

The Specification of EC2 Relay

ERCS17-058-4

August 21, 2020

EM Devices Corporation

1. Preface

This report describes the specification of EC2 relays.

Field Application Engineering Department
Global Sales Division

Prepared

Checked

Approved

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GENERAL SPECIFICATIONS

Items	Specifications (Initial)		
Contact Form	-		2 Form C
RoHS	-		Compliant ^{*1}
Contact Material	-		Silver alloy with gold alloy overlay
Contact Ratings	Max. Switching Power	-	60W ^{*2} , 62.5VA
	Max. Switching Voltage	-	220Vdc, 250Vac
	Max. Switching Current	A	2
	Max. Carrying Current	A	2
Minimum Contact Ratings	-		10mVdc, 10microAmps ^{*3}
Initial Contact Resistance	m-Ohm		Max. 75 (Initial)
Operate Time (Excluding Bounce)	ms		Approx. 2
Set Time (Excluding Bounce)			
Reset Time (Excluding Bounce)			
Release Time (Excluding Bounce)	ms		Approx. 1 without diode
Insulation Resistance	M-Ohm		1000 at 500Vdc
Withstand Voltage	Between Open Contacts	-	1000 Vac (for one minute)
	Between Adjacent Contacts		1500 V surge (10x160 μ s ^{*4})
	Between Coil to Contacts	-	[Non-latch, Single coil latch type] 1500 Vac (for one minute) 2500 V surge (2x10 μ s ^{*5})
			[Double coil latch type] 1000 Vac (for one minute) 1500 V surge (10x160 μ s ^{*4})
Shock	Misoperating	m/s ²	735
Resistance	Destructive Failure	m/s ²	980
Vibration Resistance	Misoperating	-	10 to 55 Hz at double amplitude 3mm
	Destructive Failure	-	10 to 55 Hz at double amplitude 5mm
Ambient Temperature	degree C		-40 to +85
Coil Temperature Rise	degree		18 at nominal coil voltage (140mW)
Running Specifications	Non Load		Operations 100 million ^{*6} (Non-latch type) 10 million (latch type)
	Load	50Vdc, 0.1A, Resistive	Operations 1 million at 85 deg C, 5Hz
		10Vdc, 10mA, Resistive	Operations 1 million at 85 deg C, 2Hz
Weight	Grams		Approx. 1.9

*1 (EU) 2015/863 - Restriction of Hazardous Substance

*2 We recommend the switching power of the contacts to a maximum of 30W to maintain the reliability of the relay.

*3 This value is a reference value in the resistance load. Minimum contact rating depends on switching frequency and environment temperature and the load.

*4 rise time: 10 μ s, decay time to half crest: 160 μ s

*5 rise time: 2 μ s, decay time to half crest: 10 μ s

*6 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 10 million times.

COIL SPECIFICATIONS

Non-latch Type

at 20 °C

Nominal Coil Voltage (VDC)	Coil Resistance (Ω)±10%	Must Operate Voltage (VDC)	Must Release Voltage (VDC)	Nominal Operating Power (mW)
3	64.3	2.25	0.3	140
4.5	145	3.38	0.45	140
5	178	3.75	0.5	140
9	579	6.75	0.9	140
12	1028	9.0	1.2	140
24	2880	18.0	2.4	200

Single Coil Latch Type

at 20 °C

Nominal Coil Voltage (VDC)	Coil Resistance (Ω)±10%	Set Voltage* (VDC)	Reset Voltage* (VDC)	Nominal Operating Power (mW)
3	90	2.25	2.25	100
4.5	202.5	3.38	3.38	100
5	250	3.75	3.75	100
9	810	6.75	6.75	100
12	1440	9.0	9.0	100
24	5760	18.0	18.0	100

Double Coil Latch Type

at 20 °C

Nominal Coil Voltage (VDC)	Coil Resistance (Ω)±10%	Set Voltage** (VDC)	Reset Voltage** (VDC)	Nominal Operating Power (mW)
3	S: 64.3	2.25	-	140
	R: 64.3	-	2.25	
4.5	S: 145	3.38	-	140
	R: 145	-	3.38	
5	S: 178	3.75	-	140
	R: 178	-	3.75	
9	S: 579	6.75	-	140
	R: 579	-	6.75	
12	S: 1028	9.0	-	140
	R: 1028	-	9.0	
24	S: 4114	18.0	-	140
	R: 4114	-	18.0	

Non-latch High insulation Type

at 20 °C

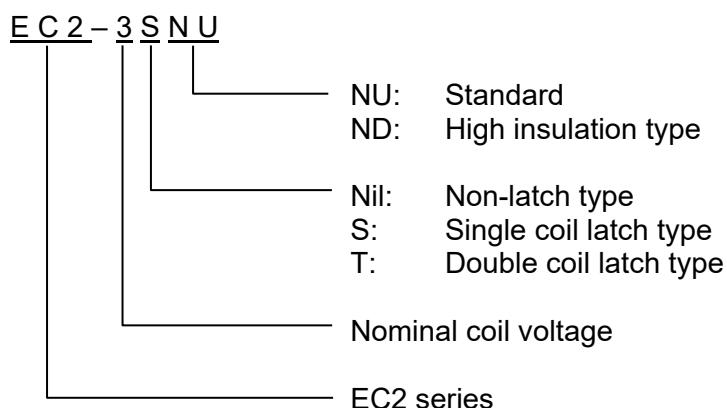
Nominal Coil Voltage (VDC)	Coil Resistance (Ω)±10%	Must Operate Voltage (VDC)	Must Release Voltage (VDC)	Nominal Operating Power (mW)
3	45	2.25	0.3	200
4.5	101	3.38	0.45	200
5	125	3.75	0.5	200
9	405	6.75	0.9	200
12	720	9.0	1.2	200
24	2504	18.0	2.4	230

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.

PART NUMBER SYSTEM



SEFETY STANDARD AND RATING

UL Recognized (UL508) File No. E73266	CSA Certificated (CSA C22.2 No.14) File No. LR46266
30 VDC, 2 A (Resistive) 110 VDC, 0.3 A (Resistive) 125 VAC, 0.5 A (Resistive)	

TUV Certificate	
(IEC61810/ EN61810)	(EN61810)
No. R 9750561	No. R 9751153
ND Type	NU Type (Non-latch and Single coil latch)
Creepage and clearance of coil to contact is more than 2 mm. (According to EN60950)	
Supplementary insulation class	Basic insulation class

SOLDERING TEMPERATURE CONDITION

1. Automatic soldering

Preheating: 110~ 120°C /110 sec. (max.)

Solder temperature: 260°C max.

Solder time: 5 seconds max.

Note: EM Devices recommends cooling down a printed circuit board less than 110°C within 40 seconds after soldering.

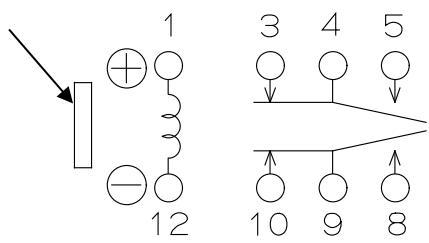
2. Manual soldering

Solder temperature: 350°C max.

Solder time: 3 seconds max.

PIN CONFIGURATIONS (Bottom View)

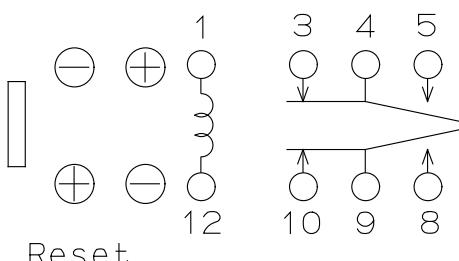
Direction mark



Note: not energized position

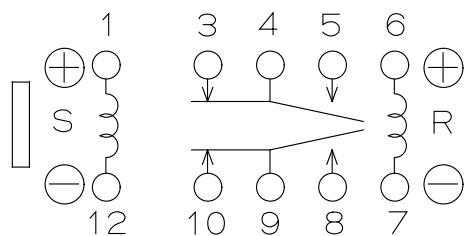
Non-latch type

Set



Note: Reset position

Single coil latch type



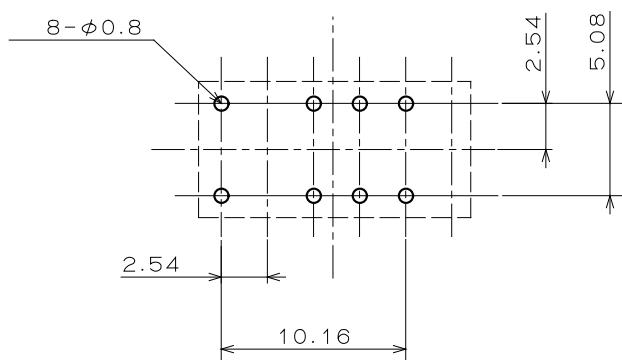
S: Set Coil
R: Reset Coil

Note: Reset position

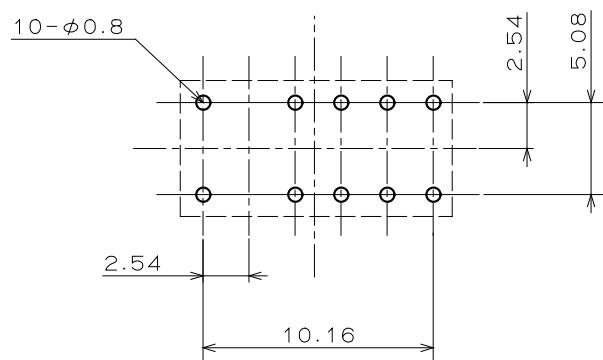
Double coil latch type

PADLAYOUT

Unit: mm



Non-latch, Single coil latch type



Double coil latch type

Note: Tolerance ± 0.1 unless otherwise specified

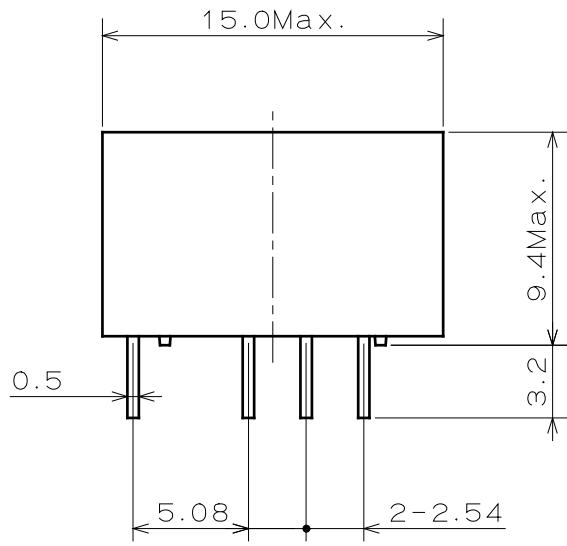
DIMENSIONS AND MARKINGS

Unit: mm

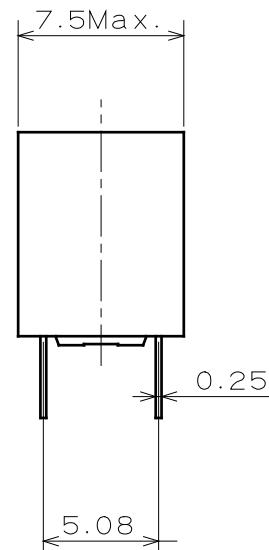
Direction mark



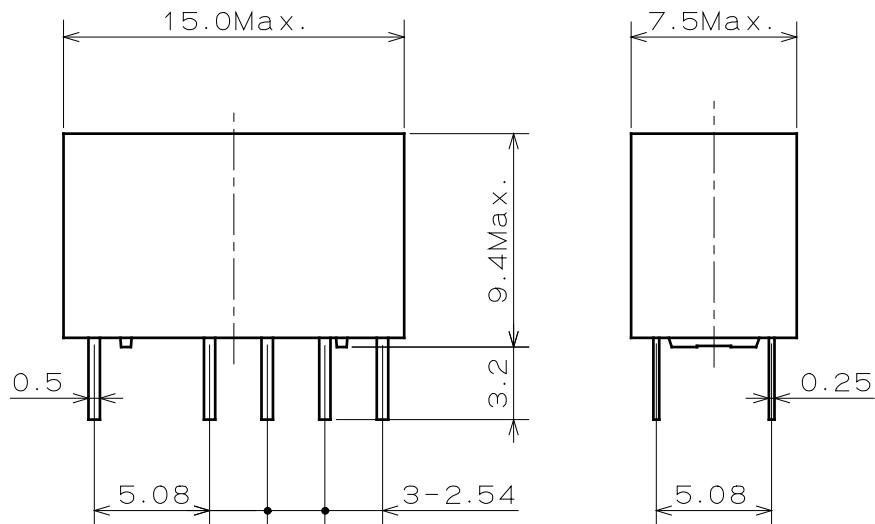
Except ND Type



ND Type (High insulation)



Non-latch, Single coil latch type

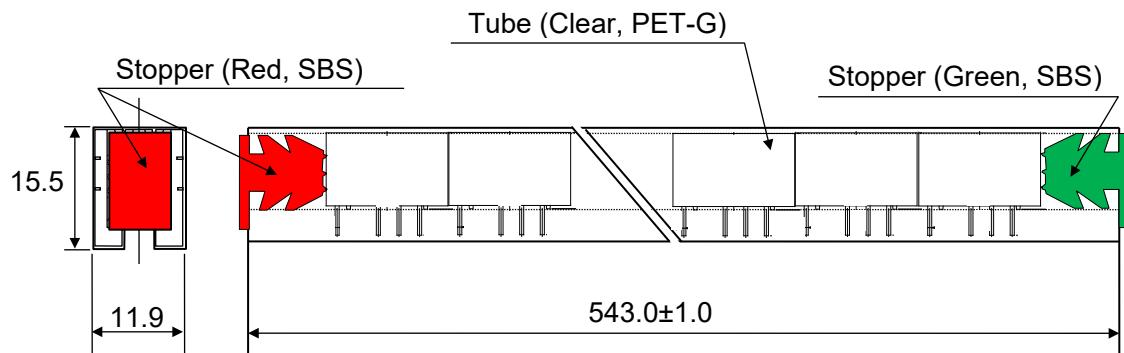


Double coil latch type

Note: Tolerance is ± 0.2 mm unless otherwise specified.

PACKAGE

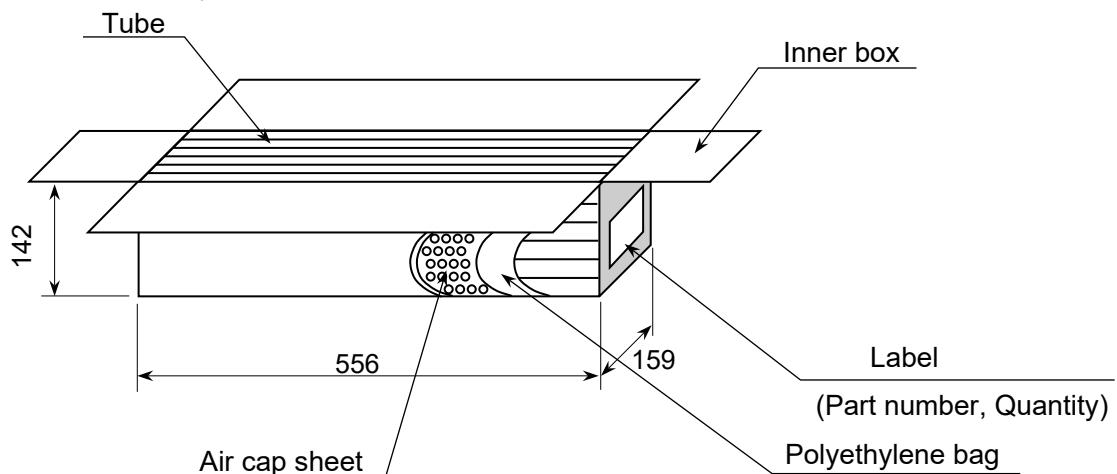
Tube (unit: mm)



Note: When the number of relays is less than regular quantity, the relays are fixed by pushing in the one side stopper or inserting a styrene form in the tube.

Inner Box (unit: mm)

The air cap sheet is laid along the bottom of inside, and the tubes are packed in polyethylene bag. "Part number", "Quantity", and "Care mark" should be indicated on the surface of outer box.



Regular Quantity

	EC2
Tube	35 pcs.
Inner Box	3,360 pcs.