

ET2F/ET1F SERIES

HIGH HEAT RESISTIVITY

DESCRIPTION

The new NEXEM ET2F/ET1F series is PC-board mount type automotive relay suitable for various motor and heater control applications that require a high quality and performance. ET2F is a twin relay type and ET1F is a single relay type. The operate temperature range for ET2F/ET1F series is -40°C through $+125^{\circ}\text{C}$.

By this high heat resistivity, the contact carrying current of ET2F/ET1F series at 25°C increases 1.3 to 1.4 times compared with that of ET2/ET1 series.

FEATURES

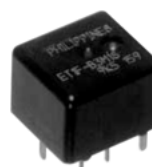
- Operating ambient temperature up to $+125^{\circ}\text{C}$ (ET2/ET1 : $+85^{\circ}\text{C}$)
- Suitable for motor and solenoid reversible control
- High performance and productivity by unique structure
- Flux tight housing

APPLICATIONS

- Motor control
- Heater control
- Solenoid control



Type ET2F



Type ET1F

For Proper Use of Miniature Relays

DO NOT EXCEED MAXIMUM RATINGS.

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

READ CAUTIONS IN THE SELECTION GUIDE.

Read the cautions described in EM Devices' "Miniature Relays" before dose designing your relays applications.

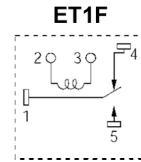
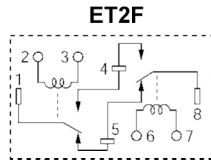
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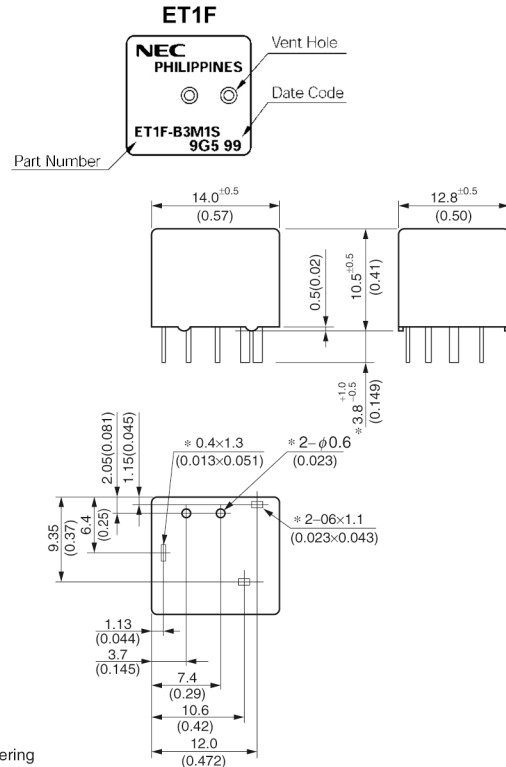
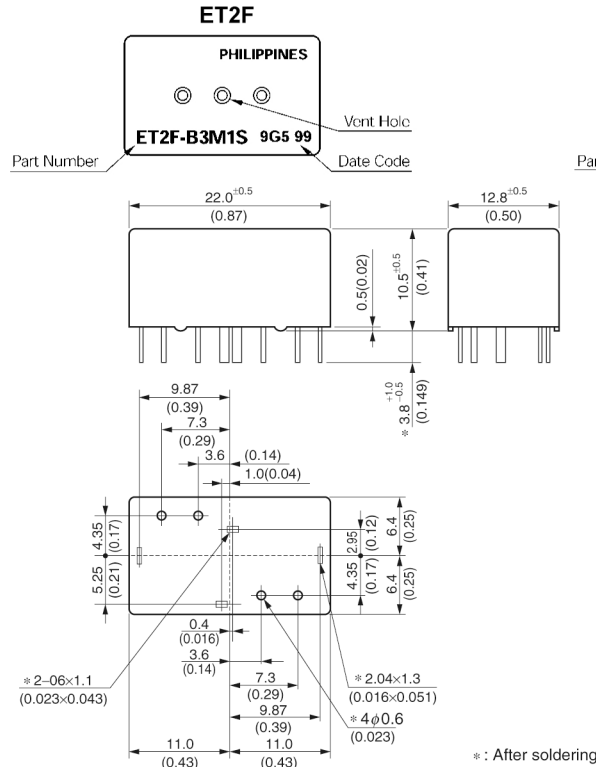


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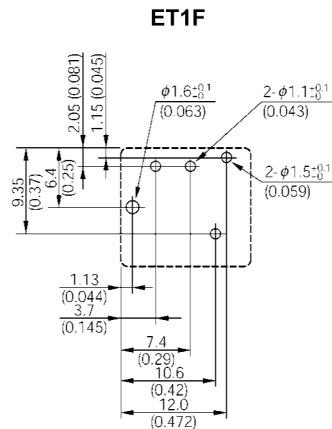
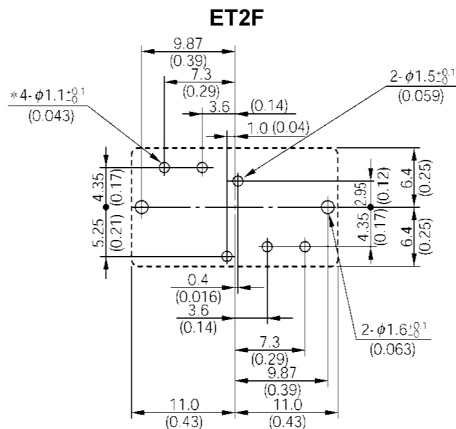
SCHEMATIC (BOTTOM VIEW)



DIMENSIONS mm (inch)



PCB PAD LAYOUT mm (inch) (BOTTOM VIEW)



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SPECIFICATIONS

(at 20°C)

Items		Type	Twin		Single					
			ET2F-B3M1/ET2F-B3M1S		ET1F-B3M1/ET1F-B3M1S					
Contact Form			1 Form c × 2 (H Bridge)		1 Form c					
Contact Ratings			Max. Switching Voltage				16 V dc			
			Max. Switching Current				25 A (at 16 Vdc)			
			Max. Carrying Current				25 A (2 minutes 12 Vdc at 125°C) 30 A (2 minutes 12 Vdc at 85°C) 35 A (2 minutes 12 Vdc at 20°C)		30 A (2 minutes 12 Vdc at 125°C) 35 A (2 minutes 12 Vdc at 85°C) 40 A (2 minutes 12 Vdc at 20°C)	
							Min. Switching Current			
			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)							
Release Time (Excluding Bounce)			3 ms typical (at Nominal Voltage, with diode) Initial							
Nominal Operating Power			640 mW							
Insulation Resistance			100 MΩ at 500 Vdc							
Breakdown Voltage			Between Open Contacts		500 Vdc min. (for 1 minute)					
			Between Coil and Contacts		500 Vdc 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 to 300 Hz, 43 m/s ² (4.4 G)					
			Destructive Failure		10 to 500 Hz, 43 m/s ² (4.4 G) 200 hour					
Ambient Temperature			-40 to +125°C (-40 to +257°F)							
Coil Temperature Rise			70°C (158°F) / W (without contact carrying current)							
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	ET2F-B3M1S	12	225	6.5	0.9
Single	1 Form c	ET1F-B3M1S				

◆ **UNSEALED TYPE**

(at 20°C)

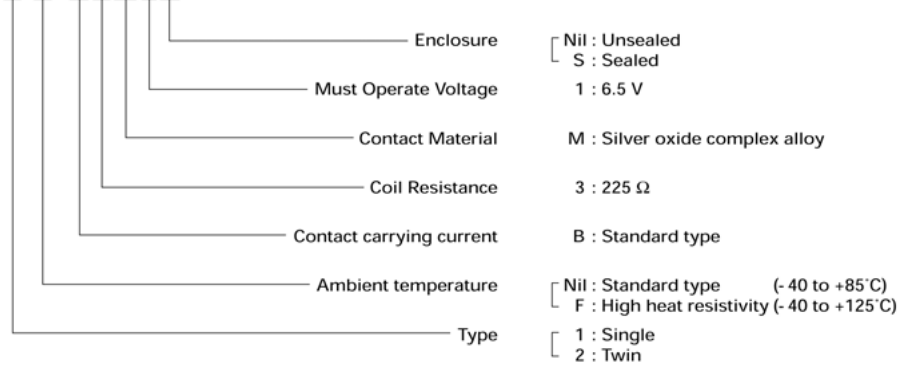
Contact Form		Part Number	Nominal Voltage (Vdc)	Coil Resistance (Ω ±10%)	Must Operate Voltage (Vdc)	Must Release Voltage (Vdc)
Twin	1 Form c × 2	ET2F-B3M1	12	225	6.5	0.9
Single	1 Form c	ET1F-B3M1				



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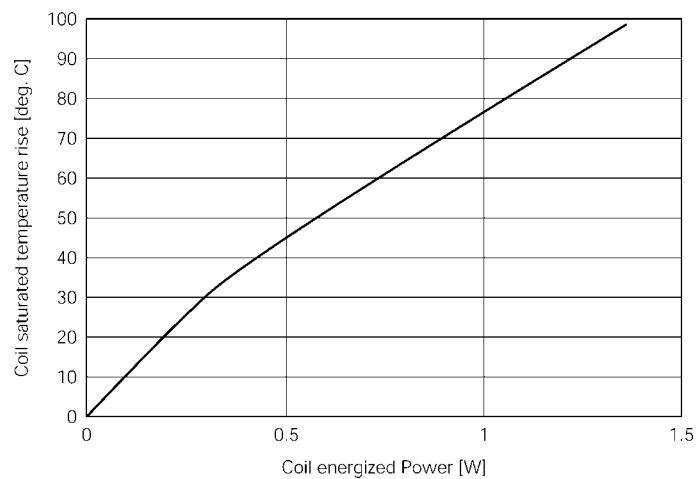
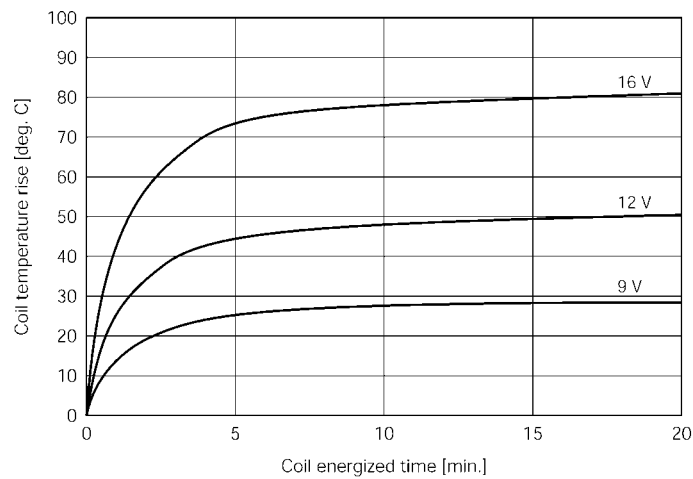
NUMBERING SYSTEM

ET2 F-B3M1S



COIL TEMPERATURE RISE

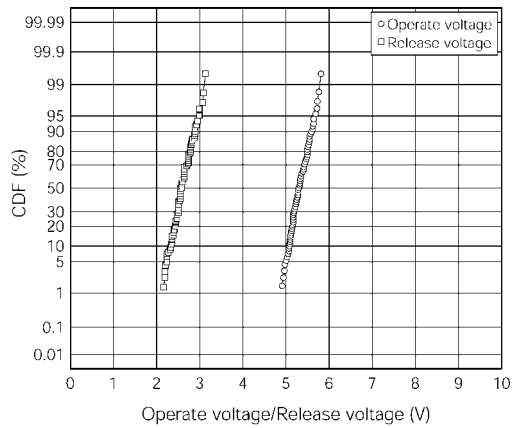
Test piece : ET1F-B3M1S



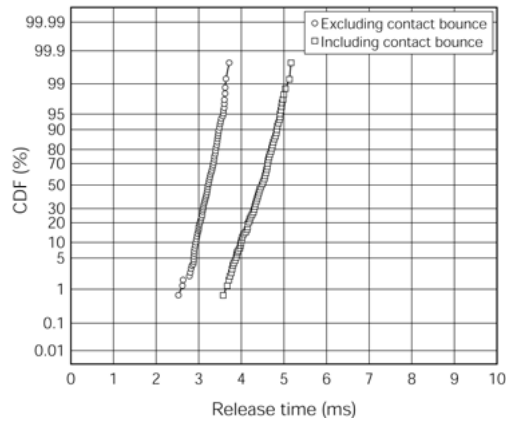
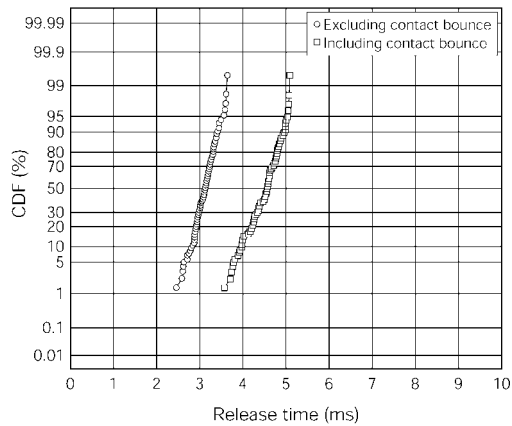
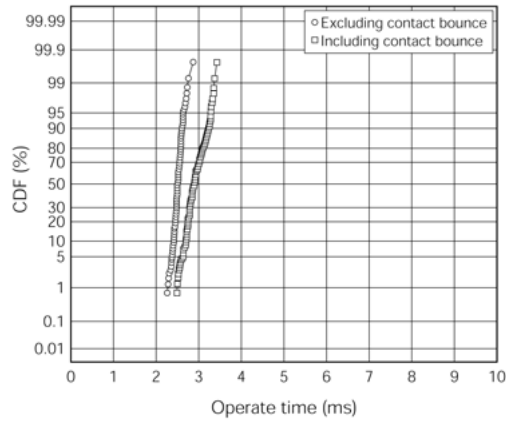
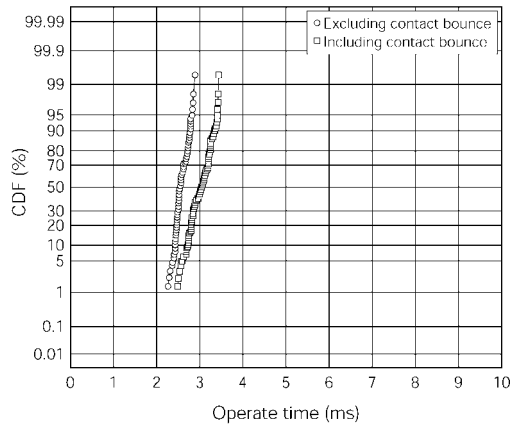
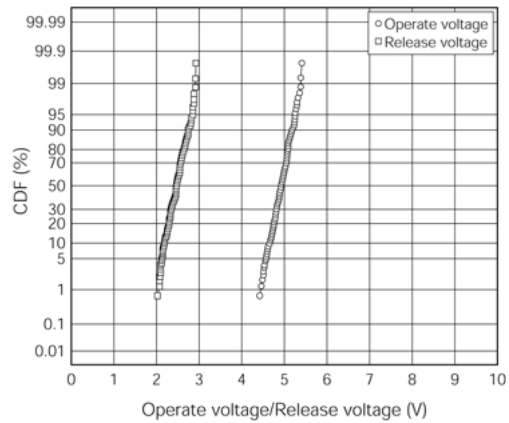
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RELAY CHARACTERISTICS DISTRIBUTION (INITIAL)

Samples : ET1F-B3M1S 100 pieces

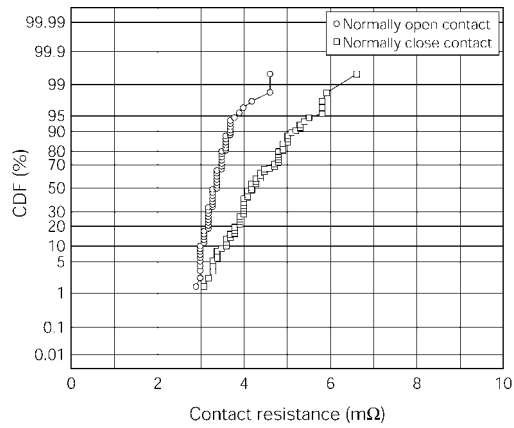


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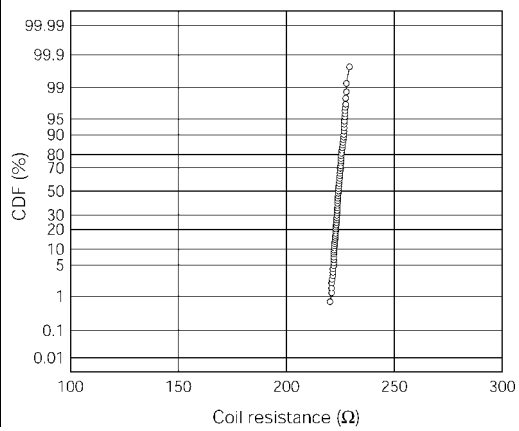
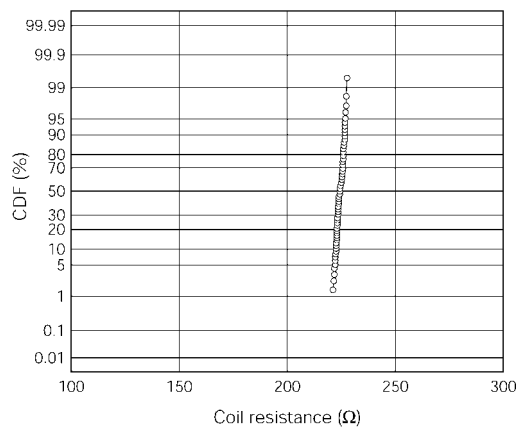
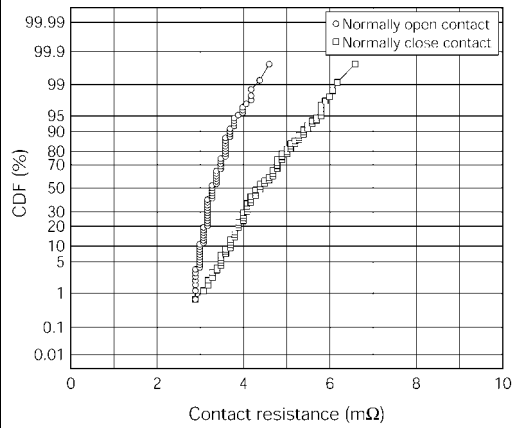


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Samples : ET1F-B3M1S 100 pieces



Samples : ET2F-B3M1S 100 pieces

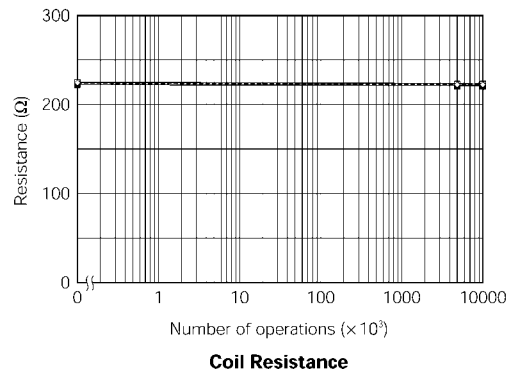
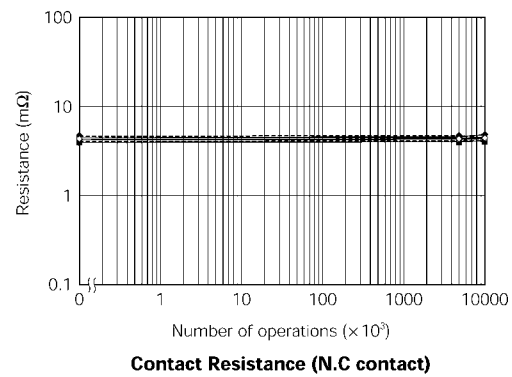
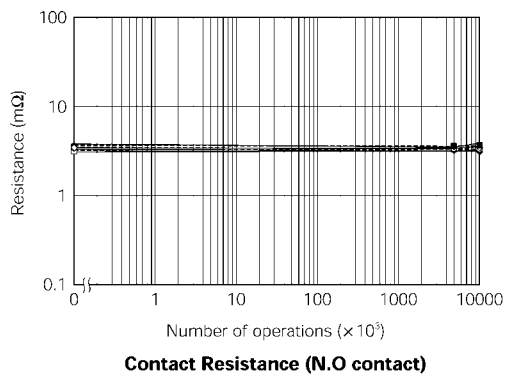
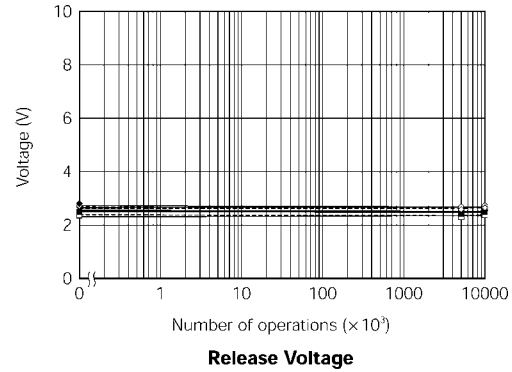
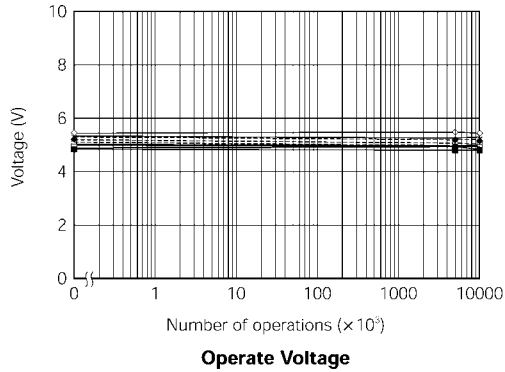


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DURABILITY LIFE

Mechanical life test

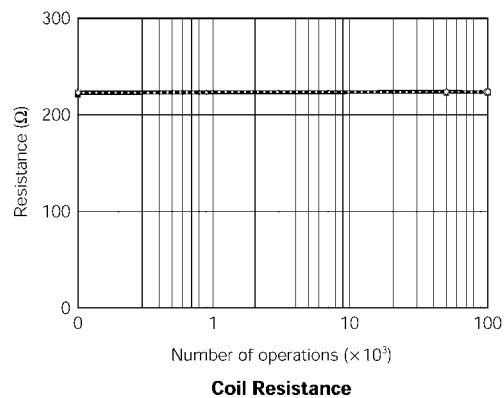
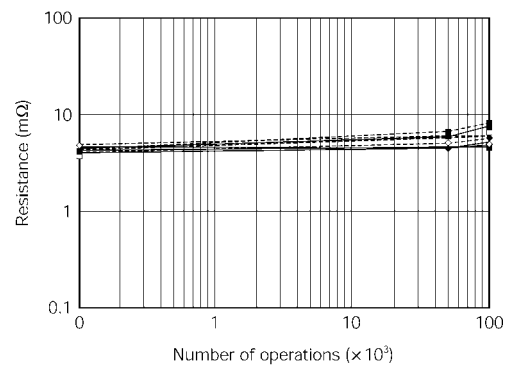
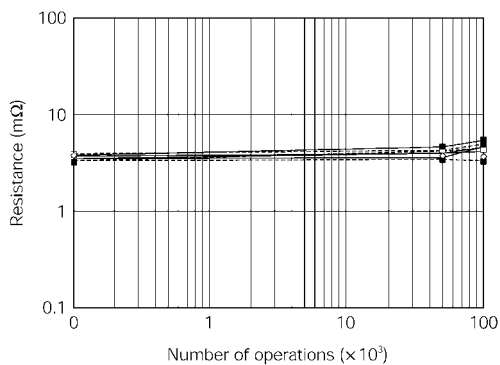
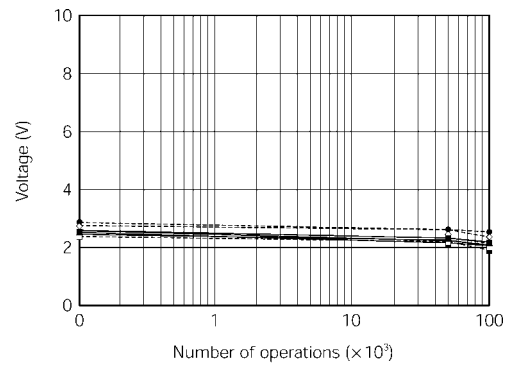
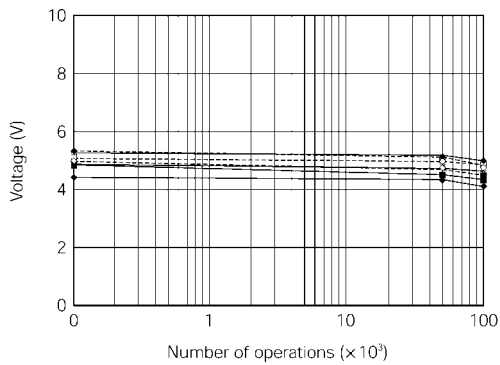
- Ambient temperature : 20°C
- Frequency : 15 Hz (50% duty)
- Contact load : No load
- Number of operations : 10×10^6
- Samples : ET2F-B3M1S 10 pieces



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Electrical life test (1)

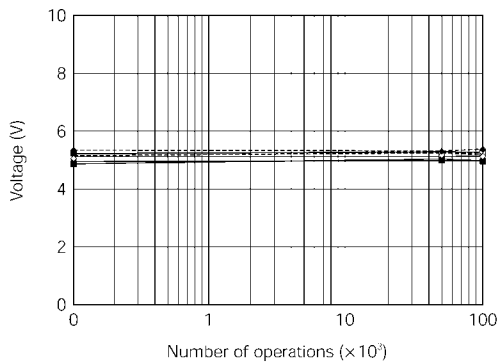
- Ambient temperature : 125°C
- Frequency : 0.2s ON/9.8s OFF, 0.1 Hz
- Contact load : 14 Vdc, 20 A, Power window motor load, locked
- Number of operations : 100×10^3
- Samples : ET2F-B3M1S 10 pieces



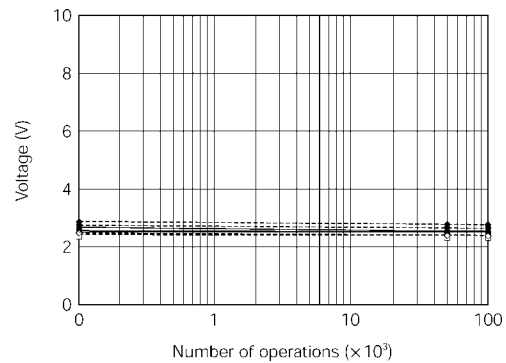
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Electrical life test (2)

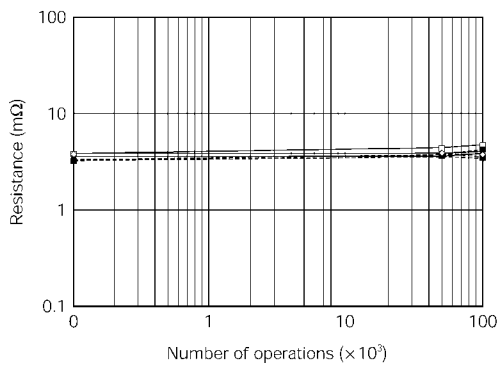
- Ambient temperature : 125°C
- Frequency : 0.2s ON/9.8s OFF, 0.1 Hz
- Contact load : 14 Vdc, 20 A, Power window motor load, unlocked
- Number of operations : 100×10^3
- Samples : ET2F-B3M1S 10 pieces



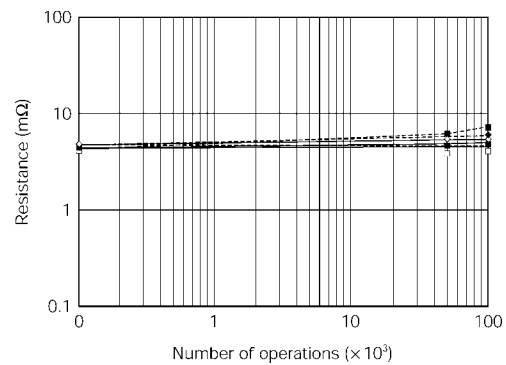
Operate Voltage



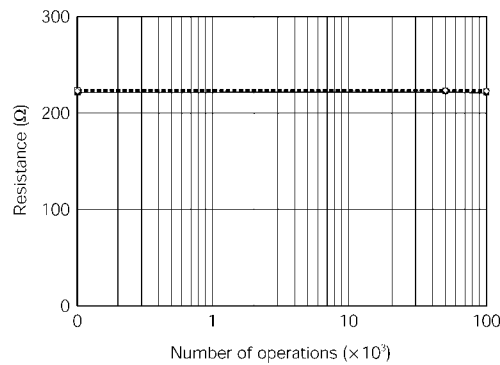
Release Voltage



Contact Resistance (N.O contact)



Contact Resistance (N.C contact)



Coil Resistance



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