POWER RELAY

1 POLE—20, 25, 30 A

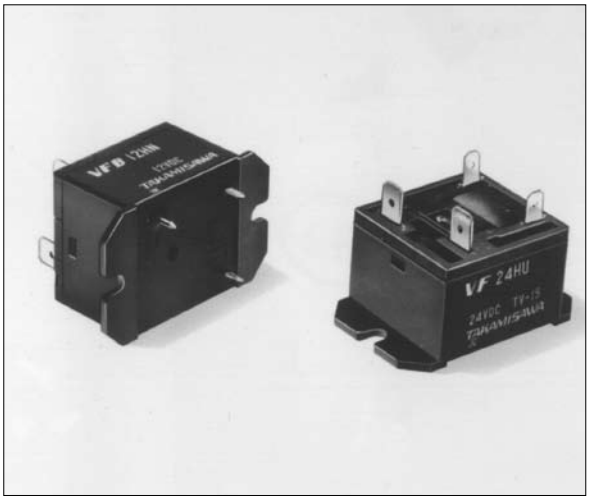
(HEAVY POWER CONTROL)

VF SERIES

RoHS compliant

■ FEATURES

- UL, CSA, VDE recognized TV-15 rated
- 1 Form A (SPST-NO) contact
- Heavy duty 20 to 30 A small power relay
- High inrush current and high surge voltage
  —Inrush current 65 A
  —Surge strength 10,000 V
- Printed circuit coil terminals type available
- Small package meets high density mounting requirement
- RoHS compliant since date code: 0435L2
  Please see page 7 for more information



■ ORDERING INFORMATION

	VF	B	–	6	H	U
[Example]	(a)	(b)	(*)	(c)	(d)	(e)

(a)	Series Name	VF : VF Series
(b)	Terminal	Nil : Top ·····All tab-terminal B : Top ·····Tab-terminal (contacts) : Bottom···PCB-terminal (coil and movable contact) D : Top ·····Tab-terminal (coil) Screw tight terminal (contacts) P : Top ·····Screw tight terminal (contacts) : Bottom···PCB terminal (coil and movable contact)
(c)	Nominal Voltage	Refer to the COIL DATA CHARAT
(d)	Contact Rating	H : 30 A (applicable for D.P.) M : 25 A L : 20 A
(e)	Standard	U : UL, CSA, VDE rating acquired

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

■ COIL DATA CHART

MODEL			Nominal voltage	Coil resistance (±10%)	Must operate voltage	Must release voltage	Nominal power
30 A Type	25 A Type	20 A Type					
VF (D or P) - 3H	VF ( ) - 3M	VF ( ) - 3L	3 VDC	7.5Ω	2.1 VDC	0.3 VDC	1,200 mW
VF (D or P) - 5H	VF ( ) - 5M	VF ( ) - 5L	5 VDC	20 Ω	3.5 VDC	0.5 VDC	1,250 mW
VF (D or P) - 6H	VF ( ) - 6M	VF ( ) - 6L	6 VDC	30 Ω	4.2 VDC	0.6 VDC	1,200 mW
VF (D or P) - 9H	VF ( ) - 9M	VF ( ) - 9L	9 VDC	67 Ω	6.3 VDC	0.9 VDC	1,200 mW
VF (D or P) -12H	VF ( ) -12M	VF ( ) -12L	12 VDC	120 Ω	8.4 VDC	1.2 VDC	1,200 mW
VF (D or P) -18H	VF ( ) -18M	VF ( ) -18L	18 VDC	270 Ω	12.6 VDC	1.8 VDC	1,200 mW
VF (D or P) -24H	VF ( ) -24M	VF ( ) -24L	24 VDC	480 Ω	16.8 VDC	2.4 VDC	1,200 mW
VF (D or P) -48H	VF ( ) -48M	VF ( ) -48L	48 VDC	1,920 Ω	33.6 VDC	4.8 VDC	1,200 mW
VF (D or P) -60H	VF ( ) -60M	VF ( ) -60L	60 VDC	3,000 Ω	42.0 VDC	6.0 VDC	1,200 mW

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

■ SPECIFICATIONS

Item			30 A Type VFD, VFP- ( ) H	25 A Type VF ( ) - ( ) M	20 A Type VF ( ) - ( ) L
Contact	Arrangement		1 form A (SPST-NO)		
	Material		Silver alloy		
	Style		Single		
	Resistance (initial)		Maximum 30m Ω (at 1 A 6 VDC)		
	Rating	Resistive	30 A 250 VAC	25 A 250 VAC	20 A 250 VAC
		Motor	2 HP 250 VAC	1.5 HP 250 VAC	1 HP 250 VAC
	Maximum Carrying Current		30 A	25 A	20 A
	Maximum Switching Power		7,500 VA	6,250 VA	5,000 VA
	Maximum Switching Voltage		250 VAC		
	Maximum Switching Current		30 A	25 A	20 A
	Minimum Switching Load*1		1A, 10V		
Coil	Nominal Power (at 20°C)		1,200 to 1,250 mW		
	Operate Power (at 20°C)		1,590 to 620 mW		
	Operating Temperature		–30°C to +65°C (no frost) (refer to the CHARACTERISTIC DATA)		
Time Value	Operate (at nominal voltage)		Maximum 20 ms		
	Release (at nominal voltage)		Maximum 5 ms		
Life	Mechanical		5×10^6 operations minimum		
	Electrical (at contact rating)		1×10^5 operations minimum (resistive load)		
			2×10^5 operations minimum (motor load)		
Other	Vibration Resistance	Misoperation	10 to 55 Hz (double amplitude of 1.5 mm)		
		Endurance	10 to 55 Hz (double amplitude of 1.5 mm)		
	Shock Resistance	Misoperation	200 m/s^2 (11 ±1 ms)		
		Endurance	1,000 m/s^2 (6 ±1 ms)		
	Weight		Approximately 55 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.

■ INSULATION

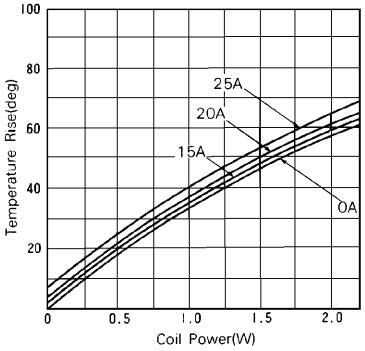
Item		30A	25A	20A	Note
Resistance (initial)		Minimum 1,000 MΩ 1 min.			at 500 VDC
Dielectric Strength	open contacts	1,200 VAC 1 min.			
	coil and contacts	4,000 VAC 1 min.			
Surge Voltage (coil and contact)		10,000 V			1.2 x 50μs standard wave

■ SAFETY STANDARD AND FILE NUMBERS

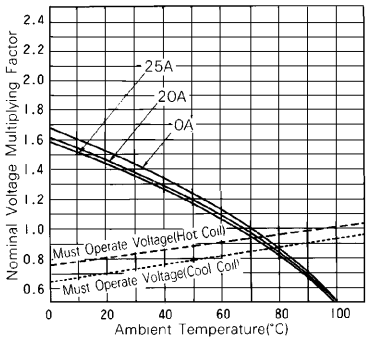
Type	Compliance	Contact rating
UL	UL 508 873 E56140	Flammability: UL 94-V0 (plastics) [VF-( )-( ) L] 20A, 250VAC (resistive) 1hp, 250VAC/125VAC TV-15 120 VAC [VF-( )-( ) M] 25A, 250VAC (resistive) 1.5 hp, 250VAC TV-15 120VAC [VFD, VFP-( )-H] 30A, 250VAC (resistive) 2 hp, 250VAC TV-15 120VAC
CSA	C22.2 No. 14 LR 35579	
VDE	0435	

■ CHARACTERISTIC DATA

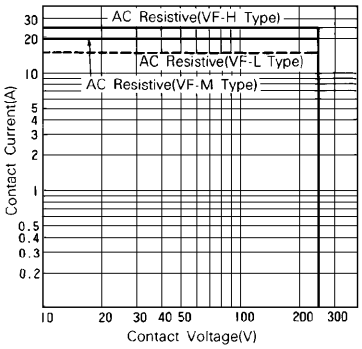
Coil Temperature Rise



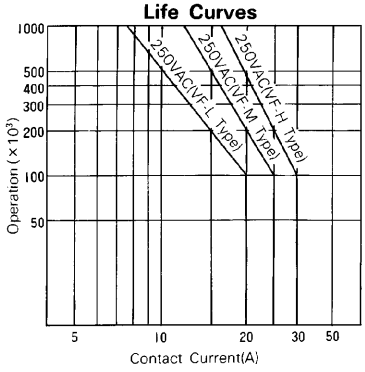
Operating Range



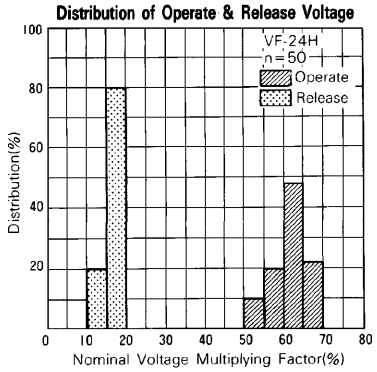
Maximum Switching Power

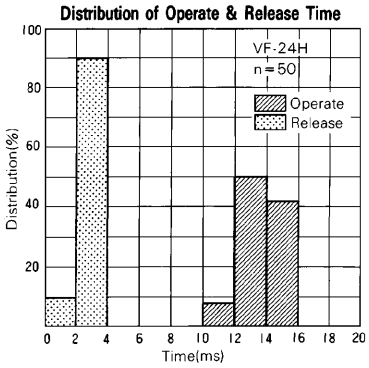


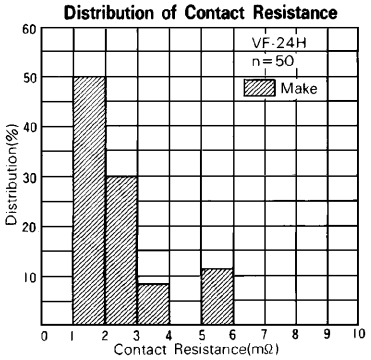
Life Curves

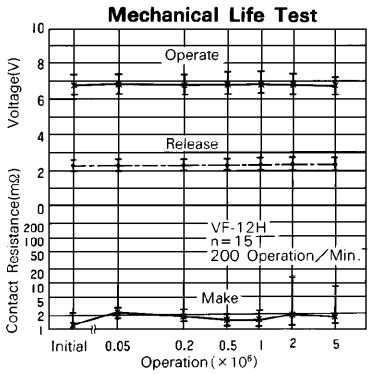


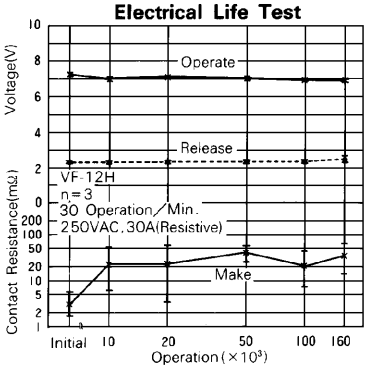
■ REFERENCE DATA







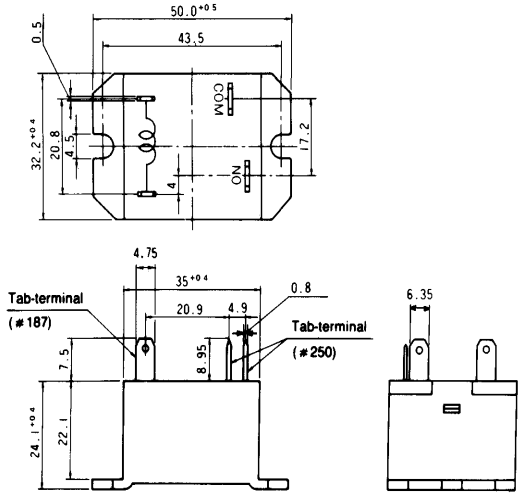


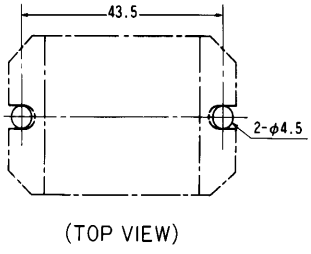


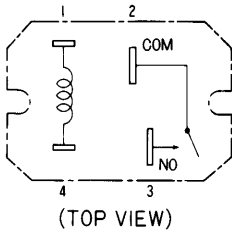
■ DIMENSIONS

- **Dimensions**
- **Schematics**
- **PC board mounting hole layout**

VF type



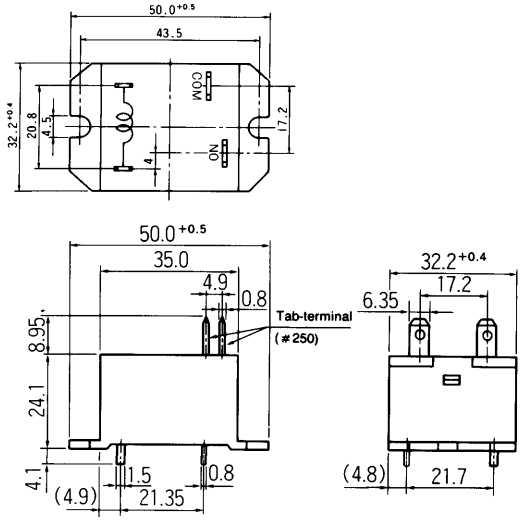


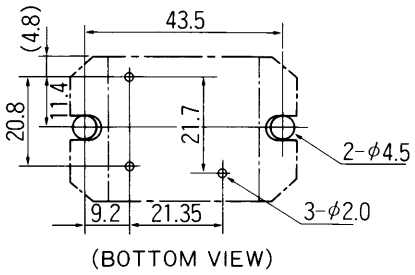


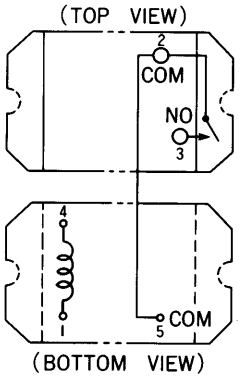
Unit: mm

- **Dimensions**
- **Schematics**
- **PC board mounting hole layout**

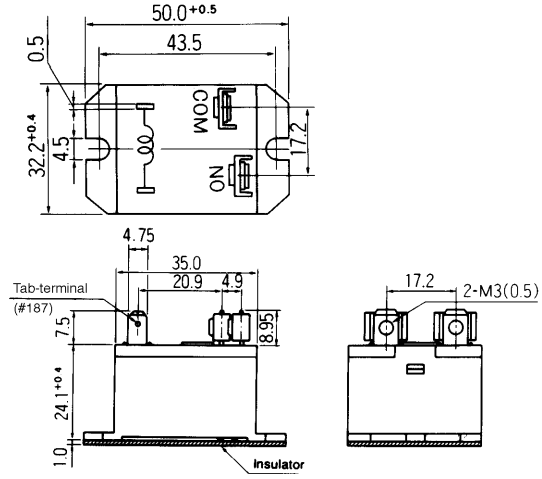
VFB type

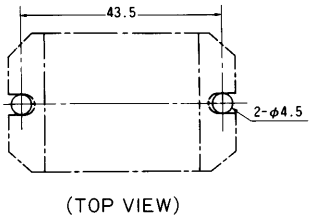


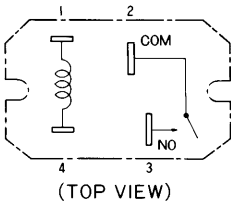




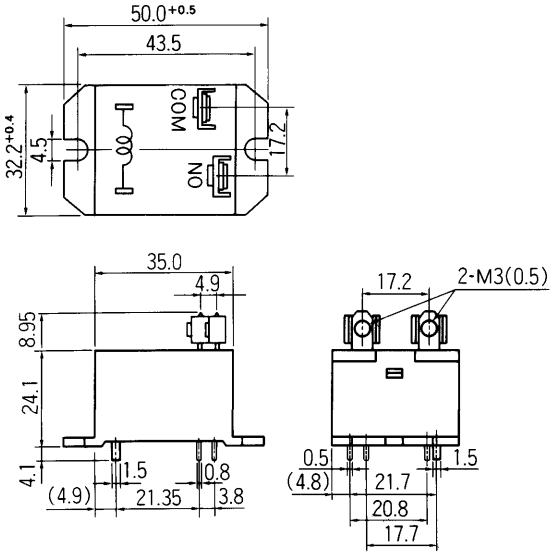
VFD type

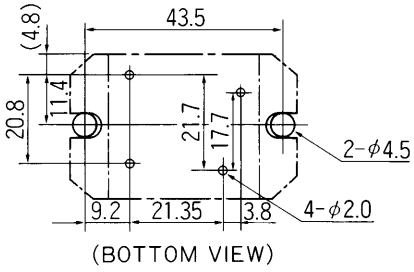


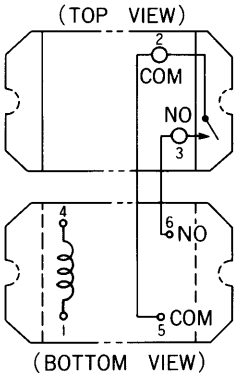




VFP type







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 soler 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 realys.

4. Tin Whisker

- Dipped SnAgCu solder is known as low risk tin whisker. No considerable length whisker was found by our in house test.

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