8 A MINIATURE POWER RELAY
IN DS RELAY SERIES
DS-P RELAYS

FEATURES
1. Compact with high contact rating
Even with small 10 mm .394 inch (H) x 11 mm .433 inch (W) x 20 mm .787 inch (L) (dimensions, high capacity switching is provided: 1a, 8 A 250 V AC; 2a and 1a1b, 5 A 250 V AC.

2. High switching capability
High contact pressure, low contact bounce, and wiping operation improve resistance to weld bonding. Resistant against lamp load and dielectric loading: 1a achieves maximum switching capacity of 2,000 VA (8A 250 V AC).

3. High sensitivity
Using the same type of high-performance polar magnetic circuits as DS relays, by matching the spring load to the magnetic force of attraction, greater sensitivity has been achieved. The resultant pick up sensitivity of about 190 mW makes possible direct driving of transistors and chips.

4. High breakdown voltage
Breakdown voltage has been raised by keeping the coil and contacts separate.

Between contact and coil
3,000 Vrms for 1 min.
5,000 V surge
breakdown voltage

Between contacts
1,000 Vrms for 1 min.
1,500 V surge breakdown voltage

5. Latching types available
6. Wide variation
Three types of contact arrangement are offered: 1a, 2a, and 1a1b. In addition, each is available in standard and reversed polarity types.

7. Sealed construction allows automatic washing.
8. Complies with safety standards
Complies with Japan Electrical Appliance and Material Safety Law requirements for operating 200 V power supply circuits, and complies with UL, CSA, and TÜV safety standards.

ORDERING INFORMATION

Contact arrangement
1a: Form A
1: 1 Form A 1 Form B
2a: 2 Form A

Operating function
Nil: Single side stable
L2: 2 coil latching

Coil voltage
DC 3, 5, 6, 9, 12, 24 V

Polarity
Nil: Standard polarity
R: Reverse polarity

Contact material
• AgSnO2 type
F: 1 Form A 1 Form B
Nil: 1 Form A, 2 Form A

Notes: 1. Reverse polarity types available (add suffix-R)
2. UL/CSA, TÜV approved type is standard.

TYPICAL APPLICATIONS
1. Office and industrial electronic devices
2. Terminal devices of information processing equipment, such as printer, data recorder.
3. Office equipment (copier, facsimile)
4. Measuring instruments
5. NC machines, temperature controllers and programmable logic controllers.

About Cd-free contacts
We have introduced Cadmium free type products to reduce Environmental Hazardous Substances.
(Note: The Suffix “F” is required only for 1 Form A 1 Form B contact type. The 1 Form A and 2 Form A contact type is originally Cadmium free, the suffix “F” is not required.)
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.mew.co.jp/ac/e/environment/
### TYPES

<table>
<thead>
<tr>
<th>Contact arrangement</th>
<th>Nominal coil voltage</th>
<th>Single side stable</th>
<th>2 coil latching</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Part No.</td>
<td></td>
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</tr>
<tr>
<td>3V DC</td>
<td>DSP1a-DC3V</td>
<td></td>
<td>DSP1a-L2-DC3V</td>
</tr>
<tr>
<td>5V DC</td>
<td>DSP1a-DC5V</td>
<td></td>
<td>DSP1a-L2-DC5V</td>
</tr>
<tr>
<td>6V DC</td>
<td>DSP1a-DC6V</td>
<td></td>
<td>DSP1a-L2-DC6V</td>
</tr>
<tr>
<td>9V DC</td>
<td>DSP1a-DC9V</td>
<td></td>
<td>DSP1a-L2-DC9V</td>
</tr>
<tr>
<td>12V DC</td>
<td>DSP1a-DC12V</td>
<td></td>
<td>DSP1a-L2-DC12V</td>
</tr>
<tr>
<td>24V DC</td>
<td>DSP1a-DC24V</td>
<td></td>
<td>DSP1a-L2-DC24V</td>
</tr>
</tbody>
</table>

Note: Reverse polarity type are manufactured by lot upon receipt of order. Self-clinching types are also available, please consult us.

### RATING

#### 1. Coil data

1) Single side stable

<table>
<thead>
<tr>
<th>Nominal coil voltage</th>
<th>Pick-up voltage (at 20°C 68°F)</th>
<th>Drop-out voltage (at 20°C 68°F)</th>
<th>Nominal operating current [\pm10%] (at 20°C 68°F)</th>
<th>Coil resistance [\pm10%] (at 20°C 68°F)</th>
<th>Nominal operating power</th>
<th>Max. allowable voltage (at 20°C 68°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3V DC</td>
<td>80%V or less of nominal voltage</td>
<td>10%V or more of nominal voltage (Initial)</td>
<td>100mA</td>
<td>30Ω</td>
<td>300mW</td>
<td>130%V of nominal voltage</td>
</tr>
<tr>
<td>5V DC</td>
<td>80%V or less of nominal voltage</td>
<td>10%V or more of nominal voltage (Initial)</td>
<td>60mA</td>
<td>83Ω</td>
<td>300mW</td>
<td>130%V of nominal voltage</td>
</tr>
<tr>
<td>6V DC</td>
<td>50mA</td>
<td>120Ω</td>
<td>33.3mA</td>
<td>270Ω</td>
<td>300mW</td>
<td>130%V of nominal voltage</td>
</tr>
<tr>
<td>9V DC</td>
<td>25mA</td>
<td>480Ω</td>
<td>12.5mA</td>
<td>1,920Ω</td>
<td>300mW</td>
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2) 2 coil latching

<table>
<thead>
<tr>
<th>Nominal coil voltage</th>
<th>Set voltage (at 20°C 68°F)</th>
<th>Reset voltage (at 20°C 68°F)</th>
<th>Nominal operating current [\pm10%] (at 20°C 68°F)</th>
<th>Coil resistance [\pm10%] (at 20°C 68°F)</th>
<th>Nominal operating power</th>
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## 2. Specifications

### Contact

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<th>Specifications</th>
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<tbody>
<tr>
<td>Initial contact resistance, max.</td>
<td>Max. 30 mΩ (By voltage drop 6 V DC 1A)</td>
</tr>
<tr>
<td>Contact material</td>
<td>Au-flashed AgSnO type</td>
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</table>

### Rating

<table>
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<tr>
<th>Item</th>
<th>Specifications</th>
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<tr>
<td>Nominal switching capacity (resistive load)</td>
<td>8 A 250 V AC, 5 A 30 DC</td>
</tr>
<tr>
<td>Max. switching power (resistive load)</td>
<td>2,000 VA, 150 W</td>
</tr>
<tr>
<td>Max. switching voltage</td>
<td>380 V AC, 125 V DC</td>
</tr>
<tr>
<td>Max. switching current</td>
<td>8 A AC, 5 A DC</td>
</tr>
<tr>
<td>Nominal operating power</td>
<td>300 mW</td>
</tr>
</tbody>
</table>

### Electrical characteristics

- **Insulation resistance (Initial)**: Min. 1,000 MΩ (at 500 V DC)
- **Breakdown voltage (Initially)**:
  - Between open contacts: 1,000 Vrms for 1 min. (Detection current: 10 mA)
  - Between contact sets: 2,000 Vrms (1 Form A 1 Form B, 2 Form A) (Detection current: 10 mA)
  - Between contact and coil: 3,000 Vrms for 1 min. (Detection current: 10 mA)
- **Surge breakdown voltage**:
  - between contacts and coil: 5,000 V
- **Temperature rise (at 65°C 149°F)**: Max. 55°C
- **Operate time [Set time] (at 20°C 68°F)**: Max. 10 ms [10 ms] (Nominal voltage applied to the coil, excluding contact bounce time)
- **Release time [Reset time] (at 20°C 68°F)**: Max. 5 ms [10 ms] (Nominal voltage applied to the coil, excluding contact bounce time)

### Mechanical characteristics

- **Shock resistance**: Functional
  - Min. 196 m/s^2 (Half-wave pulse of sine wave: 11 ms; detection time: 10 μs)
  - Destructive: Min. 980 m/s^2 (Half-wave pulse of sine wave: 6 ms)
- **Vibration resistance**: Functional
  - 10 to 55 Hz at double amplitude of 2 mm (Detection time: 10 μs)
  - Destructive: 10 to 55 Hz at double amplitude of 3.5 mm

### Conditions

- **Conditions for operation, transport and storage (Not freezing and condensing at low temperature)**
  - Ambient temperature: –40°C to +60°C
  - –40°F to +140°F
  - Ambient temperature: –40°C to +65°C
  - –40°F to +149°F
  - Ambient temperature: –40°C to +60°C
  - –40°F to +140°F
  - Solder heating: 250°C (482°F) (10s), 300°C (572°F) (5s), 350°C (662°F) (3s)
  - (Soldering depth: 2/3 terminal pitch)

### Expected life

- **Mechanical**: Min. 5×10^7 (at 180 cpm)
- **Electrical**: Min. 10^5 (resistive load)

### Unit weight

- Approx. 4.5 g / 0.16 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. Wave is standard shock voltage of ±1.2×50μs according to JEC-212-1981
3. Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT.

## REFERENCE DATA

### 1. Max. switching capacity

![Graph of Max. switching capacity](image1)

### 2.-(1) Life curve (1 Form A 1 Form B)

![Graph of Life curve 1 Form A 1 Form B](image2)

### 2.-(2) Life curve (1 Form A 1 Form B)

![Graph of Life curve 1 Form A 1 Form B](image3)

### 3.-(1) Coil temperature rise (1 Form A)

![Graph of Coil temperature rise 1 Form A](image4)

### 3.-(2) Coil temperature rise (1 Form A 1 Form B)

![Graph of Coil temperature rise 1 Form A 1 Form B](image5)

### 3.-(3) Coil temperature rise (2 Form A)

![Graph of Coil temperature rise 2 Form A](image6)
DS-P

DIMENSIONS (Unit: mm inch)

1.1 Form A type

**External dimensions**
- Single side stable
- 2 coil latching

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>10.0</td>
<td>10.5</td>
</tr>
<tr>
<td>Length</td>
<td>3.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Height</td>
<td>11.0</td>
<td>11.0</td>
</tr>
<tr>
<td>Tolerance</td>
<td>±0.3</td>
<td>±0.3</td>
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**PC board pattern (Bottom view)**
- Single side stable
- 2 coil latching

**Tolerance:** ±0.1 ±0.004

**Schematic (Bottom view)**
- Single side stable
- 2 coil latching

**Deenergized condition**

**Reset condition**

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2.1 Form A 1 Form B type

**External dimensions**
- Single side stable
- 2 coil latching

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**PC board pattern (Bottom view)**
- Single side stable
- 2 coil latching

**Tolerance:** ±0.1 ±0.004

**Schematic (Bottom view)**
- Single side stable
- 2 coil latching

**Deenergized condition**

**Reset condition**

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3.2 Form A type

**External dimensions**
- Single side stable
- 2 coil latching

<table>
<thead>
<tr>
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**PC board pattern (Bottom view)**
- Single side stable
- 2 coil latching

**Tolerance:** ±0.1 ±0.004

**Schematic (Bottom view)**
- Single side stable
- 2 coil latching

**Deenergized condition**

**Reset condition**