

EF2 Series



The new EF2 Series miniature signal relays are designed for use in electronic switching systems, PBXs, terminal equipment, telephone equipment and instrument equipment. This series exhibits 50 mW of ultra low power consumption.

FEATURES

- Low power consumption (50 mW)
- Applicable for the surge voltage standard of FCC (1500 V, 10 x 160 μ s) and BELLCORE (2500 V, 2 x 10 μ s)
- Surface mounting
- Variation of dense mounting type and/or long-joint-life type for latest SMT
 - Compatible configuration and terminal allocation with dense mounting type of EE2 series
 - Upgraded soldering joint reliability between the relay terminal and PCB by optimization of the terminal configuration; 20-year-joint-life under 35°C-per-day-temperature-difference specified in IPC-SM-785 for telecommunication equipment

SPECIFICATIONS

Contact Form		2 Form C	
Contact Ratings	Maximum switching power	30 W (resistive)	62.5 VA (resistive)
	Maximum switching voltage	220 Vdc	250 Vac
	Maximum switching current	1 A	
	Maximum carrying current	2 A	
Minimum Contact Ratings		100 mVdc, 100 μ A *4	
Initial Contact Resistance		50 mOhm typical (Initial)	
Contact Material		Silver alloy with gold alloy overlay	
Nominal Operating Power	Non-latch type	50 to 70 mW	
	Single coil latch type	30 to 80 mW	
	Double latch type	50 to 80 mW	
Operate Time (Excluding bounce)		Approximately 3 ms	
Release Time (Excluding bounce)		Approximately 3 ms	
Insulation Resistance		1000 MOhm at 500 Vdc	
Breakdown Voltage	Between open contacts	1000 Vac for one minute (1500 V surge, 10 x 160 μ s *1)	
	Between adjacent contacts		
	Between coil and contact	Non-latch type and single-coil latch type 1500 Vac for one minute (2500 V surge, 2 x 10 ms *2) Double-coil latch type 1000 Vac for one minute (1500 V surge, 10 x 160 ms *1)	
Shock Resistance		735 m/s ² (75 G) (misoperating) 980 m/s ² (100G) (destructive failure)	
Vibration Resistance		10 to 55 Hz, double amplitude 3 mm (20 G) (misoperating) 10 to 55 Hz, double amplitude 5 mm (30 G) (destructive failure)	
Ambient Temperature		Non-latch type (Additional "N"): -40 to +85°C Non-latch type (Standard): -40 to +70°C Latch type : -40 to +70°C	
Coil Temperature Rise		7 degrees at nominal coil voltage (50 mW)	
Running Specifications	Nonload	1 x 10 ⁸ *3 operations (Non-latch type)	
		1 x 10 ⁷ operations (Latch type)	
	Load	50 Vdc, 0.1 A (resistive), 1 x 10 ⁶ operations at 70°C	
		10 Vdc, 10 mA (resistive), 1 x 10 ⁶ operations at 70°C	
Weight		Approximately 2.2 grams	

*1 rise time: 10 μ s, fall time: 160 μ s

*2 rise time: 2 μ s, fall time :10 μ s

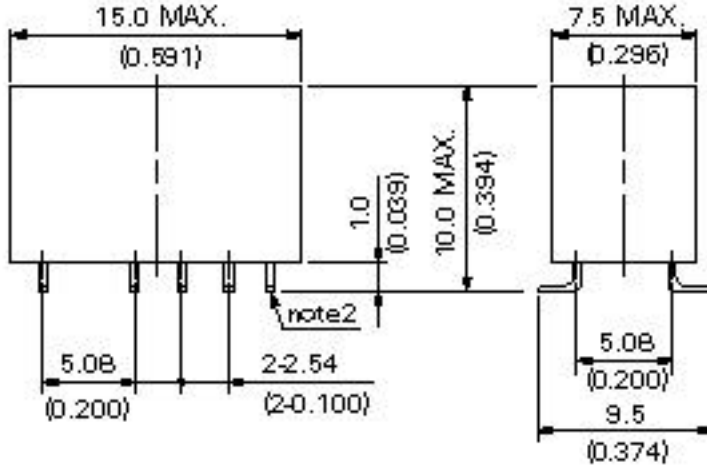
*3 This shows a number of operations where it can be running by which a fatal is not caused, and number of operations by which a steady characteristic is maintained is 1 x 10⁷ times.

*4 This value is a reference value in the resistive load. Minimum capacity changes depending on switching frequency and environment temperature and the load.

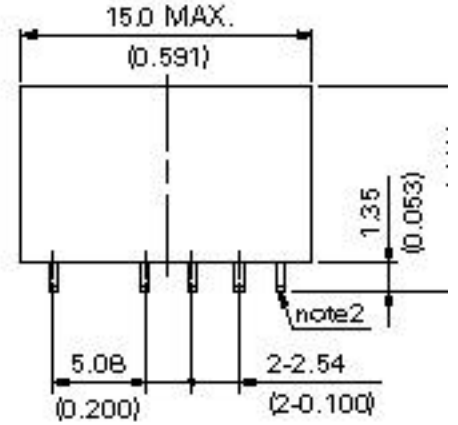
DIMENSIONS

mm (inch)

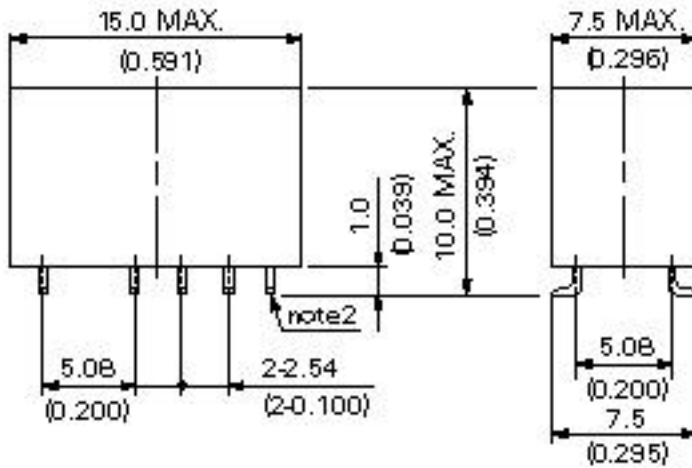
EF2-.. EF2-..NU



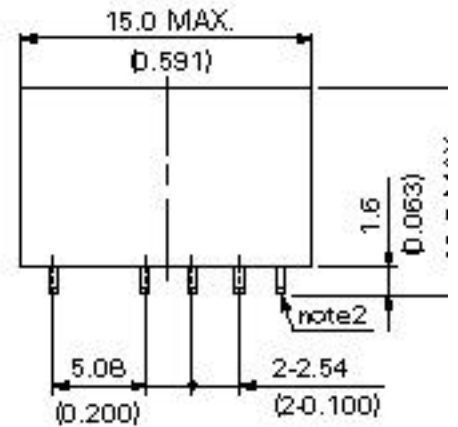
EF2-..NUX



EF2-..NUH



EF2-..NUN

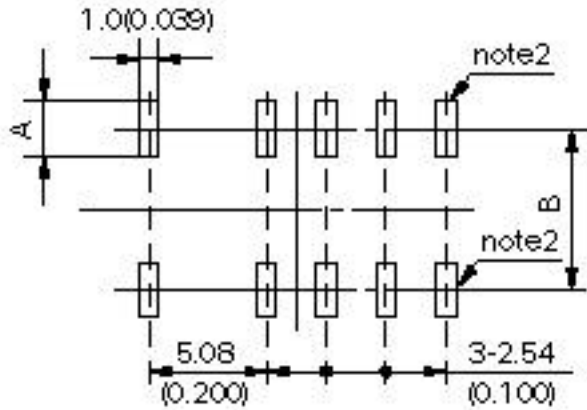


Note 1. General tolerance : ± 0.2 (± 0.008)

Note 2. This pair of pins at the right end applies to double coil latch type only.

PAD LAYOUT

(bottom view) mm (inch)



(Bottom view)

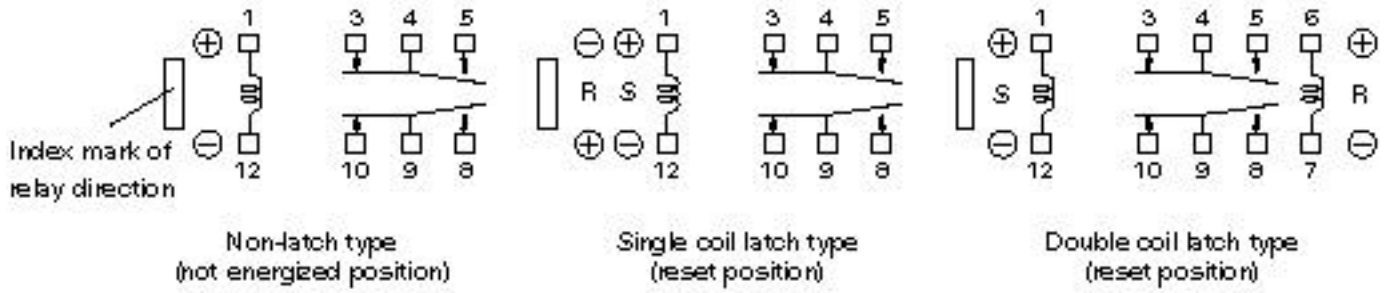
Type	A	B
EF2-..	3.0 {0.118}	7.29 {0.287}
EF2-..NU	3.0 {0.118}	7.29 {0.287}
EF2-..NUX	2.73 {0.107}	7.02 {0.276}
EF2-..NUH	2.0 {0.079}	6.29 {0.248}
EF2-..NUN	2.0 {0.079}	6.29 {0.248}

Note 1. General tolerance : ± 0.1 (± 0.004)

Note 2. This pair of pads at the right end applies to double coil latch type only.

SCHEMATICS

(bottom view)



S: Coil polarity of set (operate)
R: Coil polarity of reset (release)

PART NUMBER SYSTEM

EF2-5 SNUH

① ②③ ④

① Relay Series

② Nominal Coil Voltage

1.5, 3, 4.5, 5, 6, 9, 12, 24 V

③ Latch type

Blank: Non-Latch Type (Note 2)

S: Single Coil Latch Type

T: Double Coil Latch Type

④ Identifier

Blank: Standard Type

NU: UL Recognized, CSA Certified Type

NUX: High solder joint reliability (20 years)

NUH: Minimum footprint (7.5 x 15)

NUN: High solder joint reliability with minimum footprint

(UL, CSA : Under application for latch type)

Note 1. There are two specifications in the operating voltage of the non-latch type relay.

	Part Number	Must Operate Voltage
Additional "N" type	ED2-*NU -*NJ	75%
Standard type	ED2-*	80%

* : Nominal coil voltage

Note 2. There are two specifications in the operating voltage of the non-latch type relay.

	Part Number	Must Operate Voltage
Additional "N" type	ED2-*NU -*NUX -*NUH -*NUN	75%
Standard type	EF2-*	80%

* : Nominal coil voltage

NOMINAL LINEUP

Non-Latch Type (Standard) at 20°C

Nominal Coil Voltage (Vdc)	Coil Resistance (Ohm) ±10%	Must Operate Voltage (Vdc)	Must Release Voltage (Vdc)	Nominal Operate Power (mW)
1.5	45	1.2	0.15	50
3	180	2.4	0.3	50
4.5	405	3.6	0.45	50
5	500	4	0.5	50
6	720	4.8	0.6	50
9	1473	7.2	0.9	55
12	2400	9.6	1.2	60
24	8229	19.2	2.4	70

Non-Latch Type (Additional “N”) at 20°C

Nominal Coil Voltage (Vdc)	Coil Resistance (Ohm) ±10%	Must Operate Voltage (Vdc)	Must Release Voltage (Vdc)	Nominal Operate Power (mW)
1.5	45	1.13	0.15	50
3	180	2.25	0.3	50
4.5	405	3.38	0.45	50
5	500	3.75	0.5	50
6	720	4.5	0.6	50
9	1473	6.75	0.9	55
12	2400	9.0	1.2	60
24	8229	18.0	2.4	70

Single-Coil Latch Type at 20°C

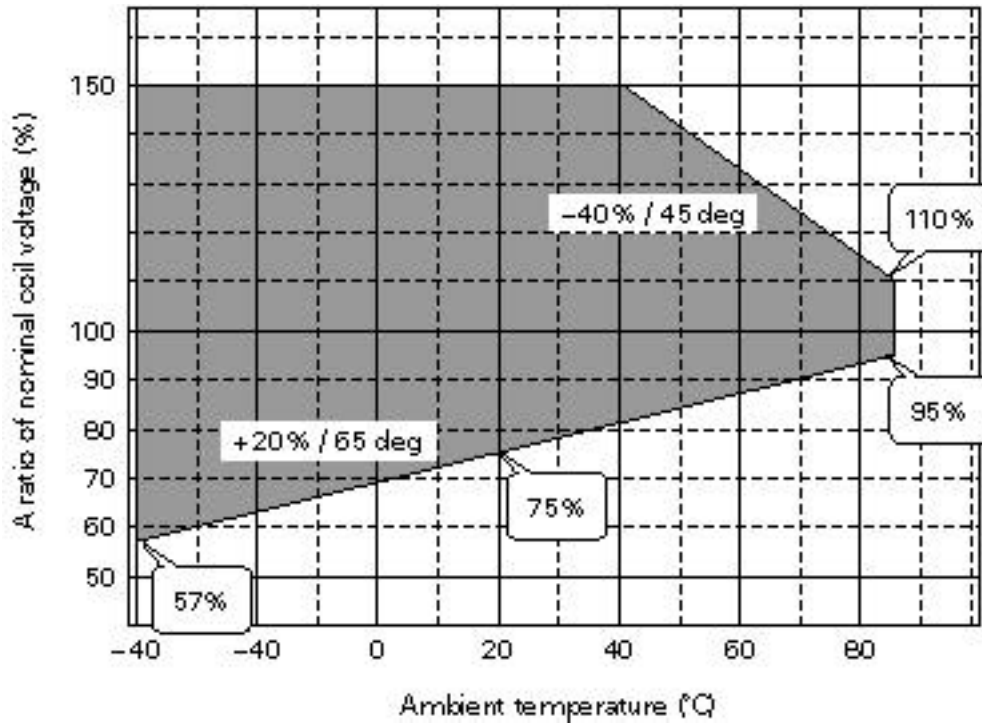
Nominal Coil Voltage (Vdc)	Coil Resistance (Ohm) ±10%	Must Operate Voltage (Vdc)	Must Release Voltage (Vdc)	Nominal Operate Power (mW)
1.5	75	1.2	1.2	30
3	300	2.4	2.4	30
4.5	675	3.6	3.6	30
5	833	4	4	30
6	1200	4.8	4.8	30
9	2700	7.2	7.2	30
12	4800	9.6	9.6	30
24	7200	19.2	19.2	80

Double Coil Latch Type at 20°C

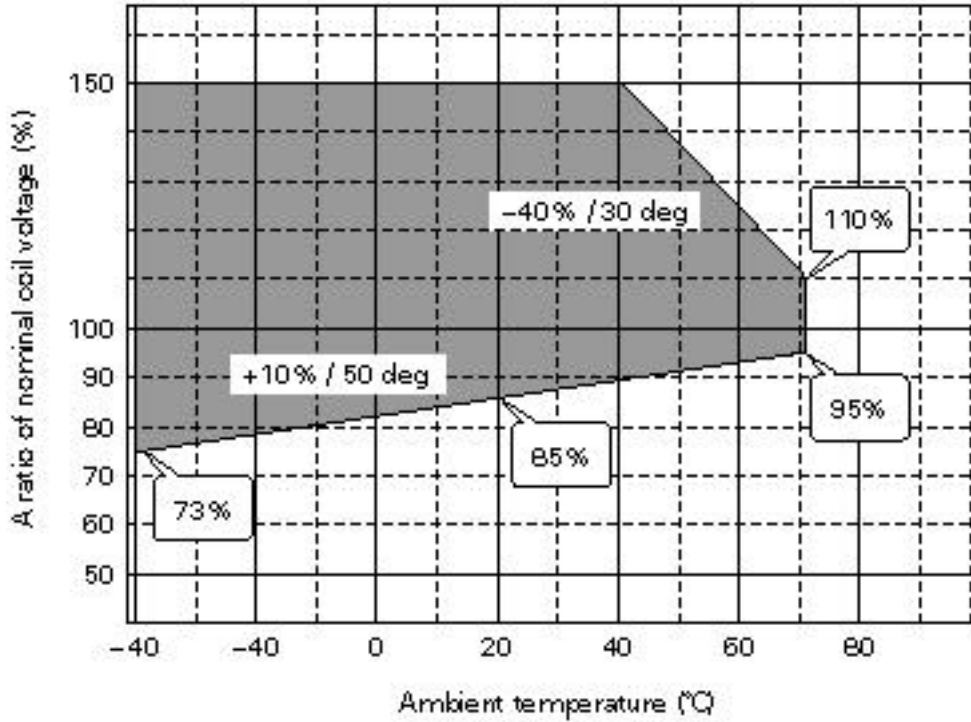
Nominal Coil Voltage (Vdc)	Coil Resistance (Ohm) ±10%	Must Operate Voltage (Vdc)	Must Release Voltage (Vdc)	Nominal Operate Power (mW)
1.5	S 45 R 45	1.2 -	- 1.2	50
3	S 180 R 180	2.4 -	- 2.4	50
4.5	S 405 R 405	3.6 -	- 3.6	50
5	S 500 R 500	4 -	- 4	50
6	S 720 R 720	4.8 -	- 4.8	50
9	S 1620 R 1620	7.2 -	- 7.2	50
12	S 2880 R 2880	9.6 -	- 9.6	50
24	S 7200 R 7200	19.2 -	- 19.2	80

Recommended Coil Voltage with Ambient Temperature

Non-Latch Type (Additional "N")



Latch Type



SAFETY STANDARD AND RATING

UL Recognized (UL508)* File No. E73266	CSA Certified (CSA C22.2 No. 14) File No. LR46266
30 Vdc, 1 A (Resistive) 110 Vdc, 0.3 A (Resistive) 125 Vac, 0.5 A (Resistive)	

* Spacing: UL114, UL478

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