

DESCRIPTION

The NEXEM EM1 series is PC-board mount type and suitable for lamps, C-R circuits, heaters, fans and pumps, etc. controls application for automobiles which require high quality and high performance.

The EM1 series have higher switching performance than the current relays like EP1, ET1 and EX1 series.

FEATURE

- Suitable for large inrush current load, such as lamps, and C-R circuits, etc.
- Large current capacity (54A 1hour at 20°C)
- High heat resistance
- Flux tight housing
- Pb free
- Through-hole reflow soldering available

APPLICATION

- Lamp control
- C-R circuit control
- Heater control
- Motor control such as fans and pumps

**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.

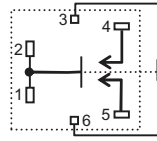
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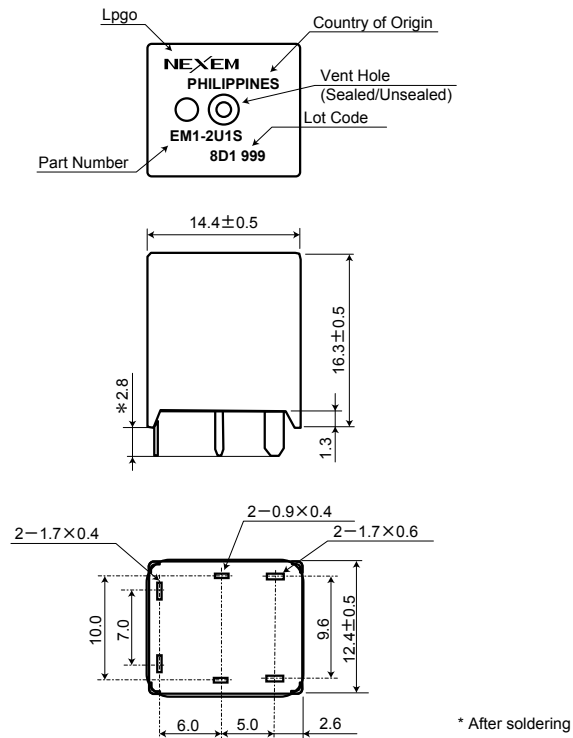
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SCHEMATIC (BOTTOM VIEW)

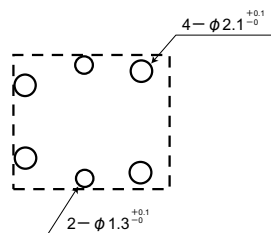


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DIMENSIONS [mm]



PCB PAD LAYOUT [mm] (BOTTOM VIEW)



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SPECIFICATIONS

(Ambient temperature:20°C)

Items			Specifications
Contact Form			1 Form U
Contact Ratings	Maximum Switching Voltage		16VDC
	Maximum Switching Current		100A ON / 60A OFF at 14VDC (Resistive, 10 operations)
	Minimum Switching Current		1A (5VDC)
	Maximum Carrying Current		54A at 14VDC for 1hour ^{*1}
	Contact Resistance		2.5mΩ typical (measured at 7A) initial
Contact Material			Silver oxide complex alloy
Operate Time (Excluding bounce)			6ms typical (at Nominal Voltage)
Release Time (Excluding bounce)			1ms typical (at Nominal Voltage, without diode) initial
Nominal Operating Power			640 mW
Insulation Resistance			100 MΩ at 500 VDC
Withstand 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 500Hz, 43m/s ² , 200hours
Ambient Temperature			− 40 to + 125°C
Running Specifications	Non-load		1 × 10 ⁶ operations
	Load	Resistive	100 × 10 ³ operations (at 14VDC, 40A)
		Lamp	100 × 10 ³ operations (at 14VDC, Inrush 120A/ Steady 14A)
Weight			Approx. 8g

*1 Mounted on PC-board: FR-4 (thickness: 1.6mm); Copper (thickness: 105 μm & width: 15mm)

This is the allowable value at abnormal case such as fuse blow. And cyclical current is not guaranteed.

COIL RATING

(Ambient temperature:20°C)

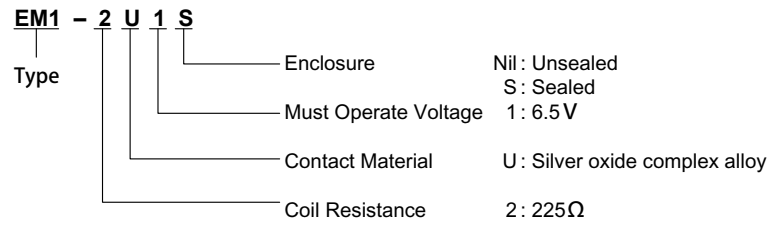
Part Numbers	Nominal Voltage (VDC)	Coil Resistance (Ω) ± 10%	Must Operate Voltage ^{*2} (VDC)	Must Release Voltage ^{*2} (VDC)
EM1-2U1	12	225	6.5	0.9

*2 Test by pulse voltage



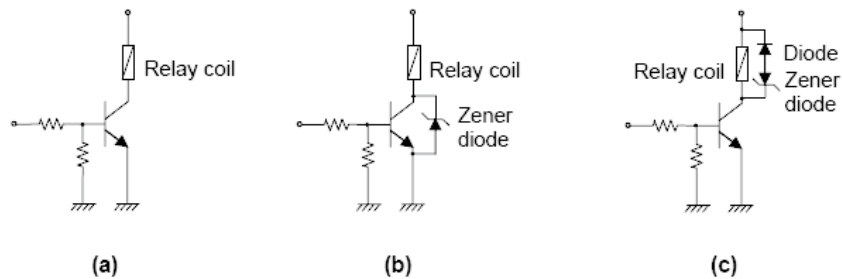
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PART NUMBER SYSTEM

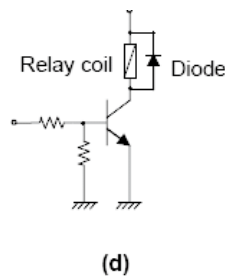


COIL DRIVE CIRCUIT

Recommended Circuit



Non-recommended Circuit



(NOTE)

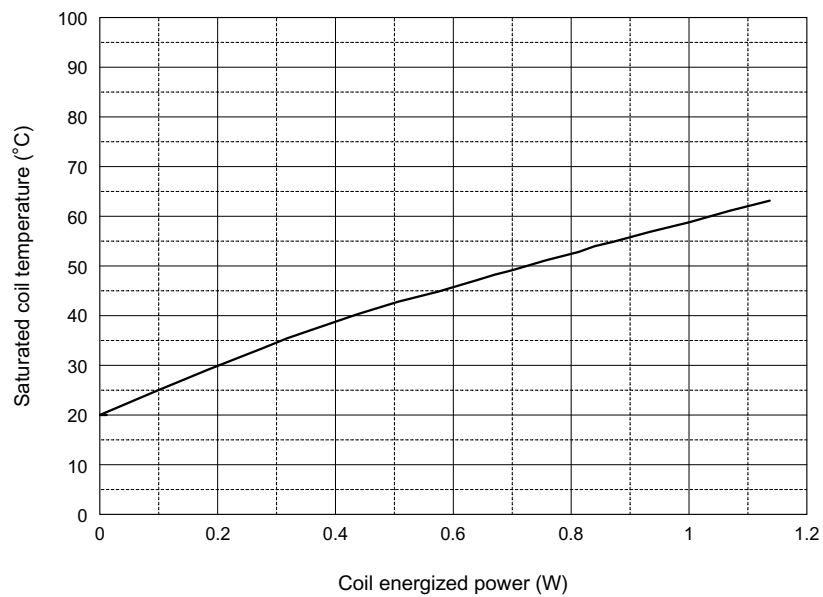
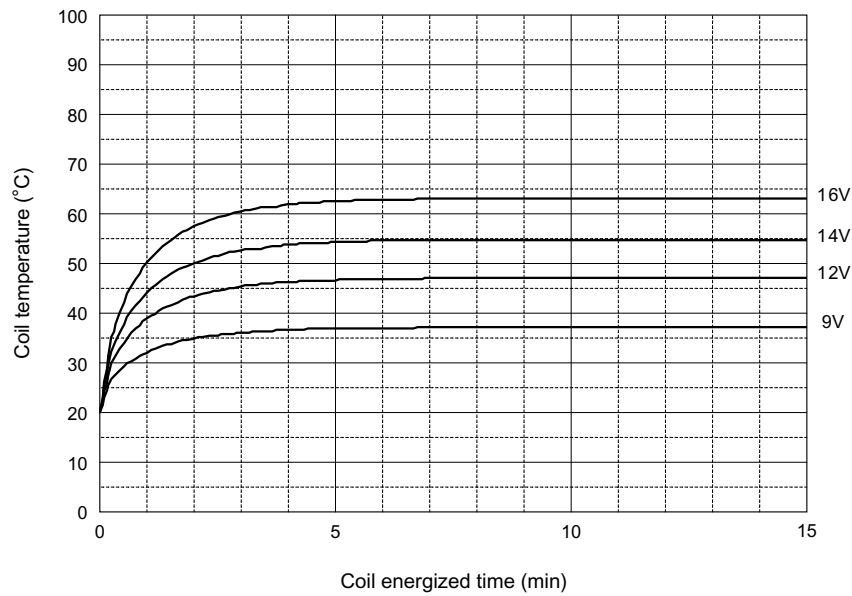
EM Devices recommends coil drive circuit (b) and (c) for coil flyback suppression, However, EM Devices does not recommend the circuit (d) because EM1 relay's performance is not yet enough.



TECHINICAL DATA

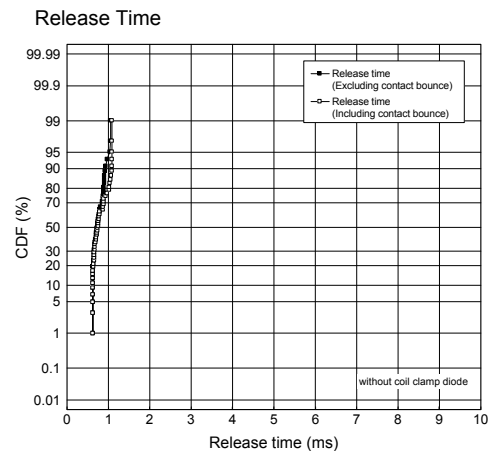
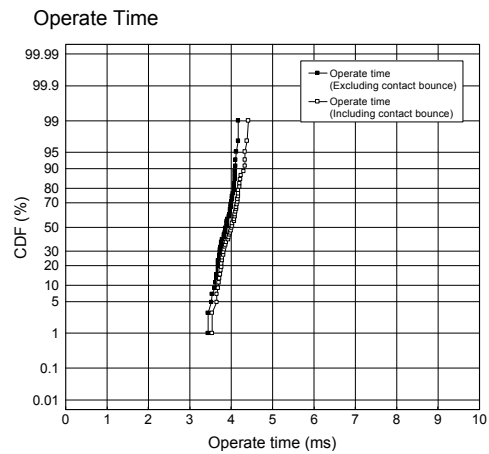
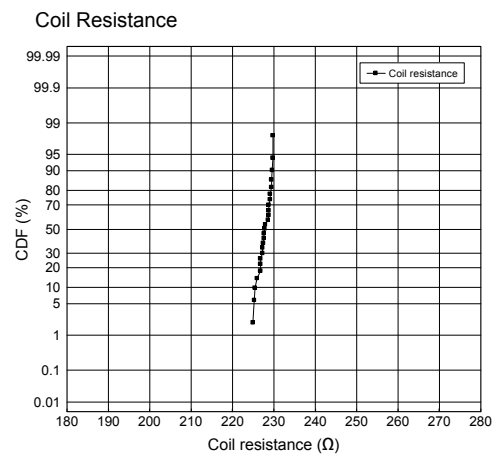
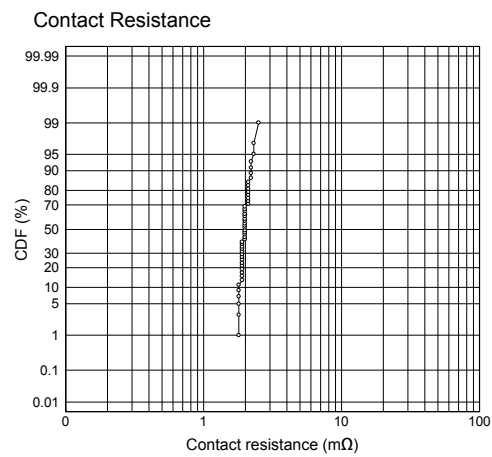
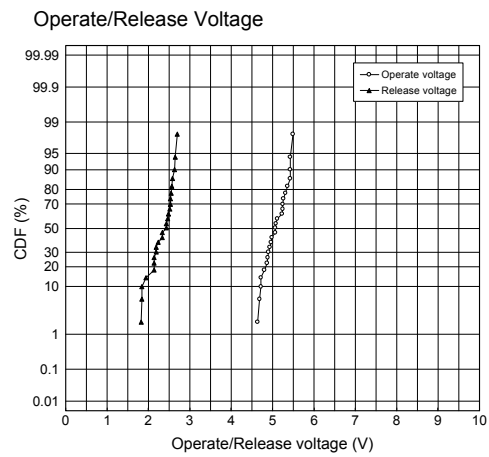
Coil Temperature Rise

(Ambient Temperature 20°C)



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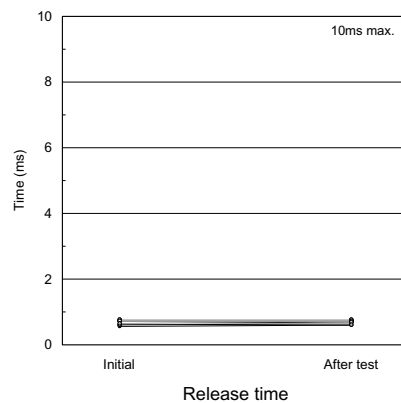
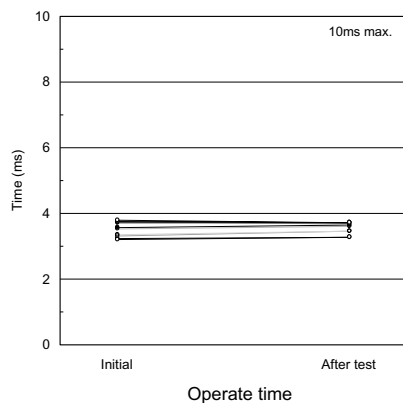
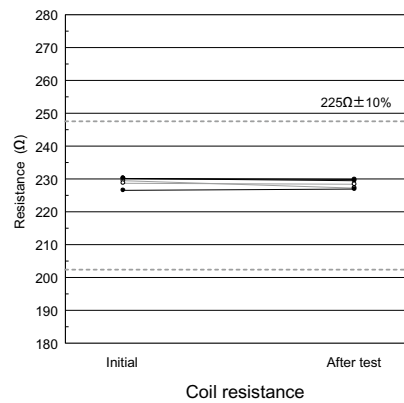
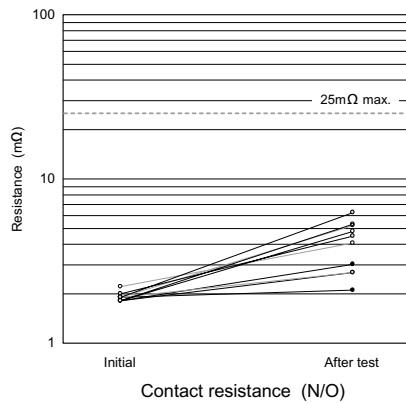
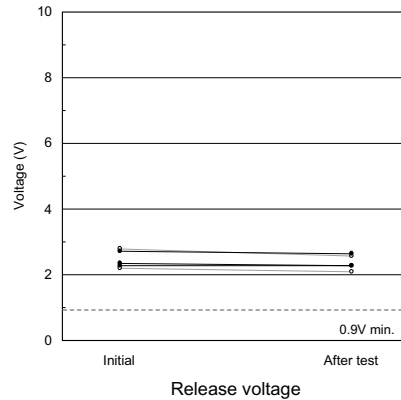
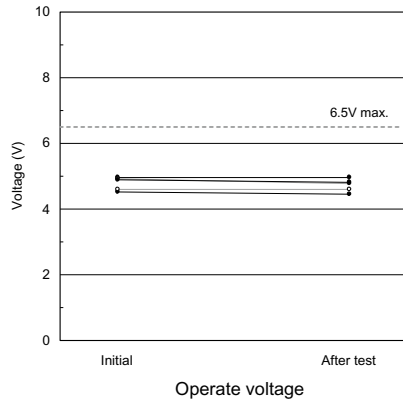
RELAY CHARACTERISTICS DISTRIBUTION (INITIAL)



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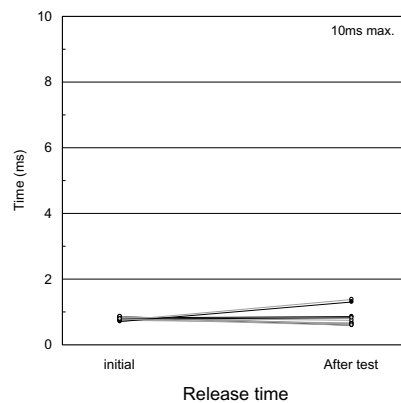
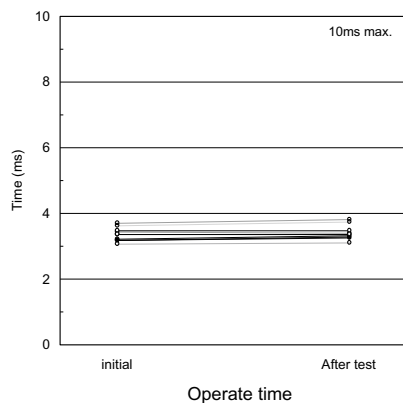
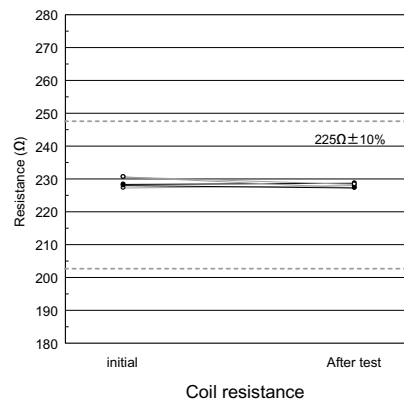
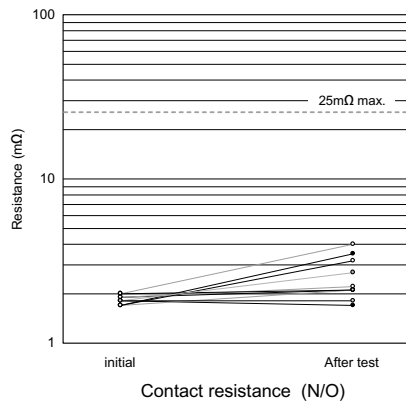
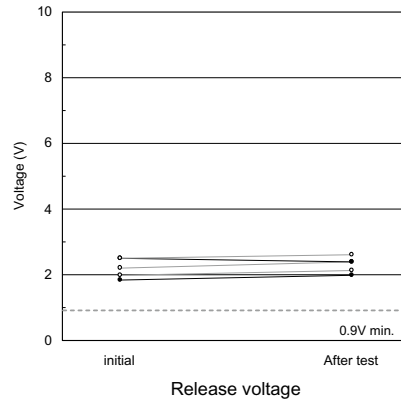
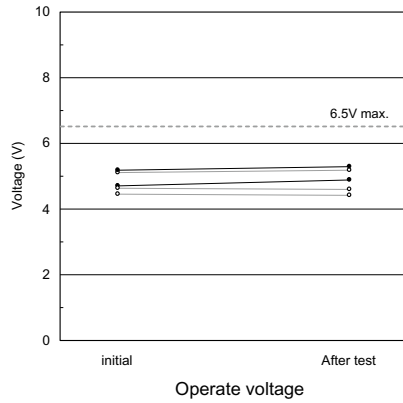
ELECTRICAL LIFE TEST (14VDC- 40A, Resistive load)

Test items	Test conditions	Samples
1. Operate voltage 2. Release voltage 3. Contact resistance 4. Coil resistance 5. Operate time 6. Release time (without coil clamp diode)	Temperature : 20°C Frequency : 1Hz(0.1s ON, 0.9s OFF) Contact load : 14VDC-40A, Resistive Number of operations : 100×10^3	EM1-2U1S 5 pcs



ELECTRICAL LIFE TEST (14VDC, Inrush current 120A, Lamp load)

Test items	Test conditions	Samples
1. Operate voltage 2. Release voltage 3. Contact resistance 4. Coil resistance 5. Operate time 6. Release time (without coil clamp diode)	Temperature : 20°C Frequency : 0.67Hz (0.2s ON, 1.3s OFF) Contact load : 14VDC, Inrush current 120A, Steady current 14A Number of operations : 100×10^3	EM1-2U1S 5 pcs



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