

POWER RELAY

1 POLE—5 A (MEDIUM LOAD CONTROL) VE SERIES

RoHS compliant

■ FEATURES

- UL, CSA, VDE recognized
- 1 form A (SPST-NO) or 1 form C (SPDT) contact
- Low cost, miniature relay with big performance in small package
 - Surge strength: 4,000 V or 6,000 V
- Slim type—meets high density mounting requirement
- Wide operating range
- Easy circuit design with completely separated terminal arrangement (coil and contact terminals)
- Plastic sealed type
- RoHS compliant since date code: 0434R
 - Please see page 7 for more information



■ ORDERING INFORMATION

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

(a)	Series Name	VE: VE Series
(b)	Nominal Voltage	Refer to the COIL DATA CHART
(c)	Contact Rating	H : Heavy duty type
(d)	Contact Arrangement	Nil : 1 form C (SPDT) M : 1 form A (SPST-NO)
(e)	Coil Type	Nil : Standard type (360 mW) S : High sensitivity type (250 mW)
(f)	Contact Material (Rating)	Nil : Gold overlay silver-nickel (N.C.: 3 A, N.O.: 5 A) E : Silver-nickel (N.C.: 3 A, N.O.: 5 A) 5 : Silver cadmium oxide (N.C.: 5 A, N.O.: 5 A)
(g)	Enclosure	K : Plastic sealed type
(h)	Surge Strength	Nil : Standard type (4,000 V) HV: High dielectric strength type (6,000 V)
(i)	Standard	VD: UL, CSA, VDE approved type

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

■ SAFETY STANDARD AND FILE NUMBERS

UL508 (File No. E56140)

C22.2 No. 14 (File No. LR35579)

VDE 0435 (File No. 11039-4940-1011)

Please note that UL/CSA ratings may differ from the standard ratings.

Type	Nominal voltage	Contact rating
VE-H	5 to 48 VDC	Normally open: 1/14 HP 125 VAC/250 VAC 5 A 30 VDC/250 VAC, resistive Pilot duty D300 Normally close: 1/14 HP 125 VAC/250 VAC 3 A 30 VDC/250 VAC, resistive Pilot duty D150
VE-HM	5 to 48 VDC	1/12 HP 125 VAC/250 VAC 5 A 30 VDC/250 VAC, resistive Pilot duty D300
VE-H5 VE-HM5	5 to 48 VDC	Normally open: 1/10 HP 125 VAC/250 VAC 5 A 30 VDC/250 VAC, resistive Pilot duty D300 Normally close: 1/14 HP 125 VAC/250 VAC 5 A 30 VDC/250 VAC, resistive

■ SPECIFICATIONS

Item			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	Arrangement		1 form A (SPST-NO)		1 form C (SPDT)	
	Material		Gold overlay silver nickel, silver nickel			Silver-cadmium oxide alloy
	Style		Single			
	Resistance (initial) (at 1 A 6 VDC)		Maximum 70 mΩ (VE-HM, H) Maximum 100 mΩ (VE-HME, HE)			Maximum 200 mΩ
	Rating (resistive)		5 A 250 VAC	5 A 250 VAC (N.O.) 3 A 250 VAC (N.C.)	5 A 250 VAC	
	Maximum Carrying Current		7 A			
	Maximum Switching Power		1,250 VA	1,250 VA (N.O.) 750 VA (N.C.)	1,250 VA	
	Maximum Switching Voltage		250 VAC, 150 VDC			
	Maximum Switching Current		5 A	5 A (N.O.) 3 A (N.C.)	5 A	
	Minimum Switching Load*1		10 mA, 5 VDC (VE-HM, H), 100 mA 5 VDC (VE-HME, HE, HM5, H5)			
Coil	Nominal Power (at 20°C)		Standard type: 0.36 W. High sensitivity type: 0.25 W			
	Operate Power (at 20°C)		Standard type: 0.177 W. High sensitivity type: 0.13 W			
	Operating Temperature		Standard: -40°C to +85°C. High sensitivity: -40°C to +90°C (no frost)			
Time Value	Operate (at nominal voltage)		Maximum 10 ms			
	Release (at nominal voltage)		Maximum 5 ms			
Insulation	Resistance (at 500 VDC)		Minimum 1,000 MΩ			
	Dielectric Strength	between open contacts	1,000 VAC 1 minute	750 VAC 1 minute	1,000 VAC 1 minute	750 VAC 1 minute
		between coil and contacts	2,000 VAC 1 minute			
	Surge Strength		Standard type: 4,000 V (at 2 x 10 μs) High dielectric strength type: 6,000 V (at 2 x 10 μs)			
Life	Mechanical		1 × 10 ⁷ operations minimum			
	Electrical (at Rating)		Standard Type: 1 × 10 ⁵ ops. min. High sensitivity type: 5 x 10 ⁴ ops. min.			
Other	Vibration Resistance	Misoperation	10 to 55 Hz (double amplitude of 3.3 mm)			
		Endurance	10 to 55 Hz (double amplitude of 3.3 mm)			
	Shock Resistance	Misoperation	100 m/s ² (11 ±1 ms)			
		Endurance	500 m/s ² (6 ±1 ms)			
	Weight		Approximately 8 g			

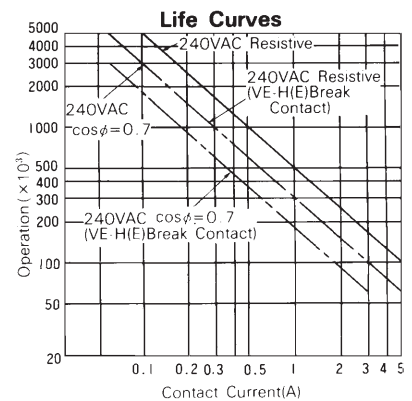
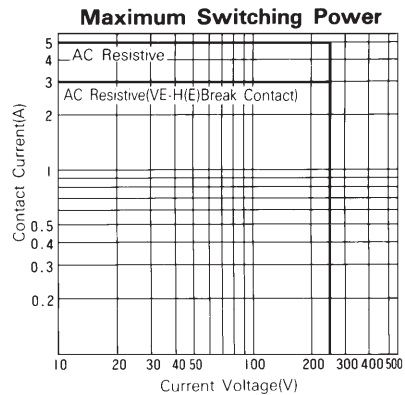
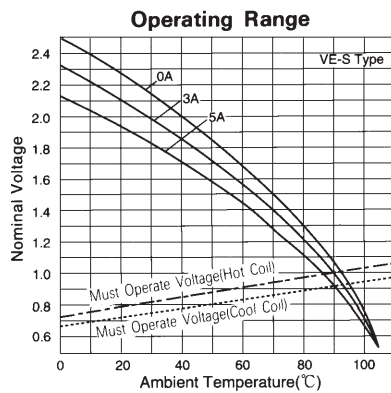
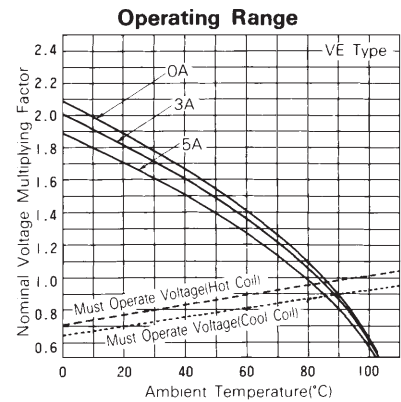
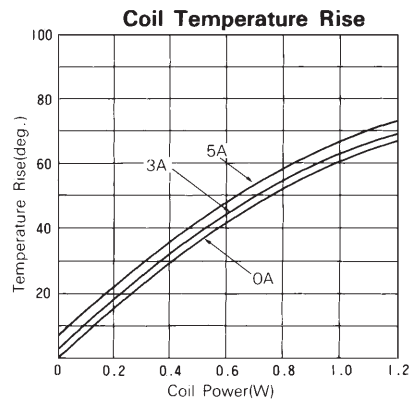
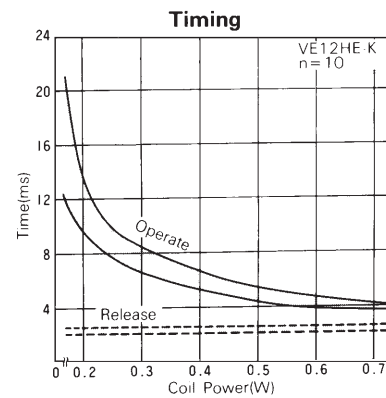
*1 Minimum switching loads mentioned above are reference values. Please perform the confirmation test with the actual load before production since reference values may vary according to switching frequencies, environmental conditions and expected reliability levels.

COIL DATA CHART

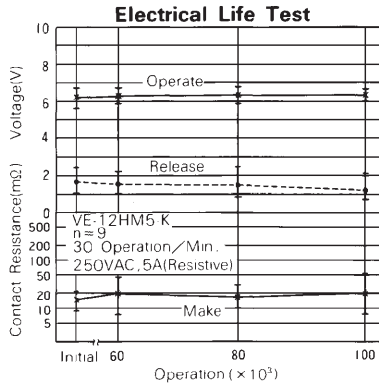
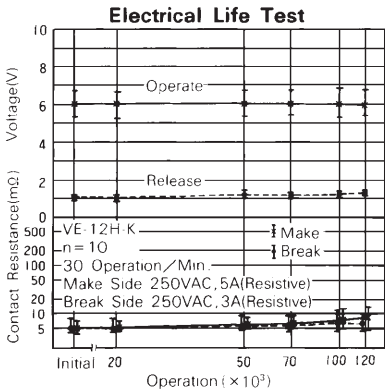
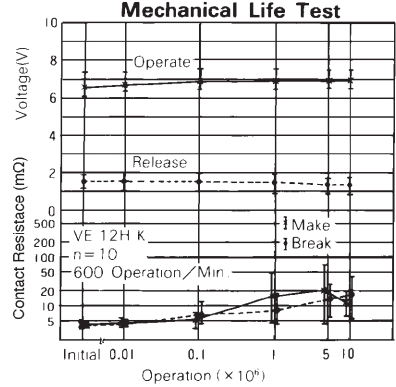
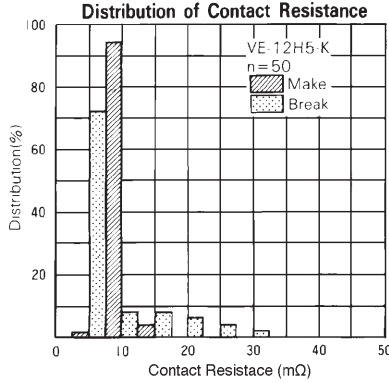
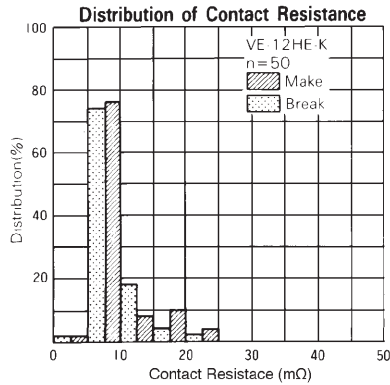
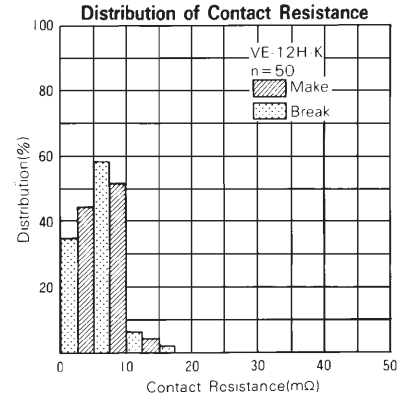
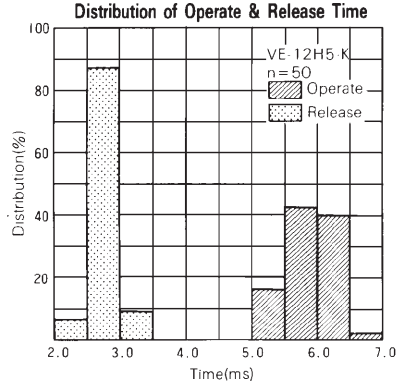
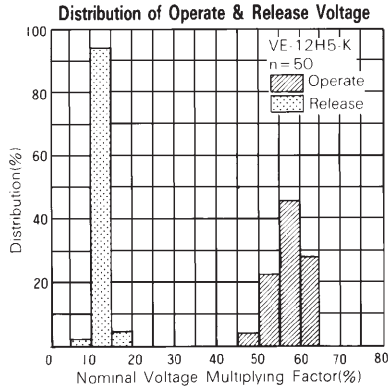
	MODEL		Nominal voltage	Coil resistance (±10%)	Must operate voltage	Must release voltage	Nominal power
	VE-() HM VE-() H	VE-() HME VE-() HE					
Standard Type	VE- 5H (M) (E)-K	VE- 5H (M) (E) 5-K	5 VDC	69 Ω	3.5 VDC	0.25 VDC	360 mW
	VE- 6H (M) (E)-K	VE- 6H (M) (E) 5-K	6 VDC	100 Ω	4.2 VDC	0.3 VDC	360 mW
	VE- 9H (M) (E)-K	VE- 9H (M) (E) 5-K	9 VDC	225 Ω	6.3 VDC	0.45 VDC	360 mW
	VE-12H (M) (E)-K	VE-12H (M) (E) 5-K	12 VDC	400 Ω	8.4 VDC	0.6 VDC	360 mW
	VE-18H (M) (E)-K	VE-18H (M) (E) 5-K	18 VDC	900 Ω	12.6 VDC	0.9 VDC	360 mW
	VE-24H (M) (E)-K	VE-24H (M) (E) 5-K	24 VDC	1,600 Ω	16.8 VDC	1.2 VDC	360 mW
	VE-48H (M) (E)-K	VE-48H (M) (E) 5-K	48 VDC	6,400 Ω	33.6 VDC	2.4 VDC	360 mW
High Sensitive Type	VE- 5H (M) S (E)-K	VE- 5H (M) S5-K	5 VDC	100 Ω	3.6 VDC	0.25 VDC	250 mW
	VE- 6H (M) S (E)-K	VE- 6H (M) S5-K	6 VDC	145 Ω	4.3 VDC	0.3 VDC	250 mW
	VE- 9H (M) S (E)-K	VE- 9H (M) S5-K	9 VDC	325 Ω	6.5 VDC	0.45 VDC	250 mW
	VE-12H (M) S (E)-K	VE-12H (M) S5-K	12 VDC	575 Ω	8.6 VDC	0.6 VDC	250 mW
	VE-18H (M) S (E)-K	VE-18H (M) S5-K	18 VDC	1,300 Ω	13.0 VDC	0.9 VDC	250 mW
	VE-24H (M) S (E)-K	VE-24H (M) S5-K	24 VDC	2,310 Ω	17.3 VDC	1.2 VDC	250 mW
	VE-48H (M) S (E)-K	VE-48H (M) S5-K	48 VDC	9,220 Ω	34.7 VDC	2.4 VDC	250 mW

Note: All values in the table are measured at 20 °C.

CHARACTERISTIC DATA



REFERENCE DATA

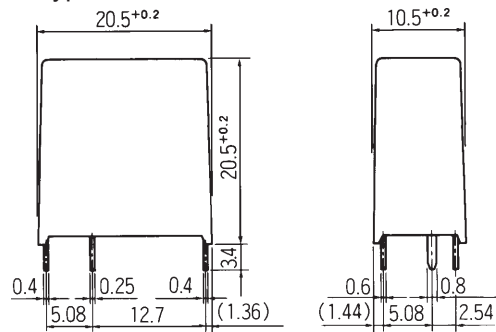


VE SERIES

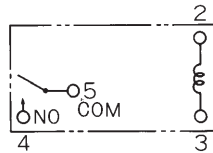
■ DIMENSIONS

- **Dimensions**

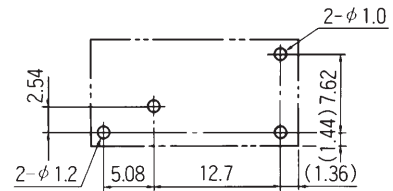
VE-M type



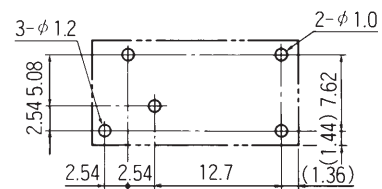
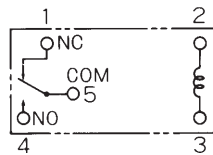
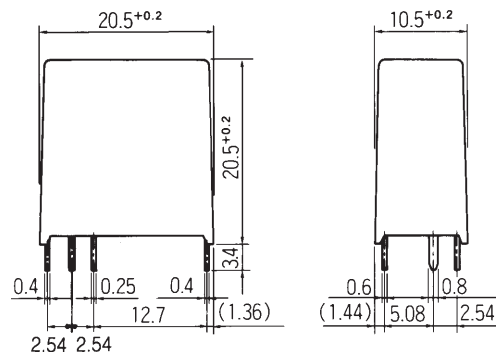
- **Schematics**
(BOTTOM VIEW)



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



VE type



Unit: mm

RoHS Compliance and Lead Free Relay Information

1. General Information

- Relays produced after the specific date code that is indicated on each data sheet are lead-free now. Most of our signal and power relays are lead-free. Please refer to Lead-Free Status Info. (<http://www.fujitsu.com/us/downloads/MICRO/fcai/relays/lead-free-letter.pdf>)
- Lead free solder paste currently used in relays is Sn-3.0Ag-0.5Cu.
- All signal and most power relays also comply with RoHS. Please refer to individual data sheets. Relays that are RoHS compliant do not contain the 5 hazardous materials that are restricted by RoHS directive (lead, mercury, chromium IV, PBB, PBDE).
- It has been verified that using lead-free relays in leaded assembly process will not cause any problems (compatible).
- "LF" is marked on each outer and inner carton. (No marking on individual relays).
- To avoid leaded relays (for lead-free sample, etc.) please consult with area sales office.
- We will ship leaded relays as long as the leaded relay inventory exists.

Note: Cadmium was exempted from RoHS on October 21, 2005. (Amendment to Directive 2002/95/EC)

2. Recommended Lead Free Solder Profile

- Recommended solder paste Sn-3.0Ag-0.5Cu.

Reflow Solder condition

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.

4. Tin Whisker

- Dipped SnAgCu solder is known as low risk tin whisker. 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
Web: 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: marcom@fcai.fujitsu.com
Web: <http://www.fujitsu.com/us/services/edevices/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
Web: <http://www.fujitsu.com/emea/services/components/>

Asia Pacific

Fujitsu Components Asia Ltd.
102E Pasir Panjang Road
#04-01 Citilink Warehouse Complex
Singapore 118529
Tel: (65) 6375-8560
Fax: (65) 6273-3021
Email: [fcal@fcal.fujitsu.com](mailto:fcsl@fcal.fujitsu.com)
Web: <http://www.fujitsu.com/sg/services/micro/components/>

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