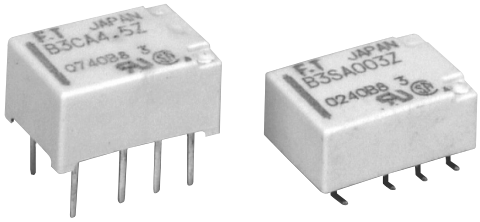
FUJITSU

ULTRA MINIATURE RELAY
2 POLES - 2 A (Low Profile Signal Relay)
FTR-B3 Series

■ FEATURES

- DPDT 2C
- Ultra miniature low profile relay with high heat resistant material
- Height: 5.45mm, Weight: 0.85g, Mounting space: 87mm^2
- Adopted superior contact spring for high frequency characteristic
- Comply with Telcordia / FCC part 68
  - Isolation distance: min. 1.6mm
  - Dielectric strength between coil and contact: 1500VAC
  - Surge strength: 2500V
- Low power: Non-latching: 140mW (230mW at 24V)
  Latching: 100mW (120mW at 24V)
- High reliable bifurcated gold overlay silver contact
- UL, CSA recognized. Conforms to BSI, IEC60950-1
- RoHS compliant. Please see page 9 for more information
- Plastic sealed



■ PARTNUMBER INFORMATION

	FTR-B3	G	B	012	Z	-	B10
[Example]	(a)	(b)	(c)	(d)	(e)		(f)

(a)	Relay type	FTR-B3	: FTR-B3-Series
(b)	Terminal type	C G S	: Through hole : Surface mount : Surface mount, space saving
(c)	Coil type	A B	: Standard type : Latching type (1 coil)
(d)	Coil rated voltage	012	: 1.5.....24 VDC Coil rating table at page 3
(e)	Contact material	Z P	: Gold overlay silver nickel : Gold overlay silver palladium
(f)	Packaging	Nil B10	: Tube packaging : Tape&Peel packaging (only for surface mount type)

Remarks: Actual marking on relay would not carry code FTR and be as below:
Ordering code: FTR-B3GB012Z-B10 Actual marking: B3GB012Z

■ SPECIFICATION

Item			Standard type	Latching type
			FTR-B3 ( ) A	FTR-B3 ( ) B
Contact Data	Configuration		2 form C	
	Construction		Bifurcated contacts	
	Material		Z: Gold overlay silver nickel / P: Gold overlay silver palladium	
	Resistance (initial)		Max. 75 mΩ at 1 A, 6 VDC	
	Contact rating (resistive)		30VDC, 1A / 125VAC, 0.3A	
	Max. carrying current		2A	
	Max. switching voltage		250 VAC / 220VDC	
	Max. switching power		62.5VA / 30W	
	Min. switching load *		0.01mA, 10mVDC	
Life	Mechanical		Min. 50 x 10^6 operations	Min. 20 x 10^6 operations
	Electrical (rated load)		Min. 100 x 10^3 operations at 1A 30VDC Min. 100 x 10^3 operations at 0.3A 125VAC	
Coil Data	Rated power (at 20 °C)		140mW - 230mW	100mW - 120mW
	Applied pulse width		-	Min. 10ms
	Operate power (at 20 °C)		80mW - 130mW	57mW - 68mW
	Operating temperature range		-40 °C to +85 °C (no frost)	
	Storage temperature / humidity		-40 °C to +85 °C / 5% to 85% RH (no frost)	
Timing Data	Operate (at nominal voltage, no bounce)		Max. 3 ms	Max. 3 ms (set)
	Release (at nominal voltage, no bounce)		Max. 3 ms	Max. 3 ms (reset)
Insulation	Resistance (initial)		Min. 1,000MΩ at 500VDC	
	Dielectric strength	Open contacts	1,000VAC (50/60Hz) 1min	
		Adjacent contacts	1,000VAC (50/60Hz) 1min.	
		Contacts to coil	1,500VAC (50/60Hz) 1min	
	Surge strength	Contacts to coil	2,500V, 2 x 10μs standard wave	
	Clearance	Open contacts	0.28 mm	
		Adjacent contacts	1.0 mm	
		Contacts to coil	1.0 mm	
	Creepage	Open contacts	0.28 mm	
		Adjacent contacts	1.0 mm	
		Contacts to coil	1.60 mm	
Other	Vibration resistance	Misoperation	10 to 55 to 10Hz single amplitude 1.65mm	
		Endurance	10 to 55 to 10Hz single amplitude 2.5mm	
	Shock	Misoperation	750m/s² (11 ±1ms)	
		Endurance	1,000m/s² (6 ±1ms)	
	Weight		Approximately 0.85 g	
	Sealing		RT III (plastic sealed)	

* 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.

■ COIL RATING

Standard type

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ohm)	Must Operate Voltage (VDC) *	Must Release Voltage (VDC) *	Rated Power (mW)
1.5	1.5	16.1	1.13	0.15	140
003	3	64.3	2.25	0.3	
4.5	4.5	145	3.38	0.45	
006	6	257	4.5	0.6	
009	9	579	6.75	0.9	
012	12	1,028	9.0	1.2	
024	24	2,504	18.0	2.4	230

Latching type (1 coil)

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ohm)	Set Voltage (VDC) *	Reset Voltage (VDC) *	Set/Reset current (mA)	Rated Power (mW)
1.5	1.5	22.5	+1.13	-1.13	50	100
003	3	90	+2.25	-2.25	25	
4.5	4.5	203	+3.38	-3.38	17	
006	6	360	+4.5	-4.5	13	
009	9	810	+6.75	-6.75	8	
012	12	1,440	+9.0	-9.0	6	
024	24	4,800	+18.0	-18.0	4	120

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

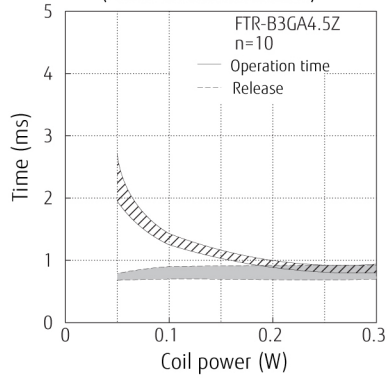
Type	Compliance	Contact rating
UL	UL 508 E 63615	Flammability: UL 94-V0 (plastics) 0.5A, 125VAC (resistive) 0.3A, 110VDC (General use) 2A, 30VDC (General use)
CSA	C22.2 No. 14 LR 40304-58	

Comply with Telcordia specifications and FCC part 68 and meet BSI, IEC60950-1:
Marking only for UL, CSA

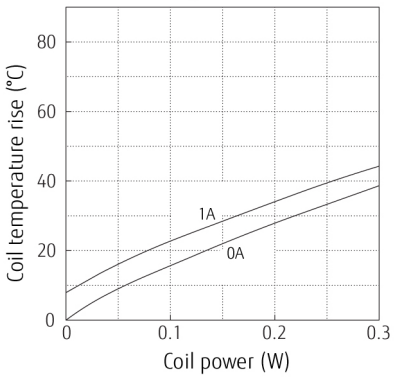
■ CHARACTERISTIC DATA (Reference)

- **Standard type**

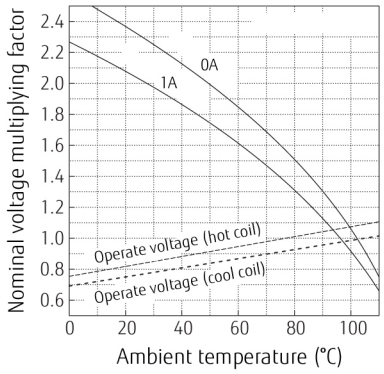
Operation
(return time characteristics)



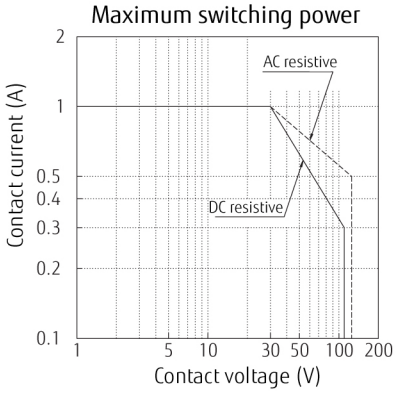
Coil temperature rise



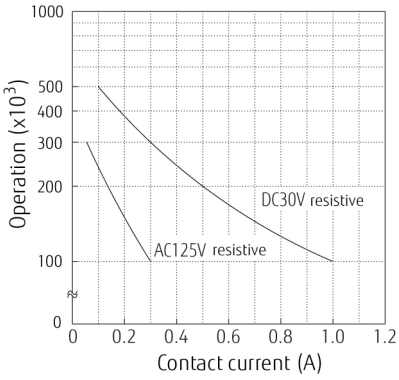
Ambient temperature
(Maximum applied voltage,
operating voltage characteristics)



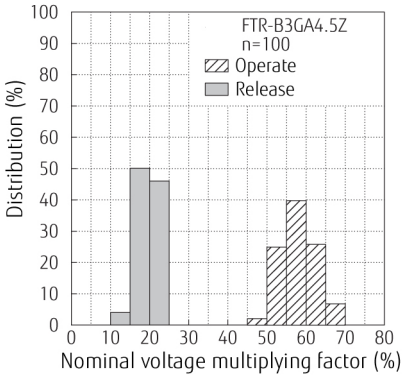
Maximum switching power



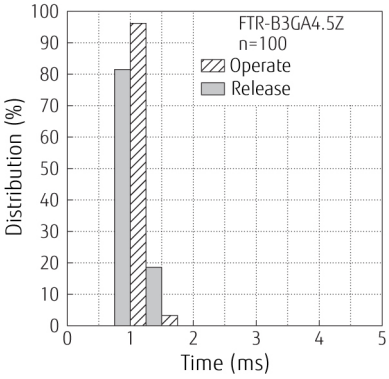
Life curve



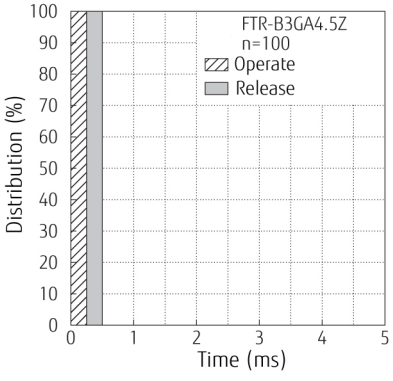
Distribution of operate/release voltage



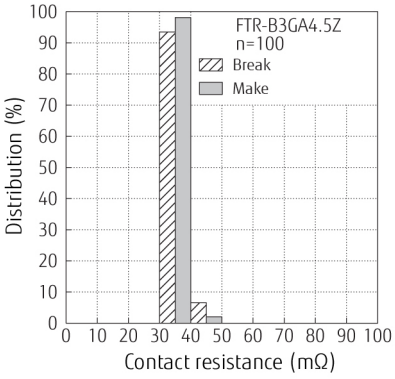
Distribution of operate/release time



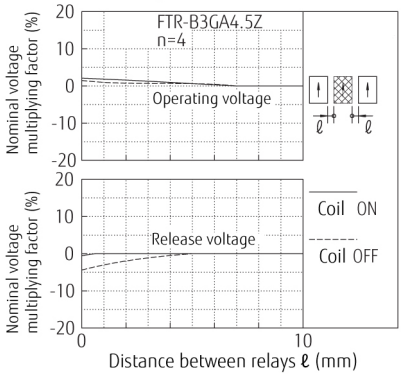
Distribution of bounce time



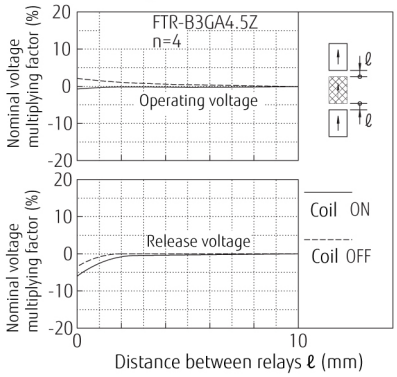
Distribution of contact resistance



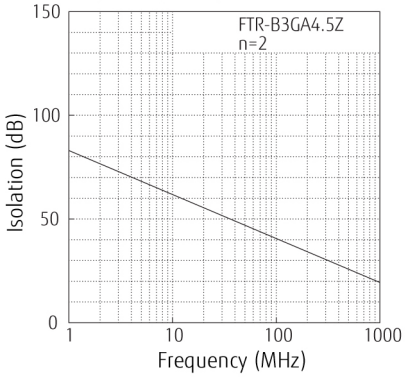
Magnetic interference



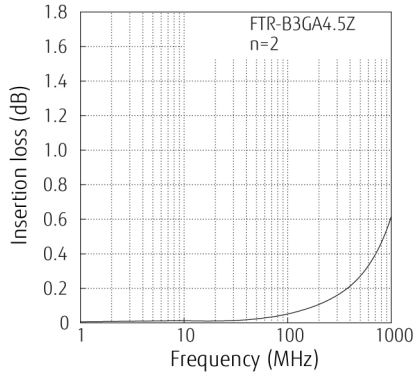
Magnetic interference



High frequency characteristics

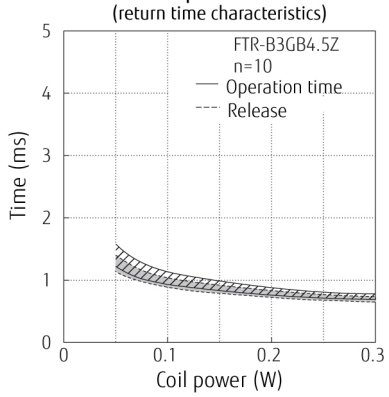


High frequency characteristics

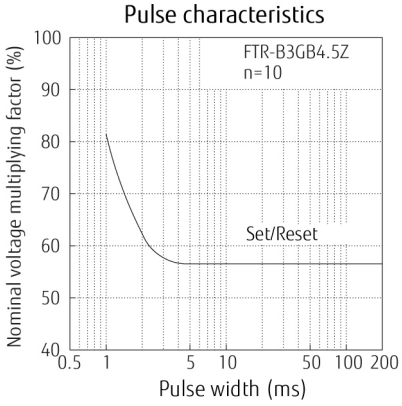


- **Latching type**

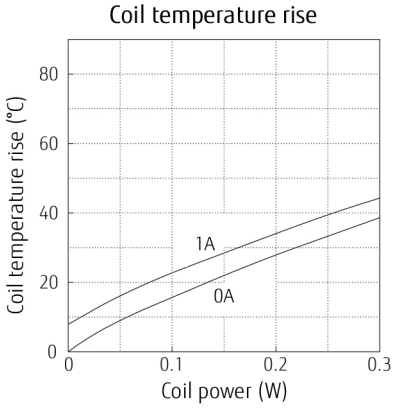
Operation
(return time characteristics)



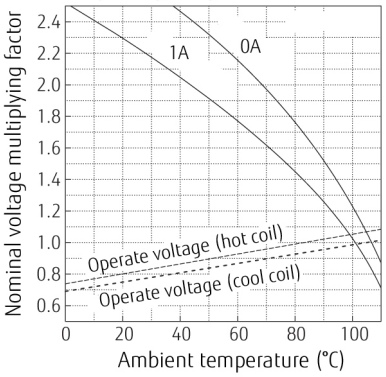
Pulse characteristics



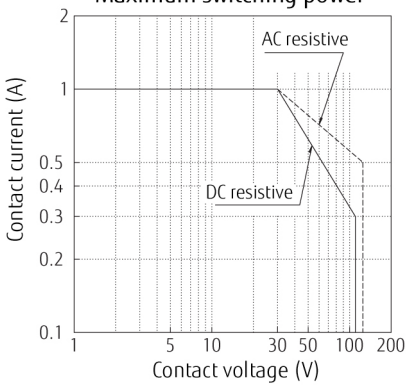
Coil temperature rise



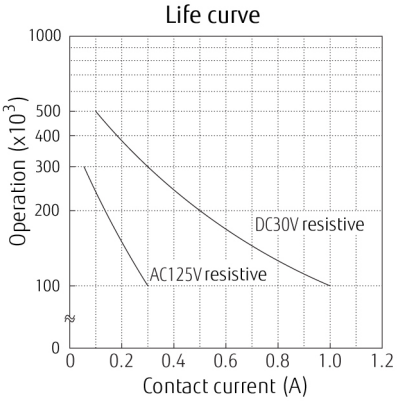
Ambient temperature
(maximum applied voltage, operating voltage characteristics)



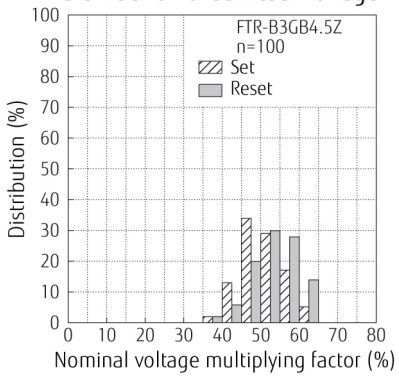
Maximum switching power



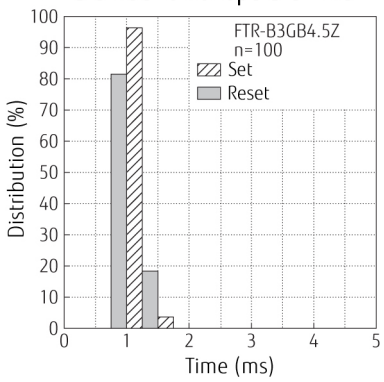
Life curve



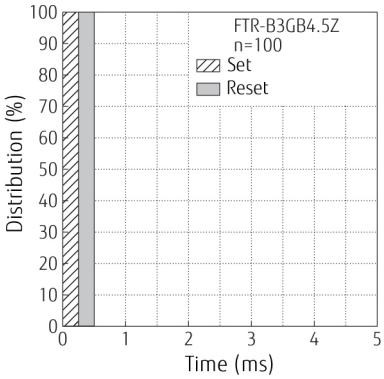
Distribution of set/reset voltage



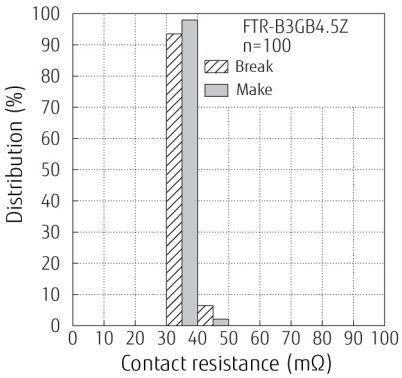
Distribution of operate time



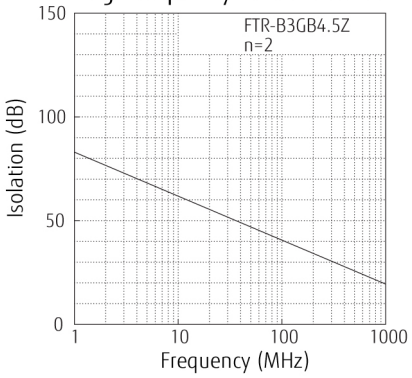
Distribution of bounce time



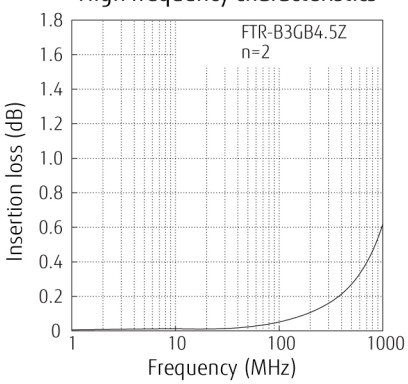
Distribution of contact resistance



High frequency characteristics



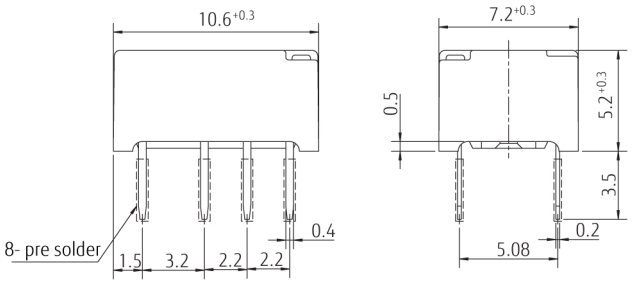
High frequency characteristics



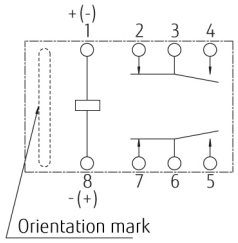
■ DIMENSIONS

FTR-B3C - Through hole type

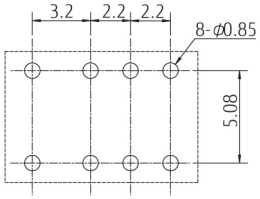
- **Dimensions**



- **Schematics ***
(BOTTOM VIEW)

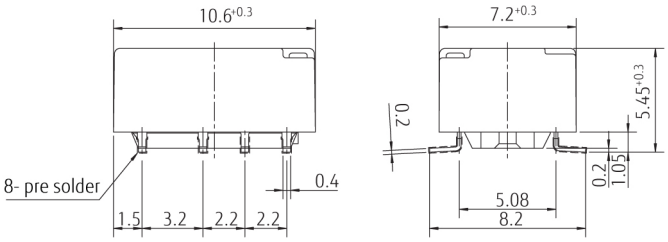


- **PC board mounting hole layout**
(BOTTOM VIEW)

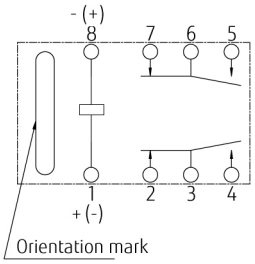


FTR-B3G - Surface mount type

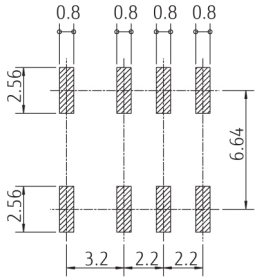
- **Dimensions**



- **Schematics ***
(TOP VIEW)

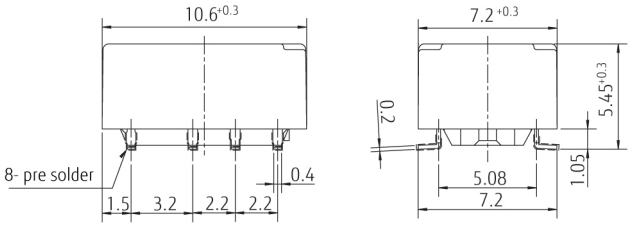


- **PC board mounting pad layout**
(TOP VIEW)

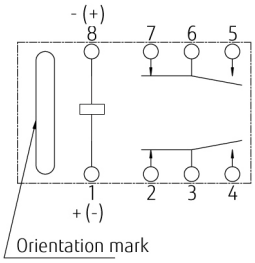


FTR-B3S - Space saving type

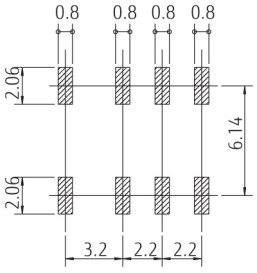
- **Dimensions**



- **Schematics ***
(TOP VIEW)



- **PC board mounting pad layout**
(TOP VIEW)



* +/-: Indicates reset state for latching relays (FTR-B3CB, FTR-B3GB and FTR-B3SB versions)
Indicates non-operate state for standard relays (FTR-B3CA, FTR-B3GA and FTR-B3SA versions)
(+)/(-): Indicates set state for latching relays, operate state for standard relays.
Note: Tolerance for PC board mounting hole/pad layout: +/-0.1.
Note: Dimensions of the terminals do not include thickness of pre-solder.

Unit: mm

■ COIL POLARITY LATCHING TYPE

Coil terminal	1	8
Set	+	-
Reset	-	+

■ RECOMMENDED SOLDERING CONDITIONS FOR SMT (SEE PAGE 9) (TEMPERATURE PROFILE)

Notes:
1. Temperature profiles on page 9 show the temperature of PC board surface.
2. Please perform soldering test with your actual PC board before mass production, since the temperatures of PC board surfaces vary according to the size of PC board, status of parts mounting and heating method.

■ PRECAUTIONS

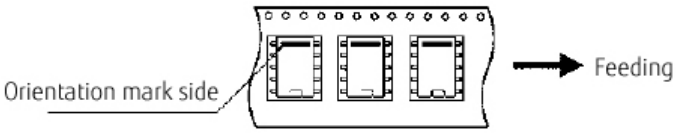
- For details on general precautions, refer to the section on technical descriptions.
- Since this is a polarized relay, follow the instructions of the internal wiring diagram for the ± connections of the coil.
- Note that the terminal layout and internal wiring of the surface mount relay are a top view.
- Characteristic data is not guaranteed value but measured values of samples from production line.

■ PACKAGING SPECIFICATIONS

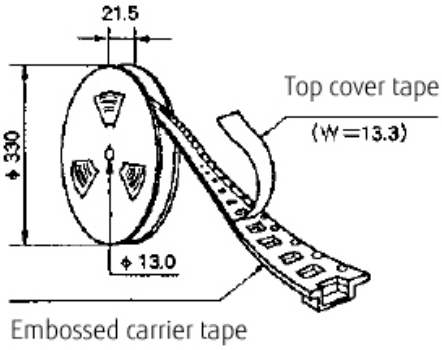
● Packaging method

- Packaging standard: JIS C 0806
- Taping type: TB 1612
- Reel type: R16D
- Quantity of 1 reel: 1000 pieces

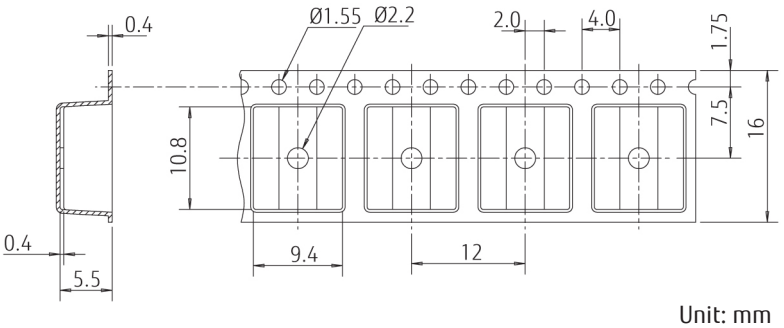
● Packaging orientation code: B



● Reel dimensions



● Tape dimensions



Unit: mm

Note:
Relays are sold in 1000 pieces per box. Minimum order quantity is 1000 pieces for tube and tape & reel packing.

General information

1. ROHS COMPLIANCE

- All relays produced by Fujitsu Components are compliant with RoHS directive 2011/65/EU including amendments.
- Use of cadmium in electrical contacts is exempted as per Annex III of the RoHS directive 2011/65/EU. Please consider expiry date of exemption. Relays with cadmium containing contacts are not to be used for new designs.
- All relays are lead-free. Please refer to Lead-Free Status Info for older date codes at: http://www.fujitsu.com/downloads/MICRO/fcai/relays/lead-free-letter.pdf

2. Recommended Lead Free Solder Condition

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

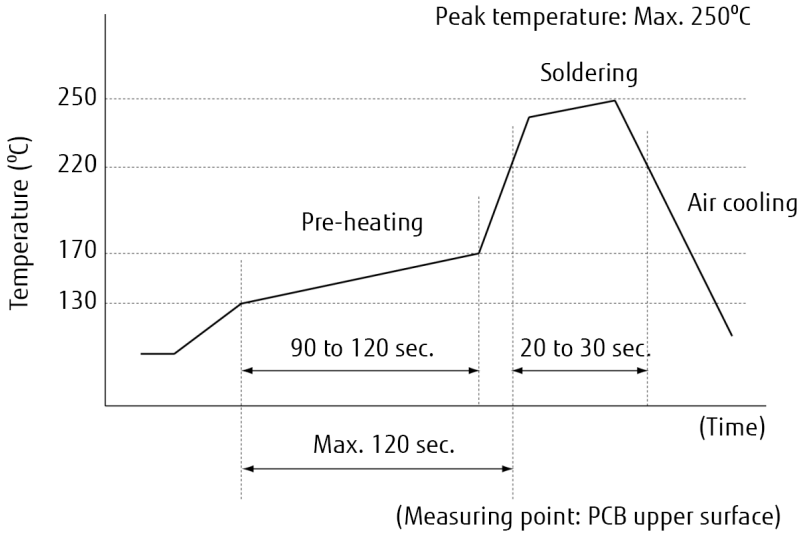
Flow Solder Condition:

Pre-heating:	maximum 120˚C within 90 sec.
Soldering:	dip within 5 sec. at 255˚C ± 5˚C solder bath

Relay must be cooled by air immediately after soldering

Solder by Soldering Iron:

Soldering Iron Temperature:	30-60W maximum 340-360˚C
Duration:	maximum 3 sec.



We highly recommend that you confirm your actual solder conditions

3. Moisture Sensitivity

- Relays must be stored under storage conditions within 1 year.
- Moisture Sensitivity Level (MSL) of FTR-B3 relay is 2a.
- SMT versions of FTR-B3 relays in Tape & Reel package will be shipped in Moisture Barrier Bag(MBB).
- SMT versions of FTR-B3 relays in Tube package will not be shipped in MBB. Therefore, these relays shall be dried by baking before reflow soldering process according to IPC/JEDEC J-STD-033.

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
Shinagawa Seaside Park Tower 19F,
12-4, Higashi-shinagawa 4-chome, Shinagawa-ku,
Tokyo,140-0002, Japan
Tel: (81-3) 3450-1682
Fax: (81-3) 3474-2385
Email: fcl-contact@cs.jp.fujitsu.com
Web: www.fujitsu.com/jp/fcl/

North and South America
FUJITSU COMPONENTS AMERICA, INC
2290 North First Street, Suite 212
San Jose, CA 95131, USA
Tel: (1-408) 745-4900
Fax: (1-408) 745-4970
Email: components@us.fujitsu.com
Web: 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
Web: www.fujitsu.com/uk/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@sg.fujitsu.com
Web: www.fujitsu.com/sg/products/devices/components

China
FUJITSU ELECTRONIC COMPONENTS (SHANGHAI) CO., LTD.
Unit 4306, InterContinental Center
100 Yu Tong Road, Shanghai 200070,
China
Tel: (86-21) 3253 0998
Fax: (86-21) 3253 0997
Email: fcal@sg.fujitsu.com
Web: www.fujitsu.com/sg/products/devices/components

Hong Kong
FUJITSU COMPONENTS HONG KONG CO., LTD
Unit 506, Inter-Continental Plaza
No.94 Granville Road, Tsim Sha Tsui, Kowloon,
Hong Kong
Tel: (852) 2881-8495
Tex: (852) 2894-9512
Email: fcal@sg.fujitsu.com
Web: www.fujitsu.com/sg/products/devices/components/

Korea
FUJITSU COMPONENTS KOREA LIMITED
Alpha Tower #403, 645 Sampyeong-dong,
Bundang-gu, Seongnam-si, Gyeonggi-do,
13524 Korea
Tel: (82) 31-708-7108
Fax: (82) 31-709-7108
Email: fcal@sg.fujitsu.com
www.fujitsu.com/sg/products/devices/components/