

POWER RELAY

1 POLE—16 A (HEAVY POWER CONTROL) VSB SERIES

RoHS compliant

FEATURES

- All or nothing relay
- UL, CSA, VDE, SEV, FIMKO, SEMKO, ÖVE, BSI recognized
- Working class: C
- Type of service: continuous duty
- Heavy duty 16 A miniature power relay
- UL Class B (130°C) insulation
- High isolation in small package
 - Insulation distance: 8 mm
 - Dielectric strength: 5,000 VAC (between coil and contacts)
 - Surge strength: 10,000 V
- Low power consumption and high sensitivity type available VSB-S)
- Plastic sealed (with tape) type available
- RoHS compliant since date code:0523
Please see page 6 for more information



ORDERING INFORMATION

VSB - 12 S T B
 [Example] (a) (*) (b) (c) (d) (e)

| | | |
|-----|---------------------|---|
| (a) | Series Name | VSB: VSB Series |
| (b) | Nominal Voltage | Refer to the COIL DATA CHART |
| (c) | Coil Type | Nil : Standard type (700 to 750 mW) S : High sensitivity type (530 mW) |
| (d) | Contact Arrangement | M : 1 form A (SPST-NO) T : 1 form C (SPDT) |
| (e) | Enclosure | B : Flux free type C : Plastic sealed type (with tape) |

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

VSB SERIES

■ COIL DATA CHART

| | MODEL | Nominal voltage | Coil resistance (±10%) | Must operate voltage* | Must release voltage* | Nominal power |
|-----------------------|------------------|-----------------|------------------------|-----------------------|-----------------------|---------------|
| Standard Type | VSB- 3 () () | 3 VDC | 12.5 Ω | 2.1 VDC | 0.3 VDC | 720 mW |
| | VSB- 5 () () | 5 VDC | 36 Ω | 3.5 VDC | 0.5 VDC | 700 mW |
| | VSB- 6 () () | 6 VDC | 50 Ω | 4.2 VDC | 0.6 VDC | 720 mW |
| | VSB- 9 () () | 9 VDC | 115 Ω | 6.3 VDC | 0.9 VDC | 700 mW |
| | VSB- 12 () () | 12 VDC | 200 Ω | 8.4 VDC | 1.2 VDC | 720 mW |
| | VSB- 14 () () | 14 VDC | 280 Ω | 9.8 VDC | 1.4 VDC | 700 mW |
| | VSB- 18 () () | 18 VDC | 460 Ω | 12.6 VDC | 1.8 VDC | 700 mW |
| | VSB- 24 () () | 24 VDC | 820 Ω | 16.8 VDC | 2.4 VDC | 700 mW |
| | VSB- 36 () () | 36 VDC | 1,850 Ω | 25.2 VDC | 3.6 VDC | 700 mW |
| | VSB- 48 () () | 48 VDC | 3,300 Ω | 33.6 VDC | 4.8 VDC | 700 mW |
| | VSB- 60 () () | 60 VDC | 5,100 Ω | 42.0 VDC | 6.0 VDC | 700 mW |
| | VSB-100 () () | 100 VDC | 13,400 Ω | 70.0 VDC | 10.0 VDC | 750 mW |
| High Sensitivity Type | VSB- 3S () () | 3 VDC | 17 Ω | 2.1 VDC | 0.3 VDC | 530 mW |
| | VSB- 5S () () | 5 VDC | 47 Ω | 3.5 VDC | 0.5 VDC | 530 mW |
| | VSB- 6S () () | 6 VDC | 68 Ω | 4.2 VDC | 0.6 VDC | 530 mW |
| | VSB- 9S () () | 9 VDC | 155 Ω | 6.3 VDC | 0.9 VDC | 530 mW |
| | VSB- 12S () () | 12 VDC | 270 Ω | 8.4 VDC | 1.2 VDC | 530 mW |
| | VSB- 14S () () | 14 VDC | 370 Ω | 9.8 VDC | 1.4 VDC | 530 mW |
| | VSB- 18S () () | 18 VDC | 610 Ω | 12.6 VDC | 1.8 VDC | 530 mW |
| | VSB- 24S () () | 24 VDC | 1,100 Ω | 16.8 VDC | 2.4 VDC | 530 mW |
| | VSB- 36S () () | 36 VDC | 2,450 Ω | 25.2 VDC | 3.6 VDC | 530 mW |
| | VSB- 48S () () | 48 VDC | 4,400 Ω | 33.6 VDC | 4.8 VDC | 530 mW |
| | VSB- 60S () () | 60 VDC | 6,800 Ω | 42.0 VDC | 6.0 VDC | 530 mW |
| | VSB-100S () () | 100 VDC | 18,560 Ω | 70.0 VDC | 10.0 VDC | 530 mW |

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

*: Specified values are subject to pulse wave voltage

■ SPECIFICATIONS

| Item | | Standard Type VSB- () | High Sensitive type VSB-()-S |
|------------|------------------------------|---|--|
| Contact | Arrangement | 1 form A (SPST- NO) or 1 form C (SPDT) | |
| | Material | Silver alloy (AgSnO) | |
| | Configuration | Single | |
| | Resistance (initial) | Maximum 100 mΩ at 1 A, 6 VDC | |
| | Rating | 16 A, 250 VAC / 30 VDC | |
| | Maximum Carrying Current*1 | 16 A | |
| | Maximum Switching Rating | 4,000 VA / 480W | |
| | Maximum Switching Voltage | 250 VAC / 150VDC | |
| | Maximum Switching Current | 16A | |
| | Maximum Switching Load*2 | 100 mA 5 VDC | |
| Coil | Nominal Power (at 20°C) | 700 to 750 mW | 530 mW |
| | Operate Power (at 20°C) | 350 to 370 mW | 260 mW |
| | Operating Temperature | -40°C to +65°C (no frost) | -40°C to +75°C (no frost) |
| Time Value | Operate (at nominal voltage) | Maximum 15ms | |
| | Release (at nominal voltage) | Maximum 10ms | |
| Life | Mechanical | 2 x 10 ⁷ operations minimum | |
| | Electrical | 1 x 10 ⁵ operations minimum (contact rating) | |
| Other | Vibration Resistance | Misoperation | 10 to 55 Hz, at double amplitude of 1.5 mm |
| | | Endurance | 10 to 55Hz, at double amplitude of 1.5 mm |
| | Shock Resistance | Misoperation | Min. 100m/s ² (11±1ms) |
| | | Endurance | Min. 1,000m/s ² (6±1ms) |
| | Weight | Approximately 18g | |

*1 Need to consider the head from PCB when max. current is more than 10A.

*2 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

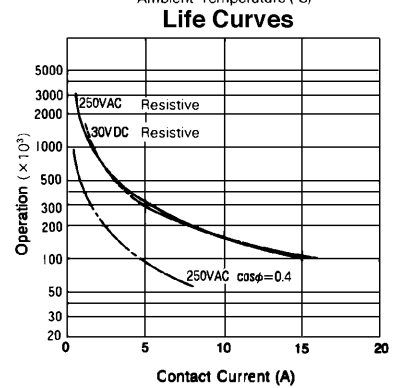
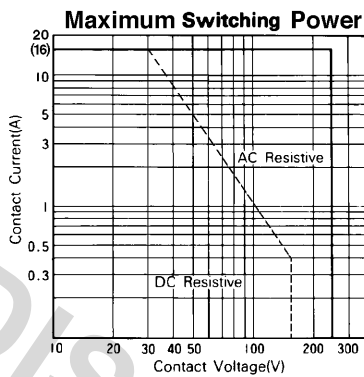
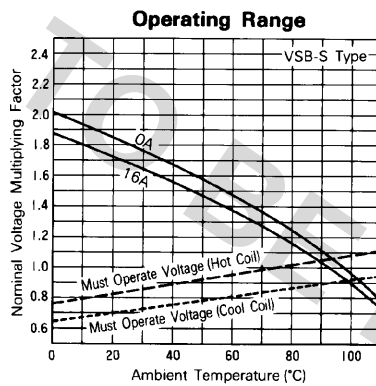
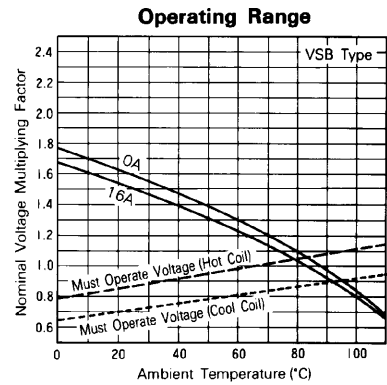
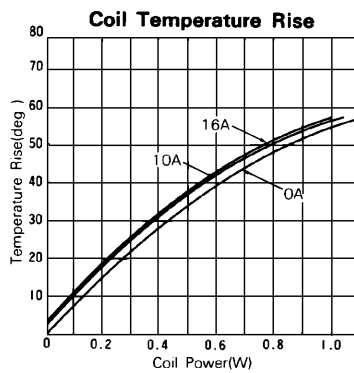
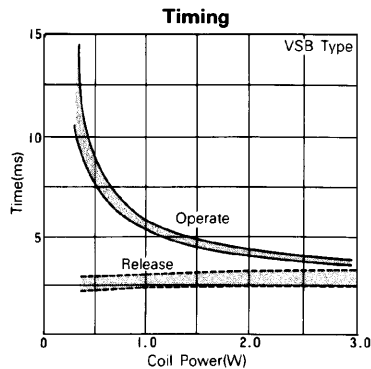
| Item | | VSB | Note |
|----------------------------------|-------------------|-----------------------------|--------------------------|
| Resistance (initial) | | Minimum 1,000 MΩ | at 500 VDC |
| Dielectric Strength | open contacts | 1,000 VAC (50/60 Hz) 1 min. | |
| | coil and contacts | 5,000 VAC (50/60 Hz) 1 min. | |
| Surge Voltage (coil and contact) | | 10,000 V | 1.2 x 50μs standard wave |

■ SAFETY STANDARDS

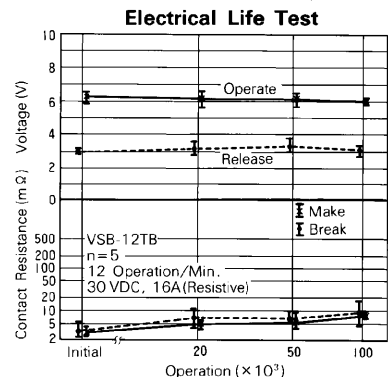
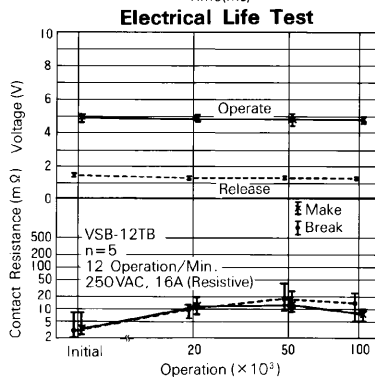
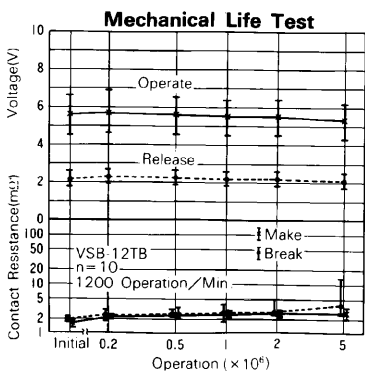
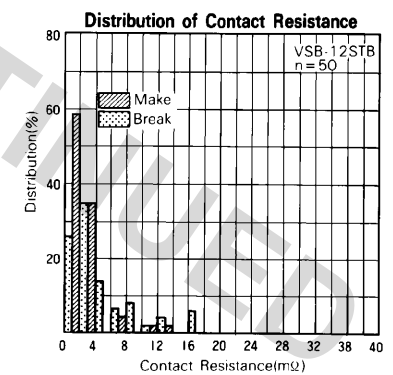
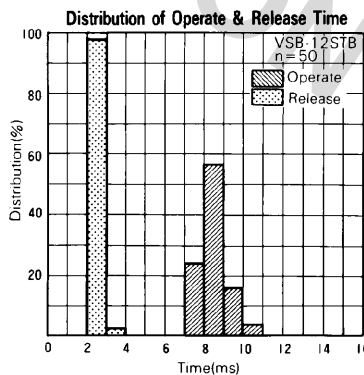
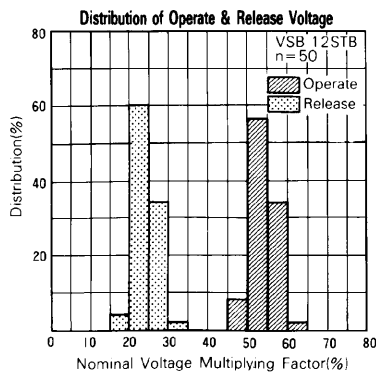
| Type | Compliance | Contact rating |
|------|--------------------------|--|
| UL | UL 508, 873 | Flammability: UL 94-V0 (plastics) |
| | E56140 | 16A, 250VAC/30VDC (resistive) 1/3 HP, 250VAC/125VAC |
| CSA | C22.2 No. 14 LR 35579 | Pilot duty: C150 |
| VDE | 0435, 0631, 0700, 0860 | |

Complies with SEV, SEMKO, FIMKO, ÖVE, BSI

CHARACTERISTIC DATA



REFERENCE DATA

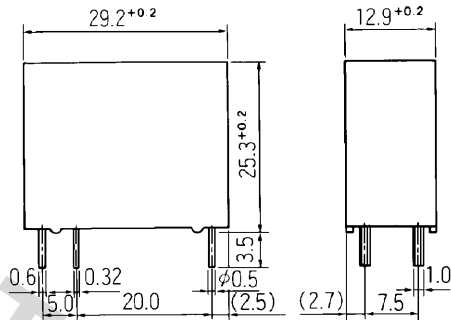


VSB SERIES

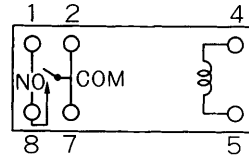
■ DIMENSIONS

● Dimensions

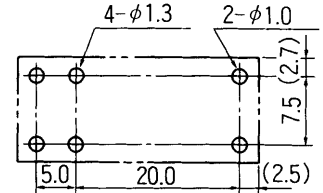
VSB-M type



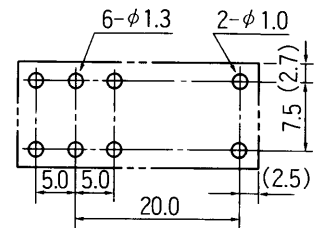
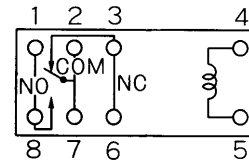
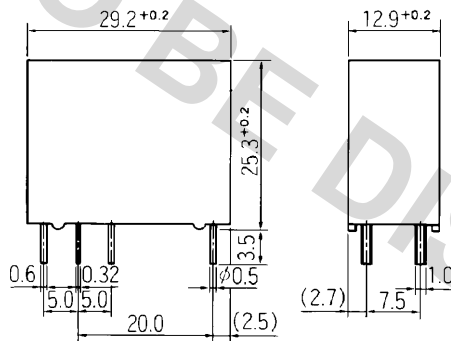
● PC board mounting hole layout (BOTTOM VIEW)



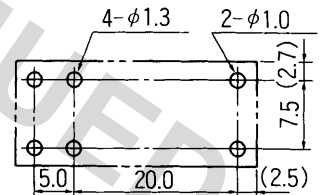
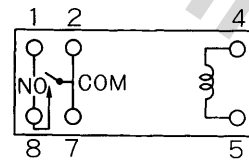
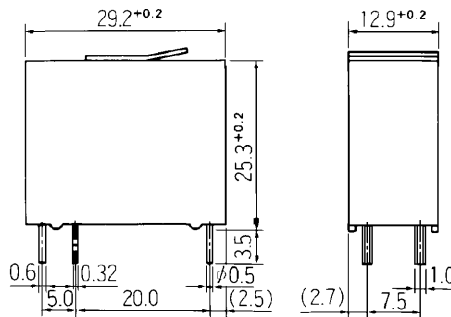
● Schematics (BOTTOM VIEW)



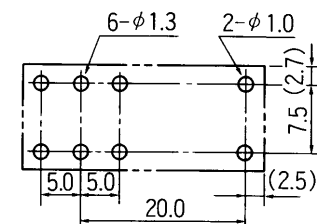
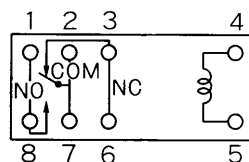
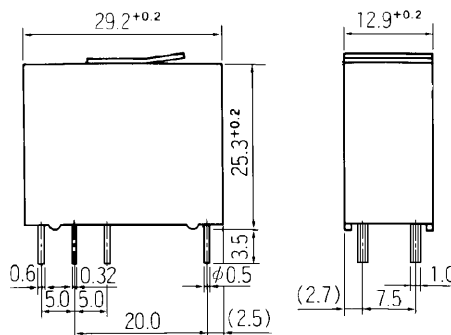
VSB type



VSB-MC type (Plastic sealed type with tape)



VSB-C type (Plastic sealed type with tape)



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. All of our signal and power relays are lead-free. Please refer to Lead-Free Status Info. (<http://www.fcai.fujitsu.com/pdf/LeadFreeLetter.pdf>)
- Lead free solder paste currently used in relays is Sn-3.0Ag-0.5Cu. From February 2005 forward Sn-3.0Cu-Ni will be used for FTRB3 and FTR-B4 series relays.
- All signal and power relays also comply with RoHS. Please refer to individual data sheets. Relays that are RoHS compliant do not contain the 6 hazardous materials that are restricted by RoHS directive (lead, mercury, cadmium, chromium IV, PBB, PBDE).
- It has been verified that using lead-free relays in lead assembly process will not cause any problems (compatible).
- "LF" is marked on each outer and inner carton. (No marking on individual relays).
- To avoid lead relays (for lead-free sample, etc.) please consult with area sales office.

We will ship lead relays as long as the lead relay inventory exists.

2. Recommended Lead Free Solder Profile

- Recommended solder paste Sn-3.0Ag-0.5Cu and Sn-3.0 Cu-Ni (only FTR-B3 and FTR-B4 from February 2005)

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

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

5. Solid State Relays

- Each lead terminal will be changed from solder plating to Sn plating and Nickel plating. A layer of Nickel plating is between the terminal and the Sn plating to avoid whisker.

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