
On our Relays
Hardly any sector of the working or living space can exist without modern relay technology today. Panasonic Industry meets the various needs with a broad range of innovative and economical relays series.

After more than 40 years of experience at the forefront of relay innovation and development, Panasonic Industry today offers a portfolio of more than 2,000 electromechanical relay versions in the field of miniaturized relays - from ultra-miniature SMD signal relays to robust, compact industrial high power types.

With our new short form we’ll invite you to gain a quick and comprehensive overview on our new relay portfolio: our endurance runners, our innovations – and for sure the ones that suit your project.

About Panasonic Industry
As established part of the global Panasonic Corporation with long-grown and European relationships we strive for continuous innovation and share the company’s overarching purpose: Shaping the future for the better.

To take your ideas to the next level, we at Panasonic Industry research, develop and produce technologies and components for a vast range of industries.

From full-custom batch-size 1 factory automation devices to next-gen electronic and electromechanical components manufactured in billions of units, our clear focus on innovation, performance and reliability sets the bar high in multiple market sectors – and trends.
Service & Support

Albeit the standard relay datasheet covers more than 80% of all applications, the paper can only cover a certain scope of values and parameters, mostly concerning worst case scenarios, for example in terms of temperature. When it comes to specific requests like switching 8A with a 6A relay, our laboratories in Germany are able to support you. Our engineers do not only perform lifetime tests but provide you with an in-depth view of the application parameters. In almost every case, there is a relay that fits your project, even if the datasheet wouldn't reveal it in the first place.

Application support is then followed by the analysis part: Continuous tests during production will ensure a high and constant quality level. When it comes to lifetime or customer-related investigations, latest technology shows results about the condition, wear-out or remaining lifetime of relays. Finally, we encourage our customers to address our support in case of questions and claims. Resorting to many decades of experience, the reason of a relay fault is mostly found not in the relay itself, but in the context of improper component decision or external factors like overcurrent, mechanical stress or hazardous materials.

" DOES THIS RELAY SUIT MY IDEA? AND IF NOT - WHICH ONE DOES? "

" IS IT POSSIBLE TO SWITCH 8A WITH A SLIM 6A RELAY? "
Industrial Relays

Proven, reliable, innovative and energy-efficient switching solutions

We find ourselves already in the midst of the next industrial revolution, which is not only a question of visions and ideas - but also of next-gen reliable and efficient components making a true difference in daily operations.

Get a glimpse on what Panasonic Industry has to offer in its latest portfolio of industrial relays – from circuit board connection types to plug-in or screw terminals, from low-level load switching to double-digit ampere values. Discover the variety of industrial switching.

Load switching capability ranges from low-level signals to double-digit ampere values.

Various connection types such as circuit boards, plug-in or screw terminals offer a large variety of options that are tailored to your application.
With a compact size and switching capability up to 2A, signal relays are used in a wide field of communication and security applications as well as in lighting, measurement or automation equipment.

Galvanic separation between control and load circuit and ruggedness against high inrush or voltage peaks (overload) makes them an ideal choice for any kind of application.

Even battery-driven or energy harvesting applications can benefit from the modern latching technology all signal relays offer. Power is only needed for few hundred milliseconds during on- or off-switching, in between the relays needs no energy to keep the state.

...NO MATTER IF YOU'RE AIMING FOR HIGH VOLTAGE ROBUSTNESS OR LOW COIL POWER LOSS.

Signal Relays
## Series Features Coil Mounting (bottom view)

### AGN
- Compact slim body
- 1,500V FCC
- 2,500V Telcordia
- Twin crossbar contacts ensures high contact reliability
- High sensitivity 100mW type available

### AGQ
- Space saving flat body
- 1,500V FCC
- 2,500V Telcordia
- The use of twin crossbar contacts ensures high contact reliability
- Power type for 3.5A inrush current available

### TX
- 1,500V FCC
- 2,500V Telcordia
- 3 types of surface-mount terminals available

### Mounting (bottom view)

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>DC 1.5, 3, 4.5, 6, 9, 12V</th>
<th>DC 24V</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGN</td>
<td></td>
<td></td>
<td>Single side stable</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>140mW</td>
<td>230mW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sensitive / 1 coil latching type</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100mW</td>
<td>120mW</td>
</tr>
<tr>
<td>AGQ</td>
<td></td>
<td></td>
<td>Single side stable</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>140mW</td>
<td>230mW</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Sensitive / 1 coil latching type</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100mW</td>
<td>120mW</td>
</tr>
<tr>
<td>TX</td>
<td></td>
<td></td>
<td>Single side stable</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>140mW</td>
<td>270mW</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>1 coil latching: 100mW</td>
<td></td>
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<td></td>
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<td></td>
<td>2 coil latching: 200mW</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>2 coil latching: 140mW</td>
<td></td>
</tr>
</tbody>
</table>

### Switching Characteristics

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coils</th>
<th>Power Consumption</th>
<th>Contact Resistance</th>
<th>On Resistance</th>
<th>Off Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGN</td>
<td></td>
<td>THT</td>
<td>140mW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGQ</td>
<td></td>
<td>THT</td>
<td>140mW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TX</td>
<td></td>
<td>THT</td>
<td>140mW</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SMD Characteristics

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coils</th>
<th>Power Consumption</th>
<th>Contact Resistance</th>
<th>On Resistance</th>
<th>Off Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGN</td>
<td></td>
<td>SMD</td>
<td>140mW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGQ</td>
<td></td>
<td>SMD</td>
<td>140mW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TX</td>
<td></td>
<td>SMD</td>
<td>140mW</td>
<td></td>
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</tbody>
</table>
## Industrial Relays | Signal Relays

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TQ SMD</strong></td>
<td></td>
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</tr>
<tr>
<td></td>
<td><em>Ultra low profile 5.8mm</em></td>
<td><em>DC 1.5, 3, 4.5, 5, 6, 9, 12V DC 24V DC 48V</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Surge withstand 2,500V</em></td>
<td><em>Single side stable: 140mW 200mW 300mW</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>3 types of surface-mount terminals available</em></td>
<td><em>1 coil latching: 70mW 100mW</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>2 coil latching: 140mW 200mW</em></td>
<td></td>
</tr>
<tr>
<td><strong>TQ THT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>1,500V FCC</em></td>
<td><em>DC 3, 4.5, 5, 6, 9, 12V DC 24V DC 48V</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Low thermal electromotive force approx. 5 µV</em></td>
<td><em>Single side stable: 140mW 200mW 300mW</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>1 coil latching: 100mW 150mW</em></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td><em>2 coil latching: 140mW 300mW</em></td>
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<tr>
<td><strong>DS1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>1,500V FCC</em></td>
<td><em>DC 1.5, 3, 5, 6, 9, 12, 24, 48V</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Single side stable: 200mW</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>1 coil latching: 90mW</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>2 coil latching: 120mW</em></td>
<td></td>
</tr>
</tbody>
</table>

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**Series Features Coil Mounting (bottom view)**

- **TQ SMD**
  - Ultra low profile 5.8mm
  - Surge withstand 2,500V
  - 3 types of surface-mount terminals available
  - DC 1.5, 3, 4.5, 5, 6, 9, 12V DC 24V DC 48V
  - Single side stable: 140mW 200mW 300mW
  - 1 coil latching: 70mW 100mW
  - 2 coil latching: 140mW 200mW

- **TQ THT**
  - 1,500V FCC
  - Low thermal electromotive force approx. 5 µV
  - DC 3, 4.5, 5, 6, 9, 12V DC 24V DC 48V
  - Single side stable: 140mW 200mW 300mW
  - 1 coil latching: 100mW 150mW
  - 2 coil latching: 140mW 300mW

- **DS1**
  - 1,500V FCC
  - DC 1.5, 3, 5, 6, 9, 12, 24, 48V
  - Single side stable: 200mW
  - 1 coil latching: 90mW
  - 2 coil latching: 120mW
Power relays - the backbone of applications in countless contexts. There are clear trends towards high power handling directly on the PCB – and towards polarized relay technology for low or (for the latching types) even zero energy consumption.
### Series Features

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Breakdown voltage</th>
<th>Surge voltage</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
</table>
| DSP    | - Miniature high sensitive power relay  
        - High breakdown voltage  
        - Creepage & clearance distance min. 3.5mm | DC 3, 5, 6, 9, 12, 24V  
        Single side stable & 2 coil latching: 300mW  
        1 coil latching: 150mW | 1,000Vrms  
2,000Vrms  
3,000Vrms  
5,000V | THT  
PCB  
Grid 2.54mm | 1a  
1a1b  
2a |
| DK     | - Creepage & clearance distance min. 8mm:  
DK2A-L1/L2 min. 6.8mm  
DK1A1B-L1/L2 min. 6.8mm | DC 3, 5, 6, 9, 12, 24V  
200mW | 1,000Vrms  
4,000Vrms  
4,000Vrms  
10,000V | THT  
PCB  
Grid 2.54mm | 1a  
1a1b  
2a |
| DE     | - Conforms to VDE0631  
- Low coil power  
- High switching capacity:  
16A = 25,000  
10A = 100,000 switching cycles  
- Creepage & clearance distance min. 8mm | DC 1.5, 3, 4.5, 5, 6, 9, 12, 24, 48V  
Single side stable & 2 coil latching: 200mW  
1 coil latching: 100mW | 1,000Vrms  
4,000Vrms  
5,000Vrms  
12,000V | THT  
PCB  
Grid 2.54mm | 1a  
1a1b  
2a |
| DW/DW-HL | - 15.8mm low profile type available  
- HL inrush type available (TV-8 UL/C-UL)  
- IEC60335-1* compliant, PTI325V (VDE approved) type available  
- Creepage & clearance distance min. 6mm | DC 3, 5, 6, 9, 12, 24V  
1 coil latching: 200mW  
2 coil latching: 400mW | 1,000Vrms  
5,000Vrms  
12,000V | THT  
PiP  
PCB, PiP  
3.50  
17.50  
7.50  
4 or 5-1.20  
dia. hole  
2 coil latching type only | 1a  
1a1b  
2a |
<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Breakdown voltage</th>
<th>Surge voltage</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
</table>
| DJ-H   | Manual Lever Type  
Creepage and clearance distance min. 8mm  
High inrush current capacity ~ 500A  
EN 60669 compliant | DC 5, 6, 9, 12, 24V  
1 coil latching: 1,000mW  
2 coil latching: 2,000mW | 1,500Vrms – 4,000Vrms  
12,000V | THT | 50A  
1a  
480V AC |
| DJ     | Optional available with manual testbutton  
Creepage and clearance distance min. 8mm  
Tungsten pre contact available | DC 5, 6, 12, 24, 48V  
Single side stable & 2 coil latching: 250mW  
1 coil latching: 150mW | 1,000Vrms – 4,000Vrms  
10,000V | PCB  
Grid 2.54mm | 1A  
2A  
2b  
2c |
| DZ-S   | IEC62055-31 UC3 compliant (short current 3,000 A)  
High switching capacity 90 A 250 VAC (resistive load)  
Twin contacts for low temperature rise | DC 5, 12, 24V  
1 coil latching: 1500mW  
2 coil latching: 3,000mW | 2,000Vrms – 4,000Vrms  
12,000V | Terminal mounting | 90A  
277V AC |
| ST     | High inrush capability, TV rating  
Frictionless pivoted rotating armature  
Socket available  
Not for new applications  
Creepage and clearance distance more than 3mm, approx. 4mm | DC 3, 5, 6, 9, 12, 24, 48V  
Single side stable & 2 coil latching: 240mW  
1 coil latching: 130mW | 1,200Vrms  
2,000Vrms  
3,750Vrms  
6,000V | PCB  
Grid 2.54mm  
(Single side stable) | 8A  
250V DC  
100V AC |
### Industrial Relays | Power Relays

**Series Features**
- **Coil Breakdown voltage**
- **Surge voltage**
- **Mounting (bottom view)**

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Breakdown voltage</th>
<th>Surge voltage</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S</strong></td>
<td>5-layer contact for wide switching capacity range: 100µA...4A</td>
<td>DC 3, 5, 6, 12, 24, 48V</td>
<td>750Vrms</td>
<td>1,000Vrms</td>
<td>THT/PCB Grid 2.54mm</td>
</tr>
<tr>
<td></td>
<td>High vibration and shock resistance</td>
<td>Single side stable &amp; 2 coil latching: 200mW (48V: 271mW)</td>
<td>1,500Vrms</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low thermal electromotive force (approx. 3uv)</td>
<td>1 coil latching: 100mW (48V: 144mW)</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sockets available</td>
<td>1 coil latching: 100mW (48V: 144mW)</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td><strong>SP</strong></td>
<td>Polarized power relay with rotating armature</td>
<td>DC 5, 6, 12, 24, 48V</td>
<td>1,500Vrms</td>
<td>3,000Vrms</td>
<td>THT/PCB Plug-in Grid 2.54mm</td>
</tr>
<tr>
<td></td>
<td>High sensitivity</td>
<td>300mW</td>
<td>3,000Vrms</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High vibration and shock resistance</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Socket available</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td><strong>LF</strong></td>
<td>Ideal for compressor and inverter loads</td>
<td>DC 5, 6, 9, 12, 18, 24V</td>
<td>1,000Vrms</td>
<td>–</td>
<td>THT/PCB Top mounting</td>
</tr>
<tr>
<td></td>
<td>High insulation resistance</td>
<td>900mW</td>
<td>5,000Vrms</td>
<td>10,000V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inrush current: 102A/200V AC 224A/100V AC</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High surge withstand voltage</td>
<td>4-1.8 Ø 27.6 ±0.1 13.8 ±0.1 12.0 ±0.1 10.0 ±0.1 12.0 ±0.1</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Creepage and clearance distance mn. 8mm</td>
<td>PCB, Top mounting</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td><strong>LF-G</strong></td>
<td>Ideal for solar inverters</td>
<td>DC 9, 12, 18, 24V</td>
<td>2,500Vrms</td>
<td>–</td>
<td>THT/PCB</td>
</tr>
<tr>
<td></td>
<td>Contact gap 1.5 mm / 1.8mm</td>
<td>1,400mW</td>
<td>4,000Vrms</td>
<td>6,000V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Compliant with IEC62109 and VDE0126</td>
<td>22A AL/02</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inrush current: 102A/200V AC 224A/100V AC</td>
<td>32A AL/02</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Creepage distance contact-coil: mn. 9.5mm</td>
<td>277V AC</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clearance distance contact-coil: mn. 6.5mm</td>
<td>277V AC</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
</tbody>
</table>
### industrial relays  | power relays

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Breakdown voltage</th>
<th>Surge voltage</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LZ / LZ-N</td>
<td>Low profile relay (15.7 mm) EN60335-1 GWT compliant Ambient temperature up to 105°C Creepage and clearance distance min. 10 mm</td>
<td>DC 5, 9, 12, 18, 24V (LZ 48V)</td>
<td>400mW</td>
<td>1,000Vrms – 5,000Vrms</td>
<td>THT, PCB</td>
</tr>
<tr>
<td>LQ</td>
<td>Low power consumption F-coil type for 105°C ambient temperature available Creepage and clearance distance: 1a: min. 4.55 mm 1c: min. 3.53 mm</td>
<td>DC 5, 6, 9, 12, 18, 24V</td>
<td>200mW (1a) 400mW (1c)</td>
<td>1,000Vrms (1a) 750Vrms (1c)</td>
<td>THT, PCB</td>
</tr>
<tr>
<td>JW</td>
<td>Class B coil insulation types available Creepage and clearance distance min. 8mm between contacts and coil (for 2 changeover contacts min. 7.5mm) Universal terminal footprint</td>
<td>DC 5, 6, 9, 12, 18, 24, 48V</td>
<td>530mW</td>
<td>1,000Vrms (2a, 2c) 3,000Vrms (1a, 1c)</td>
<td>THT, PCB</td>
</tr>
<tr>
<td>LD-P</td>
<td>Slim type: width 7 mm Creepage and clearance distance min. 6mm EN60909 (GWT2-11, GWF2-12,GWT2-13) data available</td>
<td>DC 5, 6, 9, 12, 18, 24V</td>
<td>200mW</td>
<td>750Vrms</td>
<td>THT, PCB</td>
</tr>
<tr>
<td>Series</td>
<td>Features</td>
<td>Coil</td>
<td>Breakdown voltage</td>
<td>Surge voltage</td>
<td>Mounting (bottom view)</td>
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</tr>
</tbody>
</table>
| **PA-N** | - High density mounting  
- Low operating power  
- Complies with IEC61010 reinforcement standards  
- Insulation distance: 5.29mm clearance, 5.36mm creepage  
- Complies with Standard for Hazardous Location (ANSI/ ISA 12.12.01) | DC 3, 4.5, 5, 6, 9, 12, 18, 24V  
110mW | 1,000Vrms - 3,000Vrms  
6000V |  |  |
| **PF** | - Slim size permits high density mounting  
- Slim relay for grid applications  
- Insulation construction conforms to VDE0700  
- Gold flash or gold-clad contacts available  
- Clearance distance min. 6.0mm  
- Creepage distance min. 8mm  
- Bent pin type available  
- EN60335-1, clause 30 (GWT) approved | DC 4.5, 5, 6, 12, 18, 24, 48, 60V  
170mW  
48V: 217mW  
60V: 175mW | 1,000Vrms - 4,000Vrms  
6000V |  |  |
With a gap between normally open contacts of 3.2mm, the HE-S exceeds mandatory regulations.

Our energy grid is changing. Decentralized power generation like wind engines or solar panels on each building require new ways to handle and distribute the current that keeps our modern life running. In addition, e-mobility solutions bring high power applications to each and everyone. To miniaturize this technology - and to make it affordable, HE relays are designed to bring the high power handling on the PCB – without wiring, with improved reliability and low power losses.

**High Capacity Relays**

EXTREMELY LOW POWER DISSIPATION AT THE CONTACTS IS ACHIEVED BY REDUCING THE CONTACT RESISTANCE DOWN TO 0.4MΩ.
<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Breakdown voltage</th>
<th>Surge voltage</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
</table>
| HE-S   | - High-capacity and long life  
- 170mW coil holding power for energy saving  
- Contact gap: 3.2mm  
- Safety: Mirror contact mechanisms according to IEC 60947-4-1 | DC 6, 9, 12, 24, 48V  
1,880mW | 2,000Vrms | 5,000Vrms (between coil and Form A contacts) | THT |
| HE-Y5/HE-PV | - Compliant with European photovoltaic standard VDE0126  
- Compliant with EN61810-1 2.5kW surge breakdown voltage (between contacts)  
- Contact gap 2.5mm  
- Only 310mW holding power | DC 6, 9, 12, 24V  
1,920mW | 2,000Vrms | 5,000Vrms | THT |
| HE-Y6  | - Compliant with European photovoltaic standard VDE0126  
- Compliant with EN61810-1 2.5kW surge breakdown voltage (between contacts)  
- Contact gap 3.0mm  
- Only 310mW holding power | DC 6, 9, 12, 24V  
1,920mW | 2,000Vrms | 5,000Vrms | THT |
<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Breakdown voltage</th>
<th>Surge voltage</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HE-Y7</td>
<td>- For inverter, battery charger, battery storage</td>
<td>DC 6, 9, 12, 24V</td>
<td>open contacts: 2,000Vrms</td>
<td>2,000Vrms</td>
<td>THT Top mounting</td>
</tr>
<tr>
<td></td>
<td>- Contact gap: 3.6mm</td>
<td>2,500mW</td>
<td>contact sets: 5,000Vrms</td>
<td>5,000Vrms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Only 400mW holding power</td>
<td></td>
<td>contacts to coil: 10,000V</td>
<td>10,000V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Very low contact resistance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Creepage &amp; clearance distance min. 10.55mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HE-V</td>
<td>- Max. 1,000V DC, 20A cutoff</td>
<td>DC 6, 9, 12, 15, 24V</td>
<td>open contacts: 2,000Vrms</td>
<td>2,000Vrms</td>
<td>THT</td>
</tr>
<tr>
<td></td>
<td>- Coil holding power: 210mW</td>
<td>1,920mW</td>
<td>contact sets: 4,000Vrms</td>
<td>4,000Vrms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Protective construction: Flux-resistant type</td>
<td></td>
<td>contacts to coil: 5,000Vrms</td>
<td>5,000Vrms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Contact gap: min. 3.0mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Clearance distance: min. 8mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Creepage distance: min. 9.6mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HE-R</td>
<td>- Compliant IEC 62965</td>
<td>DC 6, 9, 12, 24V</td>
<td>open contacts: 2,000Vrms</td>
<td>2,000Vrms</td>
<td>THT</td>
</tr>
<tr>
<td></td>
<td>- 1b mirror contact structure</td>
<td>4,000mW</td>
<td>contact sets: 5,000Vrms</td>
<td>5,000Vrms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Contact gap: 3.6mm</td>
<td></td>
<td>contacts to coil: 10,000V</td>
<td>10,000V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Only 490mW holding power</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Creepage / clearance &gt;8.0mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Low operation noise: 61dB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Industrial Relays  | High Capacity Relays

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Breakdown voltage</th>
<th>Surge voltage</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
</table>
| EP     | - Max. cut-off current 2,500A/300VDC (30A type)  
  - Max. 1,000VDC contact voltage 
  - Low operating noise 
  - High contact reliability 
  - DC type with sealed capsule | 10A 400V DC DC 24, 48V 1.24W | 2,500Vrms | - | 2,500Vrms |
|        |          | 20A 400V DC DC 12, 100V 3.9W | - | - | - |
|        |          | 80A 400V DC DC 12, 100V 4.2W | - | - | - |
|        |          | 200A 400V DC DC 12, 100V 6.0W | - | - | - |
|        |          | 300A 400V DC DC 12, 100V 6.0W | - | - | - |
In relays designed according to the standard EN 61810-3, the contacts are interconnected in such a way that in case of failure, e.g. when a load contact for a motor welds, the corresponding forcibly guided contacts are blocked. Redundancy in the circuit can, for example, allow a motor to be shut off whereby the blocked contact prevents the motor from being turned on again because the release circuit is not closed.

What this boils down to is, that relays with forcibly guided contacts are usually power relays with several NO (1a) and NC (1b) contacts (minimum 1a1b) that comply with the relay standards EN 61810-1 and EN 61810-3. This technology guarantees defined and hence safe operating conditions in the event of a failure.

Safety Relays

In relays designed according to the standard EN 61810-3, the contacts are interconnected in such a way that in case of failure, e.g. when a load contact for a motor welds, the corresponding forcibly guided contacts are blocked. Redundancy in the circuit can, for example, allow a motor to be shut off whereby the blocked contact prevents the motor from being turned on again because the release circuit is not closed.

What this boils down to is, that relays with forcibly guided contacts are usually power relays with several NO (1a) and NC (1b) contacts (minimum 1a1b) that comply with the relay standards EN 61810-1 and EN 61810-3. This technology guarantees defined and hence safe operating conditions in the event of a failure.
<table>
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<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Breakdown voltage</th>
<th>Surge voltage</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
</table>
| SFM    | » Extremely low height  
     » Low holding power 100mW  
     » High shock resistance >20g  
     » Reinforced insulation ≥ 5.5mm (V=230V overvoltage category III, 6kV) on NO side  
     » Ambient temperature -40 to +85°C  
     » Tape & Reel available  | DC 3, 5, 12, 18, 21, 24V 270mW | 1,500Vrms - (no contact sets next to each other)  
     2,500Vrms for NO side  | THT  
     THT type  
     RTII  
     RTIII  
     PiP  
     Schematic (BOTTOM VIEW)  |
| SFY    | » Gold clad contacts on request  
     » Reinforced insulation according to EN 50178, creepage and clearance distance 20.5mm (V=230V overvoltage category III, 6kV)  
     » Ambient temperature -40 to +85°C  
     » Tested as sealed device according to IEC / EN 60079-15:2010 clause 22.5 (VDE)  | DC 5, 12, 18, 21, 24V 670mW | 1,500Vrms  
     4,000Vrms  
     2,500 / 4,000Vrms  | THT  
     THT type  
     RTII (IP54), RTIII 4pole on request  
     PCB  |
| SFS    | » Slim profile reduces mounting area  
     » PC board sockets available  
     » DIN-rail terminal sockets available  
     » RTIII (IP54), RTIII 4pole on request  
     » Ambient temperature -40 to +85°C  
     » LED indication type available  | DC 12, 18, 21, 24, 48V 360mW (4pole) 500mW (6pole)  | 2,500Vrms  
     4,000Vrms  
     4,000Vrms  | THT  
     THT type  
     RTII (IP54), RTIII 4pole on request  
     PCB  |
<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Breakdown voltage</th>
<th>Surge voltage</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFN4D</td>
<td>+ EN 61810-3, Type B safety double contact + Reinforced insulation, creepage and clearance distance 5.5mm</td>
<td>DC 5, 9, 12, 16, 18, 21, 24, 36, 48, 60V 390mW (5 - 24V) 420mW (36 - 60V)</td>
<td>2,500Vrms 4,000Vrms 5,000Vrms</td>
<td></td>
<td>THT Grid 3.5mm</td>
</tr>
<tr>
<td>SF</td>
<td>+ SF4D: EN 61810-3, Type B safety double contact + SF2D: EN 61810-3, Type A safety double contact + SF3: EN 61810-3, Type A + For applications according to EN 50155 + IEC/EN 60335-1 (GWT) available</td>
<td>DC 5, 9, 12, 16, 18, 21, 24, 36, 48, 60V 500mW</td>
<td>2,500Vrms 4,000Vrms 5,000Vrms</td>
<td></td>
<td>THT Grid 3.5mm</td>
</tr>
</tbody>
</table>
Microwave devices can be classified into relays and coaxial switches which handle high frequency signals above several 100MHz. These devices are frequently used in the field of test and measurement equipment, wireless devices and base stations. Panasonic Industry has a wide range of relays and coaxial switch products for various frequency bands. Features include low insertion loss, high isolation, and low VSWR for impedance matching.
### Industrial Relays | High Frequency Relays

#### Series Features Coil Mounting (bottom view)

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
</table>
| **ARD** |  » Long life  
  » Stable contact resistance  
  » High sensitive coaxial switch | DC 4.5, 5, 12, 24V  
 Fail-safe (with or without indicator)  
 Latching (with or without indicator)  
 Latching with TTL driver (with self cut-off function, with or without indicator) | SMA, SMD |
|       | 34 x 13.2 x 40mm  
 32 x 32 x 40mm  
 80 x 80 x 40.5mm |          | | 26.5GHz |
| **ARJ** |  » Shielded HF relay  
  » HF characteristics at 5GHz:  
    » Isolation min. 35dB  
    » Isolation min. 30dB between contact sets  
  » Insertion loss max. 0.5dB  
  » V.S.W.R. max. 1.25 | DC 3, 4.5, 12, 24V  
 Single side stable:  
 200mW  
 2 coil latching:  
150mW | THT, SMD |
|       | 14 x 9 x 8.2mm | | | 5GHz |
| **ARN** |  » 150W carrying power at 2GHz  
  » HF characteristics at 2GHz:  
    » Isolation min. 55dB  
    » Insertion loss max. 0.12dB  
  » V.S.W.R. max. 1.15 | DC 4.5, 12, 24V  
 Single side stable:  
 320mW  
 2 coil latching:  
400mW | SMD |
|       | 14.6 x 9.6 x 10.9mm | | | 5GHz |

**Signal**

**Power**

**High Capacity**

**Safety**

**High Frequency**

**Semiconductor**

**Automotive**

**Plug-in**

**High Voltage**
## Industrial Relays | High Frequency Relays

### ARS

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
</table>
| ARS    | A or Y layout  
         | 10W at 3GHz contact carrying power  
         | Silent Type available  
         | HF characteristics @ 3GHz (50Ω PCB type):  
         | Isolation min. 35dB  
         | Insertion loss max. 0.35dB  
         | V.S.W.R. max. 1.4  |
|        | DC 3, 4.5, 9, 12, 24V  
         | Single side stable /  
         | 1 coil latching:  
         | 200mW  
         | 2 coil latching:  
         | 400mW  |

### ARA

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
</table>
| ARA    | SMD  
         | Single side stable  
         | HF characteristics at 1GHz:  
         | Isolation min. 20dB  
         | Isolation min. 30dB between contact sets  
         | Insertion loss max. 0.3dB  
         | V.S.W.R. max. 1.2  |
|        | DC 1.5, 3, 4.5, 6, 9, 12, 24, 48V  
         | Single side stable /  
         | 2 coil latching:  
         | 140mW (1.5 - 12V)  
         | 200mW (24V)  
         | 300mW (48V, only single side stable)  |
|        | 1 coil latching:  
         | 70mW (1.5 - 12V)  
         | 100mW (24V)  |
Semiconductor Relays

Maximum service life - many application purposes

Panasonic Industry offers a wide range of PhotoMOS® relays for use in telecommunication, measurement, security devices and industrial control.

The power MOSFET’s output acts as a pure ohmic resistance thus distinguishing the PhotoMOS® from an optocoupler or triac solution, since no saturation voltage or offset voltage is required.

PhotoMOS® relays with a MOSFET output enjoy an almost unlimited lifetime if used according to the specifications. Moreover, they are extremely reliable, unaffected by vibration, and their On-resistance remains stable throughout their entire lifetime. In addition to our broad product line-up for the industrial market, automotive-qualified types are also available.
### Product key & Packages

#### Channel configuration
- **S**: 4 channels (8-pin)
- **V**: 1 channels (8-pin)
- **Y**: 1 channels (B-pin)
- **W**: 2 channels (8-pin)
- **Z**: 1 channels (B-pin)

#### Output configuration
- **1**: 1 Form A (non-latching)
- **2**: 1 Form B (non-latching)
- **3**: 1 Form A & 1 Form B (latching)
- **4**: 1 Form A (latching)
- **5**: 1 Form B (latching)
- **6**: 1 Form A & 1 Form B (latching)
- **A**: Normally open
- **B**: Normally closed

#### Type
- **0**: HF type (small and power)
- **1**: GU type (Miniature)
- **2**: RF type (Low on-resistance & Economical)
- **3**: HS type (High sensitivity)
- **4**: HE type (Low on-resistance & Economical)
- **5**: Power High Capacity type
- **6**: PD type (Flat and power)
- **7**: CC type (Capacitor coupled isolation type)

#### Current limit function
- **N**: Non
- **K**: With short circuit protection (latching)
- **L**: With current limiting

#### Configuration
- **Loading voltage**: 350V to 40V
- **Load voltage**: 250V to 600V
- **V**: 2 channels (8-pin)
- **W**: 1 channel (SIL 4-pin)

#### Driving method
- **N**: Current-sensitive
- **D**: Power type voltage-sensitive
- **F**: Small size type voltage-sensitive

#### Feature
- **N**: Standard
- **R**: Low C x R
- **E**: Economical

#### I/O isolation voltage
- **N**: Basic insulation
- **H**: Reinforced insulation

#### Package
- **TSON**: Thin Small Outline No lead Package
- **VSSOP**: Very Shrink Small Outline Package
- **SON**: Small Outline No lead Package
- **SSOP**: Shrink Small Outline Package
- **SOP**: Small Outline Package
- **SOP4pin**: SOP4pin
- **SOP6pin**: SOP6pin
- **SOP8pin**: SOP8pin
- **DIP**: Dual Inline Package
- **DIP4pin**: DIP4pin
- **DIP6pin**: DIP6pin
- **Power-DIP**: Power Dual Inline Package
- **Power-DIP4pin**: Power-DIP4pin
- **Power-DIP6pin**: Power-DIP6pin
- **SIL**: Single Inline Package
- **SIL4pin**: SIL4pin

Valid only for combinations of products listed in the catalog (see "TYPES" in this catalog). Please inquire regarding combinations with products not listed in this catalog.
## Series Features Output

### GU
**General Use**
- Wide product range for most applications
- Reinforced insulation type available

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>GU</td>
<td></td>
<td>40V 1.5A 0.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100V 0.125A 2.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>350V 0.125A 7.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>600V 0.05A 70.00</td>
</tr>
</tbody>
</table>

*1a* 1b 2a 2b 1a1b DIP SOP

### GE
**Economical & General**
- Economic and Reinforced insulation

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE</td>
<td></td>
<td>30V 0.1A 60pF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>350V 0.13A 18.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60V 0.5A 0.85</td>
</tr>
</tbody>
</table>

*1a* 1b 2a 2b 1a1b DIP

### HS
**High sensitivity**
- Low LED operate current

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS</td>
<td></td>
<td>200V 0.08A 30pF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>80V 0.12A 10.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>250V 0.14A 11.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60V 0.4A 0.8</td>
</tr>
</tbody>
</table>

*1a* DIP VSSOP SSOP TSON

### RF
**Low On Resistance & Low Output Capacitance**
- Very good RF characteristics
- Low signal loss

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF</td>
<td></td>
<td>40V 0.11A 14.5pF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100V 0.12A 1.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>300V 0.05A 10.0</td>
</tr>
</tbody>
</table>

*1a* 2a 4a DIP SOP SSOP VSOP SSN

### CC
**Capacitive Coupled**
- Capacitor Coupled isolation type
- Low On resistance, low output capacitance
- High temperature range up to +105°C

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC</td>
<td></td>
<td>30V 0.75A 45pF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40V 0.3A 14.5pF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60V 0.3A 27pF</td>
</tr>
</tbody>
</table>

*1a* TSON
<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AU Automotive</strong></td>
<td>Tested in accordance to AEC-Q101, Optimized for Isolation Monitoring &amp; HV measurement</td>
<td>60V DC 0.3A (0.08Ω), 100V 0.25A (3.3Ω), 600V 8.0Ω (70Ω)</td>
</tr>
<tr>
<td><strong>Power Slim &amp; Power</strong></td>
<td>High Current in SIL package, Voltage sensitive types</td>
<td>100V DC 0.02A (310Ω), 600V 0.015A (900Ω)</td>
</tr>
<tr>
<td><strong>PD Flat &amp; Power</strong></td>
<td>High Current in Power DIP package</td>
<td>200V 0.5A (0.7Ω), 600V 0.13A (20Ω)</td>
</tr>
<tr>
<td><strong>HF Low On Resistance</strong></td>
<td>High Functionality, AC and DC types</td>
<td>40V DC 0.7A (0.3Ω), 60V DC 0.6A (0.3Ω), 250V DC 0.3A (2.3Ω)</td>
</tr>
<tr>
<td><strong>HE Low On Resistance &amp; Economical</strong></td>
<td>High Efficacy</td>
<td>10V 3.5A (0.025Ω), 40V 0.35A (0.03Ω), 60V 0.33Ω (1.6Ω), 125V 0.33Ω (2.7Ω), 250V 0.33Ω (5.8Ω)</td>
</tr>
<tr>
<td>Series</td>
<td>Features</td>
<td>Output</td>
</tr>
<tr>
<td>--------</td>
<td>----------</td>
<td>--------</td>
</tr>
<tr>
<td>APT</td>
<td>Phototric Coupler</td>
<td>600VAC 0.1A</td>
</tr>
<tr>
<td>AQH</td>
<td>No derating up to +40°C, SMD mounting</td>
<td>600VAC 1.2A</td>
</tr>
<tr>
<td>AQG</td>
<td>Voltage Controlled, Integrated Snubber Circuit</td>
<td>230VAC 2A</td>
</tr>
<tr>
<td>AQ1</td>
<td>Voltage Controlled, Heat Sink ready</td>
<td>230VAC 10A</td>
</tr>
<tr>
<td>AQJ</td>
<td>Plug terminals, Integrated Varistor</td>
<td>230VAC 25A</td>
</tr>
<tr>
<td>AQA</td>
<td>Wide range input (3 – 30VDC), Screw terminals, Status LED, Integrated Varistor</td>
<td>230VAC 40A</td>
</tr>
</tbody>
</table>
Automotive Relays

All Panasonic Industry Automotive relays comply with ISO / TS 16949.

Panasonic Industry has been contributing to the ever increasing need for innovation in transportation electronics for decades, with highly reliable, long lasting devices for transportation safety, comfort, entertainment and powertrain applications. There is continued effort within the transportation industry to balance societal and economic perspectives with the environment. Panasonic Industry continually supports these efforts with proven quality, a solid manufacturing organization and experienced engineering talent.
Modern automotive electric equipment and control technologies are a key aspect to achieve the safety, comfort and efficiency customers expect from a car nowadays. Discover how our relays and connectors meet the demand for sophisticated and sustainable automotive power and body control applications.
# Overview

## Height

<table>
<thead>
<tr>
<th>Capacity</th>
<th>70A</th>
<th>40A</th>
<th>35A</th>
<th>30A</th>
<th>20A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>30mm</td>
<td>20mm</td>
<td>15mm</td>
<td>10mm</td>
<td>5mm</td>
</tr>
</tbody>
</table>

## Capacity

### 20A
- **CJ**
  - (1)
  - **TE**
  - (1)
- **CT**
  - (1)
- **TB**
  - (1)(SMD)

### 30A
- **CT-P**
  - (1)
- **TB-P**
  - (1)
- **CN-M**
  - (1)
  - (2)
- **CN-H**
  - (1)

### 35A
- **TC**
  - (1)
- **TC-P**
  - (1)

### 40A
- **TL**
  - (2)

### 70A
- **CM**
  - (1)
- **TA**
  - (1)

- **CB**
  - Standard
  - (2a)
  - Mini ISO 297 type only

- **CW**
  - High capacity
  - (1)

---

**Micro ISO 24V type only**

**RELAYS Short form**

**Overview**

**Automotive Relays | PCB Relays**
### CT

- **Series:** CT
- **Features:**
  - Super miniature size
  - ACT512 layout = layout of 2 x ACT112
  - H-bridge type available (twin relay)
  - Quiet operation
  - Pin in Paste (with vent hole) available
  - Twin type as 8 pin or 10 pin version available
- **Coil:** 12V DC 800mW
- **Mounting:** THT, PiP, PCB, PiP
- **Dimensions:** 17.4 x 7.2 x 13.5mm
- **Currents:** 30A N.O., 16A N.C., 16V

### CT Power

- **Series:** CT Power
- **Features:**
  - Super miniature size
  - Footprint same as CT standard type
  - Suitable for motor loads
  - H-bridge type available (twin relay)
  - Pin in Paste (with vent hole) available
- **Coil:** 12V DC 1000mW
- **Mounting:** THT, PiP, PCB, PiP
- **Dimensions:** 17.4 x 7.2 x 13.5mm
- **Currents:** 30A N.O., 16A N.C., 16V

### TB

- **Series:** TB
- **Features:**
  - Super miniature size
  - H-bridge type available (twin relay)
  - Pin in Paste (with vent hole) available
  - Lamp load type available
- **Coil:** 12V DC 1,440mW (for pick-up max. 5.5V DC)
  - 900mW (for pick-up max. 6.5V DC)
  - 640mW (for pick-up max. 7.7V DC)
- **Mounting:** THT, PiP, PCB, PiP
- **Dimensions:** 14.0 x 9.2 x 14.0mm
- **Currents:** 30A N.O., 16A N.C., 16V

### TB1P

- **Series:** TB1P
- **Features:**
  - Low power consumption
  - Small board space
  - Light weight
- **Coil:** 12V DC 480mW
- **Mounting:** THT, PiP, PCB, PiP
- **Dimensions:** 14.0 x 9.2 x 14.0mm
- **Currents:** 30A N.O., 16V

---

**Automotive Relays | PCB Relays**

**RELAYS Short form**

**Automotive**

**Plug-In**

**Power**

**High Capacity**

**Safety**

**High Frequency**

**Semiconductor**

**Signa**
### Automotive Relays | PCB Relays

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
</table>
| **TL** | - 1 form U contact arrangement (double make)  
- Small board space  
- Light weight | 12V DC  
640mW (for pick-up max. 6.5V DC) | | ![TL Mounting Diagram](image1.png) |
| **TE** | - Ultra small size, smallest in its class  
- High capacity in a compact body  
- H-bridge type available (twin relay)  
- Pin in Paste (with vent hole) available | 12V DC  
1,309mW  
(900mW for pick-up max. 5.5V DC) | | ![TE Mounting Diagram](image2.png) |
| **CJ** | - Ultra small size  
- High capacity in a compact body  
- H-bridge type available (twin relay)  
- Pin in Paste (with vent hole) available | 12V DC  
900mW  
High sensitive type 640mW | | ![CJ Mounting Diagram](image3.png) |
| **CP** | - Very low profile  
- High capacity  
- 24V DC type available on request | 12V DC  
640mW | | ![CP Mounting Diagram](image4.png) |
## CP POWER
- **Series:** 14.0 x 13.0 x 9.5mm
- **Features:**
  - Very low profile
  - Improved heat conduction by additional pin
  - Pin in Paste (with vent hole) available
- **Coil:**
  - 12V DC: 450mW
  - 16V: 640mW
- **Mounting:** THT

## CP SMD
- **Series:** 14.0 x 13.0 x 10.5mm
- **Features:**
  - Very low profile
  - High capacity
- **Coil:**
  - 12V DC: 640mW
- **Mounting:** SMD

## TJ
- **Series:** 15.0 x 16.0 x 11.2mm
- **Features:**
  - Compact flat type (height: 11.2mm)
  - High capacity switching
  - Thermal resistant type
- **Coil:**
  - 12V DC: 450mW
- **Mounting:** THT

## CQ
- **Series:** 17.0 x 13.0 x 16.0mm
- **Features:**
  - Very quiet operation
  - Terminal layout identical to JUM
- **Coil:**
  - 12V DC: 640mW
- **Mounting:** THT
### Series Features Coil Mounting (bottom view)

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
</table>
| **TA**  | » Very quiet operation  
           » Flat type                                                             | 12V DC  
           640mW (for pick-up max. 7.7V DC)  
           900mW (for pick-up max. 6.5V DC)                                      | THT, PCB               |
| 1c      | 10.8 x 17.0 x 14.0mm                                                    | 30A N.O.  
           15A N.C.  
           18V                                      |
| **CN-M**| » Space-saving design  
           » SMD type available  
           » Pin in Paste (with vent hole) available                            | 12V DC  
           640mW                                                                 | THT, PCB, SMT          |
| 1a 1c   | 15.5 x 11 x 14.4mm                                                      | 30A N.O.  
           25A N.C.  
           16V                                      |
| **CN-H**| » Best space savings in its class  
           » Substitute for Micro-ISO relay  
           » Low operating power type  
           » High current-carrying capacity                                   | 12V DC  
           450mW (for pick-up max. 6.5V DC)  
           640mW (for pick-up max. 5.5V DC)                                      | THT, PCB, SMT          |
| 1a      | 17 x 10.6 x 18.3mm                                                      | 30A N.O.  
           18V                                      |
| **TG**  | » Large switching capacity in small size  
           » Substitute for micro ISO relays  
           » Low operating power type                                           | 12V DC  
           640mW (for pick-up max. 6.5V DC)  
           450mW (for pick-up max. 7.0V DC)                                      | THT, PCB, SMT          |
| 1a 1c   | 17.8 x 12.6 x 18mm                                                      | 30A N.O.  
           15A N.C.  
           18V                                      |
## Automotive Relays

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
</table>
| **TM** | - Flat type  
- Ideal for smart junction box  
- High capacity and 35A type  
- High heat resistant type | 12V DC  
- 450mW  
- (350Ω type)  
- 360mW  
- (400Ω type) | THT |
| 1a 1c 35A N.O. 15A N.C. 14V | | | Go To Overview |
| **TT** | - Double make contact 2 Form A (1 Form U)  
- 60 A fuse rating  
- High heat resistant type available | 12V DC  
- 450mW | THT  
| 2a/1a 60A N.O. 14V | | | Go To Overview |
| **TC** | - Substitute for micro ISO relays  
- Latching type available  
- High heat resistant type available | 12V DC  
- 1,309mW  
- (for pick-up max. 6.5V DC)  
- 900mW  
- (for pick-up max. 7.0V DC)  
- 640mW  
- (for pick-up max. 7.5V DC)  
- 1,920mW  
- (2 coil latching type) | THT  
| 1a 1c 2a 0W Latching relay | | | Go To Overview |

### Series Features:
- **Flat type**
- **Ideal for smart junction box**
- **High capacity and 35A type**
- **High heat resistant type**
- **Double make contact 2 Form A (1 Form U)**
- **60 A fuse rating**
- **High heat resistant type available**
- **Substitute for micro ISO relays**
- **Latching type available**
- **High heat resistant type available**

### Specifications:
- **19.2 x 16.8 x 13.6mm**
- **12V DC**
- **450mW**
- **60 A fuse rating**
- **1,309mW**
- **1,920mW**
- **350Ω type**
- **400Ω type**
- **1a standard type**
- **1c standard type**
- **2a latching type**
- **PCB, PiP**
- **1a 1c 2a 0W**
- **Latching relay**
- **15A N.C.**
- **30A N.O.**
- **14V**
### Automotive Relays | PCB Relays

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
</table>
| TH     | > Ultra compact flat type  
> High switching capacity (up to 25A)  
> 10 terminals twin type | 12V DC  
900mW  
(for pick-up max. 6.5V DC)  
655mW  
(for pick-up max. 7.7V DC) | SMD |

**Series Features Coil Mounting (bottom view)**

- **Ultra compact flat type**
- **High switching capacity (up to 25A)**
- **10 terminals twin type**

**Coil Specifications**

- **12V DC**
  - 900mW (for pick-up max. 6.5V DC)
  - 655mW (for pick-up max. 7.7V DC)

**Mounting Options**

- **SMD**
- **Twin type (10 terminal type)**
- **SMT**
- **1c type**

**Acceptable Mounting Patterns**

- **T12**
  - 23.85x16.4x3.85mm (1c)
  - 23.85x16.4x3.85mm (1c x2)

**Contact Ratings**

- **T12**
  - 12A N.O.
  - 20A N.C.
  - 16V
Panasonic Industry provides high-performing micro and mini ISO plug-in relays suitable for 12V and 24V power supply systems.

Plug-in Relays

Panasonic Industry provides high-performing micro and mini ISO plug-in relays suitable for 12V and 24V power supply systems.
### Series Features Coil Mounting (bottom view)

**CA**
- Rubber bracket / screw mounting
- Direct plug-in
- 21.5 x 14.4 x 37.0 mm

- **Standard**
  - Type
  - 1a, 1b
  - 16V
  - 15V
  - 12V DC
  - 1,800mW

- **Type S**
  - 1b, 1c
  - 16V
  - 12V DC
  - 1,400mW

- **1c 24V**
  - 1a, 1b
  - 16V
  - 24V DC
  - 1,800mW

**CM**
- Small substitute for Mini-ISO relay
- Micro-ISO terminal type
- 20 x 15 x 22 mm

- **1a, 1c**
  - 16V
  - 12V DC
  - 1,500mW

- **20A**
  - 1a, 1b
  - 35A
  - 16V

**CV-N**
- Low profile
- Low temperature rise
- Low sound pressure level
- RTIII (IP67) available
- 22.5 x 15 x 15.7 mm

- **1a, 1c**
  - 14V
  - 24V DC
  - 800mW

- **20A**
  - 1a, 1b
  - 30A
  - N.C.
  - 16V

**CB**
- 40A switching current at 85°C
- Mini-ISO type terminals
- High shock resistance
- High thermal resistance
- 26 x 22 x 25.5 mm

- **Standard**
  - Type
  - 1a, 1b
  - 16V
  - 12V DC
  - 1,400mW

- **H Type**
  - 1a, 1b
  - 16V
  - 12V DC
  - 1,800mW

- **24V Type**
  - 1a, 1c
  - 10A
  - N.C.
  - 30A
  - N.O.
  - 14V

- **1a, 1c**
  - 24V Type
  - 1a, 1b
  - 14V
  - 24V DC
  - 1,800mW
<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Mounting (bottom view)</th>
</tr>
</thead>
</table>
| CN-L   | - Continuous carrying current of 150A@85°C, 80A@125°C  
- Max. ambient temperature 125°C  
- Can be installed to engine compartment (IP54)  
- Version without fasten lug available  
- Overcurrent (> 2000A) trip function  
- No additional fuse needed | 12V DC  
30W | Screw terminal |

**External dimensions**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>91.5</td>
<td>38.5</td>
<td>85.3</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>39</td>
<td>76</td>
<td>±0.3</td>
</tr>
<tr>
<td>51.5</td>
<td>3-7</td>
<td>M6,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Screw tightening area</td>
<td>Screw terminal</td>
<td></td>
</tr>
</tbody>
</table>

**Screw terminal**

150A N.O.  
Latching relay

Go To Overview
With increasing concern for the environment, the market for eco-friendly vehicles is expanding. To contribute to a greener world and environmental compliance regulations, we provide a broad range of solutions for hybrid to full-electric vehicles. We aim at contributing to the electrification and safety of cars by offering EV relays (DC contactors) achieving high-capacity DC cutoff & space saving and Automotive relays capable of large current/voltage cutoff.

Charging the next generation of mobility.

High Voltage DC Relays

With increasing concern for the environment, the market for eco-friendly vehicles is expanding. To contribute to a greener world and environmental compliance regulations, we provide a broad range of solutions for hybrid to full-electric vehicles. We aim at contributing to the electrification and safety of cars by offering EV relays (DC contactors) achieving high-capacity DC cutoff & space saving and Automotive relays capable of large current/voltage cutoff.

Charging the next generation of mobility.
### Series Features Coil Mounting

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EV-A</strong></td>
<td>» One of the smallest and lightest in 250 A class</td>
<td>12V DC</td>
<td>Screw terminal</td>
</tr>
<tr>
<td></td>
<td>» 8,000 A short circuit tolerance</td>
<td>6000mW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>» High cut-off capacity 1,800 A at 500 V DC without contact polarity</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>» Vertical and horizontal type available</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>82.6 x 73.0 x 23.0mm</strong></td>
<td><strong>250A</strong></td>
<td><strong>500V</strong></td>
</tr>
<tr>
<td></td>
<td><strong>1a</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EV-G, EV-H</strong></td>
<td><strong>high short-circuit capacity</strong></td>
<td>12V DC</td>
<td>Screw terminal</td>
</tr>
<tr>
<td></td>
<td>» High short-circuit capacity type</td>
<td>5200mW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>» AEVH (100 A) available with lead wire</td>
<td>5400mW</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>66 x 49.7 x 37.9mm</strong></td>
<td><strong>65A</strong></td>
<td><strong>450V</strong></td>
</tr>
<tr>
<td></td>
<td><strong>1a</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>78 x 40 x 48.1mm</strong></td>
<td><strong>100A</strong></td>
<td><strong>450V</strong></td>
</tr>
<tr>
<td><strong>EV-S</strong></td>
<td><strong>quiet</strong></td>
<td>12V DC</td>
<td>Screw terminal</td>
</tr>
<tr>
<td></td>
<td>» DC type with sealed capsule, mainly for hybrid vehicles</td>
<td>4500mW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>» Very quiet operation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>» Small size and light weight</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>» Blow-out magnets allow small arcing space</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>» Safety construction</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>» High contact reliability</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>» Standard type for horizontal mounting available</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>76 x 36 x 72.3mm</strong></td>
<td><strong>68A</strong></td>
<td><strong>450V</strong></td>
</tr>
<tr>
<td></td>
<td><strong>1a</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>77 x 67.8 x 37.7mm</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Screw terminal**

- **#250 tab, 0.8t**
- **M5 bolt**
- **Lead wire**
- **(No polarity)**

**Go To Overview »**
<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Coil</th>
<th>Mounting</th>
</tr>
</thead>
</table>
| **EV** | » Sealed capsule for xEV  
 » Compact size  
 » Blow-out magnets allow small arcing space  
 » Safety construction  
 » High contact reliability | 12V DC  
 24V DC | Screw  
 Screw  
 Faston  
 Faston |
| | | | Go To Overview |
| | | | |
| | | | |
| **EBN** | » Low height for mounting within battery packs  
 » Max. 1,500 A 60 V DC switching off possible | 12V DC  
 2000mW | Plug-in |
| | | | Go To Overview |
| | | | |
| **ECN** | » Small pre-charging relay  
 » Easy connect plug-in terminal | 12V DC  
 1400mW | Screw  
 Screw |
| | | | Go To Overview |
We are dedicated to the highest standards of global sustainability as Your Committed Enabler. Find out more on our website.