COMMON PARTS/MATERIALS, SPACE USE, APPLICATION DATA SHEET FOR

Part Description	RESISTORS, CHIP, FIXED, FILM
Part Number and Type	JAXA CRK16H, JAXA CRK10H, JAXA CRK8H, JAXA CRK4H, JAXA CRK2H
Applicable Specification	JAXA-QTS-2050 JAXA-QTS-2050/E201

February 2026

Prepared and Established by
TATEYAMA KAGAKU DEVICE TECHNOLOGY CO.,LTD.

Issued by Japan Aerospace Exploration Agency

This document is the English version of JAXA QTS/ADS which was originally written and authorized in Japanese and carefully translated into English for international users. If any question arises as to the context or detailed description, it is strongly recommended to verify against the latest official Japanese version.

The release date of the English version of this data sheet: 28 May 2026

Record of Revisions

Rev.	Date	Description
NC	24 Aug. 2007	Original
A	21 Jan. 2009	Reflected S3SU-2601 (Rev. A) , issued by TATEYAMA KAGAKU DEVICE TECHNOLOGY CO., LTD.
B	1 July 2011	Reflected S3SU-2601 (Rev. B) , issued by TATEYAMA KAGAKU DEVICE TECHNOLOGY CO., LTD.
C	16 April 2012	Reflected S3SU-2601 (Rev. C) , issued by TATEYAMA KAGAKU DEVICE TECHNOLOGY CO., LTD.
D	14 Feb. 2013	Reflected S3SU-2601 (Rev. D) , issued by TATEYAMA KAGAKU DEVICE TECHNOLOGY CO., LTD.
E	6 Aug. 2014	Reflected S3SU-2601 (Rev. E) , issued by TATEYAMA KAGAKU DEVICE TECHNOLOGY CO., LTD.
F	18 Sep. 2020	Reflected S3SU-2601 (Rev. F) , issued by TATEYAMA KAGAKU DEVICE TECHNOLOGY CO., LTD.
G	24 Feb. 2026	Reflected S3SU-2601 (Rev. G) , issued by TATEYAMA KAGAKU DEVICE TECHNOLOGY CO., LTD.
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Revision Log

<table>
<tr><th>Rev.</th><th>Date</th><th>Description</th></tr>
<tr><td>–</td><td>24 Aug. 2007</td><td>Original</td></tr>
<tr><td>A</td><td>21 Jan. 2009</td><td>Revised the rated power, critical resistance value and test data for added Load life in humidity upon the revision of detail specification, JAXA-QTS-2050/E201A.
The revised contents are as follows.
1. Paragraph 3.1 Absolute Maximum Rating
CRK16H 0.063 → 0.1 W Critical resistance 39 kΩ → 24 kΩ
CRK10H 0.1 → 0.125 W Critical resistance 220 kΩ → 180 kΩ
CRK8H 0.125 → 0.25 W Critical resistance 300 kΩ → 180 kΩ
CRK4H 0.25 → 0.33 W Critical resistance 160 kΩ → 120 kΩ
2. Paragraph 4.1 Electrical Characteristics
• Short-time Overload Data (P6)
3. Paragraph 4.3 Characteristic in Operating and Environmental Conditions
(1) Life test data (P20)
(2) Load life in humidity test data (P21)</td></tr>
<tr><td>B</td><td>1 July 2011</td><td>Revised upon the revision of detail specification, JAXA-QTS-2050/E201B.
The revised contents are as follows.
1. Paragraph 3.1 Absolute Maximum Rating:
• Changed the resistance-temperature characteristics (resistance range: 1 to 9.1 Ω) from M (±300 ppm/°C) to L (±200 ppm/°C).
• Changed the nominal resistance range from (2.0 to 1 MΩ) to (1.0 to 10 MΩ).
2. Paragraph 4: CHARACTERISTIC IN NORMAL ENVIRONMENTAL CONDITIONS
Changed values
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<tr><th rowspan="2">Item</th><th colspan="2">Allowable resistance change</th></tr>
<tr><th>Before change</th><th>After change</th></tr>
<tr><td>Dielectric Withstanding Voltage (ambient atmospheric pressure)</td><td>±(0.5 %+0.01 Ω)</td><td>±(0.25 %+0.01 Ω)</td></tr>
<tr><td>Short-Time Overload</td><td>±(2.0 %+0.01 Ω)</td><td>±(0.5 %+0.01 Ω)</td></tr>
<tr><td>Board Bending</td><td>±(1.0 %+0.01 Ω)</td><td>±(0.25 %+0.01 Ω)</td></tr>
<tr><td>Resistance to Bonding Exposure</td><td>±(1.0 %+0.01 Ω)</td><td>±(0.25 %+0.01 Ω)</td></tr>
<tr><td>Resistance to soldering heat</td><td>±(2.5 %+0.01 Ω)</td><td>±(0.5 %+0.01 Ω)</td></tr>
<tr><td>Random Vibration</td><td>±(1.0 %+0.01 Ω)</td><td>±(0.25 %+0.01 Ω)</td></tr>
<tr><td>Shock</td><td>±(1.0 %+0.01 Ω)</td><td>±(0.25 %+0.01 Ω)</td></tr>
<tr><td>Thermal Shock [II]</td><td>±(1.0 %+0.01 Ω)</td><td>±(0.25 %+0.01 Ω)</td></tr>
<tr><td>Moisture Resistance</td><td>±(2.0 %+0.01 Ω)</td><td>±(0.5 %+0.01 Ω)</td></tr>
<tr><td>Low Temperature operation</td><td>±(1.0 %+0.01 Ω)</td><td>±(0.25 %+0.01 Ω)</td></tr>
<tr><td rowspan="2">Stability</td><td>±(2.0 %+0.01 Ω)</td><td>±(0.5 %+0.01 Ω)</td></tr>
<tr><td>Resistance change of Dielectric Withstanding ±(0.5 %+0.01 Ω)</td><td>Resistance change of Dielectric Withstanding ±(0.25 %+0.01 Ω)</td></tr>
<tr><td>Maintain high temperature</td><td>±(1.0 %+0.01 Ω)</td><td>±(0.25 %+0.01 Ω)</td></tr>
<tr><td>Humidity (normal condition)</td><td>±(2.0 %+0.01 Ω)</td><td>±(0.5 %+0.01 Ω)</td></tr>
<tr><td>Thermal Shock [I]</td><td>±(1.0 %+0.01 Ω)</td><td>±(0.25 %+0.01 Ω)</td></tr>
<tr><td>Life</td><td>±(3.0 %+0.01 Ω)</td><td>±(1.5 %+0.01 Ω)</td></tr>
<tr><td>Load life in humidity</td><td>±(3.0 %+0.01 Ω)</td><td>±(1.5 %+0.01 Ω)</td></tr>
</table>
</td></tr>
</table>

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Revision Log

Rev.	Date	Description
C	16 April 2012	Revised upon the revision of detail specification, JAXA-QTS-2050/E201C. The revised contents are as follows. 1. Paragraph 2.2 Mass: Changed the title of the column for mass after material change to "Mass mg (reference) 2. Paragraph 9 OTHERS: (1) Changed the contact address and telephone number due to Tokyo Marketing Center being replaced with Tokyo Branch due to company reorganization. (2) Added Osaka Office with address and telephone number.
D	14 Feb. 2013	Revised upon the revision of detail specification, JAXA-QTS-2050/E201E. The revised contents are as follows. 1. Paragraph 3.1 • Added the JAXA CRK4H to the Absolute maximum ratings (jumper resistor). 2. Paragraph 4.2: Mechanical and Thermal Characteristics (1) Changed resistance change rate due to the change of test method ± (0.25 %+0.01 Ω) →± (1.0 %+0.01 Ω) (2) Updated the data of Board Bending. 3. Paragraph 6.1 • Updated the data of failure rate.
E	6 Aug. 2014	Revised upon the revision of detail specification, JAXA-QTS-2050/E201F and the change notice 1. 1. Paragraph 1.3: Deleted JIS C 5202 2. Paragraph 2.2: Changed the mass of CRK16H (2.4 mg → 2.2 mg) 3. Paragraph 3.1: Added JAXA CRK2H to the Absolute maximum ratings (jumper resistor). 4. Paragraph 3.1: Changed the resistance range of resistance-temperature characteristics L(1.0 to 9.1 Ω), K(10 to 10 MΩ) →L(1.0 to 9.76 Ω), K(10 to 10 MΩ)
F	18 Sep. 2020	Cover page: Change only applied to Japanese. Revised upon the revision of detail specification, JAXA-QTS-2050/E201H: 1. Paragraph 2.1: Made the L2 dimensions as reference. 2. Changed low resistance range in the following paragraphs (1) Paragraph 4.1: Changed short time overload. (2) Paragraph 4.2: Changed board bending, resistance to bonding exposure, resistance to soldering heat, random vibration, shock, moisture resistance. (3) Paragraph 4.3: Changed thermal shock [II], resistance-temperature characteristic, life, stability. (4) Paragraph 5: Changed high temperature exposure, thermal shock, humidity (steady state), load life in humidity. Revised upon addition of notes: 1. Paragraph 3.4: Added a note to mounting method. 2. Paragraph 3.6: Added a note to soldering. 3. Paragraph 8: Added a note to handling. Others: • Paragraph 9: Changed the telephone number of Technology Development Group and address of Nagoya office.
G	24 Feb. 2026	Revised upon the revision of detail specification, JAXA-QTS-2050/E201J: 1. Paragraph 2.1: Changed the photograph. 2. Paragraph 2.2: Changed the mass. 3. Paragraph 2.3: Changed the construction. 4. Changed the characteristics under normal conditions in the following

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Revision Log

Rev.	Date	Description
		paragraphs. (1) Paragraph 4.1: Changed dielectric withstanding voltage, insulation resistance and short time overload. (2) Paragraph 4.2: Changed board bending, resistance to bonding exposure, resistance to soldering heat and moisture resistance. (3) Paragraph 4.3: Changed thermal shock [II], resistance-temperature characteristic, low temperature operation, life and stability. 5. Paragraph 5: Completely revised environmental limits. (1) Changed exposure to high temperature, thermal shock, humidity (steady state) and load life in humidity. (2) Deleted resistance to soldering heat step stress, resistance to soldering heat repeated stress, adhesion breakdown stress and electrostatic discharge. 6. Paragraph 6: Completely revised the following paragraphs. (1) Paragraph 6.1.1: Failure Rate (JAXA Qualified Parts) (2) Paragraph 6.1.2: Failure Rate (Commercial Parts) 7. Paragraph 8: Changed notes. 8. Paragraph 9: Others. • Changed the address, telephone and FAX number of Tokyo branch and removed Nagoya sales office.
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COMMON PARTS/MATERIALS,
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1. GENERAL

1.1 Scope

This Application Data Sheet provides additional detailed information necessary for designing or selecting products not contained in JAXA QML. Relevant information not covered in this document shall also be considered. Users are responsible for all aspects pertaining to selection and use of the product(s) specified in this document.

1.2 Applicable Documents

JAXA -QTS-2050	Resistors, High Reliability, Space Use, General Specification for
JAXA -QTS-2050/E201	Resistors, Fixed, Film, Chip, Reliability Assured, Space Use, Detail Specification for

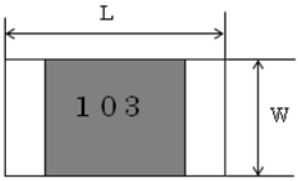
1.3 Reference Documents

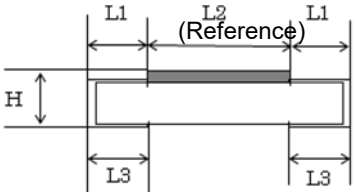
JIS C 5201-1	Fixed resistors for use in electronic equipment Part 1: Generic specification
JIS C 5201-8	Fixed resistors for use in electronic equipment Part 8: Sectional specification: Fixed chip resistors

2. SUMMARY OF PRODUCT

2.1 Externals, Dimensions and Images

Image: JAXA CRK8H type





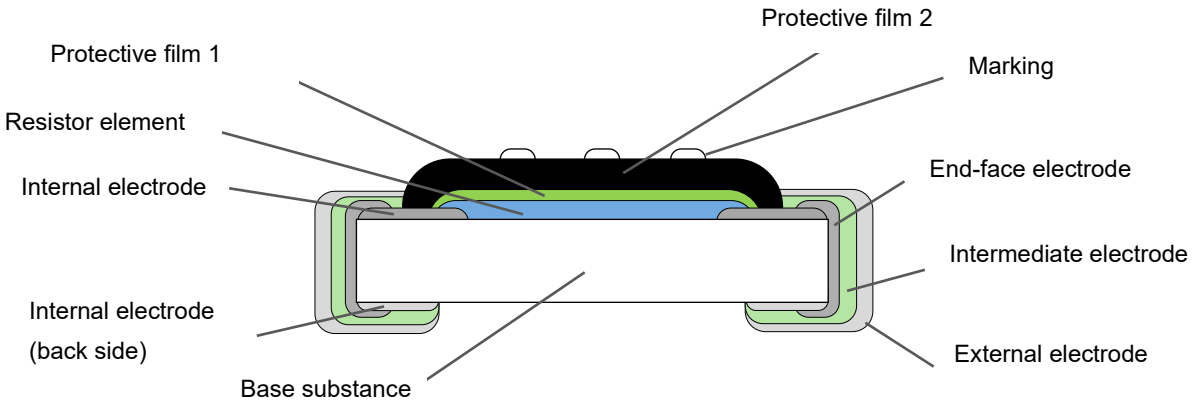
(mm)

Part number	L	W	H	L1	L2 (reference)	L3
JAXA CRK16H	1.6±0.15	0.8±0.15	0.45±0.1	0.3±0.20	1.0	0.3±0.2
JAXA CRK10H	2.0±0.20	1.25±0.20	0.50±0.1	0.4±0.20	1.3	0.4±0.2
JAXA CRK8H	3.2±0.20	1.60±0.20	0.60±0.1	0.5±0.25	2.2	0.5±0.3
JAXA CRK4H	3.2±0.20	2.60±0.20	0.60±0.1	0.5±0.20	2.0	0.5±0.3
JAXA CRK2H	5.0±0.20	2.50±0.20	0.60±0.1	0.6±0.20	3.8	0.5±0.3

2.2 Mass

Part number	Mass (mg) (reference)
JAXA CRK16H	2.1
JAXA CRK10H	4.9
JAXA CRK8H	9.1
JAXA CRK4H	14.9
JAXA CRK2H	23.3

2.3 Construction



3. USAGE

3.1 Absolute Maximum Ratings

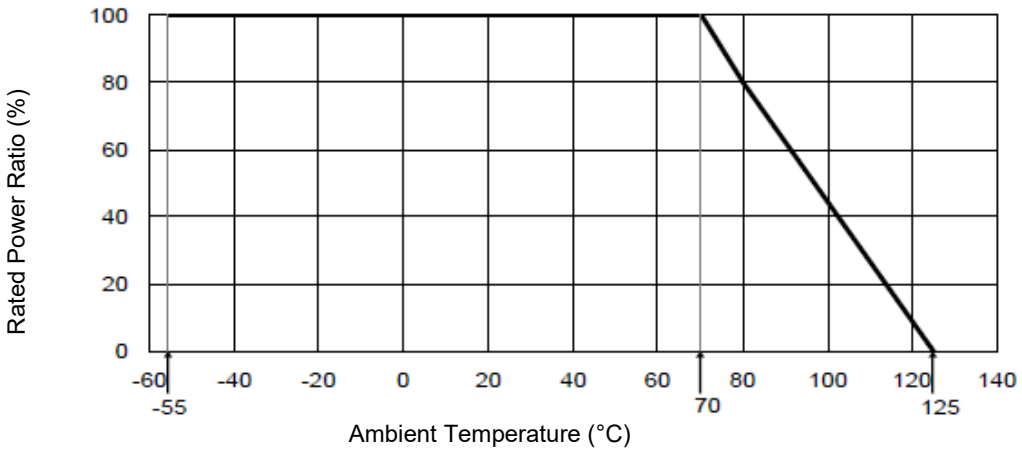
Resistors

Item	JAXA CRK16H	JAXA CRK10H	JAXA CRK8H	JAXA CRK4H	JAXA CRK2H
Operating temperature range(°C)	-55 to +125				
Rated ambient temperature(°C)	+70				
Nominal resistance range (Ω)	1.0 to 10M				
Critical resistance (Ω)	24k	180k	160k	120k	75k
Maximum operating voltage(V)	50	150	200		
Maximum overload voltage(V)	100	300	400		
Rated Power (W)	0.10	0.125	0.25	0.33	0.50
Resistance-temperature characteristic	L: ±200 ppm/°C (1.0 to 9.76 Ω), K: ±100 ppm/°C (10 to 10 MΩ)				

Jumper Resistors

Item	JAXA CRK16H	JAXA CRK10H	JAXA CRK8H	JAXA CRK4H	JAXA CRK2H
Operating temperature range(°C)	-55 to +125				
Rated ambient temperature(°C)	+70				
Nominal resistance range (Ω)	50 m or less				
Rated current (A)	1.0	1.5	2.0		
Maximum overload current(A)	2.0	3.0	4.0		

Notes: The rated current and maximum overload current shall apply to jumper resistors.
The maximum overload voltage shall be the rated power when the ambient temperature is at 70 °C or less.
Load power and load current shall be reduced in accordance with the derating curve below when the ambient temperature exceeds 70 °C.



Rated Power Derating Curve

3.2 Recommended Operating Conditions

It is recommended to operate at 50% of the rated power or less as shown in the above Rated Power Derating Curve.

3.3 Note for Circuit Design

If the rated voltage exceeds the maximum operating voltage, the maximum operating voltage shall be used as the rated voltage.

$E = \sqrt{P \cdot R}$ Where: E = Rated voltage (V)
P = Rated power (W)
R = Nominal resistance (Ω)

3.4 Mounting Method

Solder: Tin-lead alloy eutectic solder (the melting point at 183 °C)

Flux: Low corrosive rosin flux when flux is used.

Mounting method	Preheating	Soldering
Reflow	+150 to +180 °C 60 to 120 sec.	+230 °C for 10 sec. at peak +200 °C for 40 to 50 sec.
Flow	+100 to +140 °C 30 to 60 sec.	+260 °C for 5 sec.
Hand soldering	---	+350 °C as a maximum for 10 sec.

Long duration soldering at high temperature may cause electrode corrosion.

The following conditions shall be met when using soldering iron.

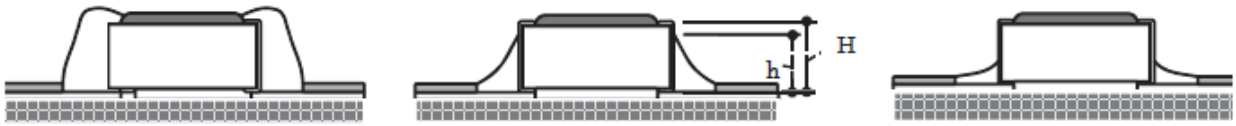
- The soldering iron shall not be applied to the protective coating of the resistor.
- Minimize the heating time for soldering when using high temperature soldering iron tip.

3.5 Cleaning

The cleaning shall be performed using alcohol (non-chlorine) solvents by soaking for 10 minutes as a maximum or ultrasonic cleaning for 3 minutes as a maximum.

3.6 Soldering

The recommended fillet shall be Chip height H/2 < Fillet height h < Chip height H



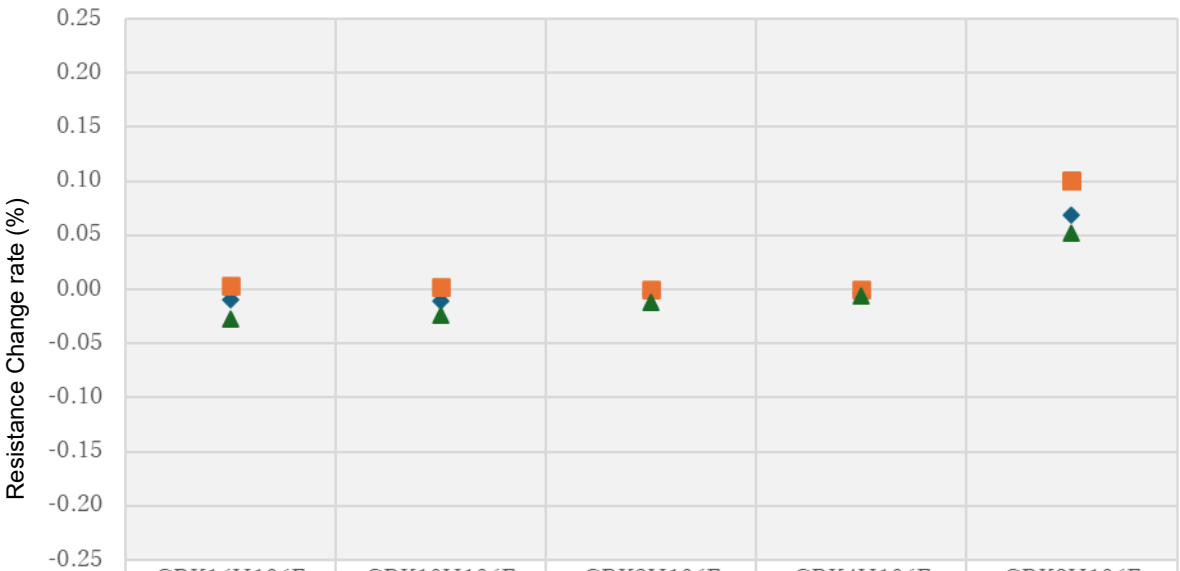
Excessive solder Proper solder Inadequate solder

If the amount of solder applied is excessive, it is susceptible to mechanical and thermal stress due to the shrinkage stress of the solder, which may cause breakage, cracks and splitting. In addition, if the amount of solder applied is inadequate, the adhesive force will be insufficient, which may cause connection failure and resistor detachment. Use a proper amount of solder.

4. CHARACTERISTIC IN NORMAL ENVIRONMENTAL CONDITIONS

4.1 Electrical Characteristics

<Dielectric withstanding voltage n=10>
Conditions: 150 V for 1 minute, Specification ±(0.25 %+0.01 Ω)



	CRK16H106F	CRK10H106F	CRK8H106F	CRK4H106F	CRK2H106F
◆ Ave	-0.01	-0.01	0.00	0.00	0.07
■ Max	0.00	0.00	0.00	0.00	0.10
▲ Min	-0.03	-0.02	-0.01	-0.01	0.05

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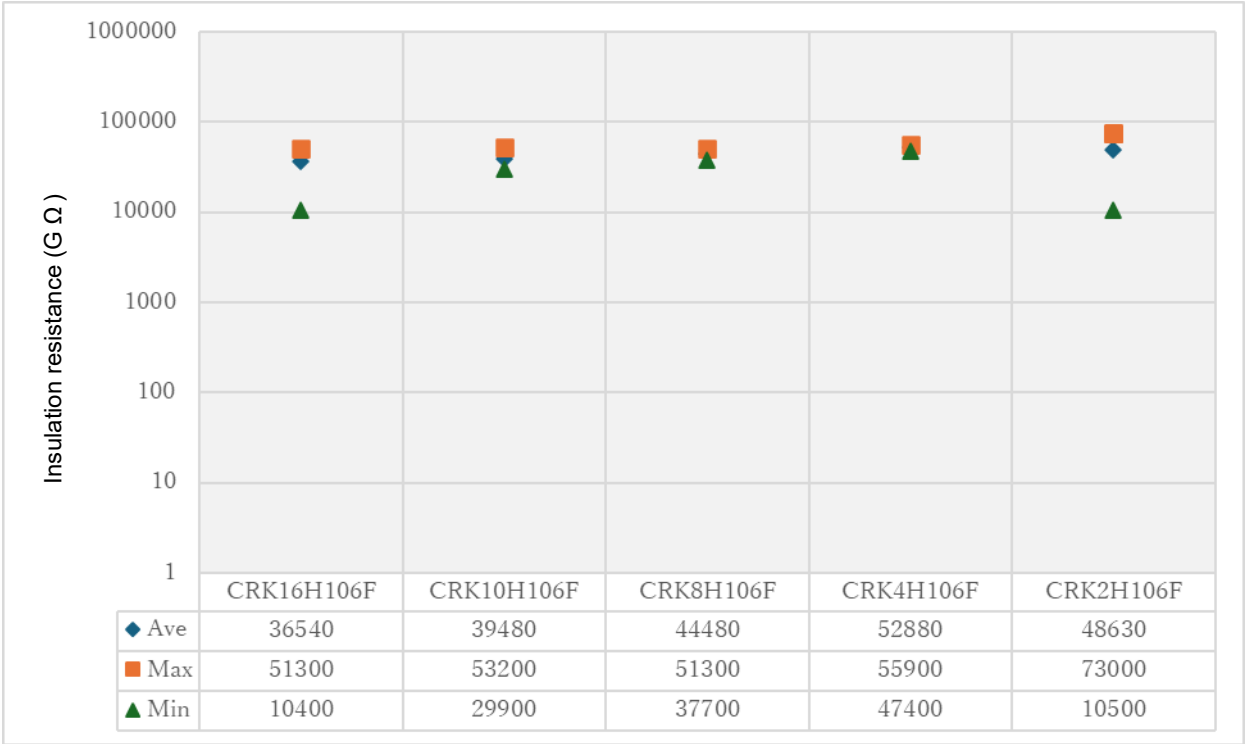
<Insulation resistance n=10>

Conditions: 100 V for 1 minute, Specification 1000 MΩ (1 GΩ) as a minimum

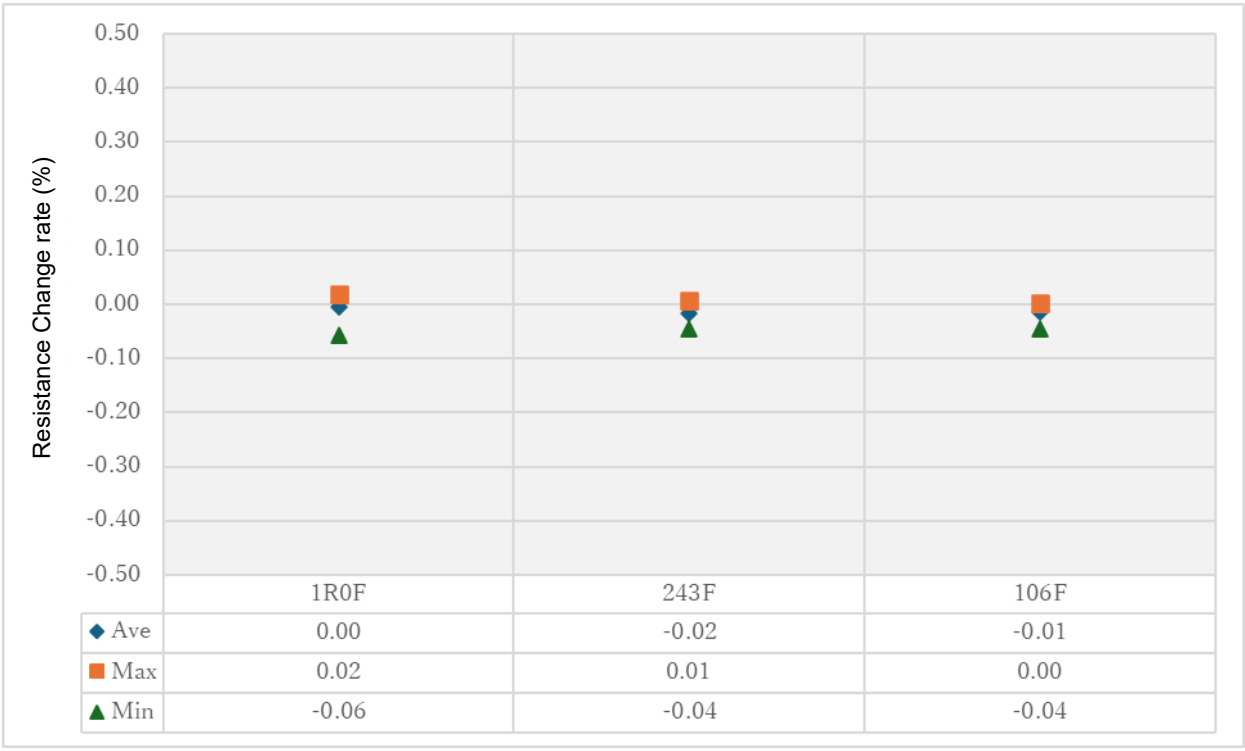


	CRK16H106F	CRK10H106F	CRK8H106F	CRK4H106F	CRK2H106F
◆ Ave	36540	39480	44480	52880	48630
■ Max	51300	53200	51300	55900	73000
▲ Min	10400	29900	37700	47400	10500

<Short-time overload n=10>

Conditions: The rated voltage V x 2.5 to 5 sec. Specification ±(0.5 %+0.01 Ω)

CRK16H



	1R0F	243F	106F
◆ Ave	0.00	-0.02	-0.01
■ Max	0.02	0.01	0.00
▲ Min	-0.06	-0.04	-0.04

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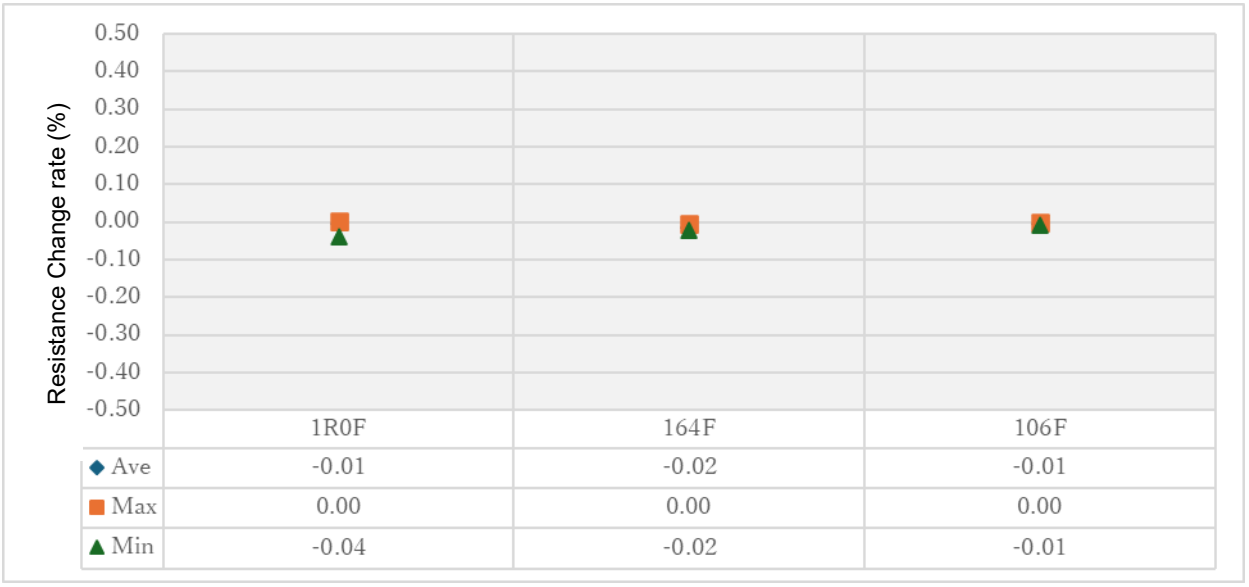
CRK10H

	1R0F	184F	106F
Ave	-0.01	-0.01	0.00
Max	0.00	0.00	0.00
Min	-0.04	-0.02	-0.01

CRK8H



	1R0F	164F	106F
Ave	-0.01	-0.02	-0.01
Max	0.00	0.00	0.00
Min	-0.04	-0.02	-0.01

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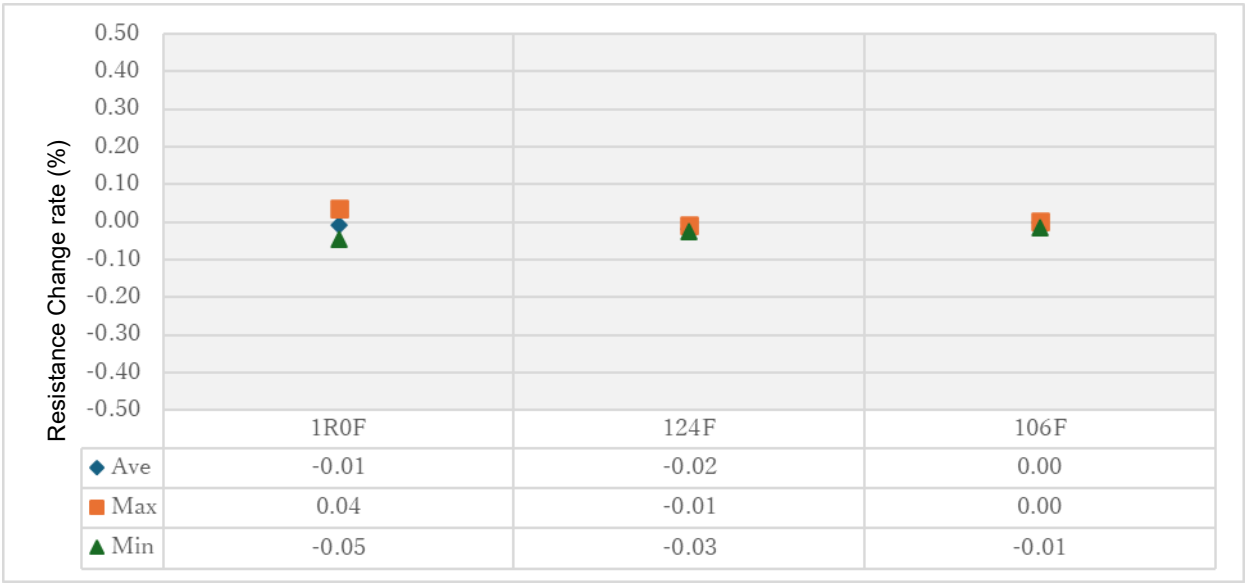
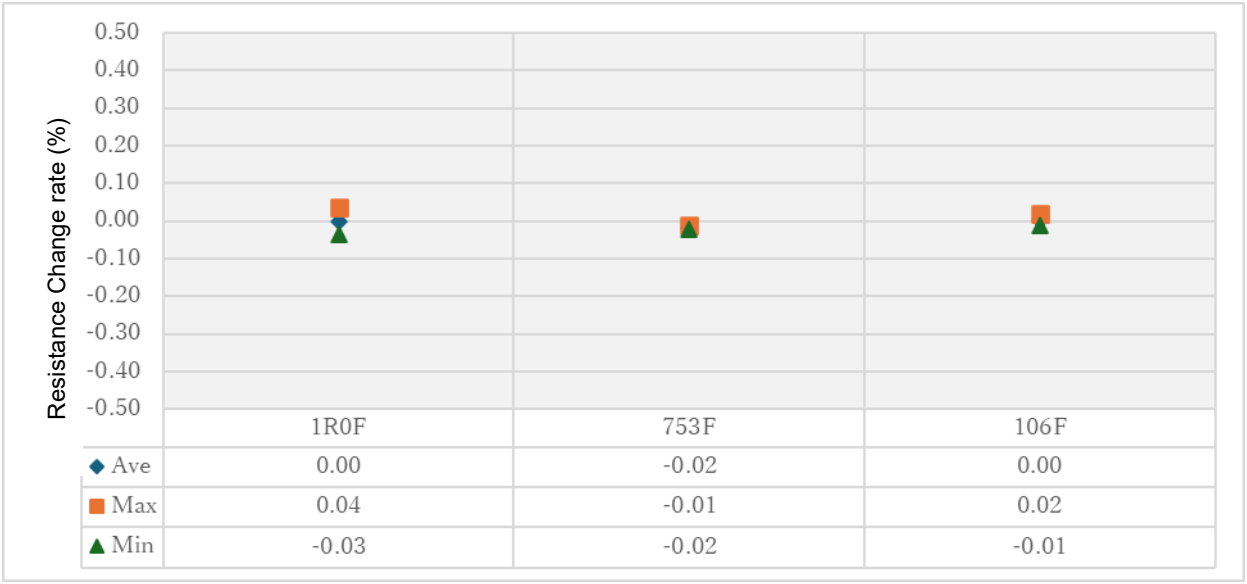
CRK4H



	1R0F	124F	106F
Ave	-0.01	-0.02	0.00
Max	0.04	-0.01	0.00
Min	-0.05	-0.03	-0.01

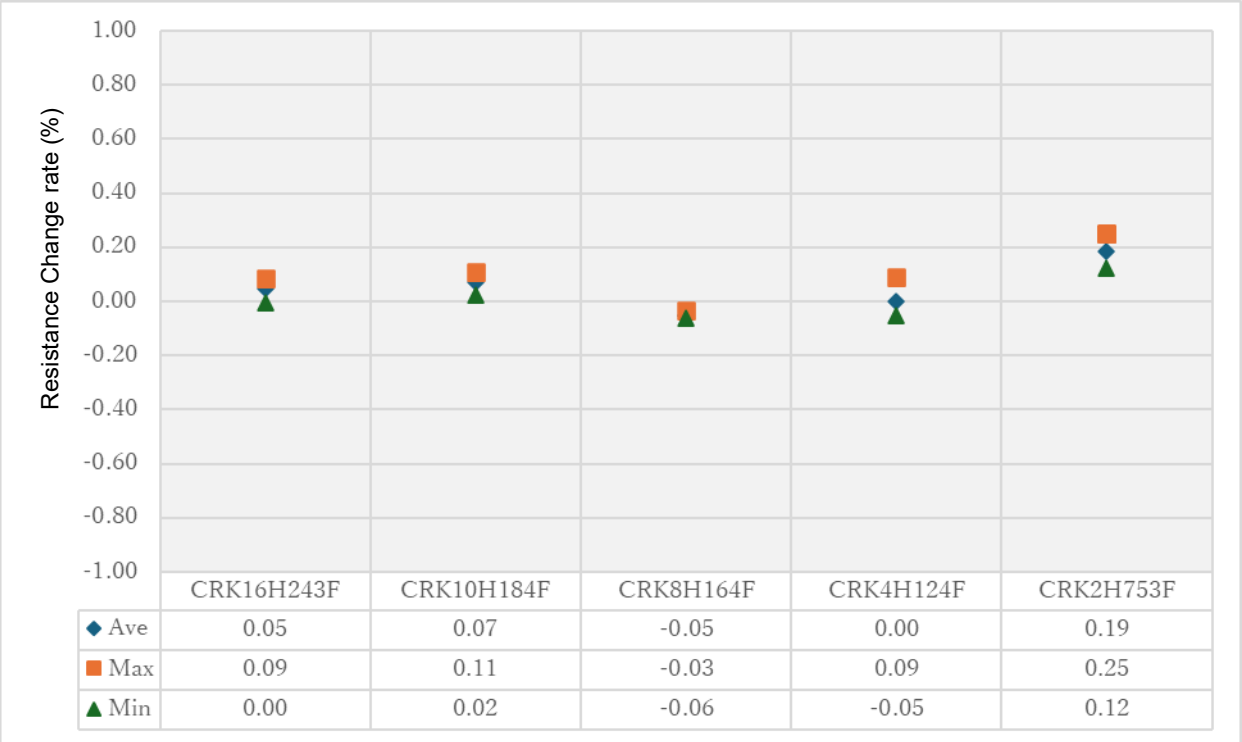
CRK2H



	1R0F	753F	106F
Ave	0.00	-0.02	0.00
Max	0.04	-0.01	0.02
Min	-0.03	-0.02	-0.01

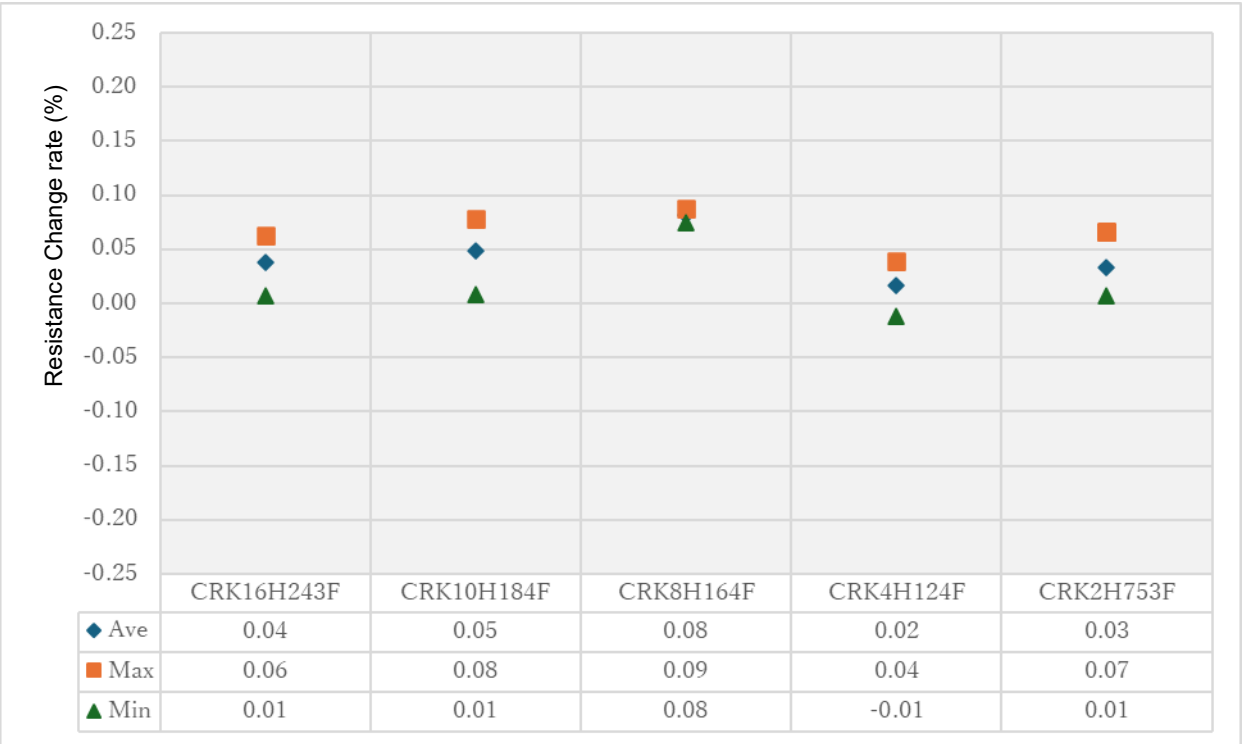
4.2 Mechanical and Thermal Characteristics

<Board Bending n=10> Condition: Flexure 2 mm Specification: ±(1.0 %+0.01 Ω)



	CRK16H243F	CRK10H184F	CRK8H164F	CRK4H124F	CRK2H753F
◆ Ave	0.05	0.07	-0.05	0.00	0.19
■ Max	0.09	0.11	-0.03	0.09	0.25
▲ Min	0.00	0.02	-0.06	-0.05	0.12

<Resistance to Bonding Exposure n=10>
Conditions: Exposure after mounting for 4 to 12 hours Specification: ±(0.25 %+0.01 Ω)



	CRK16H243F	CRK10H184F	CRK8H164F	CRK4H124F	CRK2H753F
◆ Ave	0.04	0.05	0.08	0.02	0.03
■ Max	0.06	0.08	0.09	0.04	0.07
▲ Min	0.01	0.01	0.08	-0.01	0.01

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<Resistance to Soldering Heat n=10>
Conditions: +260 °C for 10 sec. Specification: ±(0.5 %+0.01 Ω)

CRK16H

	1R0F	243F	106F
Ave	0.17	-0.02	0.02
Max	0.29	0.01	0.04
Min	0.06	-0.04	-0.02

CRK10H

	1R0F	184F	106F
Ave	0.12	-0.01	0.00
Max	0.21	0.00	0.01
Min	0.04	-0.02	-0.01

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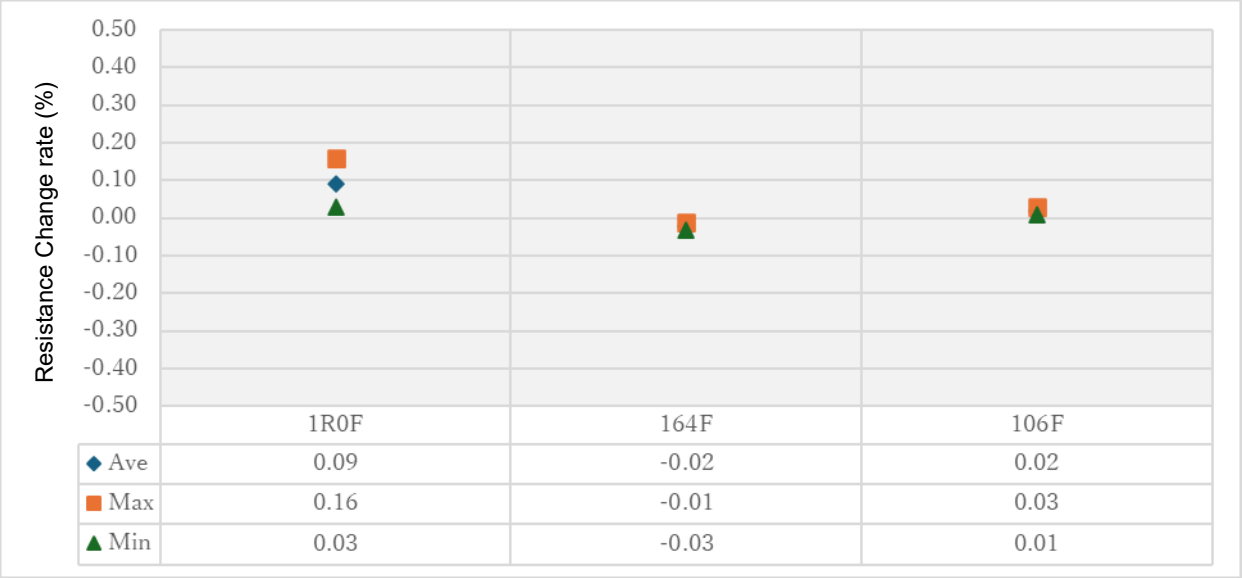
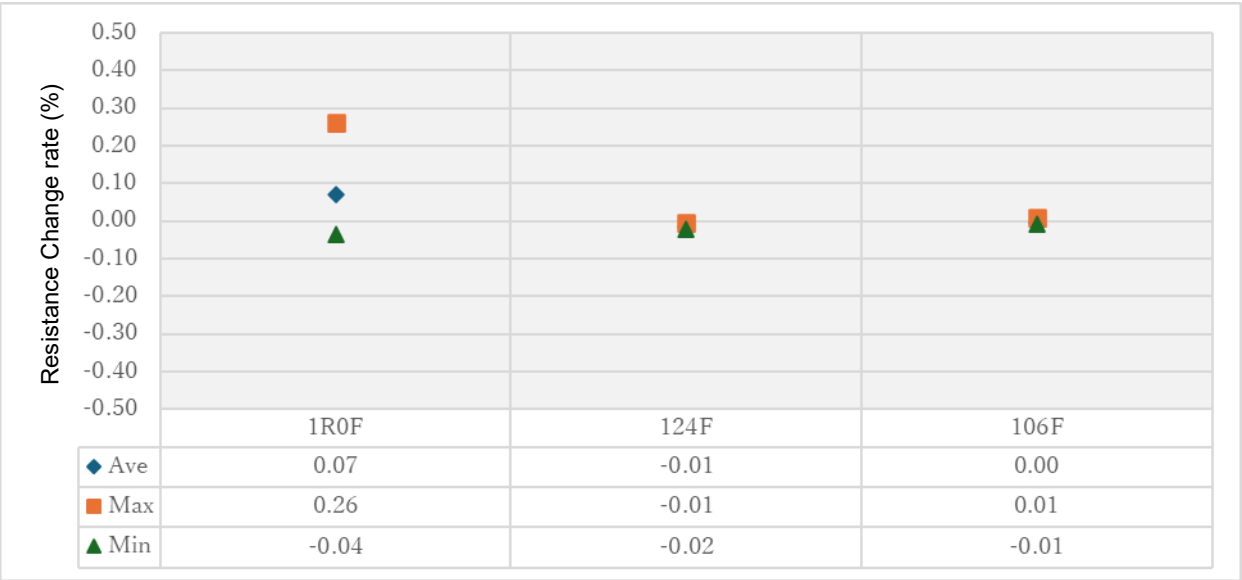
CRK8H



	1R0F	164F	106F
Ave	0.09	-0.02	0.02
Max	0.16	-0.01	0.03
Min	0.03	-0.03	0.01

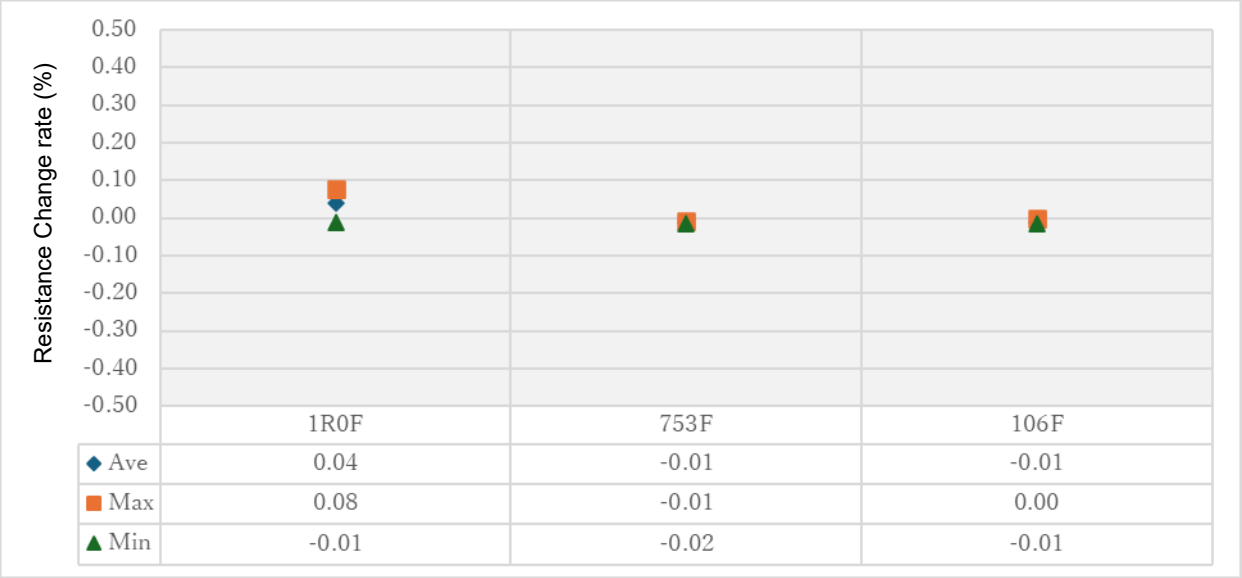
CRK4H



	1R0F	124F	106F
Ave	0.07	-0.01	0.00
Max	0.26	-0.01	0.01
Min	-0.04	-0.02	-0.01

S3SU-2601

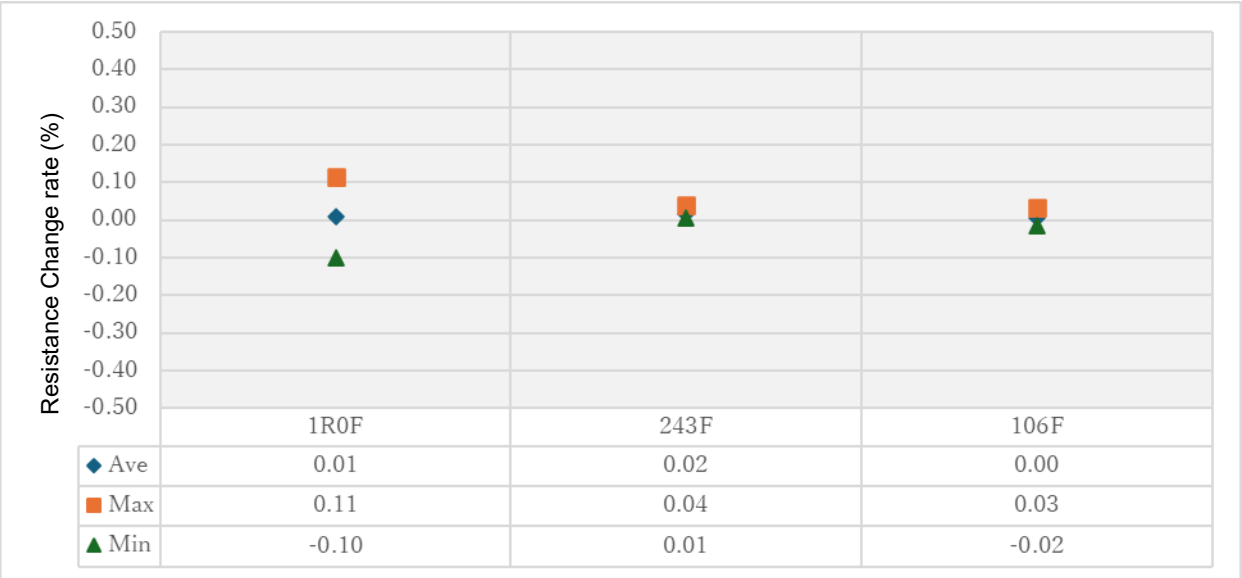
CRK2H



	1R0F	753F	106F
Ave	0.04	-0.01	-0.01
Max	0.08	-0.01	0.00
Min	-0.01	-0.02	-0.01

<Moisture resistance n=10> Conditions: +25 to +65 °C, 90 to 95 %RH, −10 °C for 10 cycles Specification: ±(0.5 %+0.01 Ω)

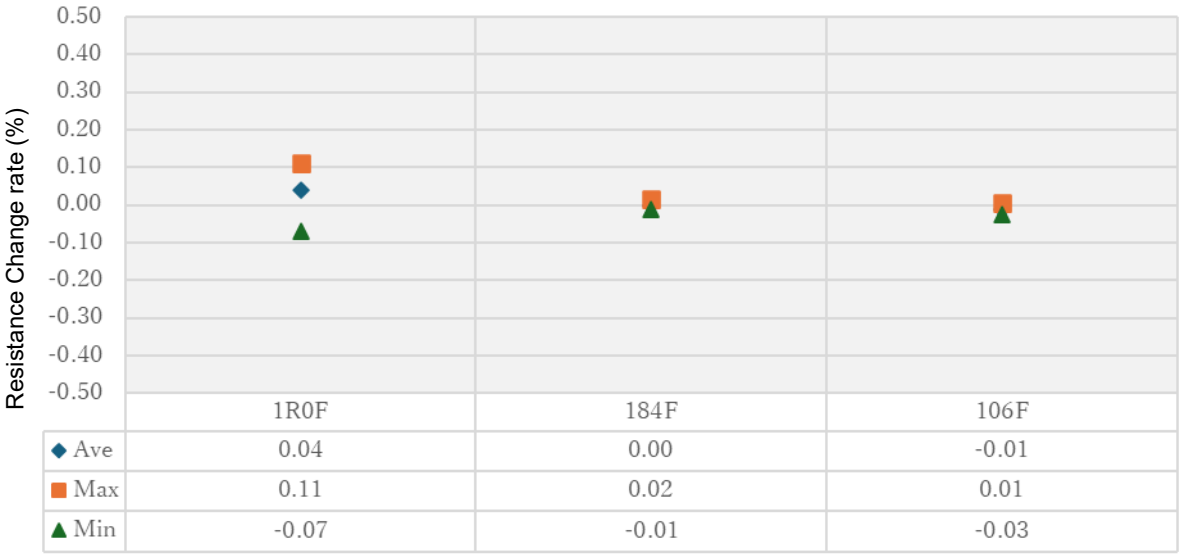
CRK16H



	1R0F	243F	106F
Ave	0.01	0.02	0.00
Max	0.11	0.04	0.03
Min	-0.10	0.01	-0.02

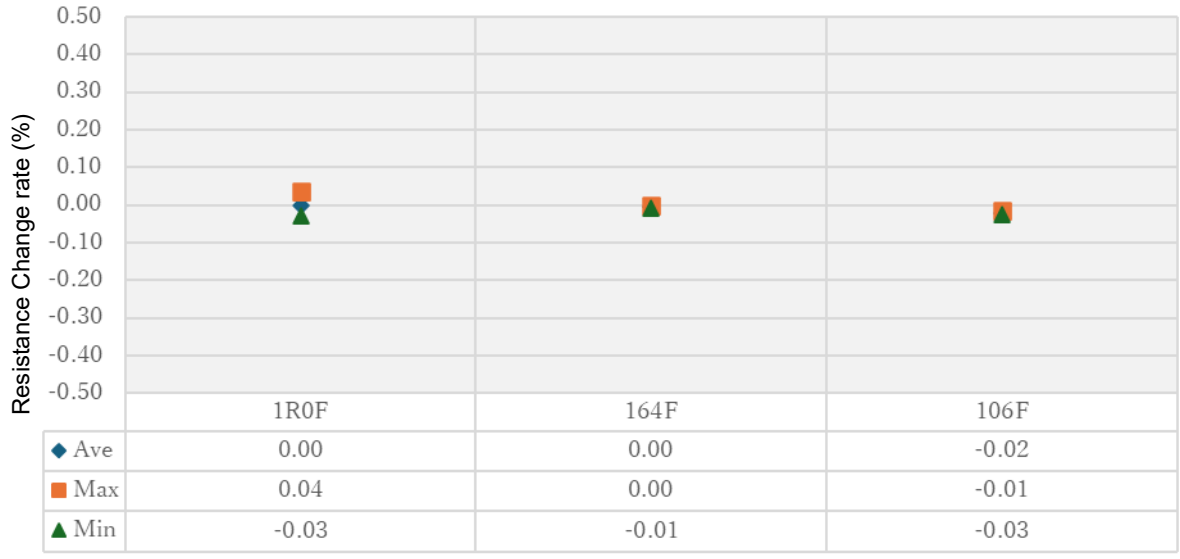
S3SU-2601

CRK10H



	1R0F	184F	106F
Ave	0.04	0.00	-0.01
Max	0.11	0.02	0.01
Min	-0.07	-0.01	-0.03

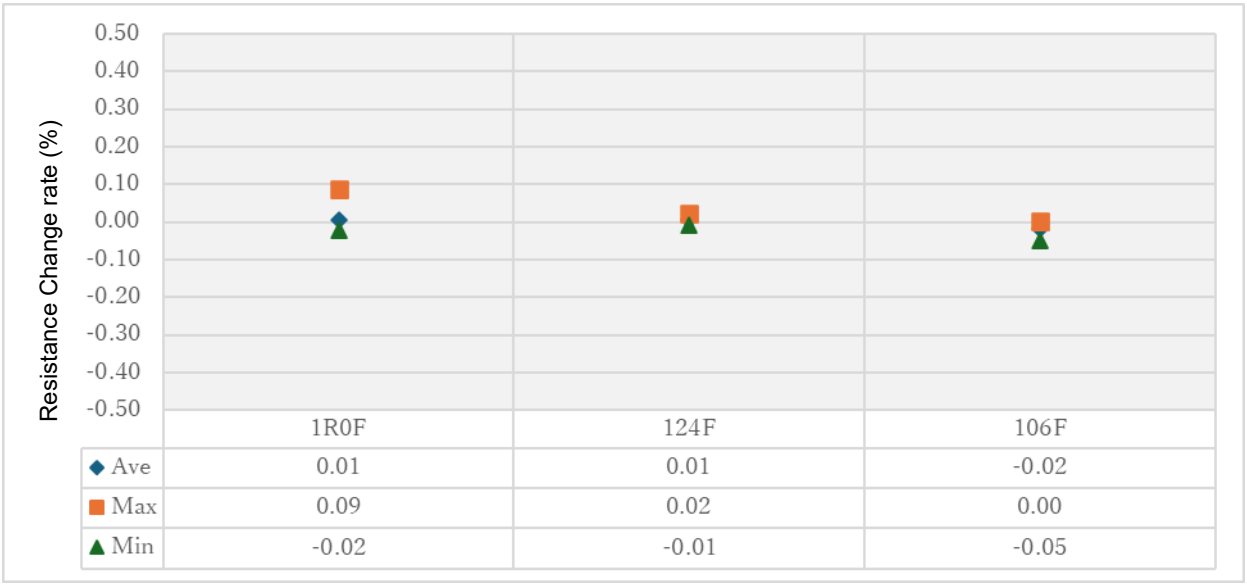
CRK8H



	1R0F	164F	106F
Ave	0.00	0.00	-0.02
Max	0.04	0.00	-0.01
Min	-0.03	-0.01	-0.03

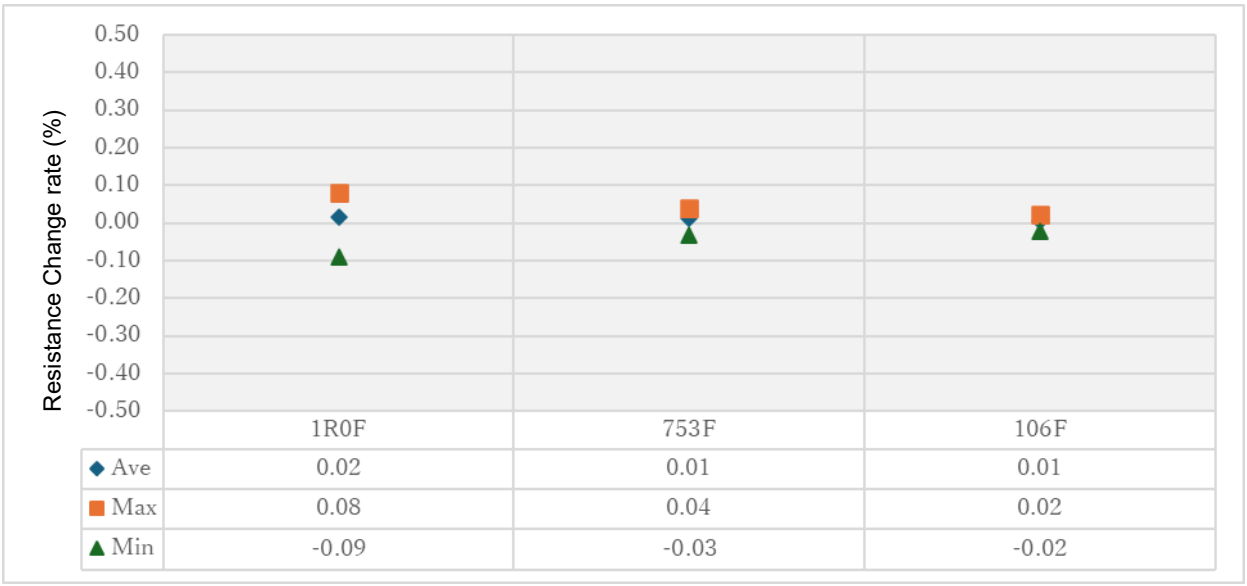
S3SU-2601

CRK4H



	1R0F	124F	106F
Ave	0.01	0.01	-0.02
Max	0.09	0.02	0.00
Min	-0.02	-0.01	-0.05

CRK2H

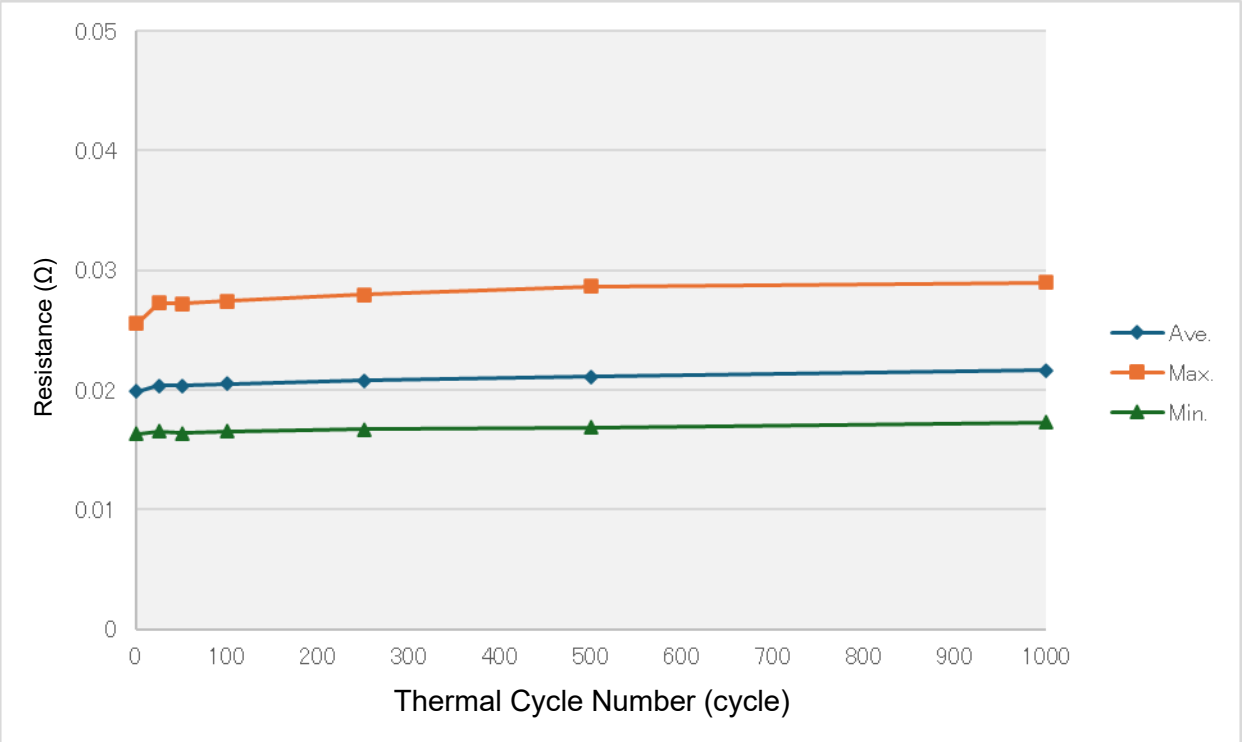


	1R0F	753F	106F
Ave	0.02	0.01	0.01
Max	0.08	0.04	0.02
Min	-0.09	-0.03	-0.02

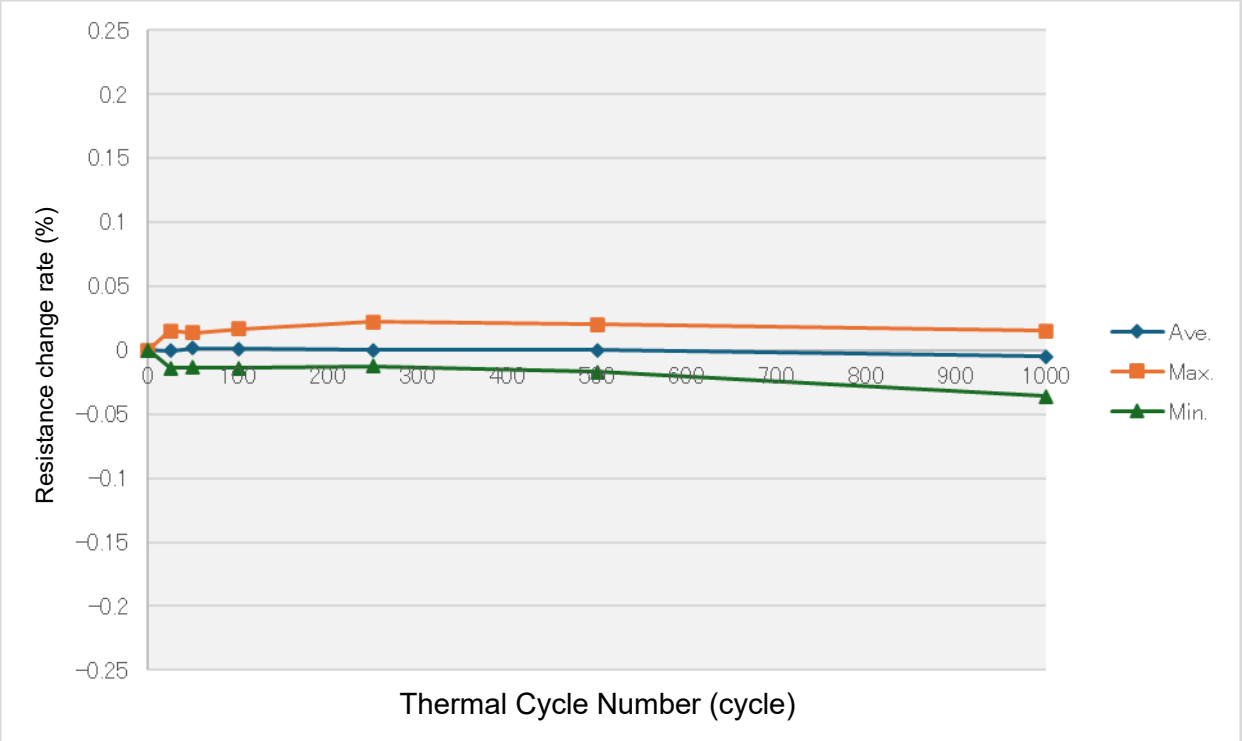
4.3 Characteristic in Operation and Environmental Conditions

<Thermal shock II n=10> Conditions: −30 °C for 15 min. to +100 °C for 15 min. of 1,000 cycles Specification: ±(0.25 %+0.01 Ω)

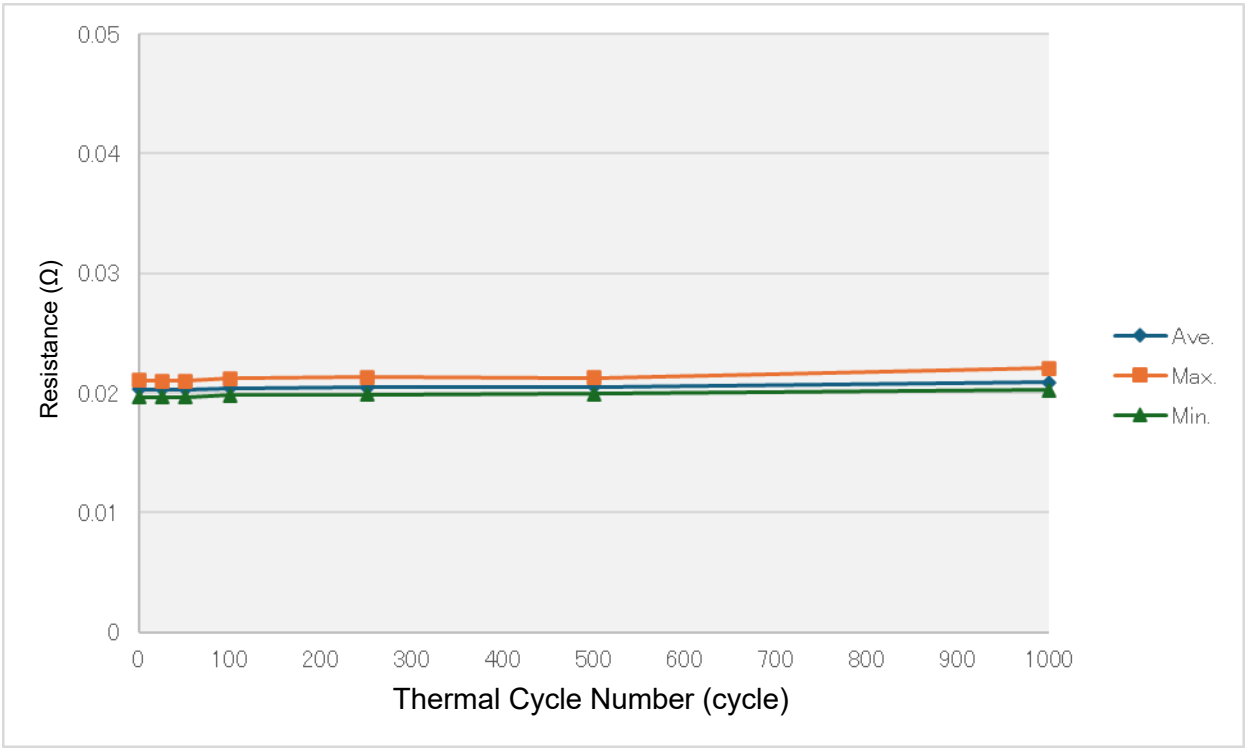
CRK16HR00



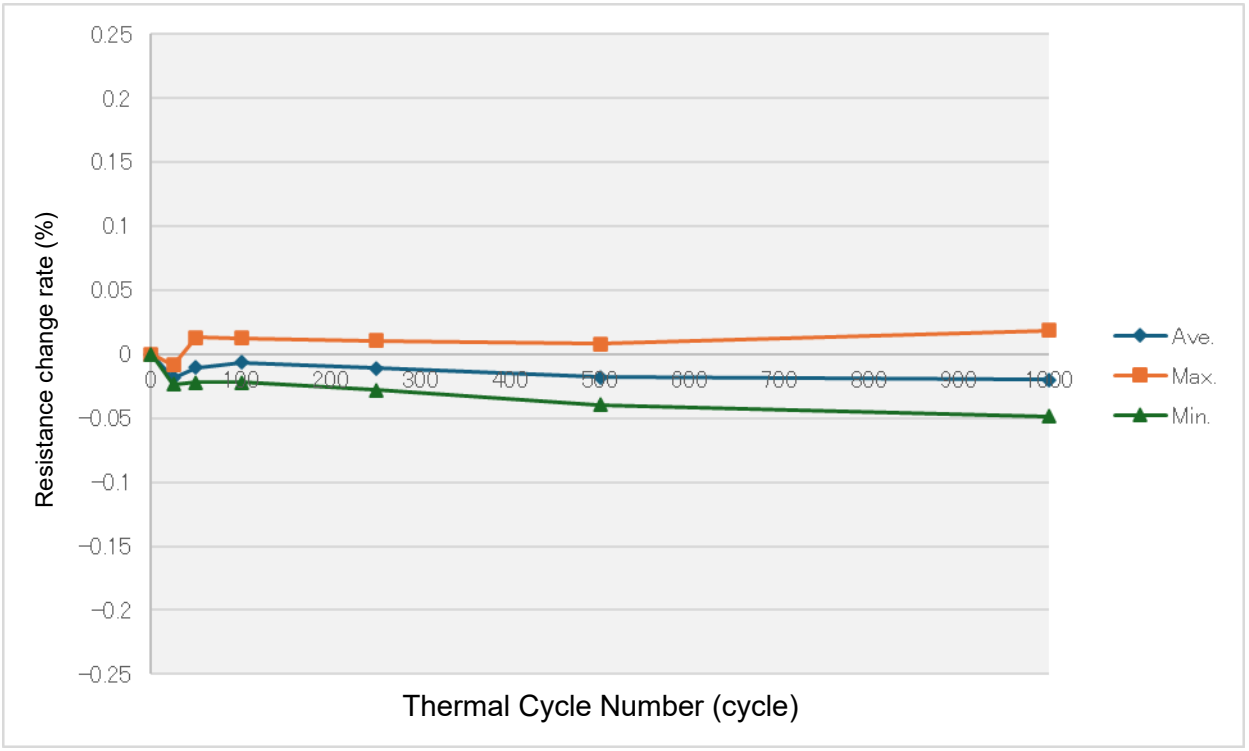
CRK16H243F



CRK10HR00

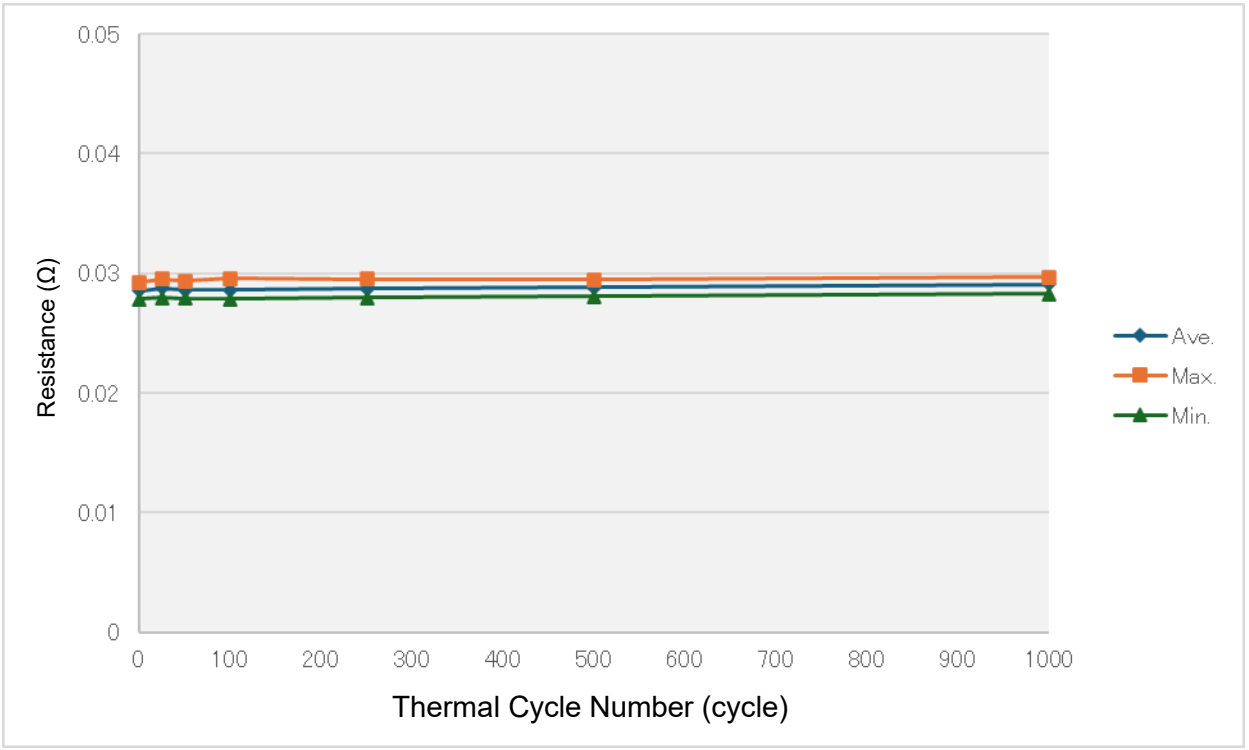


CRK10H184F

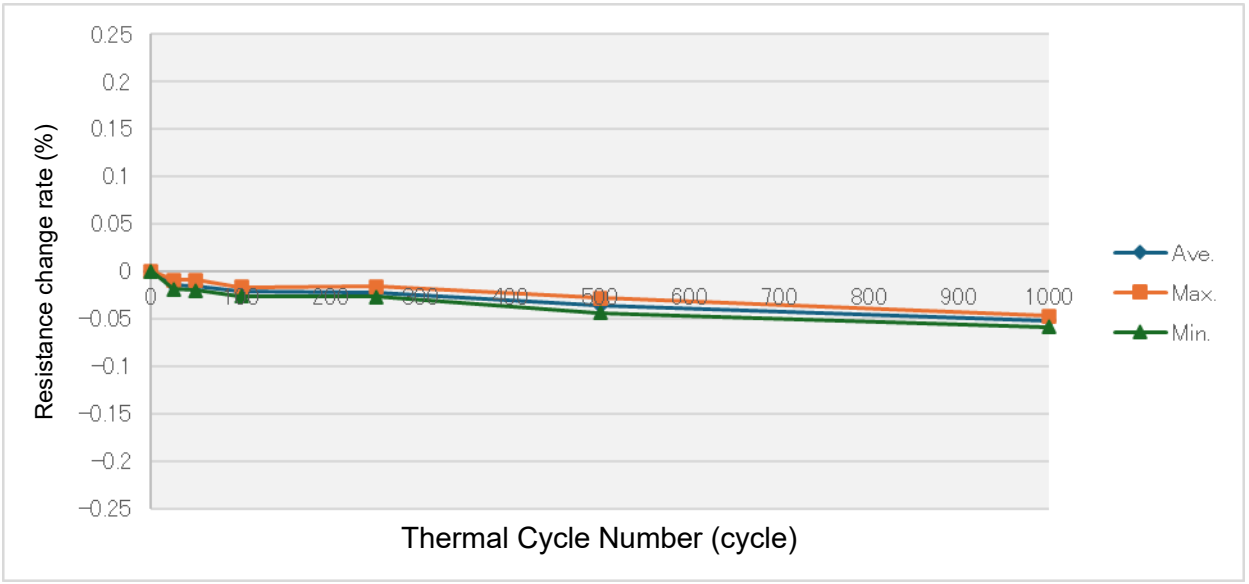


S3SU-2601

CRK8HR00

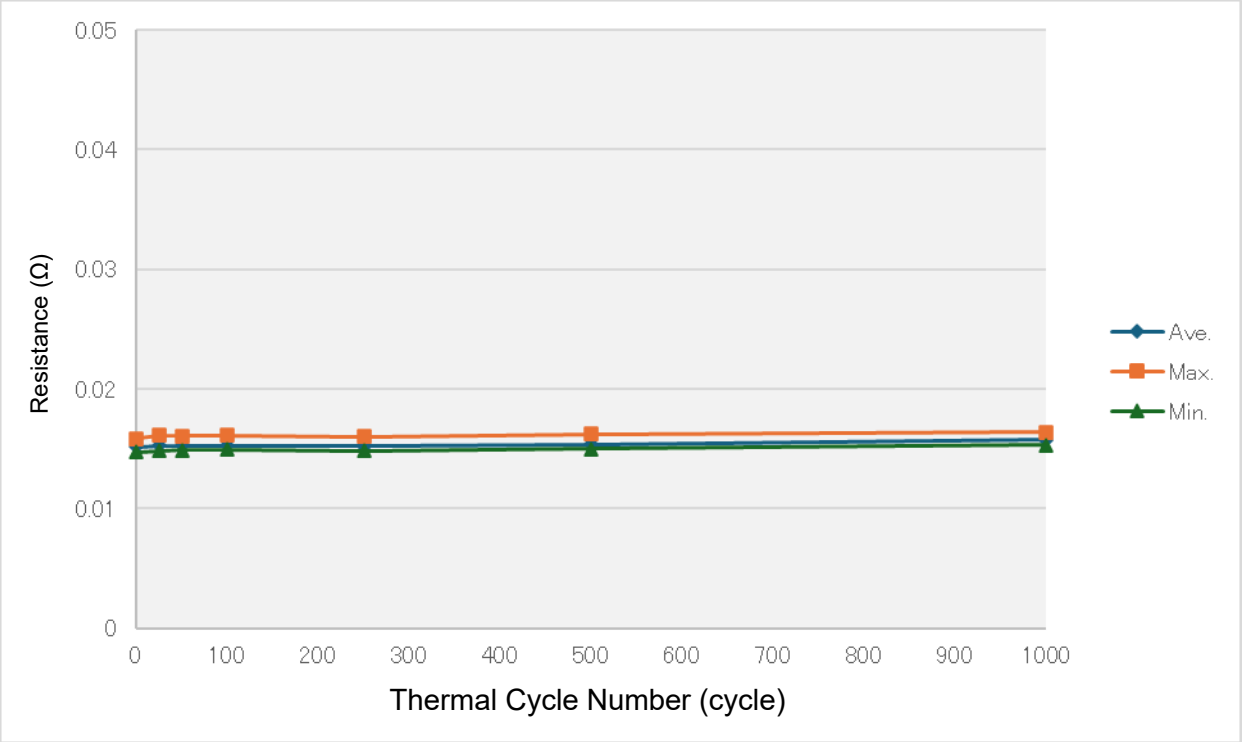


CRK8H164F

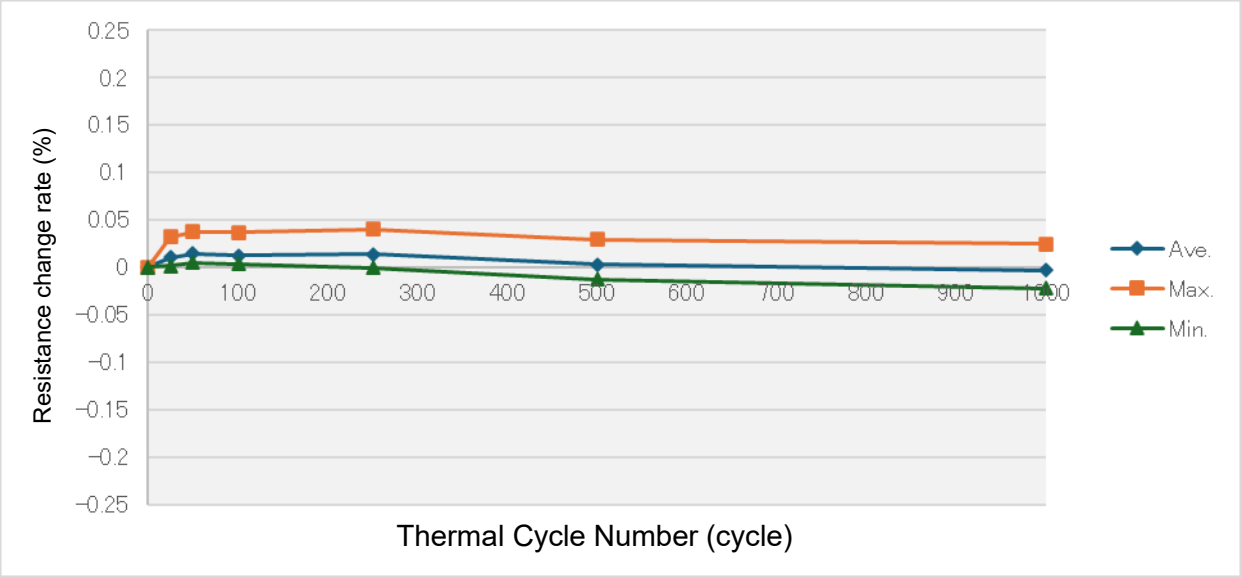


S3SU-2601

CRK4HR00

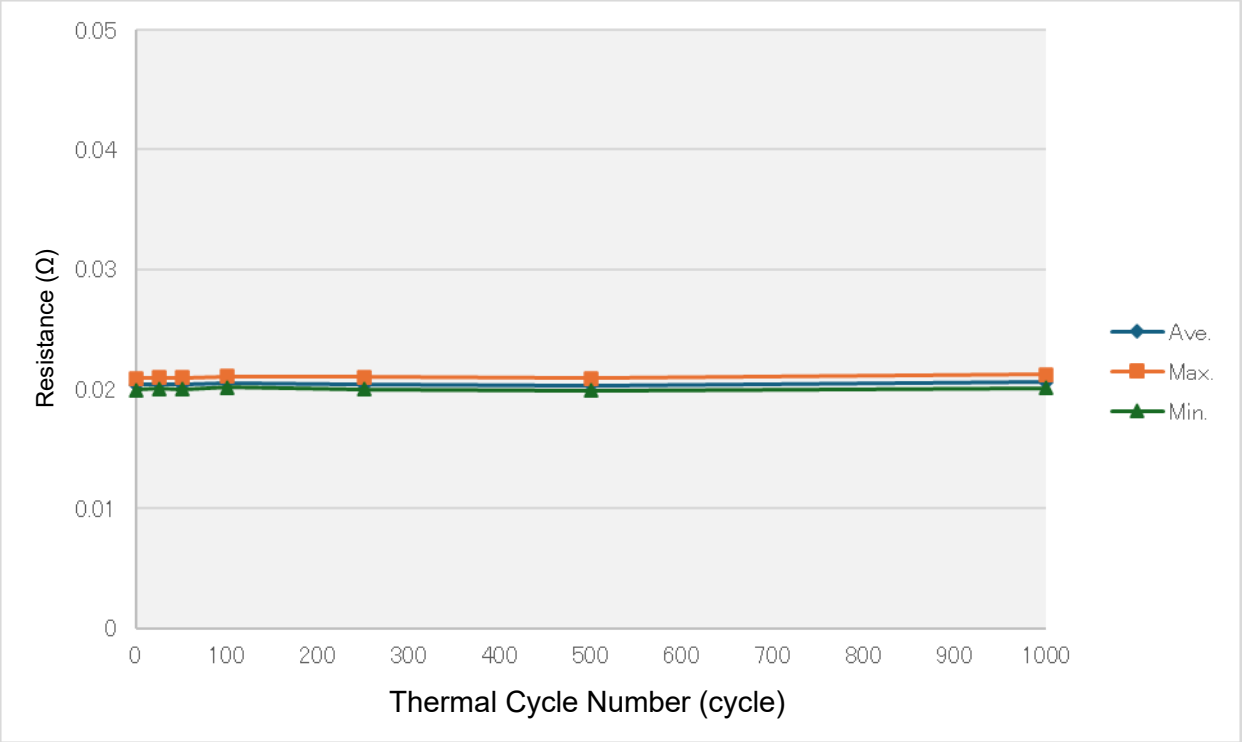


CRK4H124F

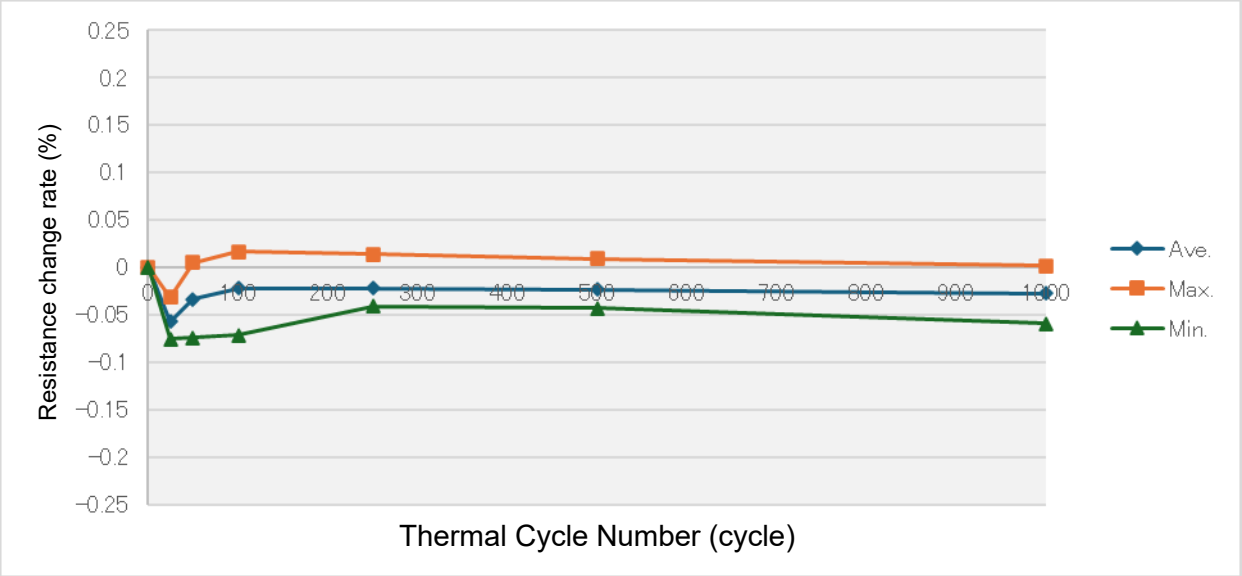


S3SU-2601

CRK2HR00



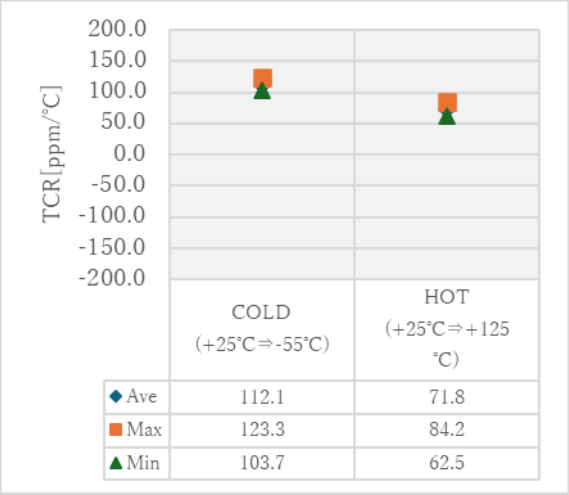
CRK2H753F



<Resistance-temperature characteristic n=10> Conditions: +25 °C→ -55 °C →+25 °C→+125 °C Specification: ±100 ppm/°C (Less than 10 Ω: ±200 ppm/°C)

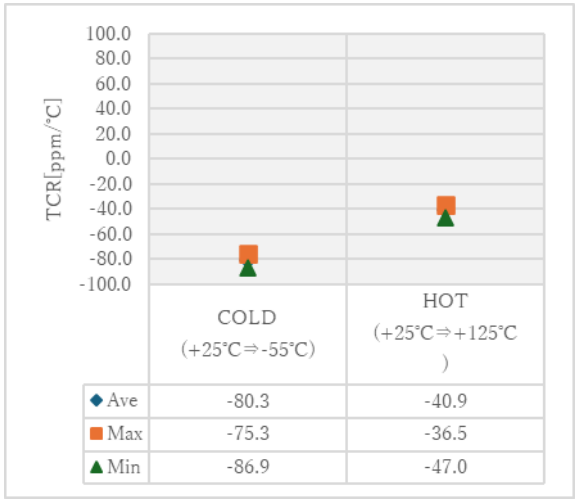
S3SU-2601

CRK16H1R0F



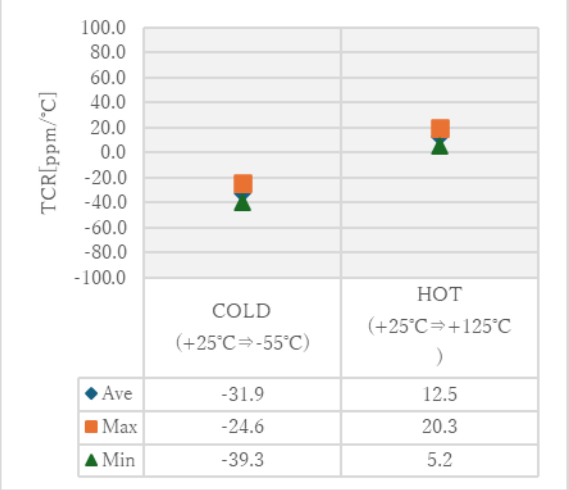
	COLD (+25°C⇒-55°C)	HOT (+25°C⇒+125°C)
◆Ave	112.1	71.8
■Max	123.3	84.2
▲Min	103.7	62.5

CRK16H243F



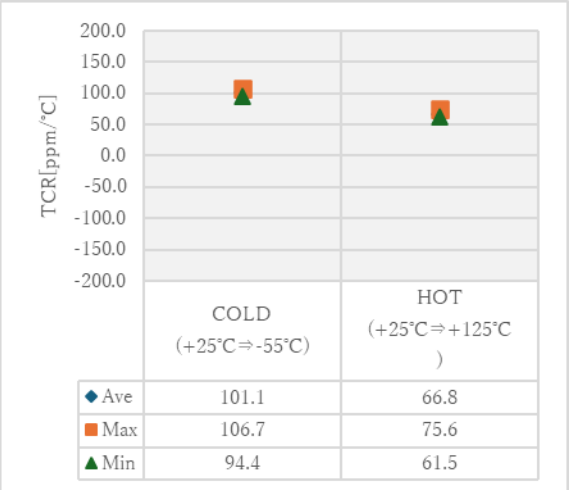
	COLD (+25°C⇒-55°C)	HOT (+25°C⇒+125°C)
◆Ave	-80.3	-40.9
■Max	-75.3	-36.5
▲Min	-86.9	-47.0

CRK16H106F



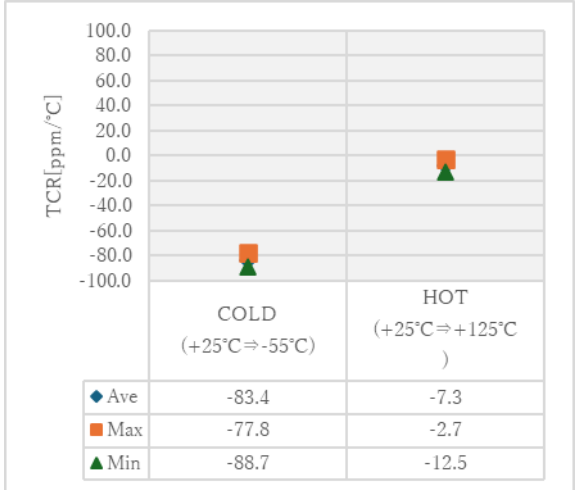
	COLD (+25°C⇒-55°C)	HOT (+25°C⇒+125°C)
◆Ave	-31.9	12.5
■Max	-24.6	20.3
▲Min	-39.3	5.2

CRK10H1R0F



	COLD (+25°C⇒-55°C)	HOT (+25°C⇒+125°C)
◆Ave	101.1	66.8
■Max	106.7	75.6
▲Min	94.4	61.5

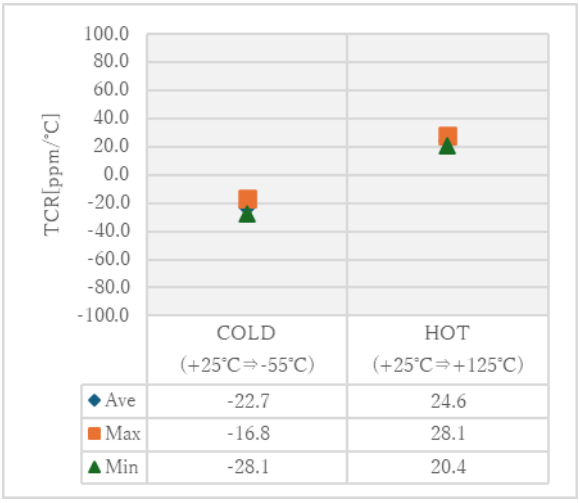
CRK10H184F



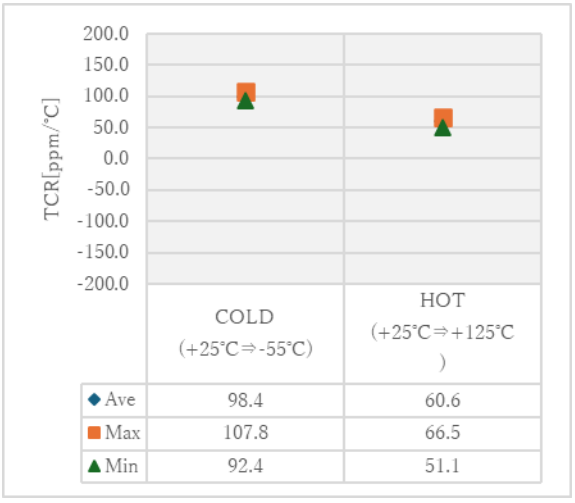
	COLD (+25°C⇒-55°C)	HOT (+25°C⇒+125°C)
◆Ave	-83.4	-7.3
■Max	-77.8	-2.7
▲Min	-88.7	-12.5

S3SU-2601

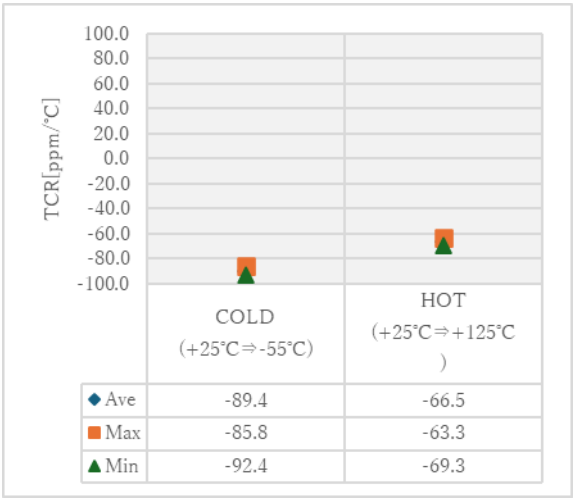
CRK10H106F



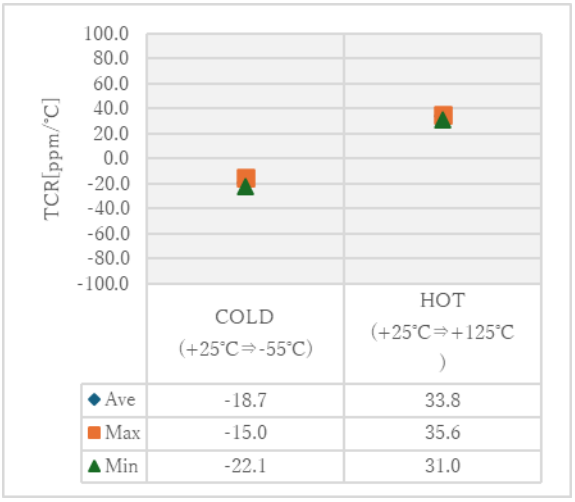
CRK8H1R0F



CRK8H164F

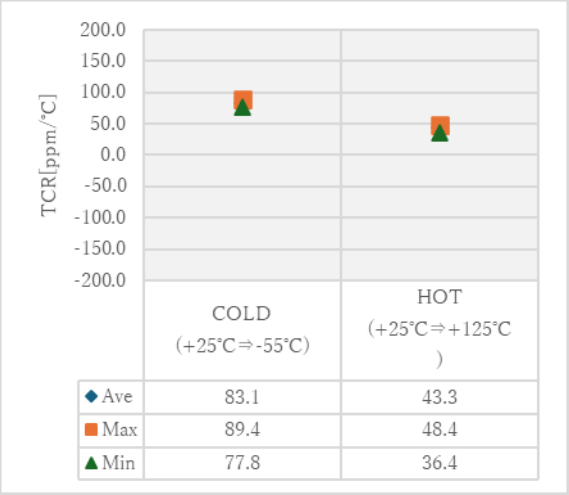


CRK8H106F



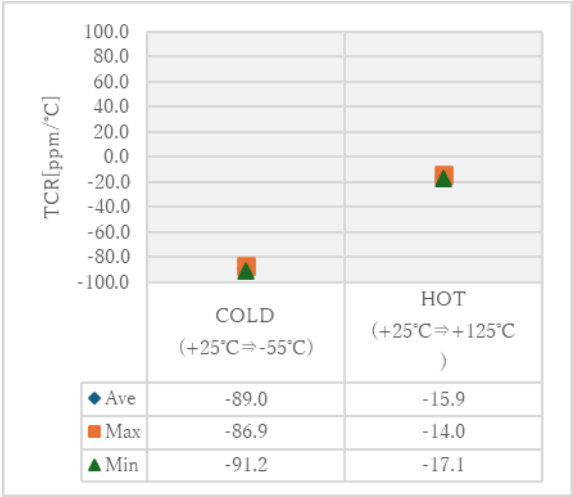
S3SU-2601

CRK4H1R0F



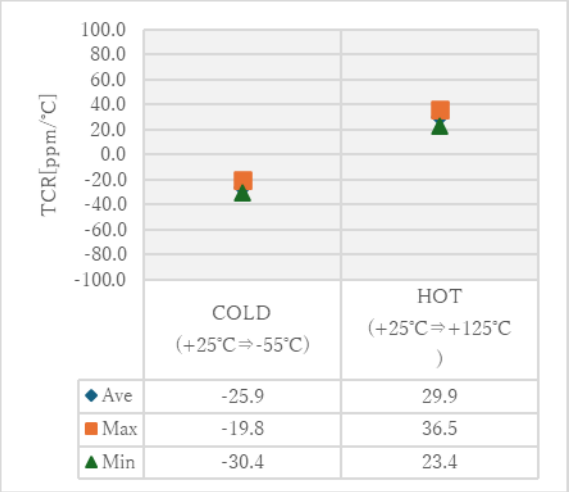
	COLD (+25°C⇒-55°C)	HOT (+25°C⇒+125°C)
Ave	83.1	43.3
Max	89.4	48.4
Min	77.8	36.4

CRK4H124F



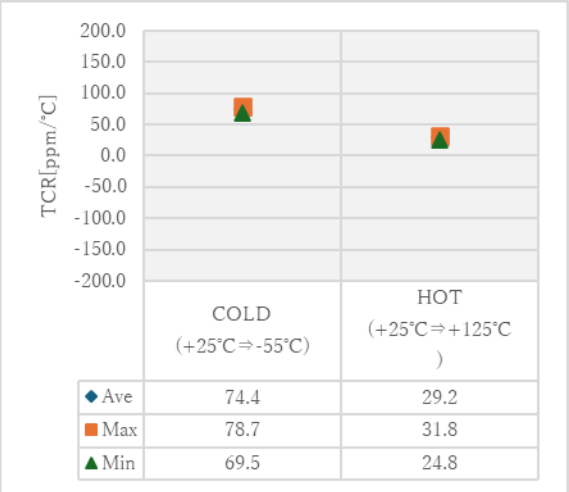
	COLD (+25°C⇒-55°C)	HOT (+25°C⇒+125°C)
Ave	-89.0	-15.9
Max	-86.9	-14.0
Min	-91.2	-17.1

CRK4H106F



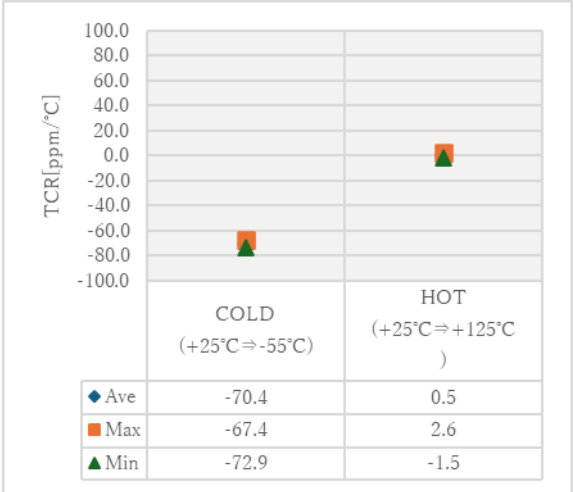
	COLD (+25°C⇒-55°C)	HOT (+25°C⇒+125°C)
Ave	-25.9	29.9
Max	-19.8	36.5
Min	-30.4	23.4

CRK2H1R0F



	COLD (+25°C⇒-55°C)	HOT (+25°C⇒+125°C)
Ave	74.4	29.2
Max	78.7	31.8
Min	69.5	24.8

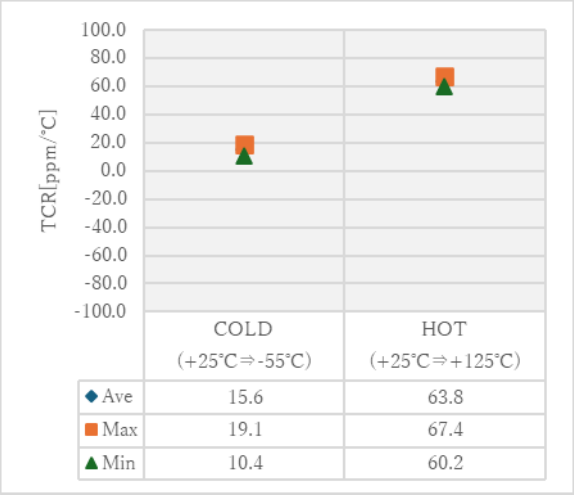
CRK2H753F



	COLD (+25°C⇒-55°C)	HOT (+25°C⇒+125°C)
Ave	-70.4	0.5
Max	-67.4	2.6
Min	-72.9	-1.5

S3SU-2601

CRK2H106F

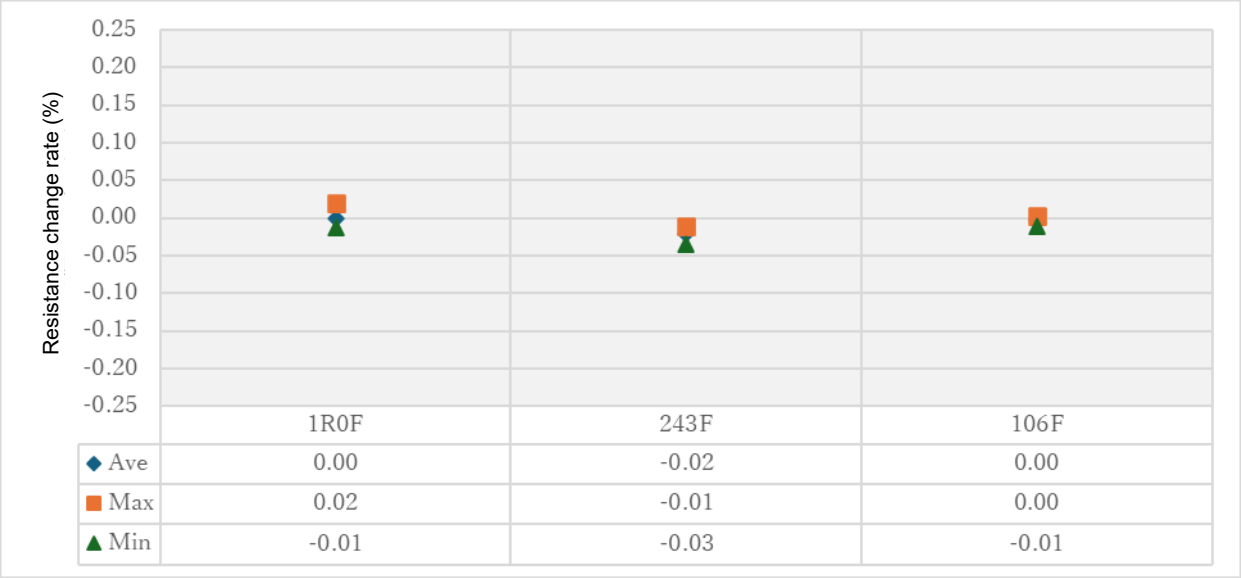


	COLD (+25°C⇒-55°C)	HOT (+25°C⇒+125°C)
Ave	15.6	63.8
Max	19.1	67.4
Min	10.4	60.2

<Low temperature operation n=10>

Conditions: −55 °C, the rated voltage V for 45 minutes Specification: ±(0.25 %+0.01 Ω)

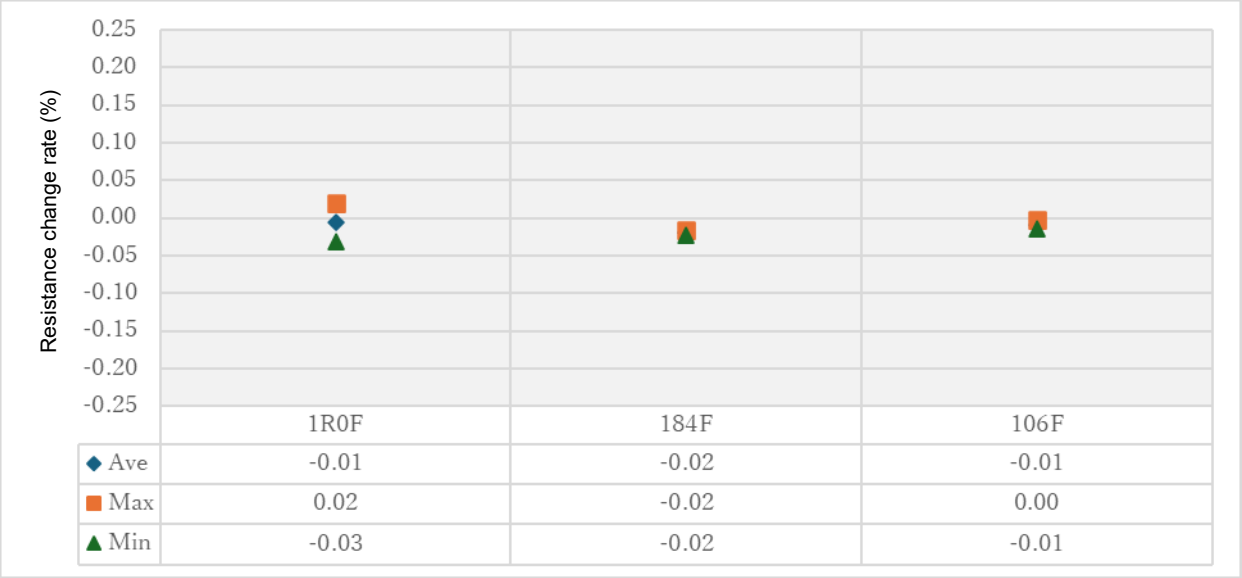
CRK16H



	1R0F	243F	106F
Ave	0.00	-0.02	0.00
Max	0.02	-0.01	0.00
Min	-0.01	-0.03	-0.01

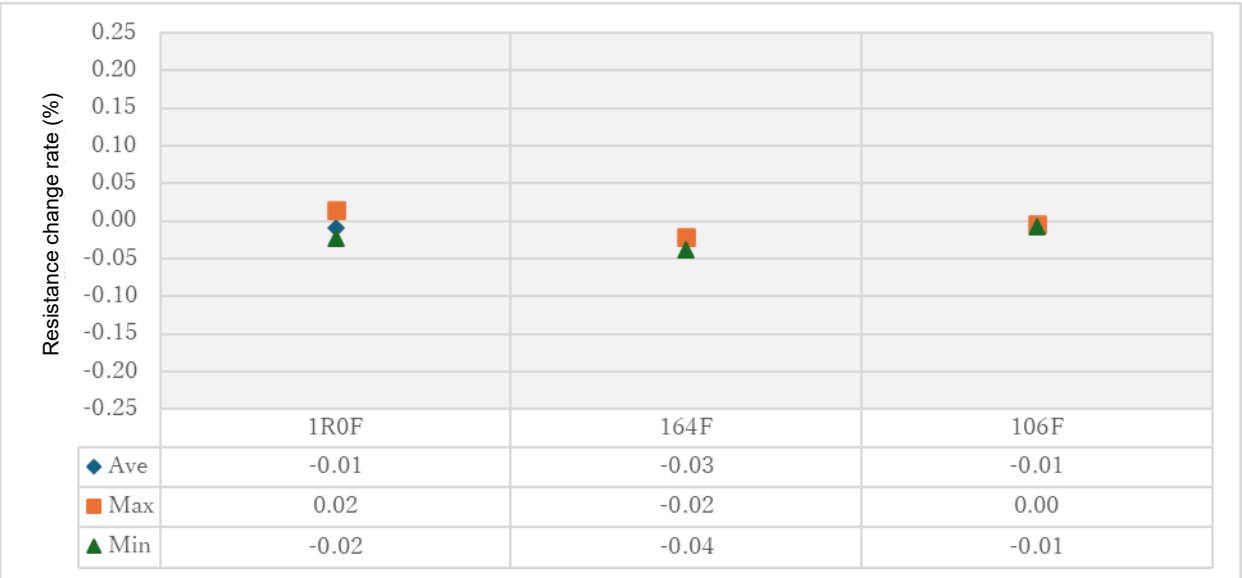
S3SU-2601

CRK10H



	1R0F	184F	106F
Ave	-0.01	-0.02	-0.01
Max	0.02	-0.02	0.00
Min	-0.03	-0.02	-0.01

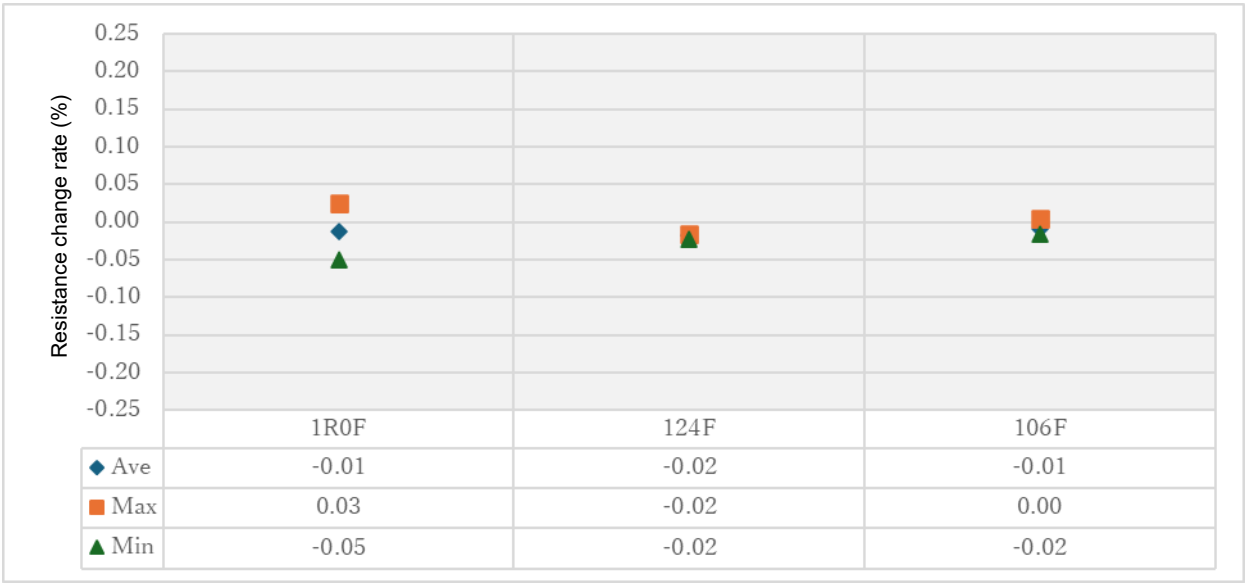
CRK8H



	1R0F	164F	106F
Ave	-0.01	-0.03	-0.01
Max	0.02	-0.02	0.00
Min	-0.02	-0.04	-0.01

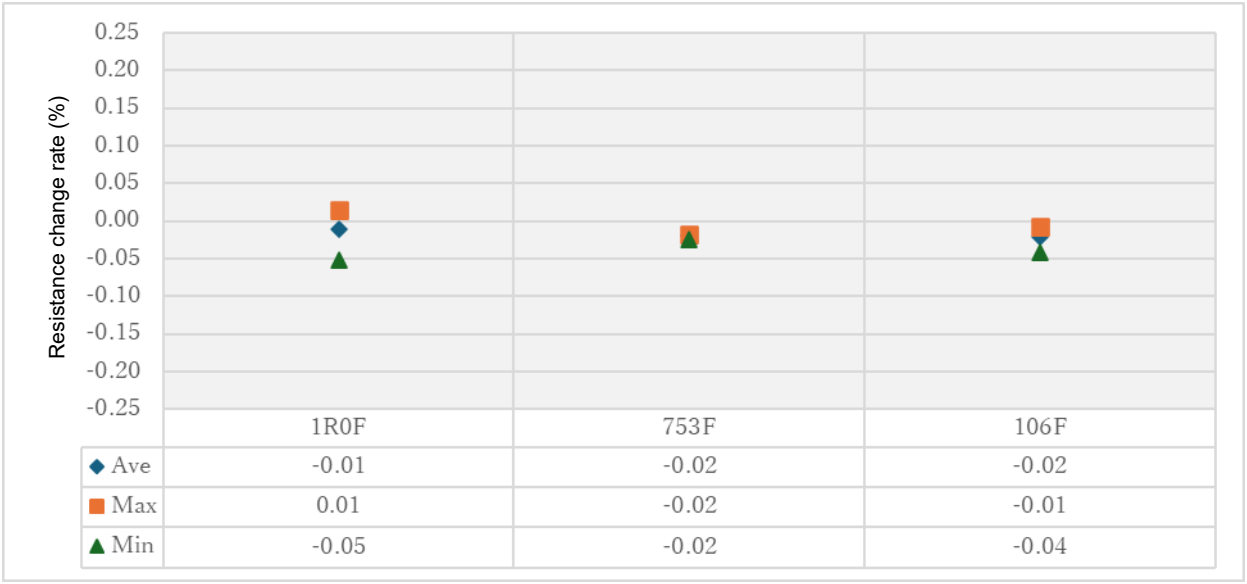
S3SU-2601

CRK4H



	1R0F	124F	106F
Ave	-0.01	-0.02	-0.01
Max	0.03	-0.02	0.00
Min	-0.05	-0.02	-0.02

CRK2H

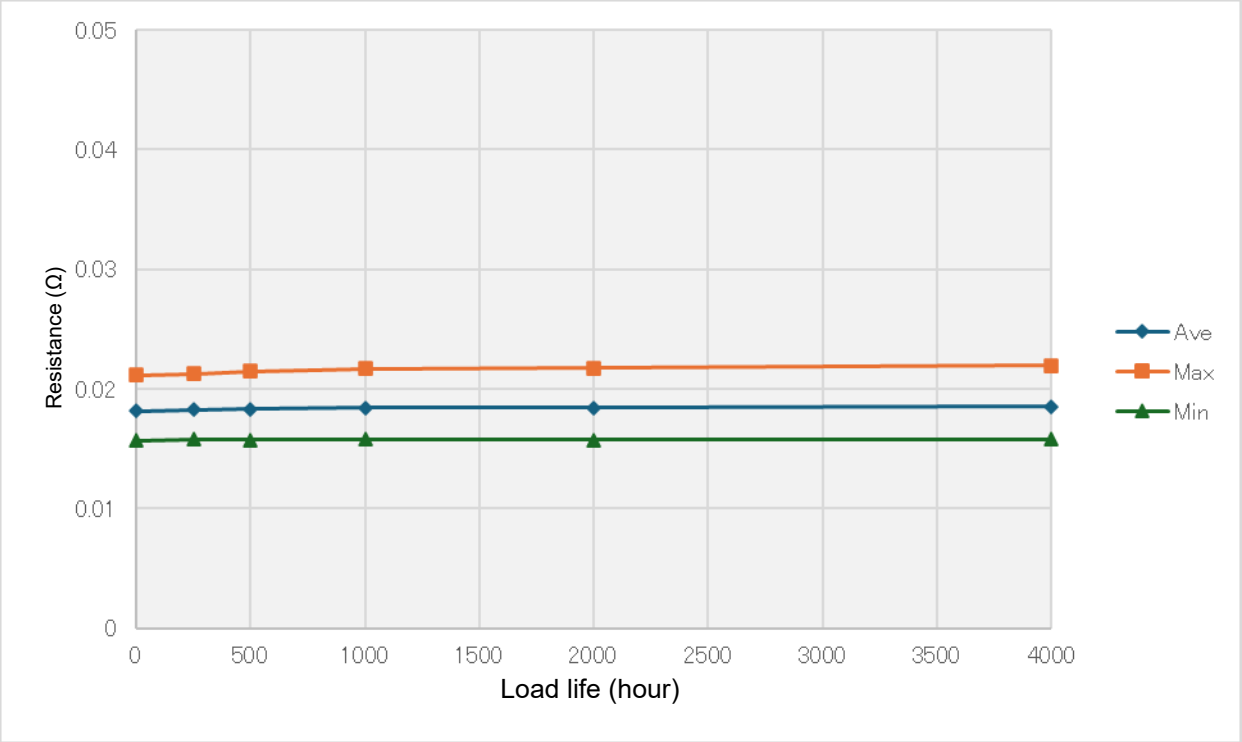


	1R0F	753F	106F
Ave	-0.01	-0.02	-0.02
Max	0.01	-0.02	-0.01
Min	-0.05	-0.02	-0.04

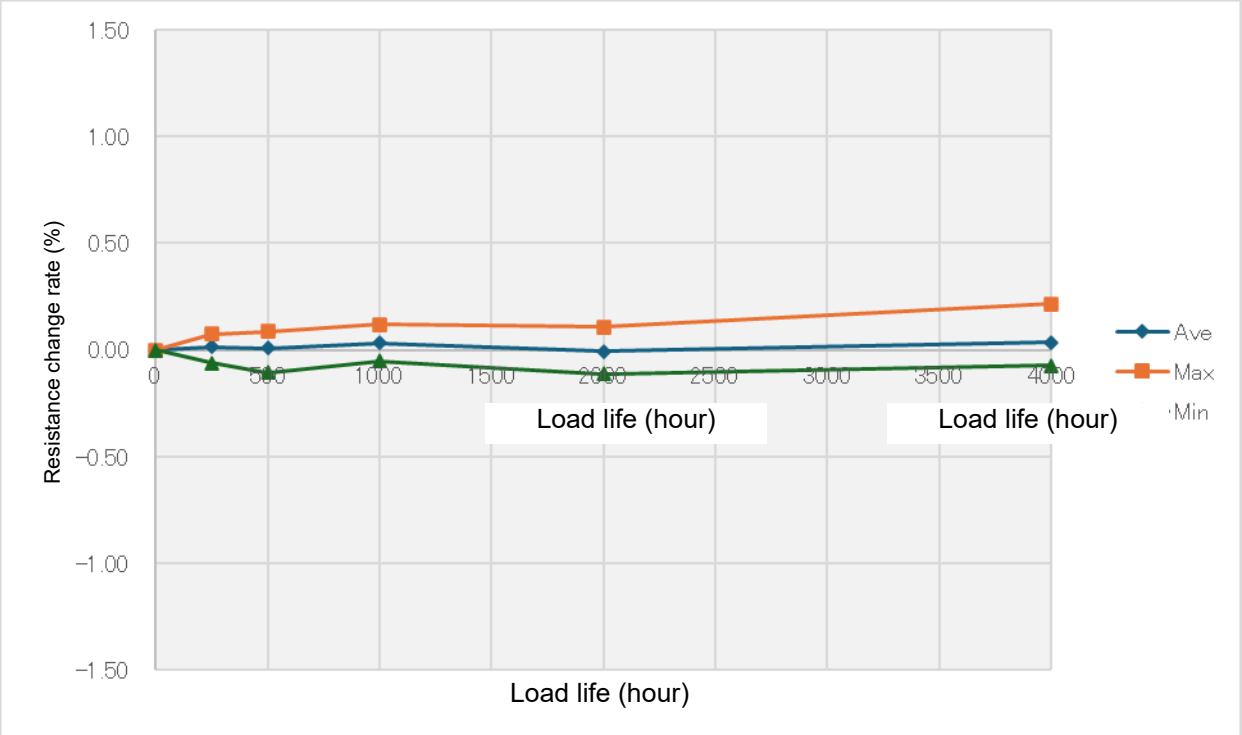
S3SU-2601

<Life n=77> Conditions: +70 °C, the rated voltage V for 90 min. on and 30 min. off for 4,000-hour, Specification: ±(1.5 %+0.01 Ω)

CRK16HR00

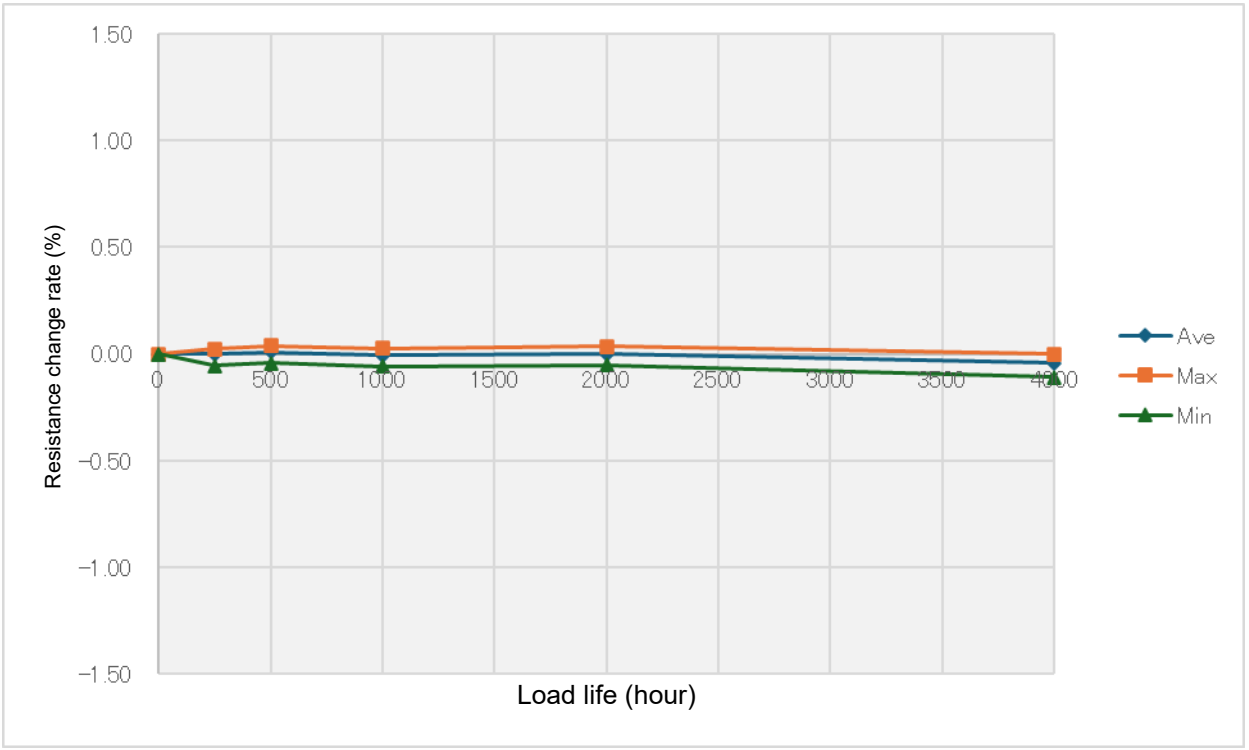


CRK16H1R0F

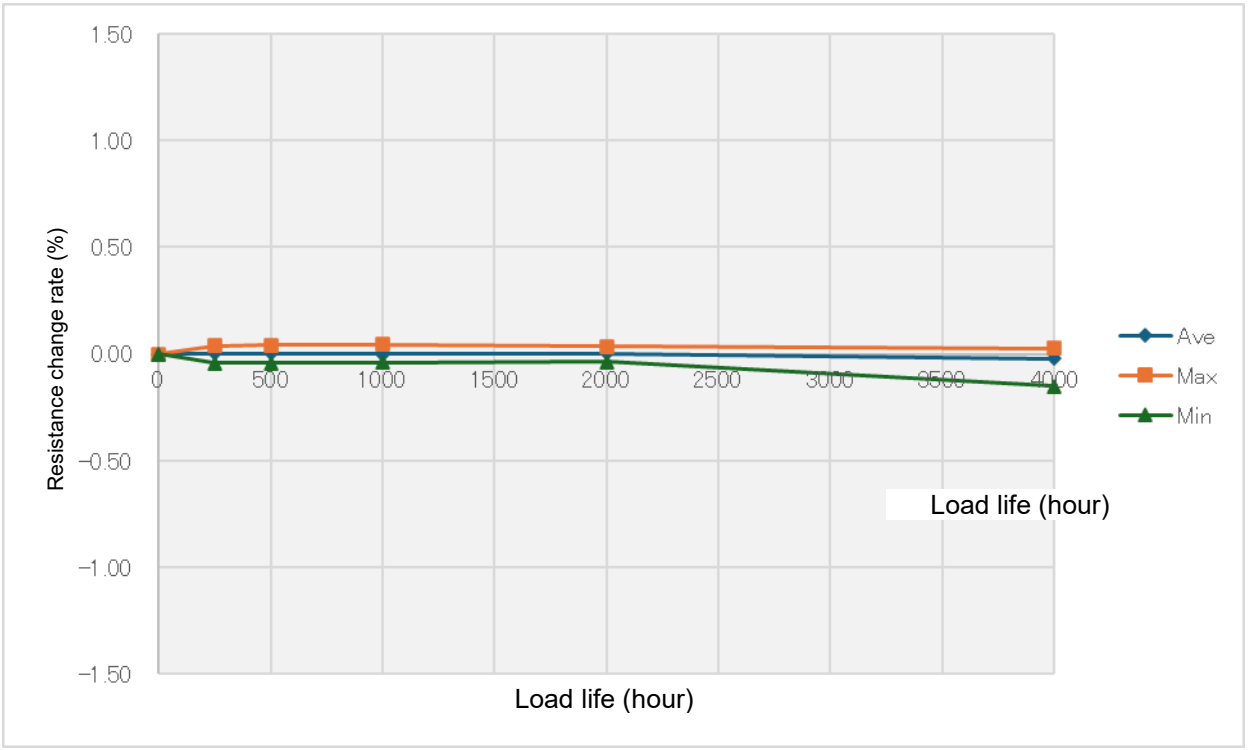


S3SU-2601

CRK16H243F

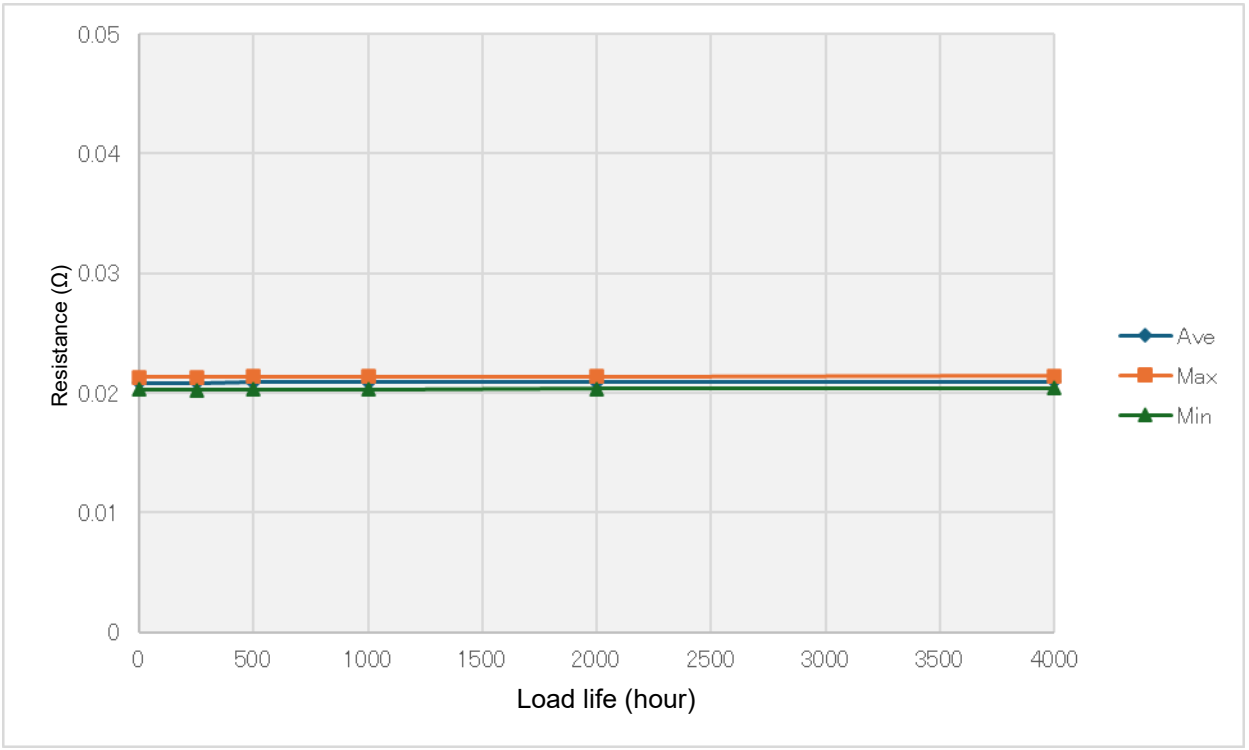


CRK16H106F

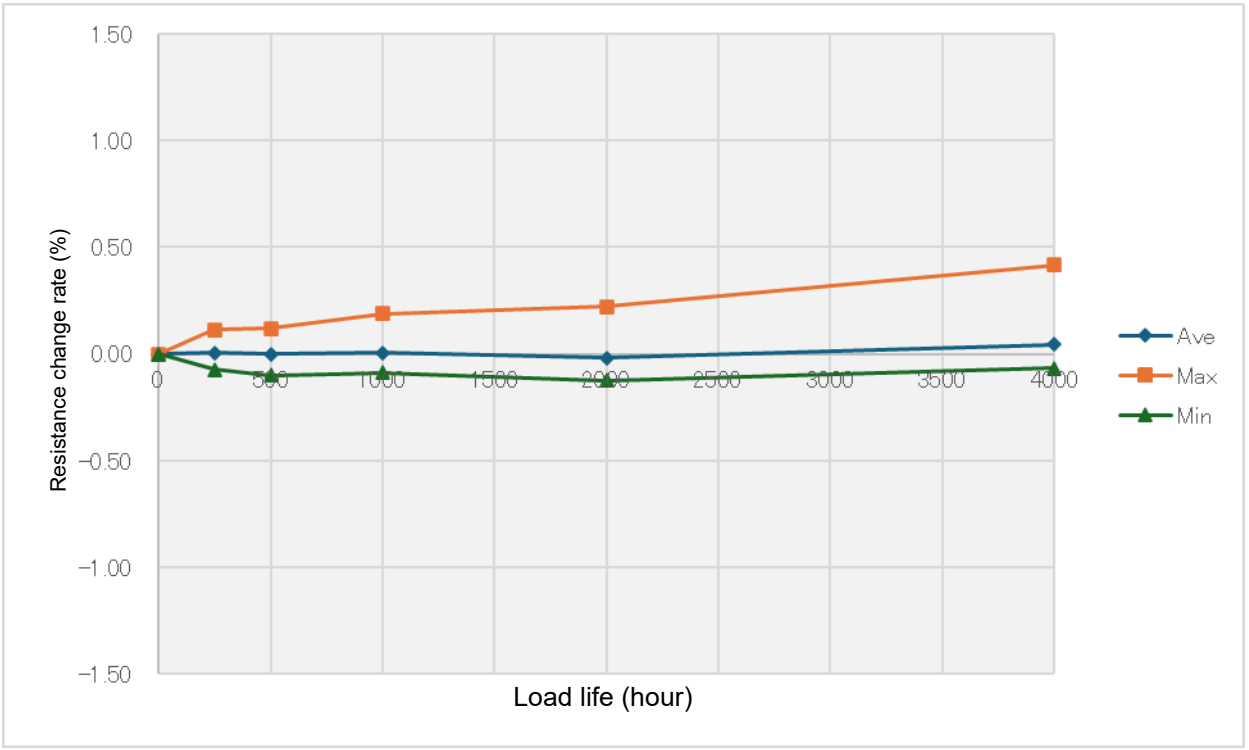


S3SU-2601

CRK10HR00

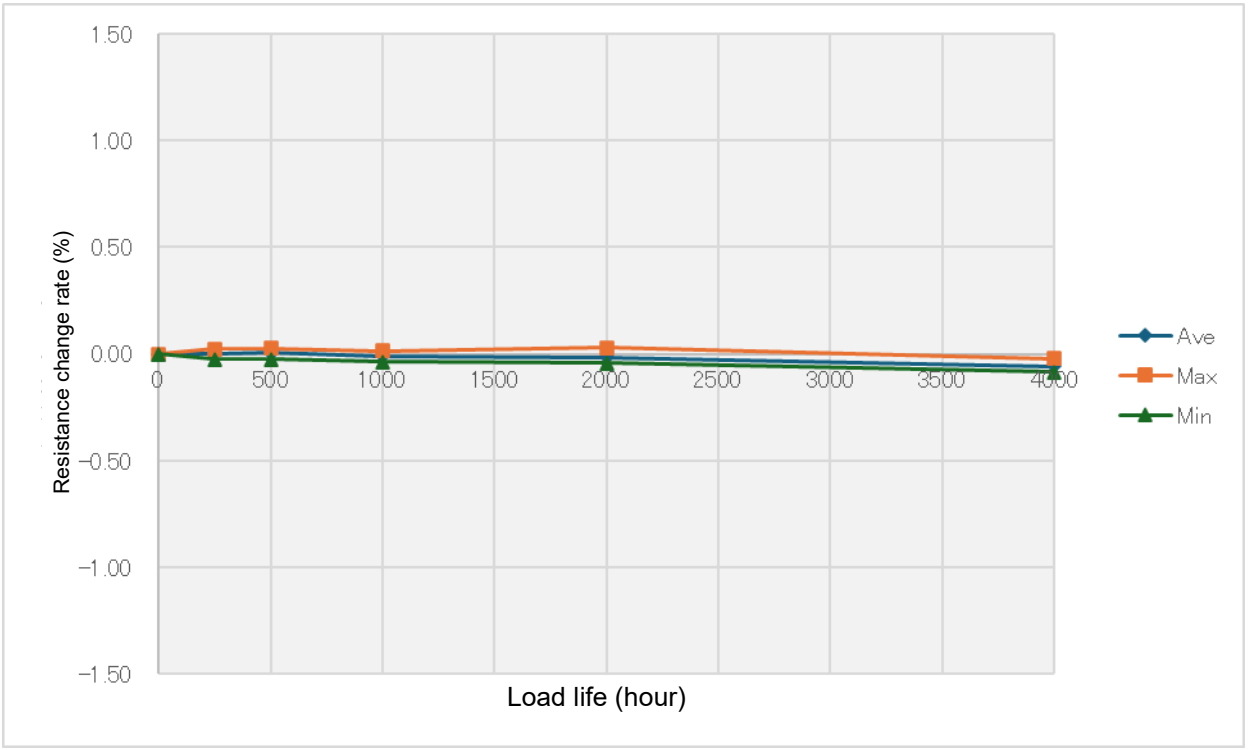


CRK10H1R0F

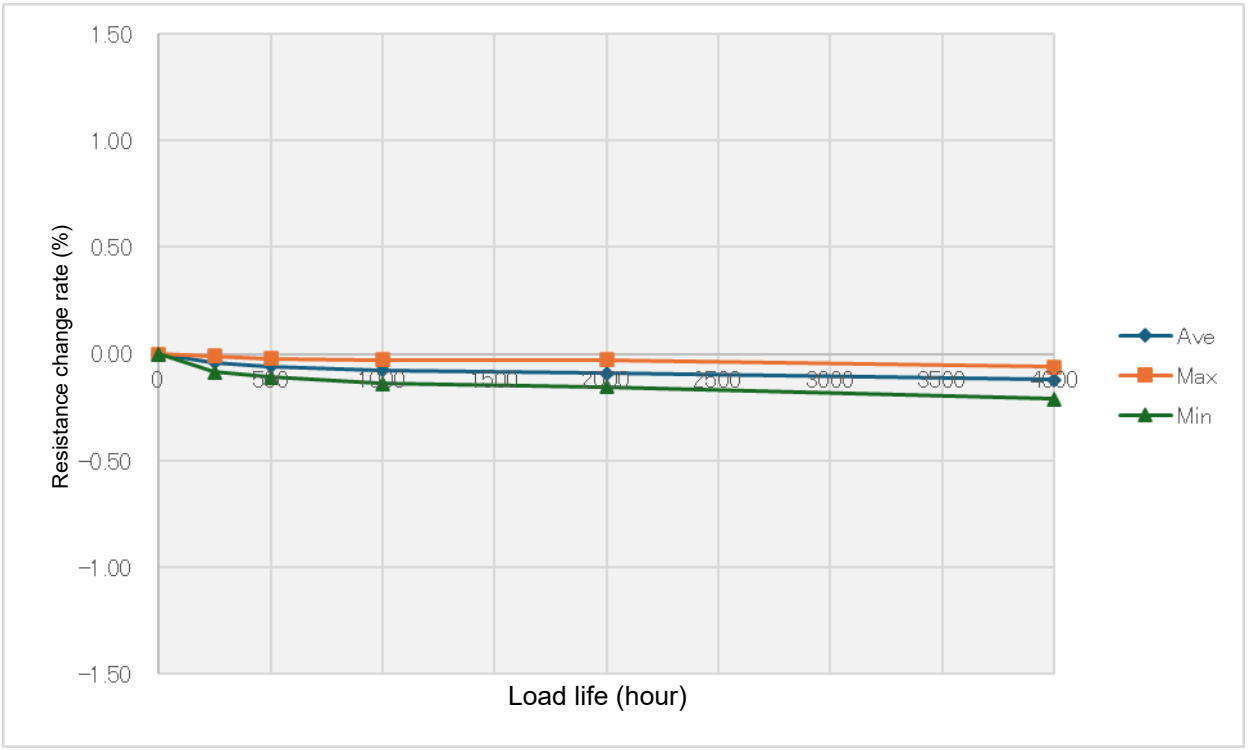


S3SU-2601

CRK10H184F

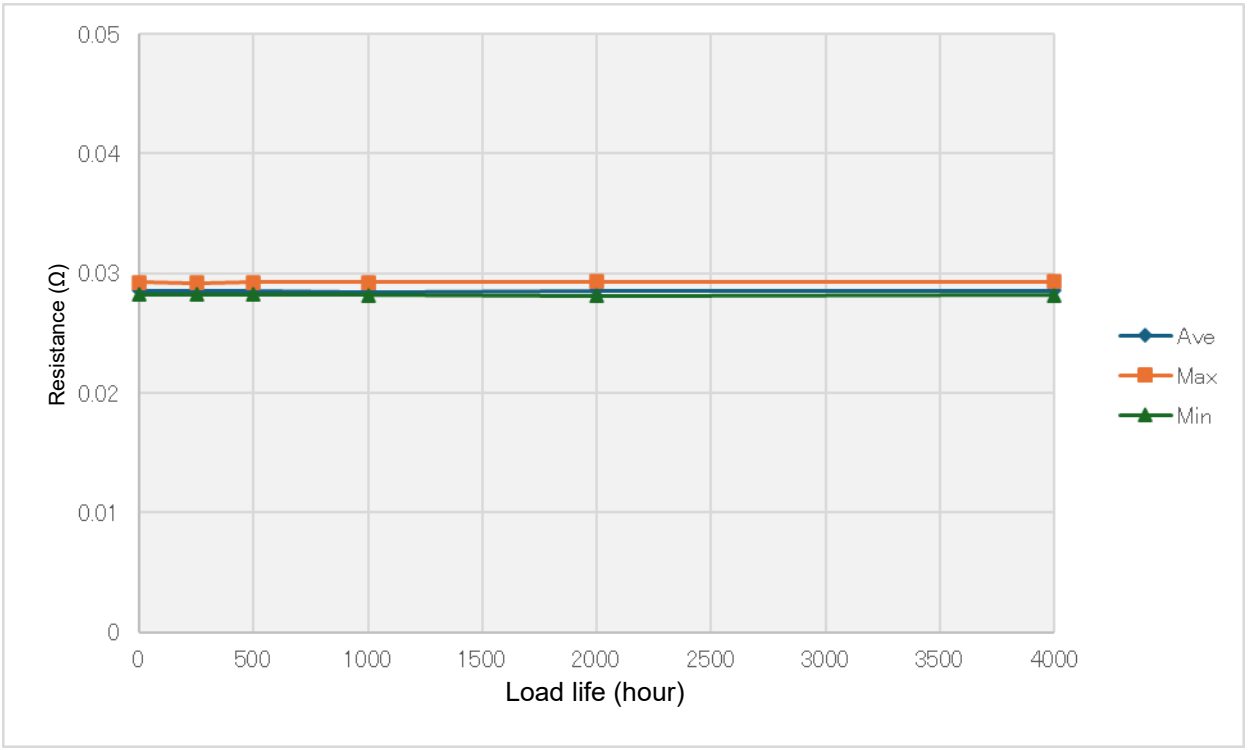


CRK10H106F

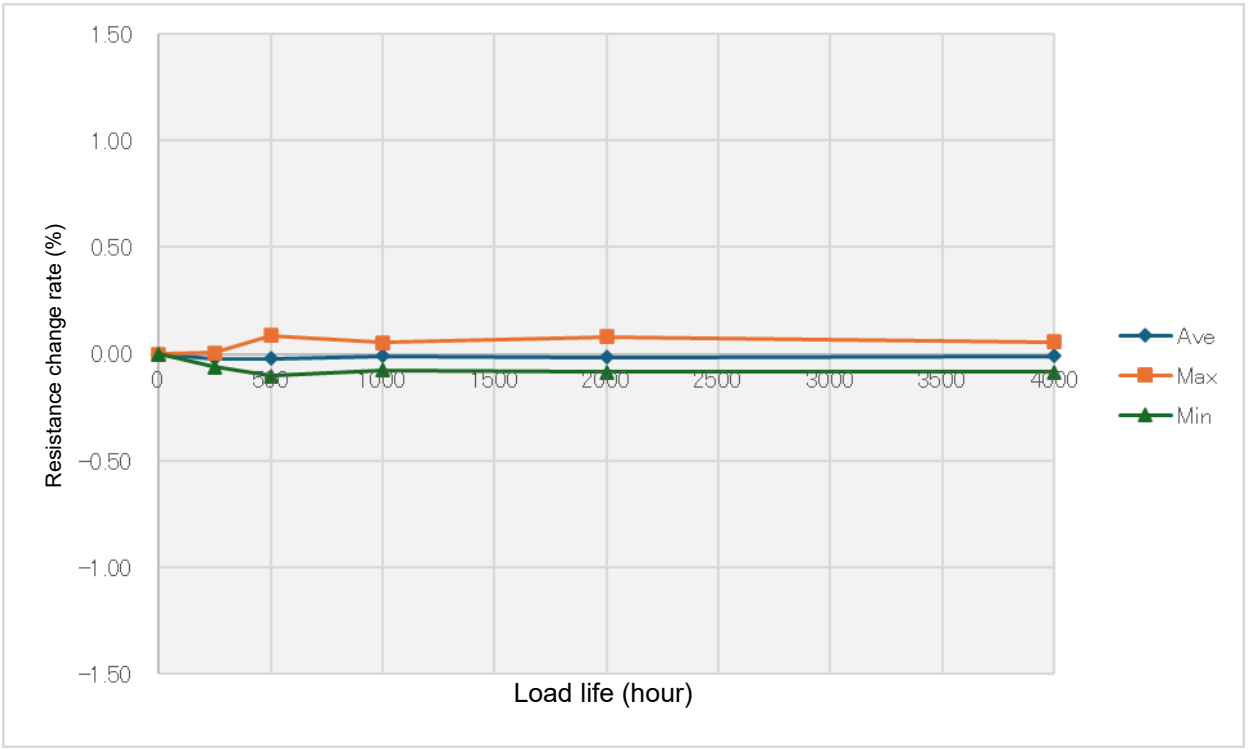


S3SU-2601

CRK8HR00

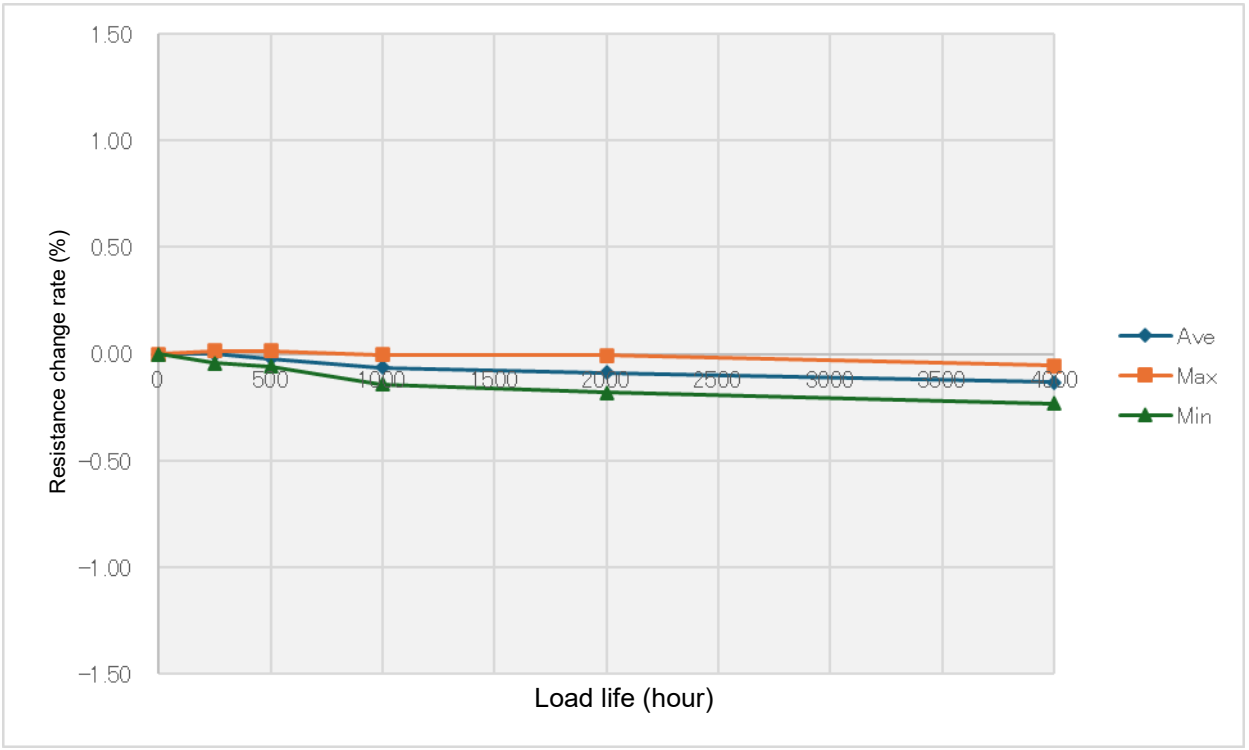


CRK8H1R0F

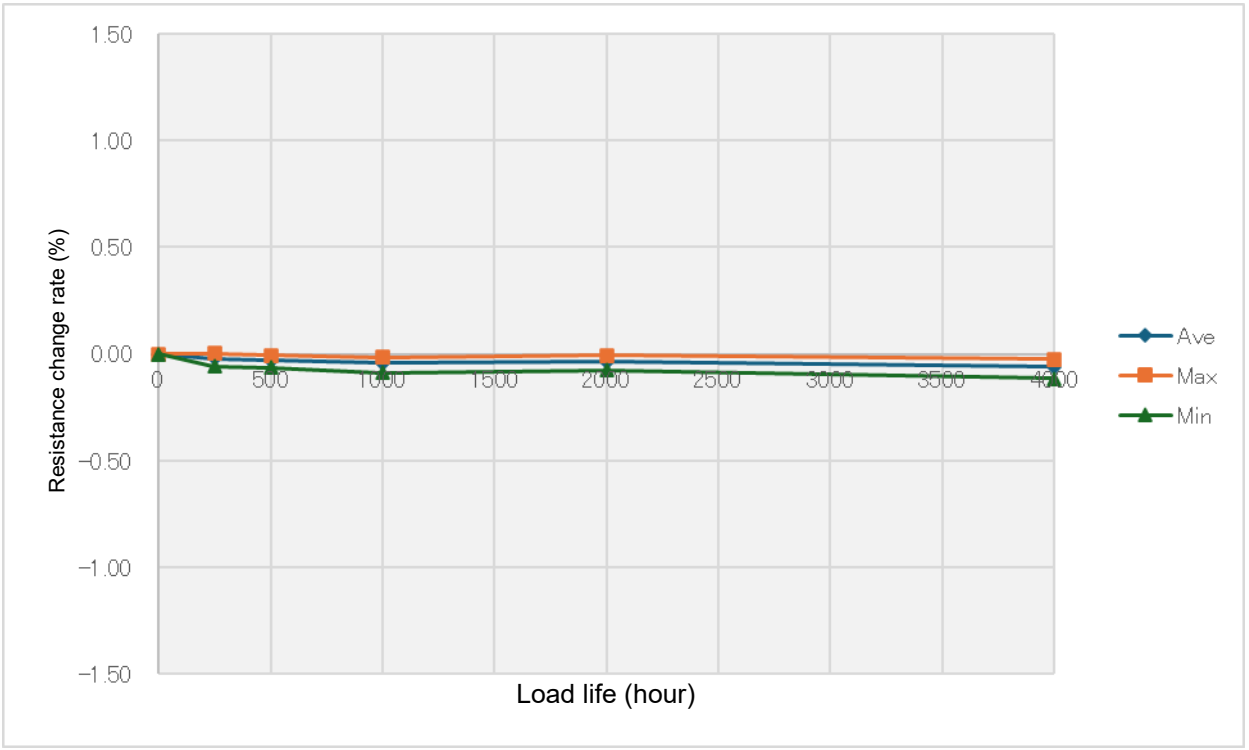


S3SU-2601

CRK8H164F

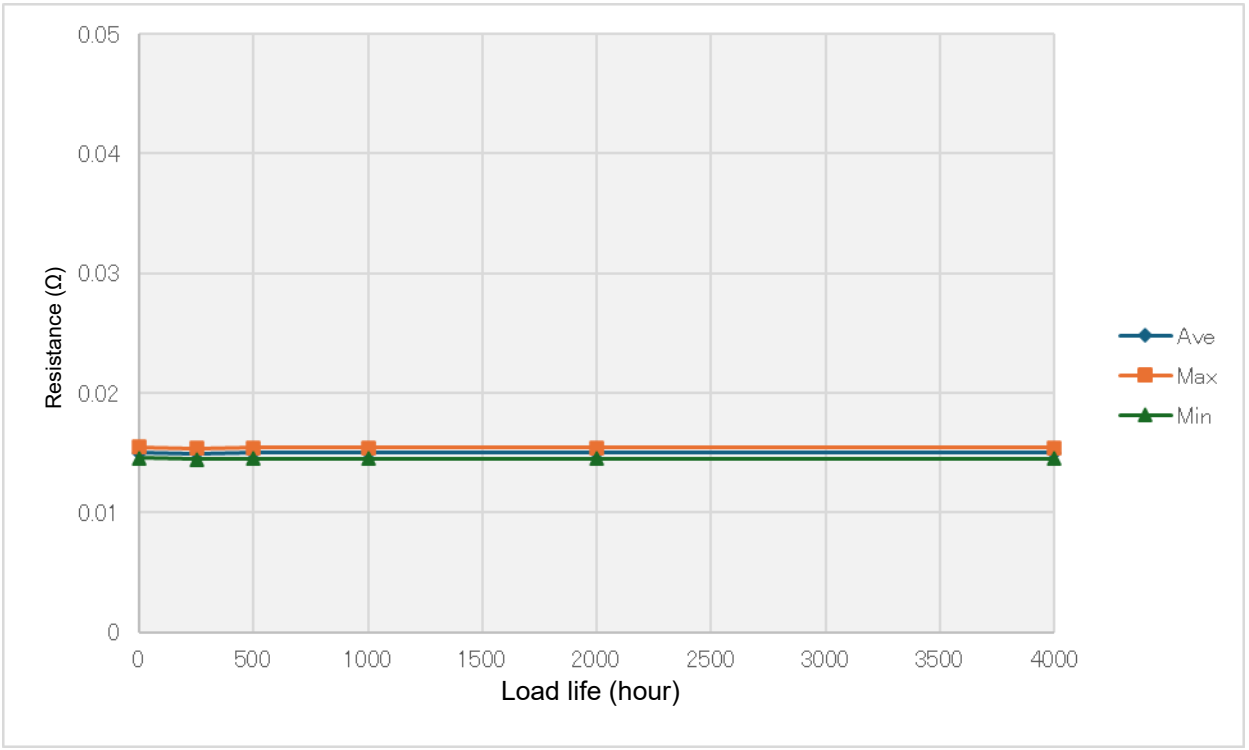


CRK8H106F

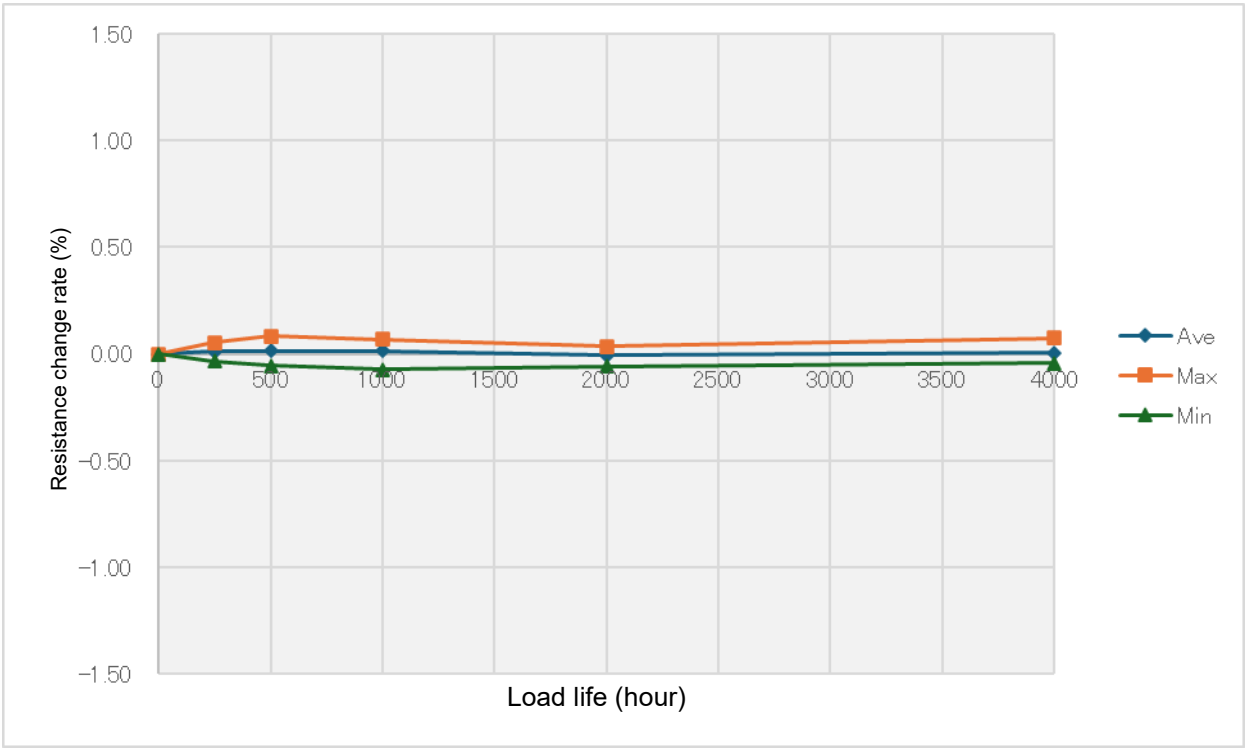


S3SU-2601

CRK4HR00

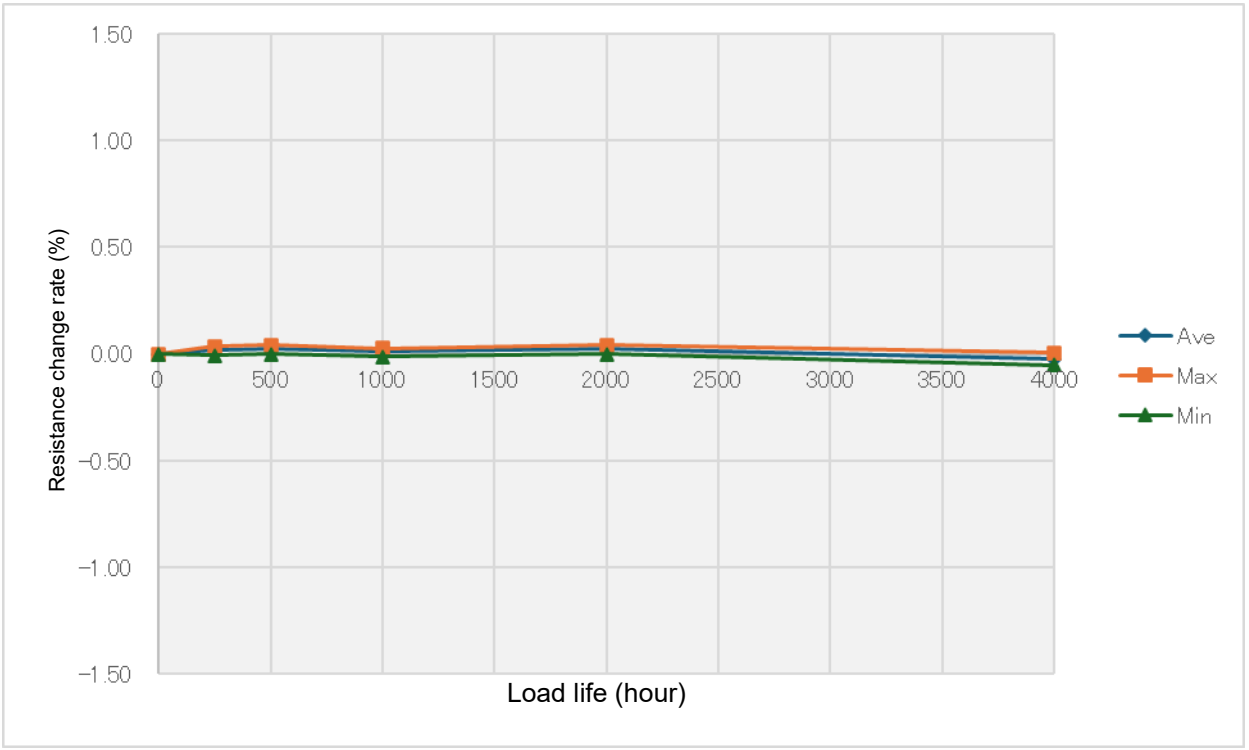


CRK4H1R0F

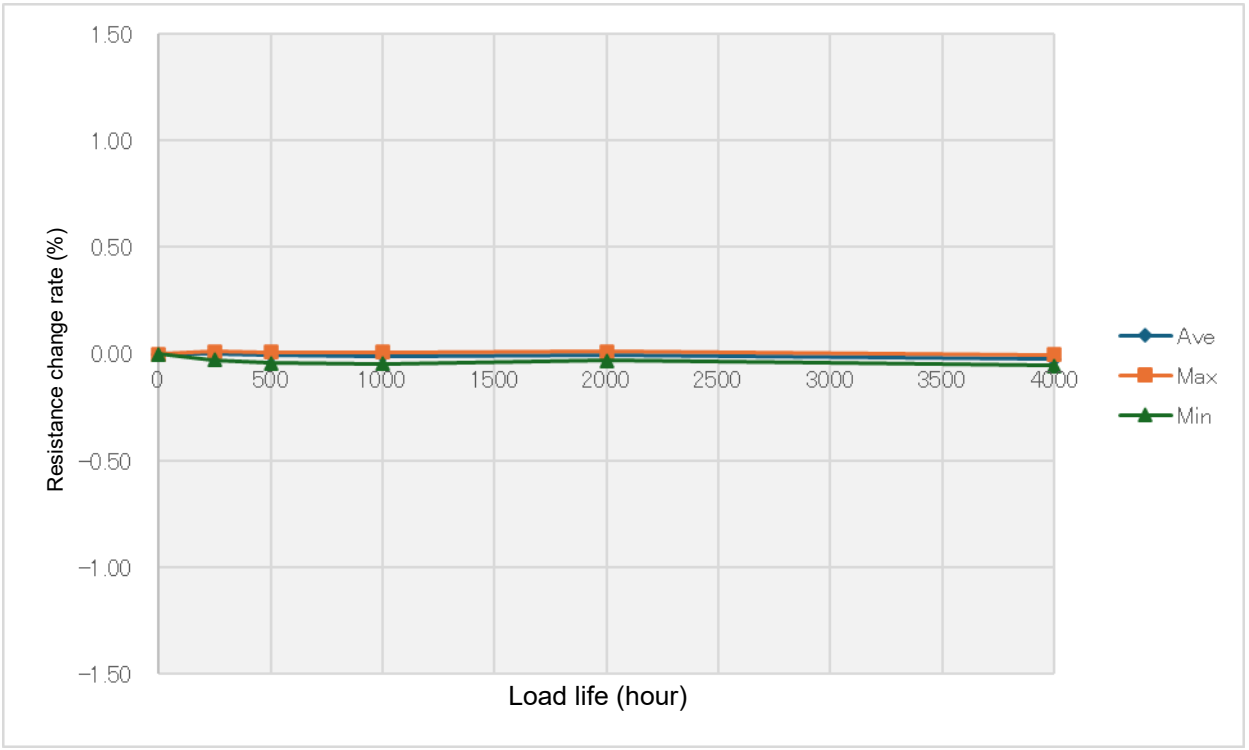


S3SU-2601

CRK4H124F

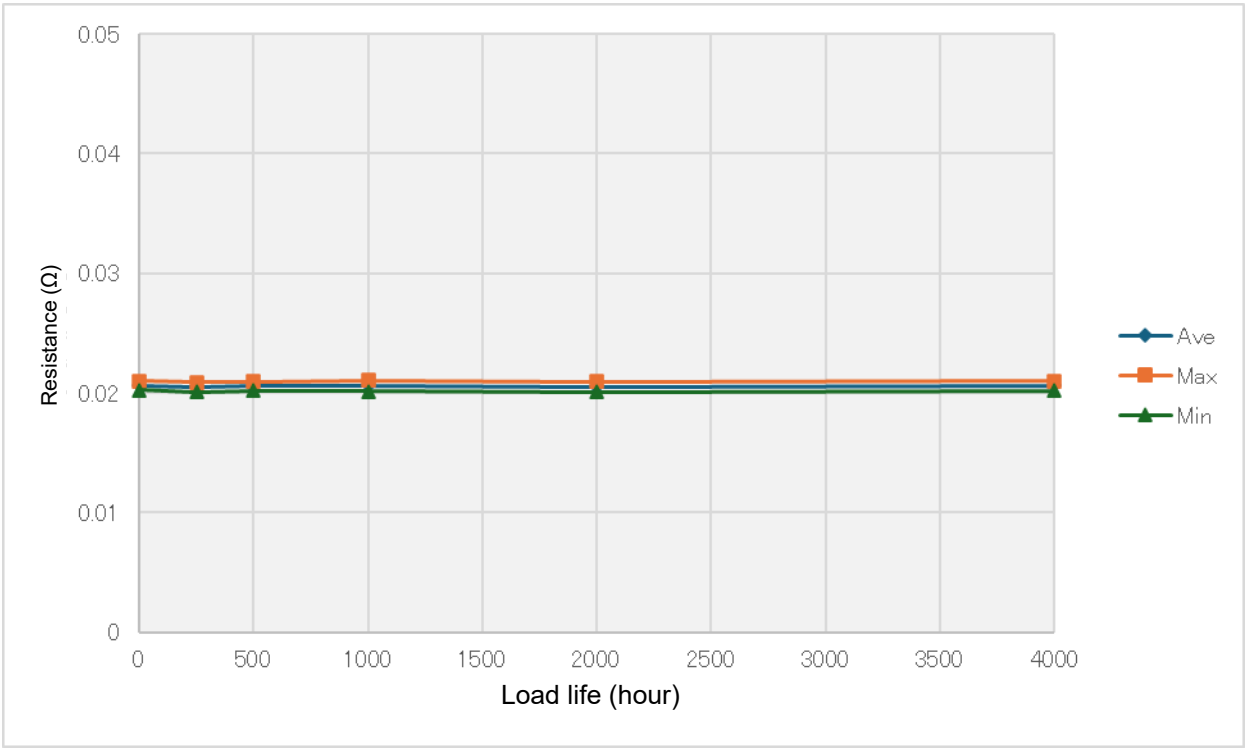


CRK4H106F

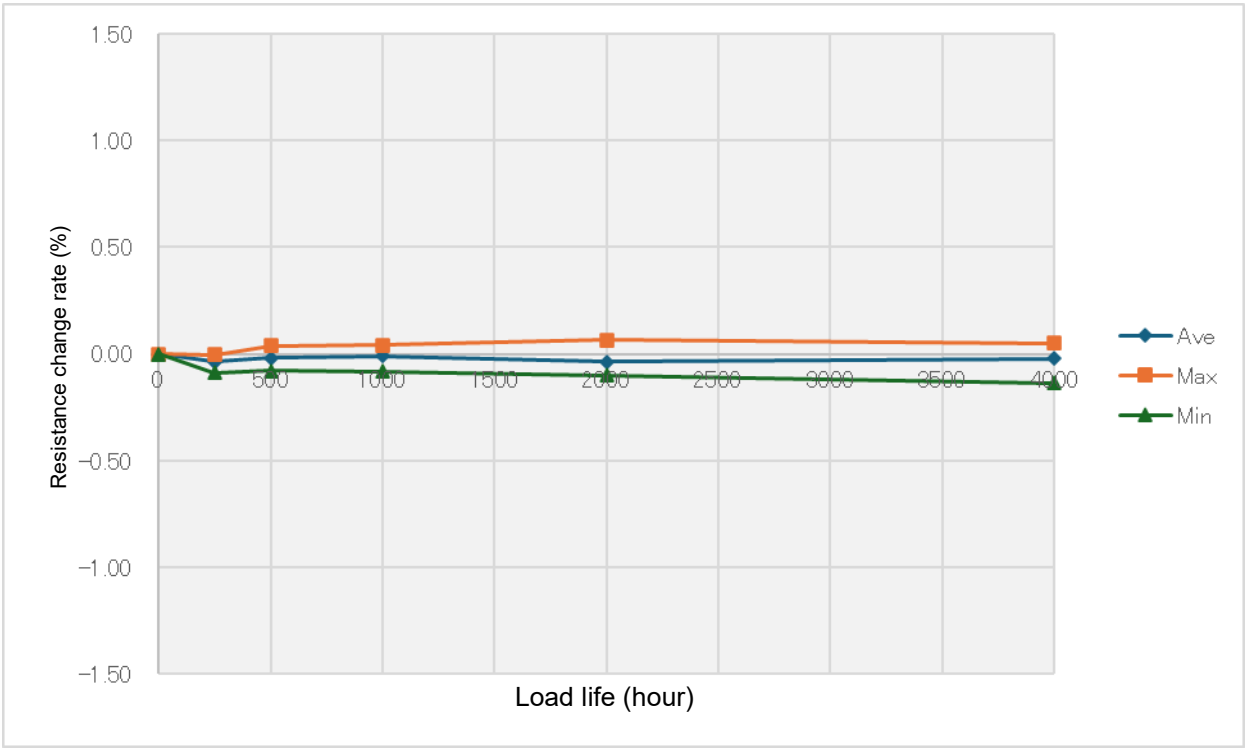


S3SU-2601

CRK2HR00

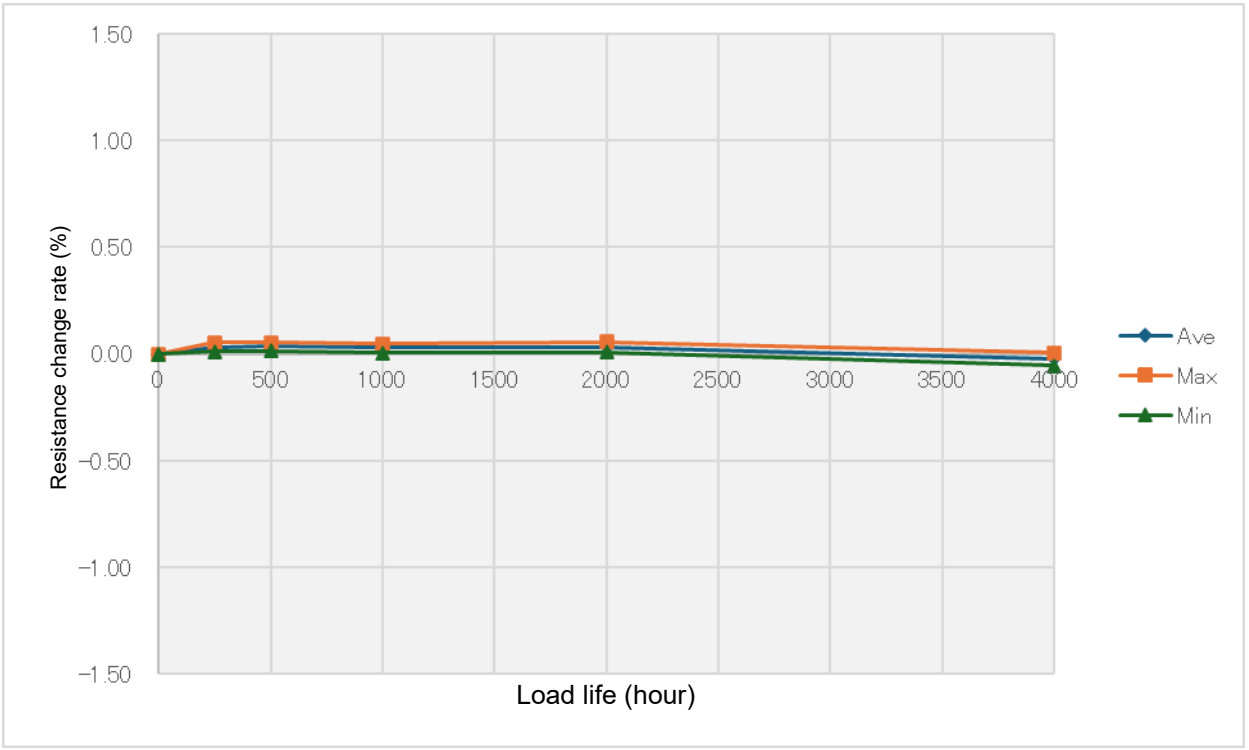


CRK2H1R0F

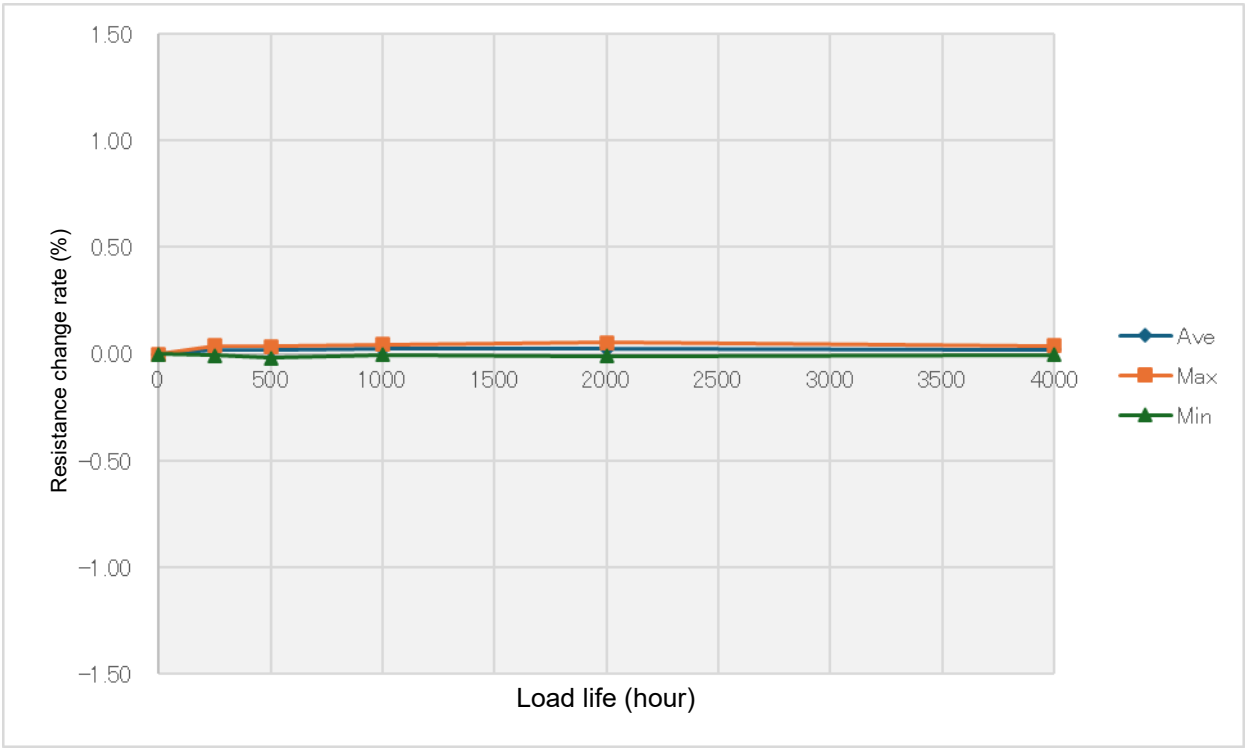


S3SU-2601

CRK2H753F



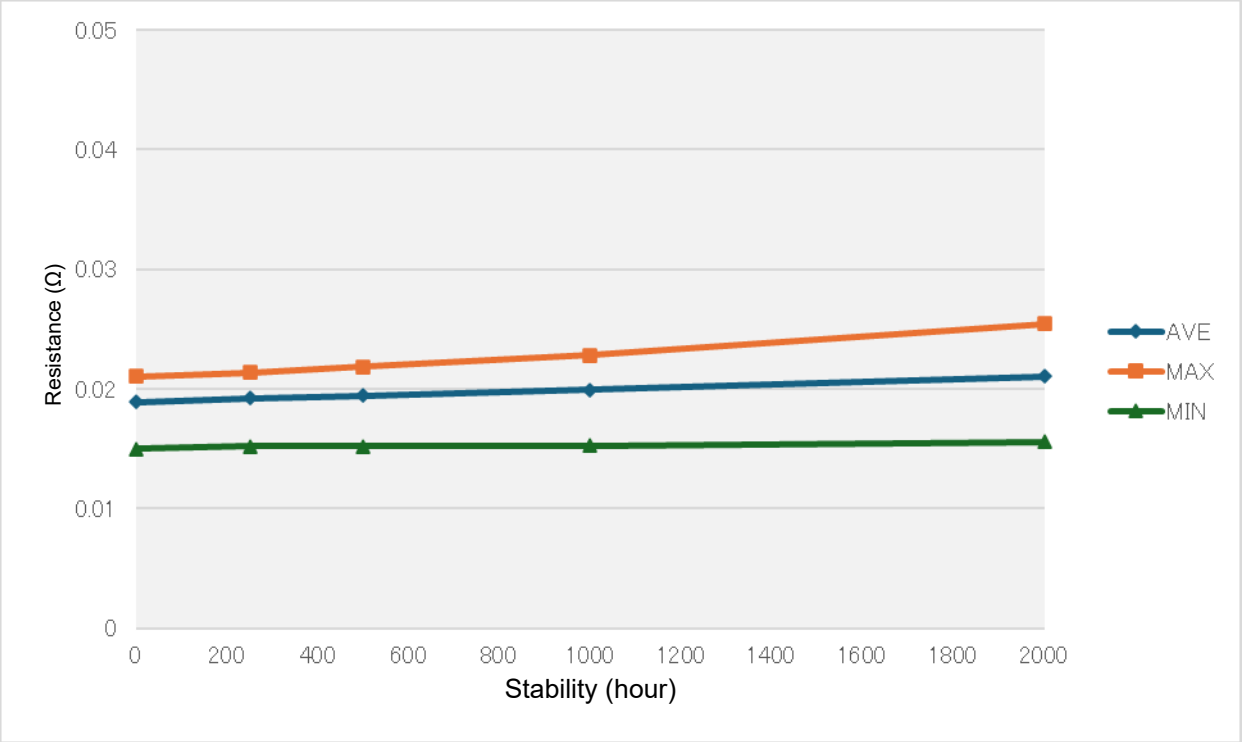
CRK2H106F



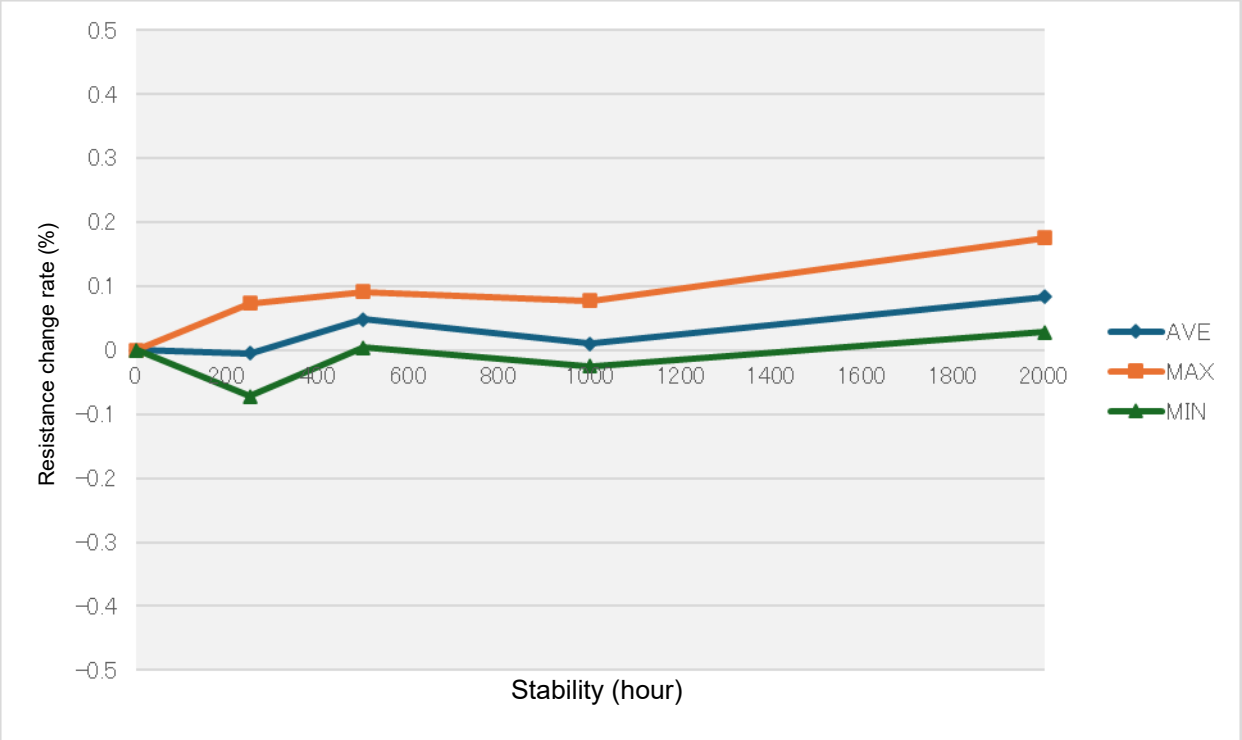
S3SU-2601

<Stability n=10> Conditions: +125 °C, no load 2,000-hour Specification: ±(0.5 %+0.01 Ω)

CRK16HR00

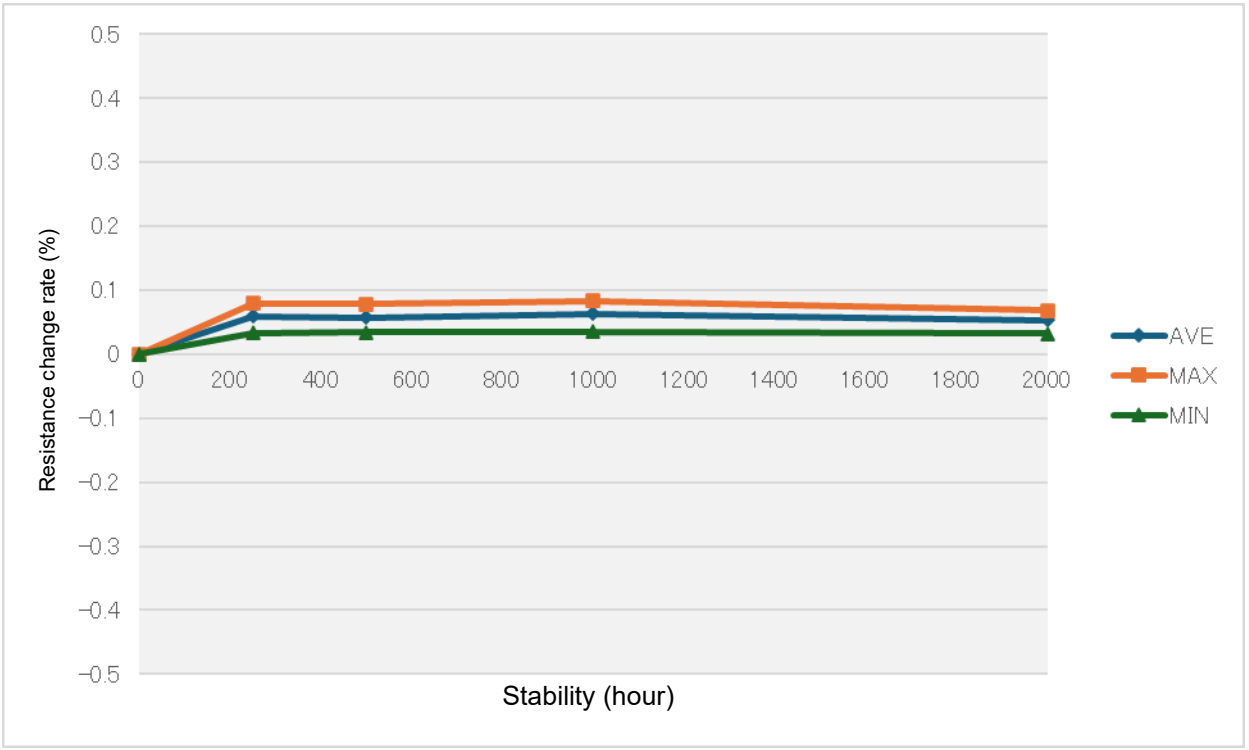


CRK16H1R0F

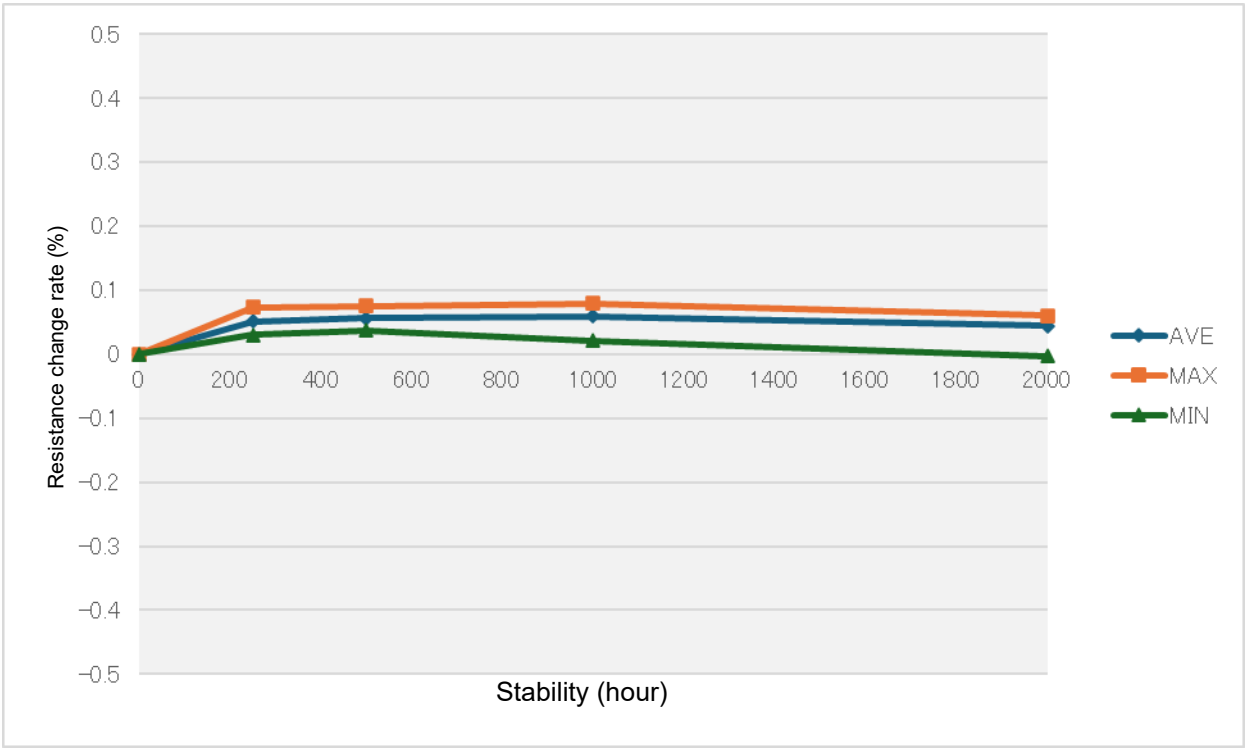


S3SU-2601

CRK16H243F

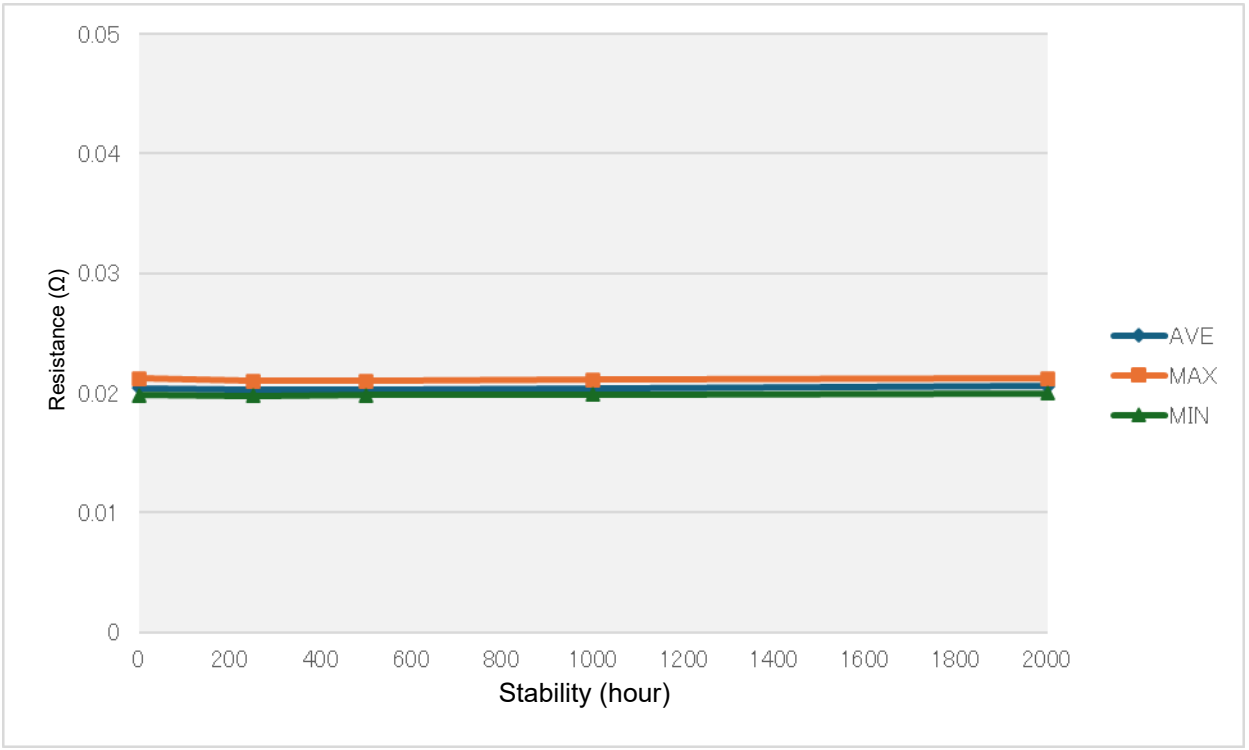


CRK16H106F



S3SU-2601

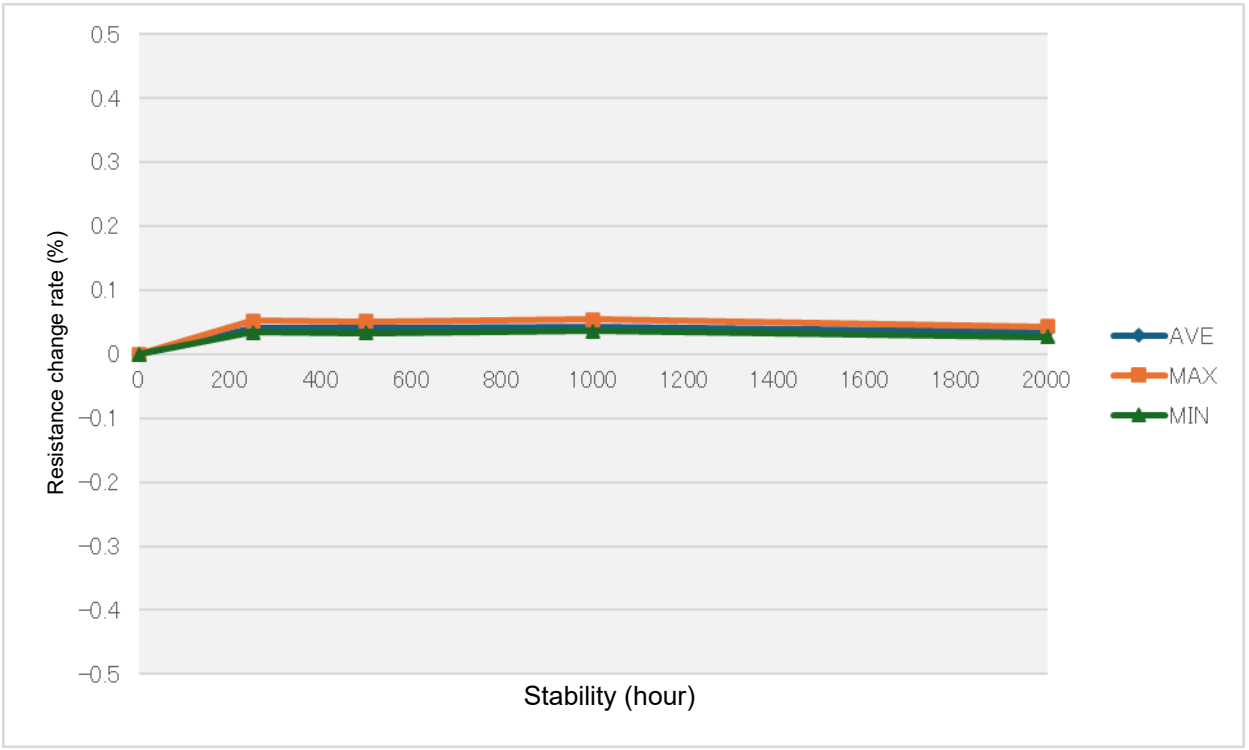
CRK10HR00



CRK10H1R0F

S3SU-2601

CRK10H184F



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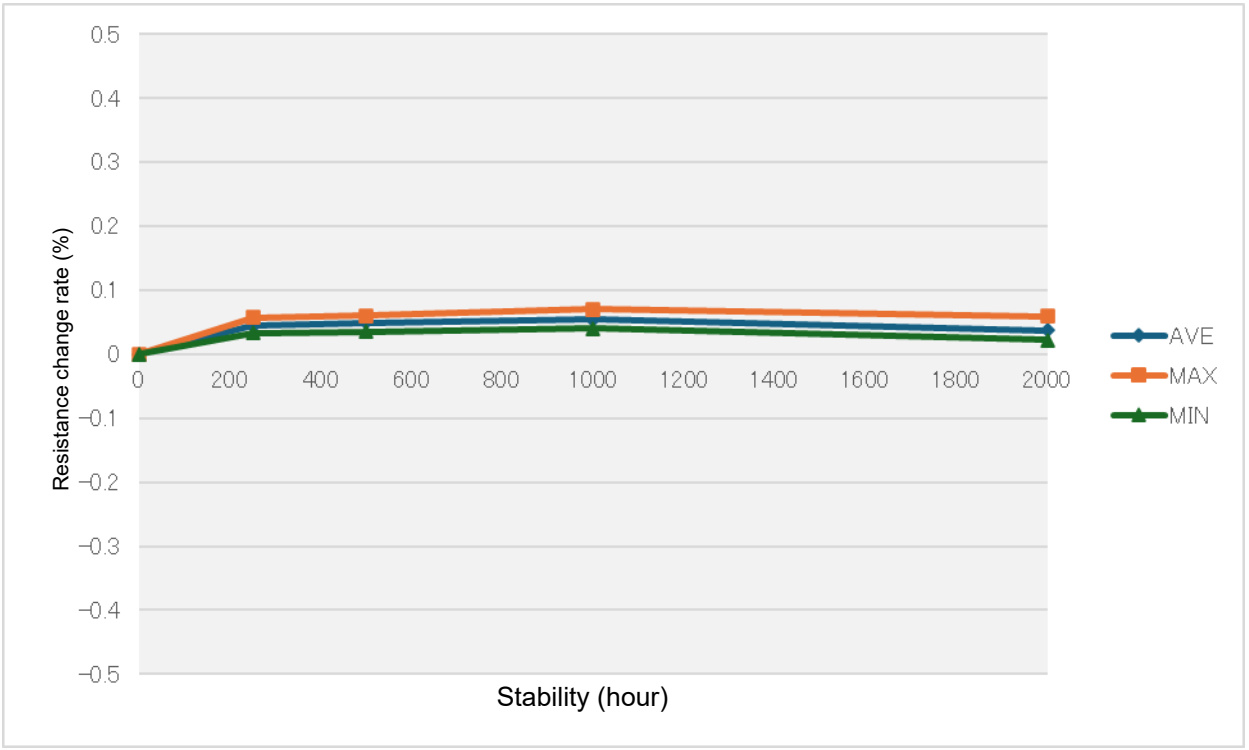
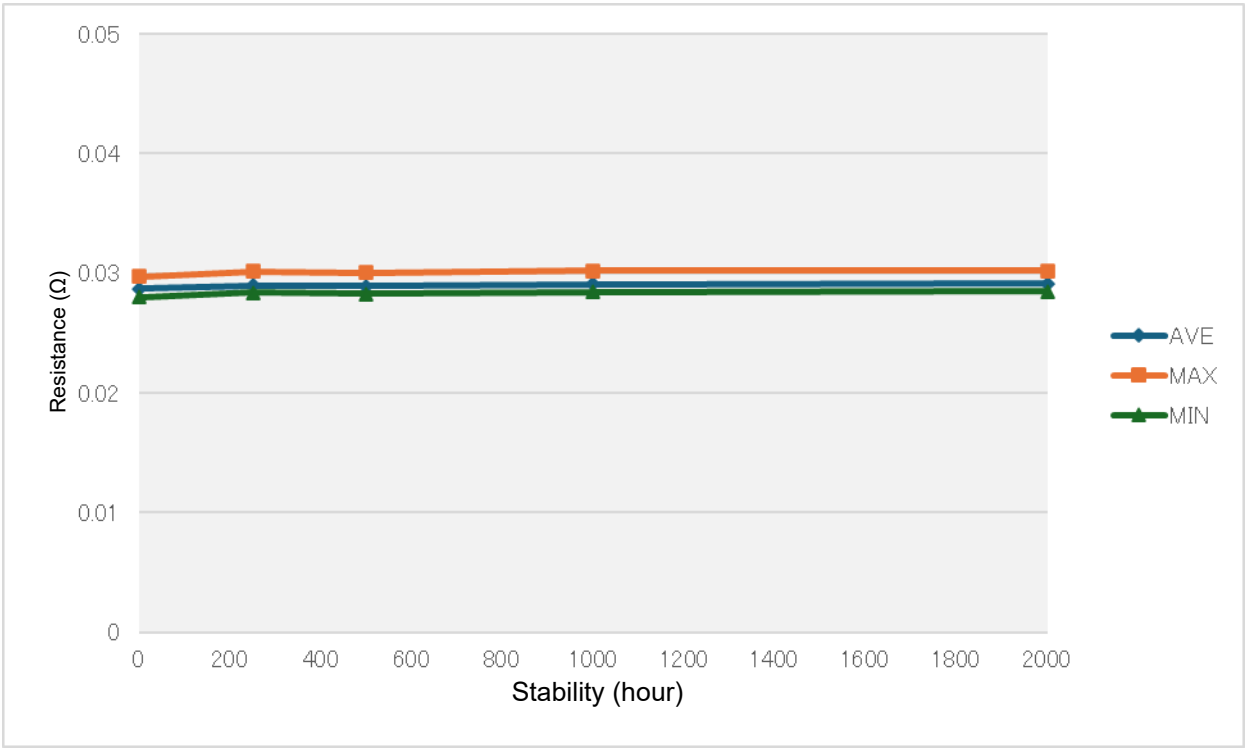
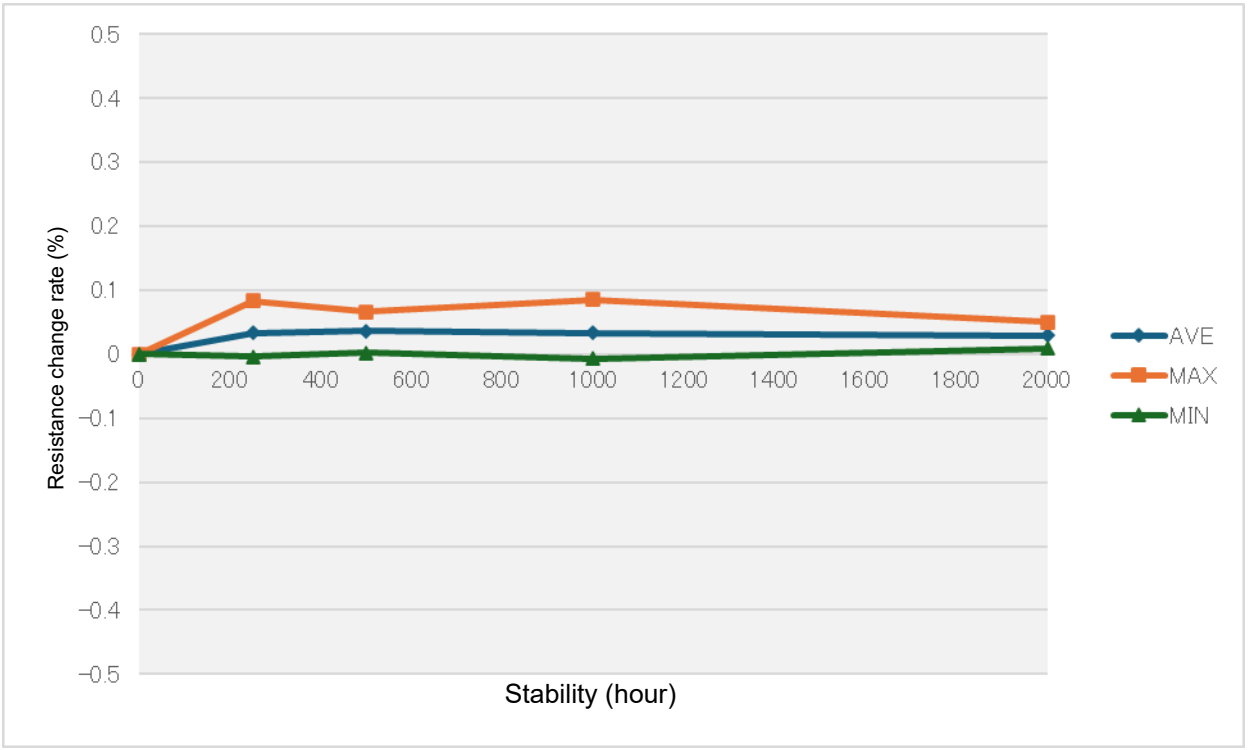


S3SU-2601

CRK8HR00F



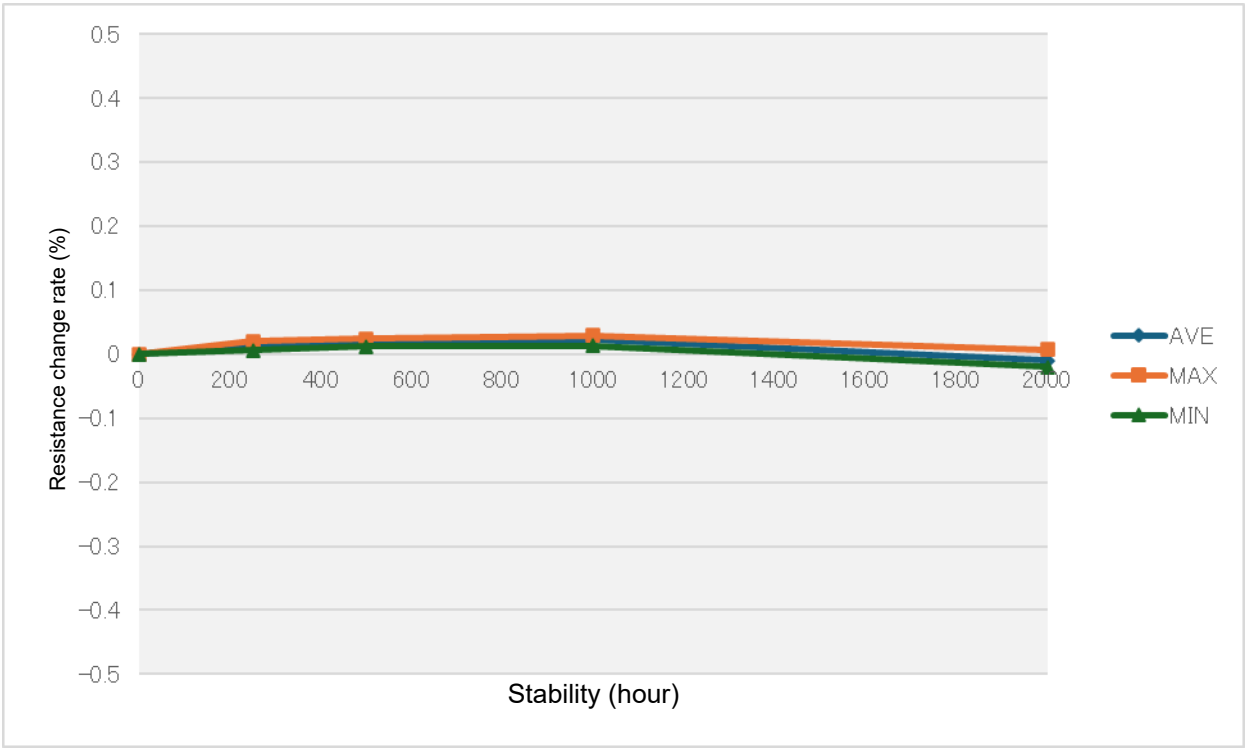
CRK8H1R0F



S3SU-2601

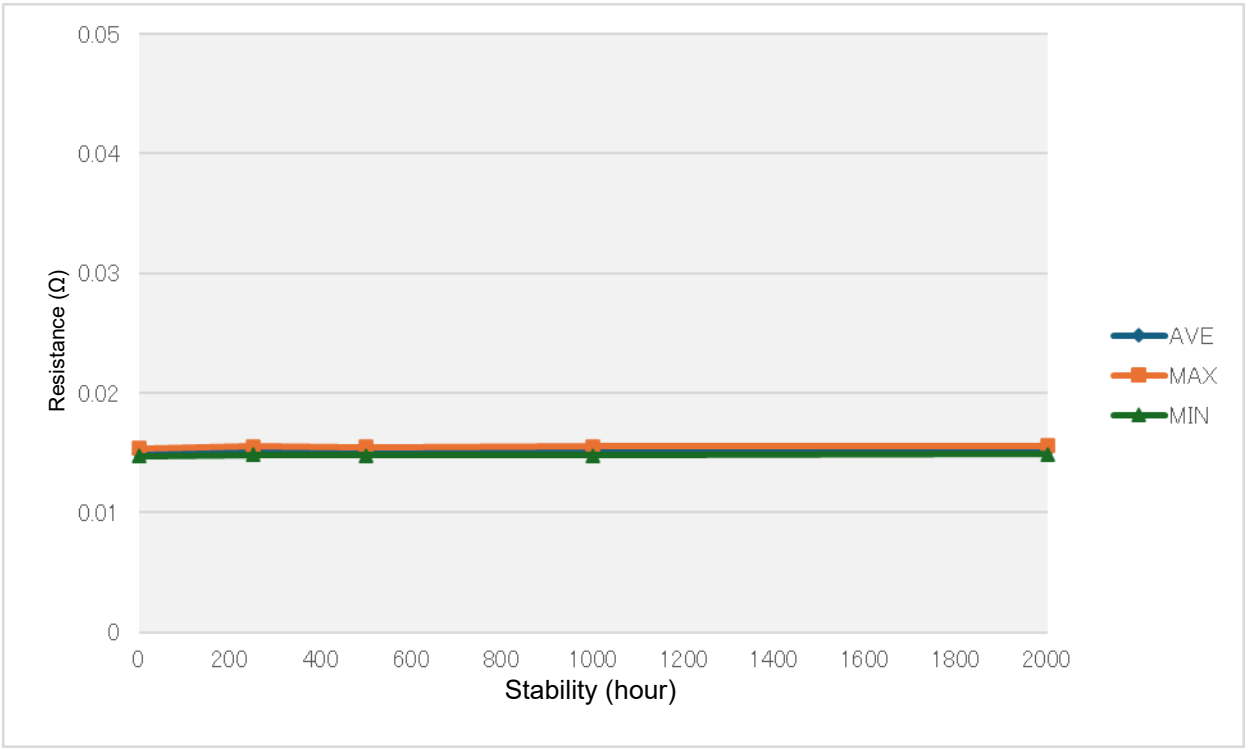
CRK8H184F

CRK8H106F

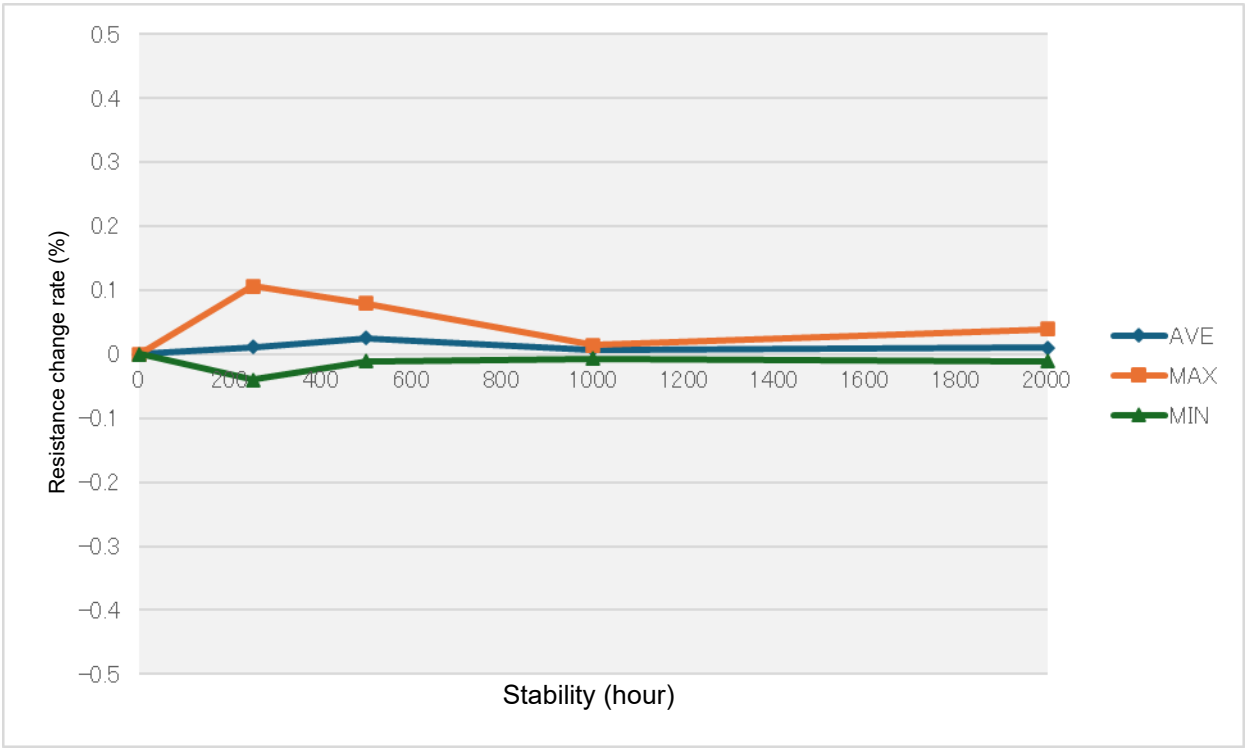


S3SU-2601

CRK4HR00

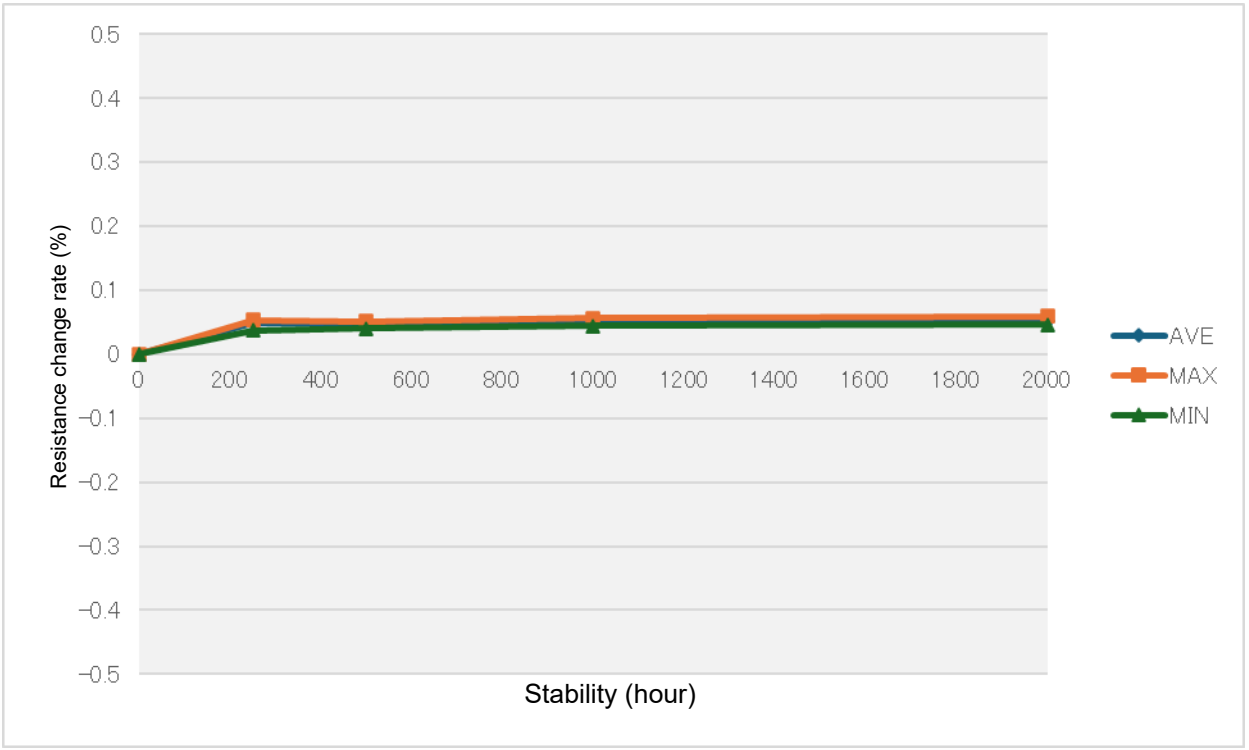


CRK4H1RF

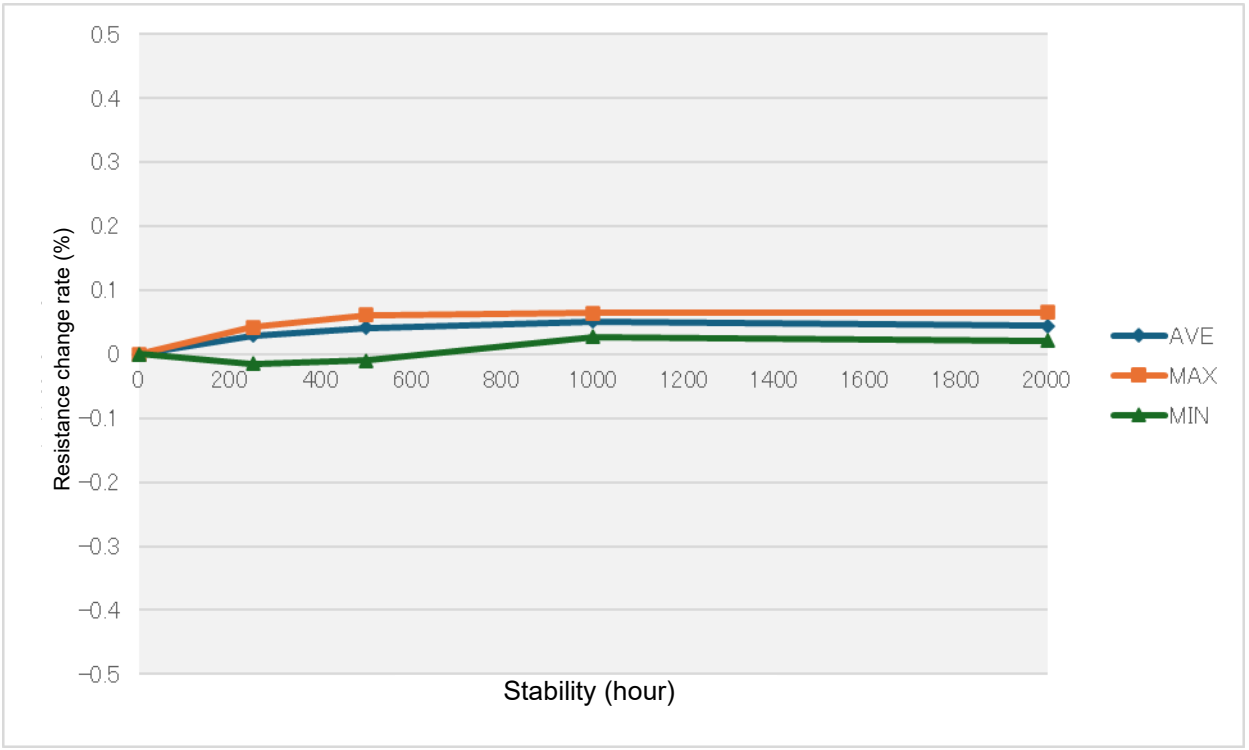


S3SU-2601

CRK4H124F

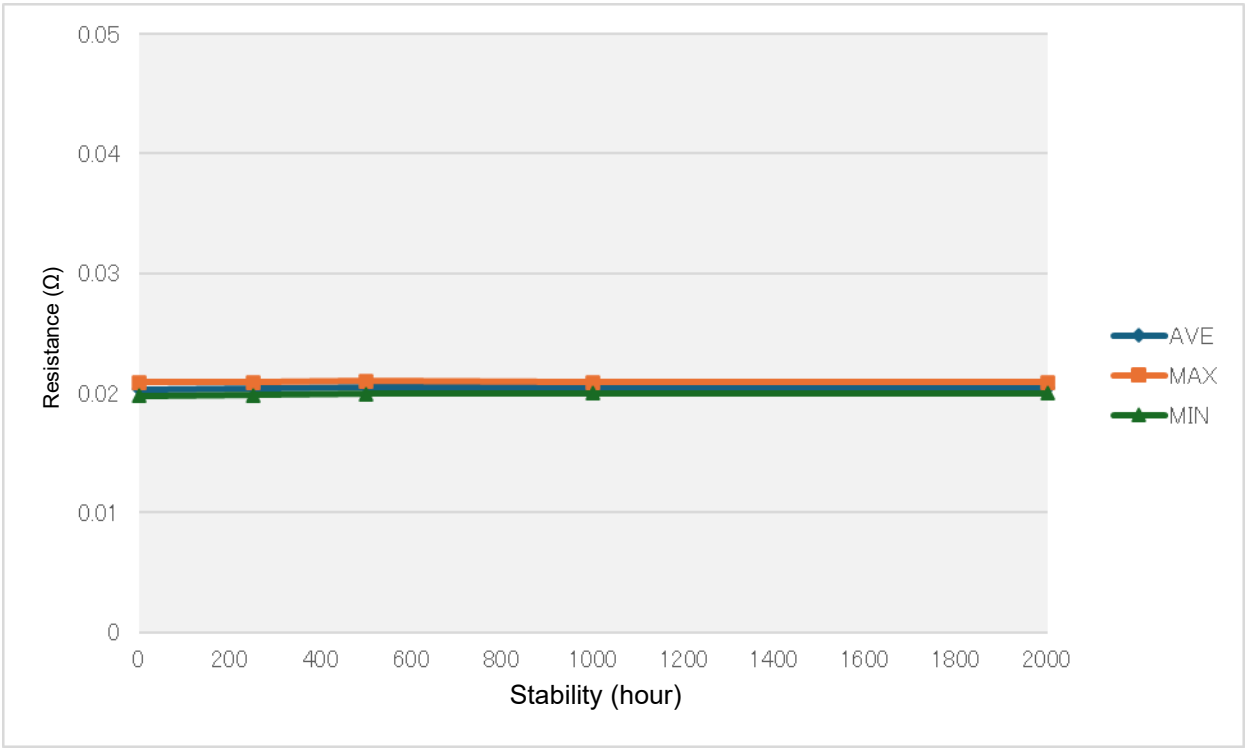


CRK4H106F

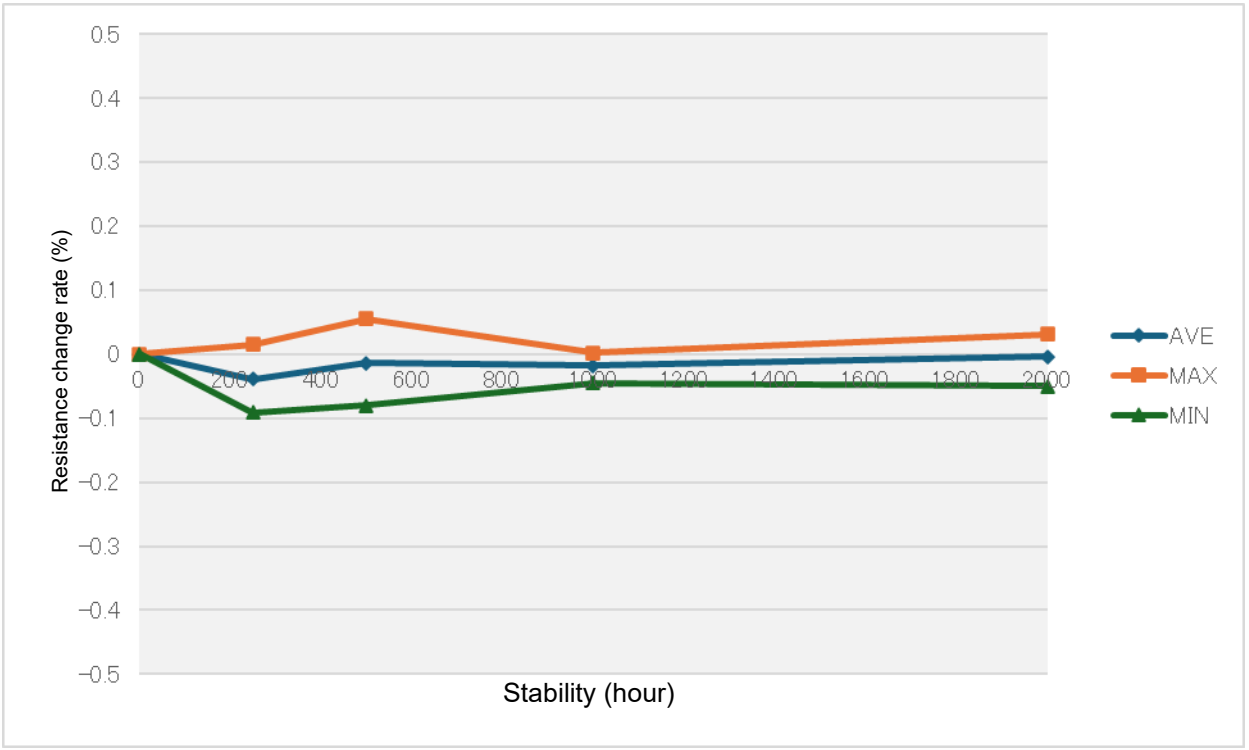


S3SU-2601

CRK2HR00

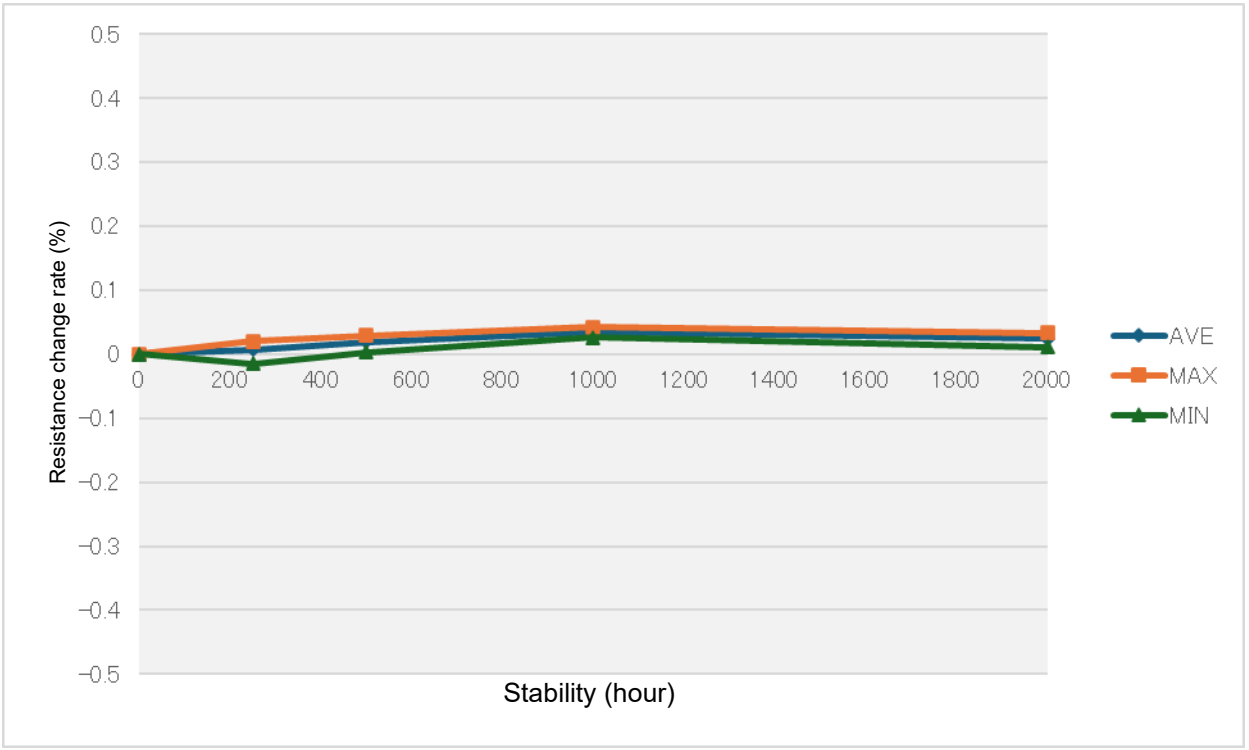


CRK2H1R0F

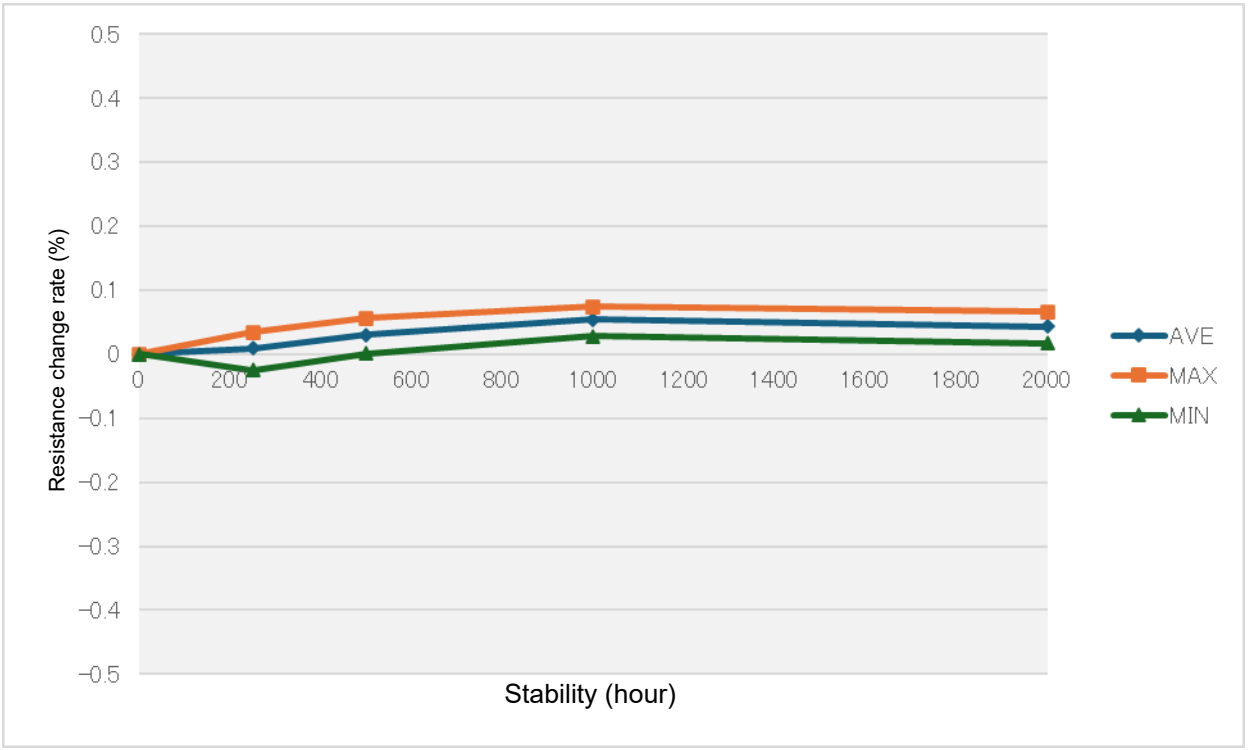


S3SU-2601

CRK2H753F



CRK2H106F



5. ENVIRONMENTAL LIMIT

<Exposure to high temperature n=10>
Conditions: +150 °C for 100-hour Specification: ±(0.25 %+0.01 Ω)

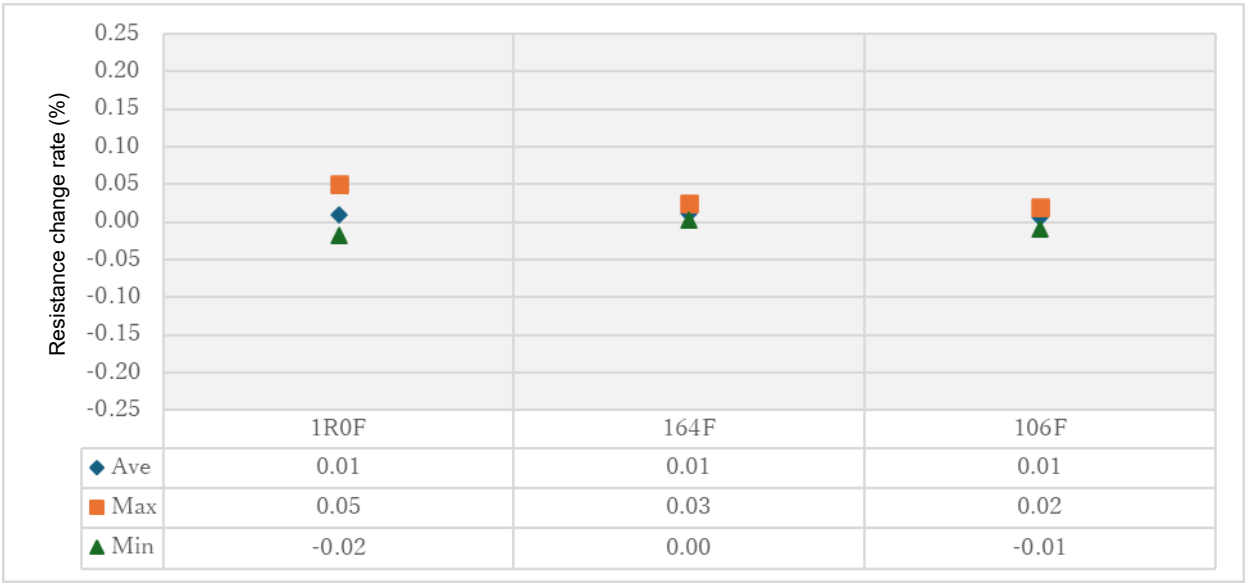
CRK16H

	1R0F	243F	106F
◆ Ave	0.02	0.00	-0.01
■ Max	0.04	0.00	0.01
▲ Min	0.00	-0.01	-0.02

CRK10H

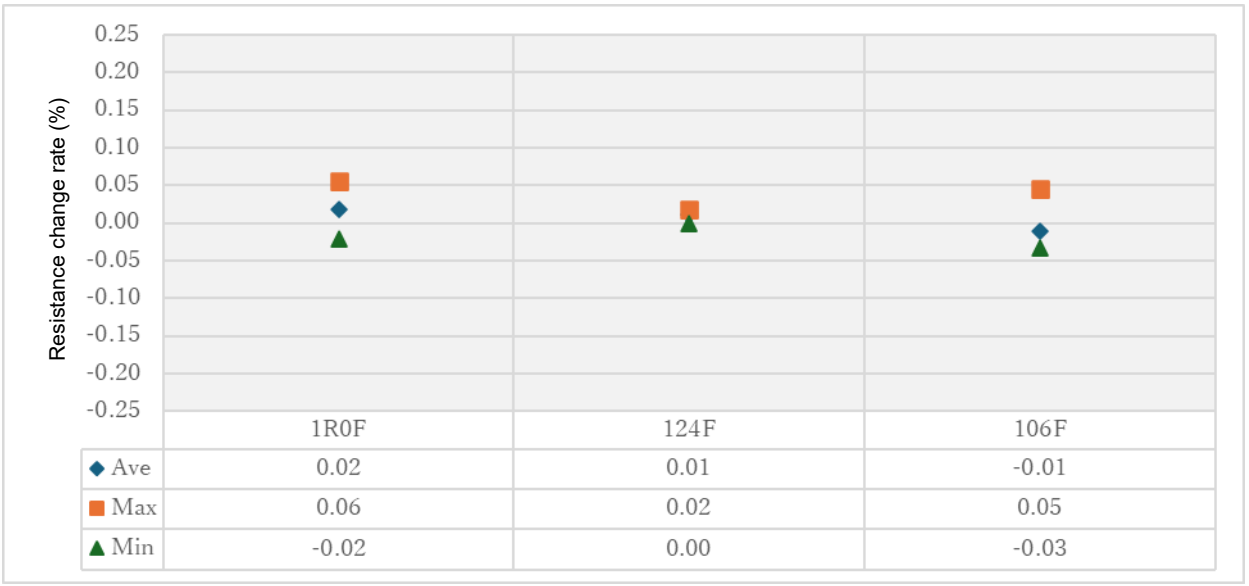
	1R0F	184F	106F
◆ Ave	0.04	0.00	-0.02
■ Max	0.08	0.00	0.00
▲ Min	0.01	-0.01	-0.03

CRK8H



	1R0F	164F	106F
Ave	0.01	0.01	0.01
Max	0.05	0.03	0.02
Min	-0.02	0.00	-0.01

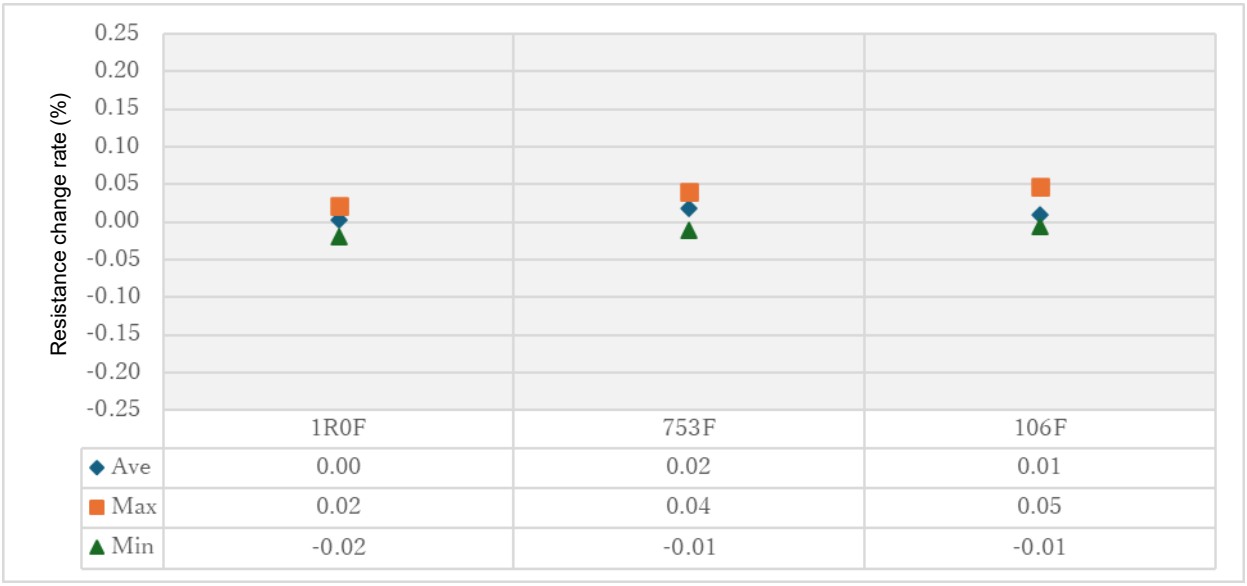
CRK4H



	1R0F	124F	106F
Ave	0.02	0.01	-0.01
Max	0.06	0.02	0.05
Min	-0.02	0.00	-0.03

S3SU-2601

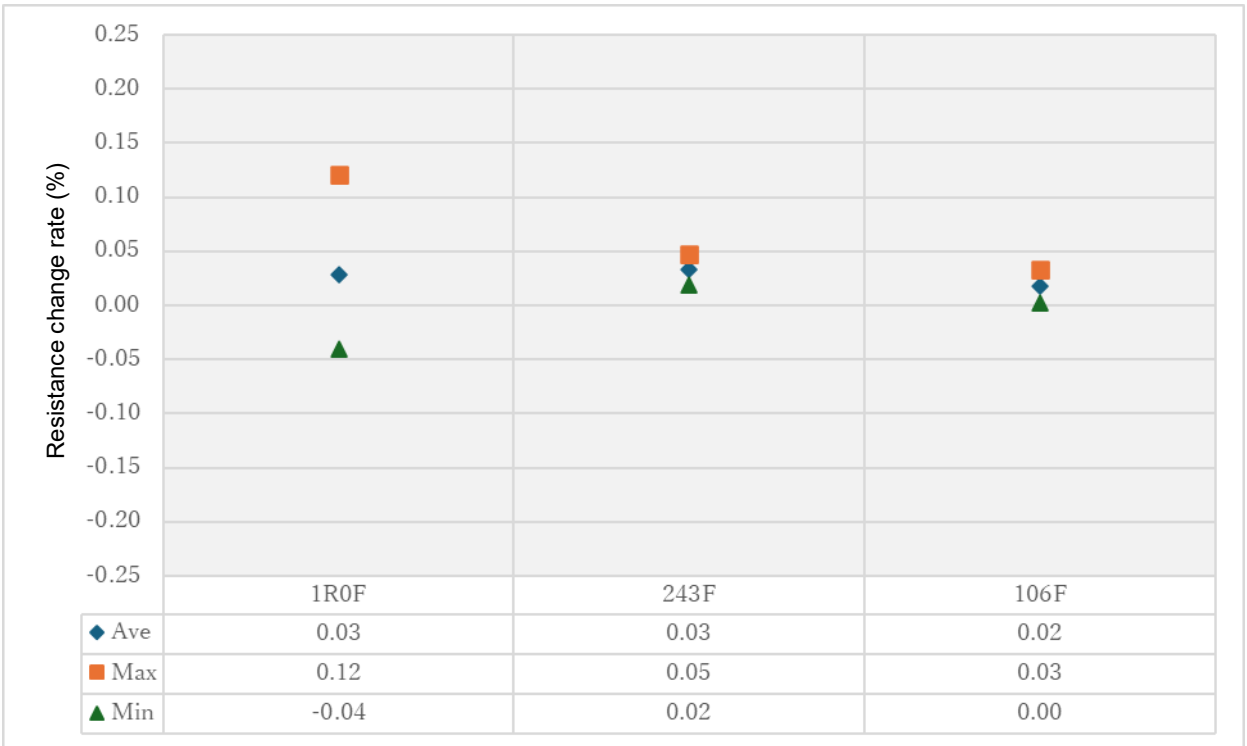
CRK2H



	1R0F	753F	106F
◆ Ave	0.00	0.02	0.01
■ Max	0.02	0.04	0.05
▲ Min	-0.02	-0.01	-0.01

<Thermal shock n=10> Conditions: −65 °C for 30 min. to +150 °C for 30 min. of 100 cycles
Specification: ±(0.25 %+0.01 Ω)

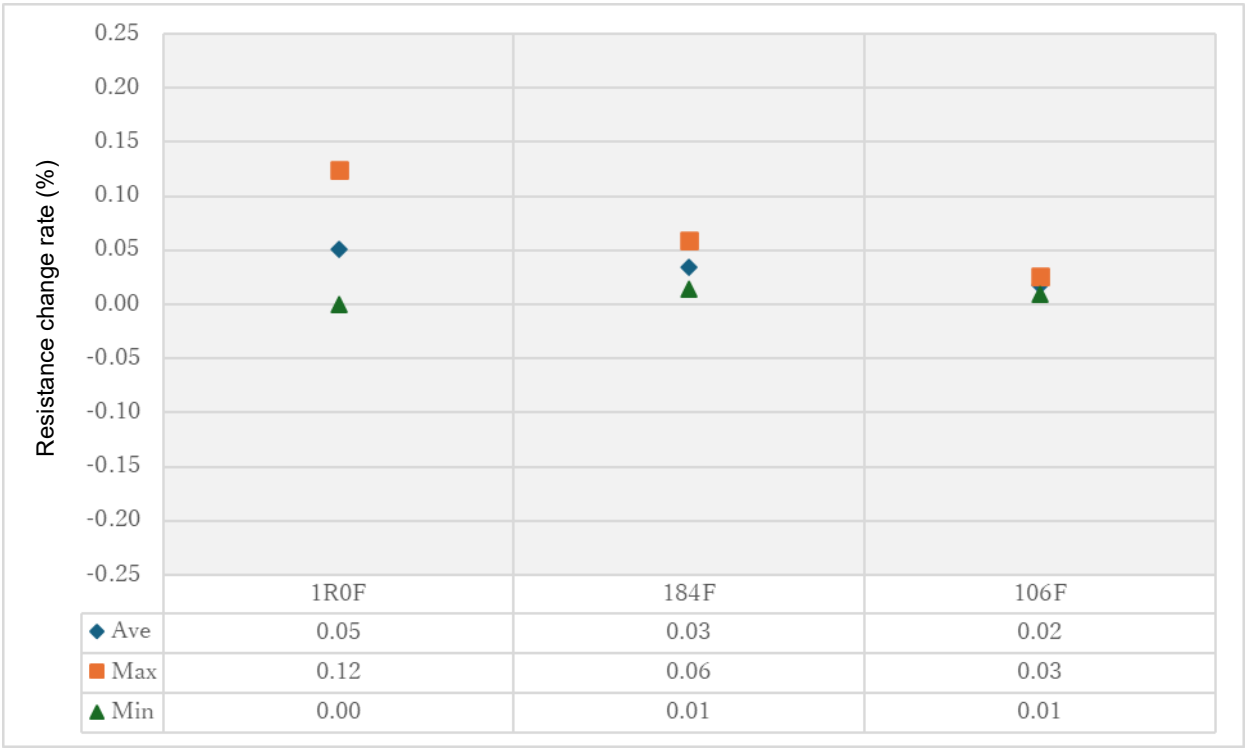
CRK16H



	1R0F	243F	106F
◆ Ave	0.03	0.03	0.02
■ Max	0.12	0.05	0.03
▲ Min	-0.04	0.02	0.00

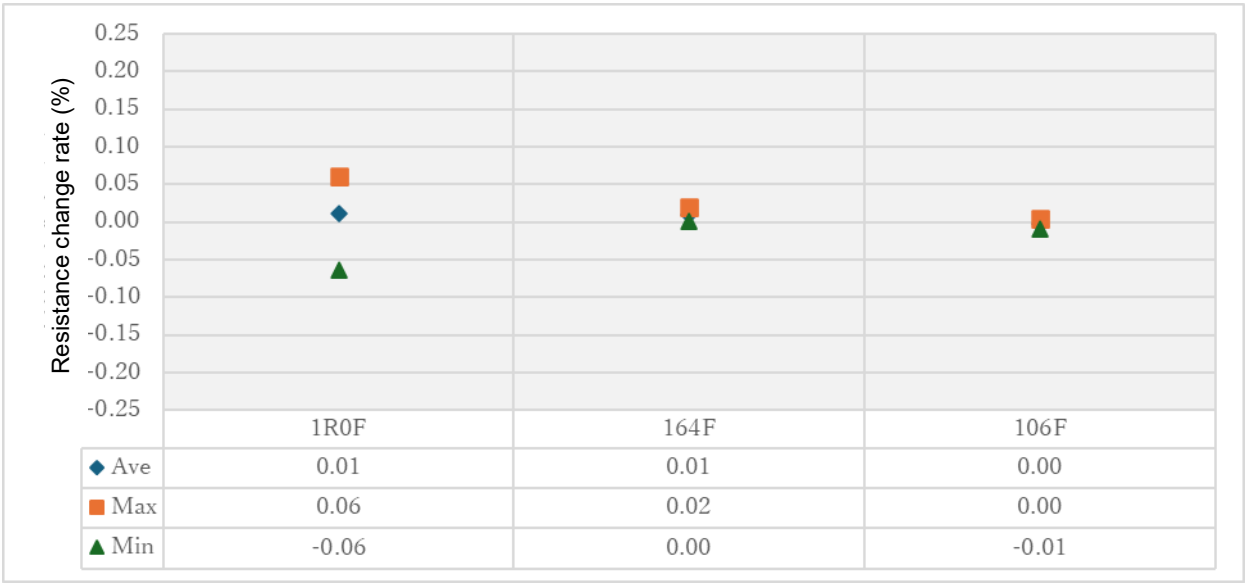
S3SU-2601

CRK10H



	1R0F	184F	106F
Ave	0.05	0.03	0.02
Max	0.12	0.06	0.03
Min	0.00	0.01	0.01

CRK8H



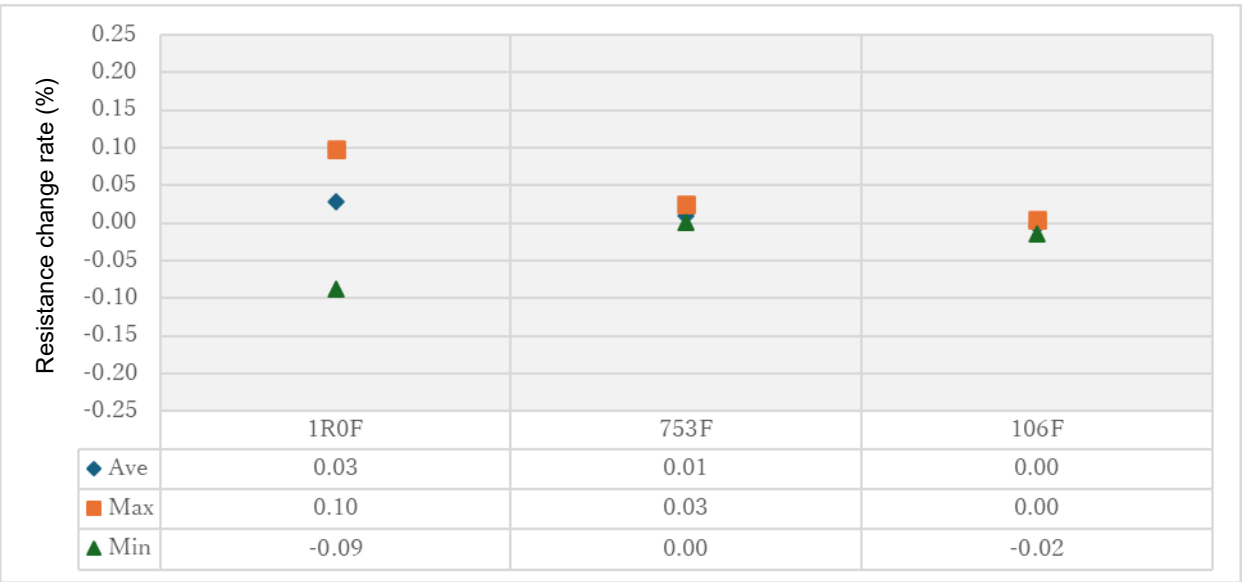
	1R0F	164F	106F
Ave	0.01	0.01	0.00
Max	0.06	0.02	0.00
Min	-0.06	0.00	-0.01

S3SU-2601

CRK4H

	1R0F	124F	106F
Ave	0.01	0.03	0.01
Max	0.07	0.03	0.02
Min	-0.05	0.02	0.01

CRK2H

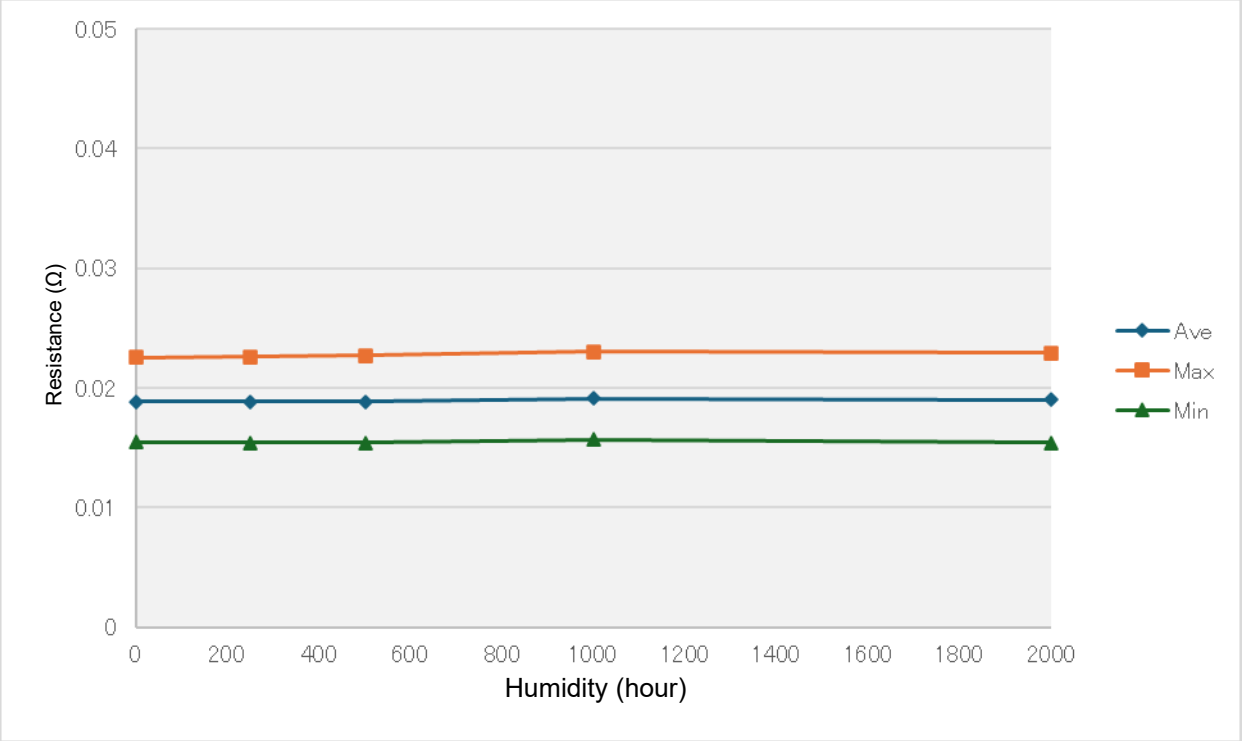


	1R0F	753F	106F
Ave	0.03	0.01	0.00
Max	0.10	0.03	0.00
Min	-0.09	0.00	-0.02

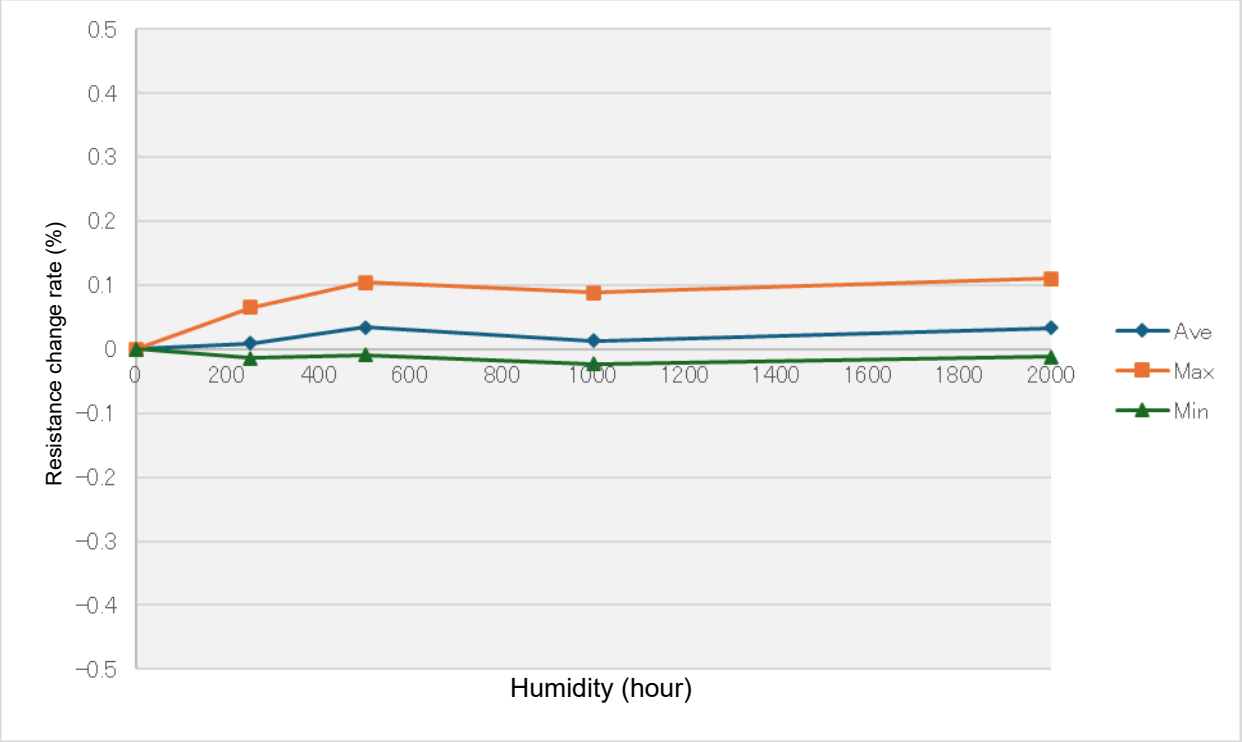
S3SU-2601

<Humidity (steady state) n=10> Conditions: +40 °C, 95 %RH, no load 2,000-hour, Specification : ±(0.5 %+0.01 Ω)

CRK16HR00

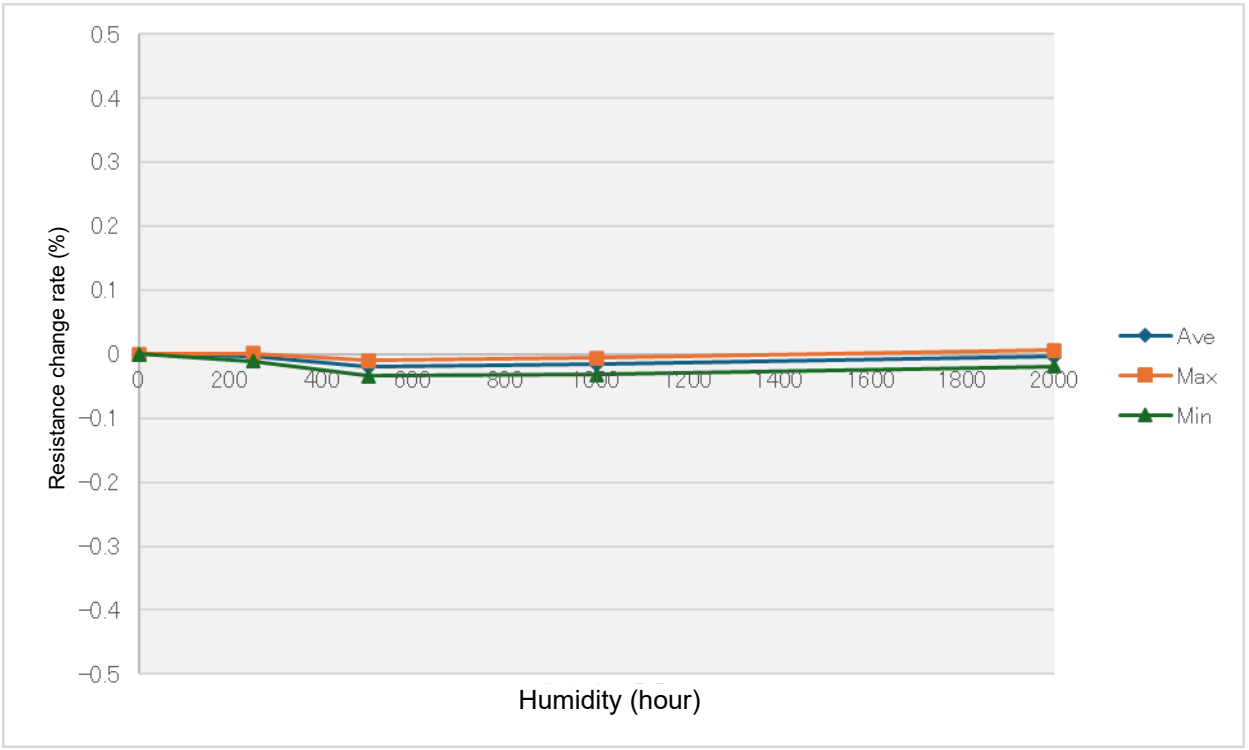


CRK16H1R0F

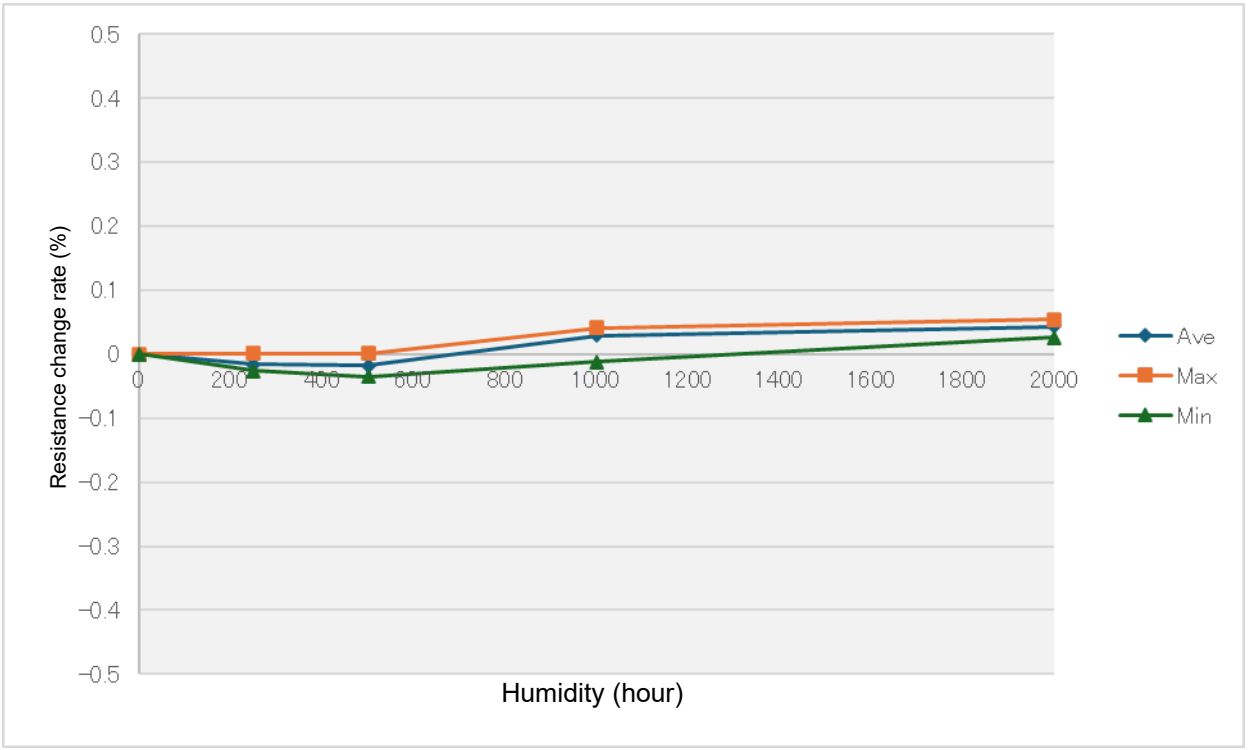


S3SU-2601

CRK16H243F

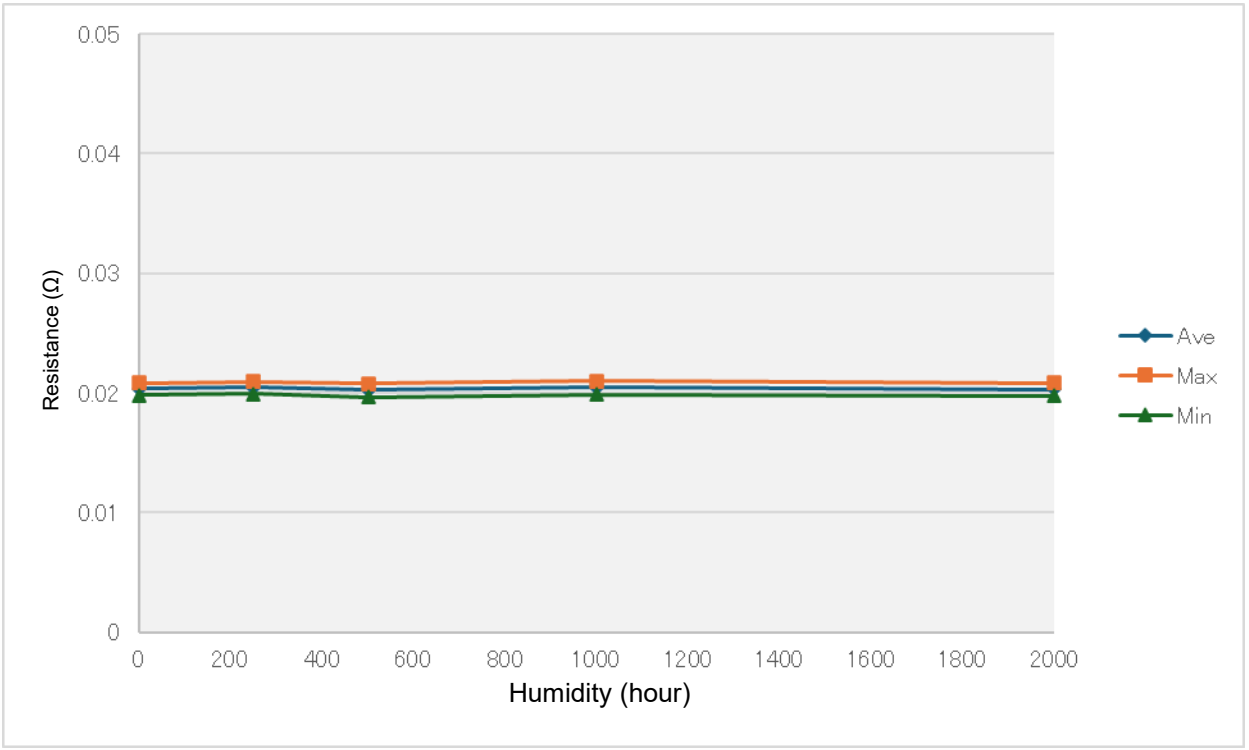


CRK16H106F

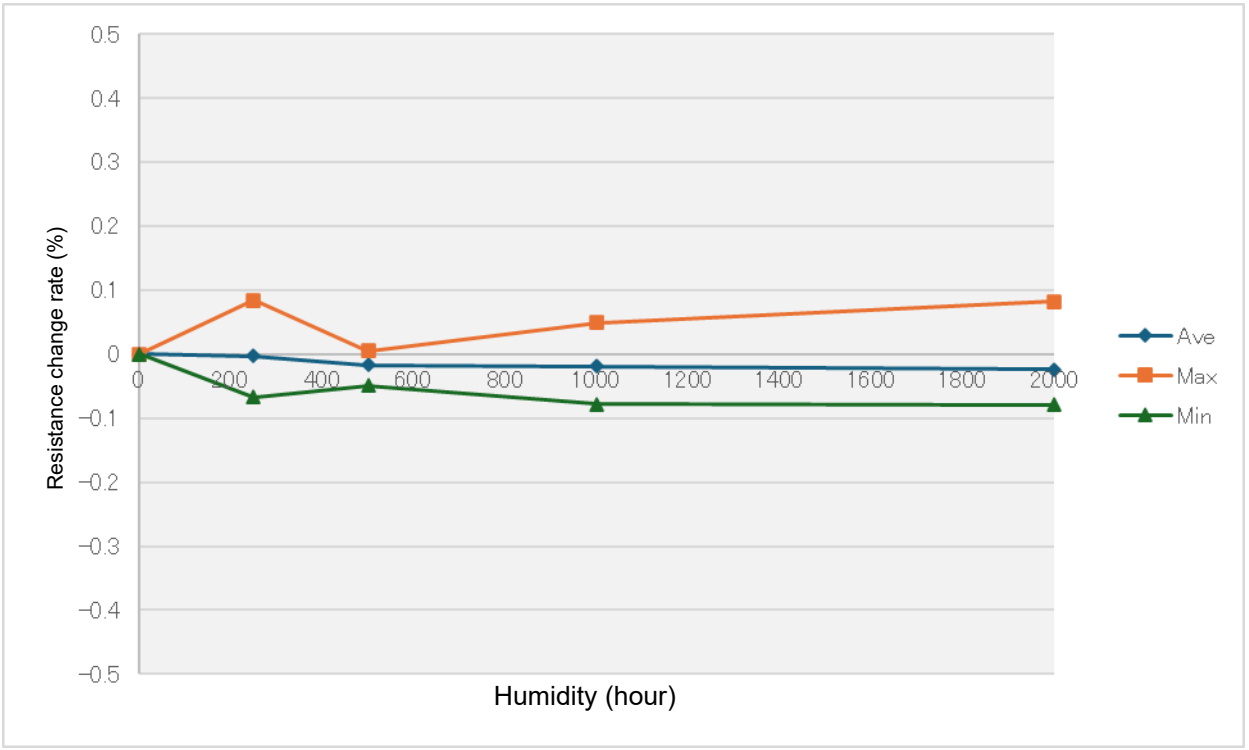


S3SU-2601

CRK10HR00

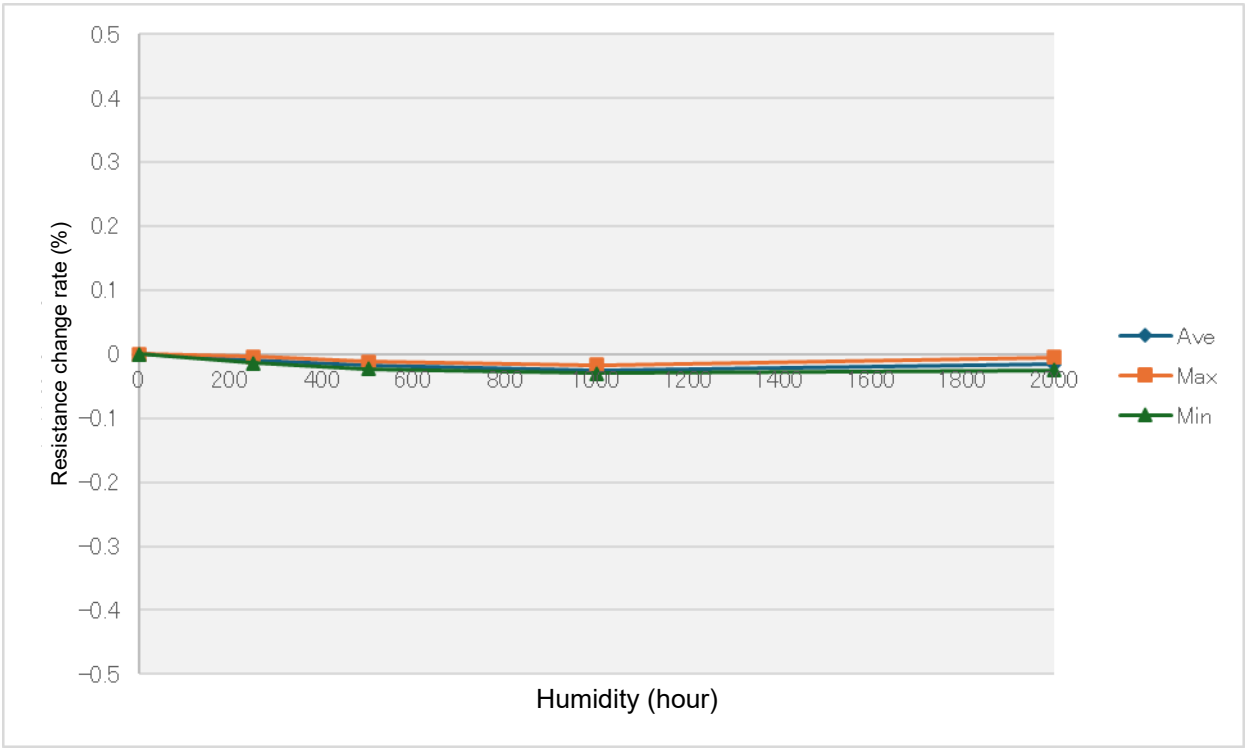


CRK10H1R0F

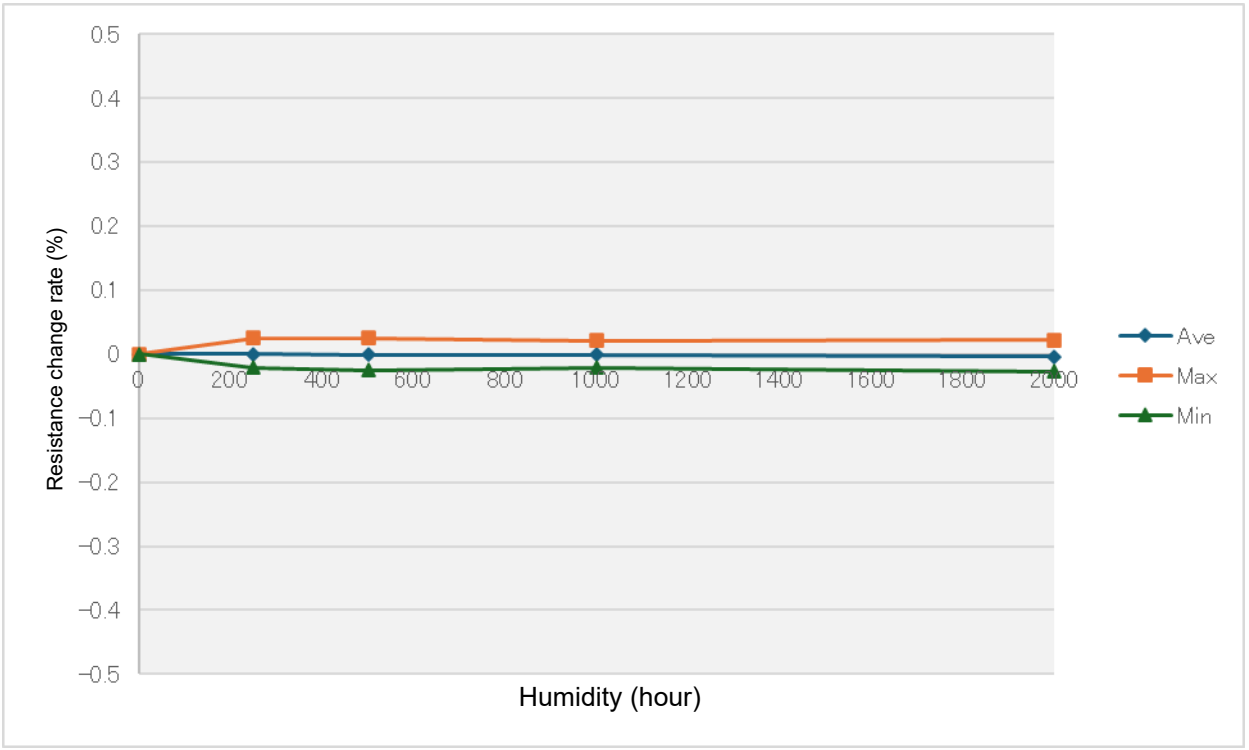


S3SU-2601

CRK10H184F

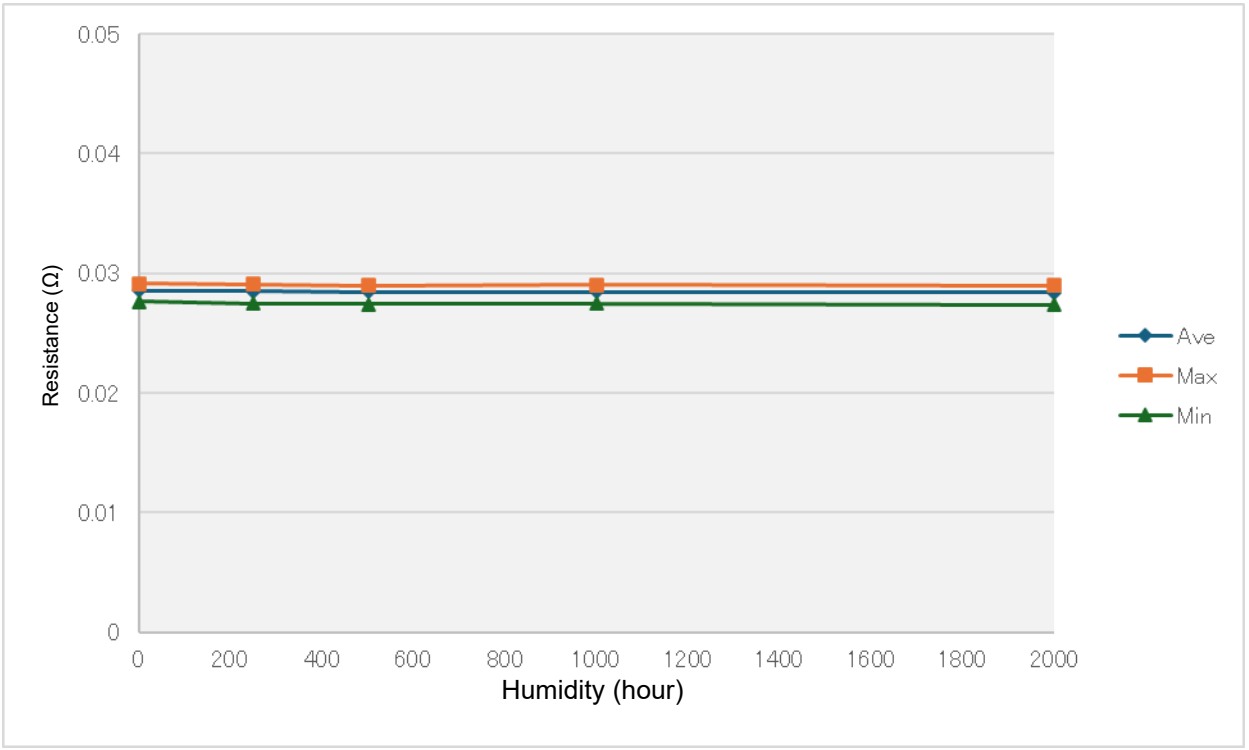


CRK10H106F

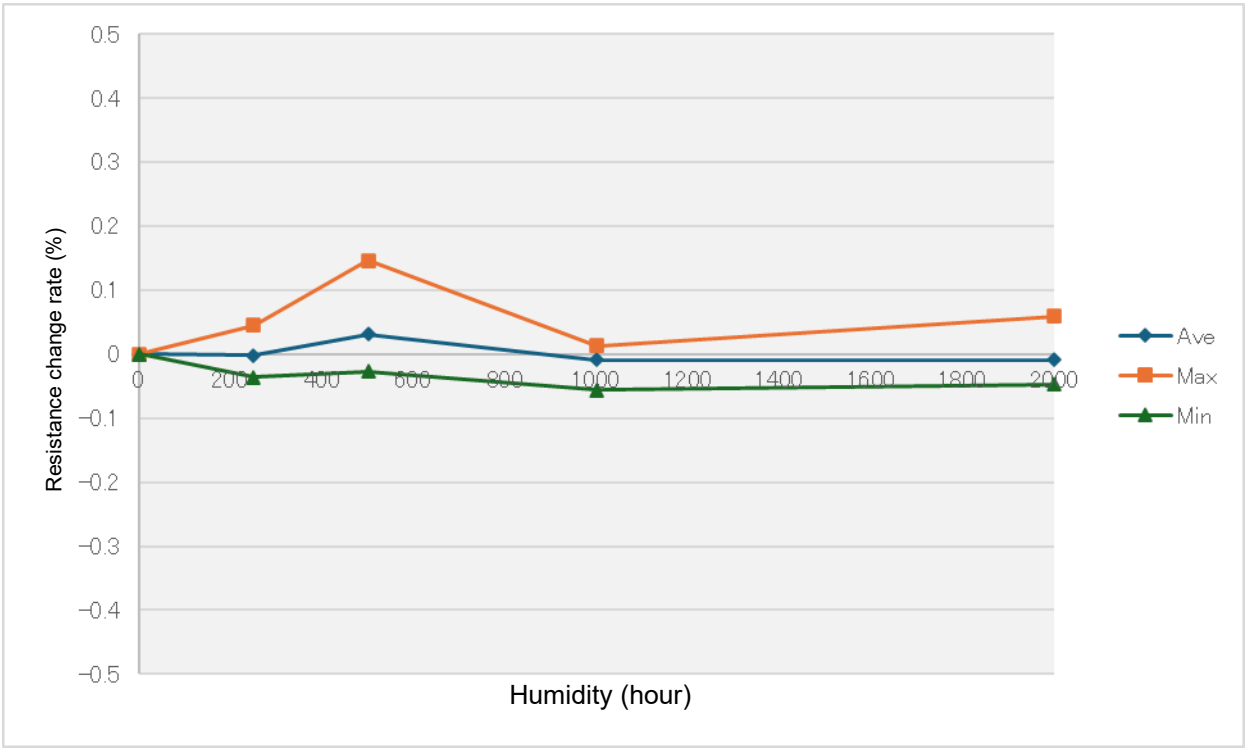


S3SU-2601

CRK8HR00

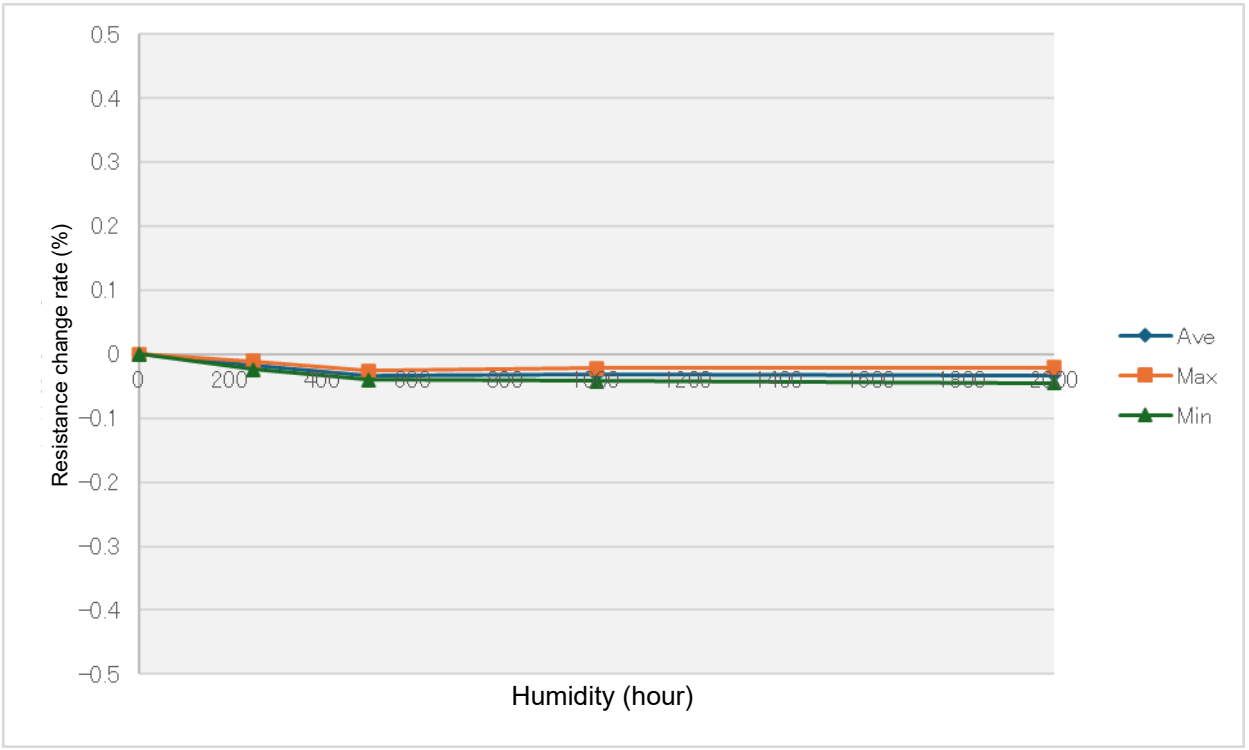


CRK8H1R0F

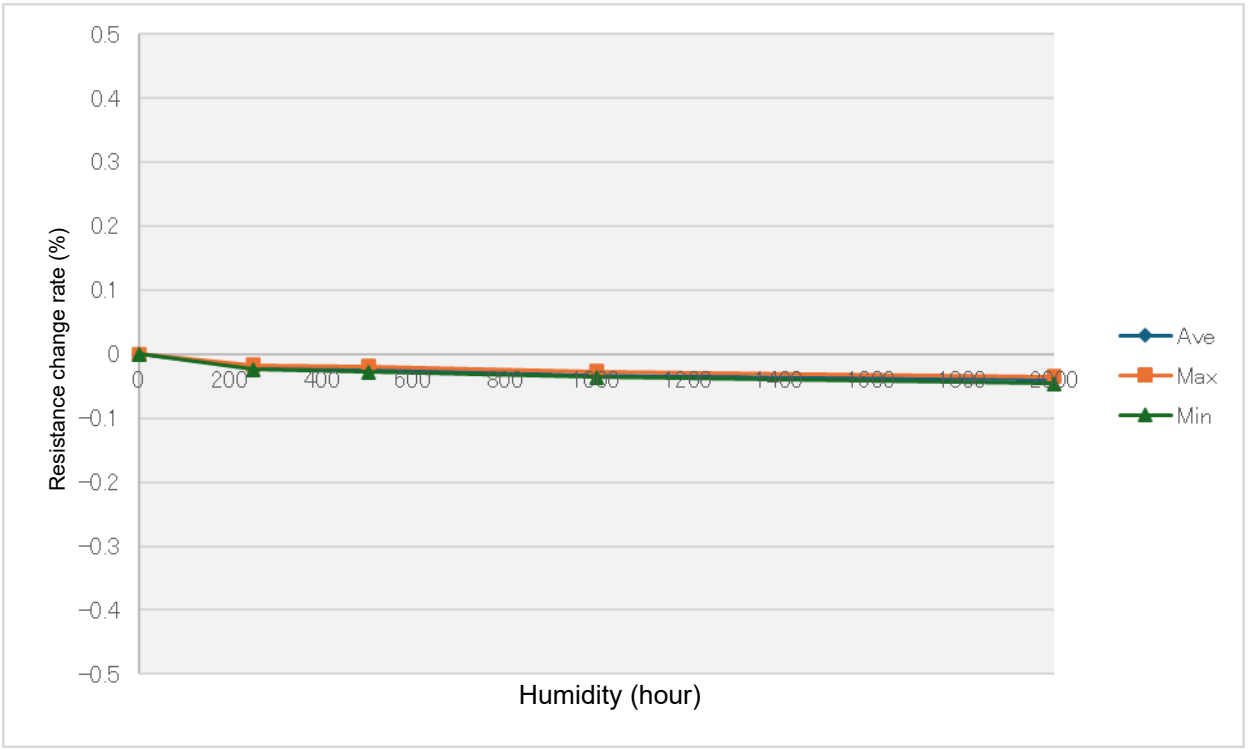


S3SU-2601

CRK8H164F

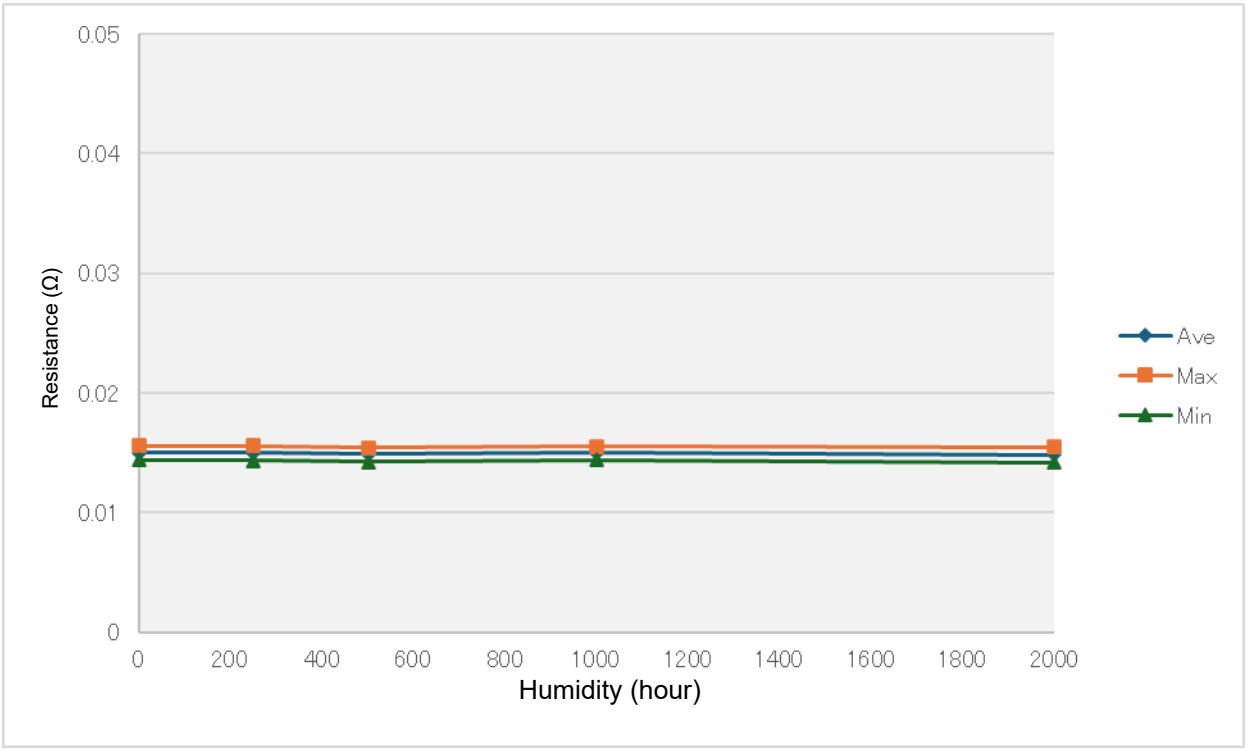


CRK8H106F

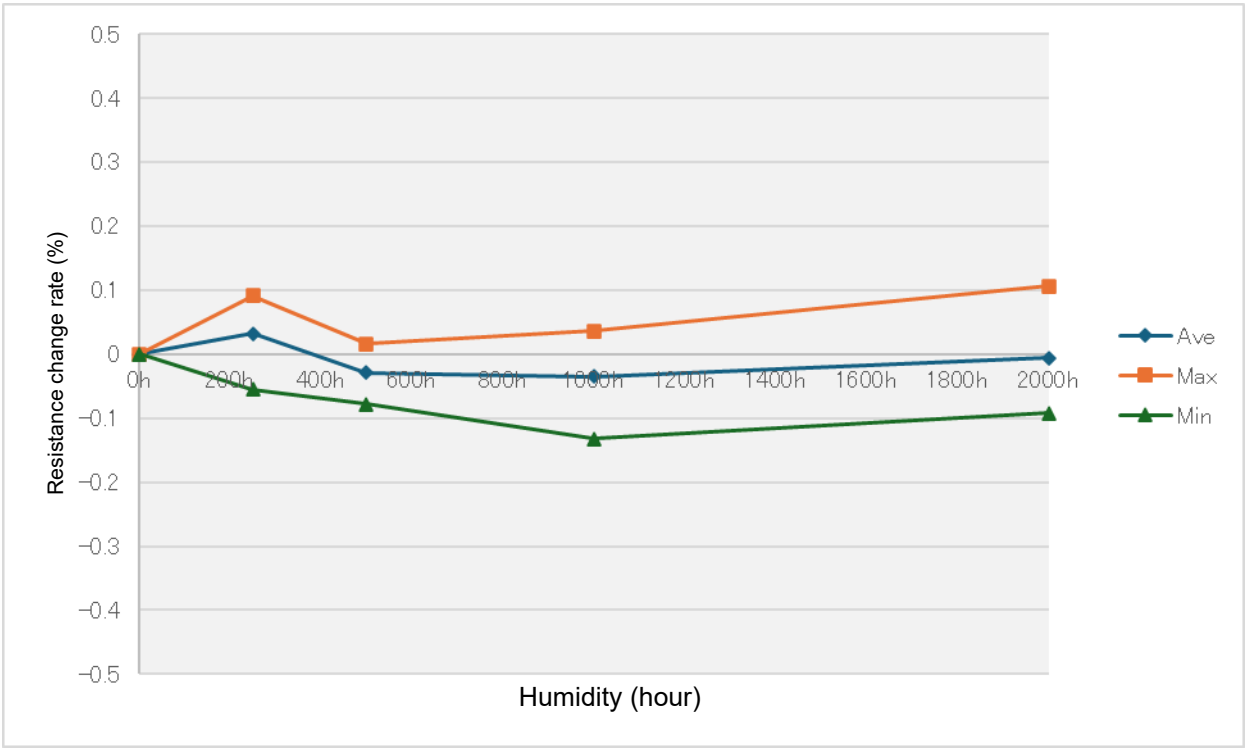


S3SU-2601

CRK4HR00

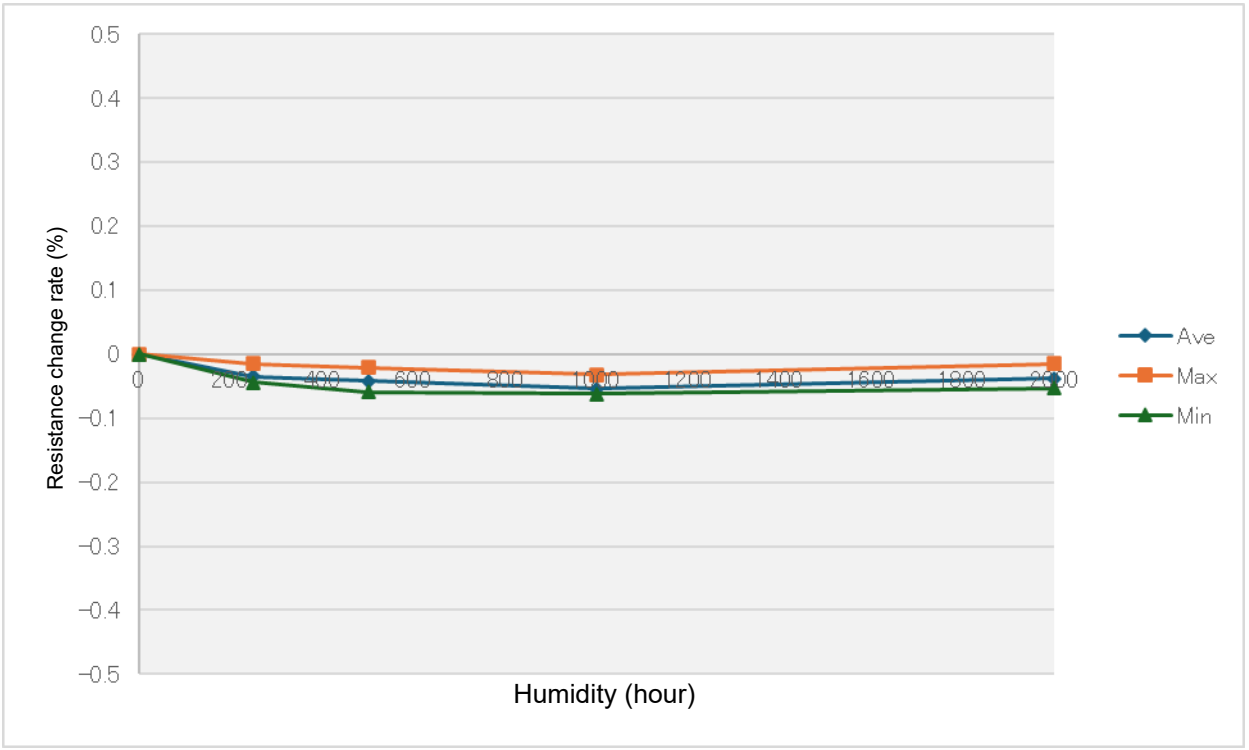


CRK4H1R0F

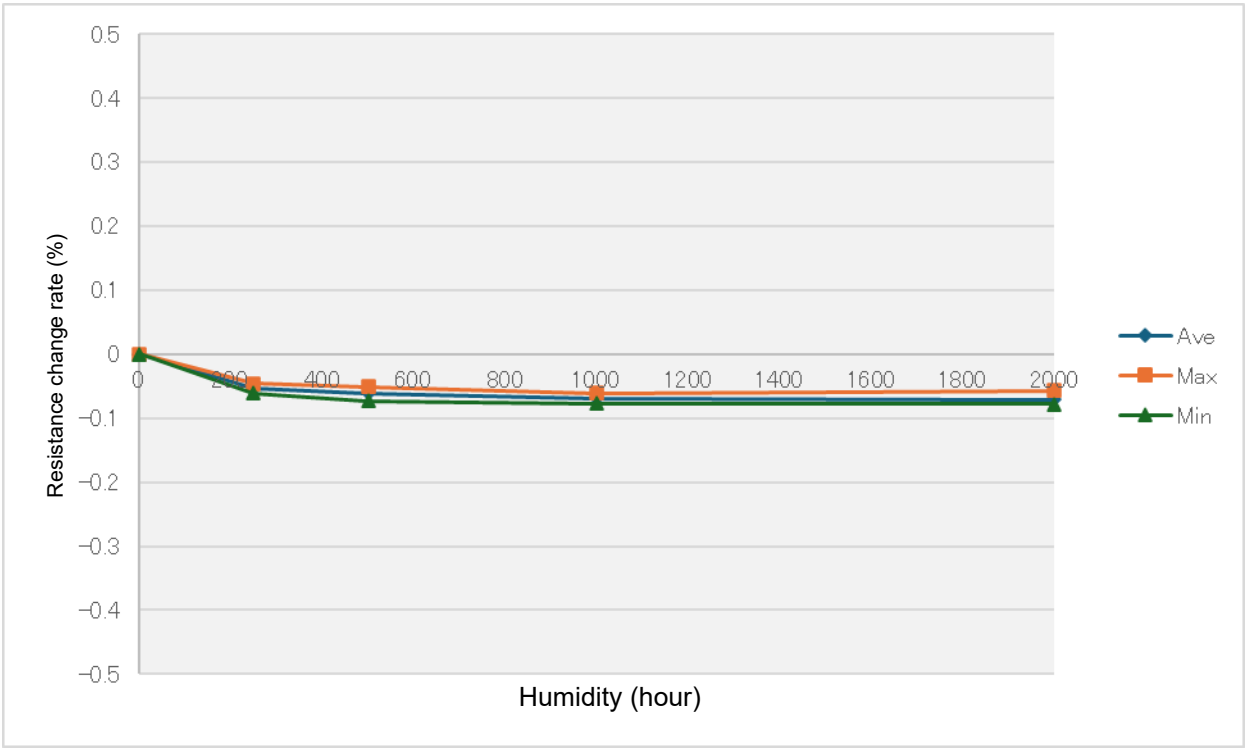


S3SU-2601

CRK4H124F

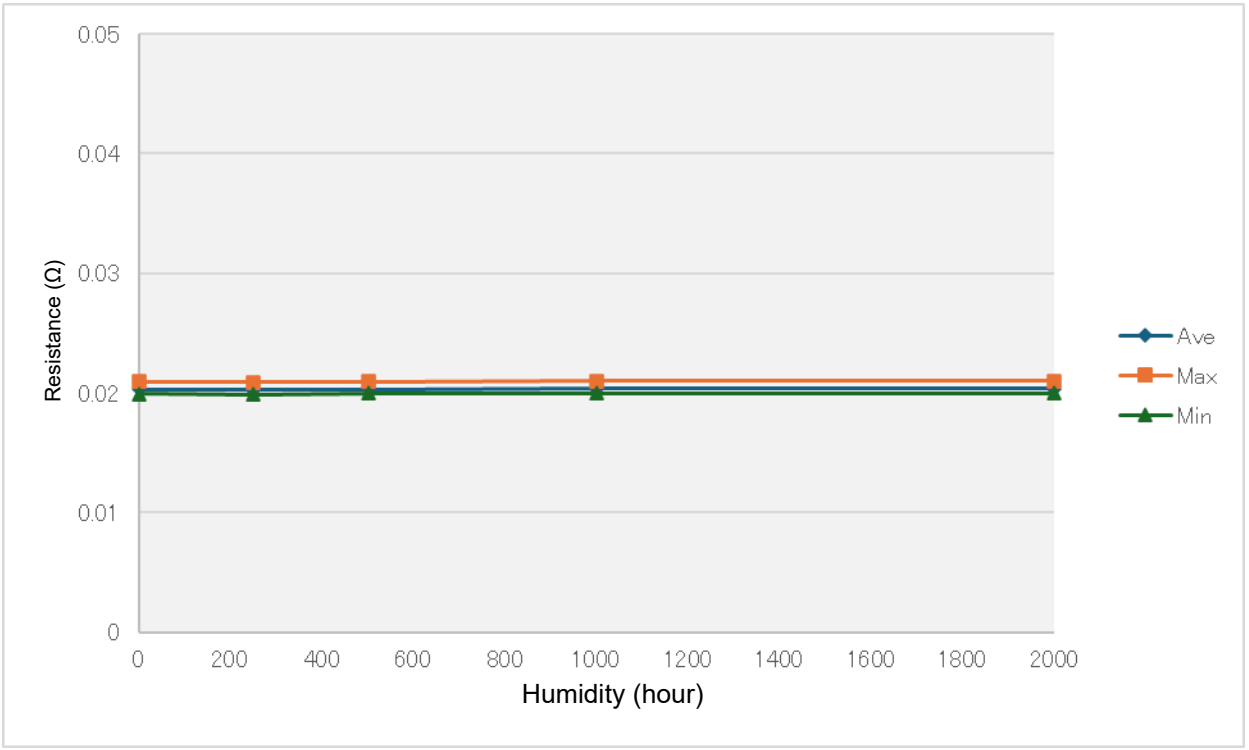


CRK4H106F

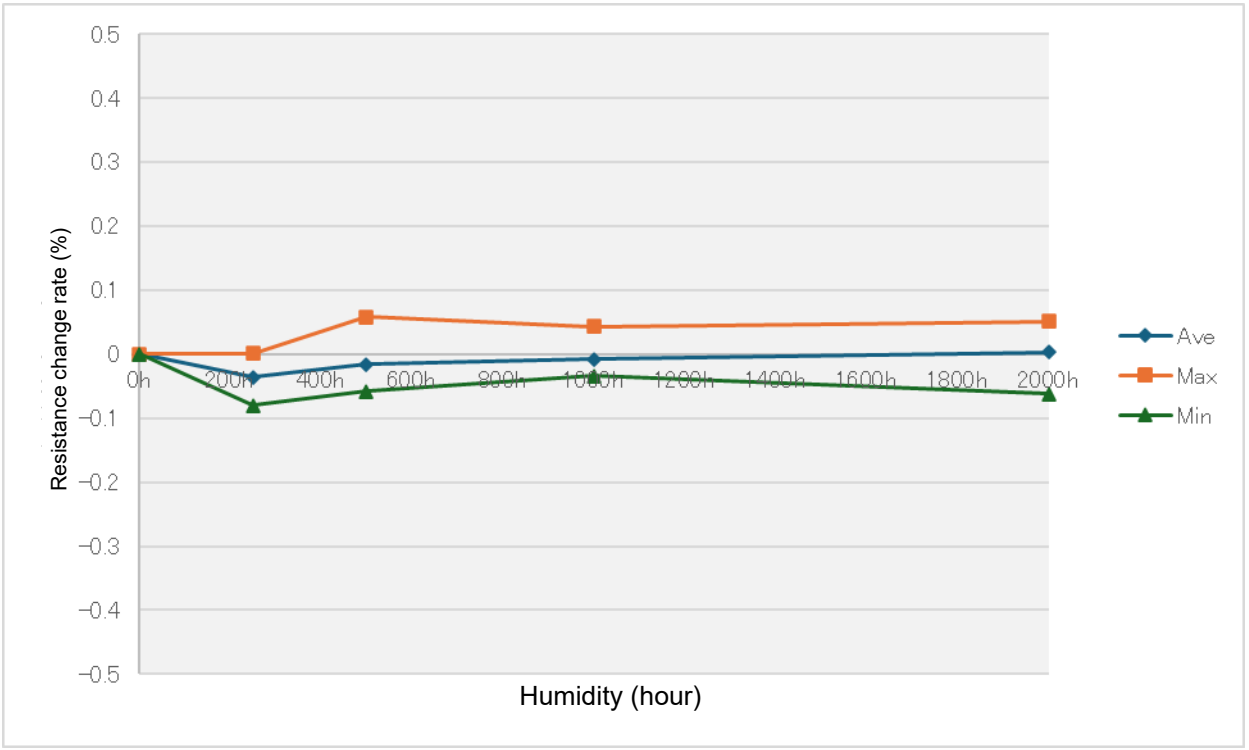


S3SU-2601

CRK2HR00

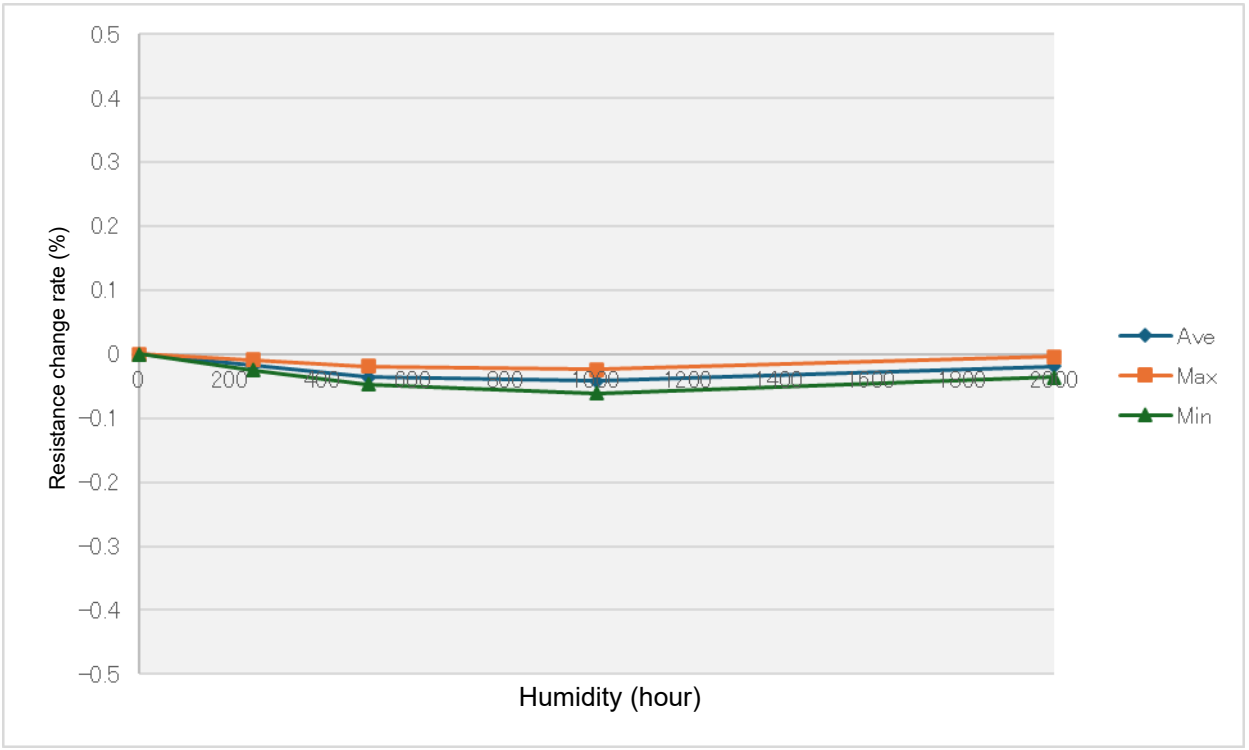


CRK2H1R0F



S3SU-2601

CRK2H753F



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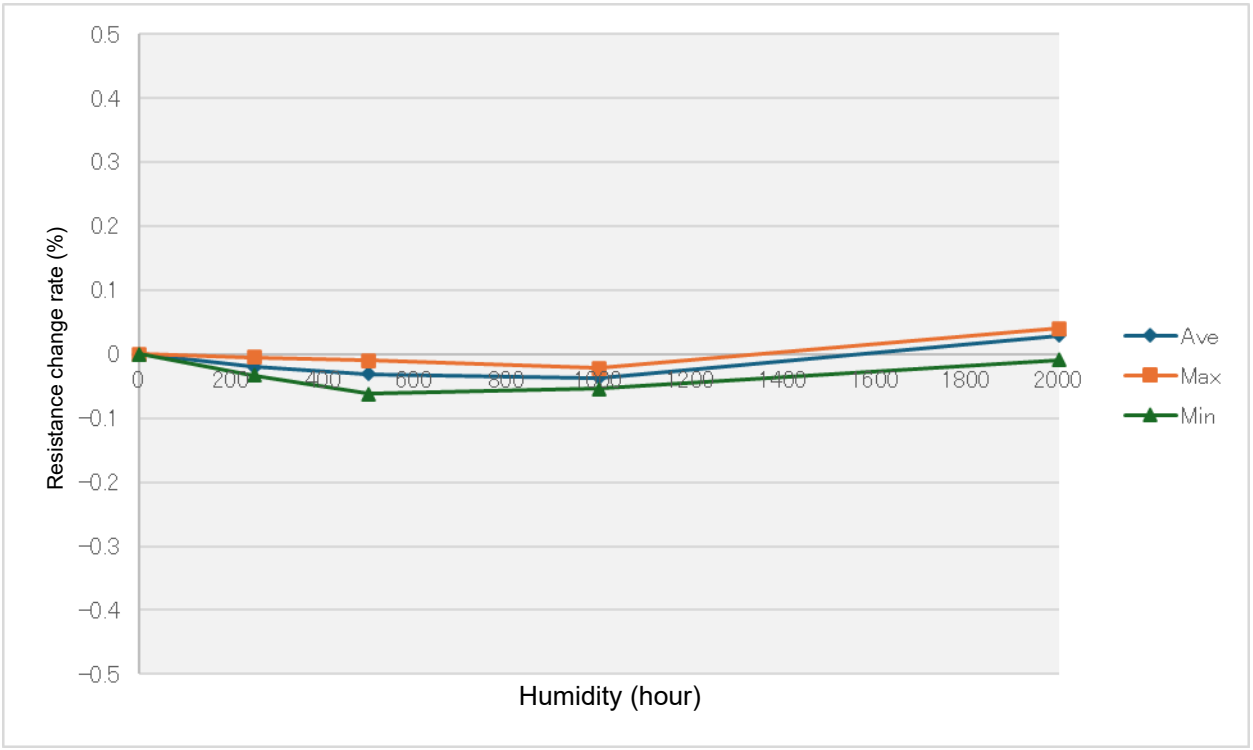
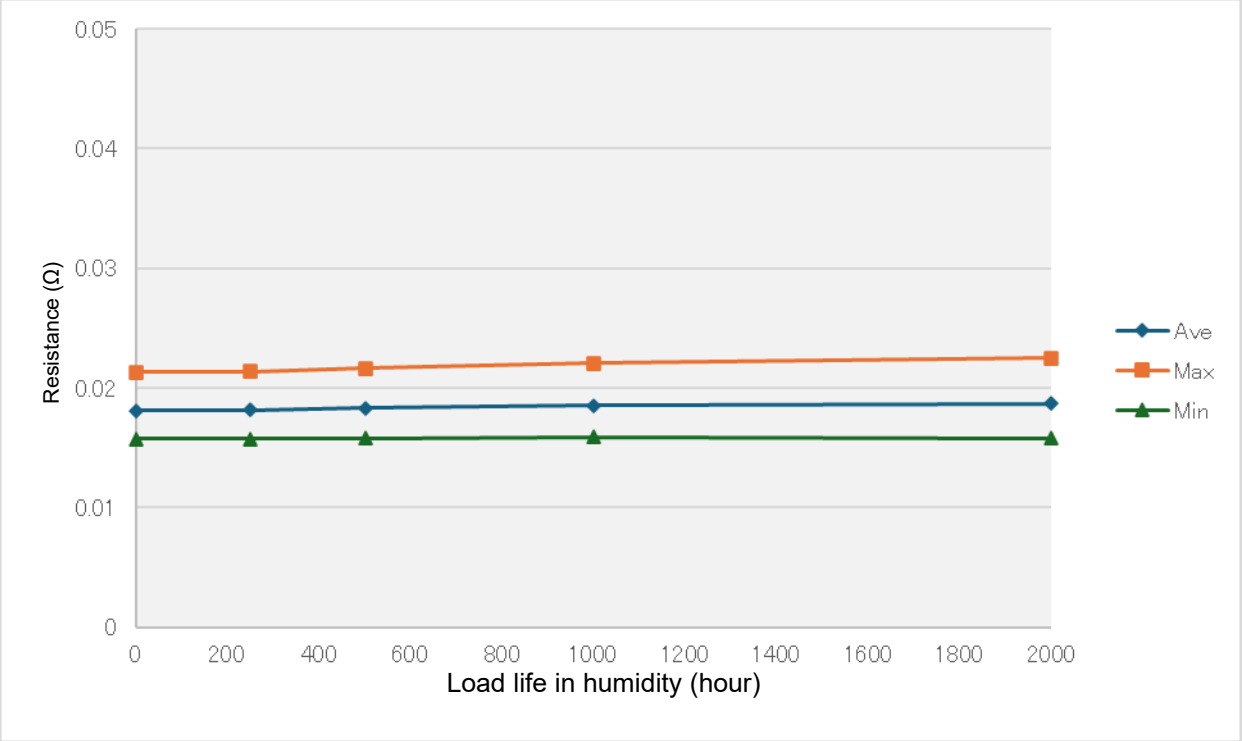


S3SU-2601

<Load life in humidity n=77> Conditions: +60 °C, 95 %RH, the rated voltage for 90 min. on/30 min. off. 2,000-hour Specification: ±(1.5 %+0.01 Ω)

CRK16HR00



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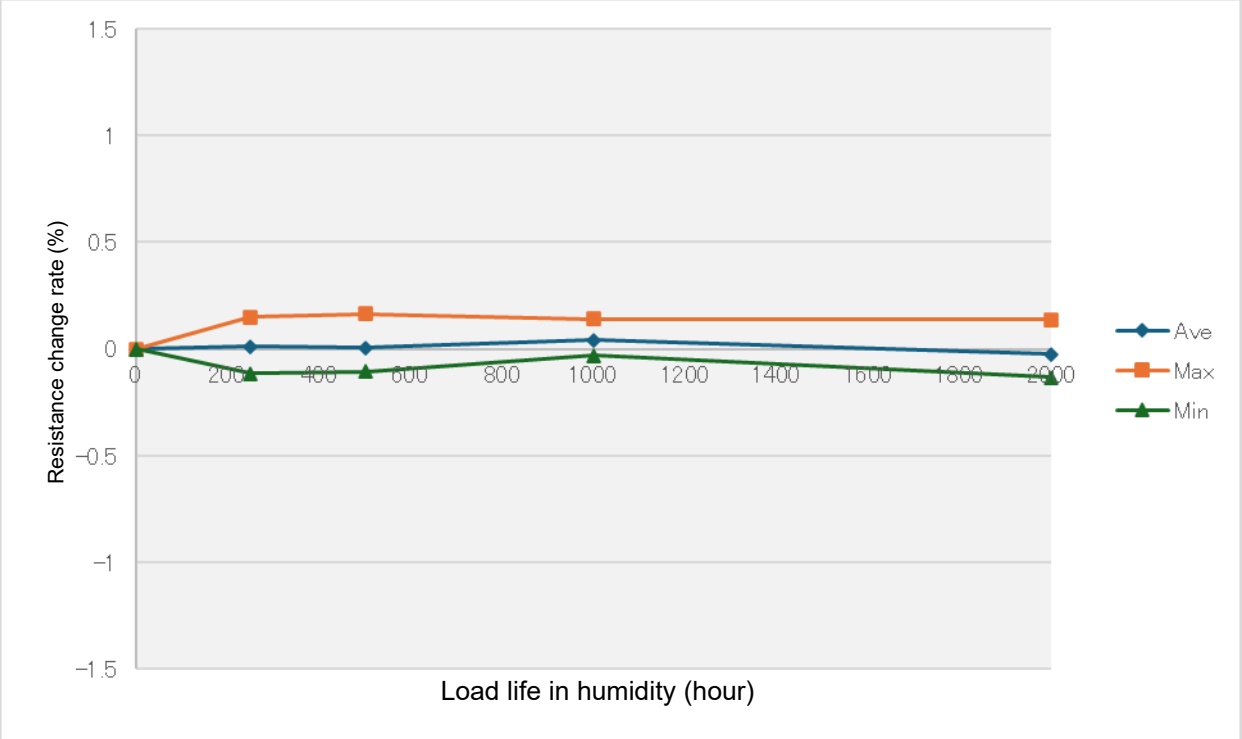

S3SU-2601

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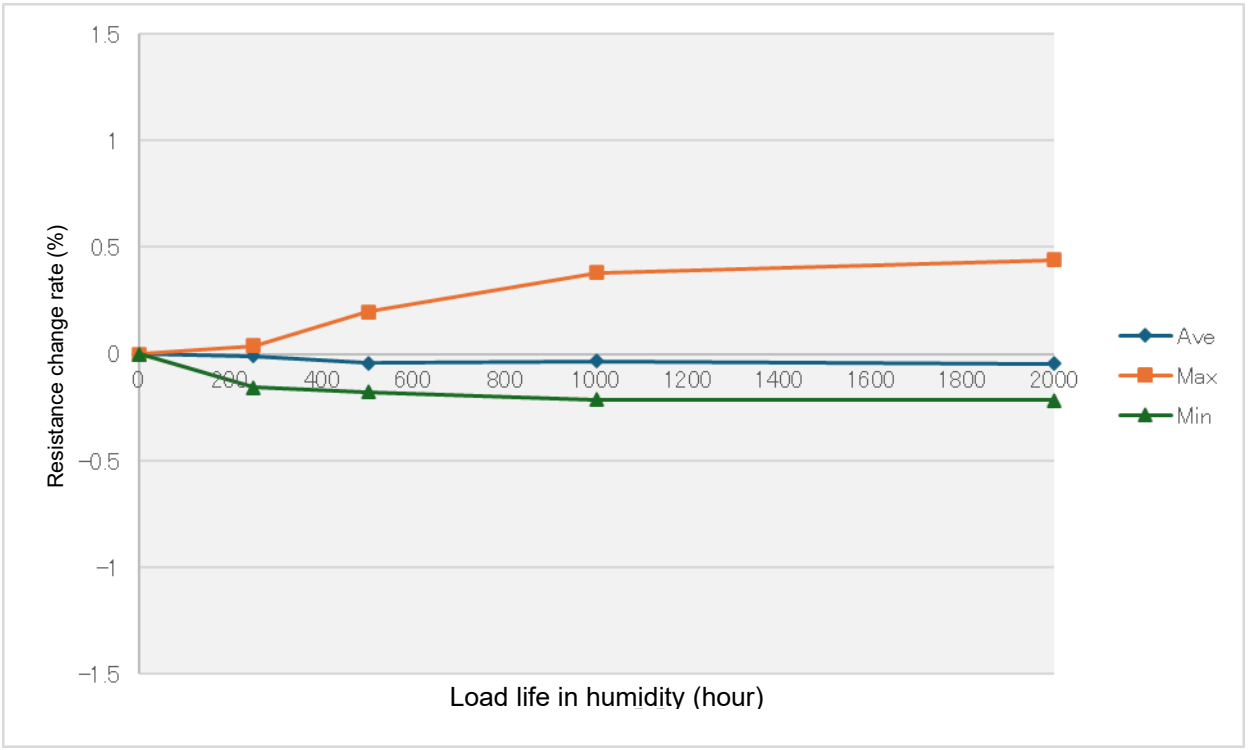
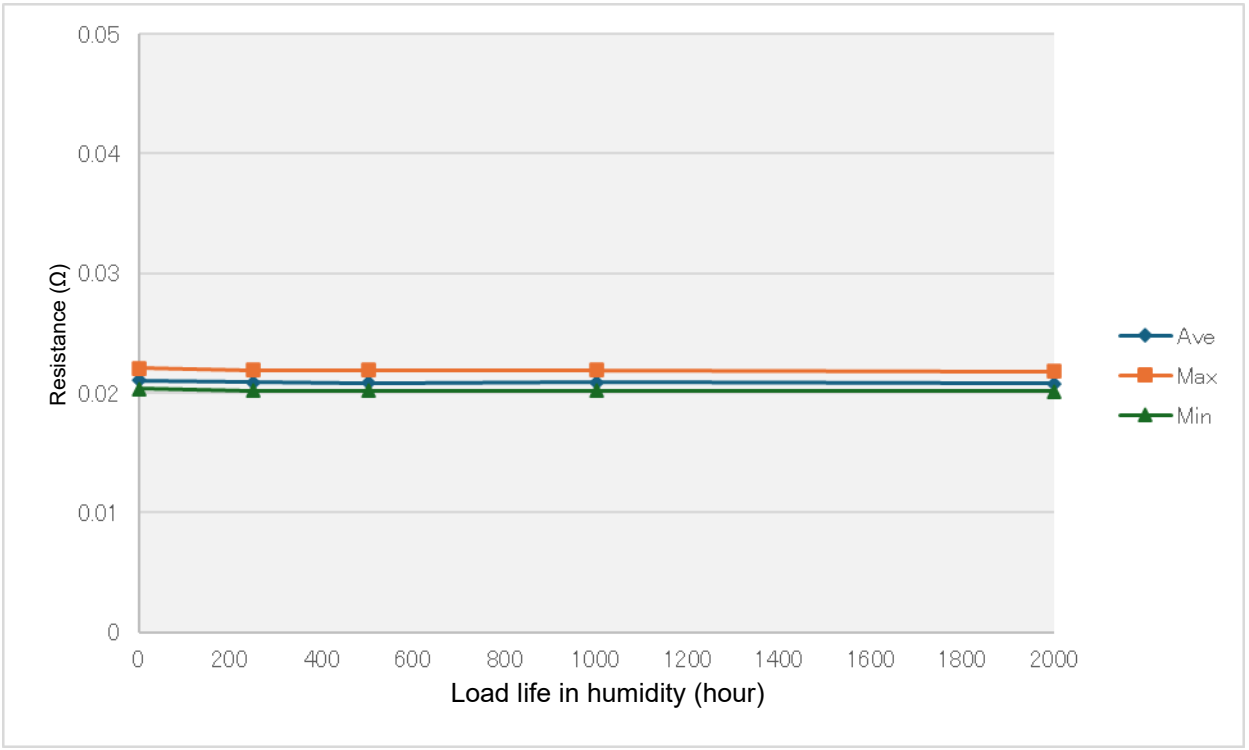


S3SU-2601

CRK10HR00



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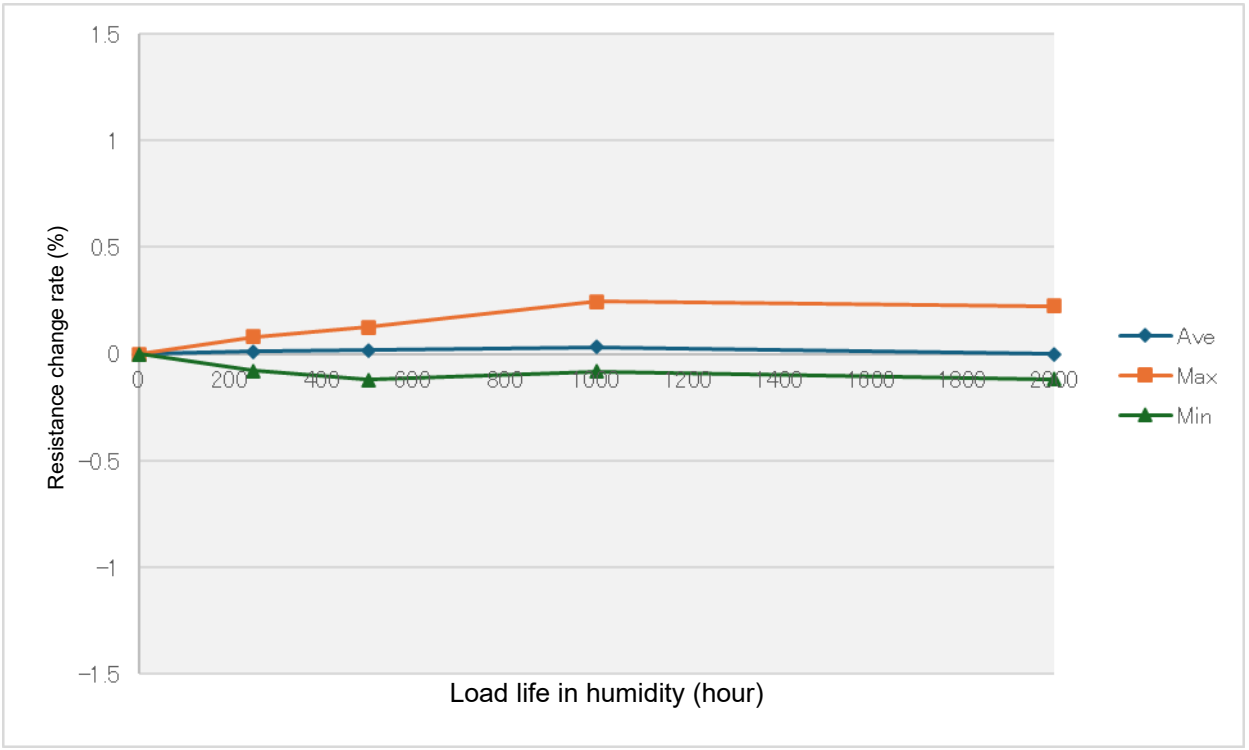

S3SU-2601

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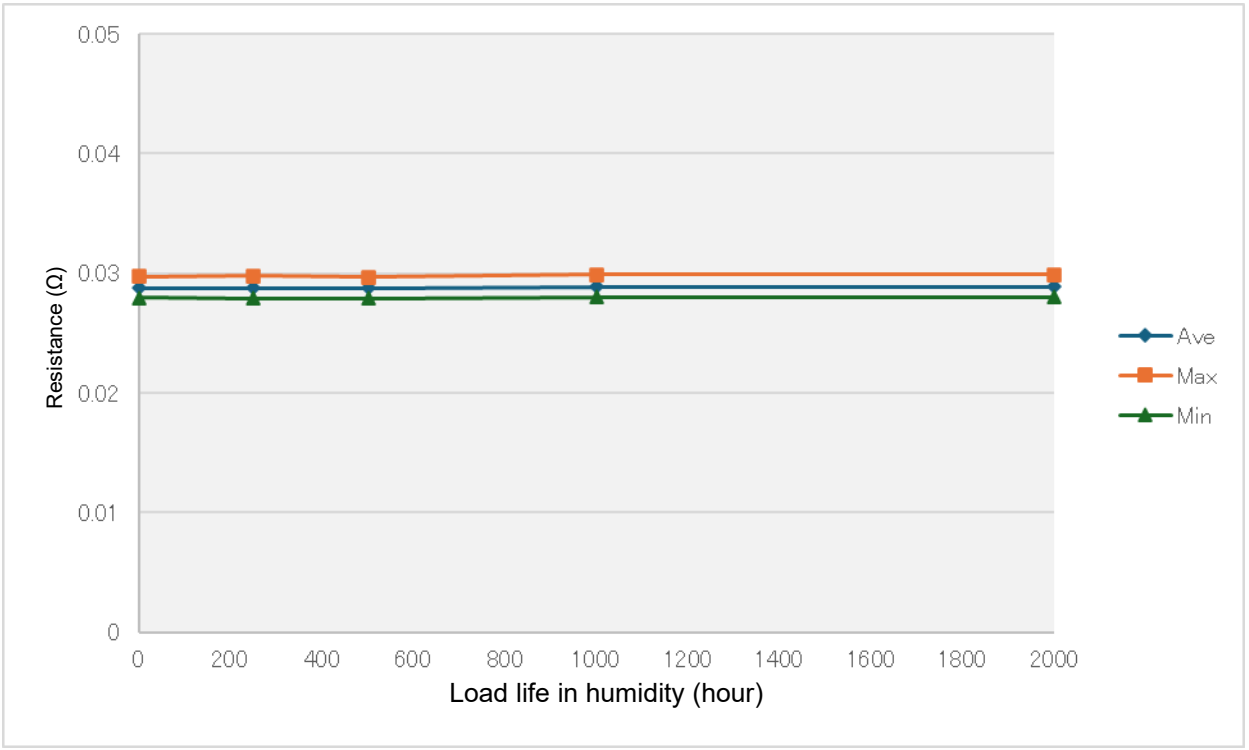
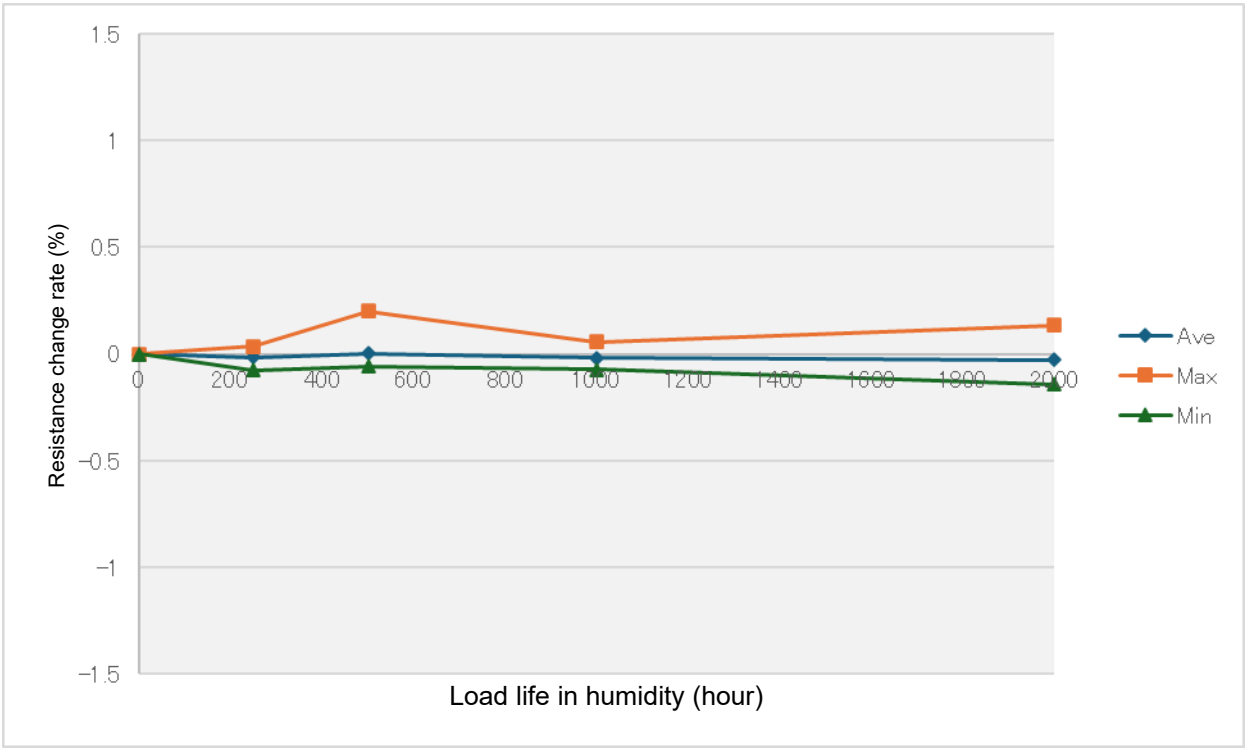
CRK10H106F

S3SU-2601

CRK8HR00



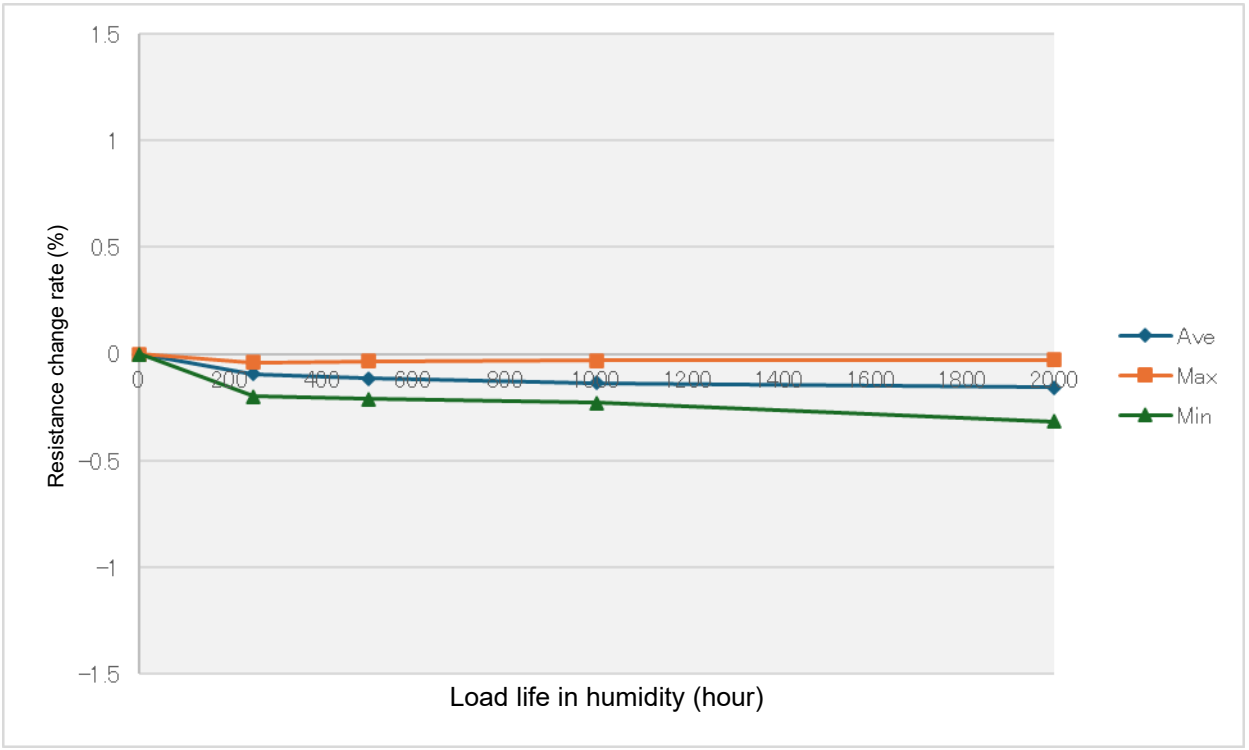
CRK8H1R0F



S3SU-2601

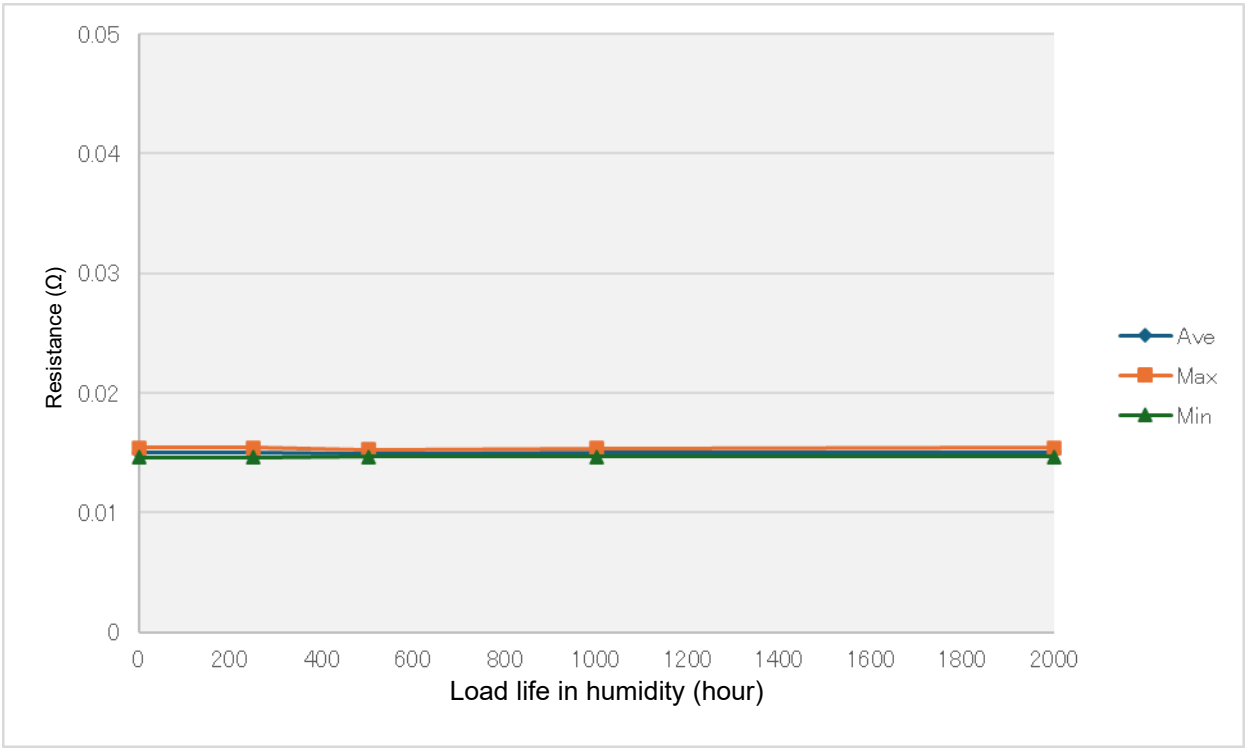
CRK8H164F

CRK8H106F



S3SU-2601

CRK4HR00



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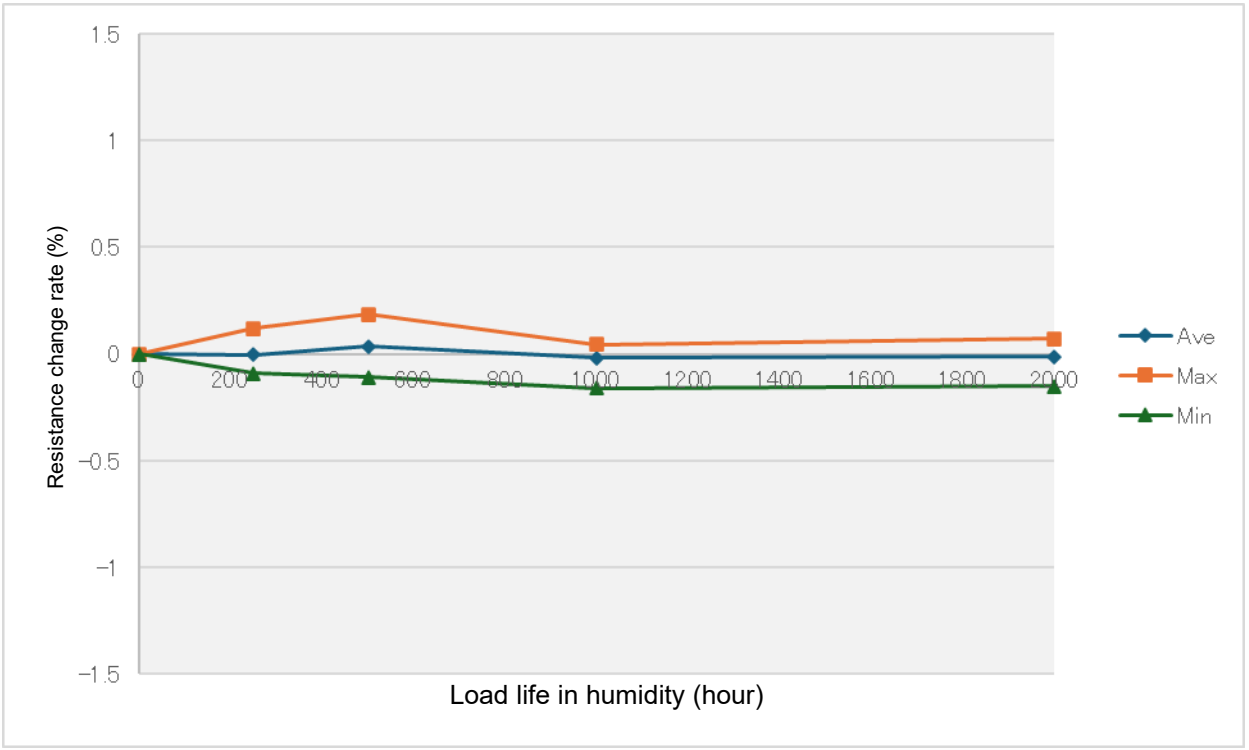


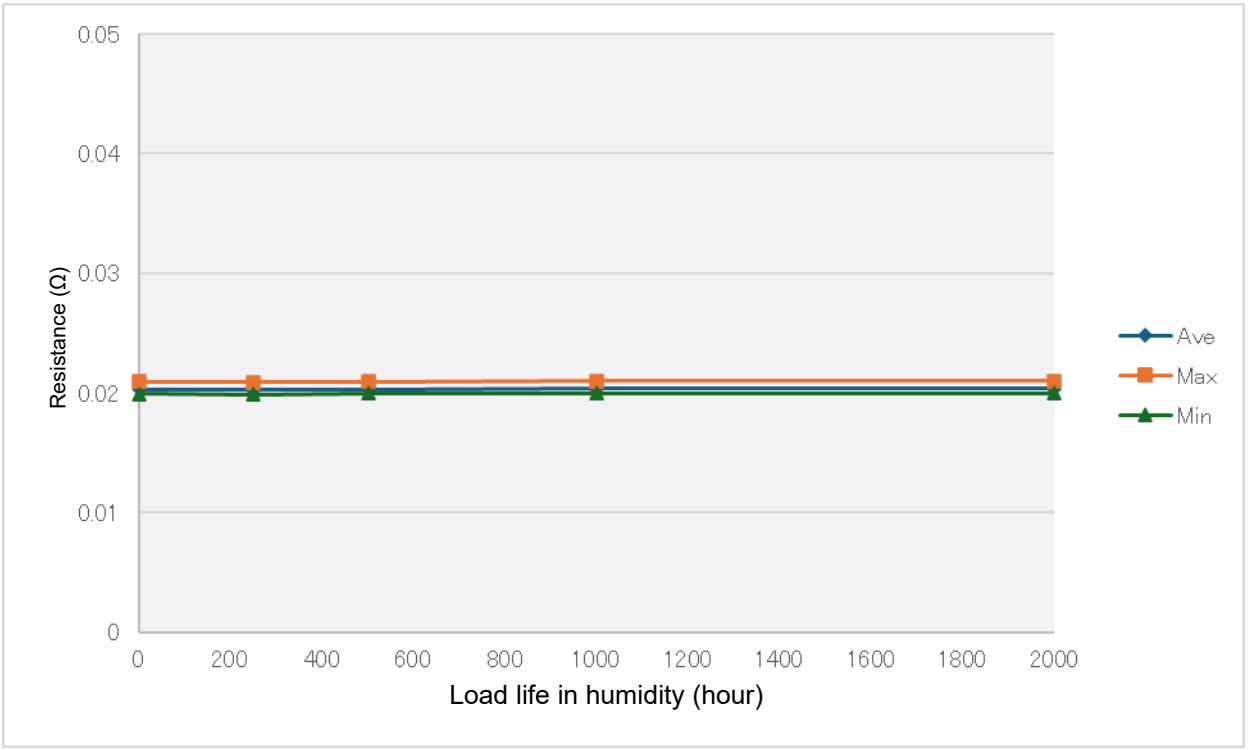
S3SU-2601

CRK4H124F

CRK4H106F

S3SU-2601

CRK2HR00



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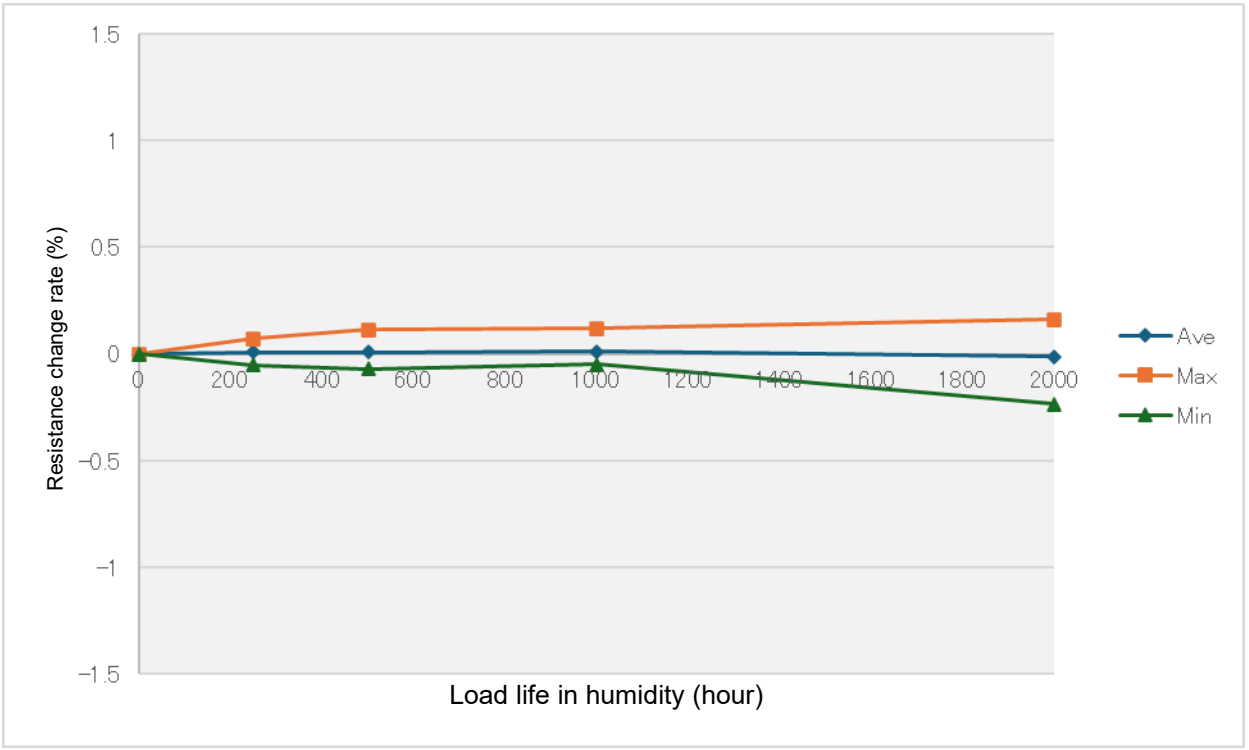

S3SU-2601

CRK2H753F

CRK2H106F

6. RELIABILITY

6.1 Failure Rate

6.1.1 Failure Rate (JAXA qualified parts)

The failure rate calculated using all data obtained during the life test (for 4,000 hours) performed at the qualification test is shown below.

Product	Total test hour (hour)	No. of defects (piece)	Failure rate ([1])	Failure rate level ([2])
JAXA CRK series	4,820,000	0	0.019 %/1,000 h	P level

([1]) Failure rate calculation
The failure rate with zero failures is calculated as follows:
$\lambda = 0.917 / T$ when λ: failure rate, T: total test hour
Reliability level: 60%
Samples: 20 items (total 1205 pieces)

([2]) Compatible with JIS C 5003 failure rate levels.

6.1.2 Failure Rate (Commercial parts with the same construction and design)

The failure rates based on field data for commercial parts with the same construction and design as the products are shown below. However, commercial parts are Ni-Sn plated.

Product	Total component hour (hour)	No. of defects (piece)	Failure rate ([1]) (FIT)
TSR series	434.39×10^{12}	0	0.000002

([1]) Failure rate calculation
The failure rate is calculated as follows:
$\lambda_{60} = \chi^2 [2(r + 1), \alpha] / [2(n \times T)] \times 10^9$ (FIT)
Reliability level: 60%
Number of products (n): Quantity of actually sold products between 2016 and 2025
Operating time (T): Calculated on assumption that the product operated 6 hours a day and that a year consists of 365 days.
Number of failures (r): The number of failures due to the product deficiency is 0.

6.2 Possible Failure Modes

Failure mode	Occurrence rate
Burnout and resistance increase	80%
Short-circuit and resistance decrease	20%

7. STORAGE

The products shall be stored in the package as provided by the manufacturer at room temperature (+15 to +35 °C), the normal humidity (25 to 85 %RH) and shall be placed in an environment free of harmful gases such as hydrochloric gas, hydrogen sulfide and sulfurous acid gas.

8. NOTES

Use caution in handling the product when using metal tweezers, etc., which may cause damages such as cracks or chips in the protective film and electrode detachment.
Do not damage the protective film and external electrodes by brushing after mounting.
When using masking tape at the time of mounting, make certain not to leave the adhesive residue of the tape and the mechanical stress on the resistor.
The products dropped during mounting or the products removed from the printed wiring board shall not be used.

9. OTHER

The contact information on this data sheet is as follows:

Manufacturer : TATEYAMA KAGAKU DEVICE TECHNOLOGY CO., LTD
Address : 3-6 Tsukioka-cho, Toyama-city, Toyama Pref. 939-8132 Japan
Telephone : +81-76-429-3588
Fax : +81-76-429-6630

Tokyo branch:
Address : 5F Daiwa Nihonbashi Hongokucho Bldg., 4-2-16 Hongokucho, Nihonbashi, Chuo-ku, Tokyo 103-0021, Japan
Telephone : +81-3-5203-7881
Fax : +81-3-5203-7882

Osaka Sales Office:
Address : Osaka Ekimae 3rd Bldg. 6F-17. 1-1-3-600 Umeda, Kita-ku, Osaka. 530-0001 Japan
Telephone : +81-66-346-1236
Fax : +81-66-346-1237