

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.

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

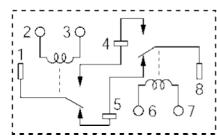
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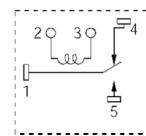
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SCHEMATIC (BOTTOM VIEW)

ET2F

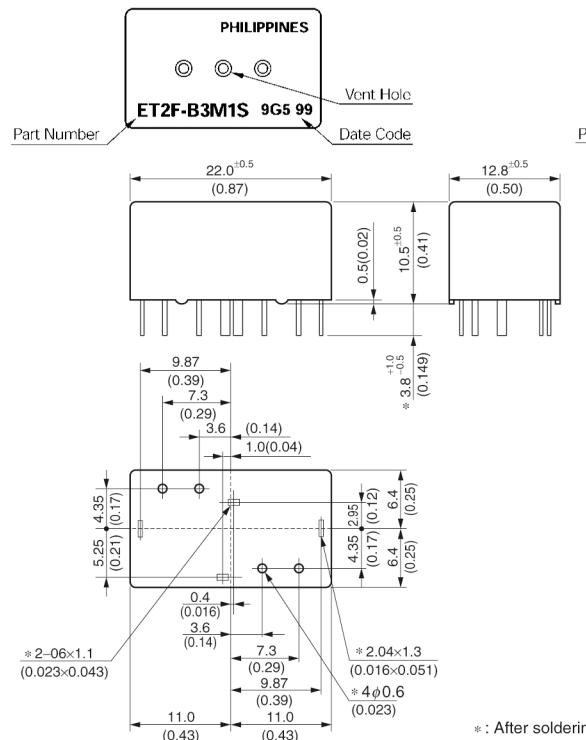


ET1F

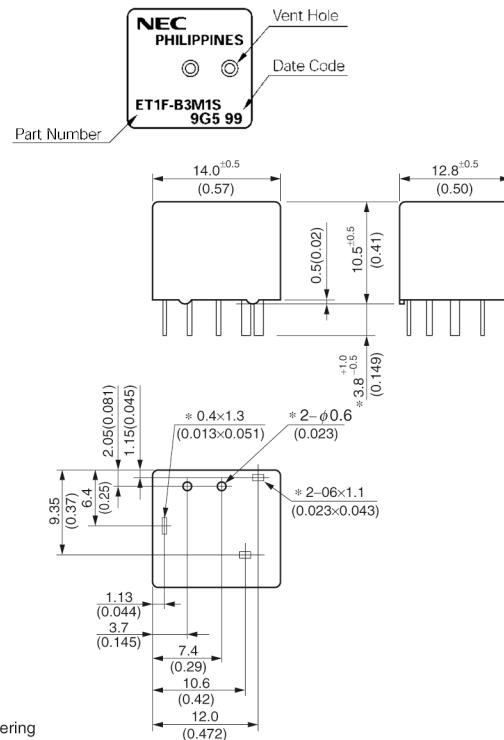


DIMENSIONS mm (inch)

ET2F

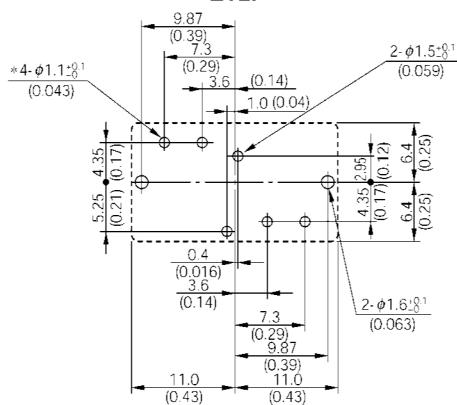


ET1F

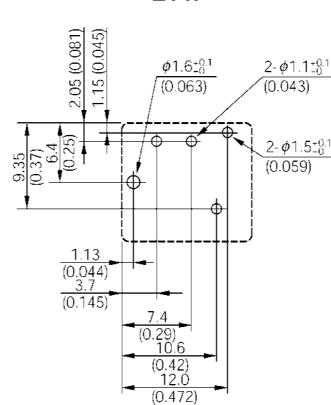


PCB PAD LAYOUT mm (inch) (BOTTOM VIEW)

ET2F



ET1F



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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	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)				
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)

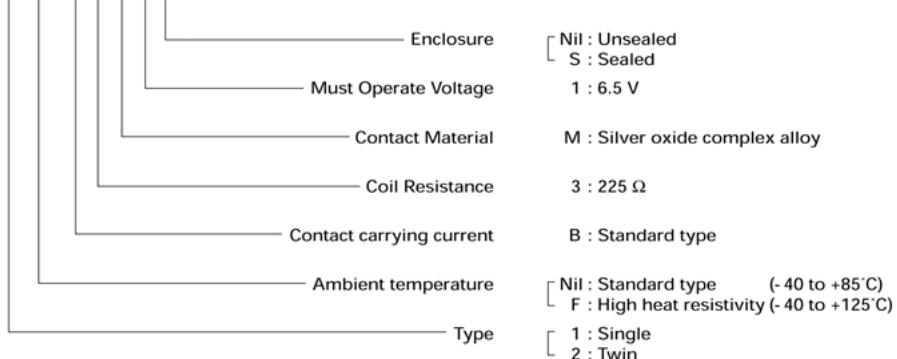
Contact Form		Part Number	Nominal Voltage (Vdc)	Coil Resistance (Ω ±10%)	Must Operate Voltage (Vdc)	Must Release Voltage (Vdc)
Twin	1 Form c × 2	ET2F-B3M1	12	225	6.5	0.9
Single	1 Form c	ET1F-B3M1				



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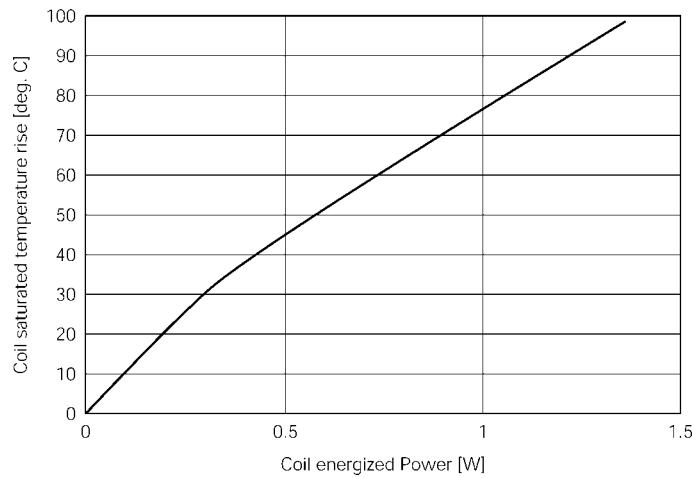
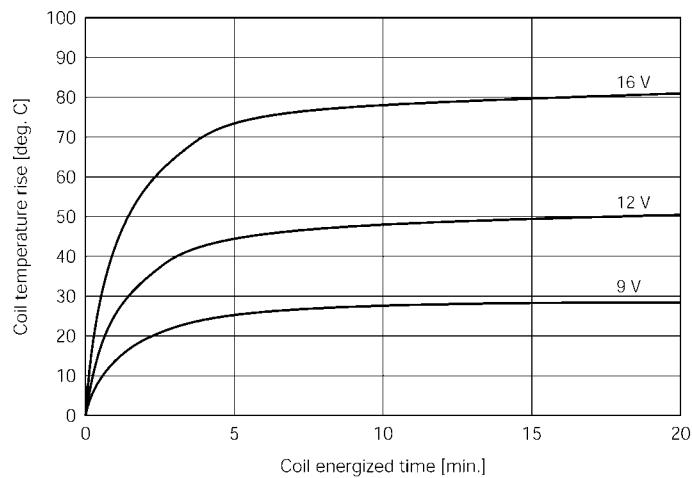
NUMBERING SYSTEM

ET2 F-B3M1S



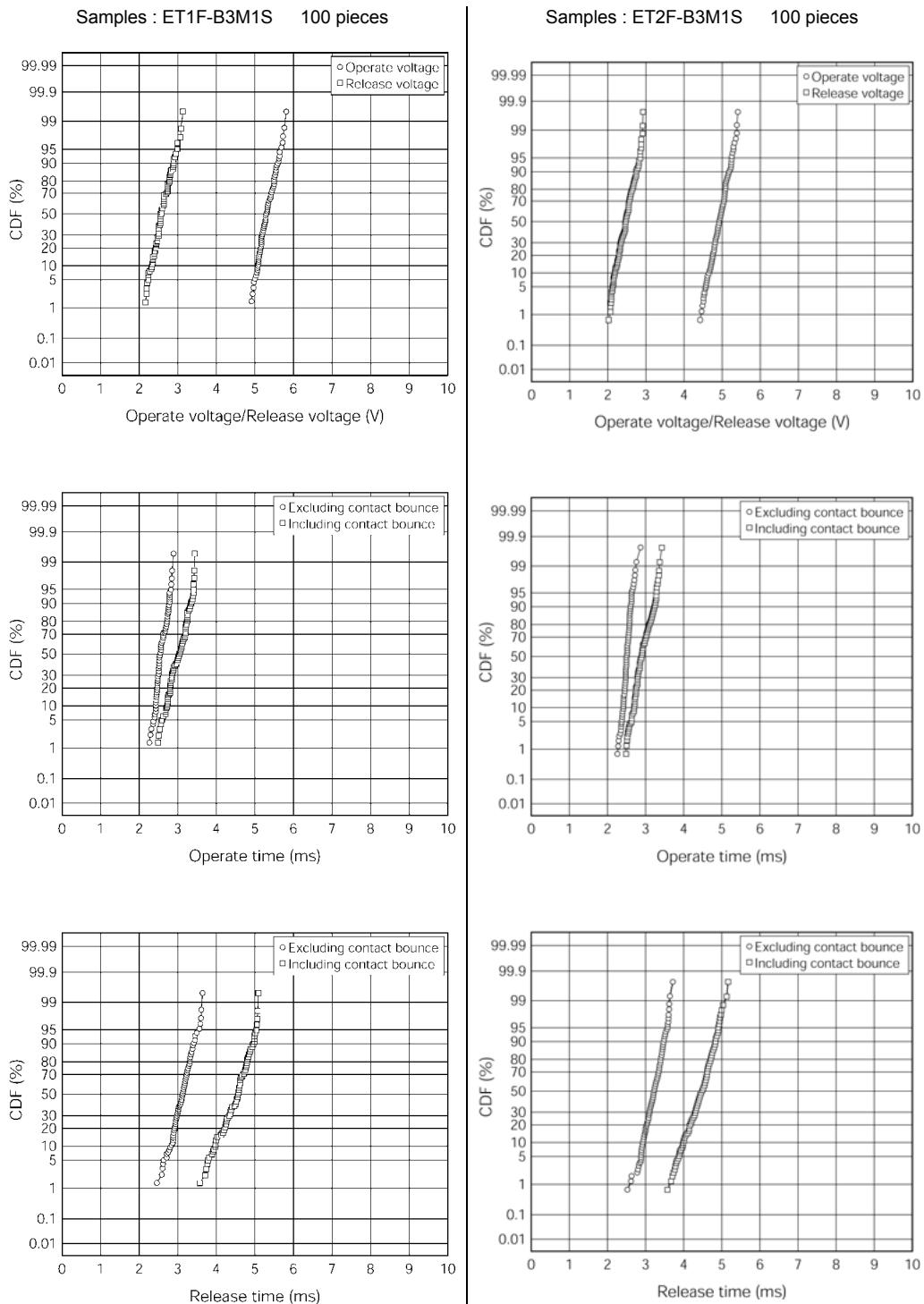
COIL TEMPERATURE RISE

Test piece : ET1F-B3M1S

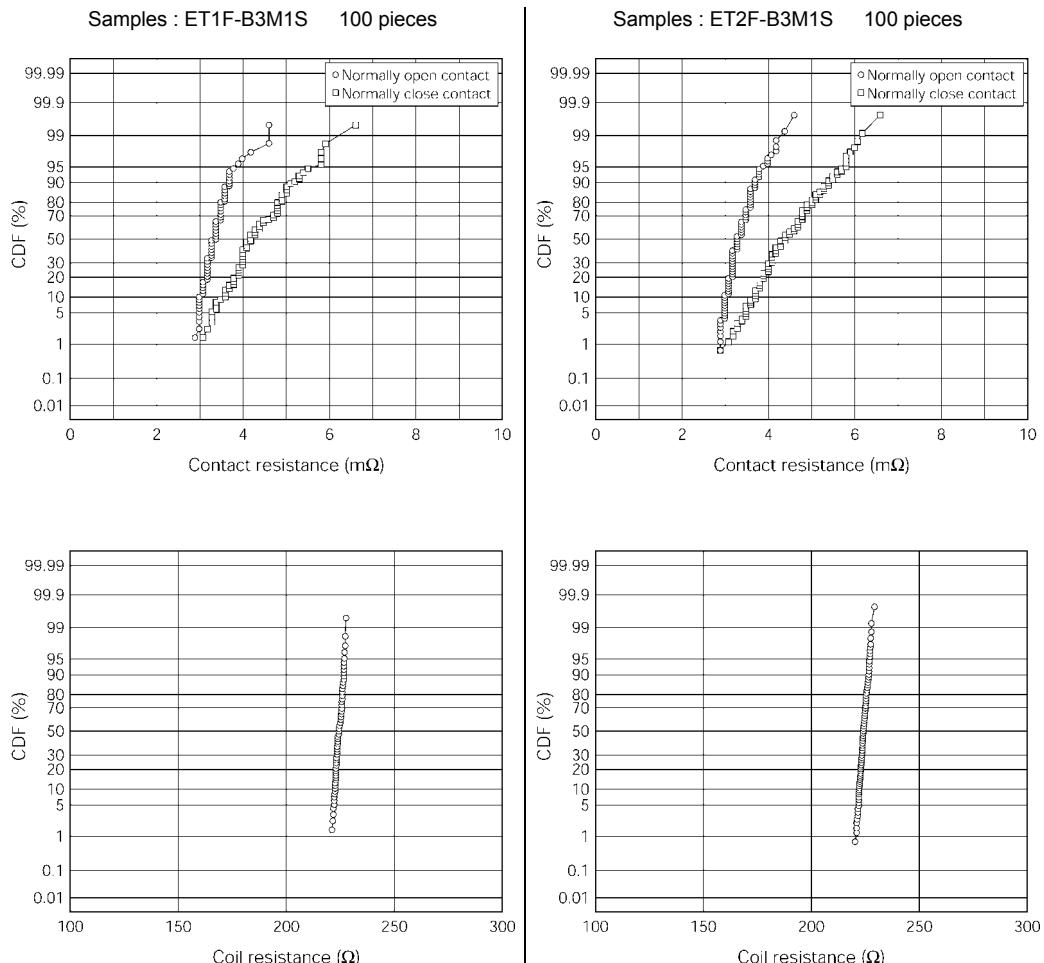


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RELAY CHARACTERISTICS DISTRIBUTION (INITIAL)



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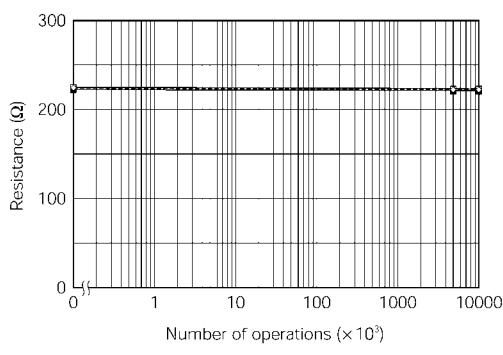
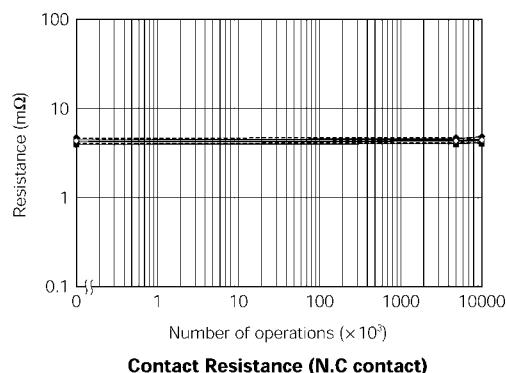
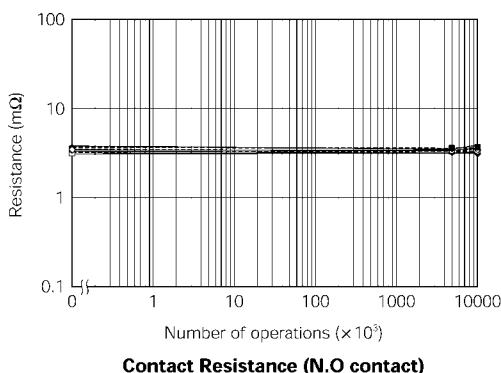
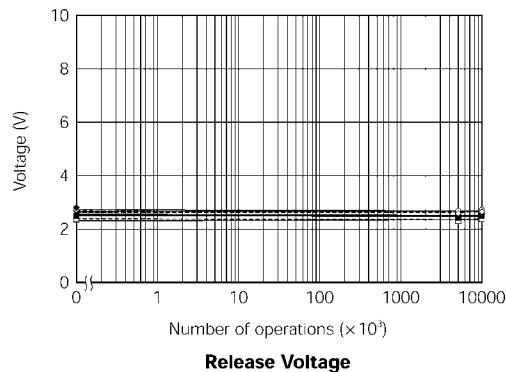
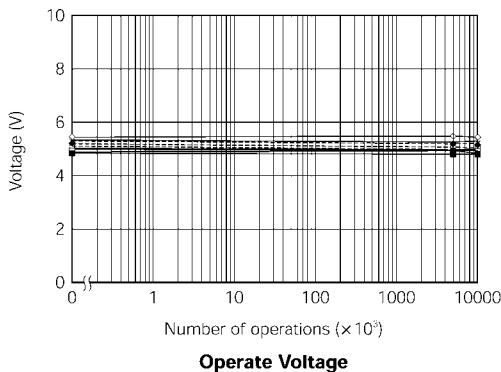


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DURABILITY LIFE

Mechanical life test

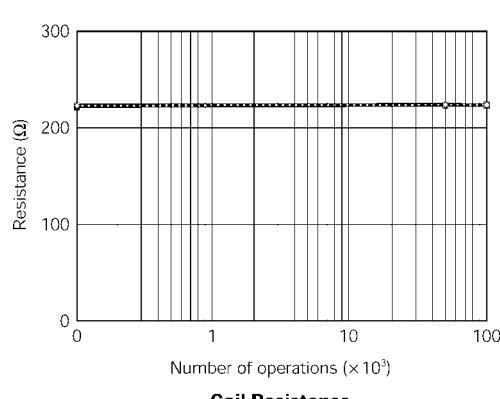
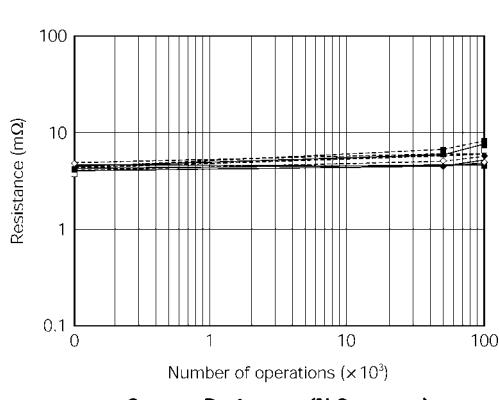
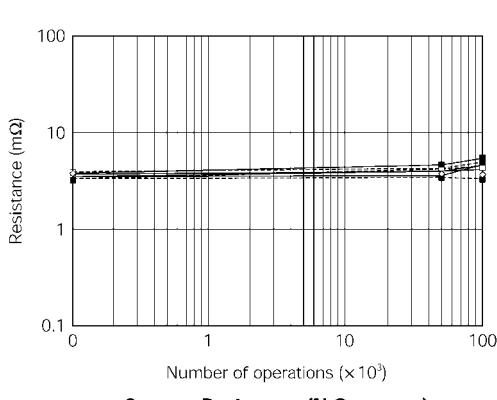
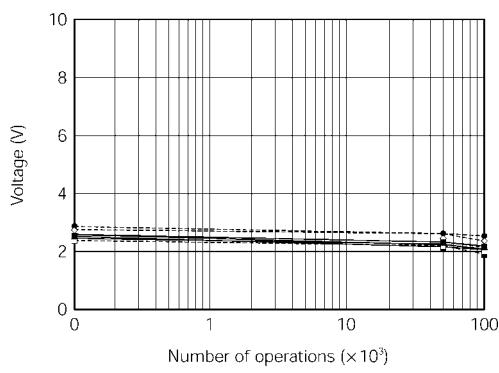
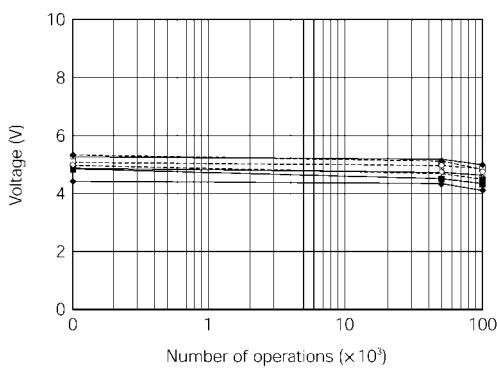
- Ambient temperature : 20°C
- Frequency : 15 Hz (50% duty)
- Contact load : No load
- Number of operations : 10×10^6
- Samples : ET2F-B3M1S 10 pieces



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Electrical life test (1)

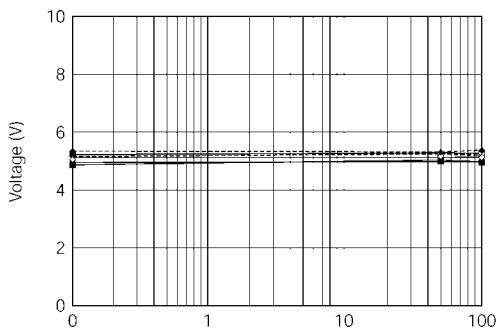
- Ambient temperature : 125°C
- Frequency : 0.2s ON/9.8s OFF, 0.1 Hz
- Contact load : 14 Vdc, 20 A, Power window motor load, locked
- Number of operations : 100×10^3
- Samples : ET2F-B3M1S 10 pieces



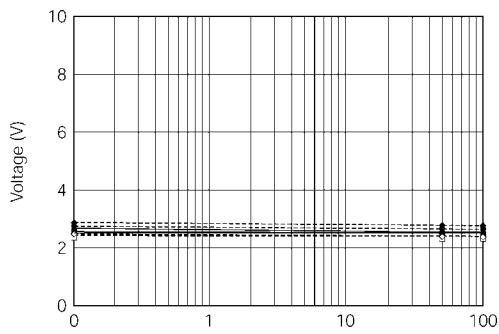
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Electrical life test (2)

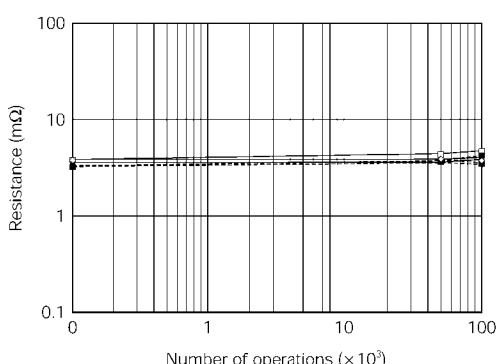
- Ambient temperature : 125°C
- Frequency : 0.2s ON/9.8s OFF, 0.1 Hz
- Contact load : 14 Vdc, 20 A, Power window motor load, unlocked
- Number of operations : 100×10^3
- Samples : ET2F-B3M1S 10 pieces



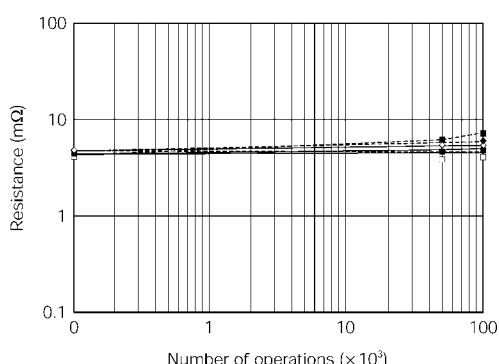
Operate Voltage



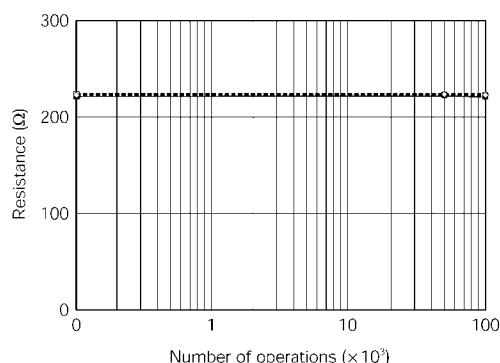
Release Voltage



Contact Resistance (N.O contact)



Contact Resistance (N.C contact)



Coil Resistance



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