

DESCRIPTION

The new NEC ET2/ET1 series is PC-board mount type automotive relay suitable for various motor and heater control applications that require a high quality and performance. The ET2/ET1 series is the relay that succeeds fundamental structure and performance of the NEC EP2/EP1 series that has the high share with a motor control usage of the automobile of the world. Besides the ET2/ET1 series is succeeding in about 50% of miniaturization in comparison with the EP2/EP1 series.

FEATURES

- PC board mounting
- Approx. 50% relay volume of EP2/EP1
- Approx. 75% relay space of EP2/EP1
- Approx. 70% relay height of EP2/EP1
- Approx. 50% relay weight of EP2/EP1

APPLICATIONS

- Motor control
- Heater control
- Solenoid control



Type ET2



Type ET1

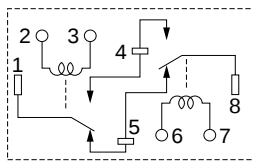
For Proper Use of Miniature Relays**DO NOT EXCEED MAXIMUM RATING.**

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.

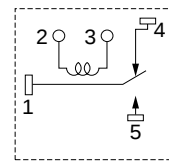
READ CAUTIONS IN THE SELECTION GUIDE.

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

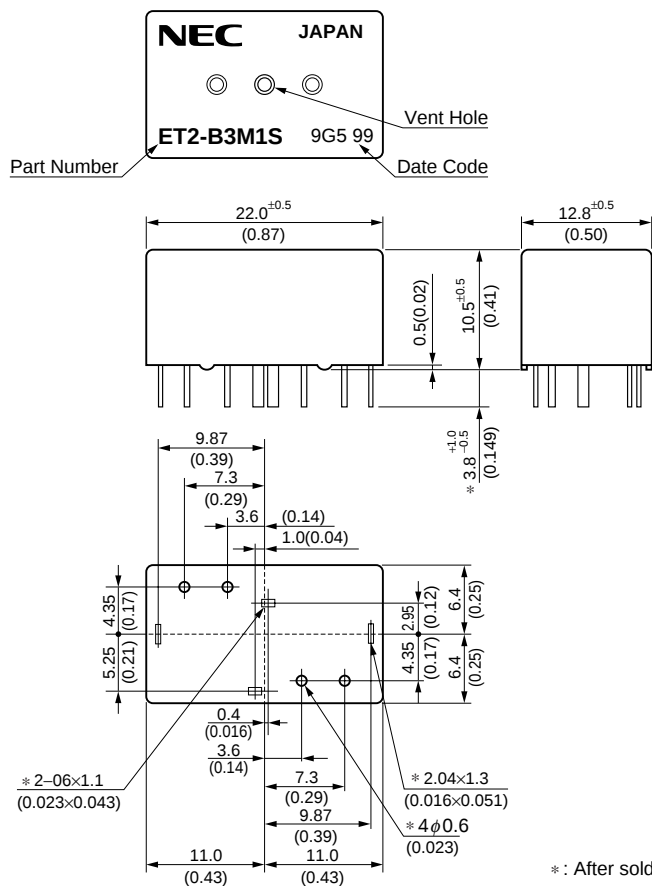
ET2



ET1

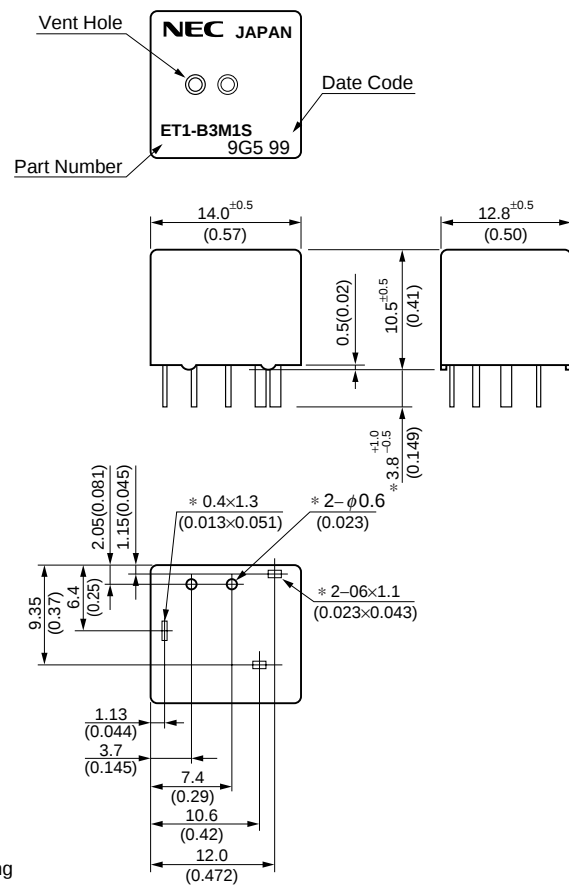


ET2

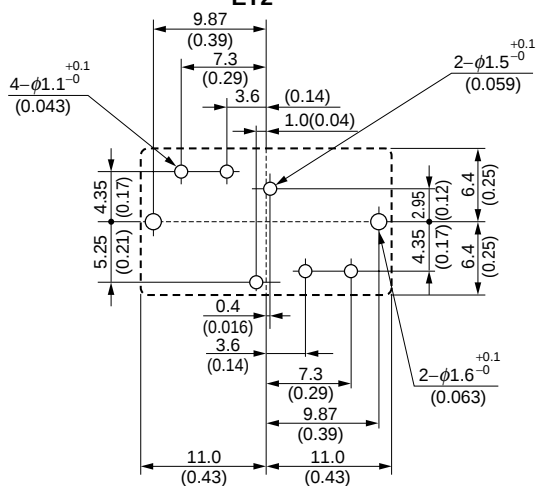


* : After soldering

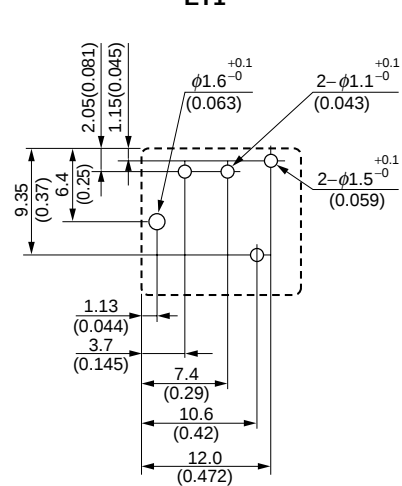
ET1



ET2



ET1



SPECIFICATIONS

(at 20 °C)

Items			Types	Twin	Single		
				ET2-B3M1/ET2-B3M1S	ET1-B3M1/ET1-B3M1S		
Contact Form				1 Form c × 2 (H Bridge)		1 Form c	
Contact Rating		Max. Switching Voltage		16 V dc			
		Max. Switching Current		25 A (at 16 Vdc)			
		Min. Switching Current		1 A (at 5 Vdc)			
		Contact Resistance		4 mΩ typical (measured at 7 A) Initial			
Contact Material				Silver oxide complex alloy			
Operate Time (Excluding Bounce)				2.5 ms typical (at Nominal Voltage) Initial			
Release Time (Excluding Bounce)				3 ms typical (at Nominal Voltage, with diode) Initial			
Nominal Operate Power				640 mW			
Insulation Resistance				100 MΩ at 500 V dc			
Breakdown Voltage		Between Open Contact		500 V ac min. (for 1 minute)			
		Between Coil and Contact		500 V ac min. (for 1 minute)			
Shock Resistance		Misoperation		98 m/s ² (10 G)			
		Destructive Failure		980 m/s ² (100 G)			
Vibration Resistance		Misoperation		10 ~ 300 Hz, 43 m/s ² (4.4 G)			
		Destructive Failure		10 ~ 500 Hz, 43 m/s ² (4.4 G) 200 hour			
Ambient Temperature				-40 to +85 °C (-40 to +185 °F)			
Coil Temperature Rise				70 °C (158 °F)/W			
Life Expectancy	Mechanical		1 × 10 ⁶ operations				
	Electrical	Power Window Motor (14 V, 20 A, Locked)		100 × 10 ³ operations			
		Power Window Motor (14 V, 20 A /3 A, Unlocked)		100 × 10 ³ operations			
Weight				Approx. 7.5 g (0.26 oz)		Approx. 4.5 g (0.16 oz)	

COIL RATING

SEALED TYPE

(at 20 °C)

Contact Form		Part Number	Nominal Voltage (Vdc)	Coil Resistance (Ω±10%)	Must Operate Voltage (Vdc)	Must Release Voltage (Vdc)
Twin	1 Form c × 2	ET2-B3M1S	12	225	6.5	0.9
Single	1 Form c	ET1-B3M1S				

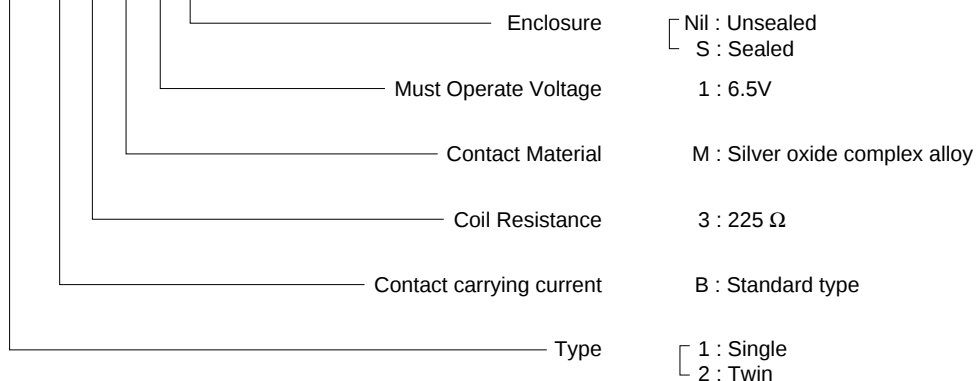
UNSEALED TYPE

(at 20 °C)

Contact Form		Part Number	Nominal Voltage (Vdc)	Coil Resistance (Ω±10%)	Must Operate Voltage (Vdc)	Must Release Voltage (Vdc)
Twin	1 Form c × 2	ET2-B3M1	12	225	6.5	0.9
Single	1 Form c	ET1-B3M1				

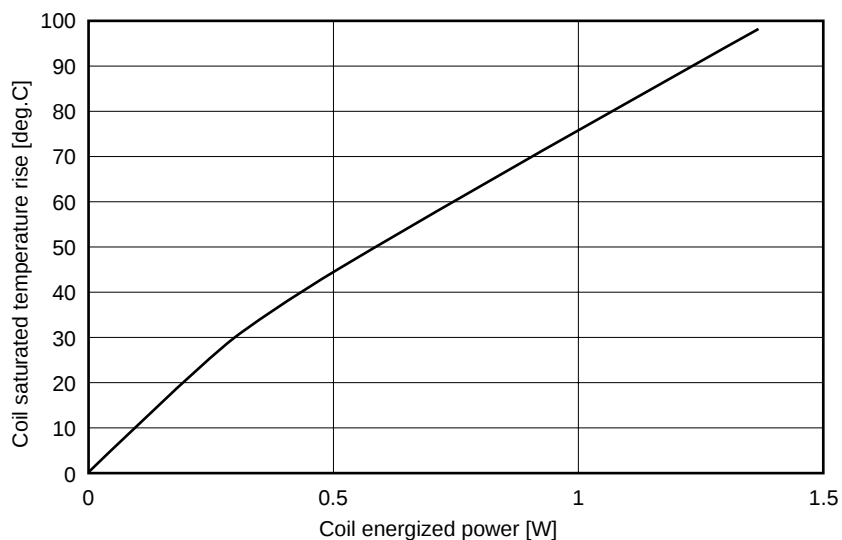
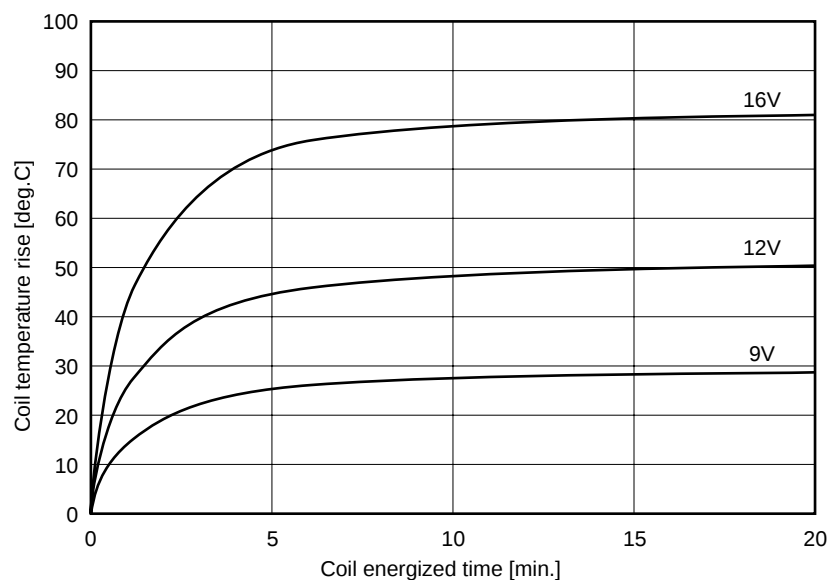
NUMBERING SYSTEM

ET2-B3M1S

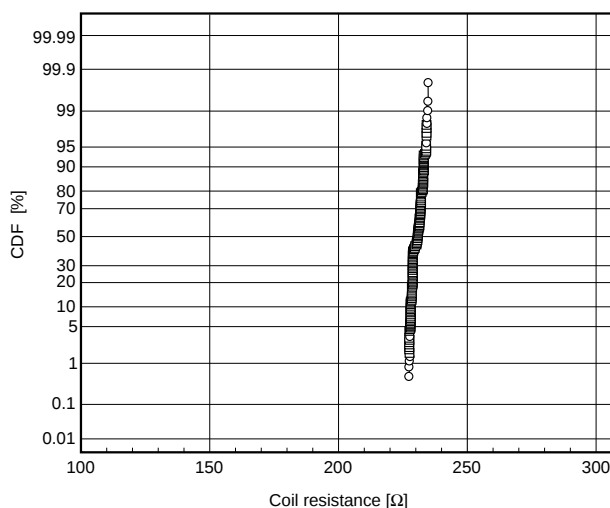
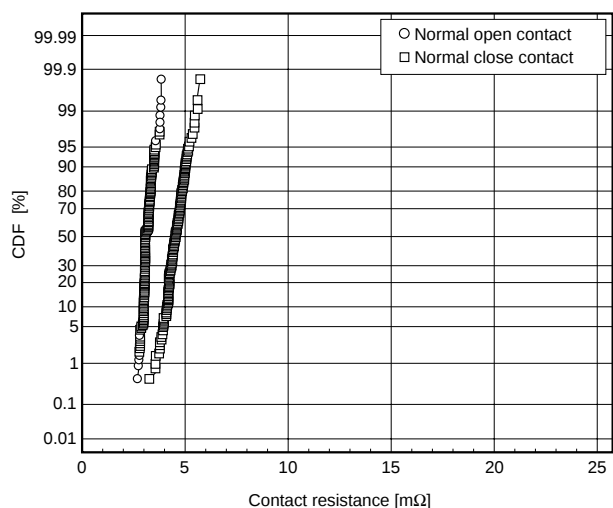
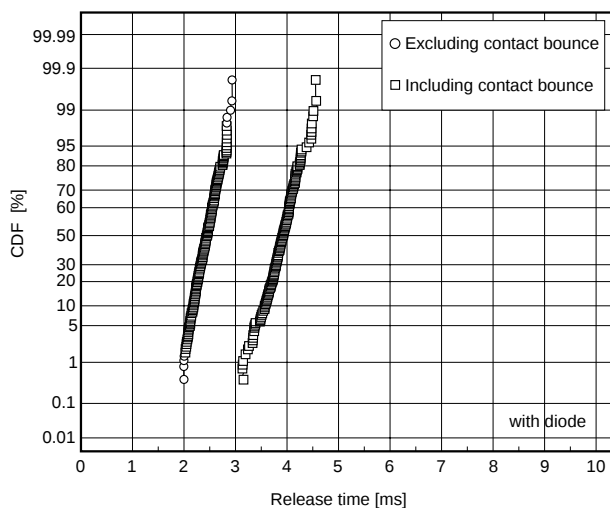
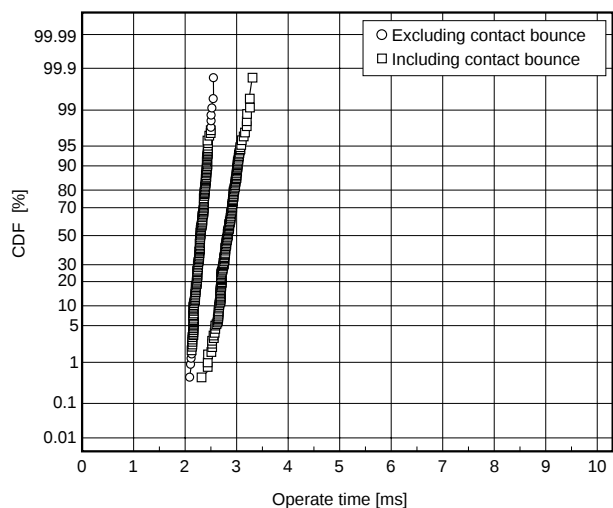
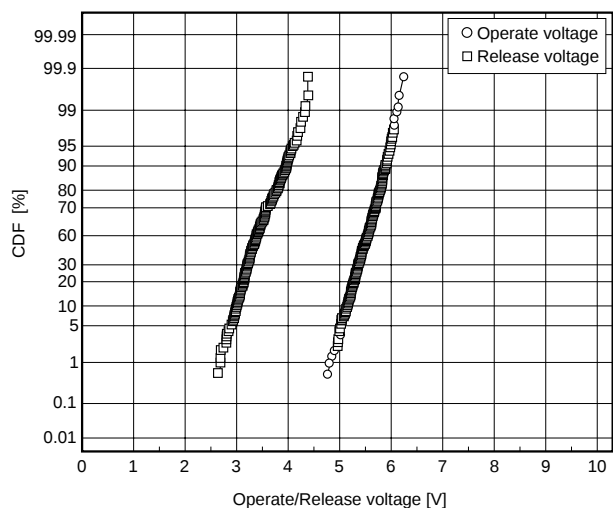


COIL TEMPERATURE RISE

Test piece : ET1-B3M1S



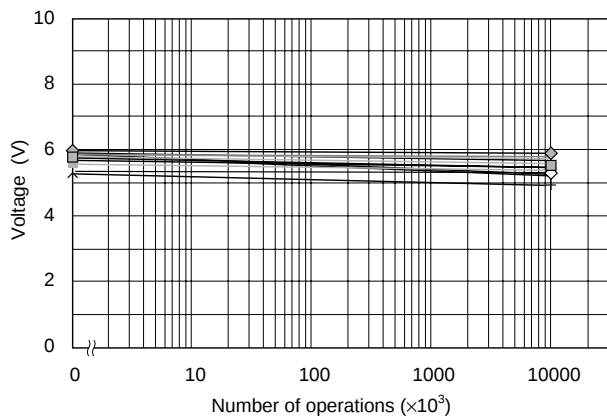
RELAY CHARACTERISTICS DISTRIBUTION (INITIAL)



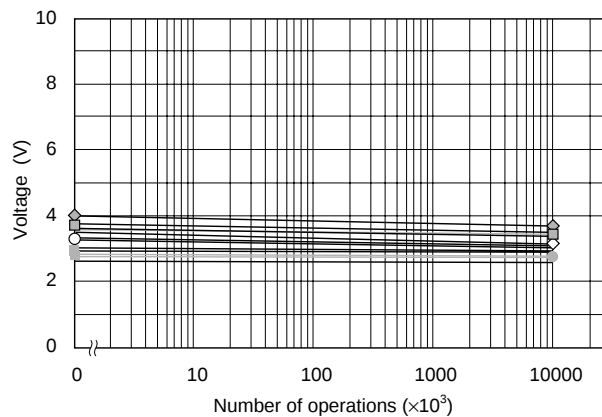
DURABILITY LIFE

Mechanical life test

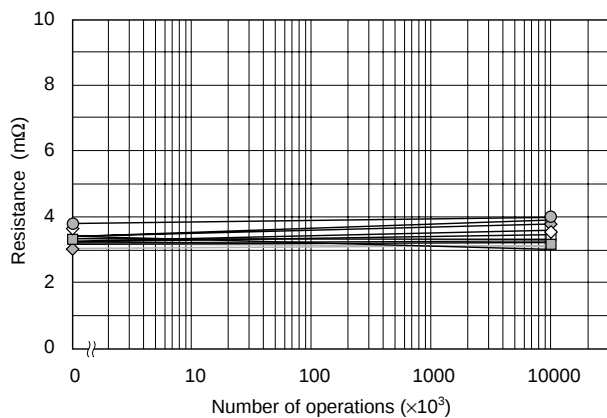
- Ambient temperature : 20 °C
- Frequency : 15 Hz (50 % duty)
- Contact load : No load
- Number of operations : 10×10^6
- Samples : ET2-B3M1S 10 pieces



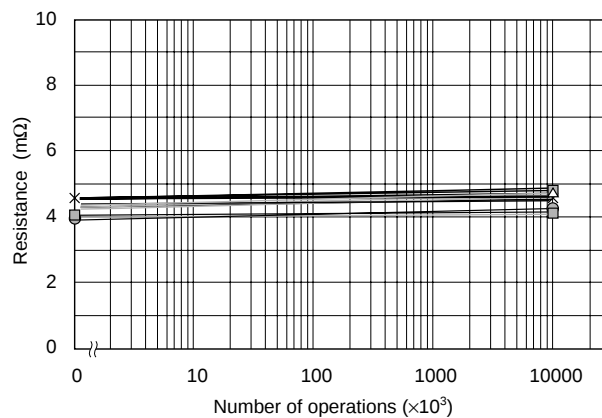
Operate Voltage



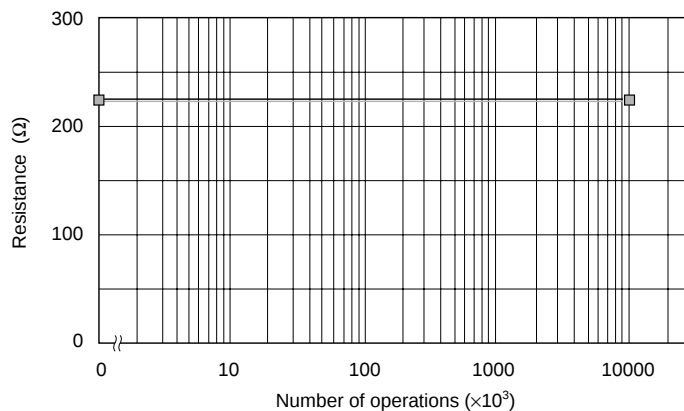
Release Voltage



Contact Resistance (N.O contact)



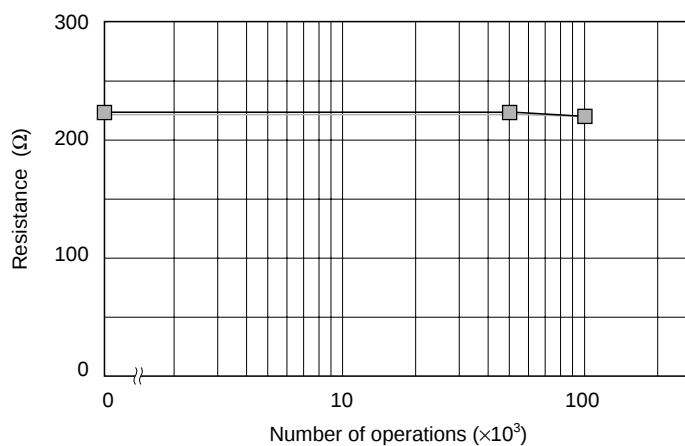
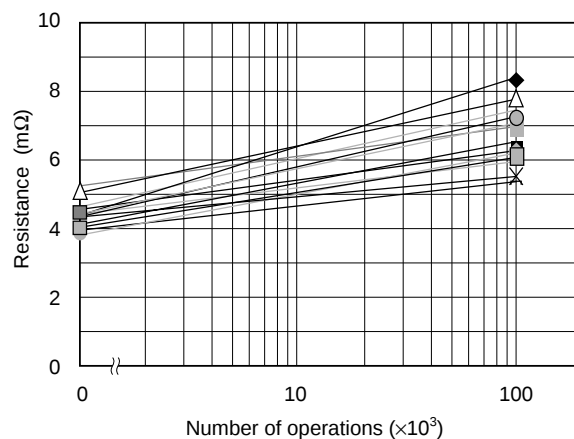
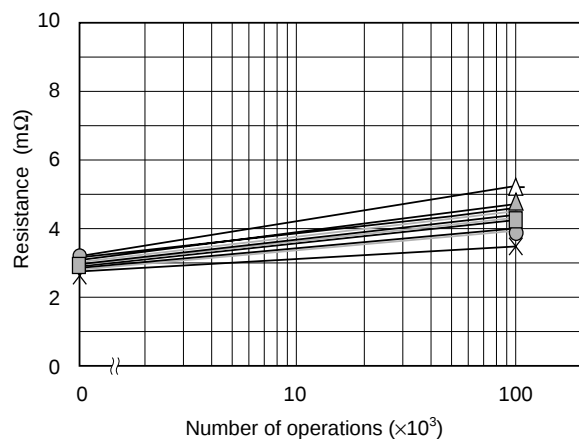
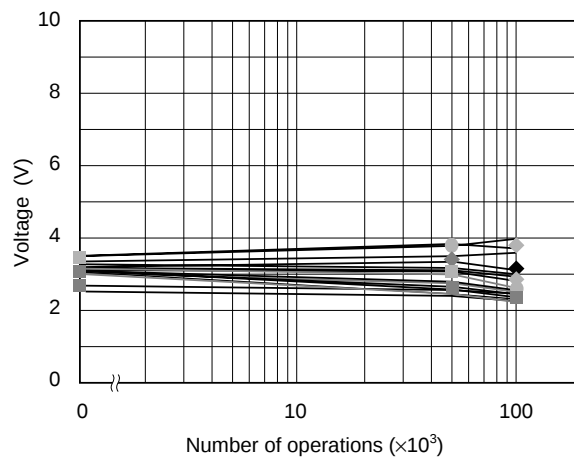
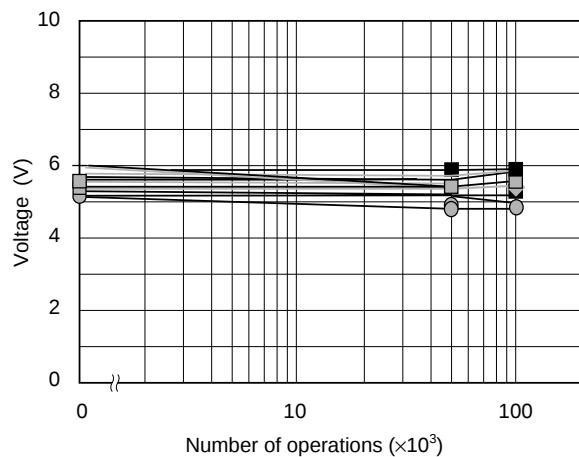
Contact Resistance (N.C contact)



Coil resistance

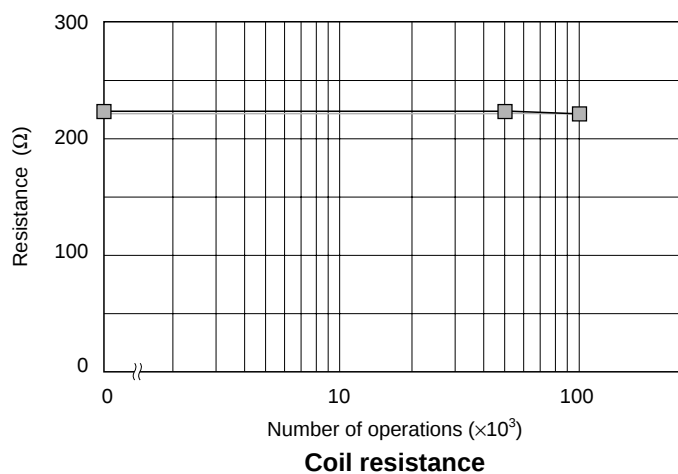
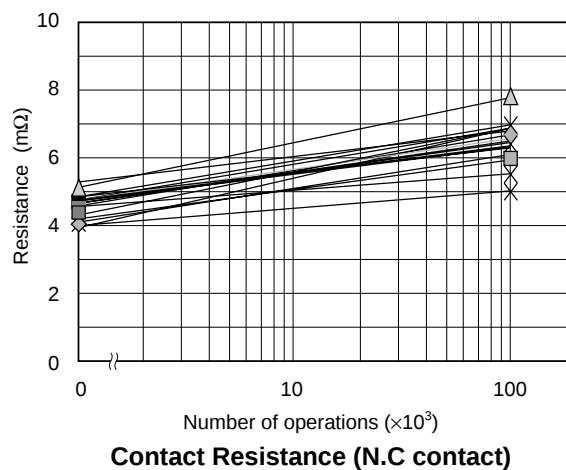
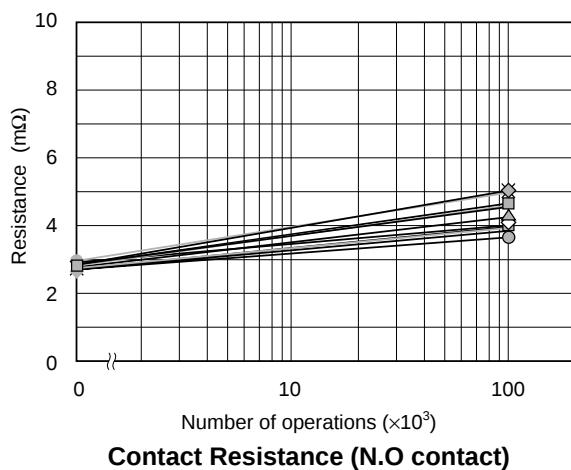
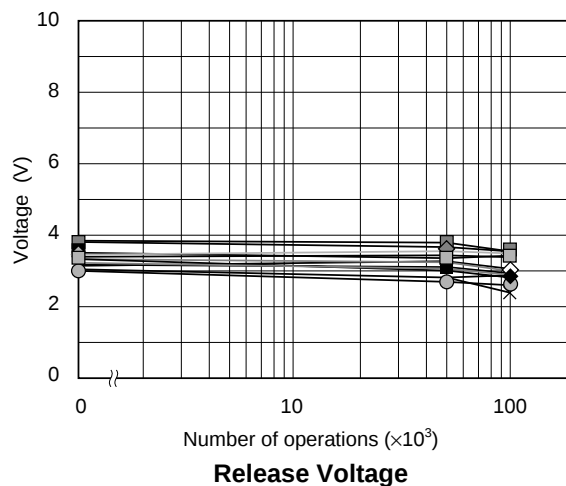
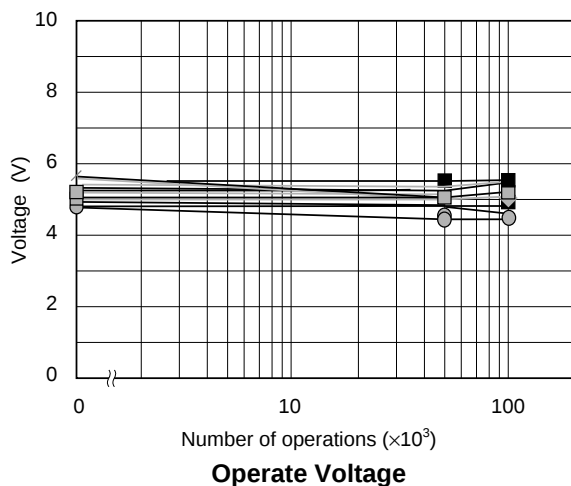
Electrical life test (1)

- Ambient temperature : 20 °C
- Frequency : 0.2s ON/9.8s OFF, 0.1 Hz
- Contact load : 14 VDC, 20A, Power window motor load, locked
- Number of operations : 100×10^3
- Samples : ET2-B3M1S 10 pieces



Electrical life test (2)

- Ambient temperature : 20 °C
- Frequency : 0.2s ON/9.8s OFF, 0.1 Hz
- Contact load : 14 VDC, 20A, Power window motor load, Unlocked
- Number of operations : 100×10^3
- Samples : ET2-B3M1S 10 pieces



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Anti-radioactive design is not implemented in this product.