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Small size, controlled 7.5A inrush current possible

TX RELAYS TH types



Compliance with RoHS Directive

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 10×160 μ 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) × 7.4(W) × 8.2(H) .591(L) × .291(W) × .323(H)

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 surfacemount 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

	TX	2	-		 - TI	H]-
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 TH: Power type (Ag+Au clad/stationary, 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.

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-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. self-clinching terminal

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

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

3. Surface-mount terminal

1) Tube 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	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	_	_	_

 \square : For each surface-mounted terminal identification, input the following letter. SA type: \underline{A} , SL type: \underline{L} , 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	_	_	_

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.

TX-TH

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		10%V or more of nominal voltage* (Initial)	31mA	145Ω														
5V DC			nominal voltage*	nominal voltage*	nominal voltage*	nominal voltage*	nominal voltage*	nominal voltage*	nominal voltage*	* nominal voltage*		100/1/	100/1/		28.1mA	178Ω	140mW	150%V of
6V DC	75%V or less of nominal voltage*										23.3mA	257Ω	14011144	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		
3V DC			33.3mA	90Ω		
4.5V DC		75%V or less of nominal voltage* (Initial) 75%V or less of nominal voltage* (Initial)	22.2mA	202.5Ω	100mW	150%V of nominal voltage
5V DC	nominal voltage*		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			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
0	,	(,	Set coil	Reset coil	Set coil	Reset coil	Set coil	Reset coil	
1.5V DC			93.8mA	93.8mA	16Ω	16Ω	140mW	140mW	150%V of nominal voltage
3V DC		75%V or less of nominal voltage* (Initial)	46.7mA	46.7mA	64.3Ω	64.3Ω			
4.5V DC			31mA	31mA	145Ω	145Ω			
5V DC	75%V or less of nominal voltage*		28.1mA	28.1mA	178Ω	178Ω			
6V DC	(Initial)		23.3mA	23.3mA	257Ω	257Ω		14011100	
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			

^{*}Pulse drive (JIS C 5442-1986)

2. Specifications

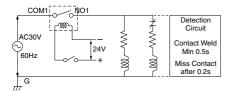
Characteristics		Item	Specifications
	Arrangement		2 Form C
Contact	Initial contact resistar	nce, max.	Max. 100 mΩ (By voltage drop 6 V DC 1A)
	Contact material		Ag+Au plating
	Nominal switching capacity		2 A 30 V DC, 0.5 A 125 V AC (resistive load)
	Max. switching powe	r	60 W, 60 VA (resistive load)
	Max. switching voltage	je	220V DC, 250V AC
Dation	Max. switching currer	nt	7.5 A (When used at 7.5 A. Regarding connection method, you must follow the precaution, below*
F	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. 1,000M Ω (at 500V DC)
	Insulation resistance	(IIIIIai)	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)
	(IIIIdai)	Between contact sets	1,000 Vrms for 1min. (Detection current: 10mA)
Electrical	Temperature rise (at 20°C 68°F)		Max. 50°C
characteristics	Temperature rise (at	20 0 00 1)	(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 ⁵ (2 A 30 V DC resistive), 5×10 ⁵ (1 A 30 V DC resistive),
Exposiou iiio	Electrical		Min. 10 ⁵ (0.5 A 125 V AC resistive) (at 20 cpm)
			Min. 2×10 ⁵ (7.5 A inrush (250 ms)/1.5 A normal 30 V AC (cosφ = 0.4)) (ON/OFF = 1s/9s)
	0	:	Ambient temperature: -40°C to +85°C (up to 24 V coil) -40°F to +185°F
Conditions	Conditions for operat	ion, 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)
	Max. operating speed	1 (at rated load)	20 cpm
Unit weight	max. operating speet	a (at rated load)	Approx. 2 g .071 oz
Jim Weigin			TAPPION. 2 9.07 1 02

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.

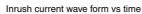
*2 Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT.

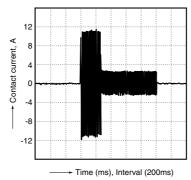
REFERENCE DATA

1. Electrical life (2 \times 10⁵ 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 $cos\phi=0.4$)





Pin layout and schematic (BOTTOM VIEW) 1 coil latching

1 3 4 5 12 10 9 8

*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.

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