FUJITSU THE POSSIBILITIES ARE INFINITE

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



NOT DISCONTINUED

■ 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 (*)

■ 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

TO BE DISCONTINUED

■ 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 20ºC)		700 to 750 mW	530 mW
	Operate Power (at 20ºC)		350 to 370 mW	260 mW
	Operating Temperature		-40ºC to +65ºC (no frost)	-40ºC to +75ºC (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

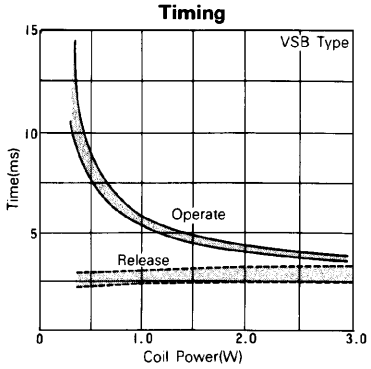
Type	Compliance	Contact rating
UL	UL 508, 873 E56140	Flammability: UL 94-V0 (plastics) 16A, 250VAC/30VDC (resistive) 1/3 HP, 250VAC/125VAC Pilot duty: C150
CSA	C22.2 No. 14 LR 35579	
VDE	0435, 0631, 0700, 0860	

Complies with SEV, SEMKO, FIMKO, ÖVE, BSI

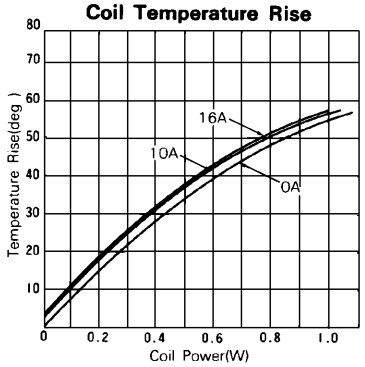
TO BE DISCONTINUED

■ CHARACTERISTIC DATA

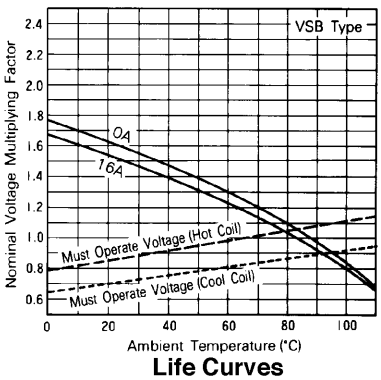
Timing



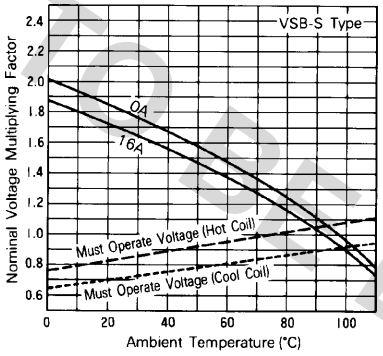
Coil Temperature Rise



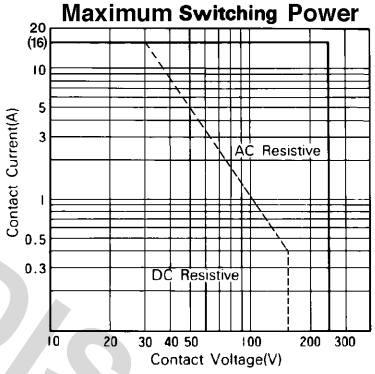
Operating Range



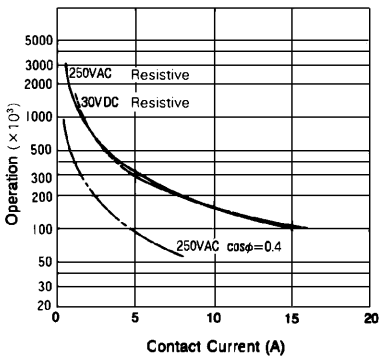
Operating Range



Maximum Switching Power

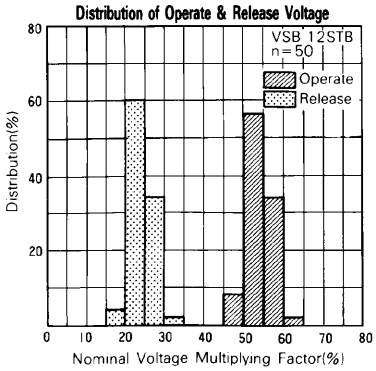


Life Curves

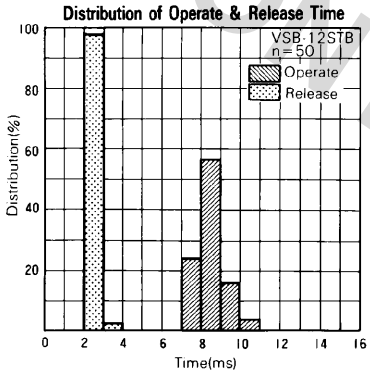


■ REFERENCE DATA

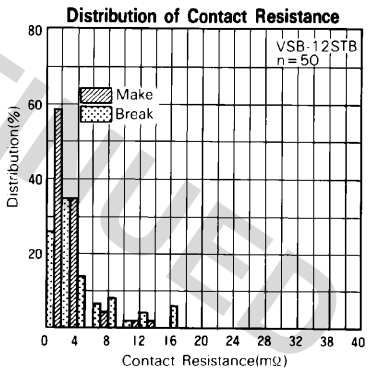
Distribution of Operate & Release Voltage



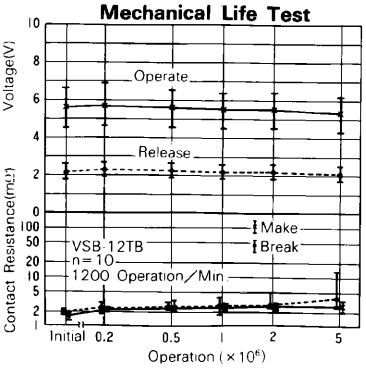
Distribution of Operate & Release Time



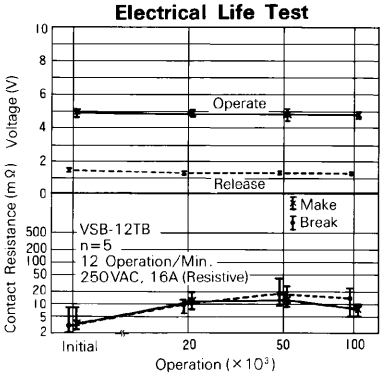
Distribution of Contact Resistance



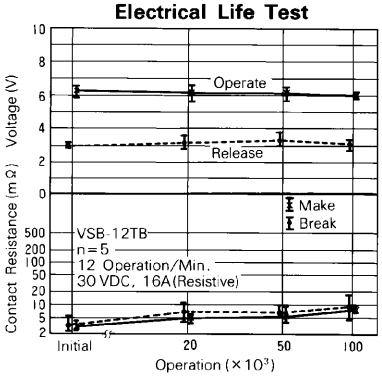
Mechanical Life Test



Electrical Life Test



Electrical Life Test

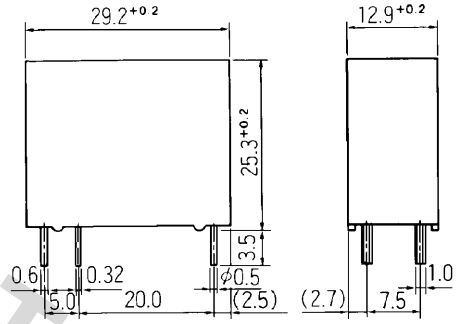


NOT RECOMMENDED FOR NEW DESIGN

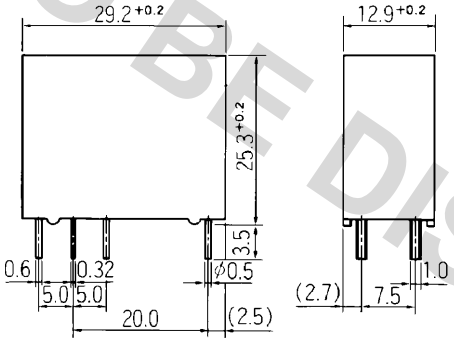
■ DIMENSIONS

● **Dimensions**

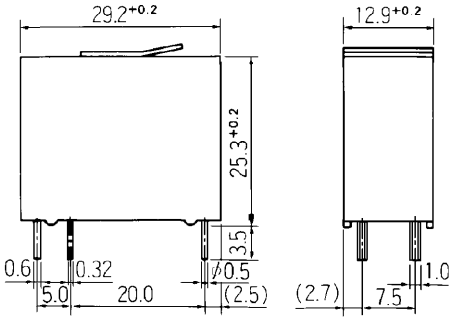
VSB-M type



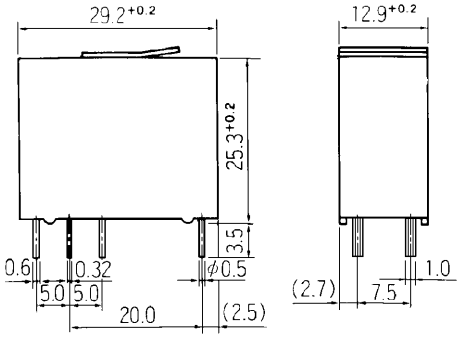
VSB type



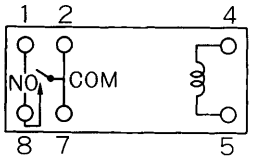
VSB-MC type (Plastic sealed type with tape)

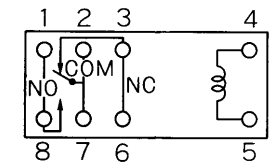


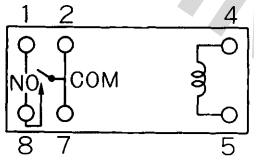
VSB-C type (Plastic sealed type with tape)

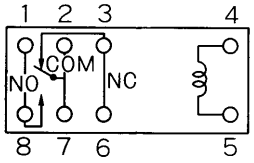


● **PC board mounting hole layout**
(BOTTOM VIEW)

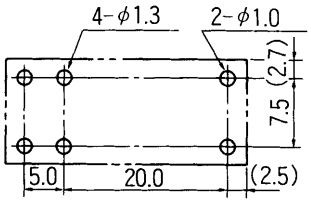


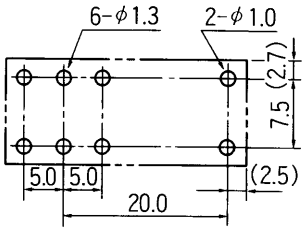


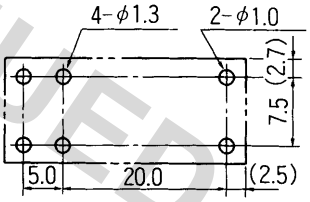


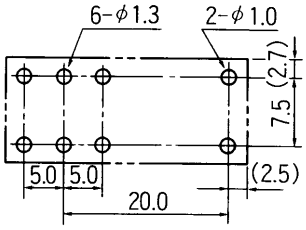


● **Schematics**
(BOTTOM VIEW)









Unit: mm

TO BE DISCONTINUED

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 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.

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 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

- SnAgCu solder is known as low riskof 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.

TO BE DISCONTINUED

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Rev. June 30, 2009

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