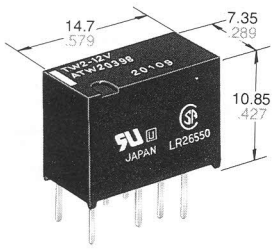
⚠ Discontinued

NAiS

ULTRA SMALL 2 AMP. POLARIZED RELAY WITH 2,500 V SURGE VOLTAGE

TW-RELAYS



mm inch

UL File No.: E43149
CSA File No.: LR26550

- **Surge withstand between contacts and coil: 2,500 V (Bellcore rating)**
- **Current surge interrupt: 4.2 A 700 V AC**
- **High contact capacity: 2 A 30 V DC**

SPECIFICATIONS

Contact

Arrangement			2 Form C
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)			60 mΩ
Contact material			Gold-clad silver nickel
Rating (resistive load)	Max. switching power		60 W, 62.5 VA
	Max. switching voltage		220 V DC, 250 V AC
	Max. switching current		2 A
UL/CSA rating			2 A 30 V DC 0.5 A 125 V AC 0.3 A 110 V DC
Expected life (min. operations)	Mechanical (at 180 cpm)		10^8
	Electrical (at 20 cpm)	2 A 30 V DC resistive	10^5
		1 A 30 V DC resistive	5×10^5
		0.5 A 125 V AC resistive	10^5

Characteristics (at 20°C 68°F)

Max. operating speed (at rated load)		20 cpm
Operate time* (at nominal voltage)		Max. 4 msec. (Approx. 2 msec.)
Release time* (at nominal voltage)		Max. 4 msec. (Approx. 1 msec.)
Set time* (latching) (at nominal voltage)		Max. 4 msec. (Approx. 2 msec.)
Reset time* (latching) (at nominal voltage)		Max. 4 msec. (Approx. 2 msec.)
Initial break-down voltage	Between open contacts	1,000 Vrms for 1 min.
	Between contact sets	1,000 Vrms for 1 min.
	Between contact and coil	1,800 Vrms for 1 min.
Surge voltage	Between open contacts (10×160 μsec.)	1,500 V FCC
	Between contacts and coil (2×10 μsec.)	2,500 V
Current surge capacity (See Note)		4.2 A 700 V AC
Initial insulation resistance		Min. 1,000 MΩ (at 500 V DC)
Temperature rise (at nominal voltage)		Max. 50°C
Ambient temperature**		−40°C to +85°C −40°F to +185°F (Not freezing and condensing at low temperature)
Shock resistance	Functional	Min. 735 m/s² (75 G)
	Destructive	Min. 980 m/s² (100 G)
Vibration resistance	Functional	196 m/s² (20 G), 10 to 55 Hz at double amplitude of 3.3 mm
	Destructive	294 m/s² (30 G), 10 to 55 Hz at double amplitude of 5 mm
Unit weight		Approx. 2 g .071 oz

*Excluding contact bounce time

**The maximum ambient temperature allows for coil temperature rise at maximum allowable coil voltage.
As for the applicable range of continuous carrying current against ambient temperature, please refer to „Maximum value of continuous carrying current" chart. (Page 3–38)

Note: The contacts can interrupt a 4.2 A 700 V AC load four times, with 2 interruptions within the positive phase angle, and 2 interruptions within the negative phase angles of a sine wave form.

ORDERING INFORMATION

Ex. TW [2] — [L2] — [H] — [12V]

Contact arrangement	Operating function	Terminal shape	Coil voltage (DC)
2: 2 Form C	Nil: Single side stable L: 1 coil latching L2: 2 coil latching	Nil: Standard PC board terminal H: Self-clinching terminal	3, 4.5, 5, 6, 9, 12, 24, 48* V

*48 V coil type: Single side stable only

TYPES AND COIL DATA (at 20°C 68°F)

Operating function	Part No.		Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Nominal operating current, mA (±10%)	Coil resistance, Ω (±10%)	Nominal operating power, mW	Max. allowable voltage, V DC
	Standard PC board terminal	Self-clinching terminal							
Single side stable	TW2-3V	TW2-H-3V	3	2.25	0.3	46.7	64.3	140	4.5
	TW2-4.5V	TW2-H-4.5V	4.5	3.38	0.45	31.1	145	140	6.7
	TW2-5V	TW2-H-5V	5	3.75	0.5	28.1	178	140	7.5
	TW2-6V	TW2-H-6V	6	4.5	0.6	23.3	257	140	9
	TW2-9V	TW2-H-9V	9	6.75	0.9	15.5	579	140	13.5
	TW2-12V	TW2-H-12V	12	9	1.2	11.7	1,028	140	18
	TW2-24V	TW2-H-24V	24	18	2.4	8.3	2,880	200	36
	TW2-48V	TW2-H-48V	48	36	4.8	5.42	8,860	260	57.6

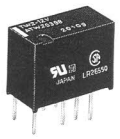
Operating function	Part No.		Nominal voltage, V DC	Set voltage, V DC (max.)	Reset voltage, V DC (max.)	Nominal operating current, mA (±10%)	Coil resistance, Ω (±10%)	Nominal operating power, mW	Max. allowable voltage, V DC
	Standard PC board terminal	Self-clinching terminal							
1 coil latching	TW2-L-3V	TW2-L-H-3V	3	2.25	2.25	33.3	90	100	4.5
	TW2-L-4.5V	TW2-L-H-4.5V	4.5	3.38	3.38	22.2	202.5	100	6.7
	TW2-L-5V	TW2-L-H-5V	5	3.75	3.75	20	250	100	7.5
	TW2-L-6V	TW2-L-H-6V	6	4.5	4.5	16.7	360	100	9
	TW2-L-9V	TW2-L-H-9V	9	6.75	6.75	11.1	810	100	13.5
	TW2-L-12V	TW2-L-H-12V	12	9	9	8.3	1,440	100	18
	TW2-L-24V	TW2-L-H-24V	24	18	18	4.17	5,760	100	36
2 coil latching	TW2-L2-3V	TW2-L2-H-3V	3	2.25	2.25	66.7	45	200	4.5
	TW2-L2-4.5V	TW2-L2-H-4.5V	4.5	3.38	3.38	44.5	101.2	200	6.7
	TW2-L2-5V	TW2-L2-H-5V	5	3.75	3.75	40	125	200	7.5
	TW2-L2-6V	TW2-L2-H-6V	6	4.5	4.5	33.3	180	200	9
	TW2-L2-9V	TW2-L2-H-9V	9	6.75	6.75	22.2	405	200	13.5
	TW2-L2-12V	TW2-L2-H-12V	12	9	9	16.7	720	200	18
	TW2-L2-24V	TW2-L2-H-24V	24	18	18	8.3	2,880	200	28.8

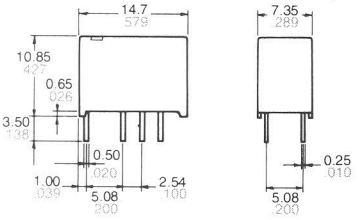
Notes: 1. Specified value of the pick-up, drop-out, set and reset voltage is with the condition of square wave coil pulse.
2. Standard packing: Tube: 50 pcs.; Case: 1,000 pcs.
3. In case of 5 V drive circuit, it is recommended to use 4.5 V type relay.

DIMENSIONS

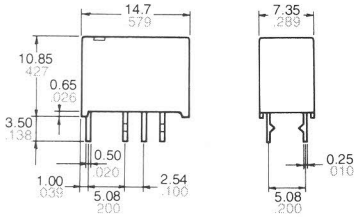
mm inch

Standard PC board terminal





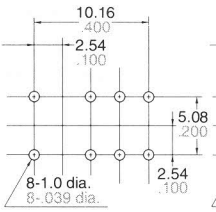
Self-clinching terminal



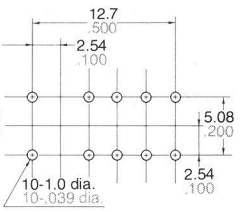
General tolerance: ±0.3 ±.012

PC board pattern (Copper-side view)

- Single side stable
- 1 coil latching



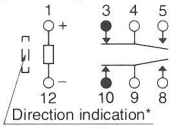
- 2 coil latching



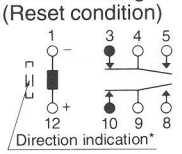
Tolerance: ±0.1 ±.004

Schematic (Bottom view)

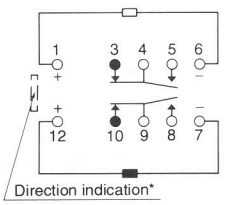
- Single side stable (Deenergized condition)



- 1 coil latching (Reset condition)



- 2 coil latching (Reset condition)

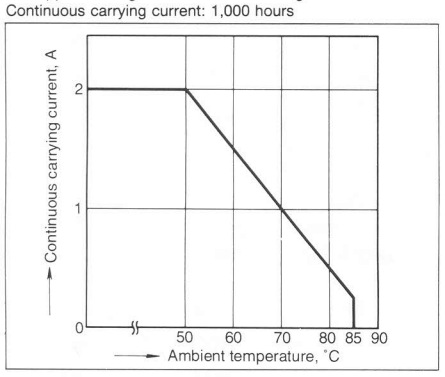


*Orientation stripe located on top of relay.

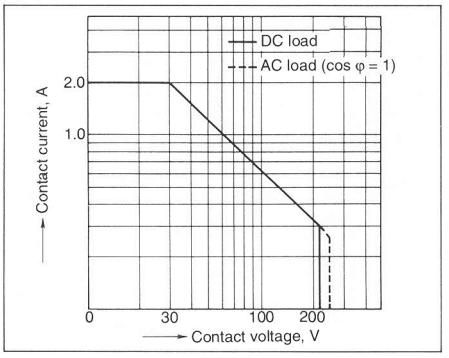
DATA

1. Maximum value of continuous carrying current

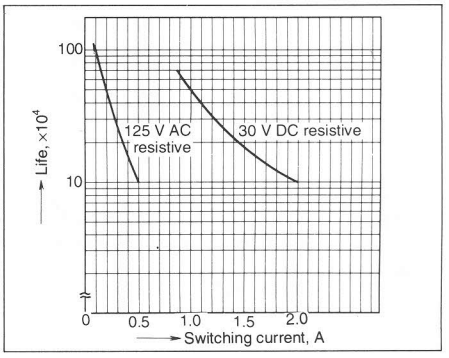
Test conditions:
Coil applied voltage: 110% of rated voltage
Continuous carrying current: 1,000 hours



2. Maximum switching power

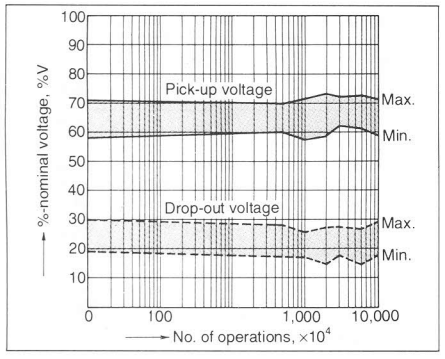


3. Life curve



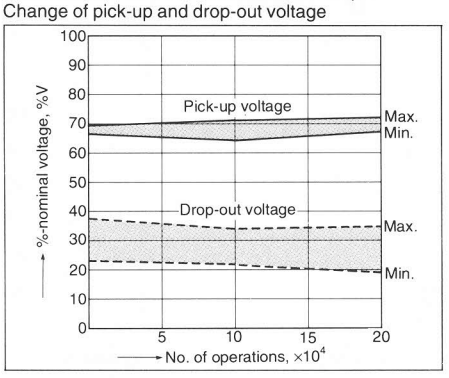
4. Mechanical life

Tested sample: TW2-12V, 10 pcs.



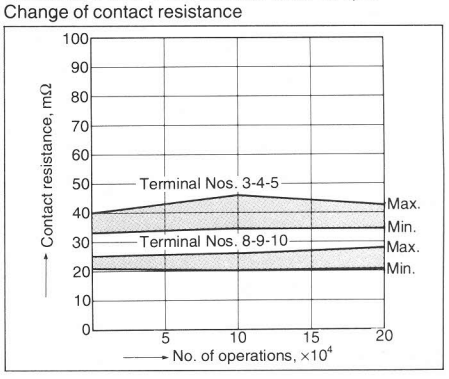
5-(1). Electrical life

Tested sample: TW2-12V, 6 pcs.
Condition: 2 A 30 V DC resistive load, 20 cpm
Change of pick-up and drop-out voltage



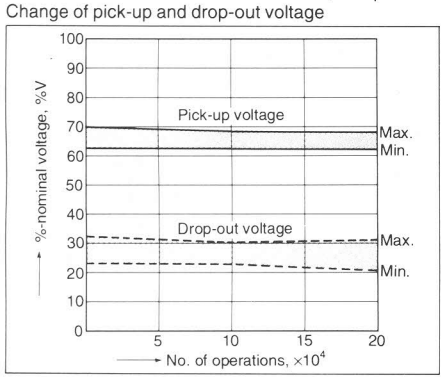
5-(1). Electrical life

Tested sample: TW2-12V, 6 pcs.
Condition: 2 A 30 V DC resistive load, 20 cpm
Change of contact resistance



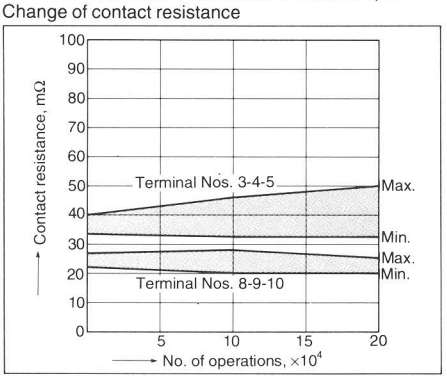
5-(2). Electrical life

Tested sample: TW2-12V, 6 pcs.
Condition: 0.5 A 125 V AC resistive load, 20 cpm
Change of pick-up and drop-out voltage

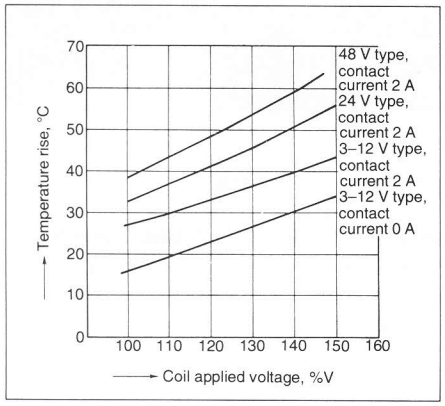


5-(2). Electrical life

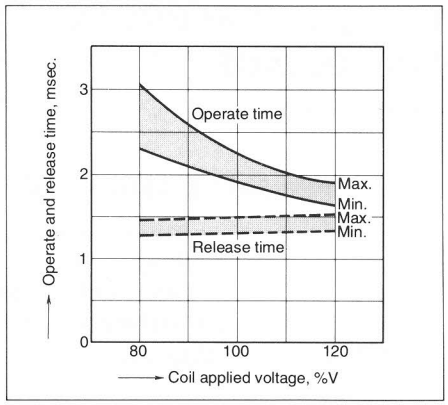
Tested sample: TW2-12V, 6 pcs.
Condition: 0.5 A 125 V AC resistive load, 20 cpm
Change of contact resistance



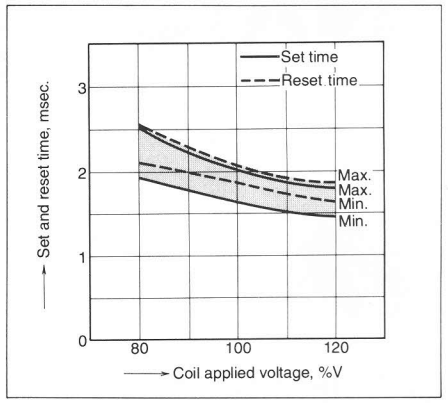
6. Coil temperature rise
Tested sample: TW2-xxV
Point measured: Inside the coil
Ambient temperature: 22°C 72°F



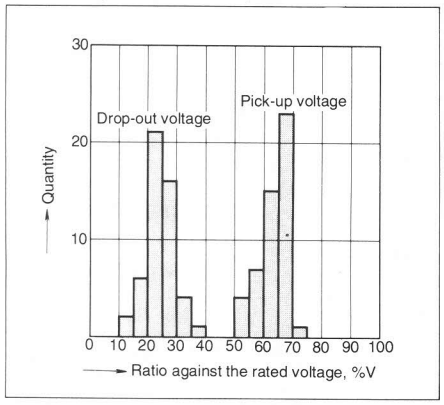
7. Operate and release time
Tested sample: TW2-12V, 5 pcs.



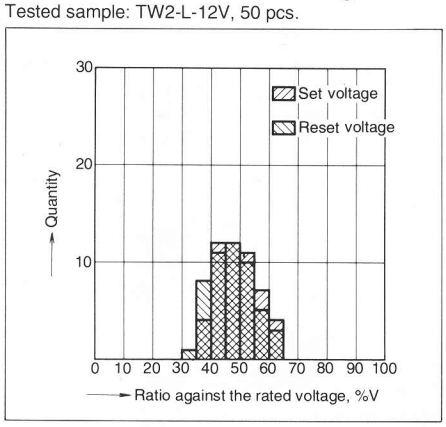
8. Set and reset time
Tested sample: TW2-L-12V, 5 pcs.



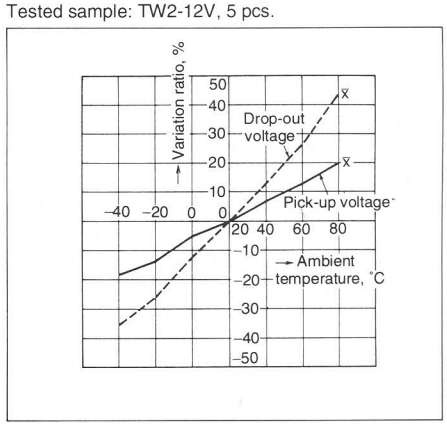
9. Distribution of pick-up and drop-out voltage
Tested sample: TW2-12V, 50 pcs.



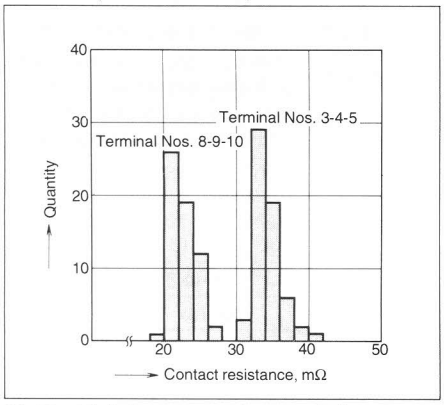
10. Distribution of set and reset voltage
Tested sample: TW2-L-12V, 50 pcs.



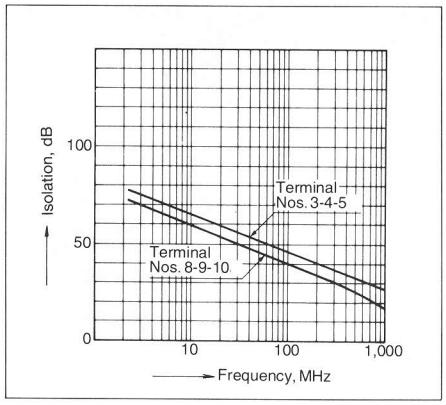
11. Ambient temperature characteristics
Tested sample: TW2-12V, 5 pcs.



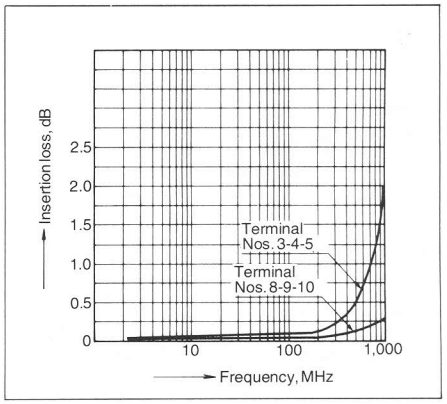
12. Distribution of contact resistance
Tested sample: TW2-12V, 30 pcs.



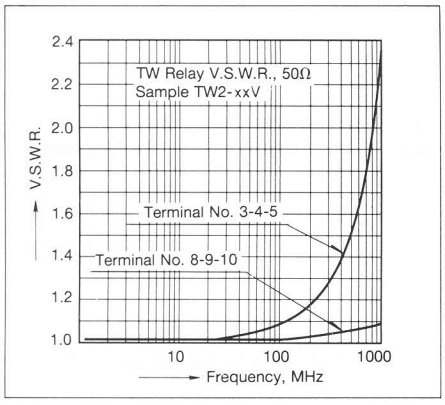
13-(1). High-frequency characteristic
Isolation characteristics



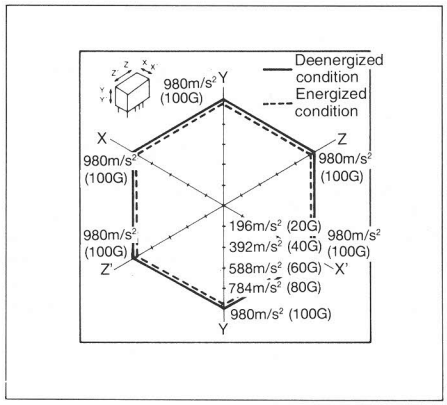
13-(2). High frequency characteristics
Insertion loss characteristics



13-(3). High frequency characteristics
Tested sample: TW2-xxV
V.S.W.R.



14-(1). Malfuntion shock (single side stable)



14-(2). Malfunction shock (latching)