Panasonic

ideas for life



Compliance with RoHS Directive

FEATURES

1. 2,000 V breakdown voltage between contact and coil

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

2. Outstanding surge resistance. Surge breakdown voltage between open contacts: 1,500 V 10×160u sec. (FCC part 68) Surge breakdown voltage between contact and coil: 2,500 V 2×10µ sec. (Bellcore)

New pin layout (LT type) added. Best seller with broad lineup and AC 2000 V breakdown voltage.

3. Nominal operating power: High sensitivity of 140mW

By using the highly efficient polar magnetic circuit "seesaw balance mechanism", a nominal operating power of 140 mW (minimum operating power of 79 mW) has been achieved.

4. High contact capacity: 2 A 30 V DC 5. Compact size

15.0(L) × 7.4(W) × 8.2(H) .591(L) × 291(W) × .323(H)

6. The use of gold-clad twin crossbar contacts ensures high contact reliability.

*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)

TX RELAYS

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 surfacemount terminal type SS: Space saving surface-mount terminal type

TYPICAL APPLICATIONS

- 1. Communications (xDSL,
- Transmission)
- 2. Measurement
- 3. Security
- 4. Home appliances, and audio/visual equipment
- 5. Automotive equipment
- 6. Medical equipment

TX 2 Contact arrangement 2: 2 Form C Surface-mount availability Nil: Standard PC board terminal type or self-clinching terminal type SA: SA type SL: SL type SS: SS type Operating function Nil: Single side stable L: 1 coil latching L2: 2 coil latching LT: 2 coil latching Terminal shape Nil: Standard PC board terminal or surface-mount terminal H: Self-clinching terminal Nominal coil voltage (DC)* 1.5, 3, 4.5, 5, 6, 9, 12, 24, 48V Contact material Nil: Standard contact (Aq+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) Notes: 1. *48 V coil type: Single side stable only

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

ORDERING INFORMATION

TYPES 1. Standard PC board terminal

Contact	Nominal coil	Single side stable	1 coil latching	2 coil latching (L2)	2 coil latching (LT)
arrangement voltage		Part No.	Part No.	Part No.	Part No.
	1.5V DC	TX2-1.5V	TX2-L-1.5V	TX2-L2-1.5V	TX2-LT-1.5V
	3V DC	TX2-3V	TX2-L-3V	TX2-L2-3V	TX2-LT-3V
	4.5V DC	TX2-4.5V	TX2-L-4.5V	TX2-L2-4.5V	TX2-LT-4.5V
2 Form C	5V DC	TX2-5V	TX2-L-5V	TX2-L2-5V	TX2-LT-5V
	6V DC	TX2-6V	TX2-L-6V	TX2-L2-6V	TX2-LT-6V
	9V DC	TX2-9V	TX2-L-9V	TX2-L2-9V	TX2-LT-9V
	12V DC	TX2-12V	TX2-L-12V	TX2-L2-12V	TX2-LT-12V
	24V DC	TX2-24V	TX2-L-24V	TX2-L2-24V	TX2-LT-24V
	48V DC	TX2-48V	_	_	_

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	Nominal coil	Single side stable	1 coil latching	2 coil latching (L2)	2 coil latching (LT)
arrangement voltage		Part No.	Part No.	Part No.	Part No.
	1.5V DC	TX2-H-1.5V	TX2-L-H-1.5V	TX2-L2-H-1.5V	TX2-LT-H-1.5V
	3V DC	TX2-H-3V	TX2-L-H-3V	TX2-L2-H-3V	TX2-LT-H-3V
	4.5V DC	TX2-H-4.5V	TX2-L-H-4.5V	TX2-L2-H-4.5V	TX2-LT-H-4.5V
2 Fom C	5V DC	TX2-H-5V	TX2-L-H-5V	TX2-L2-H-5V	TX2-LT-H-5V
	6V DC	TX2-H-6V	TX2-L-H-6V	TX2-L2-H-6V	TX2-LT-H-6V
	9V DC	TX2-H-9V	TX2-L-H-9V	TX2-L2-H-9V	TX2-LT-H-9V
	12V DC	TX2-H-12V	TX2-L-H-12V	TX2-L2-H-12V	TX2-LT-H-12V
	24V DC	TX2-H-24V	TX2-L-H-24V	TX2-L2-H-24V	TX2-LT-H-24V
	48V DC	TX2-H-48V		_	_

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

/		<u> </u>	4 11 1 1 1	0 11 11 (0)	a 111 11 (17)
Contact	Nominal coil	Single side stable	1 coil latching	2 coil latching (L2)	2 coil latching (LT)
arrangement	voltage	Part No.	Part No.	Part No.	Part No.
	1.5V DC	TX2S□-1.5V	TX2S□-L-1.5V	TX2S□-L2-1.5V	TX2S□-LT-1.5V
	3V DC	TX2S□-3V	TX2S□-L-3V	TX2S□-L2-3V	TX2S□-LT-3V
2c	4.5V DC	TX2S□-4.5V	TX2S□-L-4.5V	TX2S□-L2-4.5V	TX2S□-LT-4.5V
	5V DC	TX2S□-5V	TX2S□-L-5V	TX2S□-L2-5V	TX2S□-LT-5V
	6V DC	TX2S□-6V	TX2S□-L-6V	TX2S□-L2-6V	TX2S□-LT-6V
	9V DC	TX2S□-9V	TX2S□-L-9V	TX2S□-L2-9V	TX2S□-LT-9V
	12V DC	TX2S□-12V	TX2S□-L-12V	TX2S□-L2-12V	TX2SD-LT-12V
Ē	24V DC	TX2S□-24V	TX2S□-L-24V	TX2S□-L2-24V	TX2S□-LT-24V
	48V DC	TX2S□-48V	_	_	_

: 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	Nominal coil	Single side stable	1 coil latching	2 coil latching (L2)	2 coil latching (LT)
arrangement	voltage	Part No.	Part No.	Part No.	Part No.
	1.5V DC	TX2S□-1.5V-Z	TX2S□-L-1.5V-Z	TX2SD-L2-1.5V-Z	TX2S□-LT-1.5V-Z
	3V DC	TX2S□-3V-Z	TX2S□-L-3V-Z	TX2S□-L2-3V-Z	TX2S⊡-LT-3V-Z
2 Form C	4.5V DC	TX2S□-4.5V-Z	TX2S□-L-4.5V-Z	TX2S□-L2-4.5V-Z	TX2S⊡-LT-4.5V-Z
	5V DC	TX2S□-5V-Z	TX2SD-L-5V-Z	TX2S□-L2-5V-Z	TX2S□-LT-5V-Z
	6V DC	TX2S□-6V-Z	TX2S□-L-6V-Z	TX2S□-L2-6V-Z	TX2S⊡-LT-6V-Z
	9V DC	TX2S□-9V-Z	TX2S□-L-9V-Z	TX2S□-L2-9V-Z	TX2S□-LT-9V-Z
	12V DC	TX2S□-12V-Z	TX2SD-L-12V-Z	TX2S□-L2-12V-Z	TX2S□-LT-12V-Z
	24V DC	TX2S□-24V-Z	TX2S□-L-24V-Z	TX2S□-L2-24V-Z	TX2S□-LT-24V-Z
	48V DC	TX2S -48V-Z	_	_	_

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).

RATING

1. Coil data

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 [±10%] (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 20°C 68°F)							
1.5V DC		10%V or more of nominal voltage* (Initial)	93.8mA	16Ω		150%V of							
3V DC			46.7mA	64.3Ω	140mW								
4.5V DC			31mA	145Ω									
5V DC			28.1mA	178Ω									
6V DC	75%V or less of nominal voltage*		nominal voltage*							23.3mA	257Ω	140111	nominal voltage
9V DC	(Initial)			15.5mA	579Ω								
12V DC			11.7mA	1,028Ω									
24V DC			5.8mA	4,114Ω									
48V DC			5.6mA	8,533Ω	270mW	120%V of nominal voltage							

2) 1 coil latching

Nominal coil voltage	Set voltage (at 20°C 68°F)	Reset voltage (at 20°C 68°F)	Nominal operating current [±10%] (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 20°C 68°F)
1.5V DC			66.7mA	22.5Ω		150%V of nominal voltage
3V DC	75%V or less of		33.3mA	90Ω	- 100mW	
4.5V DC		75%V or less of	22.2mA	202.5Ω		
5V DC			20mA	250Ω		
6V DC	nominal voltage* (Initial)	nominal voltage* (Initial)	16.7mA	360Ω		
9V DC	(11.1mA	810Ω		
12V DC			8.3mA	1,440Ω		
24V DC			4.2mA	5,760Ω		

3) 2 coil latching (L2, LT)

Nominal coil voltage	Set voltage (at 20°C 68°F)	Reset voltage (at 20°C 68°F)					operating wer	Max. applied voltage (at 20°C 68°F	
-			Set coil	Reset coil	Set coil	Reset coil	Set coil	Reset coil	
1.5V DC		75%V or less of 75%V or less of nominal voltage* (Initial) (Initial)	133.9mA	133.9mA	11.2Ω	11.2Ω		200mW	150%V of nominal voltage
3V DC			66.7mA	66.7mA	45Ω	45Ω	- 200mW		
4.5V DC			44.5mA	44.5mA	101.2Ω	101.2Ω			
5V DC			40mA	40mA	125Ω	125Ω			
6V DC			33.3mA	33.3mA	180Ω	180Ω			
9V DC	(22.2mA	22.2mA	405Ω	405Ω			
12V DC			16.7mA	16.7mA	720Ω	720Ω			
24V DC			8.3mA	8.3mA	2,880Ω	2,880Ω			

*Pulse drive (JIS C 5442-1986)

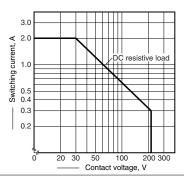
2. Specifications

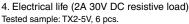
Characteristics		Item	Specifications		
	Arrangement		2 Form C		
Contact	Initial contact resistar	nce, max.	Max. 100 mΩ (By voltage drop 6 V DC 1A)		
Jonaci	Contact material		Standard contact: Ag+Au clad, AgPd contact (low level load): AgPd+Au clad (stationary), AgPd (movable)		
	Nominal switching ca	pacity	Standard contact: 2 A 30 V DC, AgPd contact: 1 A 30 V DC (resistive load)		
	Max. switching power		Standard contact: 60 W (DC), AgPd contact: 30 W (DC) (resistive load)		
	Max. switching voltag	le	220V DC		
	Max. switching currer	nt	Standard contact: 2 A, AgPd contact: 1 A		
Rating	Min. switching capaci	ty (Reference value)*1	10µA 10mV DC		
		Single side stable	140 mW (1.5 to 24 V DC), 270 mW (48 V DC)		
	Nominal operating	1 coil latching	100 mW (1.5 to 24 V DC)		
	power	2 coil latching	200 mW (1.5 to 24 V DC)		
	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)		
		Between contact and coil	2,000 Vrms for 1min. (Detection current: 10mA)		
		Between contact sets	1,000 Vrms for 1min. (Detection current: 10mA)		
Electrical	Surge breakdown	Between open contacts	1,500 V (10×160μs) (FCC Part 68)		
haracteristics	voltage (Initial)	Between contacts and coil	2,500 V (2×10µs) (Telcordia)		
	Temperature rise (at 20°C 68°F)		Max. 50°C (By resistive method, nominal coil voltage applied to the coil; contact carrying current: 2		
	Operate time [Set time] (at 20°C 68°F)		Max. 4 ms [Max. 4 ms] (Nominal coil 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 coil voltage applied to the coil, excluding contact bounce time.) (without diode)		
	Shock resistance	Functional	Min. 750 m/s ² (Half-wave pulse of sine wave: 6 ms; detection time: 10µs.)		
lechanical	SHOCK TESISIANCE	Destructive	Min. 1,000 m/s ² (Half-wave pulse of sine wave: 6 ms.)		
haracteristics	Vibration resistance	Functional	10 to 55 Hz at double amplitude of 3.3 mm (Detection time: 10µs.)		
	VIDIALION TESISLATICE	Destructive	10 to 55 Hz at double amplitude of 5 mm		
xpected life	Mechanical		Min. 10 ⁸ (at 180 cpm)		
spected life	Electrical		Min. 10 ⁵ (2 A 30 V DC resistive), 5×10 ⁵ (1 A 30 V DC resistive) (at 20 cpm)		
Conditions	Conditions for operat	ion, transport and storage $*_2$	Ambient temperature: -40°C to +85°C (up to 24 V coil) -40°F to +185°F (up to 24 V coil) [-40°C to +70°C (48 V coil) -40°F to +158°F (48 V coil)]; Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)		
	Max. operating speed	d (at rated load)	20 cpm		
Jnit weight			Approx. 2 g .071 oz		

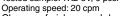
s: *1 This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load. (AgPd contact type or SX relays are available for low level load switching [10V DC, 10mA max. level])
 *2 Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT.

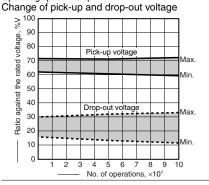
REFERENCE DATA

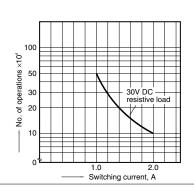
1. Maximum switching capacity





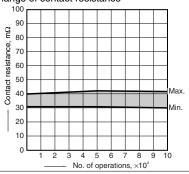


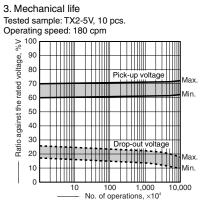




Change of contact resistance

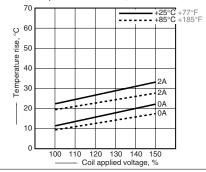
2. Life curve





5-(1). Coil temperature rise Tested sample: TX2-5V, 6 pcs. Point measured: Inside the coil

Ambient temperature: 25°C 77°F, 85°C 185°F



All Rights Reserved © COPYRIGHT Panasonic Electric Works Co., Ltd.

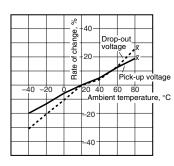
Operate time

--- Release time

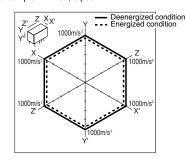
5-(2). Coil temperature rise Tested sample: TX2-48V, 6 pcs. Point measured: Inside the coil Ambient temperature: 25°C 77°F, 70°C 158°F

+25°C +77°F +70°C +158°F ပ္ ⁶⁰ .g 50 2A Temperature 24 40 0A ΛΔ 30 20 10 0 100 110 120 130 140 150 Coil applied voltage, %

7. Ambient temperature characteristics Tested sample: TX2-5V, 5 pcs.



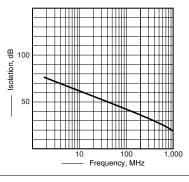
9 Malfunctional shock (single side stable) Tested sample: TX2-5V, 6 pcs.



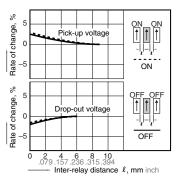
6-(1). Operate and release time (with diode) Tested sample: TX2-5V, 10 pcs.

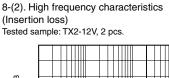
Operate time ms . . . -- Release time Operate and release time, Max Max Mir 2 0 70 80 90 100 110 120 Coil applied voltage, %V

8-(1). High frequency characteristics (Isolation) Tested sample: TX2-12V, 2 pcs.



10-(1). Influence of adjacent mounting Tested sample: TX2-12V, 6 pcs.





90

6-(2). Operate and release time (without diode)

. . .

100

Coil applied voltage, %V

110 120

Tested sample: TX2-5V, 10 pcs.

Max

Mi

Max. Min.

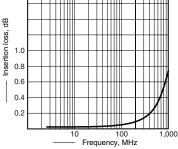
ms

release time,

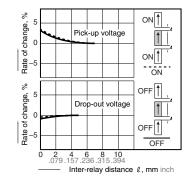
Operate and

0

70 80

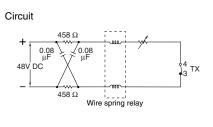


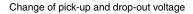
10-(2). Influence of adjacent mounting Tested sample: TX2-12V, 6 pcs.

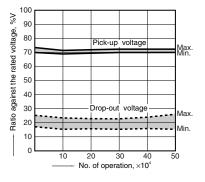


11. Pulse dialing test Tested sample: TX2-5V, 6 pcs.

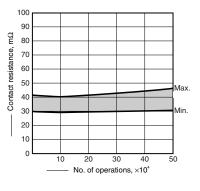
(35 mA 48 V DC wire spring relay load)







Change of contact resistance

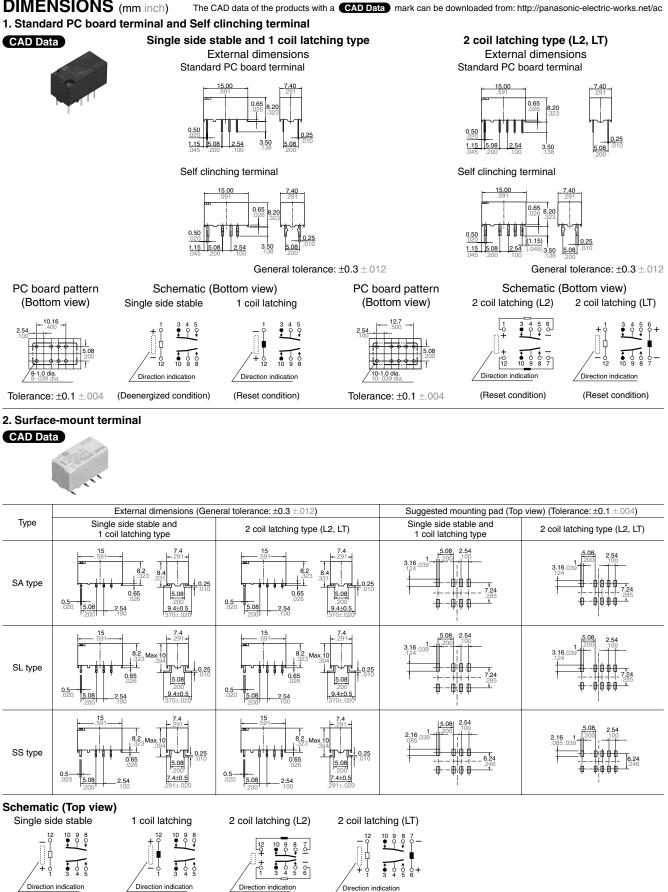


Note: Data of surface-mount type are the same as those of PC board terminal type.

All Rights Reserved © COPYRIGHT Panasonic Electric Works Co., Ltd.

TΧ

DIMENSIONS (mm inch)



All Rights Reserved © COPYRIGHT Panasonic Electric Works Co., Ltd.

(Reset condition)

(Reset condition)

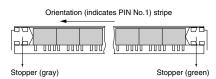
(Reset condition)

(Deenergized condition)

NOTES

1. 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.



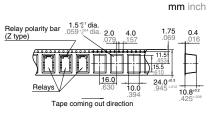
2) Tape and reel packing (surface-mount terminal type)

- (1) Tape dimensions
- (i) SA type

mm inch

Tape coming out direction

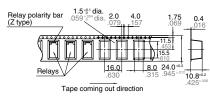
(ii) SL type



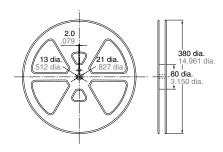
mm inch

mm inch

(iii) SS type



(2) Dimensions of plastic reel



2. 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.

For general cautions for use, please refer to the "Cautions for use of Signal Relays" or "General Application Guidelines".