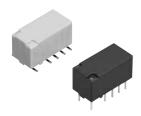


# Panasonic ideas for life

# Small size, controlled 7.5A inrush current possible

# TX RELAYS TH types



RoHS compliant

## **FEATURES**

- 1. Small size, controlled 7.5A inrush current possible
- 2. 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.

#### 3. Outstanding surge resistance.

Surge breakdown voltage between open contacts:

1,500 V 10×160μ sec. (FCC part 68) Surge breakdown voltage between contact and coil:

2,500 V 2×10µ sec. (Bellcore)

# 4. 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.

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

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

# 7. Outstanding vibration and shock resistance.

Functional shock resistance: 750 m/s<sup>2</sup> Destructive shock resistance:

1.000 m/s<sup>2</sup>

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.

#### A range of surface-mount types is also available

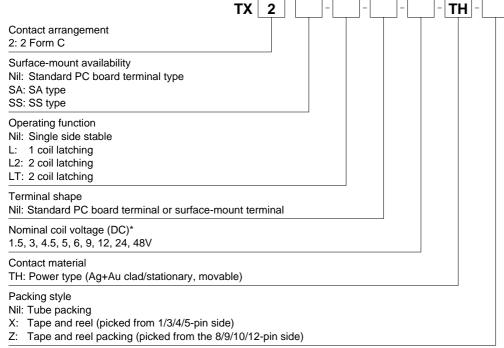
SA: Low-profile surface-mount terminal type

SS: Space saving surface-mount terminal type

#### TYPICAL APPLICATIONS

- 1. Air-conditioning control (solenoid load)
- 2. Others, High-capacity control etc.

#### ORDERING INFORMATION



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.

## **TYPES**

#### 1. Standard PC board terminal

Contact	Nominal coil	Single side stable	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-TH	TX2-L-1.5V-TH	TX2-L2-1.5V-TH	TX2-LT-1.5V-TH
	3V DC	TX2-3V-TH	TX2-L-3V-TH	TX2-L2-3V-TH	TX2-LT-3V-TH
	4.5V DC	TX2-4.5V-TH	TX2-L-4.5V-TH	TX2-L2-4.5V-TH	TX2-LT-4.5V-TH
	5V DC	TX2-5V-TH	TX2-L-5V-TH	TX2-L2-5V-TH	TX2-LT-5V-TH
2 Form C	6V DC	TX2-6V-TH	TX2-L-6V-TH	TX2-L2-6V-TH	TX2-LT-6V-TH
	9V DC	TX2-9V-TH	TX2-L-9V-TH	TX2-L2-9V-TH	TX2-LT-9V-TH
	12V DC	TX2-12V-TH	TX2-L-12V-TH	TX2-L2-12V-TH	TX2-LT-12V-TH
	24V DC	TX2-24V-TH	TX2-L-24V-TH	TX2-L2-24V-TH	TX2-LT-24V-TH
	48V DC	TX2-48V-TH	_	_	_

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

#### 2. Surface-mount terminal

#### 1) Tube packing

Contact Nomir	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-TH	TX2S□-L-1.5V-TH	TX2S□-L2-1.5V-TH	TX2S□-LT-1.5V-TH
	3V DC	TX2S□-3V-TH	TX2S□-L-3V-TH	TX2S□-L2-3V-TH	TX2S□-LT-3V-TH
	4.5V DC	TX2S□-4.5V-TH	TX2S□-L-4.5V-TH	TX2S□-L2-4.5V-TH	TX2S□-LT-4.5V-TH
	5V DC	TX2S□-5V-TH	TX2S□-L-5V-TH	TX2S□-L2-5V-TH	TX2S□-LT-5V-TH
2c	6V DC	TX2S□-6V-TH	TX2S□-L-6V-TH	TX2S□-L2-6V-TH	TX2S□-LT-6V-TH
	9V DC	TX2S□-9V-TH	TX2S□-L-9V-TH	TX2S□-L2-9V-TH	TX2S□-LT-9V-TH
	12V DC	TX2S□-12V-TH	TX2S□-L-12V-TH	TX2S□-L2-12V-TH	TX2S□-LT-12V-TH
	24V DC	TX2S□-24V-TH	TX2S□-L-24V-TH	TX2S□-L2-24V-TH	TX2S□-LT-24V-TH
	48V DC	TX2S□-48V-TH	_	_	_

 $<sup>\</sup>square$ : For each surface-mounted terminal identification, input the following letter. SA type:  $\underline{A}$ , SS type:  $\underline{S}$ Standard packing: Tube: 40 pcs.; Case: 1,000 pcs.

#### 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-TH-Z	TX2S□-L-1.5V-TH-Z	TX2S□-L2-1.5V-TH-Z	TX2S□-LT-1.5V-TH-Z
	3V DC	TX2S□-3V-TH-Z	TX2S□-L-3V-TH-Z	TX2S□-L2-3V-TH-Z	TX2S□-LT-3V-TH-Z
	4.5V DC	TX2S□-4.5V-TH-Z	TX2S□-L-4.5V-TH-Z	TX2S□-L2-4.5V-TH-Z	TX2S□-LT-4.5V-TH-Z
2 Form C	5V DC	TX2S□-5V-TH-Z	TX2S□-L-5V-TH-Z	TX2S□-L2-5V-TH-Z	TX2S□-LT-5V-TH-Z
	6V DC	TX2S□-6V-TH-Z	TX2S□-L-6V-TH-Z	TX2S□-L2-6V-TH-Z	TX2S□-LT-6V-TH-Z
	9V DC	TX2S□-9V-TH-Z	TX2S□-L-9V-TH-Z	TX2S□-L2-9V-TH-Z	TX2S□-LT-9V-TH-Z
	12V DC	TX2S□-12V-TH-Z	TX2S□-L-12V-TH-Z	TX2S□-L2-12V-TH-Z	TX2S□-LT-12V-TH-Z
	24V DC	TX2S□-24V-TH-Z	TX2S□-L-24V-TH-Z	TX2S□-L2-24V-TH-Z	TX2S□-LT-24V-TH-Z
	48V DC	TX2S□-48V-TH-Z	_	_	_

 $<sup>\</sup>square$ : For each surface-mounted terminal identification, input the following letter. SA type:  $\underline{A}$ , SS type:  $\underline{S}$ 

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

Note: 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.

## **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			93.8mA	16Ω		
3V DC			46.7mA	64.3Ω		
4.5V DC		tage* nominal voltage*	31mA	145Ω	140mW	150%V of nominal voltage
5V DC	750()/		28.1mA	178Ω		
6V DC	75%V or less of nominal voltage*		23.3mA	257Ω		
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

# TX-TH

#### 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		
3V DC			33.3mA	90Ω		
4.5V DC	75%V or less of nominal voltage* (Initial)	nominal voltage* nominal voltage*	22.2mA	202.5Ω	100m\//	150%V of nominal voltage
5V DC			20mA	250Ω		
6V DC			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)	cur	operating rent 20°C 68°F)		sistance 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 nominal voltage* (Initial) (Initial)	93.8mA	93.8mA	16Ω	16Ω	- 140mW	140mW	150%V of nominal voltage
3V DC			46.7mA	46.7mA	64.3Ω	64.3Ω			
4.5V DC			31mA	31mA	145Ω	145Ω			
5V DC			28.1mA	28.1mA	178Ω	178Ω			
6V DC			23.3mA	23.3mA	257Ω	257Ω			
9V DC	()		15.5mA	15.5mA	579Ω	579Ω			
12V DC			11.7mA	11.7mA	1,028Ω	1,028Ω			
24V DC			5.8mA	5.8mA	4,114Ω	4,114Ω			

<sup>\*</sup>Pulse drive (JIS C 5442-1986)

#### 2. Specifications

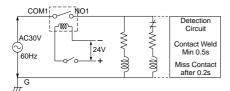
Characteristics		Item	Specifications				
	Arrangement		2 Form C				
Contact	Initial contact resistance, max.		Max. 100 mΩ (By voltage drop 6 V DC 1A)				
	Contact material		Ag+Au plating				
	Nominal switching ca	pacity	2 A 30 V DC, 0.5 A 125 V AC (resistive load)				
	Max. switching powe	r	60 W, 60 VA (resistive load)				
	Max. switching voltage	je	220V DC, 250V AC				
D. (*	Max. switching currer	nt	7.5 A (When used at 7.5 A. Regarding connection method, you must follow the precaution, below*.)				
Rating	Min. switching capac	ity (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	140 mW (1.5 to 24 V DC)				
	Insulation resistance	(Initial)	Min. 1,000MΩ (at 500V DC)				
	insulation resistance	(IIIIIIai)	Measurement at same location as "Initial breakdown voltage" section.				
	Dan aladaaaa aalta aa	Between open contacts	1,000 Vrms for 1min. (Detection current: 10mA)				
	Breakdown voltage (Initial)	Between contact and coil	2,000 Vrms for 1min. (Detection current: 10mA)				
		Between contact sets	1,000 Vrms for 1min. (Detection current: 10mA)				
Electrical	Temperature rise (at 20°C 68°F)		Max. 50°C				
characteristics			(By resistive method, nominal coil voltage applied to the coil; contact carrying current: 2A.)				
	Surge breakdown	Between open contacts	1,500 V (10×160μs) (FCC Part 68)				
	voltage (Initial)	Between contacts and coil	2,500 V (2×10μs) (Telcordia)				
	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/s² (Half-wave pulse of sine wave: 6 ms; detection time: 10μs.)				
Mechanical	Shock resistance	Destructive	Min. 1,000 m/s² (Half-wave pulse of sine wave: 6 ms.)				
characteristics	Vibration resistance	Functional	10 to 55 Hz at double amplitude of 3.3 mm (Detection time: 10µs.)				
	Vibration resistance	Destructive	10 to 55 Hz at double amplitude of 5 mm				
	Mechanical		Min. 108 (at 180 cpm)				
Expected life			Min. 10 <sup>5</sup> (2 A 30 V DC resistive), 5×10 <sup>5</sup> (1 A 30 V DC resistive),				
Expected life	Electrical		Min. 10⁵ (0.5 A 125 V AC resistive) (at 20 cpm)				
			Min. $2\times10^5$ (7.5 A inrush (250 ms)/1.5 A normal 30 V AC ( $\cos\phi = 0.4$ )) (ON/OFF = 1s/9s)				
Conditions	0 1111 1		Ambient temperature: -40°C to +85°C (up to 24 V coil) -40°F to +185°F				
	Conditions for operation, transport and storage*2		[-40°C to +70°C (48 V coil) -40°F to +158°F]; Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)				
	May aparating apag	d (at rated land)					
Limit vuoimint	Max. operating speed (at rated load)		20 cpm				
Unit weight	1		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.

\*2 Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 24).

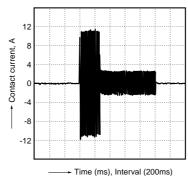
## REFERENCE DATA

1. Electrical life (2  $\times$  10<sup>5</sup> operation is possible) Tested sample: TX2SA-24V-TH, 6 pcs. Switching frequency: ON:OFF = 1s:9s Ambient temperature: 25°C 77°F Circuit



Condition: 30 V AC Inrush current 7.5 A (execution value), inrush time 250 ms Normal current 1.5 A (execution value), (inductive load  $\cos\phi=0.4$ )

Inrush current wave form vs time

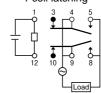


#### \*Precaution

When using at 7.5 A, connection of NO (pin #5 and #8) and COM (pin #4 and #9) in the circuit is required.

Pin layout and schematic (BOTTOM VIEW)

1 coil latching



For general REFERENCE DATA, DIMENSIONS and NOTES, please refer to the "TX Relay".