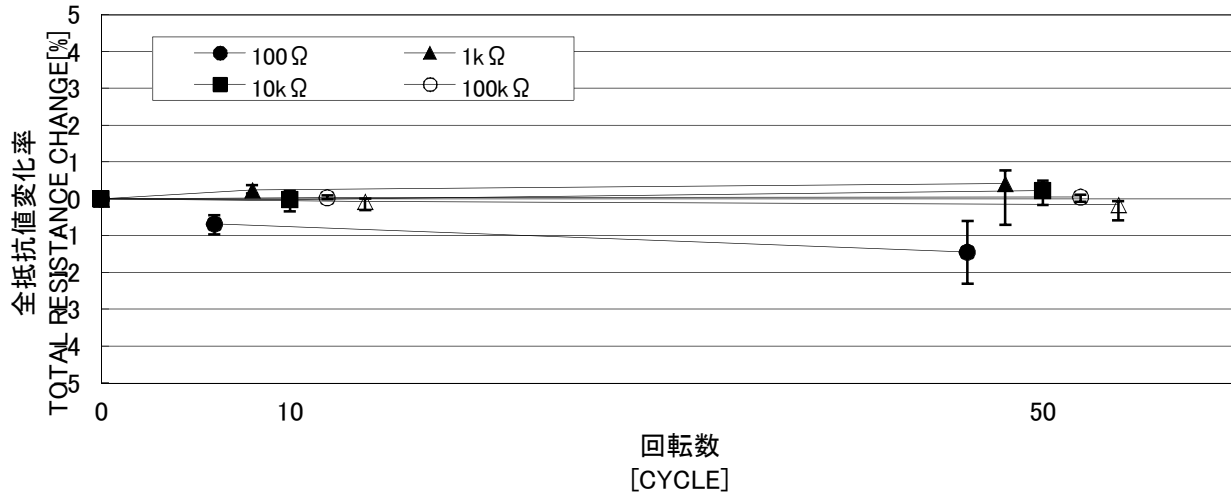
集中接触抵抗 CONTACT RESISTANCE



VG067 Pb(F)

〈動作耐久性〉
〈ROTATIONAL LIFE〉

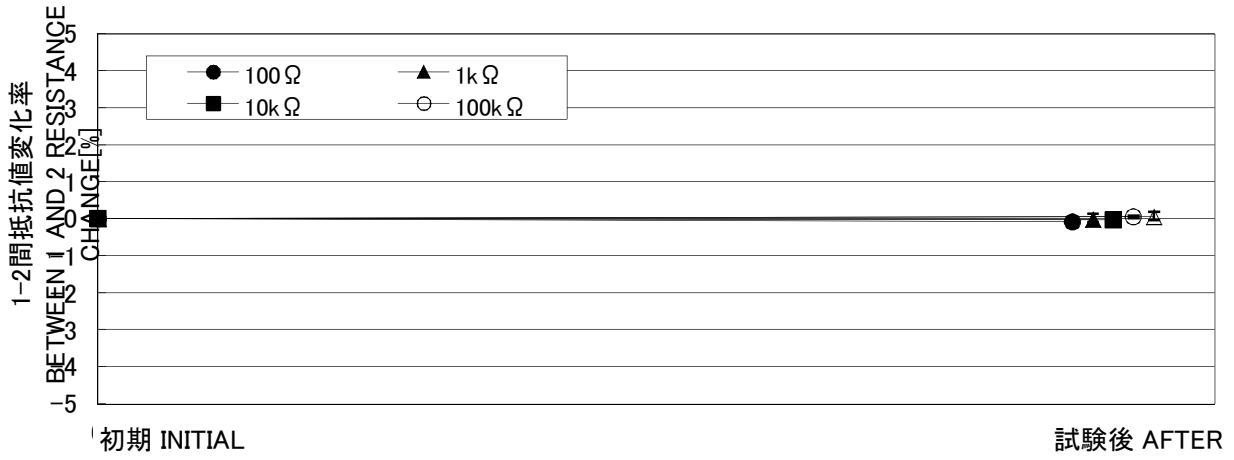
全抵抗値変化率 TOTAL RESISTANCE CHANGE



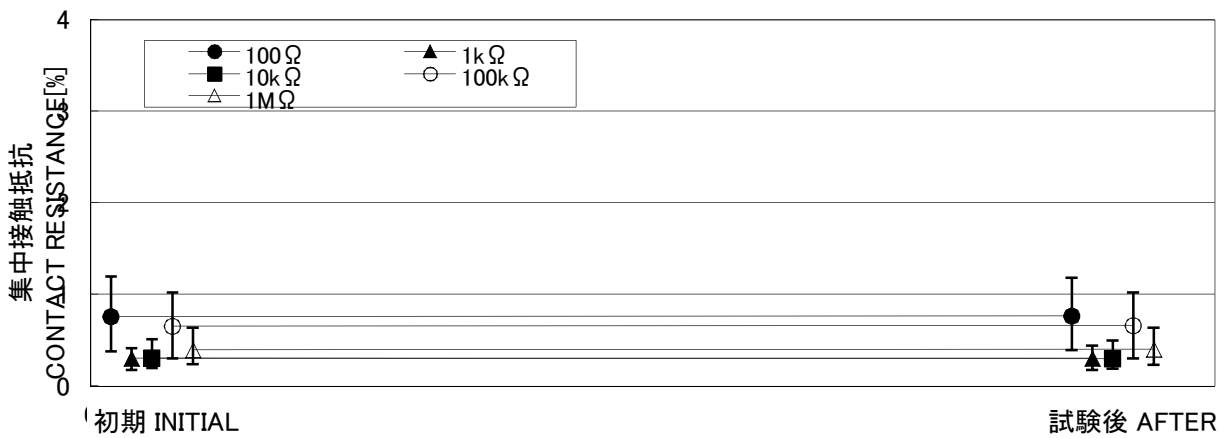
VG067 Pb(F)

〈耐振性〉
〈VIBRATION〉

1-2間抵抗値変化率 BETWEEN 1 AND 2 RESISTANCE CHANGE



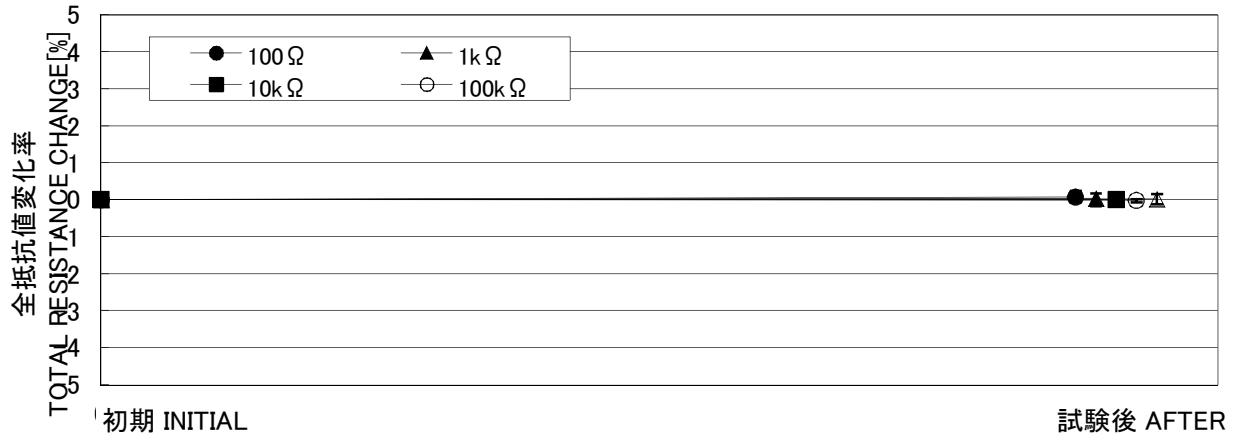
集中接触抵抗 CONTACT RESISTANCE



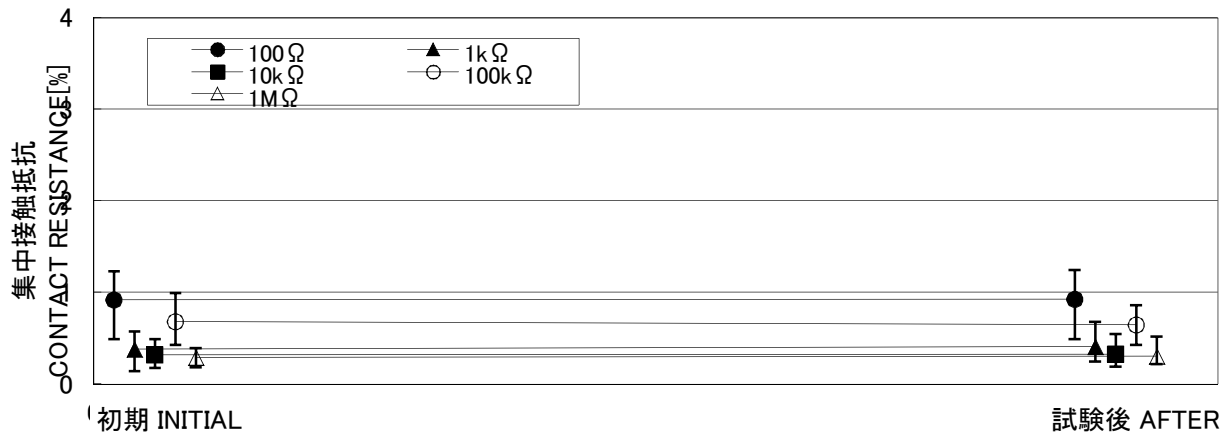
VG067 Pb(F)

〈はんだ耐熱性〉
〈RESISTANCE TO SOLDERING HEAT〉

全抵抗値変化率 TOTAL RESISTANCE CHANGE



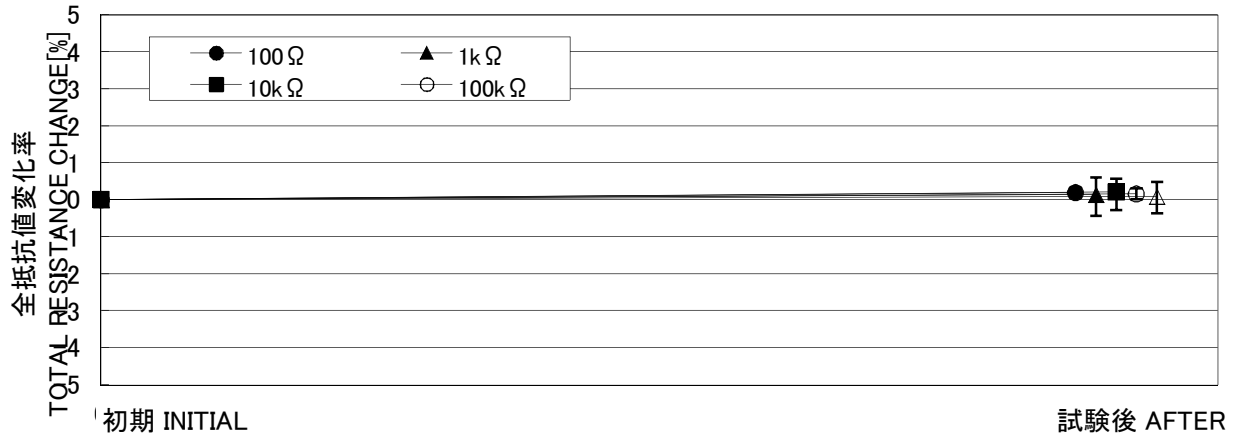
集中接触抵抗 CONTACT RESISTANCE



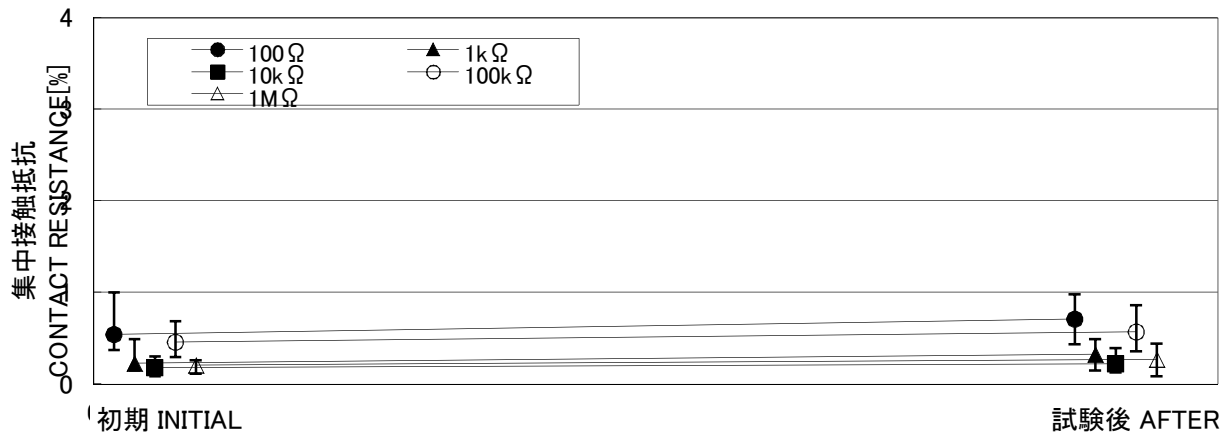
VG067 Pb(F)

〈耐硫化性〉
〈RESISTANCE TO SULPHURATE ATMOSPHERIC〉

全抵抗値変化率 TOTAL RESISTANCE CHANGE



集中接触抵抗 CONTACT RESISTANCE



VG067 Pb(F)

〈抵抗温度特性〉
〈T.C.R.〉

抵抗温度係数 T.C.R.

