Panasonic
ideas for life

| IC DRIVABLE PC BOARD RELAY FOR FIELD LOAD SWITCHING | ST RELAYS |

31 1.220 14 .551 11.3 .445

mm inch

FEATURES

- **Sealed to meet the combination process of automatic wave soldering and cleaning needs**
- **Latching types available**
- **High switching capacity and high sensitivity in subminiature size 150 mW pick-up, 8 A inrush capacity: 51 A for 1a1b, 35 A for 2a**
- **High shock and vibration resistance Shock: 20 G, Vibration: 10 to 55 Hz at double amplitude of 2 mm**

About Cd-free contacts

We have introduced Cadmium free type products to reduce Environmental Hazardous Substances.
(The suffix "F" should be added to the part number)
Please replace parts containing Cadmium with Cadmium-free products and evaluate them with your actual application before use because the life of a relay depends on the contact material and load.

RoHS Directive compatibility information
http://www.nais-e.com/

SPECIFICATIONS

Contacts

Arrangement		1 Form A 1 Form B	2 Form A
Contact material		Au-flashed AgSnO$_2$ type	
Initial contact resistance, max.		30 mΩ	
Rating (resistive)	Max. switching power	2,000 VA, 150 W	
	Max. switching voltage	380 V AC, 250 V DC	
	Max. switching current	8 A	
	Min. switching capacity#1	100 mA, 5 V DC	
HP rating		1/4 HP 125, 250 V AC	
Inrush current capability		51 A (TV-3 equivalence) for 1a1b 35 A (TV-1 equivalence) for 2a	
Expected life (min. operations)	Mechanical (at 180 cpm)	10^7	
	Electrical 8 A 250 V AC (resistive)	10^5 (ON : OFF = 1 s : 5 s)	

Coil (polarized) (at 25°C 77°F)

Single side stable	Nominal operating power	Approx. 240 mW
Latching	Nominal set and reset power	Approx. 240 mW

#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.

Remarks
* Specifications will vary with foreign standards certification ratings.
*1 Measurement at same location as "Initial breakdown voltage" section
*2 Detection current: 10 mA
*3 Wave is standard shock voltage of $\pm 1.2 \times 50 \mu s$ according to JEC-212-1981
*4 Excluding contact bounce time
*5 Half-wave pulse of sine wave: 11ms; detection time: 10μs
*6 Half-wave pulse of sine wave: 6ms
*7 Detection time: 10μs
*8 Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT

Characteristics (at 25°C 77°F 50% Relative humidity)

Max. operating speed		20 cpm (at rated load)
Initial insulation resistance*1		1,000 MΩ (at 500 V DC)
Initial breakdown voltage*2	Between contact sets	2,000 Vrms
	Between open contacts	1,200 Vrms
	Between contacts and coil	3,750 Vrms
Surge voltage between coil and contact*3		Min. 6,000 V
Operate time*4 (at nominal voltage)		Max. 15 ms (Approx. 10 ms)
Release time (without diode)*4 (at nominal voltage)		Max. 10 ms (Approx. 8 ms)
Set time*4 (latching) (at nominal voltage)		Max. 10 ms (Approx. 8 ms)
Reset time*4 (latching) (at nominal voltage)		Max. 10 ms (Approx. 8 ms)
Temperature rise (at 60°C)		Max. 55°C with nominal coil voltage and at 8 A switching current
Shock resistance	Functional*5	Min. 196 m/s^2 {20 G}
	Destructive*6	Min. 980 m/s^2 {100 G}
Vibration resistance	Functional*7	117.6 m/s^2 {12 G}, 10 to 55 Hz at double amplitude of 2 mm
	Destructive	176.4 m/s^2 {18 G}, 10 to 55 Hz at double amplitude of 3 mm
Conditions for operation, transport and storage*8 (Not freezing and condensing at low temperature)	Ambient temp.	−40°C to +60°C −40°F to +140°F
	Humidity	5 to 85% R.H.
Unit weight		Approx. 10g .353 oz

TYPICAL APPLICATIONS

Sequence controllers, facsimiles, telephone controls, remote control security devices and security equipment.

ORDERING INFORMATION

| Ex. ST | 1 | — | L2 | — | DC48V | — | F |
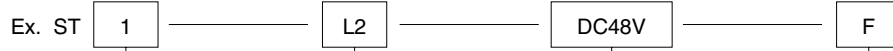
Contact arrangement	Operating function	Coil voltage	Contact material
1: 1 Form A 1 Form B 2: 2 Form A	Nil: Single side stable L2: 2 coil latching	DC 3, 5, 6, 9, 12, 24, 48 V	F: AgSnO₂ type contact

(Notes) 1. Standard packing: Carton; 50 pcs., Case; 500 pcs.
      2. 1 coil latching type available.

TYPES AND COIL DATA (at 20°C 68°F)

Single side stable

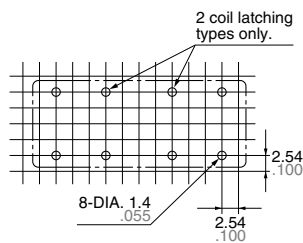| Part No.		Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Maximum allowable voltage, V DC (60°C 140°F)	Coil resistance, Ω (±10%)	Nominal operating current, mA
1 Form A 1 Form B	2 Form A						
ST1-DC3V-F	ST2-DC3V-F	3	2.4	0.3	4.5	38	78.9
ST1-DC5V-F	ST2-DC5V-F	5	4.0	0.5	7.5	105	47.6
ST1-DC6V-F	ST2-DC6V-F	6	4.8	0.6	9.0	150	40
ST1-DC9V-F	ST2-DC9V-F	9	7.2	0.9	13.5	360	25
ST1-DC12V-F	ST2-DC12V-F	12	9.6	1.2	18.0	600	20
ST1-DC24V-F	ST2-DC24V-F	24	19.2	2.4	36.0	2,400	10
ST1-DC48V-F	ST2-DC48V-F	48	38.4	4.8	72.0	9,000	5.3

2 coil latching

Part No.		Nominal voltage, V DC	Set and reset voltage, V DC (max.)	Maximum allowable voltage, V DC (60°C 140°F)	Coil resistance, Ω (±10%)	Nominal operating current, mA
1 Form A 1 Form B	2 Form A					
ST1-L2-DC3V-F	ST2-L2-DC3V-F	3	2.4	4.5	40	75
ST1-L2-DC5V-F	ST2-L2-DC5V-F	5	4.0	7.5	110	45.5
ST1-L2-DC6V-F	ST2-L2-DC6V-F	6	4.8	9.0	155	38.7
ST1-L2-DC9V-F	ST2-L2-DC9V-F	9	7.2	13.5	360	25
ST1-L2-DC12V-F	ST2-L2-DC12V-F	12	9.6	18.0	640	18.8
ST1-L2-DC24V-F	ST2-L2-DC24V-F	24	19.2	36.0	2,400	10
ST1-L2-DC48V-F	ST2-L2-DC48V-F	48	38.4	72.0	10,200	4.7

DIMENSIONS

mm inch

General tolerance: ±0.2 ±.008
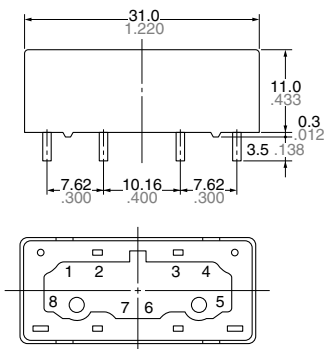
PC board pattern (Copper-side view)

2 coil latching types only.

8-DIA. 1.4 .055

2.54 .100
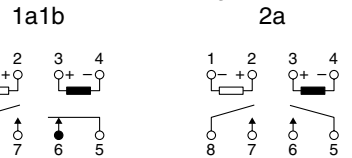
2.54 .100

Tolerance: ±0.1 ±.004

Schematic (Bottom view)
Single side stable

1a1b   2a
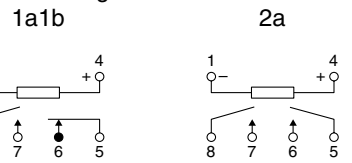
(Deenergized condition)
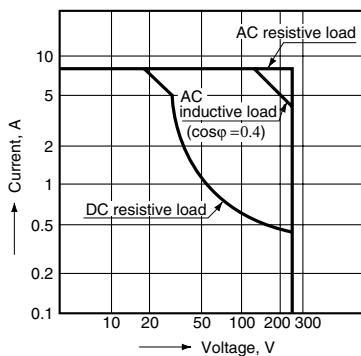
2 coil latching

1a1b   2a

(Reset condition)

Diagram shows the "reset" position when terminals 3 and 4 are energized. Energize terminals 1 and 2 to transfer contacts.

Diagram shows the "reset" position when terminals 3 and 4 are energized. Energize terminals 1 and 2 to transfer contacts.
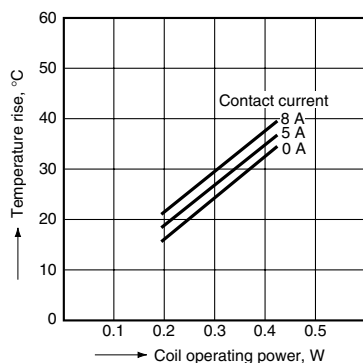
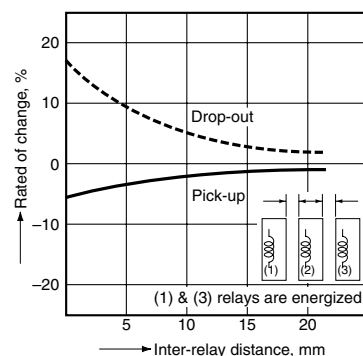# ST

REFERENCE DATA

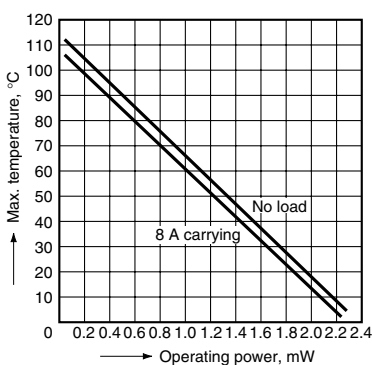### 1. Max. switching power

2. Coil temperature rise
Sample: ST1-DC24V

3. Influence of adjacent mounting
Sample: ST1-DC24V

(1) & (3) relays are energized.

4. Max. ambient temperature by operating power

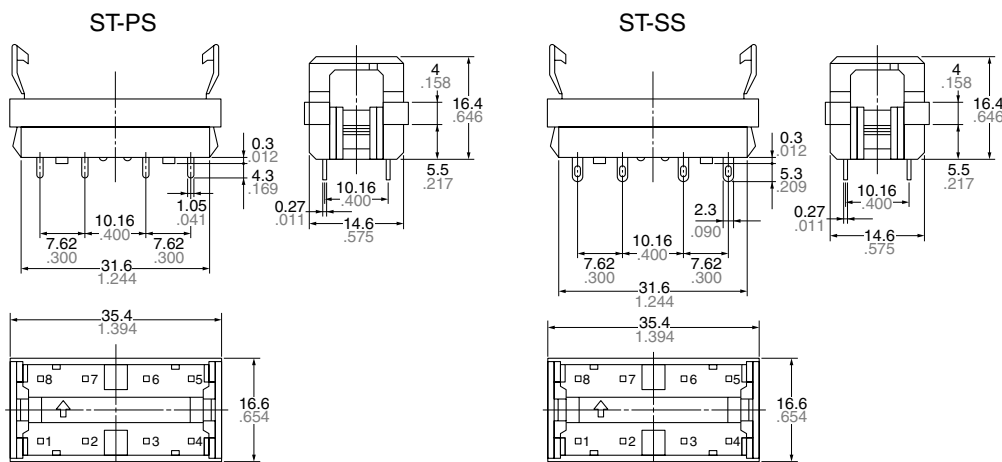## ST relay socket

ST-SS
Solder terminal socket

ST-PS
PC board terminal socket

Specifications

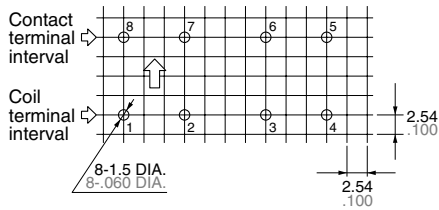| Breakdown voltage	4,000 Vrms Coil/Contacts 2,000 Vrms Contacts/Contacts
Insulation resistance	More than 1,000 MΩ between terminals
Heat resistance	150°C (302°F) for 1 hr
Max. continuous current	10 A
Relay insertion life	15 times

DIMENSIONS
mm inch

ST-PS

ST-SS

Precautions for use (socket)

1. PC board mounting method
PC board pattern

Contact terminal interval
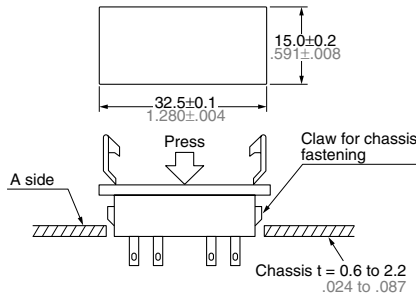
Coil terminal interval

8-1.5 DIA.
8-.060 DIA.

2.54
.100

2.54
.100

The terminal configuration is symmetrical on the left and right, so an arrow mark ⇧ is stamped on the socket to prevent mis-insertion. We recommend printing the same arrow mark ⇧ on the component mounting side (side opposite from pattern) of the PC board. In this case, the terminal configuration becomes the terminal nos. noted near the drilling holes.

2. Chassis cutout
Chassis cutting dimensions

15.0±0.2
.591±.008

32.5±0.1
1.280±.004

Press

A side

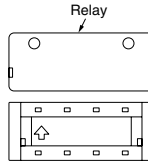Claw for chassis fastening

Chassis t = 0.6 to 2.2
.024 to .087

If the chassis hole is punched with a press, set so the release R on the front side (A side).
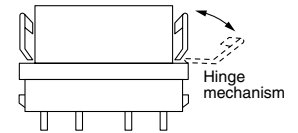
The range for chassis thickness is 0.6 to 2.2 mm .024 to .087 inch.
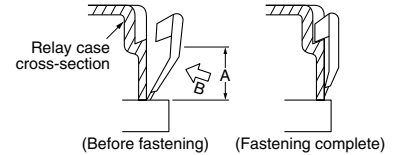
3. Relay mounting and removal
(1) Align the directions of the relay and socket.

Relay

(2) Insert the relay all the way in, so it is securely in place.

Hinge mechanism

(3) Press the part indicated by A in the B direction, and fasten by placing the hook on the relay.

Relay case cross-section

A
B

(Before fastening)   (Fastening complete)

(4). When removing the relay, completely release the hooks on both sides and pull the relay out.

For Cautions for Use, see Relay Technical Information