DATA SHEET

NEC/TOKIN

AUTOMOTIVE RELAYS
EX2/EX1 SERIES

DESCRIPTION

The new NEC EX2/EX1 series is PC-board mount type and the most suitable for various motor and heater controls in the automobiles which require high quality and high performance.

The EX2 series is succeeding in about 60% of miniaturization in comparison with the ET2 series. The EX1 series is succeeding in about 50% of miniaturization in comparison with the ET1 series.

The EX2/EX1 series is under development now.

FEATURES

- PC-board mounting
- Lead free solder is used
- Approx. 75% relay volume of ET2
- Approx. 65% relay volume of ET1
- Approx. 60% relay space of ET2
- Approx. 50% relay space of ET1
- Approx. 88% relay weight of ET2
- Approx. 78% relay weight of ET1

APPLICATIONS

- Motor control
- Solenoid control

EX2 SERIES

EX1 SERIES

For Proper Use of Miniature Relays

DO NOT EXCEED MAXIMUM RATING

Do not use relay under excessive conditions such as over ambient temperature, over voltage and over current. Incorrect use could result in abnormal heating and damage to the relay or other parts.

READ CAUTIONS IN THE SELECTION GUIDE

Read the cautions described in NEC's "Miniature Relays" (ER0046EJ*) before dose designing your relay applications.

This information in this document is subject to change without notice.

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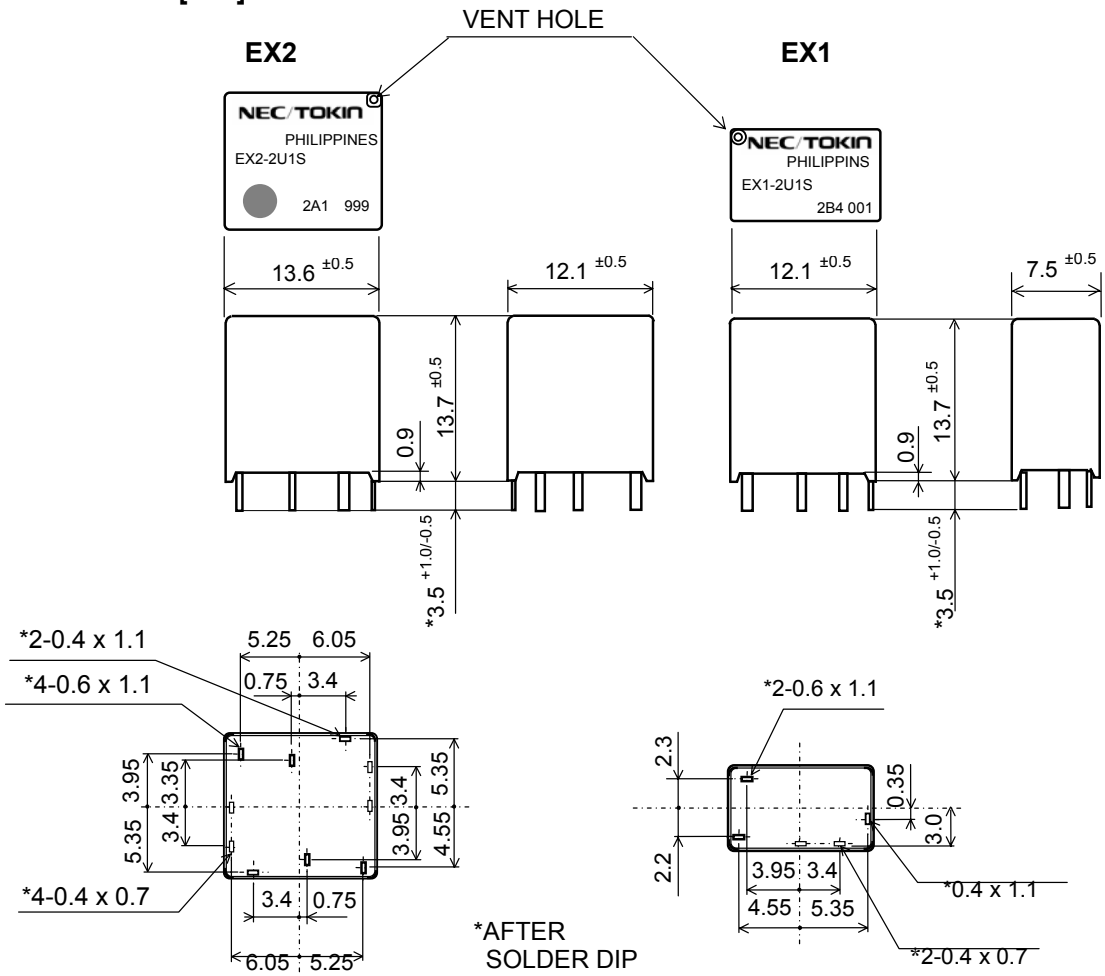
NEC/TOKIN Iwate, Ltd.

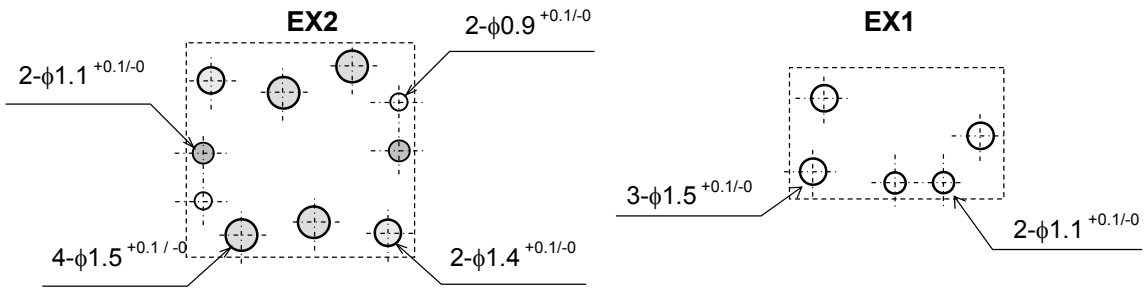
SCHEMATIC (BOTTOM VIEW)

(Unit A) (Unit B)

DIMENSIONS [mm]



PCB PAD LAYOUT [mm] (BOTTOM VIEW)



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SPECIFICATION

(at 20°C)

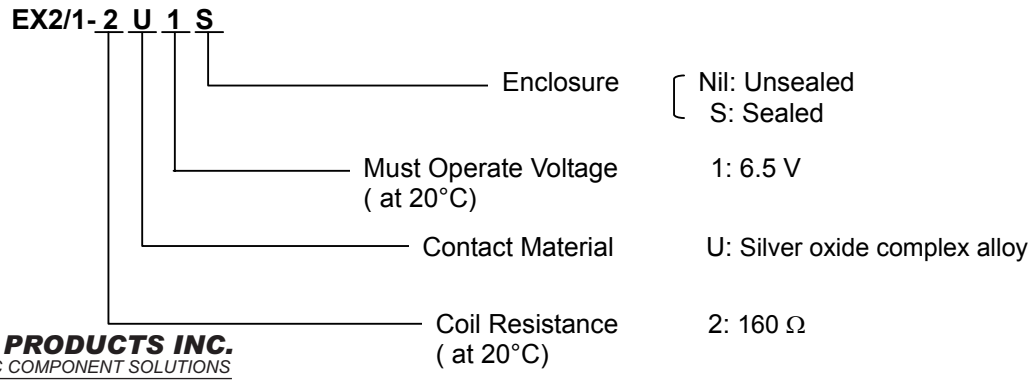
Items			Specifications	
			EX2	EX1
Contact Form			1c x 2 (Separate)	1c
Contact Rating	Max. Switching Voltage		16Vdc	
	Max. Switching Current		30A (at16Vdc)	
	Min. Switching Current		1A (5Vdc)	
	Max. Carrying Current		35A (2minutes max. 12Vdc at 25°C) 30A (2minutes max. 12Vdc at 85°C) 20A (2minutes max. 12Vdc at 125°C)	
	Contact Resistance		4mΩ typical (measured at 7A) initial	
Contact Material			Silver oxide complex alloy	
Operate Time (Excluding Bounce)			2.5ms typical (at nominal voltage)	
Release Time (Excluding Bounce)			3ms typical (at nominal voltage with diode)	
Nominal Operate Power			900mW	
Insulation Resistance			100MΩ at 500Vdc	
Withstand Voltage	Between Open Contact		500Vac min. (for 1minute)	
	Between Contact and Coil		500Vac min. (for 1minute)	
Shock Resistance	Misoperation		98m/s^2	
	Destructive Failure		980m/s^2	
Vibration Resistance	Misoperation		10 to 300Hz, 43m/s^2	
	Destructive Failure		10 to 500Hz 43m/s^2, 200hour	
Ambient Temperature			-40 to +125 °C	
Coil Temperature Rise			70°C /W (without contact carrying current)	
Life Expectancy	Mechanical		1 x 10^6 operations	
	Electrical	P/W motor lock (14Vdc, 25A)	100x10^3 operations	
		P/W motor free (14Vdc, 25A/7A)	100x10^3 operations	
Weight			Approx. 6.4g	Approx. 3.5g

COIL RATING

(at 20°C)

Part Numbers	Nominal Voltage (Vdc)	Coil Resistance (Ω)+/-10%	Must Operate Voltage (Vdc)	Must Release Voltage (Vdc)
EX2/1-2U1S (Sealed type)	12	160	6.5	0.9
EX2/1-2U1 (Unsealed type)	12	160	6.5	0.9

NUMBERING SYSTEM



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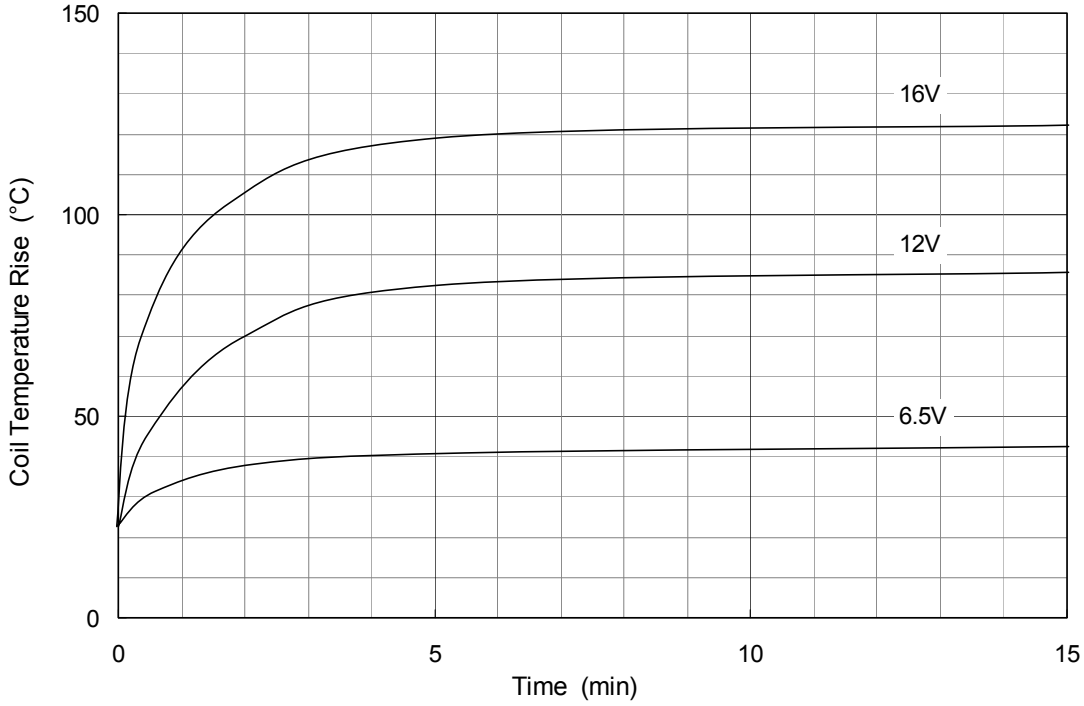
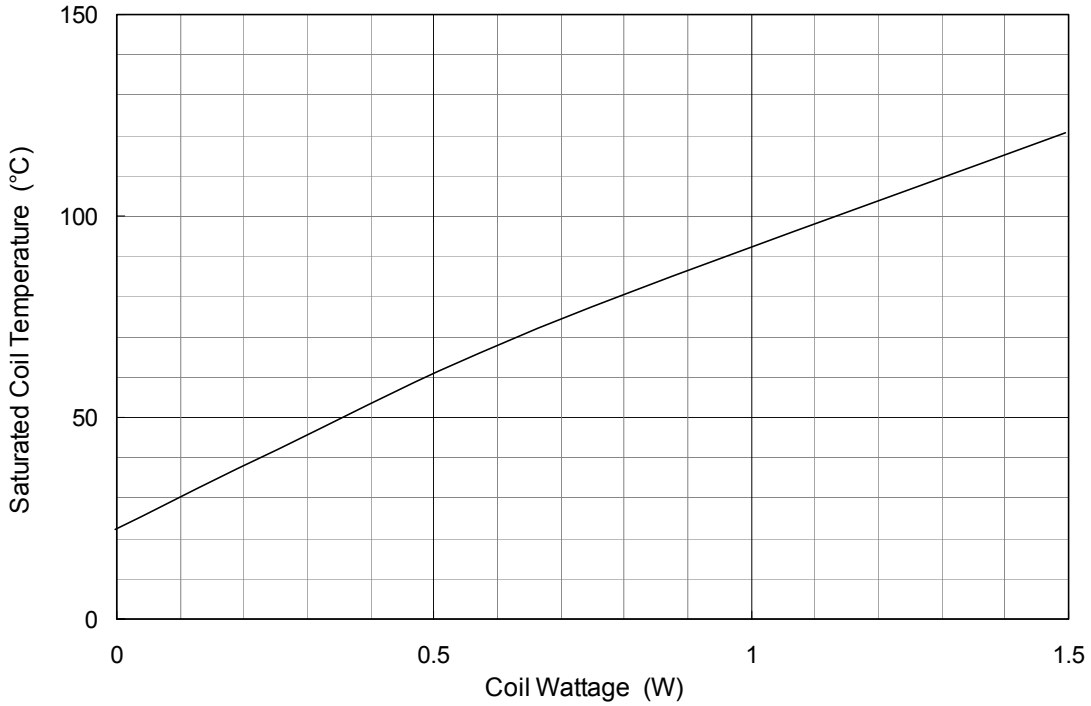
TECHNICAL DATA

Coil Temperature Rise





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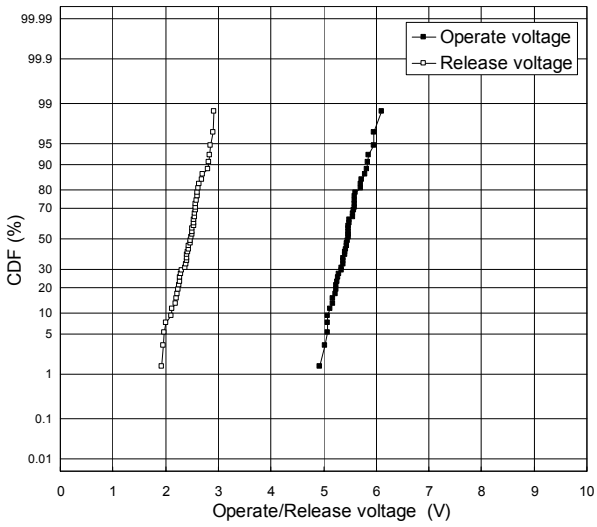
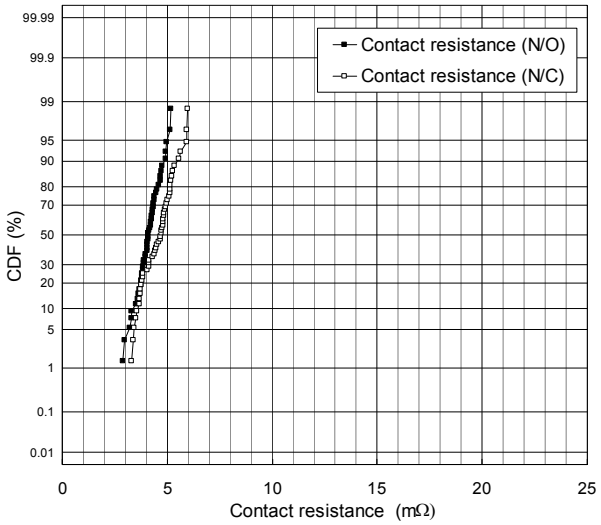
RELAY CHARACTERISTICS DISTRIBUTION (INITIAL, n = 25 pcs., at 20°C)

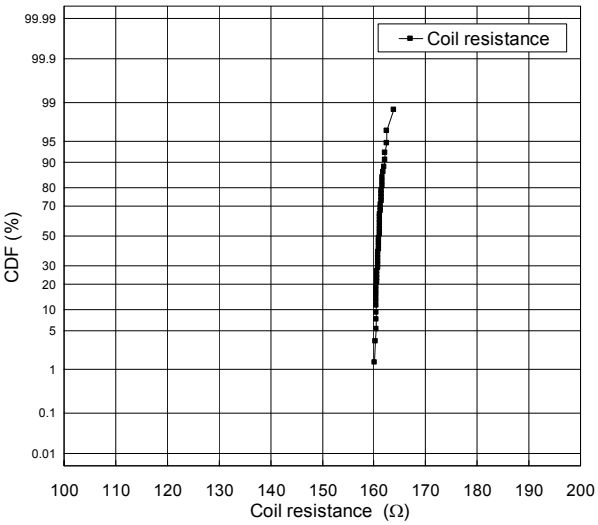
Operate/Release Voltage



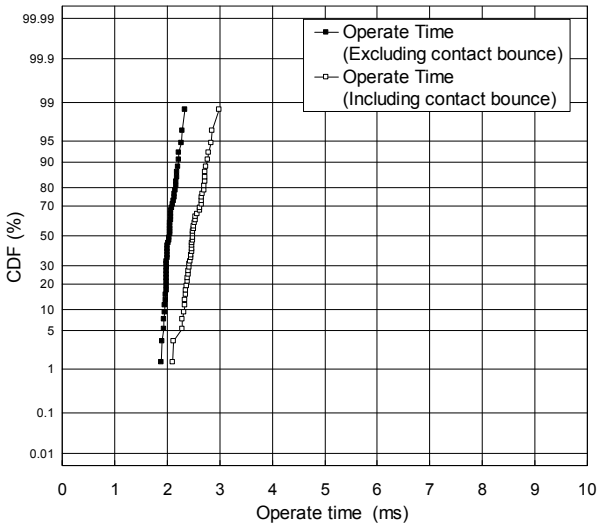
Contact Resistance



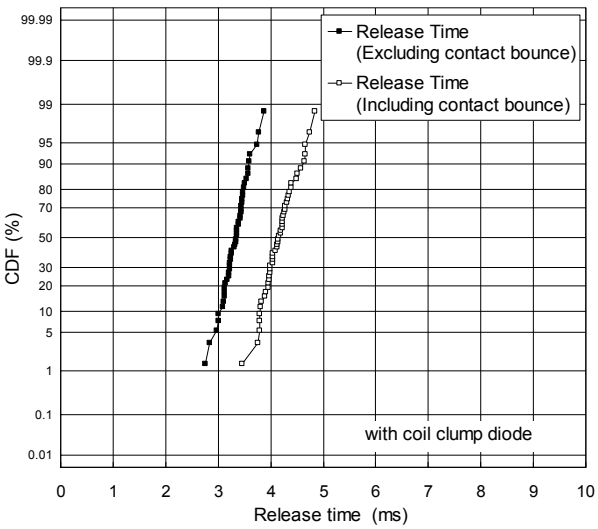
Coil Resistance



Operate Time



Release Time



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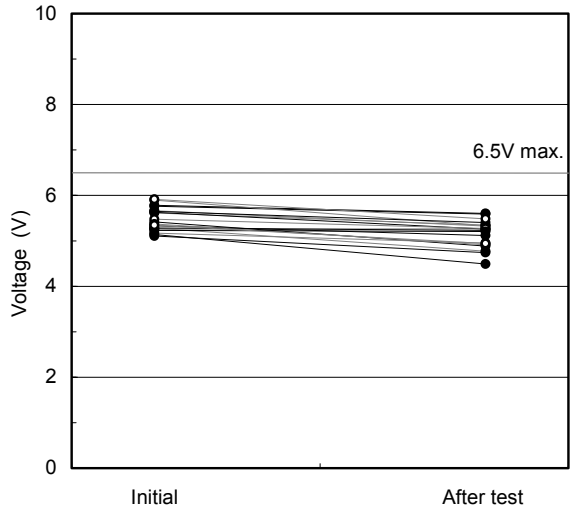
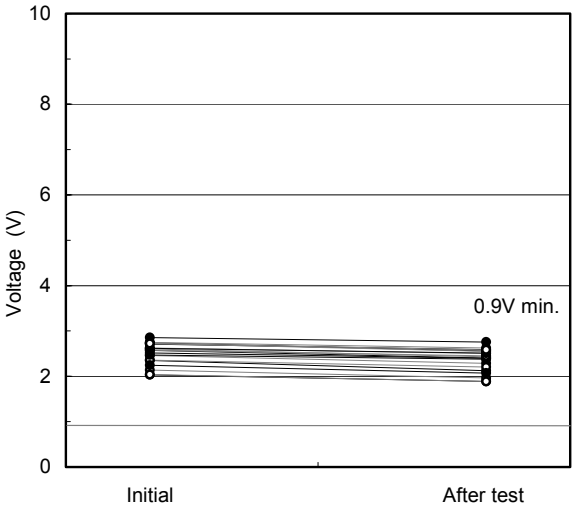
ELECTRICAL LIFE TEST (14Vdc-25A, P/W motor, Lock)

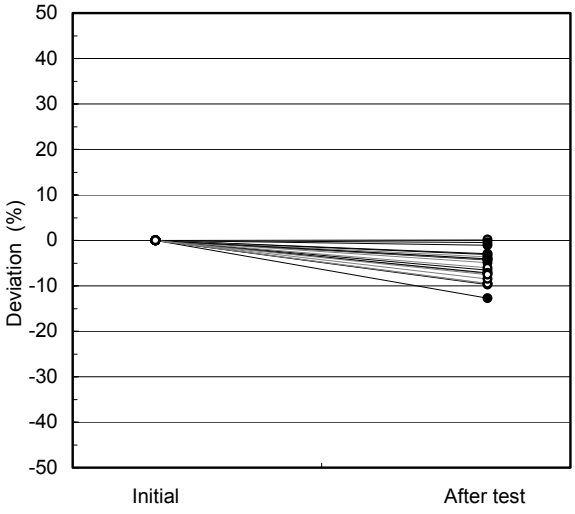
Test items	Test conditions	Samples
1. Operate voltage 2. Release voltage 3. Contact resistance 4. Coil resistance 5. Operate time 6. Release time (with coil clump diode)	Temperature : 20°C Frequency : 0.2s ON, 9.8s OFF, 0.1Hz Contact load : 14Vdc-25A, P/W motor, Lock Number of operations : 100 x 10^3	EX2-2U1S 10 pcs



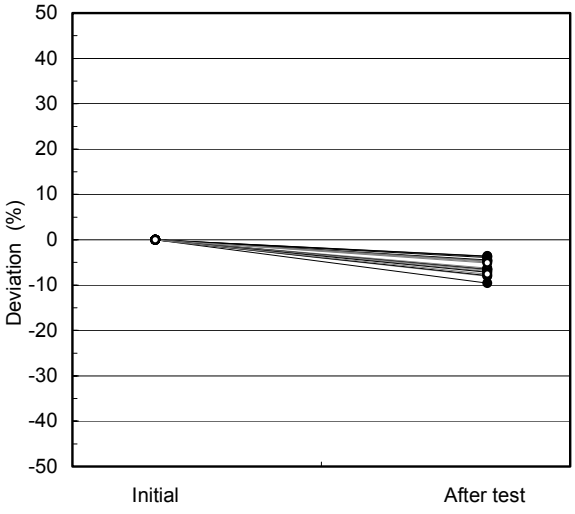
Operate voltage



Release voltage



Operate voltage



Release voltage

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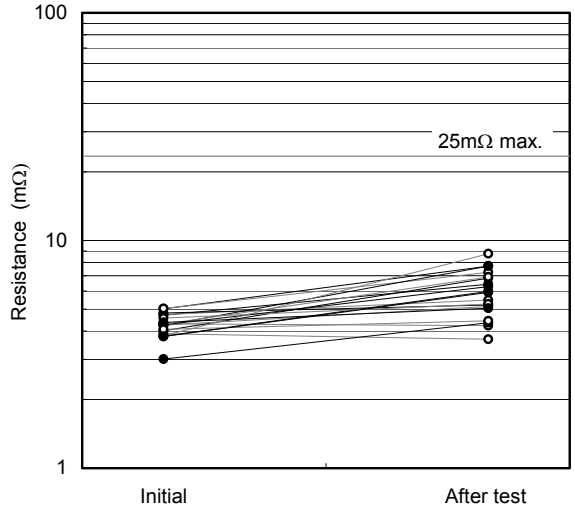
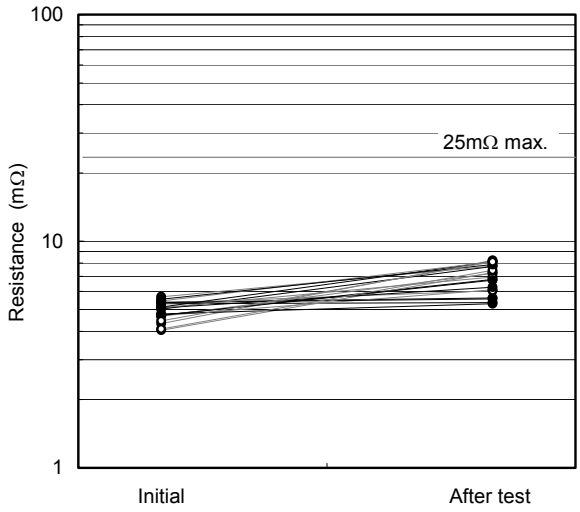
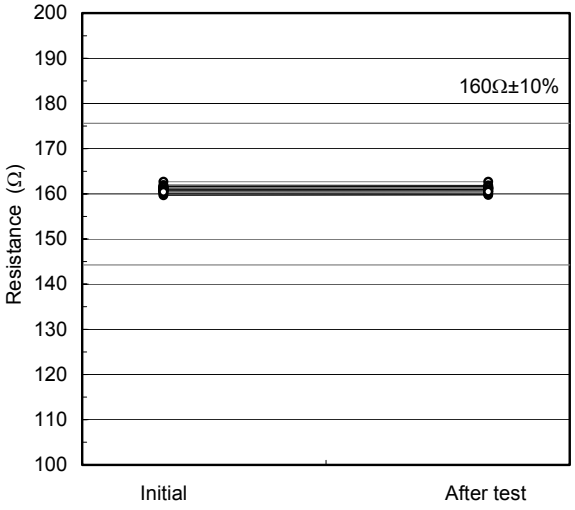


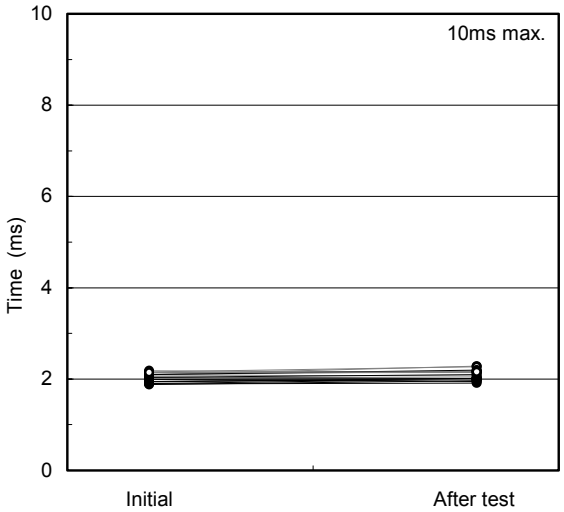
Contact resistance (N/O)



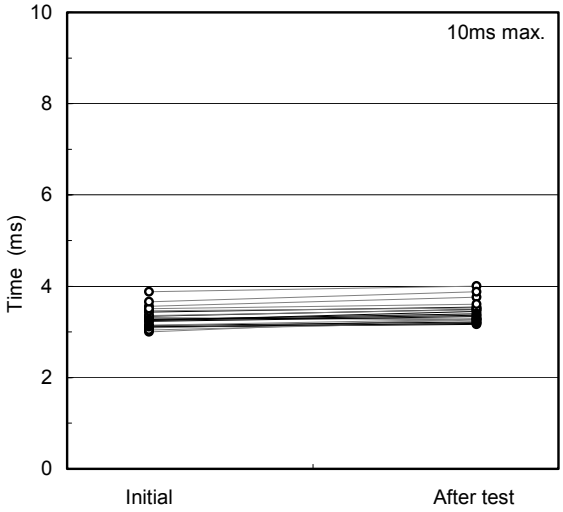
Contact resistance (N/C)



Coil resistance



Operate time



Release time