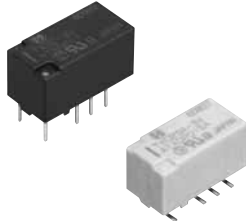


Panasonic

ideas for life

HIGH INSULATION RELAYS (Conforming to the supplementary insulation class of EN Standards (EN41003))

TX-D RELAYS



RoHS Directive compatibility information
<http://www.mew.co.jp/ac/e/environment/>

FEATURES

1. Approved to the supplementary insulation class in the EN standards (EN41003).

The insulation distance between the contact and coil meet the supplementary insulation class of the EN41003 standards as required for equipment connected to the telephone lines in Europe.

Satisfies the following conditions:

- Clearances: 2.0 mm .079 inch or more
- Creepage distance: 2.5 mm .098 inch or more

2. 2,000 V breakdown voltage between contact and coil.

The body block construction of the coil that is sealed formation offers a high breakdown voltage of 2,000 V between contact and coil, and 1,000 V between open contacts.

3. Outstanding surge resistance.

Surge breakdown voltage between open contacts:
1,500 V 10×160 μsec. (FCC part 68)
Surge breakdown voltage between contact and coil:
2,500 V 2×10 μsec. (Telcordia)

4. Nominal operating power: High sensitivity of 200mW

By using the highly efficient polar magnetic circuit "seesaw balance mechanism", a nominal operating power of 200 mW has been achieved.

5. High contact capacity: 2 A 30 V DC

6. High contact reliability achieved with gold-clad crossbar twin contacts and the use of gas expelling materials during formation.

*We also offer a range of products with AgPd contacts suitable for use in low level load analog circuits (Max. 10V DC 10 mA).

*SX relays designed for low level loads are also available.

7. Outstanding vibration and shock resistance.

Functional shock resistance: 750 m/s²
Destructive shock resistance: 1,000 m/s²
Functional vibration resistance: 10 to 55 Hz (at double amplitude of 3.3 mm .130 inch)
Destructive vibration resistance: 10 to 55 Hz (at double amplitude of 5 mm .197 inch)

8. Sealed construction allows automatic washing.

9. A range of surface-mount types is also available.

SA: Low-profile surface-mount terminal type
SL: High connection reliability surface-mount terminal type
SS: Space saving surface-mount terminal type

10. M.B.B. type available

TYPICAL APPLICATIONS

1. Facsimile
2. Modem
3. Communications (XDSL)
4. Medical equipment
5. Automotive equipment
6. Security

ORDERING INFORMATION



Contact arrangement
2: 2 Form C

Surface-mount availability
Nil: Standard PC board terminal or self-clinching terminal
SA: SA type SL: SL type SS: SS type

Operating function
Nil: Single side stable L: 1 coil latching

Type of operation
Nil: Standard type
2M: 2 M.B.B. type (Single side stable type only)

Terminal shape
Nil: Standard PC board terminal or surface-mount terminal type
H: Self-clinching terminal

Coil voltage (DC)
1.5, 3, 4.5, 5, 6, 9, 12, 24V

Contact material
Nil: Standard contact (Ag+Au clad)
-1: AgPd contact (low level load); AgPd+Au clad (stationary), AgPd (movable)

Packing style
Nil: Tube packing
X: Tape and reel (picked from 1/3/4/5-pin side)
Z: Tape and reel packing (Picked from the 8/9/10/12-pin side)

Note: In case of 5 V transistor drive circuit, it is recommended to use 4.5 V type relay.

TX-D**TYPES****1. Standard (B.B.M.) type****1) Standard PC board terminal**

Contact arrangement	Nominal coil voltage	Single side stable	1 coil latching
		Part No.	Part No.
2 Form C	1.5V DC	TXD2-1.5V	TXD2-L-1.5V
	3V DC	TXD2-3V	TXD2-L-3V
	4.5V DC	TXD2-4.5V	TXD2-L-4.5V
	5V DC	TXD2-5V	TXD2-L-5V
	6V DC	TXD2-6V	TXD2-L-6V
	9V DC	TXD2-9V	TXD2-L-9V
	12V DC	TXD2-12V	TXD2-L-12V
	24V DC	TXD2-24V	TXD2-L-24V

Standard packing: Tube: 40 pcs.; Case: 1,000 pcs.

Note: Please add "-1" to the end of the part number for AgPd contacts (low level load).

2) Self-clinching terminal

Contact arrangement	Nominal coil voltage	Single side stable	1 coil latching
		Part No.	Part No.
2 Form C	1.5V DC	TXD2-H-1.5V	TXD2-L-H-1.5V
	3V DC	TXD2-H-3V	TXD2-L-H-3V
	4.5V DC	TXD2-H-4.5V	TXD2-L-H-4.5V
	5V DC	TXD2-H-5V	TXD2-L-H-5V
	6V DC	TXD2-H-6V	TXD2-L-H-6V
	9V DC	TXD2-H-9V	TXD2-L-H-9V
	12V DC	TXD2-H-12V	TXD2-L-H-12V
	24V DC	TXD2-H-24V	TXD2-L-H-24V

Standard packing: Tube: 40 pcs.; Case: 1,000 pcs.

Note: Please add "-1" to the end of the part number for AgPd contacts (low level load).

3) Surface-mount terminal**(1) Tube packing**

Contact arrangement	Nominal coil voltage	Single side stable	1 coil latching
		Part No.	Part No.
2 Form C	1.5V DC	TXD2S□-1.5V	TXD2S□-L-1.5V
	3V DC	TXD2S□-3V	TXD2S□-L-3V
	4.5V DC	TXD2S□-4.5V	TXD2S□-L-4.5V
	5V DC	TXD2S□-5V	TXD2S□-L-5V
	6V DC	TXD2S□-6V	TXD2S□-L-6V
	9V DC	TXD2S□-9V	TXD2S□-L-9V
	12V DC	TXD2S□-12V	TXD2S□-L-12V
	24V DC	TXD2S□-24V	TXD2S□-L-24V

□: For each surface-mounted terminal identification, input the following letter. SA type: A, SL type: L, SS type: S

Standard packing: Tube: 40 pcs.; Case: 1,000 pcs.

Note: Please add "-1" to the end of the part number for AgPd contacts (low level load).

(2) Tape and reel packing

Contact arrangement	Nominal coil voltage	Single side stable	1 coil latching
		Part No.	Part No.
2 Form C	1.5V DC	TXD2S□-1.5V-Z	TXD2S□-L-1.5V-Z
	3V DC	TXD2S□-3V-Z	TXD2S□-L-3V-Z
	4.5V DC	TXD2S□-4.5V-Z	TXD2S□-L-4.5V-Z
	5V DC	TXD2S□-5V-Z	TXD2S□-L-5V-Z
	6V DC	TXD2S□-6V-Z	TXD2S□-L-6V-Z
	9V DC	TXD2S□-9V-Z	TXD2S□-L-9V-Z
	12V DC	TXD2S□-12V-Z	TXD2S□-L-12V-Z
	24V DC	TXD2S□-24V-Z	TXD2S□-L-24V-Z

□: For each surface-mounted terminal identification, input the following letter. SA type: A, SL type: L, SS type: S

Standard packing: Tape and reel: 500 pcs.; Case: 1,000 pcs.

Notes: 1. Tape and reel packing symbol "-Z" is not marked on the relay. "X" type tape and reel packing (picked from 1/2/3/4-pin side) is also available.

2. Please add "-1" to the end of the part number for AgPd contacts (low level load). (Ex. TXD2SA-1.5V-1-Z)

2. M.B.B type**1) Standard PC board terminal**

Contact arrangement	Nominal coil voltage	Single side stable
		Part No.
2 Form C	1.5V DC	TXD2-2M-1.5V
	3V DC	TXD2-2M-3V
	4.5V DC	TXD2-2M-4.5V
	5V DC	TXD2-2M-5V
	6V DC	TXD2-2M-6V
	9V DC	TXD2-2M-9V
	12V DC	TXD2-2M-12V
	24V DC	TXD2-2M-24V

Standard packing: Tube: 40 pcs.; Case: 1,000 pcs.

2) Self-clinching terminal

Contact arrangement	Nominal coil voltage	Single side stable
		Part No.
2 Form C	1.5V DC	TXD2-2M-H-1.5V
	3V DC	TXD2-2M-H-3V
	4.5V DC	TXD2-2M-H-4.5V
	5V DC	TXD2-2M-H-5V
	6V DC	TXD2-2M-H-6V
	9V DC	TXD2-2M-H-9V
	12V DC	TXD2-2M-H-12V
	24V DC	TXD2-2M-H-24V

Standard packing: Tube: 40 pcs.; Case: 1,000 pcs.

3) Surface-mount terminal**(1) Tube packing**

Contact arrangement	Nominal coil voltage	Single side stable
		Part No.
2 Form C	1.5V DC	TXD2S□-2M-1.5V
	3V DC	TXD2S□-2M-3V
	4.5V DC	TXD2S□-2M-4.5V
	5V DC	TXD2S□-2M-5V
	6V DC	TXD2S□-2M-6V
	9V DC	TXD2S□-2M-9V
	12V DC	TXD2S□-2M-12V
	24V DC	TXD2S□-2M-24V

□: For each surface-mounted terminal identification, input the following letter. SA type: A, SL type: L, SS type: S

Standard packing: Tube: 40 pcs.; Case: 1,000 pcs.

2) Tape and reel packing

Contact arrangement	Nominal coil voltage	Single side stable
		Part No.
2 Form C	1.5V DC	TXD2S□-2M-1.5V-Z
	3V DC	TXD2S□-2M-3V-Z
	4.5V DC	TXD2S□-2M-4.5V-Z
	5V DC	TXD2S□-2M-5V-Z
	6V DC	TXD2S□-2M-6V-Z
	9V DC	TXD2S□-2M-9V-Z
	12V DC	TXD2S□-2M-12V-Z
	24V DC	TXD2S□-2M-24V-Z

□: For each surface-mounted terminal identification, input the following letter. SA type: A, SL type: L, SS type: S

Standard packing: Tape and reel: 500 pcs.; Case: 1,000 pcs.

Notes: 1. Types ("-1" to the end of part No.) designed to withstand strong vibration caused, for example, by the use of terminal cutters, can also be ordered.

However, please contact us if you need parts for use in low level load. (Ex. TXD2SA-2M-1.5V-1-Z)

2. Tape and reel packing symbol "-Z" is not marked on the relay. "X" type tape and reel packing (picked from 1/2/3/4-pin side) is also available.

TX-D**RATING****1. Coil data****[Standard (B.B.M.) type]**

1) Single side stable

Nominal coil voltage	Pick-up voltage (at 20°C 68°F)	Drop-out voltage (at 20°C 68°F)	Nominal operating current [$\pm 10\%$] (at 20°C 68°F)	Coil resistance [$\pm 10\%$] (at 20°C 68°F)	Nominal operating power	Max. allowable voltage (at 20°C 68°F)
1.5V DC	75%V or less of nominal voltage* (Initial)	10%V or more of nominal voltage* (Initial)	132.7mA	11 Ω	200mW	120%V of nominal voltage
3V DC			66.7mA	45 Ω		
4.5V DC			44.4mA	101 Ω		
5V DC			40.0mA	125 Ω		
6V DC			33.3mA	180 Ω		
9V DC			22.2mA	405 Ω		
12V DC			16.7mA	720 Ω	230mW	
24V DC			9.6mA	2,504 Ω		

2) 1 coil latching

Nominal coil voltage	Set voltage (at 20°C 68°F)	Reset voltage (at 20°C 68°F)	Nominal operating current [$\pm 10\%$] (at 20°C 68°F)	Coil resistance [$\pm 10\%$] (at 20°C 68°F)	Nominal operating power	Max. allowable voltage (at 20°C 68°F)
1.5V DC	75%V or less of nominal voltage* (Initial)	75%V or less of nominal voltage* (Initial)	100.0mA	15 Ω	150mW	120%V of nominal voltage
3V DC			50.0mA	60 Ω		
4.5V DC			33.3mA	135 Ω		
5V DC			30.0mA	166 Ω		
6V DC			25.0mA	240 Ω		
9V DC			16.7mA	540 Ω		
12V DC			12.5mA	960 Ω	170mW	
24V DC			7.1mA	3,388 Ω		

[M.B.B. type]

Nominal coil voltage	Pick-up voltage (at 20°C 68°F)	Drop-out voltage (at 20°C 68°F)	Nominal operating current [$\pm 10\%$] (at 20°C 68°F)	Coil resistance [$\pm 10\%$] (at 20°C 68°F)	Nominal operating power	Max. allowable voltage (at 20°C 68°F)
1.5V DC	75%V or less of nominal voltage* (Initial)	10%V or more of nominal voltage* (Initial)	166.7mA	9 Ω	250mW	120%V of nominal voltage
3V DC			83.3mA	36 Ω		
4.5V DC			55.6mA	81 Ω		
5V DC			50.0mA	100 Ω		
6V DC			41.7mA	144 Ω		
9V DC			27.8mA	324 Ω		
12V DC			20.8mA	576 Ω	270mW	
24V DC			11.3mA	2,133 Ω		

*Pulse drive (JIS C 5442-1986)

2. Specifications

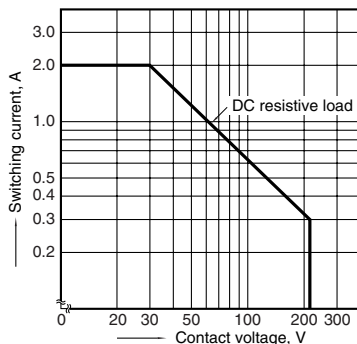
Characteristics	Item	Specifications		
		2 Form C	2 Form D (M.B.B.type)	
Contact	Arrangement	Standard contact: Ag+Au clad, AgPd contact (low level load): AgPd+Au clad (stationary), AgPd (movable)		
	Initial contact resistance, max.	Max. 100 mΩ (By voltage drop 6 V DC 1A)		
	Contact material	Standard contact: Ag+Au clad, AgPd contact (low level load): AgPd+Au clad (stationary), AgPd (movable)		
Rating	Nominal switching capacity (resistive load)	Standard contact: 2 A 30 V DC, AgPd contact: 1 A 30 V DC	1 A 30 V DC	
	Max. switching power (resistive load)	Standard contact: 60 W (DC), AgPd contact: 30 W (DC)	30 W (DC)	
	Max. switching voltage	220 V DC		
	Max. switching current	Standard contact: 2 A, AgPd contact: 1 A		
	Min. switching capacity (Reference value)*1	10μA10mV DC		
	Nominal operating power	Single side stable	200 mW (1.5 to 12 V DC), 230 mW (24 V DC)	250 mW (1.5 to 12 V DC), 270 mW (24 V DC)
		1 coil latching	150 mW (1.5 to 12 V DC), 170 mW (24 V DC)	—
Electrical characteristics	Insulation resistance (Initial)	Min. 1,000MΩ (at 500V DC) Measurement at same location as "Initial breakdown voltage" section.		
	Breakdown voltage (Initial)	Between open contacts	1,000 Vrms for 1min. (Detection current: 10mA)	500 Vrms for 1min. (Detection current: 10mA)
		Between contact and coil	2,000 Vrms for 1min. (Detection current: 10mA)	
		Between contact sets	1,000 Vrms for 1min. (Detection current: 10mA)	
	Surge breakdown voltage (Initial)	Between open contacts	1,500 V (10×160μs) (FCC Part 68)	—
		Between contacts and coil	2,500 V (2×10μs) (Telcordia)	
	Temperature rise (at 20°C 68°F)	Max. 50°C (By resistive method, nominal voltage applied to the coil; contact carrying current: 2A [1A: M.B.B.])		
	Operate time [Set time] (at 20°C 68°F)	Max. 4 ms [Max. 4 ms] (Nominal voltage applied to the coil, excluding contact bounce time.)		
	Release time [Reset time] (at 20°C 68°F)	Max. 4 ms [Max. 4 ms] (Nominal voltage applied to the coil, excluding contact bounce time.) (without diode)		
	Mechanical characteristics	Shock resistance	Functional	Min. 750 m/s ² (Half-wave pulse of sine wave: 6 ms; detection time: 10μs.)
Destructive			Min. 1,000 m/s ² {100G} (Half-wave pulse of sine wave: 6 ms.)	
Vibration resistance		Functional	10 to 55 Hz at double amplitude of 3.3 mm (Detection time: 10μs.)	
		Destructive	10 to 55 Hz at double amplitude of 5 mm	
Expected life	Mechanical	Min. 10 ⁸ (at 180 cpm)		
	Electrical	Min. 10 ⁵ (2 A 30 V DC resistive), Min. 5×10 ⁵ (1 A 30 V DC resistive) (at 20 cpm)	Min. 10 ⁵ (1 A 30 V DC resistive) (at 20 cpm)	
Conditions	Conditions for operation, transport and storage*2	Ambient temperature: -40°C to +85°C -40°F to +185°F; Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)		
	Max. operating speed (at rated load)	20 cpm		
Unit weight	Approx. 2 g .071 oz			

Notes: *1 This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load. (AgPd contact type or SX relays are available for low level load switching [10V DC, 10mA max. level])

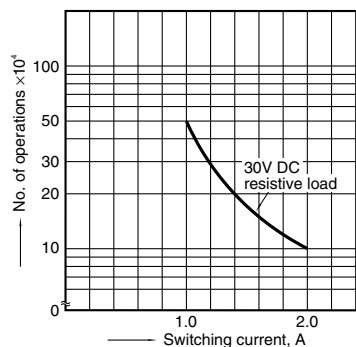
*2 Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT.

REFERENCE DATA

1. Maximum switching capacity

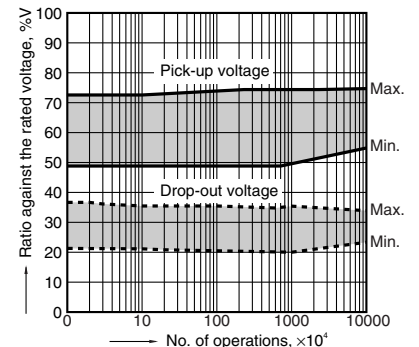


2. Life curve



3. Mechanical life

Tested sample: TXD2-5V, 10 pcs.
Operating speed: 180 cpm

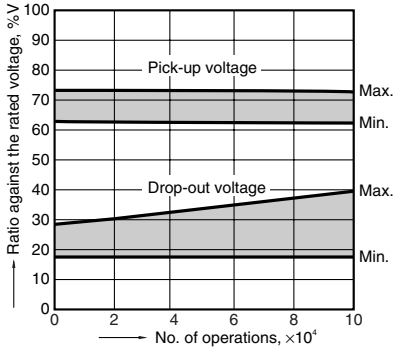


TX-D

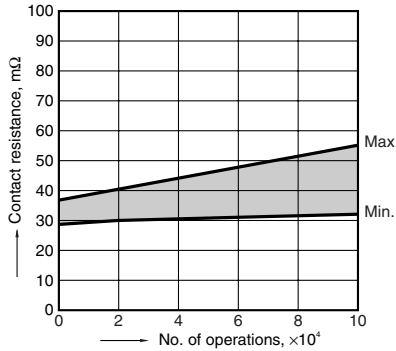
4. Electrical life (2 A 30 V DC resistive load)

Tested sample: TXD2-5V, 6 pcs.
Operating speed: 20 cpm

Change of pick-up and drop-out voltage

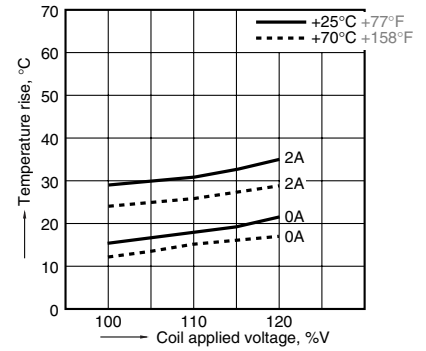


Change of contact resistance



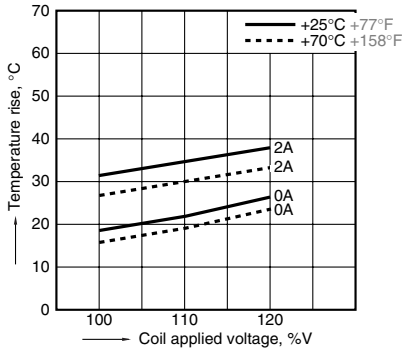
5-(1). Coil temperature rise

Tested sample: TXD2-5V, 6 pcs.
Measured portion: Inside the coil
Ambient temperature: 25°C 77°F, 70°C 158°F



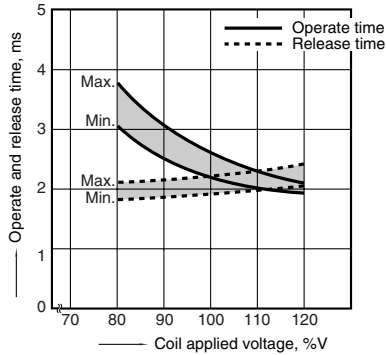
5-(2). Coil temperature rise

Tested sample: TXD2-24V, 6 pcs.
Measured portion: Inside the coil
Ambient temperature: 25°C 77°F, 70°C 158°F



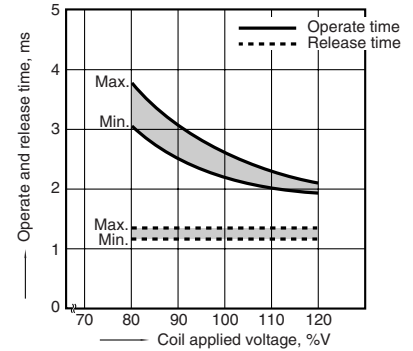
6-(1). Operate/release time characteristics (with diode)

Tested sample: TXD2-5V, 10 pcs.



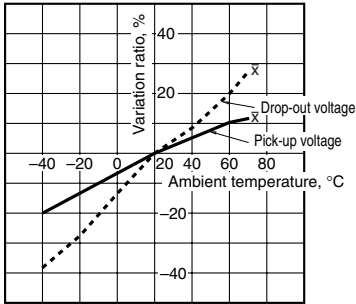
6-(2). Operate/release time characteristics (without diode)

Tested sample: TXD2-5V, 10 pcs.



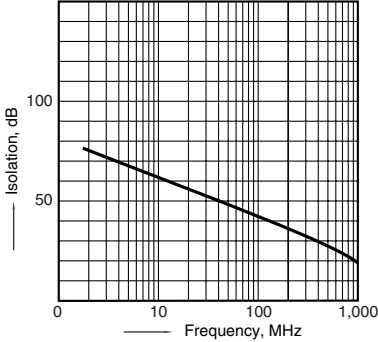
7. Ambient temperature characteristics

Tested sample: TXD2-5V, 5 pcs.



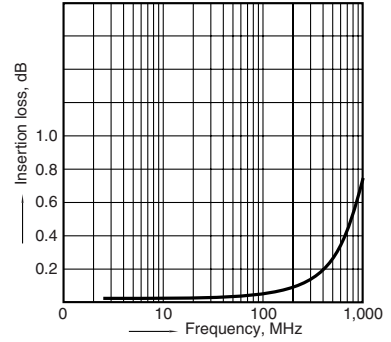
8. High-frequency characteristics (Isolation)

Tested sample: TXD2-12V, 2 pcs.



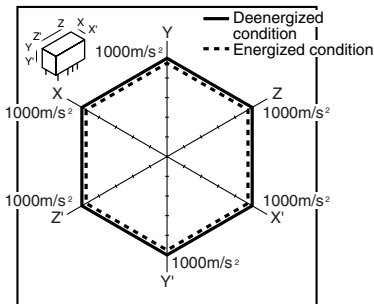
9. High-frequency characteristics (Insertion loss)

Tested sample: TXD2-12V, 2 pcs.



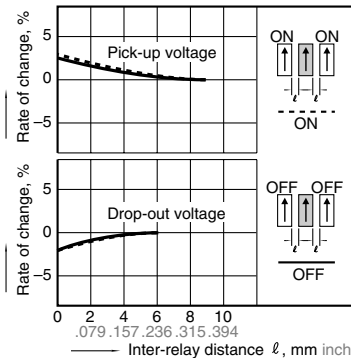
10. Malfunctional shock (single side stable)

Tested sample: TXD2-5V, 6 pcs



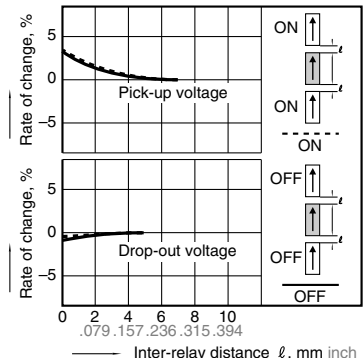
11-(1). Influence of adjacent mounting

Tested sample: TXD2-12V, 6 pcs.



11-(2). Influence of adjacent mounting

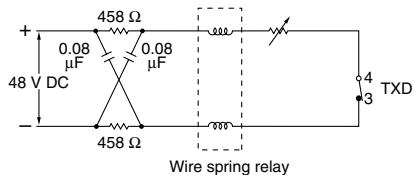
Tested sample: TXD2-12V, 6 pcs.



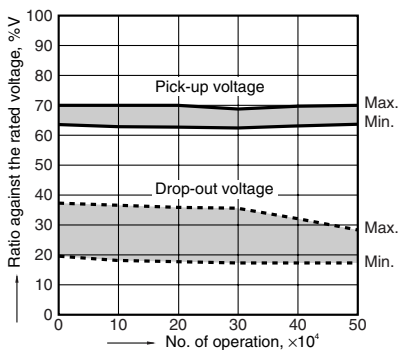
12. Actual load test (35 mA 48 V DC wire spring relay load)

Tested sample: TXD2-5V, 6 pcs.

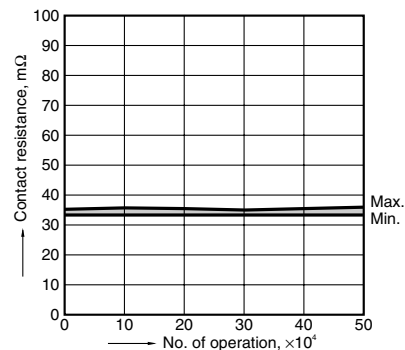
Circuit



Change of pick-up and drop-out voltage



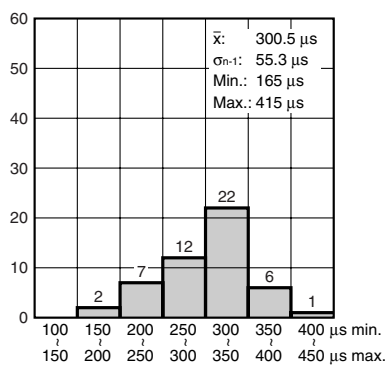
Change of contact resistance



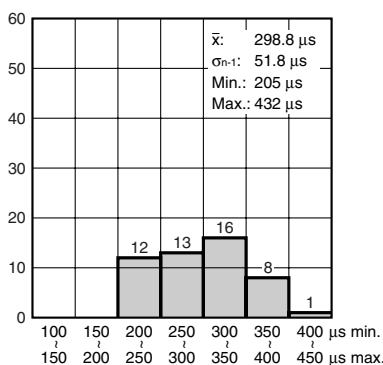
13-(1). Distribution of M.B.B. time

Tested sample: TXD2-2M-5V, 50 pcs.

Terminal No. 3-4-5: ON



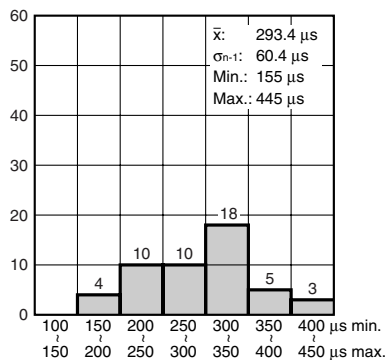
Terminal No. 3-4-5: OFF



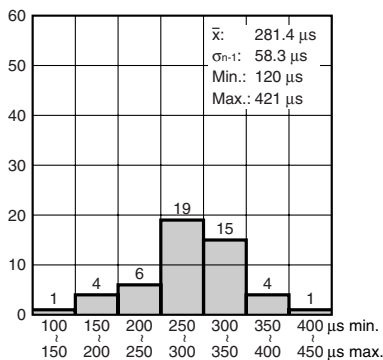
13-(2). Distribution of M.B.B. time

Tested sample: TXD2-2M-5V, 50 pcs.

Terminal No. 8-9-10: ON



Terminal No. 8-9-10: OFF



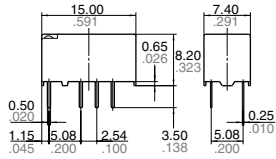
TX-D

DIMENSIONS (Unit: mm inch)

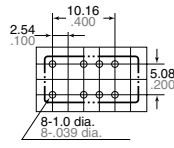
1. Standard PC board terminal and self-clinching terminal



External dimensions
Standard PC board terminal

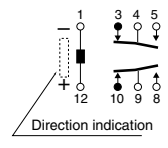
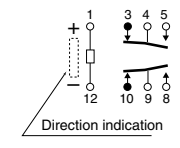


PC board pattern
(Bottom view)

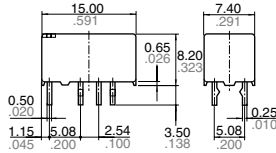


Tolerance: $\pm 0.1 \pm 0.04$

Schematic (Bottom view)
Single side stable 1 coil latching



Self clinching terminal



General tolerance: $\pm 0.3 \pm 0.12$

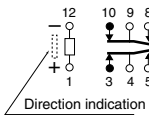
2. Surface-mount terminal



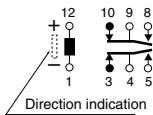
Type	External dimensions (General tolerance: $\pm 0.3 \pm 0.12$)	Suggested mounting pad (Top view) (Tolerance: $\pm 0.1 \pm 0.04$)
	Single side stable and 1 coil latching	
SA type	<p>Dimensions: 15 (591), 7.4 (291), 8.2 (323), 0.65 (026), 0.5 (020), 5.08 (200), 2.54 (100), 9.4±0.5 (370±0.20), 0.25 (010)</p>	<p>Dimensions: 3.16 (039), 5.08 (200), 2.54 (100), 7.24 (285)</p>
SL type	<p>Dimensions: 15 (591), 7.4 (291), 8.2 (323), 0.65 (026), 0.5 (020), 5.08 (200), 2.54 (100), 9.4±0.5 (370±0.20), 0.25 (010), Max. 10 (394)</p>	<p>Dimensions: 3.16 (039), 5.08 (200), 2.54 (100), 7.24 (285)</p>
SS type	<p>Dimensions: 15 (591), 7.4 (291), 8.2 (323), 0.65 (026), 0.5 (020), 5.08 (200), 2.54 (100), 7.4±0.5 (291±0.20), 0.25 (010), Max. 10 (394)</p>	<p>Dimensions: 2.16 (035), 5.08 (200), 2.54 (100), 6.24 (246)</p>

Schematic (Top view)

Single side stable



1 coil latching



NOTES

1. Coil operating power

Pure DC current should be applied to the coil. The wave form should be rectangular. If it includes ripple, the ripple factor should be less than 5%.

However, check it with the actual circuit since the characteristics may be slightly different. The nominal operating voltage should be applied to the coil for more than 10 ms to set/reset the latching type relay.

2. Coil connection

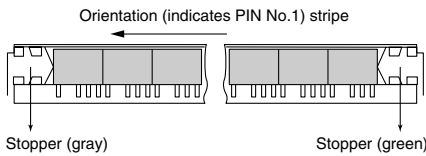
When connecting coils, refer to the wiring diagram to prevent mis-operation or malfunction.

3. External magnetic field

Since T series relays are highly sensitive polarized relays, their characteristics will be affected by a strong external magnetic field. Avoid using the relay under that condition.

4. Packing style

1) The relay is packed in a tube with the relay orientation mark on the left side, as shown in the figure below.

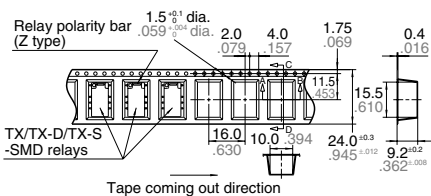


2) Tape and reel packing (surface-mount terminal type)

(1) Tape dimensions

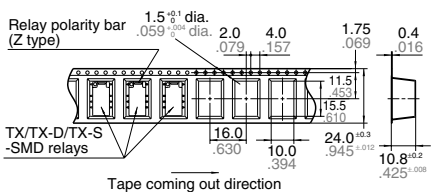
(i) SA type

mm inch



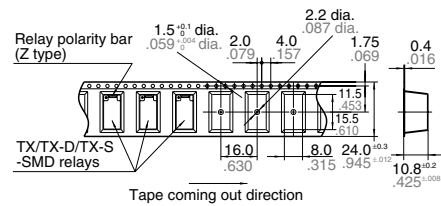
(ii) SL type

mm inch



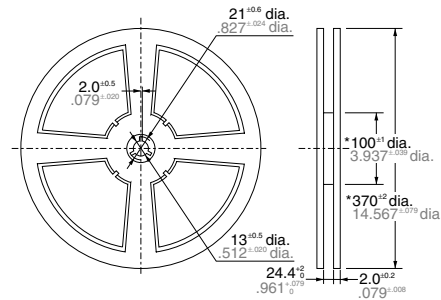
(iii) SS type

mm inch



(2) Dimensions of plastic reel

mm inch



Note: Dimensions of items produced after December 2006 have changed as shown below.
100⁺¹ dia. 3.937^{+0.039} dia. → 80⁺¹ dia. 3.150^{+0.039} dia.;
370⁺¹² dia. 14.567^{+0.039} dia. → 380⁺² dia. 14.961^{+0.079} dia.

5. Automatic insertion

To maintain the internal function of the relay, the chucking pressure should not exceed the values below.

Chucking pressure in the direction A:

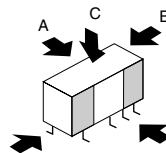
4.9 N {500gf} or less


Chucking pressure in the direction B:

9.8 N {1 kgf} or less

Chucking pressure in the direction C:

9.8 N {1 kgf} or less



Please chuck the  portion.

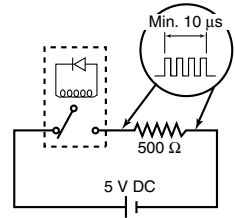
Avoid chucking the center of the relay.

In addition, excessive chucking pressure to the pinpoint of the relay should be avoided.

6. M.B.B. contact relays

A small OFF time may be generated by the contact bounce during contact switching. Check the actual circuit carefully.

If the relay is dropped accidentally, check the appearance and characteristics including M.B.B. time before use.



Measuring condition of M.B.B. time

7. Others

1) If in error the relay has been dropped, the appearance and characteristics should be checked before use without fail.

2) The cycle lifetime is defined under the standard test condition specified in the JIS* C 5442-1986 standard (temperature 15°C to 35°C 59°F to 95°F, humidity 25% to 85%). Check this with the real device as it is affected by coil driving circuit, load type, activation frequency, activation phase, ambient conditions, and other factors.

For Cautions for Use, see Relay Technical Information.