

# POWER RELAY 1 POLE - 5A Medium Load Control

# **VE Series**

#### **■ FEATURES**

- UL, CSA, VDE, CQC recognized
- 1 form A (SPST-NO) or 1 form C (SPDT) contact
- Low cost, miniature relay with big performance in smal package
  - Higher surge voltage type is available (6,000 V)
  - 2,000 VAC between coil and contacts
- Slim type—meets high density mounting requirements
- Wide operating range
- Easy circuit design with completely separated terminal arrangement (coil and contact terminals)
- Plastic sealed type, RTIII
- Creepage min. 3.2 mm
- RoHS compliant.

Please see page 6 for more information



### ■ PARTNUMBER INFORMATION

	VE	-	12	Н	M	S	E	-	K	-	HV	- '	VD
[Example]	(a)	(*)	(b)	(c)	(d)	<u>(e)</u>	(f)		(g)		(h)		(i)

(a)	Relay type	VE	: VE Series
(b)	Coil rated voltage	12	: 548VDC Coil rating table at page 3
(c)	Contact rating	Н	: Heavy duty type
(d)	Contact configuration	Nil M	: 1 form C (SPDT) : 1 form A (SPST-NO)
(e)	Coil type	Nil S	: Standard type (360mW) : High sensitive type (250mW)
(f)	Contact material	Nil E 5	: Gold overlay silver-nickel (N.C.: 3A, N.O.: 5A) : Silver-nickel (N.C.: 3A, N.O.: 5A) : Silver cadmium oxide (N.C.: 5A, N.O.: 5A)
(g)	Enclosure	К	: Plastic sealed type, RTIII
(h)	Surge strength	Nil HV	: Standard type (4,000V) : High dielectric strength type (6,000V)
(i)	Approvals	VD	: UL, CSA, VDE approved type

Note: Actual marking omits the hyphen (-) of (\*)

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## ■ SPECIFICATION

			VE-( ) HM(S)E-K VE-( ) HM(S)-K	VE-( ) H(S)E-K VE-( ) H(S)-K	VE-( ) HM(S)5-K	VE-( ) H(S)5-K		
Contact Data	Configuration	1 form A (SPST-NO)	1 form C (SPDT)	1 form A (SPST-NO) 1 form C (SPE				
	Construction	Single						
	Material	Gold overlay silver nickel, silver nickel, silver-cadmium oxide alloy (AgNi + Au, AgNi, AgCd)						
	Resistance (initial) (at 6 VDC,	Max. 70mOhm (VE-HM, H) Max. 100mOhm (VE-HME, HE)  Max. 200mOhm						
	Contact rating (resistive)	5A, 250VAC	5A, 250VAC (N.O.) 3A, 250VAC (N.C.)	5A, 250VAC				
	Max. carrying current		7A					
	Max. switching voltage		250VAC, 150 VD	0				
	Max. switching power	1,250VA	1,250VA (N.O.) 750VA (N.C.)	1,250VA				
	Max. switching current	Max. switching current		5A (N.O.) 3A (N.C.)	5A			
	Min. switching load *		10 mA, 5 VDC (VE-HM, H), 100 mA 5 VDC (VE-HME, HE, HM5, H5)					
Life	Mechanical		Min. 10 x 10 <sup>6</sup> operations					
	Electrical (at rating)		Min. 100 x 10 <sup>3</sup> operations Standard type  Min. 50 x 10 <sup>3</sup> operations High sensitive type					
Coil Data	Rated power (at 20 °C)	360 mW standard	l type, 250 mW hi	gh sensitive type				
	Operate power (at 20 °C)	ver (at 20 °C)		177 mW standard type, 130 mW high sensitive type				
	Operating temperature range		Standard: -40 °C to +85 °C High sensitivity: -40 °C to +90 °C (no frost)					
Timing Data	Operate (at nominal voltage)		Max. 10 ms (without bounce)					
	Release (at nominal voltage)		Max. 5 ms (no diode)					
Insulation	Resistance (initial)	Min. 1,000MOhm at 500VDC						
	Dielectric strength	Open contacts	1,000VAC 1min.	750VAC 1min.	1,000VAC 1min.	750VAC 1min.		
	Contacts to coil		2,000VAC, 1min					
	Surge strength Coil to contacts		Standard: 4,000V / High sensitive: 6,000V, 1.2 x 50µs standard wave					
Other	Vibration resistance Misoperation Endurance		10 to 55Hz double amplitude 3.3 mm					
			10 to 55Hz double amplitude 3.3 mm					
	Shock Misoperation Endurance		Min. 100m/s <sup>2</sup> (11 ± 1ms)					
			Min. 500m/s <sup>2</sup> (6 ± 1ms)					
	Weight	Approximately 8 g						
	Sealing	Plastic sealed RTIII						

<sup>\*</sup> Minimum switching loads mentioned above are reference values. Please perform the confirmation test with actual load before production since reference values may vary according to switching frequencies, environmental contions and expected reliability levels.

## **■ COIL RATING**

Standard type (360 mW)

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ohm)	Must Operate Voltage (VDC) *	Must Release- Voltage (VDC) *	Rated Power (mW)
5	5	69	3.5	0.25	
6	6	100	4.2	0.3	
9	9	225	6.3	0.45	
12	12	400	8.4	0.6	360
18	18	900	12.6	0.9	
24	24	1,600	16.8	1.2	
48	48	6,400	33.6	2.4	

## High sensitive type (250 mW)

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ohm)	Must Operate Voltage (VDC) *	Must Release- Voltage (VDC) *	Rated Power (mW)
5	5	100	3.6	0.25	
6	6	145	4.3	0.3	
9	9	325	6.5	0.45	
12	12	575	8.6	0.6	250
18	18	1,300	13	0.9	
24	24	2,310	17.3	1.2	
48	48	9,220	34.7	2.4	

Note: All values in the table are valid for 20°C and zero contact current.

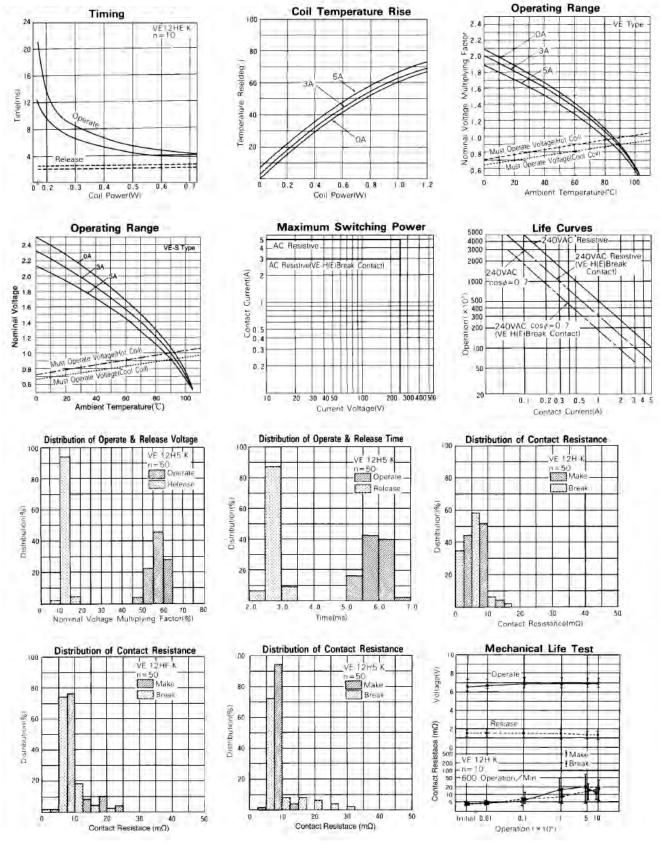
## ■ SAFETY STANDARDS

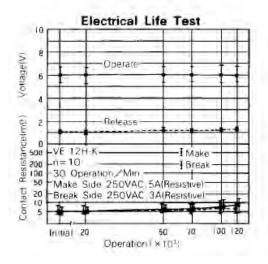
Туре	Compliance	Contact rating				
UL	UL 508	Flammability: UL 94-V0 (plastics)				
004	E 56149, E 45026	VE-( )-H: 5A, 250VA/30VDC (N.O. resistive)				
CSA	C22.2 No. 14 LR 35579	3A, 250VAC (N.C. resistive) 5A, 30VDC (N.C. resistive) 1/14 HP, 250VAC /125VAC VE-( )-HM 5A, 250VAC/30VDC (resistive) 1/12 HP, 250VAC /125VAC VE-( )-H5 5A, 250VAC/30VDC (N.O. resistive) 1/10 HP, 250VAC /125VAC (N.O. resistive) 5A, 250VAC/30VDC (N.C. resistive) 1/14 HP, 250VAC /125VAC (N.C. resistive) VE-( )-HM5 5A, 250VAC/30VDC (resistive) 1/10 HP, 250VAC /125VAC				
VDE	0435 part 201 40017070	5A, 250VAC, cos φ 1 3A, 250VAC, cos φ 1				

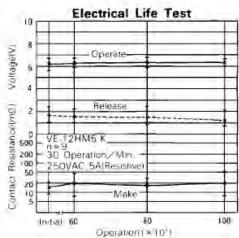
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<sup>\*</sup> Specified operate values are valid for pulse wave voltage.

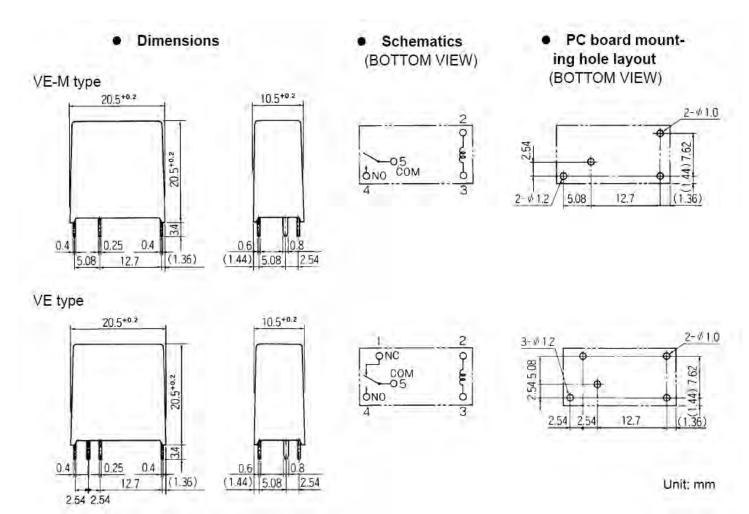
#### ■ CHARACTERISTIC DATA / REFERENCE DATA







## DIMENSIONS



## **RoHS Compliance and Lead Free Information**

### 1. General Information

- All signal and power relays produced by Fujitsu Components are compliant with RoHS directive 2002/95EC including amendments.
- Cadmium as used in electrical contacts is exempted from the RoHS directives on October 21st, 2005. (Amendment to Directive 2002/95/EC)
- All of our signal and power relays are lead-free. Please refer to Lead-Free Status Info for older date codes at: http://www.fujitsu.com/us/downloads/MICRO/fcai/relays/lead-free-letter.pdf
- Lead free solder plating on relay terminals is Sn-3.0Ag-0.5Cu, unless otherwise specified. This material has been verified to be compatible with PbSn assembly process.

## 2. Recommended Lead Free Solder Profile

• Recommended solder Sn-3.0Ag-0.5Cu.

#### Flow Solder condition:

Pre-heating: maximum 120°C dip within 5 sec. at 260°C solder bath

## Solder by Soldering Iron:

Soldering Iron

Temperature: maximum 360°C Duration: maximum 3 sec.

We highly recommend that you confirm your actual solder conditions

## 3. Moisture Sensitivity

• Moisture Sensitivity Level standard is not applicable to electromechanical relays, unless otherwise indicated.

#### 4. Tin Whiskers

• Dipped SnAgCu solder is known as presenting a low risk to tin whisker development. No considerable length whisker was found by our in house test.

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