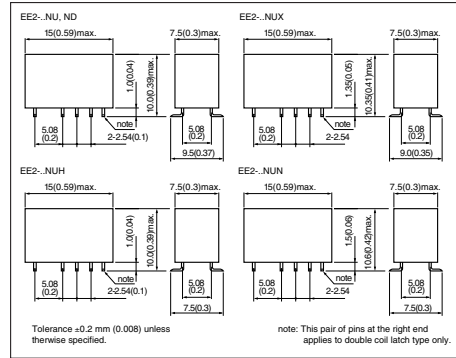


# EE2 Series

The EE2 series is surface-mounting type sustaining high-performance of NEC TOKIN EC2 series.

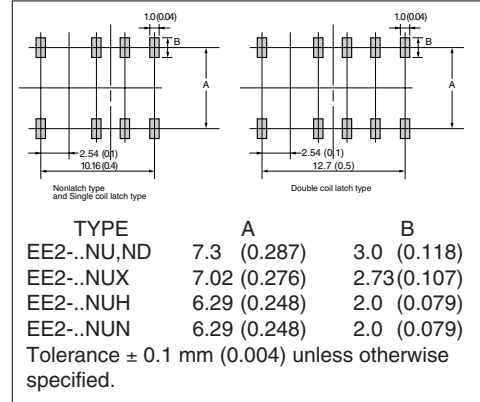


## ■ DIMENSIONS mm(inch)



## ■ RECOMMENDED PAD LAYOUT

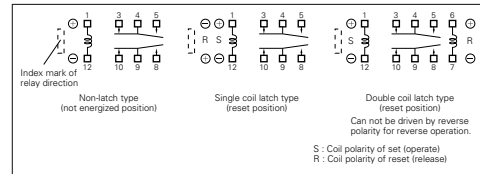
(bottom view)mm(inch)



## ■ FEATURES

- Compact and light weight
- Low power consumption
- Reduced mounting space: 15 mm X 9.5 mm
- High-breakdown voltage of coil to contacts: 1500 Vac, 2500 V, (2 X 10 $\mu$ S\*3)
- Capable of High-power switching : 700 Vac, 4.2 A ,4 times in case of accident
- NK type guarantee 1.5Kvac over withstanding voltage at open contact. (Only make contact)
- ND type (High-insulation type) conform to supplementary insulation for EN60950 (TUV certified)
- 2 form c contact arrangement

## ■ SCHEMATICS (bottom view)



## ■ SPECIFICATIONS

Contact Form		2 Form c
Contact Material		Silver alloy with gold alloy overlay
Contact Ratings (UL / CSA Rating)	Maximum Switching Power	60 W, 125 VA
	Maximum Switching Voltage	220 Vdc, 250 Vac
	Maximum Switching Current	2 A
	Maximum Carrying Current	2 A
Minimum Contact Ratings		10 mVdc, 10 $\mu$ A*1
Initial Contact Resistance		75 m $\Omega$ max.(Initial)
Nominal Operating Power	Nonlatch type	140 mW (3 to 12 V), 200mW (24 V) (ND type:200 to 230 mW) (NK type:230 mW)
	Single coil latch type	100 mW (ND type:100 to 170 mW)
	Double coil latch type	140 mW
Operate Time (Excluding bounce)		Approx. 2 ms
Release Time (Excluding bounce)		Approx. 1 ms without diode
Insulation Resistance		1000 M $\Omega$ at 500 Vdc
Withstand Voltage	Between open contacts	1000 Vac (for one minute) 1500 V surge (10 x 160 $\mu$ S*2)
		NK type: Make contact: 1500 Vac (for one minute) 2500 V surge (2 x 10 $\mu$ S*3) Break contact: 1000 Vac (for one minute) 1500 V surge (10 x 160 $\mu$ S*2)
	Between adjacent contacts	1000 Vac (for one minute), 1500 V surge (10 x 160 $\mu$ S*2)
Between coil to contacts		1500 Vac (for one minute), 2500 V surge (2 x 10 $\mu$ S*3)
Shock Resistance		735 m/s <sup>2</sup> (misoperating) 980 m/s <sup>2</sup> (destructive failure)
Vibration Resistance		10 to 55 Hz, double amplitude 3 mm (misoperating) 10 to 55 Hz, double amplitude 5 mm (destructive failure)
Ambient Temperature		-40 to +85°C
Coil Temperature Rise		1 x 10 <sup>8</sup> *4 operations(Non-latch type) 1 x 10 <sup>7</sup> operations(latch type)
Running Specifications	Nonload	18 degrees at nominal coil voltage (140 mW)
	Load	50 Vdc, 0.1 A (resistive) 1 x 10 <sup>6</sup> operations at 85°C, 5 Hz 10 Vdc, 10 mA (resistive) 1 x 10 <sup>6</sup> operations at 85°C, 2 Hz
Weight		Approx. 1.9 g

\* 1 This value is a reference value in the resistance load.

Minimum capacity changes depending on switching frequency and environment temperature and the load.

\* 2 rise time : 10  $\mu$ s, decay time to half crest : 160  $\mu$ s

\* 3 rise time : 2  $\mu$ s, decay time to half crest : 10  $\mu$ s

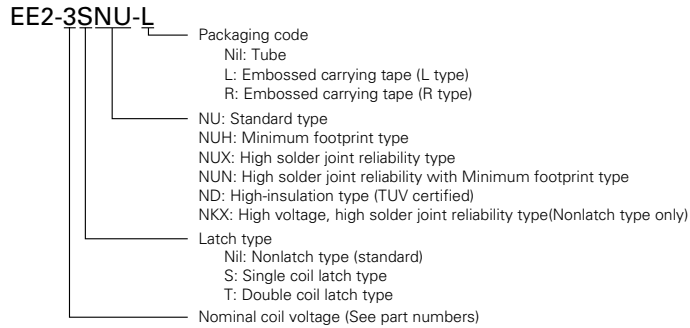
\* 4 This shows a number of operation where it can be running by which a fatal defect is not caused, and a number of operation by which a steady characteristic is maintained is 1x10<sup>7</sup> operations.



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# EE2 Series

## ■ PART NUMBER SYSTEM



## ■ SAFETY STANDARD AND RATING

UL Recognized (UL508)* File No. E73266	CSA Certified (CSA C22.2 No14) File No. LR46266
30 Vdc, 2 A (Resistive)	
110 Vdc, 0.3 A (Resistive)	
125 Vac, 0.5 A (Resistive)	

\* Spacing : UL114, UL478

TUV Certified (EN61810 / IEC61810)	
No. R 9750561	No. R 9751153
"ND" Type (Nonlatch and Single-coil-latch)	Except ND Type (Nonlatch and Single-coil-latch)
Creepage and clearance of coil to contact is over than 2 mm (According EN60950)	
Supplementary insulation class	Basic insulation class

## ■ PART NUMBERS

### • Nonlatch Type

at 20 °C

Part Number (Standard)	Nominal Coil Voltage (Vdc)	Coil Resistance (Ω) ±10%	Must Operate Voltage* (Vdc)	Must Release Voltage* (Vdc)
EE2-3	3	64.3	2.25	0.3
EE2-4.5	4.5	145	3.38	0.45
EE2-5	5	178	3.75	0.5
EE2-6	6	257	4.5	0.6
EE2-9	9	579	6.75	0.9
EE2-12	12	1028	9.0	1.2
EE2-24	24	2880	18.0	2.4

### • Single Coil Latch Type

at 20 °C

Part Number (Standard)	Nominal Coil Voltage (Vdc)	Coil Resistance (Ω) ±10%	Must Operate Voltage* (Vdc)	Must Release Voltage* (Vdc)
EE2-3S	3	90	2.25	2.25
EC2-4.5S	4.5	202.5	3.38	3.38
EE2-5S	5	250	3.75	3.75
EE2-6S	6	360	4.5	4.5
EE2-9S	9	810	6.75	6.75
EE2-12S	12	1440	9.0	9.0
EE2-24S	24	5760	18.0	18.0

Note \* Test by pulse voltage

\*\* S : Set coil (pin No.1...⊕ , pin No.12...⊖ ) R : Reset coil (pin No.6...⊕ , pin No.7...⊖ )

The latch type relays should be initialized at appointed position before using, and should be energized to specific polarity by above polarity to avoid wrong operation.  
Any special coil requirement, Please contact NEC TOKIN for availability.



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# EE2 Series

## • Double Coil Latch Type\*\* (Can not be driven by reverse polarity for reverse operation)

at 20 °C

Part Number (Standard)	Nominal Coil Voltage (Vdc)	Coil Resistance ( $\Omega$ ) $\pm 10\%$	Must Operate Voltage* (Vdc)	Must Release Voltage* (Vdc)
EE2-3T	3	S 64.3	2.25	–
		R 64.3	–	2.25
EE2-4.5T	4.5	S 145	3.38	–
		R 145	–	3.38
EE2-5T	5	S 178	3.75	–
		R 178	–	3.75
EE2-6T	6	S 257	4.5	–
		R 257	–	4.5
EE2-9T	9	S 579	6.75	–
		R 579	–	6.75
EE2-12T	12	S 1028	9.0	–
		R 1028	–	9.0
EE2-24T	24	S 4114	18.0	–
		R 4114	–	18.0

## • Nonlatch ND Type

at 20 °C

Part Number	Nominal Coil Voltage (Vdc)	Coil Resistance ( $\Omega$ ) $\pm 10\%$	Must Operate Voltage* (Vdc)	Must Release Voltage* (Vdc)
EE2-3ND	3	45	2.25	0.3
EE2-4.5ND	4.5	101	3.38	0.45
EE2-5ND	5	125	3.75	0.5
EE2-6ND	6	180	4.5	0.6
EE2-9ND	9	405	6.75	0.9
EE2-12ND	12	720	9.0	1.2
EE2-24ND	24	2504	18.0	2.4

## • Single Coil Latch ND Type

at 20 °C

Part Number	Nominal Coil Voltage (Vdc)	Coil Resistance ( $\Omega$ ) $\pm 10\%$	Must Operate Voltage* (Vdc)	Must Release Voltage* (Vdc)
EE2-3SND	3	90	2.25	2.25
EE2-4.5SND	4.5	203	3.38	3.38
EE2-5SND	5	250	3.75	3.75
EE2-6SND	6	360	4.5	4.5
EE2-9SND	9	810	6.75	6.75
EE2-12SND	12	960	9.0	9.0
EE2-24SND	24	3388	18.0	18.0

## • Nonlatch NKX Type (High voltage, high solder joint reliability type)

at 20 °C

Part Number	Nominal Coil Voltage (Vdc)	Coil Resistance ( $\Omega$ ) $\pm 10\%$	Must Operate Voltage* (Vdc)	Must Release Voltage* (Vdc)
EE2-3NKX	3	39.1	2.25	0.3
EE2-4.5NKX	4.5	88.0	3.38	0.45
EE2-12NKX	12	626	9.0	1.2

Note \* Test by pulse voltage

\*\* S : Set coil (pin No.1... $\oplus$ , pin No.12... $\ominus$ ) R : Reset coil (pin No.6... $\oplus$ , pin No.7... $\ominus$ )

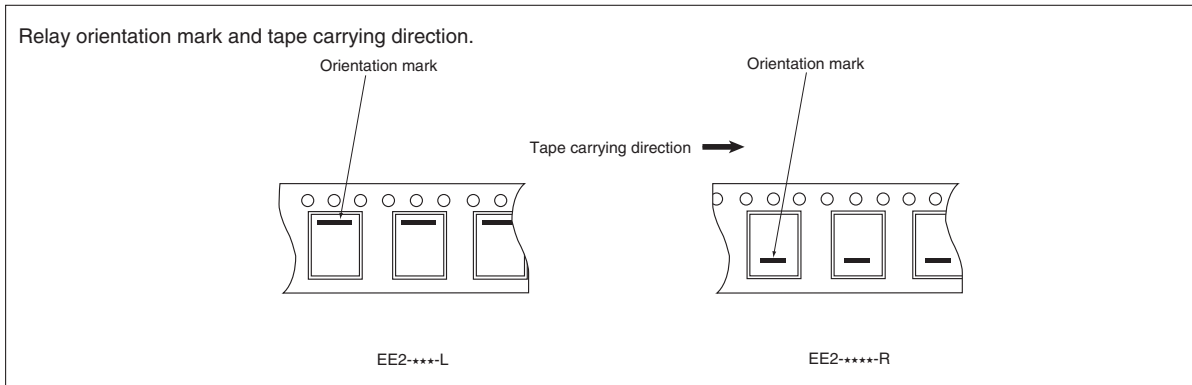
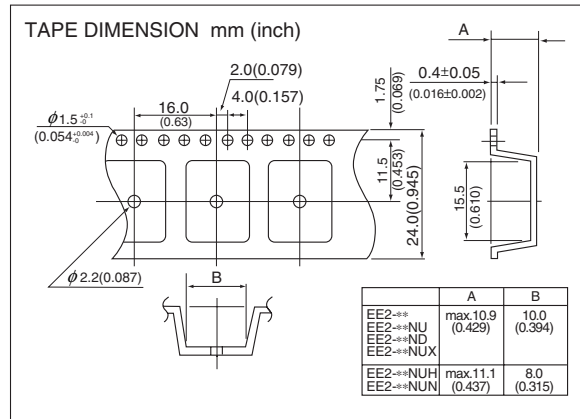
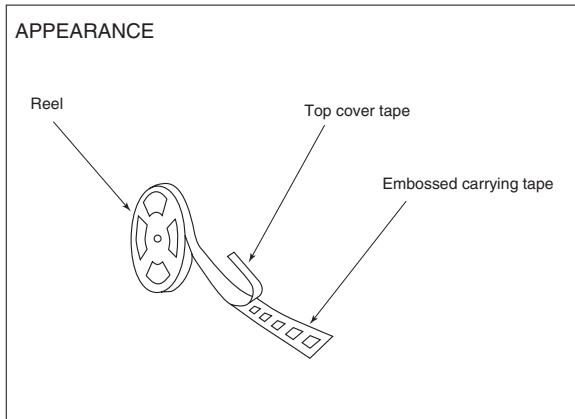
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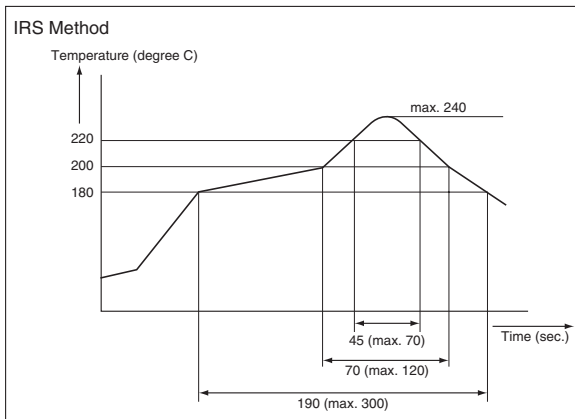
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# EE2 Series

## TAPE PACKAGE (OPTION)



## SOLDERING CONDITION



### Note

1. Temperature profile shows printed circuit board surface temperature on the relay terminal portion.
2. Please check the actual soldering condition to use other method except above mentioned temperature profiles.



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# EC2/EE2 Series

## ■ Recommended relay drive conditions

Drive under conditions. If it is impossible, please inquire to NEC TOKIN.

Nonlatch type	Voltage: within $\pm 5\%$ at nominal voltage	Ambient temperature -40~+85°C
Single coil latch type Double coil latch type	Square pulse (rise and fall time is rapidly) Pulse height: within $\pm 5\%$ at nominal voltage Pulse width: more than 10 ms	

## ■ Technical document

Please confirm technical document before use.

It is able to receive a document at NECTOKIN's World-wide-web site.

(<http://www.nec-tokin.com>)

ITEM	TITLE
Data sheet	EC2 series
	EE2 series
	EC2(ND)/EE2(ND) series
Information	EC2/EE2 series technical data
User's manual	Function and note on correct use
Application note	Application circuit of miniature signal relay



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