

DESCRIPTION

The new NEC TOKIN EP1K series is PC-board mount type and suitable for various heaters, fans and pumps, etc. controls in the automobiles which require high quality and high performance.

The EP1K series was developed based on the EP1 series and the performance of carrying current is about 10A larger than the EP1F relay.

FEATURE

- Large current capacity (54A 1hour at 20°C , Approx. 10A larger than the EP1F)
- High heat resistance
- Flux tight housing
- Pb free
- Through-hole reflow soldering available

APPLICATION

- 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 NEC's "Miniature Relays" (9600RSGVOL11E1003N1) before dose designing your relay applications.

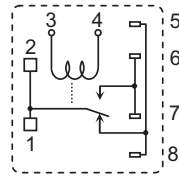
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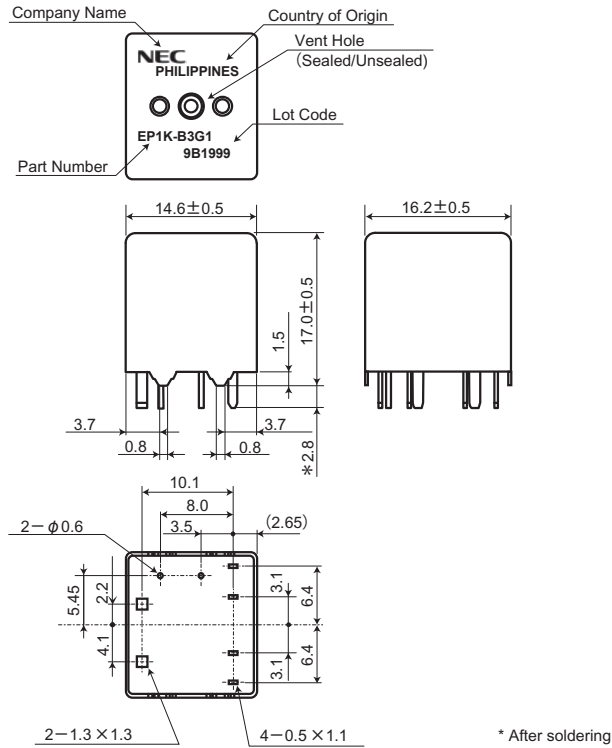


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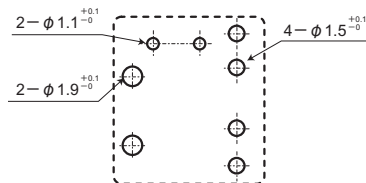
SCHEMATIC (BOTTOM VIEW)



DIMENSIONS [mm]



PCB PAD LAYOUT [mm] (BOTTOM VIEW)



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SPECIFICATIONS

(Ambient Temperature 20°C)

| Items | | Specifications |
|---------------------------------|---------------------------|---|
| Contact Form | | 1 Form C |
| Contact Ratings | Maximum Switching Voltage | 16VDC |
| | Maximum Switching Current | 30A |
| | Minimum Switching Current | 1 A (5VDC) |
| | Maximum Carrying Current | 54A at 14VDC for 1hour *1 |
| | Contact Resistance | 4mΩ typical (measured at 7A) initial |
| Contact Material | | Silver oxide complex alloy |
| Operate Time (Excluding bounce) | | 5ms typical (at Nominal Voltage) |
| Release Time (Excluding bounce) | | 2ms typical (at Nominal Voltage, without diode) initial 8ms typical (at Nominal Voltage, with diode) initial |
| Nominal Operating Power | | 0.64W |
| Coil Temperature Rise | | Approx. 45°C /W (contact carrying current 0A) |
| Insulation Resistance | | 100MΩ at 500VDC |
| Withstand Voltage | Between open contacts | 500VAC (for 1minute) |
| | Between coil and contacts | 500VAC (for 1minute) |
| Shock Resistance | Misoperation | 98m/s ² (10G) |
| | Destructive Failure | 980m/s ² (100G) |
| Vibration Resistance | Misoperation | 10 to 300Hz, 43m/s ² (4.4G) |
| | Destructive Failure | 10 to 500Hz , 43m/s ² (4.4G), 200 hours |
| Ambient Temperature | | - 40 to + 125°C |
| Running Specifications | Non-load | 1 x 10 ⁶ operations |
| | Load (Motor load) | 100 × 10 ³ operations (at 25°C, 14VDC, Lock 25A / Steady 7A) 100 × 10 ³ operations (at 125°C, 14VDC, Lock 18A / Steady 5A) |
| Weight | | Approx. 8g |

*1 Mounted on PC-board: FR-4 (Thickness; 1.6mm), Copper (Thickness; 105 μm,Width; 15mm)

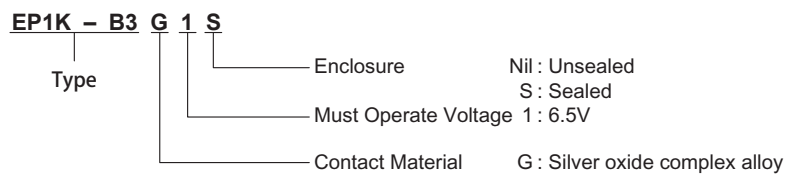
COIL RATING

(Ambient temperature:20°C)

| Part Numbers | Nominal Voltage (VDC) | Coil Resistance (Ω) ± 10% | Must Operate Voltage ^{*2} (VDC) | Must Release Voltage ^{*2} (VDC) |
|--------------|-----------------------|---------------------------|--|--|
| EP1K-B3G1 | 12 | 225 | 6.5 | 0.9 |

*2 Test by pulse voltage

PART NUMBER SYSTEM



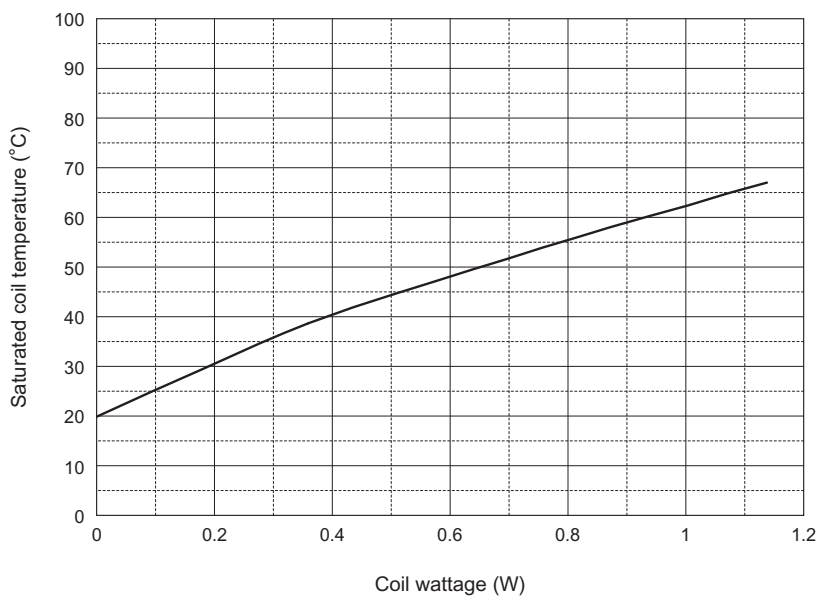
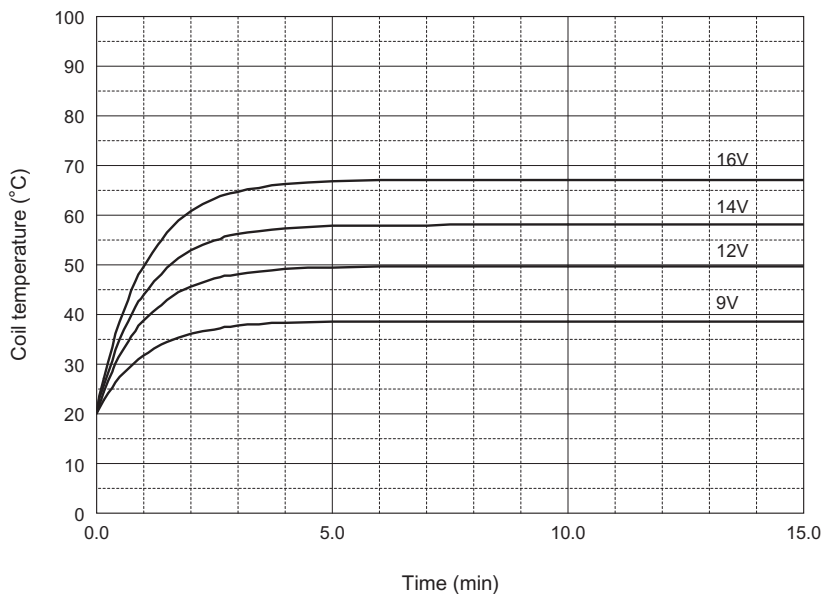
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TECHINICAL DATA

Coil Temperature Rise

(Mounted on PC-board: FR-4 (Thickness; 1.6mm), Copper (Thickness; 105 μ m,Width; 15mm)

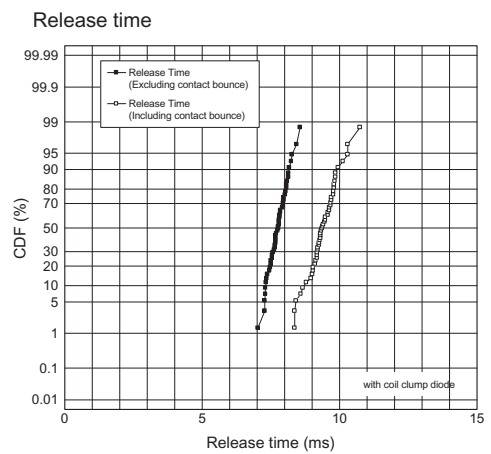
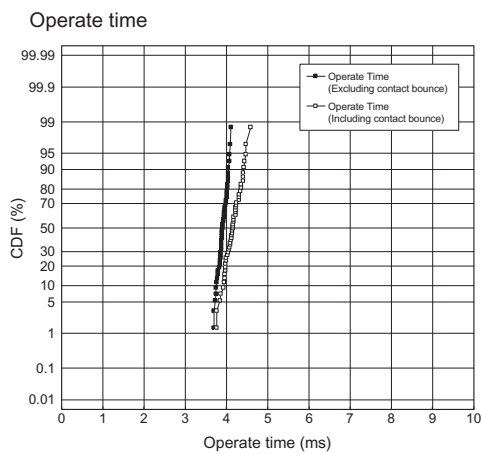
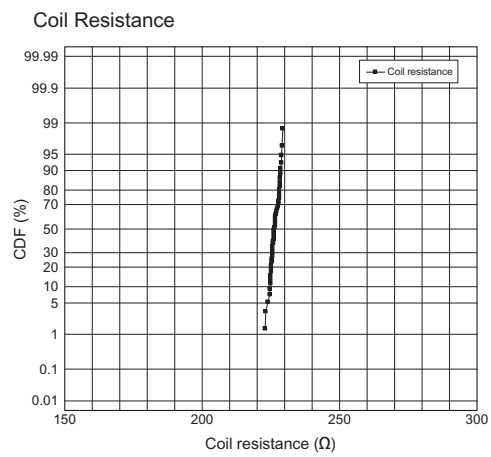
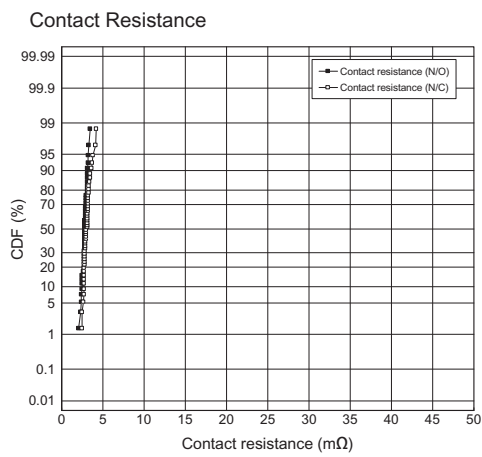
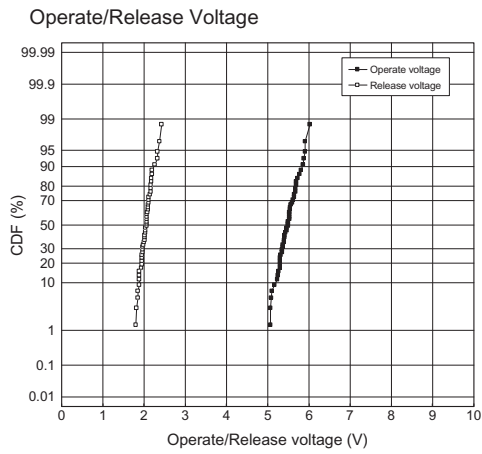
(Ambient Temperature 20°C)



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RELAY CHARACTERISTICS DISTRIBUTION (INITIAL)

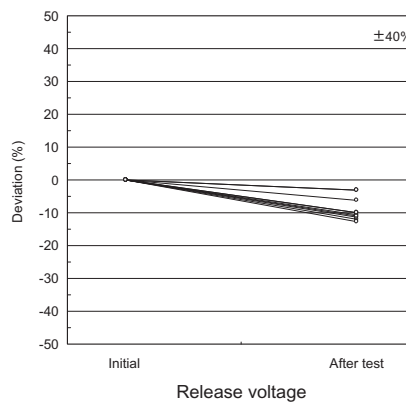
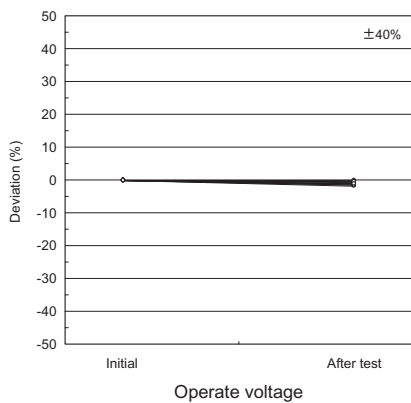
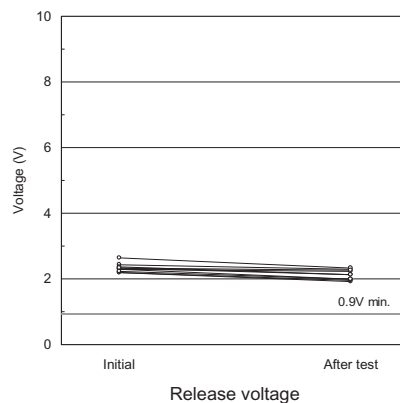
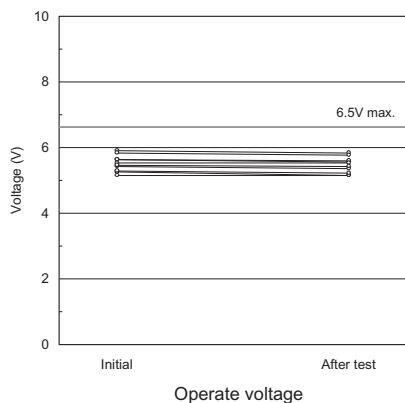
Specimen : EP1K-B3G1S
 Ambient Temperature : 20°C
 Quantity : 50pcs.



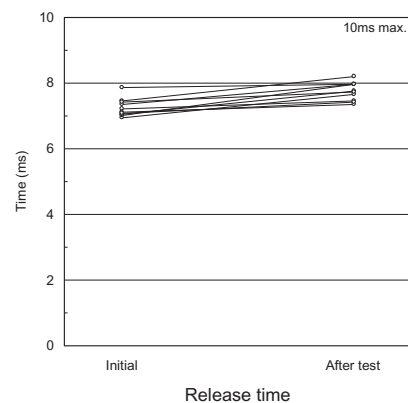
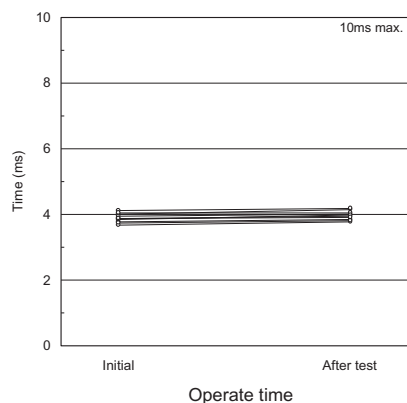
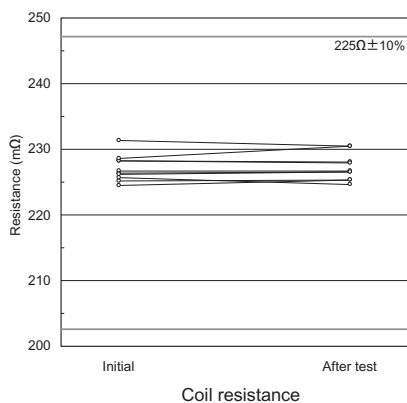
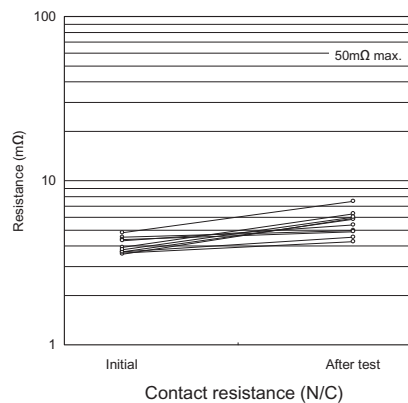
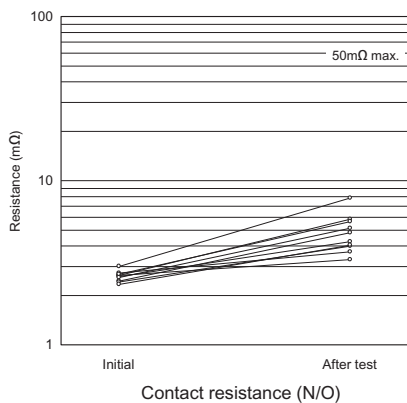
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ELECTRICAL LIFE TEST (14VDC-25A, P/W motor, Lock)

| Test items | Test conditions | Samples |
|--|--|----------------------|
| 1. Operate voltage 2. Release voltage 3. Contact resistance 4. Coil resistance 5. Operate time 6. Release time (with coil clump diode) | Temperature : 20°C Frequency : 0.1Hz (0.2s ON, 9.8s OFF) Contact load : 14VDC-25A, P/W motor, Lock Number of operations : 100 × 10 ³ | EP1K-B3G1S 10 pcs |



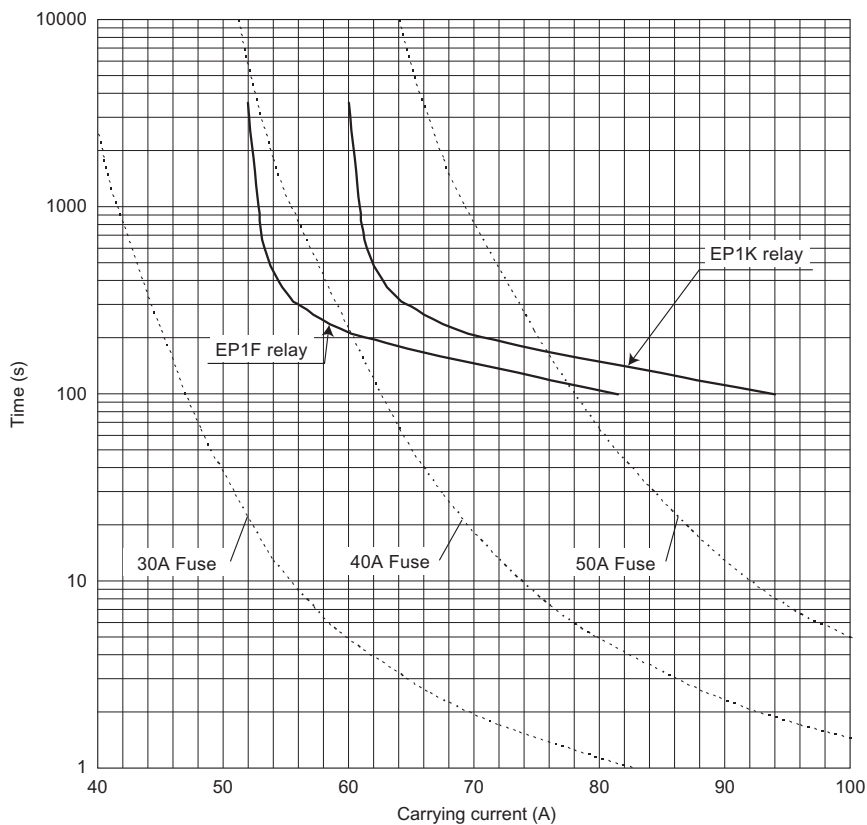
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CARRYING CURRENT PERFORMANCE

| Test items | Test conditions | Samples |
|------------------|--|--|
| Carrying current | Coil wattage : 0.87W (225 Ω ,14VDC) | EP1K-B3G1S EP1F-B3G1S 5 pcs for each |
| | Temperature : 20°C | |
| | Mounting conditions : Mounted on NT's PC board | |
| | PC board : FR-4, t1.6 | |
| | Cu pattern thickness : 105 μm | |
| | Pattern size : 15mm(width) × 100mm(length) | |
| | Failuer mode : Coil layer short | |



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