

## **Reliability Test Comparison Data**

Chip NTC Thermistor

P/N: NCP03WF104*05RL
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\*---means resistance tolerance F( $\pm 1\%$ ) E( $\pm 3\%$ ) J( $\pm 5\%$ )

### 1. Climatic performance

1-1. Dry Heat

1-2. Cold

1-3. Damp Heat

1-4. Change of Temperature

1-5. High Temperature Load

### 2. Mechanical performance

2-1. Solderability

2-2. Soldering Heat Resistant

2-3. Vibration Resistant

2-4. Resistance to Bending of Substance

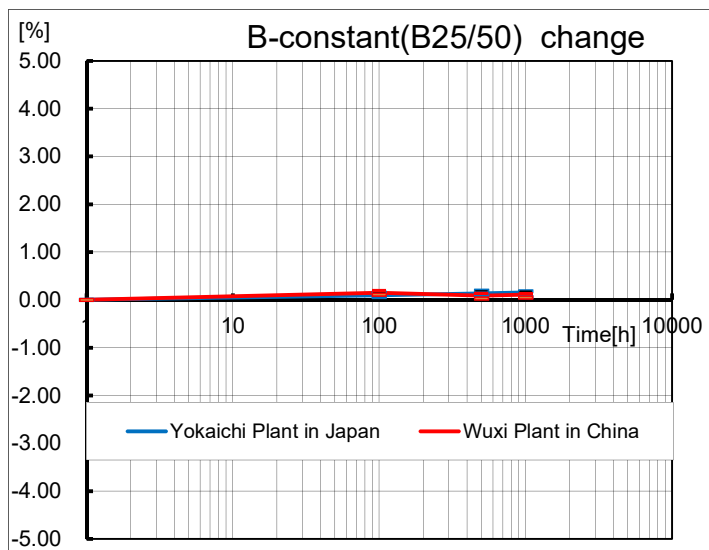
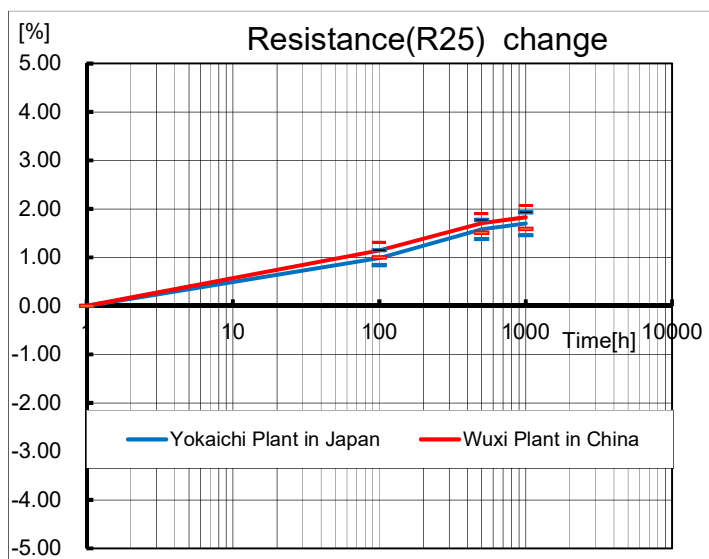
## 1-1.Dry Heat

P/N : **NCP03WF104\*05RL**

Test Condition : +125°C±3°C in air, without loading.  
NTC Thermistor shall be soldered on the glass epoxy PCB and be tested.

Criteria : Resistance( $R_{25}$ ) change shall be less than ±5%  
B-constant( $B_{25/50}$ ) change shall be less than ±2%

Samples : 10 pcs



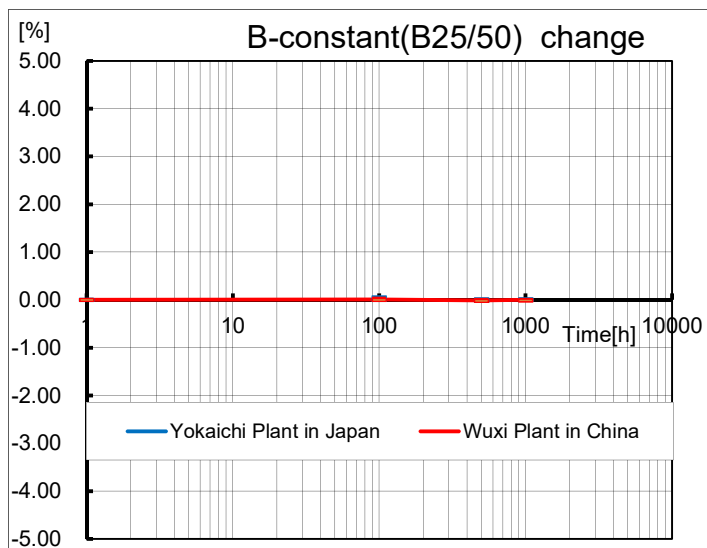
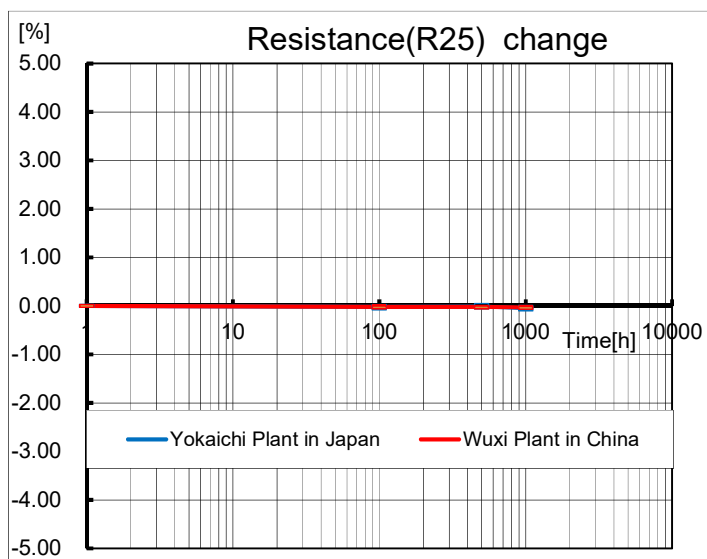
## 1-2.Cold

P/N : **NCP03WF104\*05RL**

Test Condition :  $-40 \pm 3^{\circ}\text{C}$  in air, without loading.  
NTC Thermistor shall be soldered on the glass epoxy PCB and be tested.

Criteria : Resistance( $R_{25}$ ) change shall be less than  $\pm 5\%$   
B-constant( $B_{25/50}$ ) change shall be less than  $\pm 2\%$

Samples : 10 pcs



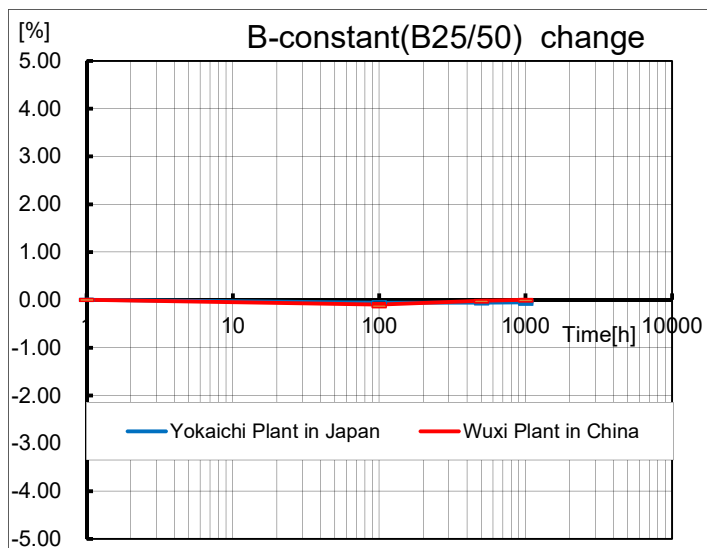
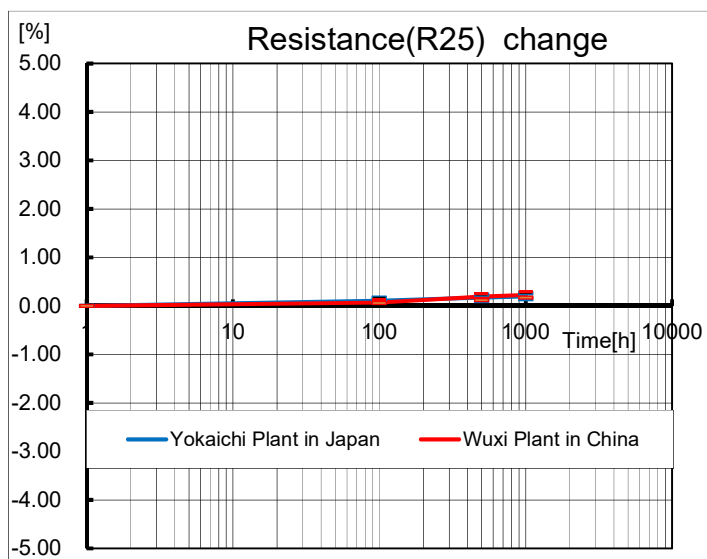
## 1-3.Damp Heat

P/N : **NCP03WF104\*05RL**

Test Condition : +60±2°C, 90~95%RH in air, without loading.  
NTC Thermistor shall be soldered on the glass epoxy PCB and be tested.

Criteria : Resistance( $R_{25}$ ) change shall be less than ±5%  
B-constant( $B_{25/50}$ ) change shall be less than ±2%

Samples : 10 pcs



## 1-4.Change of Temperature

P/N : **NCP03WF104\*05RL**

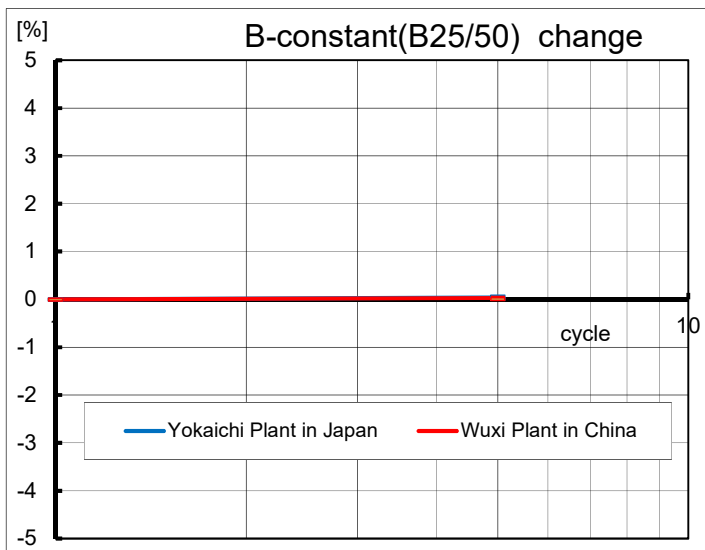
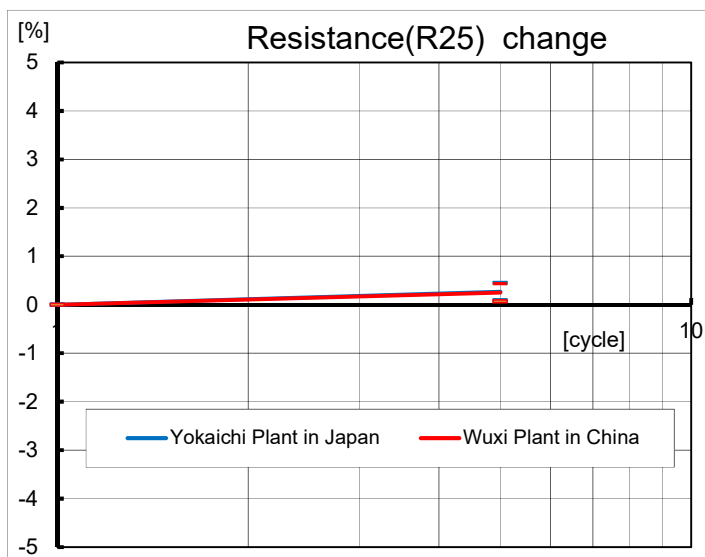
Test Condition : 5 cycles of following sequence, without loading.

Step	1	-40°C +0/-3°C	× 30min.
	2	Room Temp.	× 10~15min.
	3	+125°C +3/-0°C	× 30min.
	4	Room Temp.	× 10~15min.

NTC Thermistor shall be soldered on the glass epoxy PCB and be tested.

Criteria :Resistance( $R_{25}$ ) change shall be less than  $\pm 5\%$   
B-constant( $B_{25/50}$ ) change shall be less than  $\pm 2\%$

Samples :10 pcs



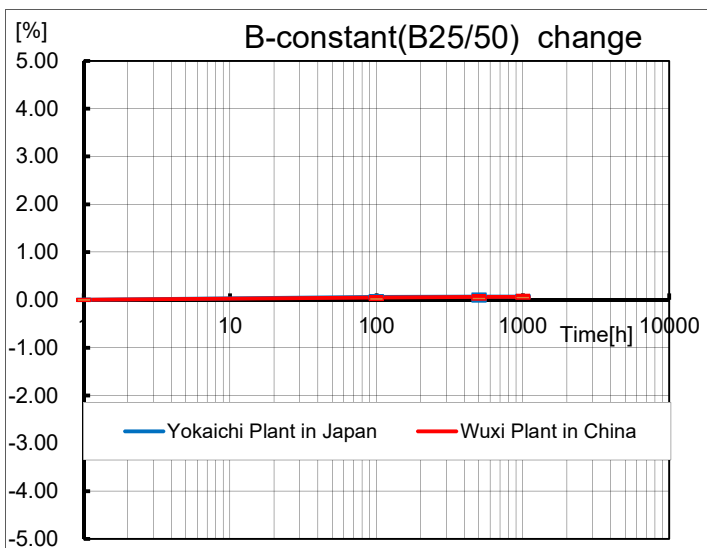
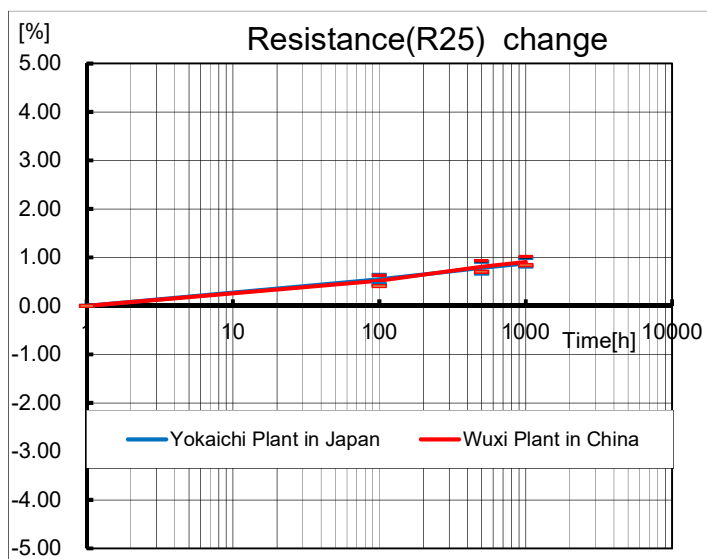
## 1-5.High Temperature Load

P/N : **NCP03WF104\*05RL**

Test Condition : +85±2°C in air, with Max. Operating Current.  
NTC Thermistor shall be soldered on the glass epoxy PCB and be tested.

Criteria : Resistance( $R_{25}$ ) change shall be less than ±5%  
B-constant( $B_{25/50}$ ) change shall be less than ±2%

Samples : 10 pcs



## 2-1.Solderability

P/N	:NCP03WF104*05RL	
Test Condition:	Soldering Temp :245°C±5°C Solder :Sn-3.0Ag-0.5Cu Immersion Time :3±0.5sec NTC Thermistor shall be immersed completely under the solder meniscus.	
Criteria	Minimum 95% of the whole electrode surface shall be covered with solder.	
Samples	:10 pcs	
No.	Yokaichi Plant in Japan	Wuxi Plant in China
1	Good	Good
2	Good	Good
3	Good	Good
4	Good	Good
5	Good	Good
6	Good	Good
7	Good	Good
8	Good	Good
9	Good	Good
10	Good	Good
Note:		

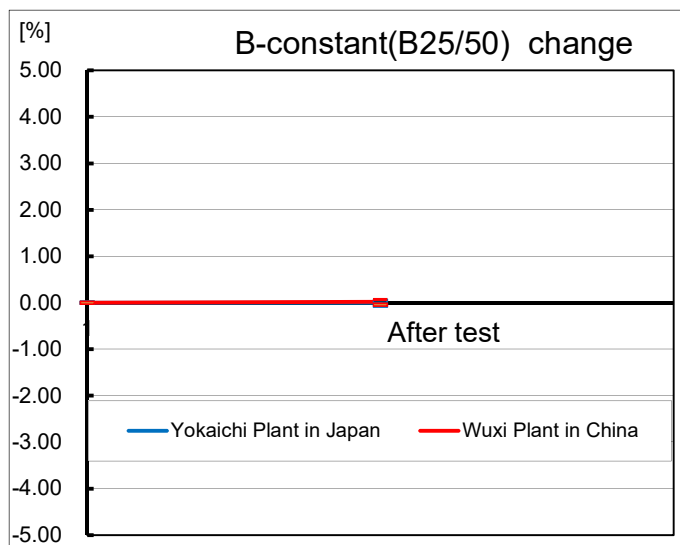
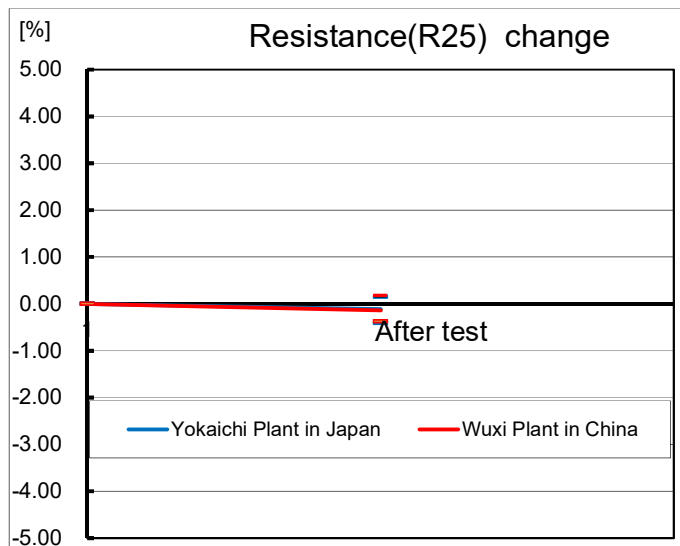
## 2-2.Soldering Heat Resistant

P/N :NCP03WF104\*05RL

Test Condition :Soldering Terr :260°C±5°C  
Solder :Sn-3.0Ag-0.5Cu  
Immersion Tim :10±0.5sec  
NTC Thermistor shall be immersed completely under the solder meniscus.  
Preheating Temp.:150±5°C  
Preheating Time.:3min

Criteria :Resistance( $R_{25}$ ) change shall be less than ±5%  
B-constant( $B_{25/50}$ ) change shall be less than ±2%

Samples :10 pcs





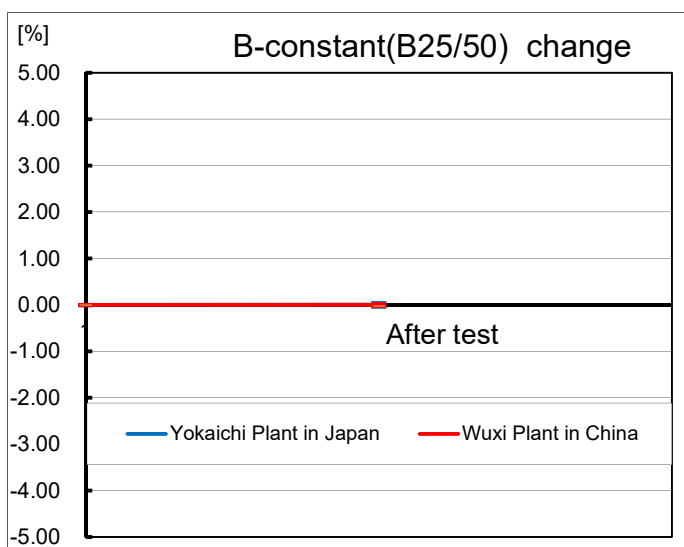
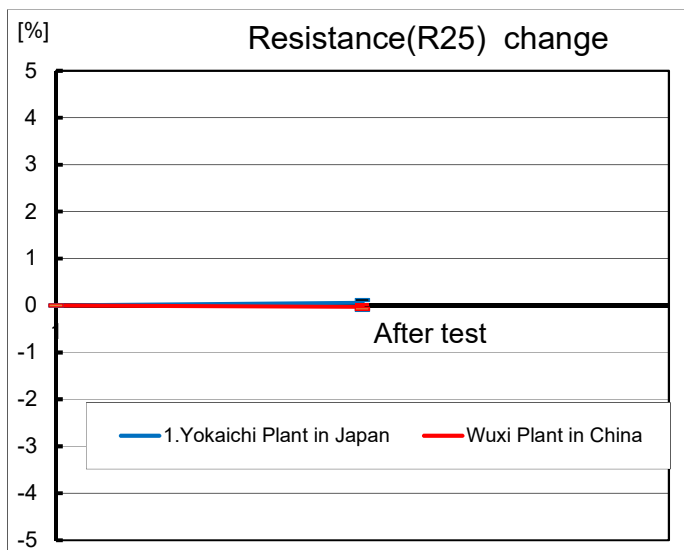
## 2-3.Vibration Resistant

P/N : **NCP03WF104\*05RL**

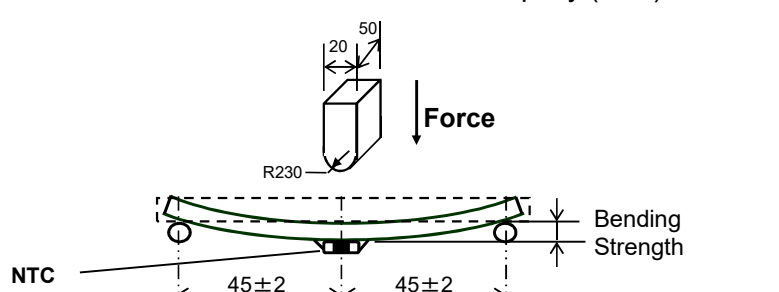
Test Condition : Solder NTC Thermistor on the Glass Epoxy PCB (FR4).  
Frequency : 10Hz~55Hz~10Hz (1min.)  
Amplitude : 1.5mm  
Vibrated for a period of 2hrs. In 3 directions perpendicularly intersecting each other (for total of 6hrs.).

Criteria : Resistance( $R_{25}$ ) change shall be less than  $\pm 5\%$   
B-constant( $B_{25/50}$ ) change shall be less than  $\pm 2\%$

Samples : 10 pcs



## 2-4. Resistance to Bending of Substance

P/N	:NCP03WF104*05RL	
Test Condition	:Solder NTC Thermistor on Test Board, and apply force on back side of Test Board as shown below: Bending Speed : 1.0 mm/s Bending Strength : 1.0 mm Hold Time : 5±1sec. Board Dimension : 100×40×0.8t mm Board Material : Glass Epoxy (FR4)	
		
Samples	:10 pcs	
	Unit:mm	
No.	Yokaichi Plant in Japan	Wuxi Plant in China
1	Good	Good
2	Good	Good
3	Good	Good
4	Good	Good
5	Good	Good
6	Good	Good
7	Good	Good
8	Good	Good
9	Good	Good
10	Good	Good
Note:		