


EF Series

20A Miniature, Power PC Board Relay RoHS Compliant

Applications : Air Conditioners, Washing Machine, Dish Washer

 File No. E58304

 File No. R 50117320

Users should thoroughly review the technical data before selecting a product part number. It is recommended that user also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

■ Features

- 1 pole 20A, 1 NO contact.
- Low height max. 20.0mm (max. 30.0mm with quick connect terminal).
- Ambient temperature 85°C (100Kops at 20A/250VAC).
- #250 Quick connect terminal direction for space saving.
- Meet 4,000VAC dielectric voltage between coil and contacts.
- RoHS compliant (Directive 2002/95/EC).
- UL coil insulation system Class155(F).

■ Contact Ratings @ 23°C

Safety Standard Approval	Contact Ratings
UL and TUV	20A, 250VAC, resistive
TUV	80A Inrush $\cos \phi = 0.7, 0.3s, 250VAC$
	20A Steady $\cos \phi = 0.9, 1.2s, 250VAC$
UL	1HP 277VAC; 30,000ops 85C

Max. Switching Power	5,000VA
Max. Switching Voltage	250VAC
Max. Switching Current	20A

■ Coil Ratings @ 23°C

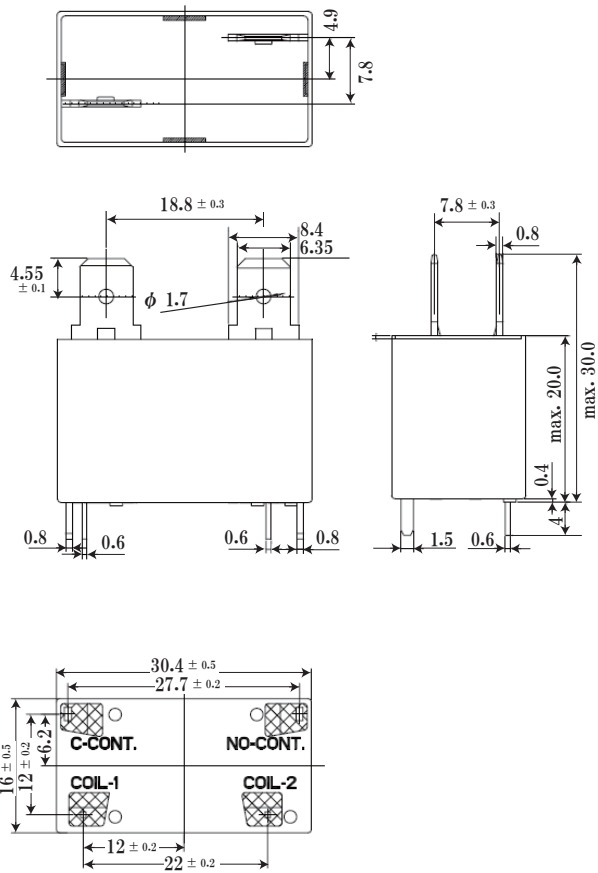
Rated Voltage	Must Operate Voltage	Must Release Voltage	Limiting Voltage	Rated Coil Power (Approx.)
5 - 48 VDC	75% max. of rated voltage	5% min. of rated voltage	130% of rated voltage	900mW

Coil Data				
Rated Coil Voltage (VDC)	Rated Current (mA)	Coil Resistance (ohms) $\pm 10\%$	Must Operate Voltage (VDC)	Must Release Voltage (VDC)
5	178.6	28	3.75	0.25
6	150.0	40	4.50	0.30
9	100.0	90	6.75	0.45
12	75.0	160	9.0	0.6
18	50.0	360	13.5	0.9
24	37.5	640	18.0	1.2
48	18.8	2,560	36.0	2.4

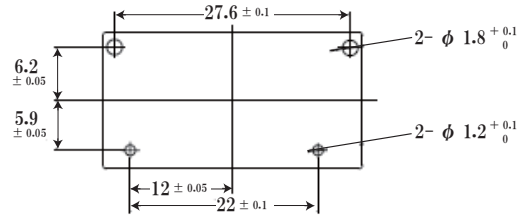
■ Specification

Item	Specifications	
Contact	Arrangements	1a (1 Form A)
	Material	AgSnO
	Minimum Load	100mA, 5VDC (reference data)
	Initial Contact Resistance	100m Ω @1A 6VDC
Mounting	PC Board	
Enclosure	Flux Proof (RTII)	
Operate Time	20ms max.	
Release Time	10ms max.	
Insulation	Initial Insulation Resistance Between Mutually Insulated Elements :	1,000M ohms min. @500VDC
	Initial Dielectric Strength Between Open Contacts :	1,000VAC 50/60Hz (1 min)
	Between Coil and Contacts :	4,000VAC 50/60Hz (1 min)
	Clearance/Creepage Between coil and contacts :	min. 6mm/6mm
	Surge Voltage Between Coil and Contacts :	8,000V (1.2/50 μ s)
	Tracking Index of Relay Base	PTI 250
	Insulation to IEC 60664-1 - Type of Insulation Between Coil and Contacts :	basic
Between Open Contacts :	basic	
- Rated Insulation Voltage	250V	
- Pollution Degree	2	
- Rated Voltage System	230/400V	
- Overvoltage Category	II	
Endurance	Mechanical	5 million ops (@ no load, 300 ops. per min.)
	Electrical	100,000 ops. (@ 20A 250VAC, resistive, 85°C, 6 ops. per min.)
		100,000 ops. (@ 80A Inrush $\cos \phi = 0.7, 0.3s,$ 20A steady $\cos \phi = 0.9, 1.2s,$ room temperature, 20 ops. per min.)
Vibration Resistance	Function : 10 ~ 50Hz, 1.5mm double amplitude Destruction : 10 ~ 50Hz, 1.5mm double amplitude	
Shock Resistance	Function : 980m/s ² (Half-sine wave of 6ms) Destruction : 98m/s ² (Half-sine wave of 11ms, permitted duration 1ms)	
Ambient Temperature Range	-40°C ~ + 85°C (with no icing or condensation)	
Operating Humidity	20 ~ 85%RH (with no condensation)	
Weight	Approx. 18g	

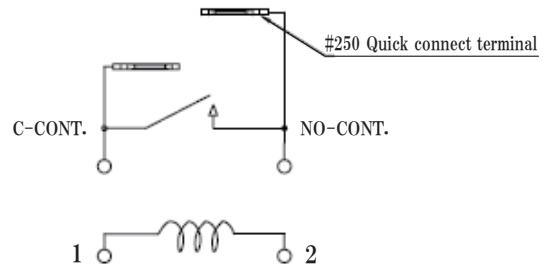
Outline Dimensions (unit : mm)



PC Board Layouts (Bottom View)



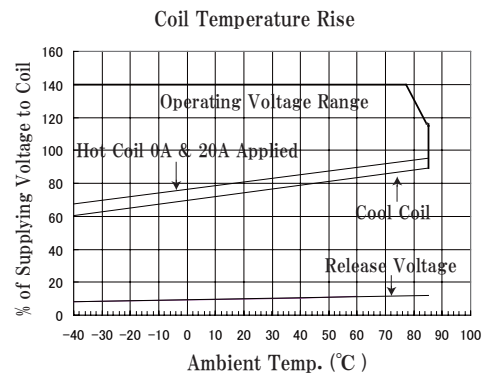
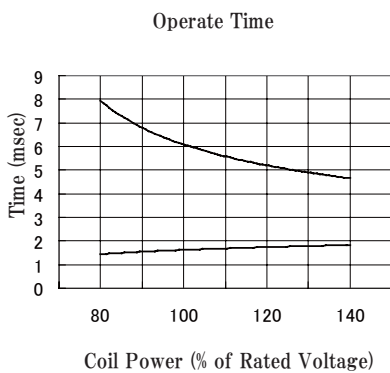
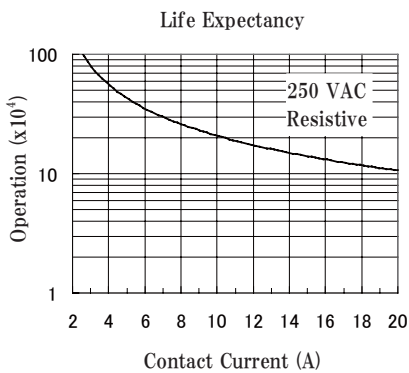
Wiring Diagram (Bottom View)



* Refer to below table for any tolerance not specified in the dimension.

	Tolerance
0.99mm max.	± 0.1mm
1 - 2.99mm	± 0.2mm
3mm min.	± 0.3mm

Reference Data



■ Ordering Information

Typical Part Number →

E F | **0 0** - **1** | **A** | **2** - **D** | **0 1 2** - **F**

1. Product Family

EF = 20A Miniature, Power PC Board Relay

2. Sub-Product Family

00 = Standard type

3. Poles

1 = 1 pole

4. Contact Arrangement

A = 1a (1 Form A)

5. Contact Material

2 = AgSnO

6. Coil Version

D = DC standard 900 mW

7. Coil Voltage

005 = 5VDC 018 = 18VDC
 006 = 6VDC 024 = 24VDC
 009 = 9VDC 048 = 48VDC
 012 = 12VDC

8. Sealing Level

F = Flux Proof (RTII)

■ Ordering Information

Description	Type	Poles	Contact Arrangement	Coil Material	Coil Version	Coil Voltage	Sealing Level	Part Number
EF00-1A2-D012-F	Standard Type	1	1a	AgSnO	DC Standard	12 VDC	Flux Proof	1649659-4
EF00-1A2-D024-F					900mW	24 VDC	(RTII)	1649659-6

*Please contact us on parts that are not on the list.