

Twin type (8 terminals)

mm inch

## FEATURES

- Ultra small size

Twin type: $17.4(\mathrm{~L}) \times 14.0(\mathrm{~W}) \times 13.5(\mathrm{H}) \mathrm{mm}$
$.685(\mathrm{~L}) \times .551(\mathrm{~W}) \times .531(\mathrm{H})$ inch
Slim 1c type: 17.4(L) $\times 7.2(\mathrm{~W}) \times 13.5(\mathrm{H}) \mathrm{mm}$ .685(L)×.283(W) $\times .531(\mathrm{H})$ inch

- Twin (1 Form C $\times 2$ )

Forward/reverse motor control is possible with a single relay.

- Simple footprint enables ease of PC board layout
$※ 10$ terminals layout



## SPECIFICATIONS

## Contact

| Arrangement |  |  | 1 Form $\mathrm{C} \times 2$ (H bridge), 1 Form C |
| :---: | :---: | :---: | :---: |
| Contact material |  |  | Silver alloy |
| Initial contact resistance, max. (By voltage drop 6 V DC 1 A) |  |  | $100 \mathrm{~m} \Omega$ |
| Initial contact voltage drop, max. |  |  | 0.2 V (at 10 A switching) |
| Rating | Nominal s capacity | witching | $\begin{aligned} & \text { N.O.: } 20 \text { A } 14 \text { V DC } \\ & \text { N.C.: } 10 \text { A } 14 \text { V DC } \end{aligned}$ |
|  | Max. carry | ing current | 35 A for 2 minutes, 25 A for 1 hour $\left(14 \mathrm{~V}\right.$, at $20^{\circ} \mathrm{C} 68^{\circ} \mathrm{F}$ ) |
| Expected life (min. operation) | Mechanica | (at 120 cpm ) | Min. $10^{7}$ |
|  | Electrical | Resistive load | Min. $10{ }^{5 * 1}$ |
|  |  | Motor load | Min. $2 \times 10^{5 * 2}$ |
|  |  | Motor load | Min. $10^{5 * 3}$ |
| Coil |  |  |  |
| Nominal operating power |  |  | 800 mW |

## Remarks

* Specifications will vary with foreigh standards certification ratings.
*1 At nominal switching capacity, operating frequency: 1s ON, 9s OFF
*2 N.O.: at 5 A (steady), 25 A (inrush)/N.C.: at 20 A (brake) 14 V DC, operating frequency: 0.5 s ON, 9.5 s OFF
${ }^{* 3}$ At 25A 14 V DC (Motor lock), operating frequency: 0.5 s ON, 9.5 s OFF
*4 Measurement at same location as "Initial breakdown voltage " section
${ }^{5}$ Detection current: 10 mA
*6 Excluding contact bounce time
*7 Half-wave pulse of sine wave: 11 ms ; detection: $10 \mu \mathrm{~s}$
*8 Half-wave pulse of sine wave: 6 ms
*9 Detection time: $10 \mu \mathrm{~s}$


## Characteristics

| Max. operating speed (at nominal switching capacity) |  |  | 6 cpm |
| :---: | :---: | :---: | :---: |
| Initial insulation resistance*4 |  |  | Min. $100 \mathrm{M} \Omega$ (at 500 V DC) |
| Initial breakdown voltage*5 | Between contacts |  | 500 Vrms for 1 min. |
|  | Between con and coil | ontacts | 500 Vrms for 1 min. |
| Operate time ${ }^{* 6}$ (at nominal voltage) (at $20^{\circ} \mathrm{C} 68^{\circ} \mathrm{F}$ ) |  |  | Max. 10ms (Initial) |
| Release time (without diode)*6 (at nominal voltage) (at $20^{\circ} \mathrm{C} 68^{\circ} \mathrm{F}$ ) |  |  | Max. 10ms (Initial) |
| Shock resistance ${ }^{\text {F }}$ F |  | ctional*7 | Min. $100 \mathrm{~m} / \mathrm{s}^{2}\{10 \mathrm{G}\}$ |
|  |  | uctive*8 | Min. 1,000 m/s ${ }^{2}$ \{100G\} |
| Vibration resistance |  | ctional*9 | $\begin{gathered} 10 \text { to } 100 \mathrm{~Hz}, \\ \text { Min. } 44.1 \mathrm{~m} / \mathrm{s}^{2}\{4.5 \mathrm{G}\} \end{gathered}$ |
|  |  | tructive*10 | $\begin{gathered} 10 \text { to } 500 \mathrm{~Hz}, \\ \text { Min. } 44.1 \mathrm{~m} / \mathrm{s}^{2}\{4.5 \mathrm{G}\} \\ \hline \end{gathered}$ |
| Conditions for operation, transport and storage*11 (Not freezing and condensing at low temperature) |  | Ambient temp | $\begin{aligned} & -40^{\circ} \mathrm{C} \text { to }+85^{\circ} \mathrm{C} \\ & -40^{\circ} \mathrm{F} \text { to }+185^{\circ} \mathrm{F} \end{aligned}$ |
|  |  | Humidity | 5 to 85\% R.H. |
| Unit weight |  |  | Approx. 8.0g .280z (Twin type) Approx. 4.0g . 140 z (Slim 1c type) |

*10 Time of vibration for each direction;
$\mathrm{X}, \mathrm{Y}$, direction: 2 hours
$Z$ direction: 4 hours
*11 Refer to 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 61)

## TYPICAL

APPLICATIONS

- Power windows
- Auto door lock
- Power sunroof
- Electrically powered mirrors


## ORDERING INFORMATION



Standard packing; 1 Form C: Carton(tube package) 30pcs. Case 1,500pcs.
1 Form C $\times 2$ : Carton(tube package) 30pcs. Case 900pcs.

## TYPES AND COIL DATA (at $20^{\circ} \mathrm{C} 68^{\circ} \mathrm{F}$ )

| Contact <br> arrangement | Part No. | Nominal <br> voltage, <br> V DC | Pick-up <br> voltage, <br> V DC (max.) | Drop-out <br> voltage, <br> V DC (min.) | Coil <br> resistance, <br> $\Omega( \pm 10 \%)$ | Nominal <br> operating <br> current, <br> $m A( \pm 10 \%)$ | Nominal <br> operating <br> power, <br> mW | Usable <br> voltage range, <br> V DC |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $1 c$ | ACT112 | 12 | (Initial) <br> 7.2 | (Initial) <br> 1.0 | 180 | 53.3 | 800 | 10 to 16 |
| $1 c \times 2$ <br> $(8$ terminals type $)$ | ACT212 | 12 | (Initial) <br> 7.2 | (Initial) <br> 1.0 | 180 | 53.3 | 800 | 10 to 16 |
| $1 c \times 2$ <br> $(10$ terminals type $)$ | ACT512 | 12 | (Initial) <br> 7.2 | (Initial) <br> 1.0 | 180 | 53.3 | 800 | 10 to 16 |

## DIMENSIONS

## 1. Twin type (8 terminals)



PC board pattern (Bottom view)


Tolerance: $\pm 0.1 \pm .004$
Schematic (Bottom view)

Tolerance
$\pm 0.1 \pm .004$
$\pm 0.2 \pm .008$
$\pm 0.3 \pm .012$


* Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering. Intervals between terminals is measured at A surface level.

2. Twin type (10 terminals)



Dimension:
Max. 1mm . 039 inch:
1 to 3 mm .039 to .118 inch:
Min. 3mm . 118 inch:

PC board pattern (Bottom view)


Tolerance: $\pm 0.1 \pm .004$
Schematic (Bottom view)


[^0]3. Slim 1c type

4.3 Dimension: Max. 1mm . 039 inch: 1 to 3 mm .039 to .118 inch: Min. 3mm . 118 inch:
$\pm 0.3 \pm .012$
$\pm 0.2 \pm .008$
PC board pattern (Bottom view)


Tolerance: $\pm 0.1 \pm .004$
Schematic (Bottom view)


* Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering. Intervals between terminals is measured at A surface level.


## EXAMPLE OF CIRCUIT

Forward/reverse control circuits of DC motor for power windows

(10) Power window motor

## REFERENCE DATA

1 -(1). Coil temperature rise (at $20^{\circ} \mathrm{C} 68^{\circ} \mathrm{F}$ ) Sample: ACT212, 3pcs
Contact carrying current: 0A, 10A, 20A


2-(1). Electrical life test (Motor load)
Tested sample: ACT212, 3pcs.
Load: 5A steady, Inrush 25A, 14V DC
Operating frequency: ON 0.5 s , OFF 9.5 s


1 -(2). Coil temperature rise (at $85^{\circ} \mathrm{C} 185^{\circ} \mathrm{F}$ )
Sample: ACT212, 3pcs
Contact carrying current: 0A, 10A, 20A


2-(2). Electrical life test (Motor lock)
Tested sample: ACT212, 3pcs.
Load: 25A, 14V DC
Operating frequency: ON 0.5 s , OFF 9.5 s


For Cautions for use, see Relay Technical Information (Page 48 to 76).


[^0]:    * Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering. Intervals between terminals is measured at A surface level.

