DATA SHEET

AUTOMOTIVE RELAY

ET2F/ET1F SERIES

HIGH HEAT RESISTIVITY

DESCRIPTION

The 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℃ through +125℃ .

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

FEATURES

- Operating ambient temperature up to +125°C (ET2/ET1 : +85°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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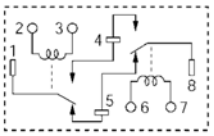
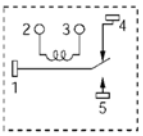
SCHEMATIC (BOTTOM VIEW)

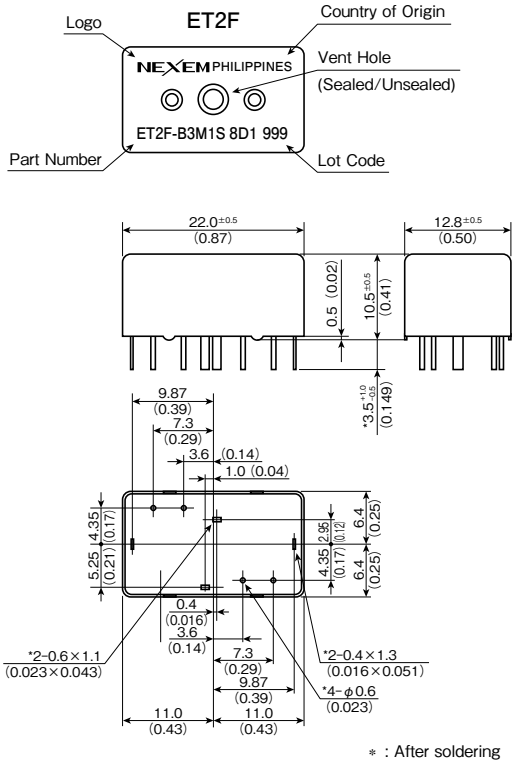
ET2F

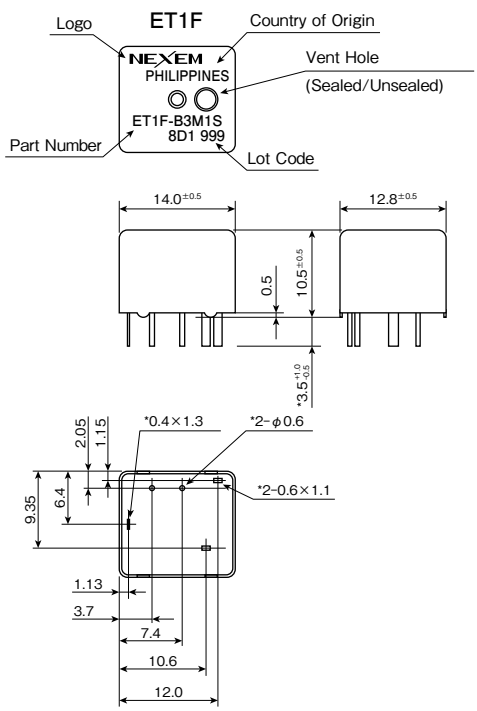


ET1F



DIMENSIONS mm (inch)

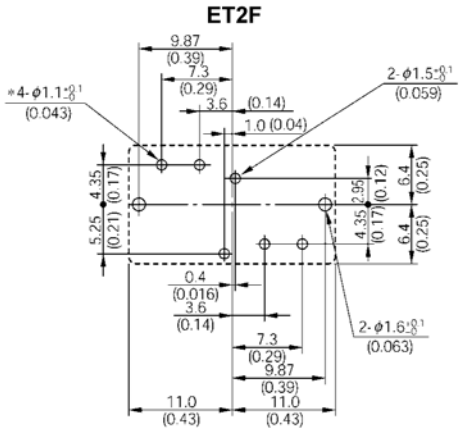




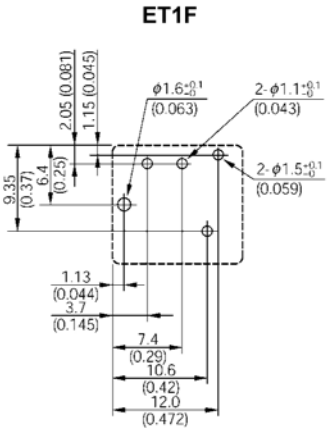
∗ : After soldering

PCB PAD LAYOUT mm (inch) (BOTTOM VIEW)

ET2F



ET1F



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SPECIFICATIONS

(Ambient temperature:20℃)

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		Maximum Switching Voltage	16 V dc	
		Maximum Switching Current	25 A (at 16 Vdc)	
		Maximum 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)
		Minimum Switching Current	1 A (at 5 VDC)	
		Contact Resistance	4 mΩ typical (measured at 7 A) Initial	
Contact Material			Silver oxide comlex 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 VAC min. (for 1 minute)	
		Between Coil and Contacts	500 VAC min. (for 1 minute)	
Shock Resistance		Misoperation	98 m/s^2	
		Destructive Failure	980 m/s^2	
Vibration Resistance		Misoperation	10 to 300 Hz, 43 m/s^2	
		Destructive Failure	10 to 500 Hz, 43 m/s^2 200 hour	
Ambient Temperature			-40 to +125°C (–40 to +257°F)	
Coil Temperature Rise			70°C (158°F) / W (without contact carrying current)	
Running Specification	Non-load		1 × 10^6 operations	
	Load	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

(Ambient temperature:20℃)

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

(Ambient temperature:20℃)

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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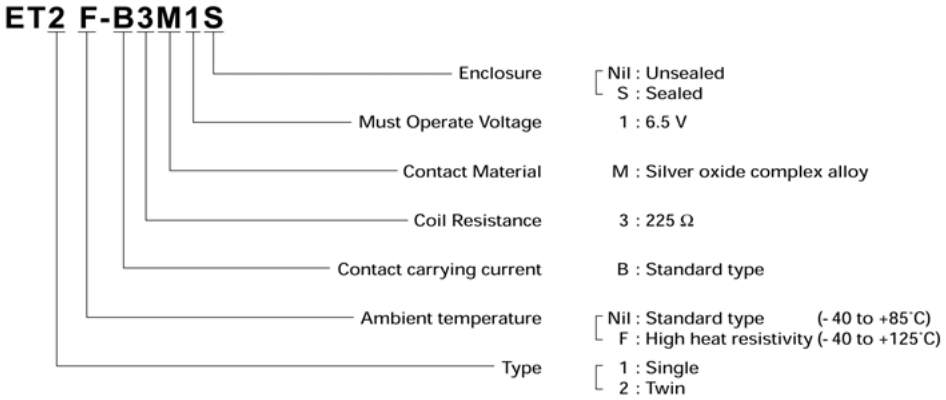
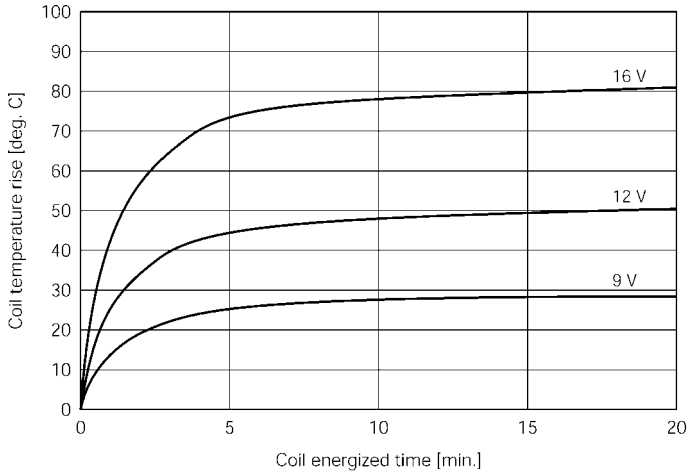
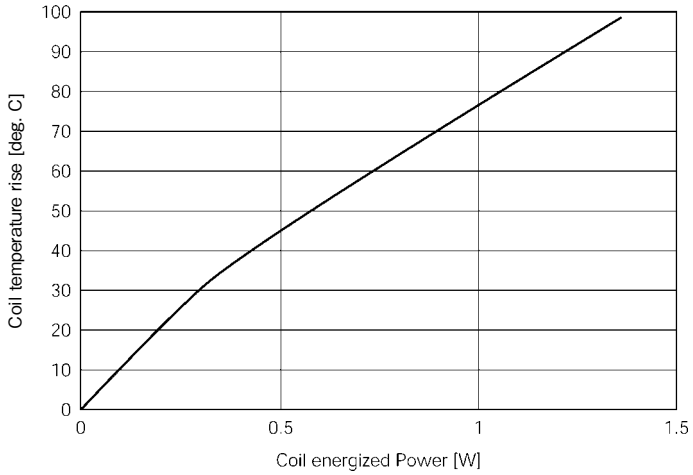
NUMBERING SYSTEM



COIL TEMPERATURE RISE

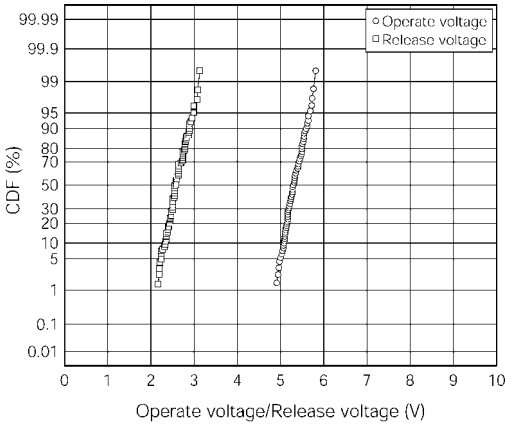
Test piece : ET1F-B3M1S

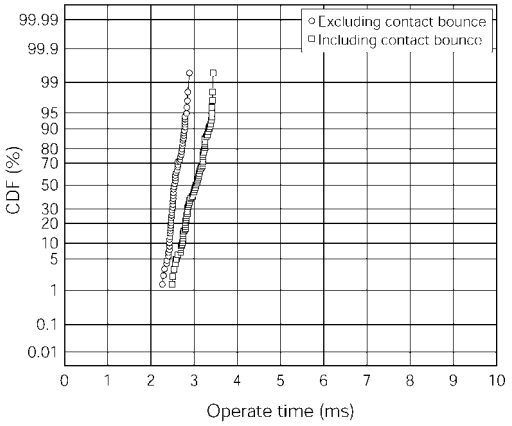


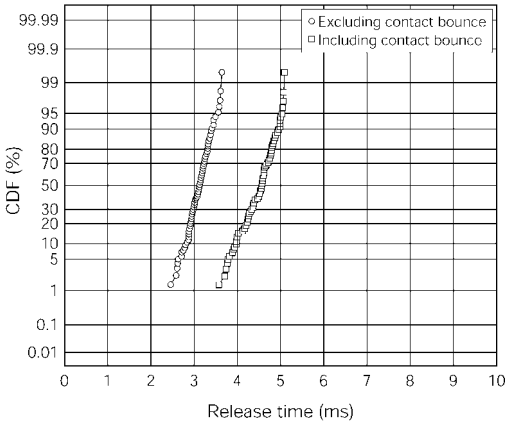


RELAY CHARACTERISTICS DISTRIBUTION (INITIAL)

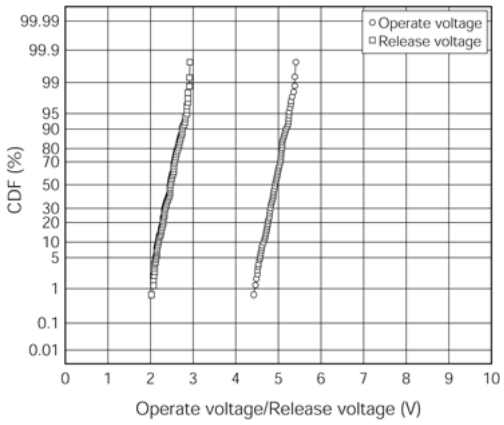
Samples : ET1F-B3M1S 100 pieces

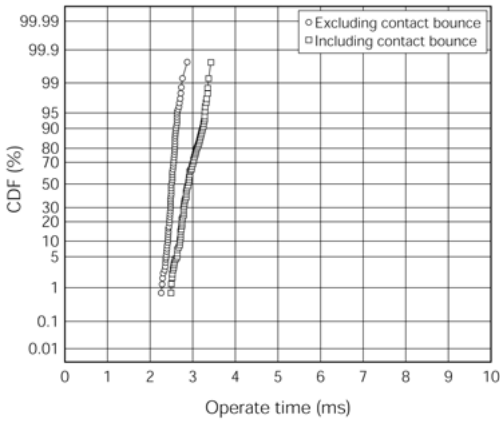


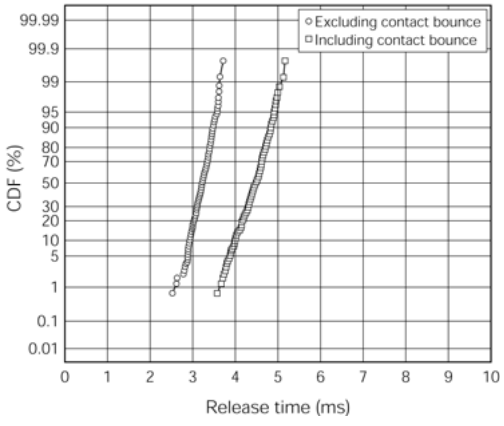




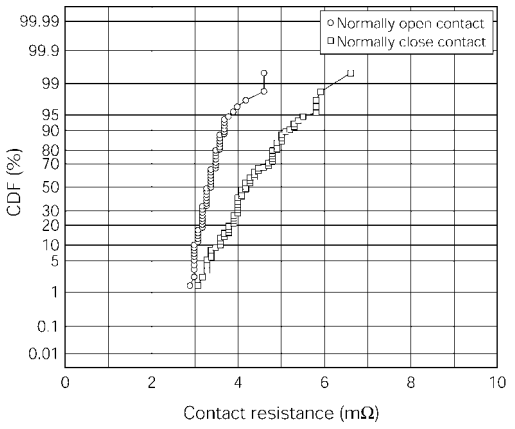
Samples : ET2F-B3M1S 100 pieces

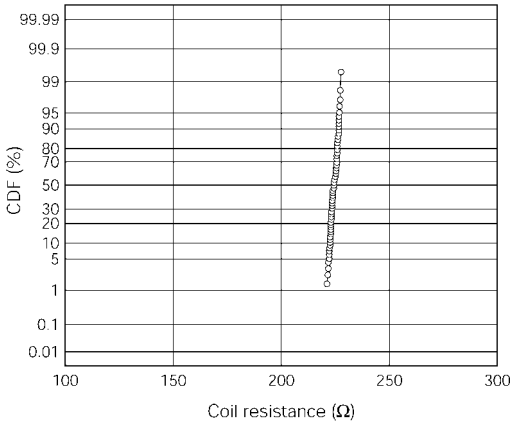




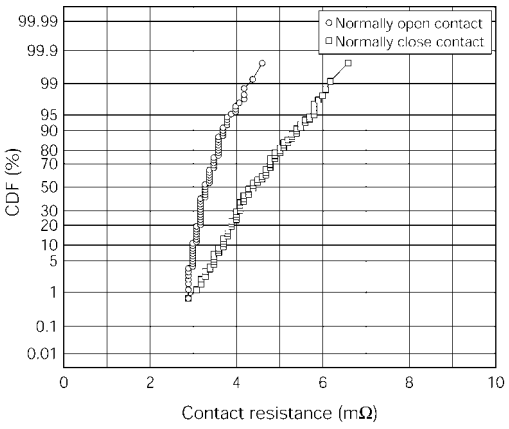


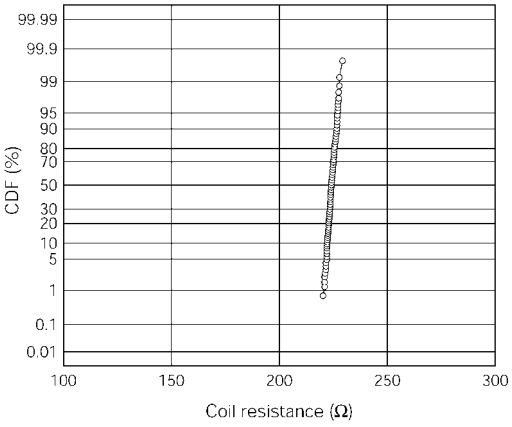
Samples : ET1F-B3M1S 100 pieces





Samples : ET2F-B3M1S 100 pieces

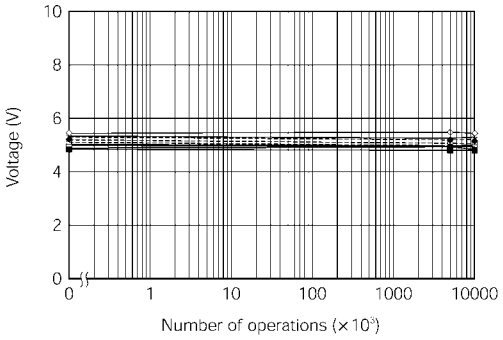




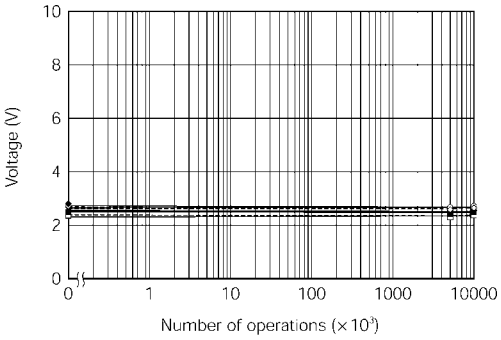
DURABILITY LIFE

Mechanical life test

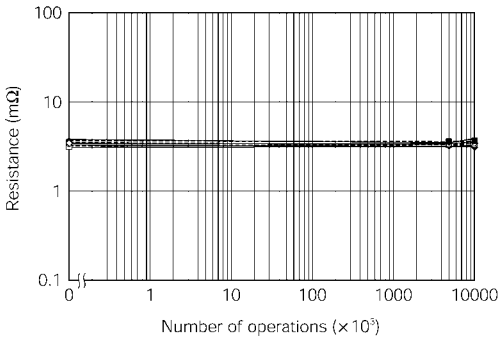
- Ambient temperature : 20°C
- Frequency : 15 Hz (50% duty)
- Contact load : No load
- Number of operations : 10×10^6
- Samples : ET2F-B3M1S 10 pieces



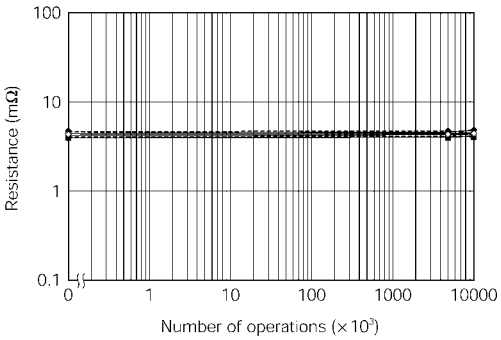
Operate Voltage



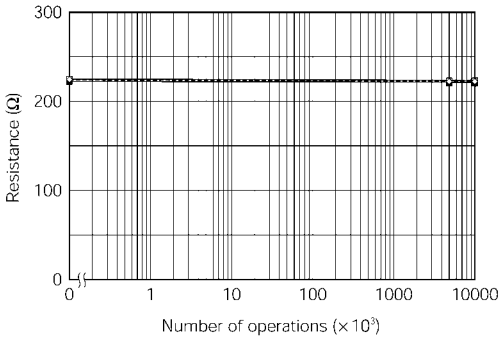
Release Voltage



Contact Resistance (N.O contact)



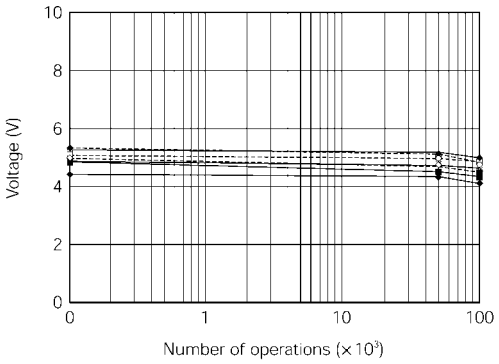
Contact Resistance (N.C contact)



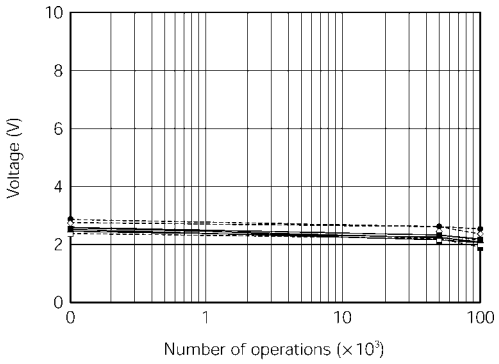
Coil Resistance

Electrical life test (1)

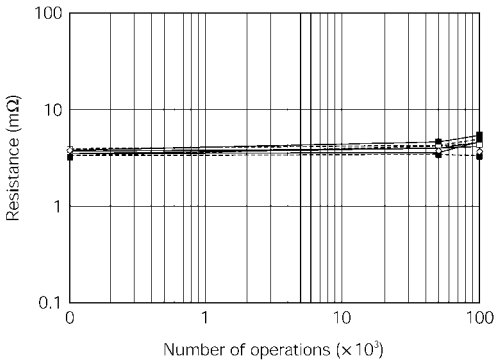
- Ambient temperature : 125°C
- Frequency : 0.2s ON/9.8s OFF, 0.1 Hz
- Contact load : 14 VDC, 20A, Power window motor load, locked
- Number of operations : 100 × 10^3
- Samples : ET2F-B3M1S 10 pieces



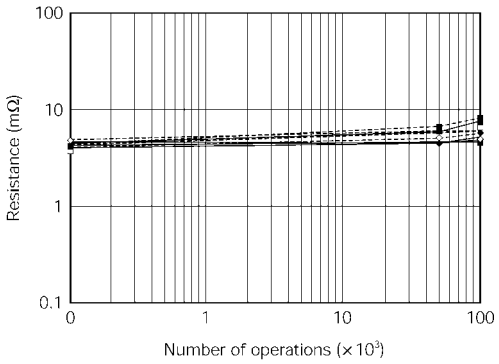
Operate Voltage



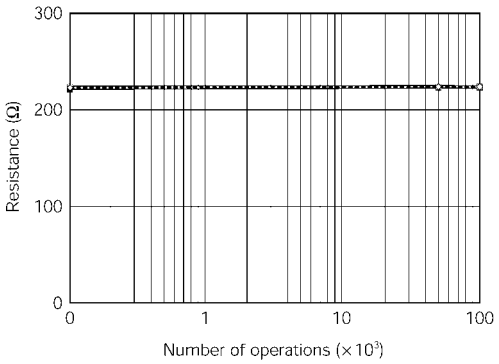
Release Voltage



Contact Resistance (N.O contact)



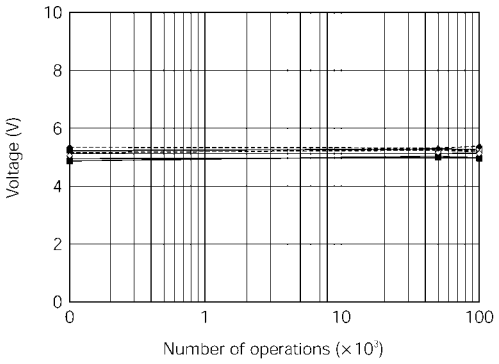
Contact Resistance (N.C contact)



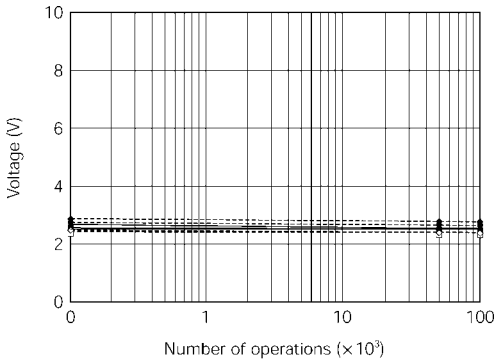
Coil Resistance

Electrical life test (2)

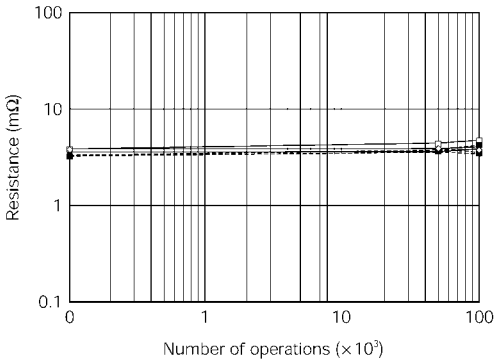
- Ambient temperature : 125°C
- Frequency : 0.2s ON/9.8s OFF, 0.1 Hz
- Contact load : 14 VDC, 20A, Power window motor load, unlocked
- Number of operations : 100 × 10^3
- Samples : ET2F-B3M1S 10 pieces



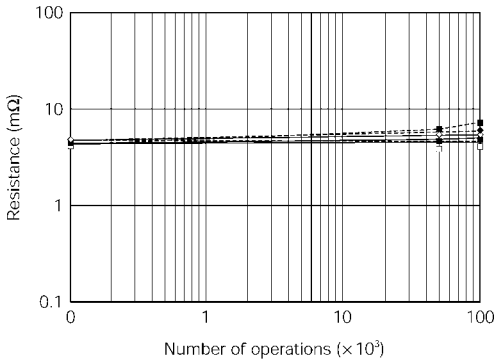
Operate Voltage



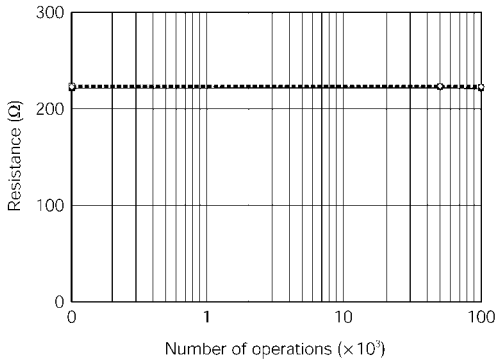
Release Voltage



Contact Resistance (N.O contact)



Contact Resistance (N.C contact)



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