

# 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

[Example]  $\frac{VE}{(a)}$  -  $\frac{12}{(*)}$   $\frac{H}{(b)}$   $\frac{M}{(c)}$   $\frac{S}{(d)}$   $\frac{E}{(e)}$  -  $\frac{K}{(f)}$  -  $\frac{HV}{(g)}$  -  $\frac{VD}{(i)}$

(a)	Relay type	VE	: VE Series
(b)	Coil rated voltage	12	: 5...48VDC Coil rating table at page 3
(c)	Contact rating	H	: 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	K	: 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 (\*)

# VE SERIES

## ■ 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 (SPDT)	
	Construction	Single				
	Material	Gold overlay silver nickel, silver nickel, silver-cadmium oxide alloy (AgNi + Au, AgNi, AgCd)				
	Resistance (initial) (at 6 VDC, 1A)	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 VDC				
	Max. switching power	1,250VA	1,250VA (N.O.) 750VA (N.C.)	1,250VA		
	Max. switching current	5A	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 type, 250 mW high sensitive type				
	Operate power (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	10 to 55Hz double amplitude 3.3 mm			
		Endurance	10 to 55Hz double amplitude 3.3 mm			
	Shock	Misoperation	Min. 100m/s <sup>2</sup> (11 ± 1ms)			
		Endurance	Min. 500m/s <sup>2</sup> (6 ± 1ms)			
	Weight	Approximately 8 g				
Sealing	Plastic sealed RTIII					

\* 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 conditions and expected reliability levels.

# VE SERIES

## ■ 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	360
6	6	100	4.2	0.3	
9	9	225	6.3	0.45	
12	12	400	8.4	0.6	
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	250
6	6	145	4.3	0.3	
9	9	325	6.5	0.45	
12	12	575	8.6	0.6	
18	18	1,300	13	0.9	
24	24	2,310	17.3	1.2	
48	48	9,220	34.7	2.4	

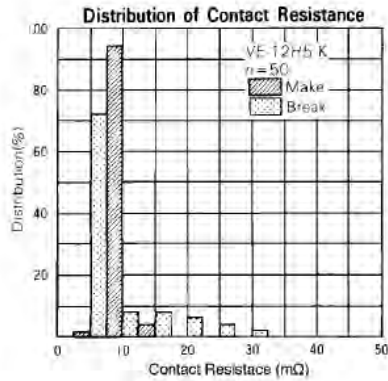
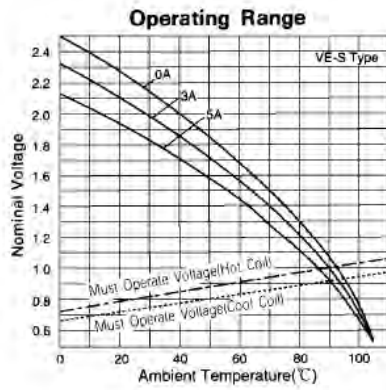
Note: All values in the table are valid for 20°C and zero contact current.

\* Specified operate values are valid for pulse wave voltage.

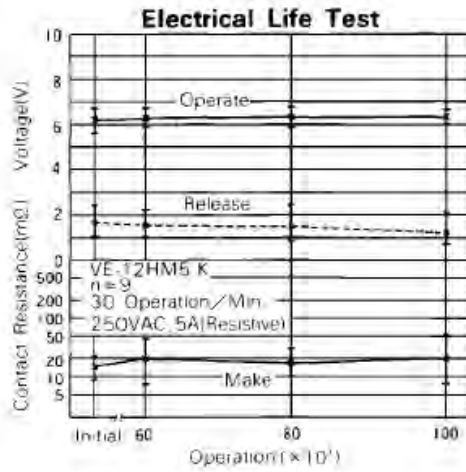
## ■ SAFETY STANDARDS

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

## CHARACTERISTIC DATA / REFERENCE DATA



# VE SERIES



## ■ DIMENSIONS

### ● Dimensions

#### VE-M type



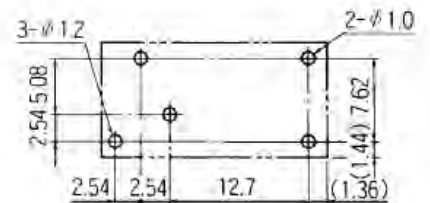
### ● Schematics (BOTTOM VIEW)



### ● PC board mounting hole layout (BOTTOM VIEW)



#### VE type



Unit: mm

## RoHS Compliance and Lead Free Information

### 1. General Information

- All signal and power relays produced by Fujitsu Components are compliant with RoHS directive 2002/95/EC 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  
Soldering: 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.

## Fujitsu Components International Headquarter Offices

### Japan

Fujitsu Component Limited  
Gotanda-Chuo Building  
3-5, Higashigotanda 2-chome, Shinagawa-ku  
Tokyo 141, Japan  
Tel: (81-3) 5449-7010  
Fax: (81-3) 5449-2626  
Email: [promothq@ft.ed.fujitsu.com](mailto:promothq@ft.ed.fujitsu.com)  
Web: [www.fcl.fujitsu.com](http://www.fcl.fujitsu.com)

### North and South America

Fujitsu Components America, Inc.  
250 E. Caribbean Drive  
Sunnyvale, CA 94089 U.S.A.  
Tel: (1-408) 745-4900  
Fax: (1-408) 745-4970  
Email: [components@us.fujitsu.com](mailto:components@us.fujitsu.com)  
Web: <http://us.fujitsu.com/components>

### Europe

Fujitsu Components Europe B.V.  
Diamantlaan 25  
2132 WV Hoofddorp  
Netherlands  
Tel: (31-23) 5560910  
Fax: (31-23) 5560950  
Email: [info@fceu.fujitsu.com](mailto:info@fceu.fujitsu.com)  
Web: [emea.fujitsu.com/components/](http://emea.fujitsu.com/components/)

### Asia Pacific

Fujitsu Components Asia Ltd.  
102E Pasir Panjang Road  
#01-01 CitiLink Warehouse Complex  
Singapore 118529  
Tel: (65) 6375-8560  
Fax: (65) 6273-3021  
Email: [fcal@fcal.fujitsu.com](mailto:fcal@fcal.fujitsu.com)  
Web: <http://www.fujitsu.com/sg/services/micro/components/>

©2010 Fujitsu Components Europe B.V. All rights reserved. All trademarks or registered trademarks are the property of their respective owners.

The contents, data and information in this datasheet are provided by Fujitsu Component Ltd. as a service only to its user and only for general information purposes.

The use of the contents, data and information provided in this datasheet is at the users' own risk.

Fujitsu has assembled this datasheet with care and will endeavor to keep the contents, data and information correct, accurate, comprehensive, complete and up to date.

Fujitsu Components Europe B.V. and affiliated companies do however not accept any responsibility or liability on their behalf, nor on behalf of its employees, for any loss or damage, direct, indirect or consequential, with respect to this datasheet, its contents, data, and information and related graphics and the correctness, reliability, accuracy, comprehensiveness, usefulness, availability and completeness thereof.

Nor do Fujitsu Components Europe B.V. and affiliated companies accept on their behalf, nor on behalf of its employees, any responsibility or liability for any representation or warrant of any kind, express or implied, including warranties of any kind for merchantability or fitness for particular use, with respect to these datasheets, its contents, data, information and related graphics and the correctness, reliability, accuracy, comprehensiveness, usefulness, availability and completeness thereof. Rev. July 22, 2010



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.