

AUTOMOTIVE RELAYS

ET2/ET1 SERIES

DESCRIPTION

The NEXEM 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 NEXEM EP2/EP1 series that has the high share with a motor control usage of the automobile at automobile industry in the world. Besides the ET2/ET1 series is succeeding for about 50% of miniaturization compared to ET2/ET1 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 EM Devices' "Miniature Relays" before dose designing your relay applications.

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

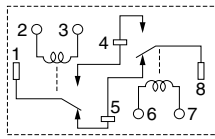
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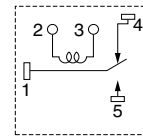
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SCHEMATIC (BOTTOM VIEW)

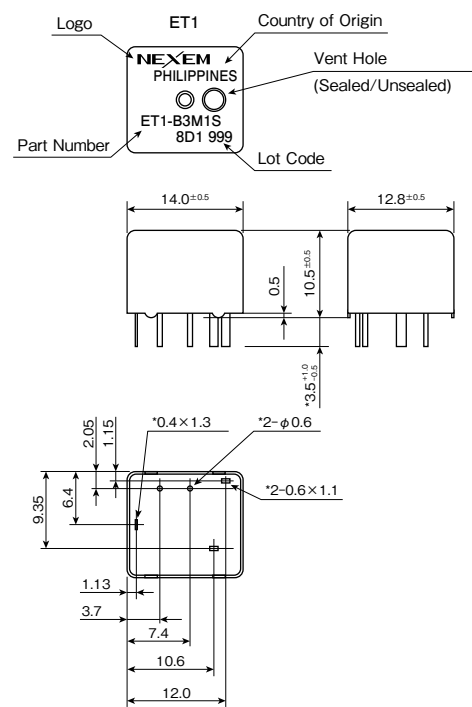
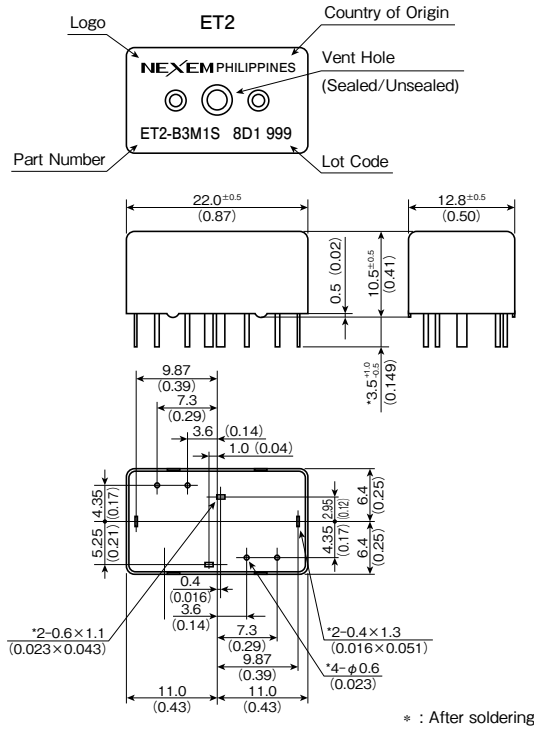
ET2



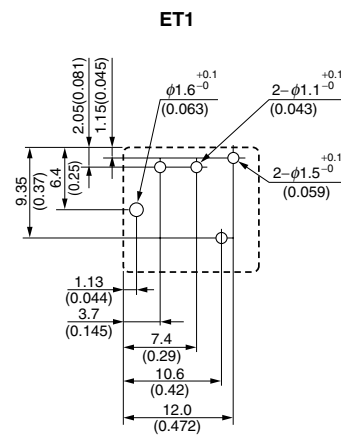
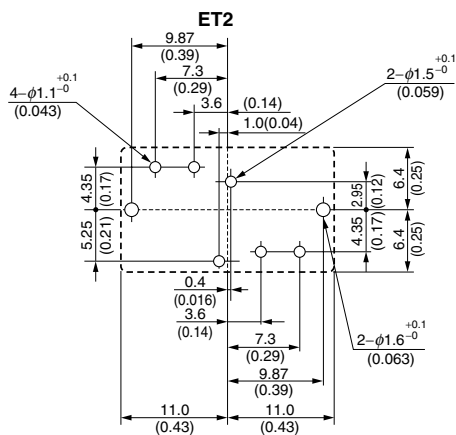
ET1



DIMENSIONS mm (inch)



PCB PAD LAYOUT mm (inch) (BOTTOM VIEW)



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SPECIFICATIONS

(Ambient temperature: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		Maximum Switching Voltage	16 VDC	
		Maximum Switching Current	25 A (at 16 VDC)	
		Minimum 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 VDC	
Breakdown Voltage		Between Open Contact	500 VAC min. (for 1 minute)	
		Between Coil and Contact	500 VAC min. (for 1 minute)	
Shock Resistance		Misoperation	98 m/s ²	
		Destructive Failure	980 m/s ²	
Vibration Resistance		Misoperation	10 – 300 Hz, 43 m/s ²	
		Destructive Failure	10 – 500 Hz, 43 m/s ² 200 hour	
Ambient Temperature			–40 to +85 °C (–40 to +185 °F)	
Coil Temperature Rise			70 °C (158 °F)/W	
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°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

(Ambient temperature: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				



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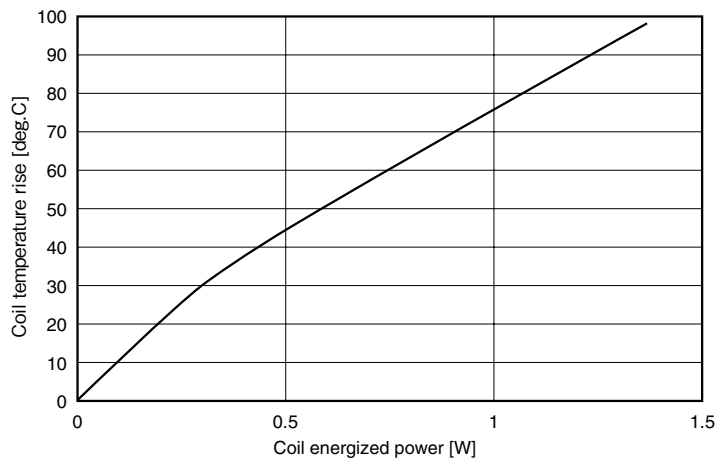
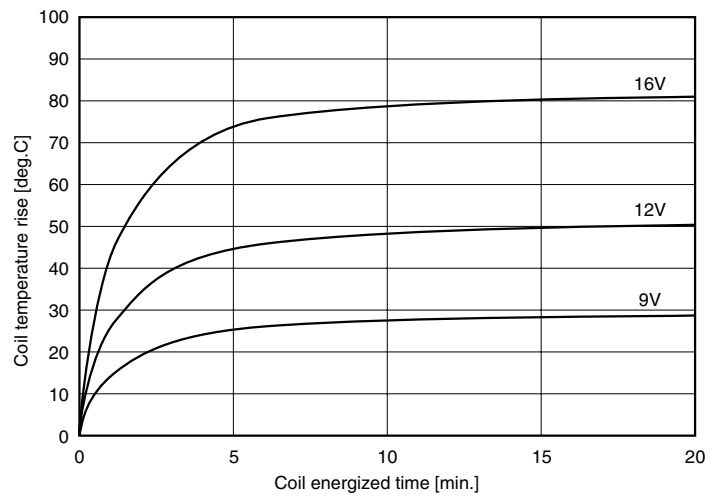
NUMBERING SYSTEM

ET2-B3M1S

Enclosure	Nil : Unsealed S : Sealed
Must Operate Voltage	1 : 6.5V
Contact Material	M : Silver oxide complex alloy
Coil Resistance	3 : 225 Ω
Contact carrying current	B : Standard type
Type	1 : Single 2 : Twin

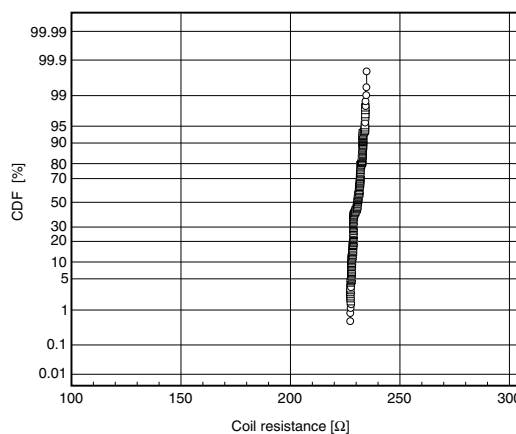
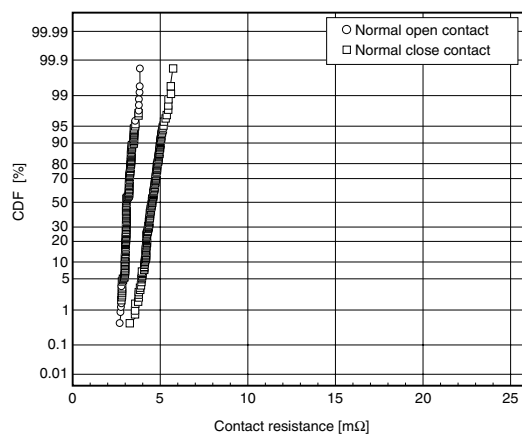
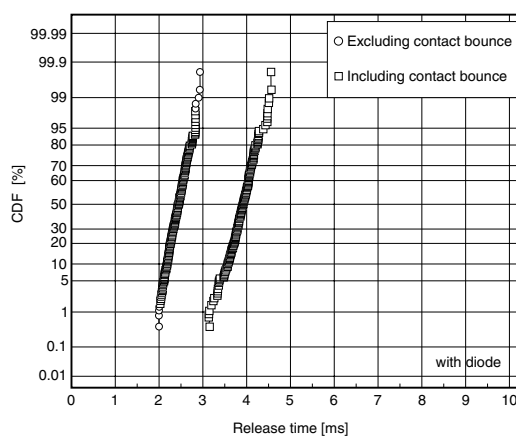
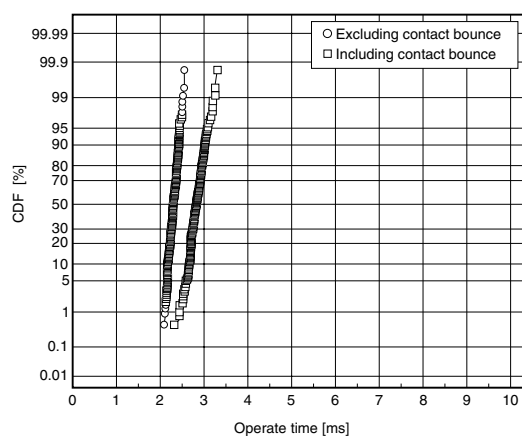
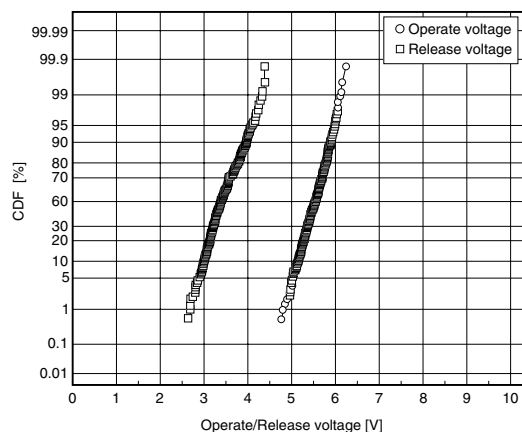
COIL TEMPERATURE RISE

Test piece : ET1-B3M1S



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RELAY CHARACTERISTICS DISTRIBUTION (INITIAL)

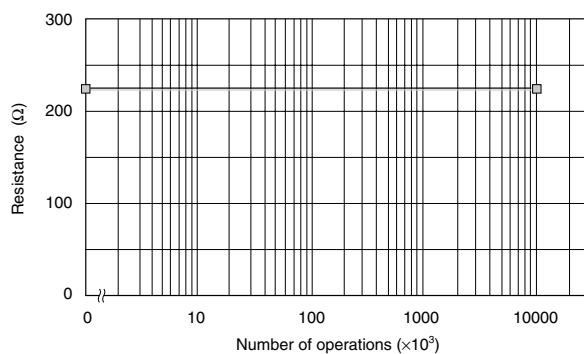
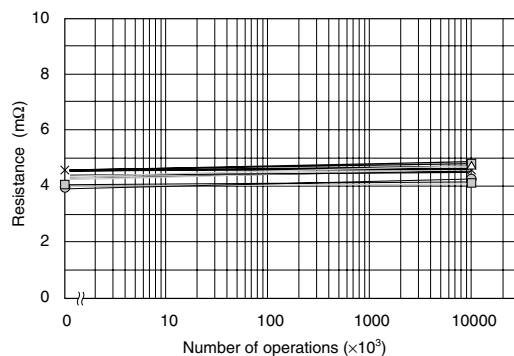
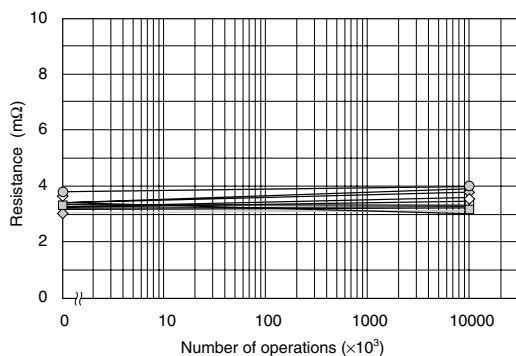
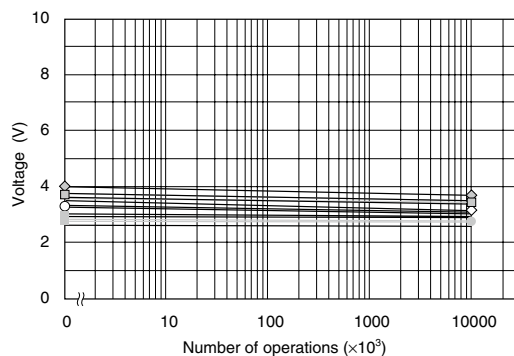
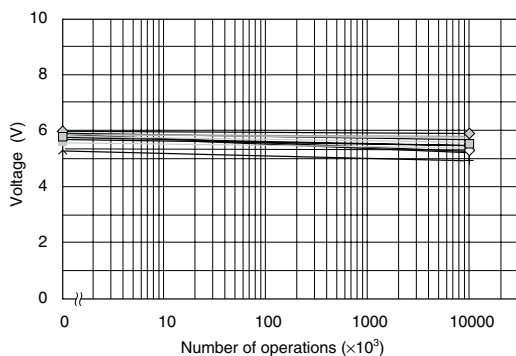


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DURABILITY LIFE

Mechanical life test

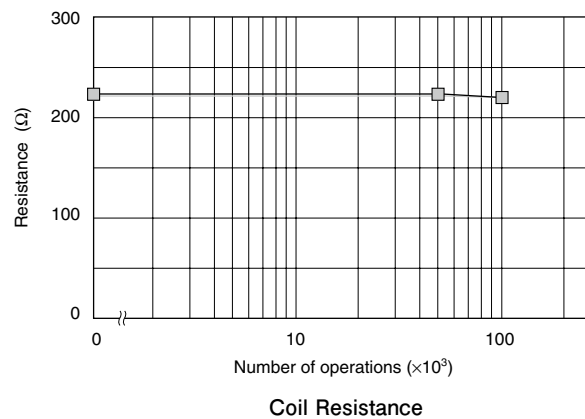
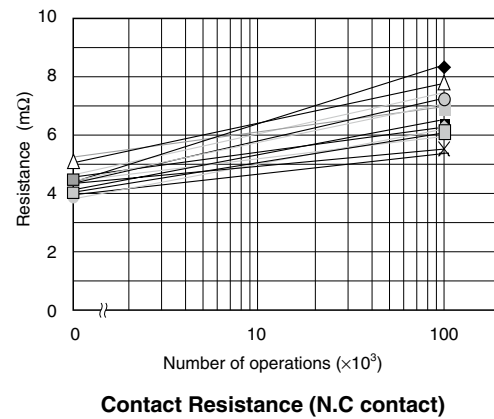
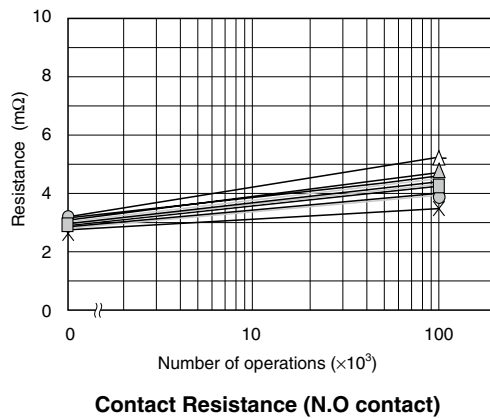
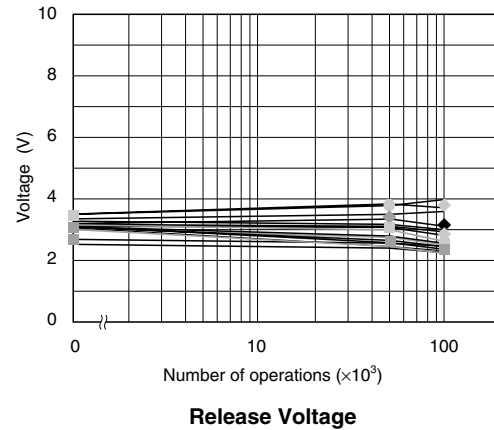
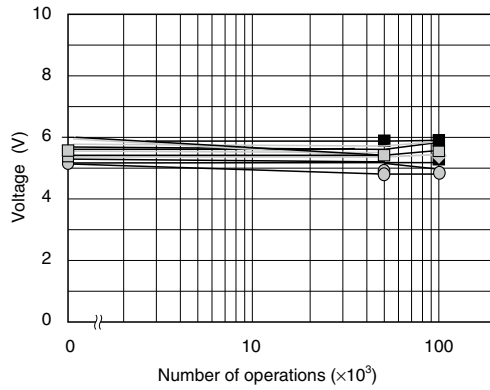
- Ambient temperature : 20 °C
- Frequency : 15 Hz (50 % duty)
- Contact load : No load
- Number of operations : 10×10^6
- Samples : ET2-B3M1S 10 pieces



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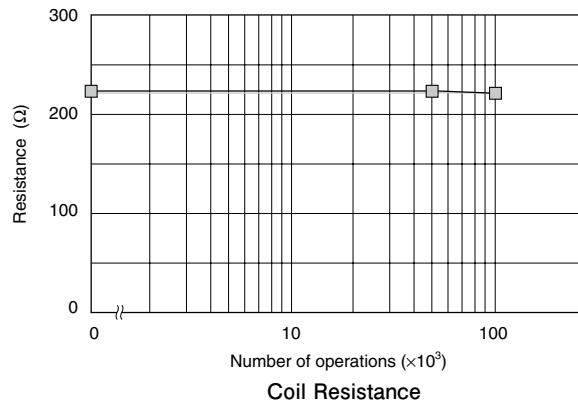
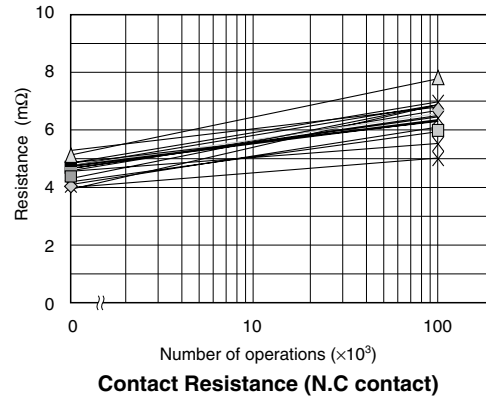
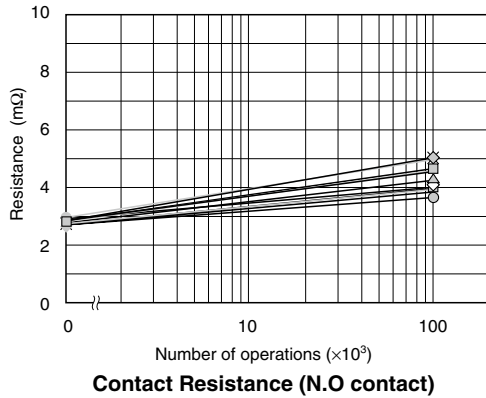
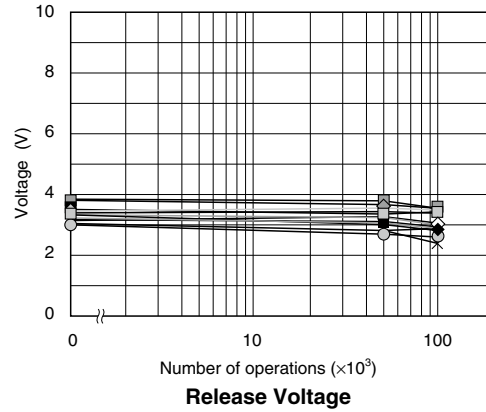
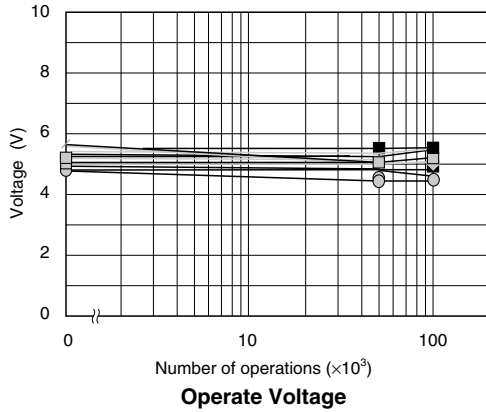
Electrical life test (1)

- 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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