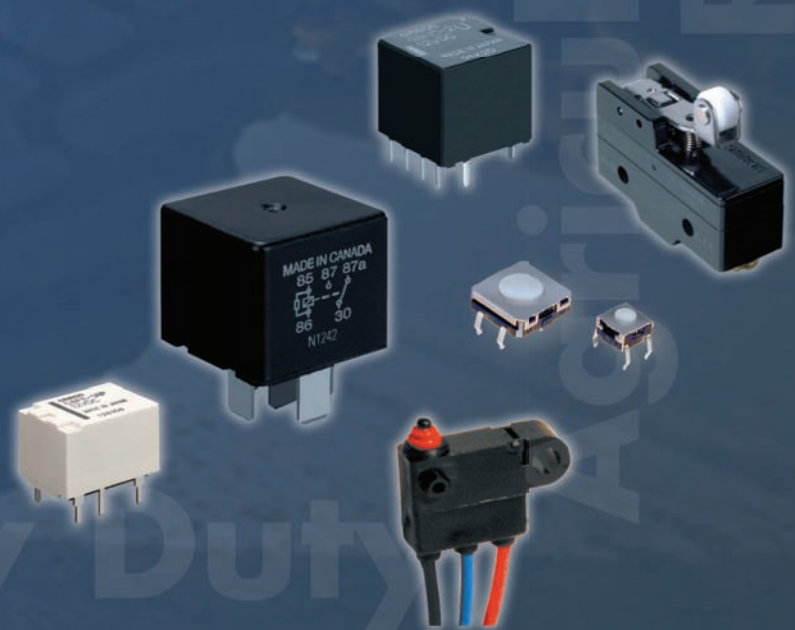


# Relays and Switches for the Transportation Market

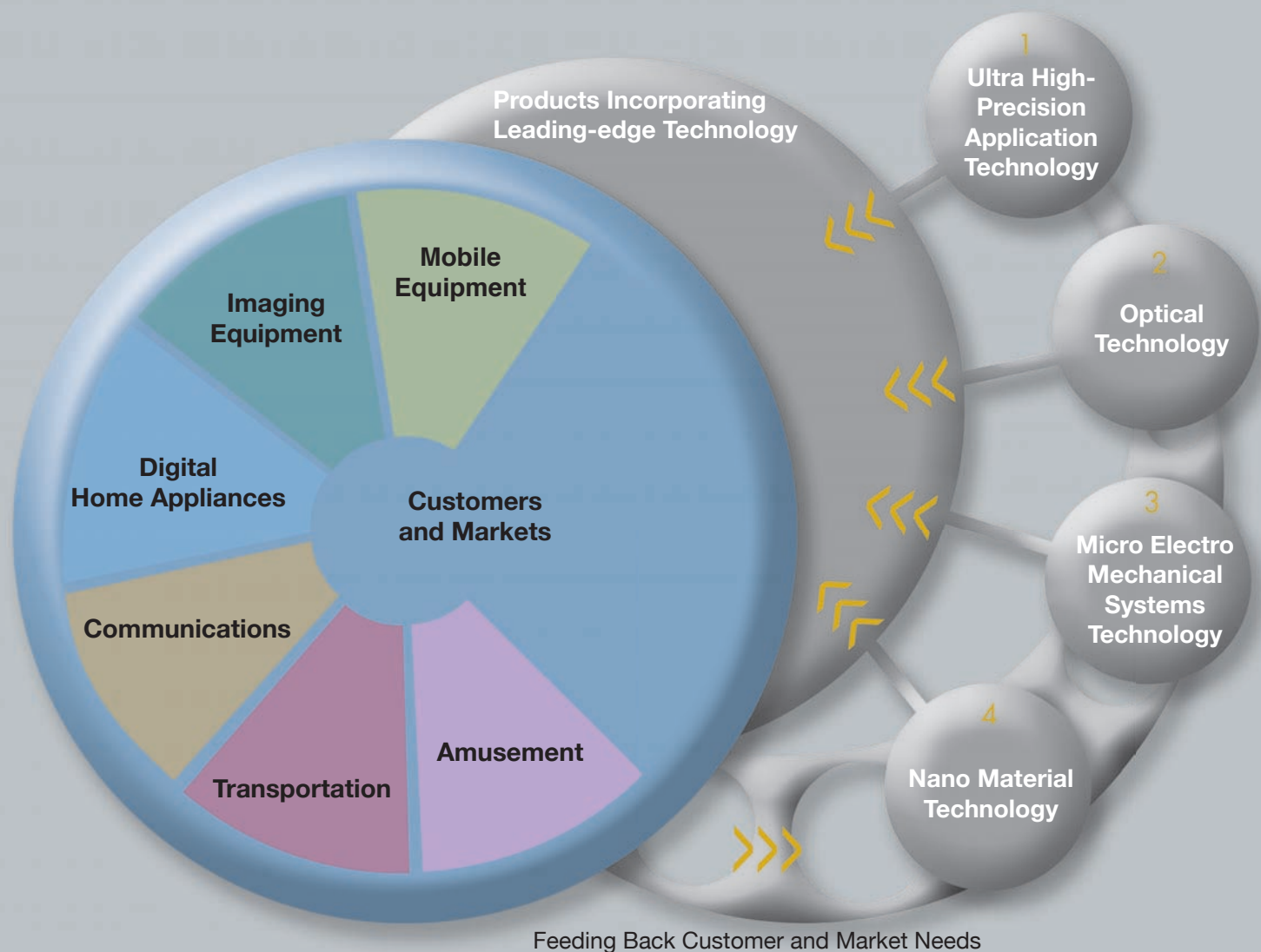
Selection Guide



**OMRON**  
ELECTRONIC COMPONENTS

## OMRON Responds to IT Evolution with Four Advanced Technologies

Omron means reliable products and advanced technologies for the marketplace...  
Omron has developed electronic components such as relays, switches, & connectors as well as other innovative products meeting the needs of our age.  
Now, unique Omron technologies along with a worldwide supply network the promise of quality, performance, and delivery is being actualized.  
To satisfy the marketplace, Omron supports global business challenges by acting as a strategic partner supporting the activities of our customers.



### Four core technologies to meet customers' needs:

Investment in technology leads directly to mature expertise in the field.  
This expertise enables Omron to meet the dreams of the consumer marketplace.

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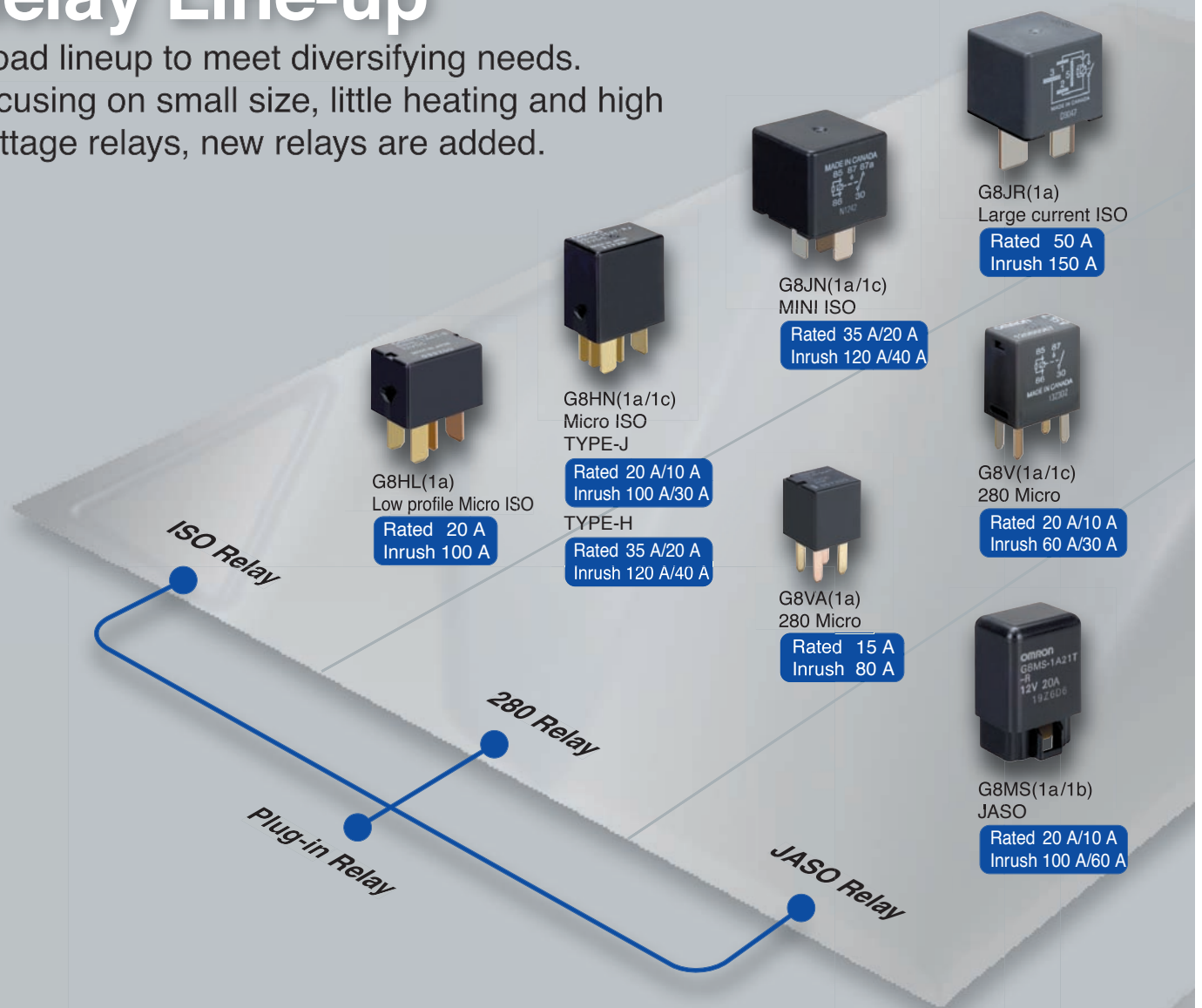
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***Relays and Switches  
for the Transportation Market***

# Relay Line-up

Broad lineup to meet diversifying needs.  
Focusing on small size, little heating and high wattage relays, new relays are added.



G8W(1a/1c)  
280MINI  
Rated 35 A/20 A  
Inrush 120 A/40 A



G4R(1a)  
JASO  
Rated 25 A  
Inrush 120 A



G4L(1a)  
JASO  
Rated 20 A  
Inrush 100 A



G8PE(1a/1c)  
Rated 40 A/25 A  
Inrush 180 A/60 A



G8HL-P(1a)  
Rated 20 A  
Inrush 100 A



G8SE(1a)  
Rated 20 A  
Inrush 80 A



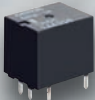
G8NW(1c x 2)  
Rated 5 A  
Max 30 A



G8SN(1c)  
Rated 10 A  
Max 35 A



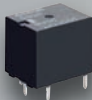
G8FE(1a)  
Rated 15 A  
Inrush 80 A



G8QE(1a)  
Rated 10 A  
Inrush 60 A



G8ND(1c x 2)  
(H-Bridge)  
Rated 5 A  
Max 30 A



G8QN(1c)  
Rated 5 A  
Max 30 A



G8N(1c)  
Rated 5 A  
Max 30 A

High wattage

Twin

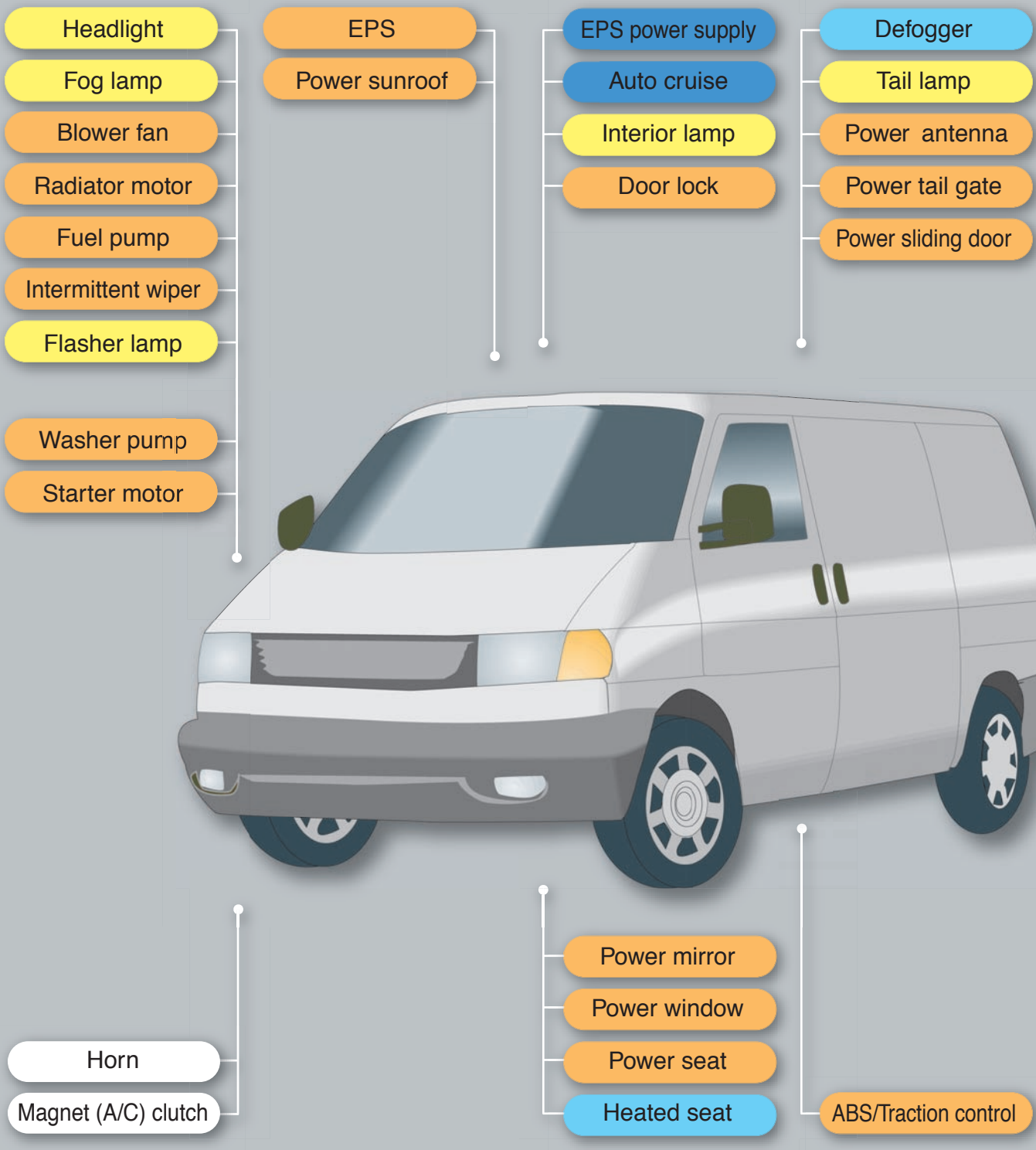
Relay for PCB

Single

# Application

Omron's goal is convenience, comfort and safety by providing relays and switches that meet the reliability requirements of the Transportation market while always considering the effect on the environment.

## Recommended relays for each purpose and application



Recommended relays for each purpose and application

 Recommended relay to use     Switchable relay

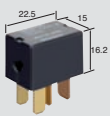
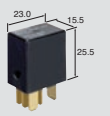
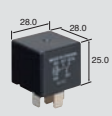
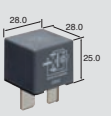
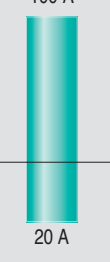
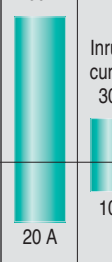
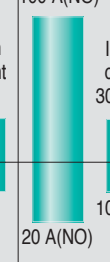
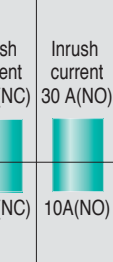
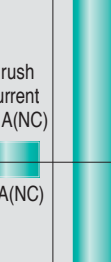
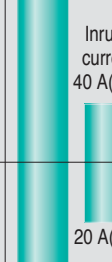
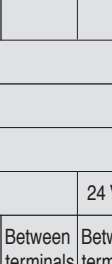
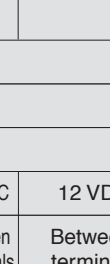
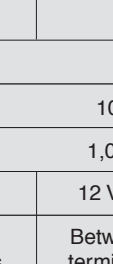
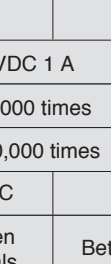
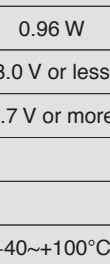
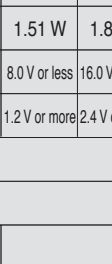
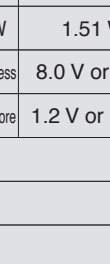
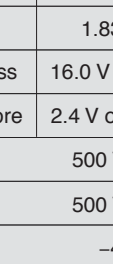
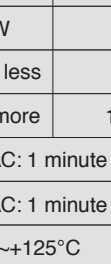
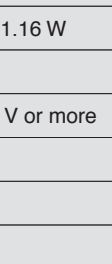
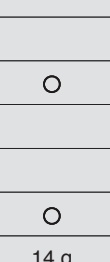
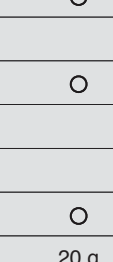
| Type          | Kind            | Model  | Appearance                                                                          | Contact configuration | Coil voltage | Lamp                                                                                |                                                                                     |                                                                                     | Motor<br>(Inrush current)                                                           |                                                                                     |                                                                                   | Capacitor<br>(Inrush current)                                                         |                                                                                       |                                                                                       | Resistor                                                                              |                                                                                       |                                                                                     | Inductive load                                                                        |                                                                                       |
|---------------|-----------------|--------|-------------------------------------------------------------------------------------|-----------------------|--------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|               |                 |        |                                                                                     |                       |              | 240 W                                                                               | 120 W                                                                               | 80 W or less                                                                        | Over 50 A                                                                           | 50-30 A                                                                             | 30 A or less                                                                      | Over 150 A                                                                            | 150-100 A                                                                             | 100 A or less                                                                         | Over 20 A                                                                             | 20-10 A                                                                               | 10 A or less                                                                        | Magnet clutch                                                                         | Horn                                                                                  |
| Relay for PCB | General purpose | G8N    |    | 1c                    | 12 V         |                                                                                     |                                                                                     |    |                                                                                     |                                                                                     |  |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                       |  |                                                                                       |    |
|               |                 | G8ND   |    | 1c × 2                | 12 V         |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                     |                                                                                       |                                                                                       |
|               |                 | G8NW   |    | 1c × 2                | 12 V         |                                                                                     |                                                                                     |    |                                                                                     |                                                                                     |  |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                       |  |                                                                                       |    |
|               |                 | G8QN   |    | 1c                    | 12 V         |                                                                                     |                                                                                     |    |                                                                                     |                                                                                     |  |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                       |  |                                                                                       |    |
|               |                 | G8SN   |    | 1c                    | 12 V         |                                                                                     |                                                                                     |    |                                                                                     |    |                                                                                   |                                                                                       |                                                                                       |                                                                                       |                                                                                       |    |                                                                                     |                                                                                       |    |
|               | High wattage    | G8QE   |    | 1a                    | 12 V         |                                                                                     |    |    |                                                                                     |    |                                                                                   |                                                                                       |                                                                                       |    |                                                                                       |                                                                                       |  |                                                                                       |    |
|               |                 | G8FE   |    | 1a                    | 12 V         |    |    |    |    |    |                                                                                   |    |    |    |                                                                                       |    |                                                                                     |    |    |
|               |                 | G8SE   |  | 1a                    | 12 V         |  |  |  |  |  |                                                                                   |  |  |  |                                                                                       |  |                                                                                     |  |  |
|               |                 | G8HL-P |  | 1a                    | 12 V         |  |  |  |  |  |                                                                                   |  |  |  |                                                                                       |  |                                                                                     |  |  |
|               |                 | G8PE   |  | 1a/1c                 | 12 V         |  |  |  |  |  |                                                                                   |  |  |  |  |  |                                                                                     |  |                                                                                       |
| Plug-in relay | ISO relay       | G8HL   |  | 1a                    | 12 V         |  |  |  |  |  |                                                                                   |  |                                                                                       |                                                                                       |                                                                                       |  |                                                                                     |  |  |
|               |                 | G8HN   |  | 1a/1c                 | 12 V/24 V    |  |  |  |  |  |                                                                                   |  |                                                                                       |                                                                                       |  |  |                                                                                     |  |                                                                                       |
|               |                 | G8JN   |  | 1a/1c                 | 12 V         |  |  |  |  |  |                                                                                   |  |                                                                                       |                                                                                       |  |  |                                                                                     |  |                                                                                       |
|               |                 | G8JR   |  | 1a                    | 12 V         |  |  |  |  |  |                                                                                   |  |                                                                                       |                                                                                       |  |  |                                                                                     |  |                                                                                       |
|               | 280 relay       | G8V    |  | 1a/1c                 | 12 V         |  |  |  |  |  |                                                                                   |  |                                                                                       |                                                                                       |  |  |                                                                                     |  |                                                                                       |
|               |                 | G8VA   |  | 1a                    | 12 V         |                                                                                     |  |  |                                                                                     |  |                                                                                   |  |                                                                                       |                                                                                       |                                                                                       |  |                                                                                     |  |                                                                                       |
|               |                 | G8W    |  | 1a/1c                 | 12 V         |  |  |  |  |  |                                                                                   |  |                                                                                       |                                                                                       |  |  |                                                                                     |  |                                                                                       |
|               | JASO relay      | G4R    |  | 1a                    | 12 V/24 V    |  |  |  |  |  |                                                                                   |  |                                                                                       |                                                                                       |  |  |                                                                                     |  |                                                                                       |
|               |                 | G8MS   |  | 1a/1b                 | 12 V         |  |  |  |  |  |                                                                                   |  |  |                                                                                       |                                                                                       |  |                                                                                     |  |                                                                                       |
|               |                 | G4L    |  | 1a                    | 12 V         |                                                                                     |  |  |  |  |                                                                                   |                                                                                       |  |                                                                                       |                                                                                       |  |                                                                                     |  |                                                                                       |

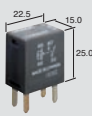
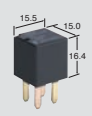
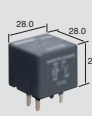
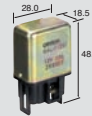
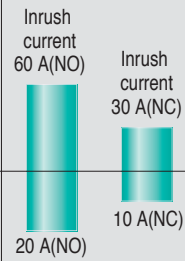
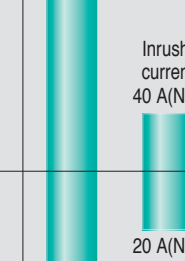
# Relay Series

| Kind                                  |                                                                                                                | Relay for PCB                                                                     |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------|------------------------------------------------|-----------------------|---------------|------------------------------------------------------------------------------------------------------------------|--|-----------------|------------------------------------------------------------------------------------------------------------------|--|-----------|--|------------------|--|
| Type                                  |                                                                                                                | G8N                                                                               |                                                                                                                |                      |                                                |                                                                                                                  | G8ND                                                                                |                                                |                                                                                                                  | G8NW                                                                                |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
|                                       |                                                                                                                | G8N-1                                                                             | G8N-1S                                                                                                         | G8N-1L               | G8N-1H                                         | G8N-1U                                                                                                           | G8N-1F                                                                              | G8ND-2                                         | G8ND-2S                                                                                                          | G8ND-2U                                                                             | G8NW-2                                         | G8NW-2S                                                                                                          | G8NW-2L                 | G8NW-2H                                        | G8NW-2U               | G8NW-2F       |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| Model                                 |                                                                                                                | Standard                                                                          | Low operating voltage                                                                                          | High heat resistance | High heat resistance and low operating voltage | Super low operating voltage                                                                                      | For Lamp                                                                            | Standard                                       | Low operating voltage                                                                                            | Super low operating voltage                                                         | Standard                                       | Low operating voltage                                                                                            | High heat resistance    | High heat resistance and low operating voltage | Low operating voltage | For Lamp      |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| Appearance                            |                                                                                                                |  |                                                                                                                |                      |                                                |                                                                                                                  |  |                                                |                                                                                                                  |  |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| Purpose                               |                                                                                                                | DC motor control for transportation components                                    |                                                                                                                |                      |                                                |                                                                                                                  | For flasher lamp                                                                    | DC motor control for transportation components |                                                                                                                  |                                                                                     | DC motor control for transportation components |                                                                                                                  |                         |                                                | For flasher lamp      |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| Contact                               | Contact configuration                                                                                          | 1c(SPDT)                                                                          |                                                                                                                |                      |                                                |                                                                                                                  | 1c × 2(SPDT × 2)(H-Bridge)                                                          |                                                |                                                                                                                  | 1c × 2(SPDT × 2)                                                                    |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
|                                       | Contact material                                                                                               | AgSn type (non-cadmium)                                                           |                                                                                                                |                      |                                                |                                                                                                                  | PdRu alloy                                                                          |                                                | AgSn type (non-cadmium)                                                                                          |                                                                                     |                                                |                                                                                                                  |                         | PdRu alloy                                     |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
|                                       | Rated load                                                                                                     | 14 VDC 25 A Motor load                                                            |                                                                                                                |                      |                                                |                                                                                                                  | 54 W Lamp: 85 times/min                                                             | 14 VDC 25 A Motor load                         |                                                                                                                  |                                                                                     |                                                |                                                                                                                  | 54 W Lamp: 85 times/min |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
|                                       | Max switching current                                                                                          | 180 A                                                                             | Motor lock current 30 A<br> |                      |                                                |                                                                                                                  |                                                                                     | 5 A                                            | Motor lock current 30 A<br> |                                                                                     |                                                | Motor lock current 30 A<br> |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
|                                       |                                                                                                                | 160 A                                                                             |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
|                                       |                                                                                                                | 140 A                                                                             |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| 120 A                                 |                                                                                                                |                                                                                   |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| 100 A                                 | Motor lock current 30 A<br> |                                                                                   |                                                                                                                |                      | 5 A                                            | Motor lock current 30 A<br> |                                                                                     |                                                | Motor lock current 30 A<br> |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| 80 A                                  |                                                                                                                |                                                                                   |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| 60 A                                  |                                                                                                                |                                                                                   |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| 40 A                                  |                                                                                                                |                                                                                   |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| 20 A                                  | Motor lock current 30 A<br> |                                                                                   |                                                                                                                |                      | 5 A                                            | Motor lock current 30 A<br> |                                                                                     |                                                | Motor lock current 30 A<br> |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| Continuous carry current              |                                                                                                                |                                                                                   |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     | 10 A                                           | Motor lock current 30 A<br>   |                         |                                                |                       | 5 A           | Motor lock current 30 A<br> |  |                 | Motor lock current 30 A<br> |  |           |  |                  |  |
| 20 A                                  |                                                                                                                |                                                                                   |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| 30 A                                  |                                                                                                                |                                                                                   |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| 40 A                                  |                                                                                                                |                                                                                   |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| 50 A                                  | Motor lock current 30 A<br> |                                                                                   |                                                                                                                |                      | 5 A                                            | Motor lock current 30 A<br> |                                                                                     |                                                | Motor lock current 30 A<br> |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| Min applicable load (Reference value) |                                                                                                                |                                                                                   |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     | 5 VDC 100 mA                                   |                                                                                                                  |                         |                                                |                       | 5 VDC 1 A     | 5 VDC 100 mA                                                                                                     |  |                 |                                                                                                                  |  | 5 VDC 1 A |  |                  |  |
| Endurance (Lifetime)                  |                                                                                                                |                                                                                   |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     | Electrical (Rated load)                        | 100,000 times                                                                                                    |                         |                                                |                       |               | 2000 hours                                                                                                       |  | 100,000 times   |                                                                                                                  |  |           |  | 2000 hours       |  |
|                                       |                                                                                                                |                                                                                   |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     | Mechanical                                     | 1,000,000 times                                                                                                  |                         |                                                |                       |               | 10,000,000 times                                                                                                 |  | 1,000,000 times |                                                                                                                  |  |           |  | 10,000,000 times |  |
| Coil                                  | Rated coil voltage                                                                                             | 12 VDC                                                                            |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
|                                       | Coil resistant                                                                                                 | 225 Ω                                                                             | 180 Ω                                                                                                          | 225 Ω                | 180 Ω                                          | 130 Ω                                                                                                            | 130 Ω                                                                               | 225 Ω                                          | 180 Ω                                                                                                            | 130 Ω                                                                               | 225 Ω                                          | 180 Ω                                                                                                            | 225 Ω                   | 180 Ω                                          | 130 Ω                 | 130 Ω         |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
|                                       | Rated power consumption                                                                                        | 640 mW                                                                            | 800 mW                                                                                                         | 640 mW               | 800 mW                                         | 1108 mW                                                                                                          | 1108mW                                                                              | 640 mW                                         | 800 mW                                                                                                           | 1108mW                                                                              | 640 mW                                         | 800 mW                                                                                                           | 640 mW                  | 800 mW                                         | 1108 mW               | 1108 mW       |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
|                                       | Operating voltage                                                                                              | 7.2 V or less                                                                     | 6.5 V or less                                                                                                  | 7.2 V or less        | 6.5 V or less                                  | 5.5 V or less                                                                                                    | 7.2 V or less                                                                       | 7.2 V or less                                  | 6.5 V or less                                                                                                    | 5.5 V or less                                                                       | 7.2 V or less                                  | 6.5 V or less                                                                                                    | 7.2 V or less           | 6.5 V or less                                  | 5.5 V or less         | 7.2 V or less |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
|                                       | Release voltage                                                                                                | 1.0 V or more                                                                     |                                                                                                                |                      |                                                | 0.8 V or more                                                                                                    |                                                                                     | 1.0 V or more                                  |                                                                                                                  | 0.8 V or more                                                                       | 1.0 V or more                                  |                                                                                                                  |                         |                                                | 0.8 V or more         |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| Withstand voltage                     | Between a coil and contact                                                                                     | 500 VAC: 1 minute                                                                 |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
|                                       | Between contacts                                                                                               | 500 VAC: 1 minute                                                                 |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| Ambient temperature                   |                                                                                                                | -40~+85℃<br>High heat resistance: -40~+105℃                                       |                                                                                                                |                      |                                                |                                                                                                                  | -40~+85℃                                                                            |                                                |                                                                                                                  | -40~+85℃<br>High heat resistance: -40~+105℃                                         |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| Protection structure                  | Unsealed type (In a case)                                                                                      |                                                                                   |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
|                                       | Flux protection type                                                                                           |                                                                                   |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
|                                       | Fully sealed type                                                                                              | ○                                                                                 |                                                                                                                |                      |                                                |                                                                                                                  | ○                                                                                   |                                                |                                                                                                                  | ○                                                                                   |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| Terminal                              | Surface mount terminal                                                                                         |                                                                                   |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
|                                       | PCB terminal                                                                                                   | ○                                                                                 |                                                                                                                |                      |                                                |                                                                                                                  | ○                                                                                   |                                                |                                                                                                                  | ○                                                                                   |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
|                                       | Plug-in terminal                                                                                               |                                                                                   |                                                                                                                |                      |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                                                                                     |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |
| Weight (about)                        |                                                                                                                | 4.0 g                                                                             |                                                                                                                |                      |                                                |                                                                                                                  | 7.5 g                                                                               |                                                |                                                                                                                  | 8.0 g                                                                               |                                                |                                                                                                                  |                         |                                                |                       |               |                                                                                                                  |  |                 |                                                                                                                  |  |           |  |                  |  |

| Relay for PCB                                                                     |                       |                      |                                                |                          |                                                                                   |                                                                       |                                                                                   |                                                                                   |                                                                      |                                                                                   |                                                                                     |                                                                                 | Kind                                                                                |                                                                                     |                                                                                                                                                      |                       |
|-----------------------------------------------------------------------------------|-----------------------|----------------------|------------------------------------------------|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| G8QN                                                                              |                       |                      |                                                | G8SN                     | G8QE                                                                              | G8FE                                                                  |                                                                                   | G8SE                                                                              |                                                                      | G8HL-P                                                                            | G8PE                                                                                |                                                                                 | Type                                                                                |                                                                                     |                                                                                                                                                      |                       |
| G8QN-1C4                                                                          |                       | G8QN-1C4-05          |                                                | G8QN-1C4-RUC             | G8SN-1C4-FD                                                                       | G8QE-1A                                                               | G8FE-1AP<br>G8FE-1AF                                                              | G8FE-1AP-L<br>G8FE-1AF-L                                                          | G8SE-1A4-E                                                           | G8SE-1A4-L                                                                        | G8HL-1A4P                                                                           | G8PE-1A4                                                                        | G8PE-1C4                                                                            | Model                                                                               |                                                                                                                                                      |                       |
| Standard                                                                          | Low operating voltage | High heat resistance | High heat resistance and low operating voltage | For Lamp                 | Standard                                                                          | Standard                                                              | Standard                                                                          | Low operating voltage                                                             | Standard                                                             | High heat resistance                                                              | Standard                                                                            | Standard                                                                        |                                                                                     | Model                                                                               |                                                                                                                                                      |                       |
|  |                       |                      |                                                |                          |  |                                                                       |  |  |                                                                      |  |  |                                                                                 |  |  | Appearance                                                                                                                                           |                       |
| DC motor control for transportation components                                    |                       |                      |                                                | For flasher lamp         | DC motor control for transportation components                                    | Head lamp, Tail lamp, Horn                                            | Head lamp, Tail lamp, EPS                                                         |                                                                                   | Head lamp, Fog lamp, EPS, etc.                                       |                                                                                   | Head lamp, EPS, etc.                                                                | Blower fan, Defogger, etc.                                                      |                                                                                     | Purpose                                                                             |                                                                                                                                                      |                       |
| 1c(SPDT)                                                                          |                       |                      |                                                |                          |                                                                                   | 1a(SPST)                                                              |                                                                                   |                                                                                   |                                                                      |                                                                                   |                                                                                     | 1c(SPDT)                                                                        | Contact configuration                                                               | Contact                                                                             |                                                                                                                                                      |                       |
| AgSn type (non-cadmium)                                                           |                       | PdRu alloy           |                                                | AgSn type (non-cadmium)  |                                                                                   |                                                                       |                                                                                   |                                                                                   |                                                                      |                                                                                   |                                                                                     |                                                                                 | Contact material                                                                    |                                                                                     |                                                                                                                                                      |                       |
| 14 VDC 25 A Motor load                                                            |                       |                      |                                                |                          | 14 VDC 30 A Motor load                                                            | 12 VDC 120 W Lamp load                                                | 12 VDC 15 A Resistance load                                                       |                                                                                   | 12 VDC 20 A Resistance load                                          |                                                                                   | 12 VDC 40 A Resistance load                                                         | 12 VDC 40 A/25 A Resistance load                                                | Rated load                                                                          |                                                                                     |                                                                                                                                                      |                       |
| <div>Motor lock current 30 A</div> <div><div></div></div> <div>5 A</div>          |                       |                      |                                                | 108 W Lamp: 85 times/min | <div>Motor lock current 35 A</div> <div><div></div></div> <div>10 A</div>         | <div>Inrush current 60 A</div> <div><div></div></div> <div>10 A</div> | <div>Inrush current 80 A</div> <div><div></div></div> <div>15 A</div>             |                                                                                   | <div>Inrush current 80A</div> <div><div></div></div> <div>20 A</div> | <div>Inrush current 60 A</div> <div><div></div></div> <div>20 A</div>             | <div>Inrush current 100 A</div> <div><div></div></div> <div>20 A</div>              | <div>Inrush current 180 A(NO)</div> <div><div></div></div> <div>40 A (NO)</div> | <div>Inrush current 60 A(NC)</div> <div><div></div></div> <div>25 A (NC)</div>      |                                                                                     | <div>180 A</div> <div>160 A</div> <div>140 A</div> <div>120 A</div> <div>100 A</div> <div>80 A</div> <div>60 A</div> <div>40 A</div> <div>20 A</div> | Max switching current |
| 5 VDC 100 mA                                                                      |                       |                      |                                                |                          | 5 VDC 1 A                                                                         | 5 VDC 100 mA                                                          | 5 VDC 1 A                                                                         |                                                                                   |                                                                      |                                                                                   |                                                                                     |                                                                                 |                                                                                     |                                                                                     | Min applicable load (Reference value)                                                                                                                |                       |
| 100,000 times                                                                     |                       |                      |                                                | 2000 hours               | 100,000 times                                                                     |                                                                       |                                                                                   |                                                                                   |                                                                      |                                                                                   |                                                                                     |                                                                                 |                                                                                     | Electrical (Rated load)                                                             |                                                                                                                                                      | Endurance (Lifetime)  |
| 1,000,000 times                                                                   |                       |                      |                                                | 10,000,000 times         | 1,000,000 times                                                                   |                                                                       |                                                                                   |                                                                                   |                                                                      |                                                                                   |                                                                                     |                                                                                 |                                                                                     | Mechanical                                                                          |                                                                                                                                                      |                       |
| 12 VDC                                                                            | 9 VDC                 | 12 VDC               | 9 VDC                                          | DC12V                    |                                                                                   |                                                                       |                                                                                   |                                                                                   |                                                                      |                                                                                   |                                                                                     |                                                                                 | Rated coil voltage                                                                  |                                                                                     | Coil                                                                                                                                                 |                       |
| 210 Ω                                                                             | 180 Ω                 | 210 Ω                | 180 Ω                                          | 210 Ω                    | 210 Ω                                                                             | 320 Ω                                                                 | 180 Ω                                                                             | 180 Ω                                                                             | 225 Ω                                                                | 225 Ω                                                                             | 320 Ω                                                                               | 135 Ω                                                                           | 135 Ω                                                                               | Coil resistant                                                                      |                                                                                                                                                      |                       |
| 686 mW                                                                            | 450 mW                | 686 mW               | 450 mW                                         | 686 mW                   | 686 mW                                                                            | 450 mW                                                                | 800 mW                                                                            | 800 mW                                                                            | 640 mW                                                               | 640 mW                                                                            | 450 mW                                                                              | 1067m W                                                                         | 1067 mW                                                                             | Rated power consumption                                                             |                                                                                                                                                      |                       |
| 7.3 V or less                                                                     | 6.5 V or less         | 7.3 V or less        | 6.5 V or less                                  | 7.3 V or less            | 6.5 V or less                                                                     | 8.0 V or less                                                         | 7.3 V or less                                                                     | 6.0 V or less                                                                     | 7.3 V or less                                                        | 7.3 V or less                                                                     | 8.0 V or less                                                                       | 7.0 V or less                                                                   | 6.8 V or less                                                                       | Operating voltage                                                                   |                                                                                                                                                      |                       |
| 1.2 V or more                                                                     | 0.6 V or more         | 1.2 V or more        | 0.6 V or more                                  | 1.2 V or more            | 0.9 V or more                                                                     | 1.0 V or more                                                         |                                                                                   |                                                                                   | 1.2 V or more                                                        |                                                                                   | 0.7 V or more                                                                       | 1.0 V or more                                                                   |                                                                                     | Release voltage                                                                     |                                                                                                                                                      |                       |
| 500 VAC: 1 minute                                                                 |                       |                      |                                                |                          |                                                                                   |                                                                       |                                                                                   |                                                                                   |                                                                      |                                                                                   |                                                                                     |                                                                                 | Between a coil and contact                                                          |                                                                                     | Withstand voltage                                                                                                                                    |                       |
| 500 VAC: 1 minute                                                                 |                       |                      |                                                |                          |                                                                                   |                                                                       |                                                                                   |                                                                                   |                                                                      |                                                                                   |                                                                                     |                                                                                 | Between contacts                                                                    |                                                                                     |                                                                                                                                                      |                       |
| -40~+85°C<br>High heat resistance: -40~+105°C                                     |                       |                      |                                                |                          | -40~+85°C                                                                         | -40~+105°C                                                            |                                                                                   |                                                                                   | -40~+85°C<br>High heat resistance: -40~+110°C                        |                                                                                   | -40~+100°C                                                                          | -40~+105°C                                                                      |                                                                                     | Ambient temperature                                                                 |                                                                                                                                                      |                       |
|                                                                                   |                       |                      |                                                |                          |                                                                                   |                                                                       |                                                                                   |                                                                                   |                                                                      |                                                                                   |                                                                                     |                                                                                 |                                                                                     | Unsealed type (In a case)                                                           | Protection structure                                                                                                                                 |                       |
|                                                                                   |                       |                      |                                                |                          |                                                                                   |                                                                       |                                                                                   |                                                                                   |                                                                      |                                                                                   |                                                                                     |                                                                                 |                                                                                     | Flux protection type                                                                |                                                                                                                                                      |                       |
| ○                                                                                 |                       |                      |                                                |                          | ○                                                                                 | ○                                                                     | ○                                                                                 |                                                                                   | ○                                                                    |                                                                                   | ○                                                                                   | ○                                                                               |                                                                                     | Fully sealed type                                                                   | Terminal                                                                                                                                             |                       |
|                                                                                   |                       |                      |                                                |                          |                                                                                   |                                                                       |                                                                                   |                                                                                   | ○                                                                    |                                                                                   |                                                                                     |                                                                                 |                                                                                     | Surface mount terminal                                                              |                                                                                                                                                      |                       |
| ○                                                                                 |                       |                      |                                                |                          | ○                                                                                 | ○                                                                     | ○                                                                                 |                                                                                   | ○                                                                    |                                                                                   | ○                                                                                   | ○                                                                               |                                                                                     | PCB terminal                                                                        |                                                                                                                                                      |                       |
|                                                                                   |                       |                      |                                                |                          |                                                                                   |                                                                       |                                                                                   |                                                                                   |                                                                      |                                                                                   |                                                                                     |                                                                                 |                                                                                     | Plug-in terminal                                                                    |                                                                                                                                                      |                       |
| 6.0 g                                                                             |                       |                      |                                                |                          | 12.5 g                                                                            | 6.0 g                                                                 | 8.7 g                                                                             |                                                                                   | 16.0 g                                                               |                                                                                   | 13.0 g                                                                              | 20.0 g                                                                          |                                                                                     | Weight (about)                                                                      |                                                                                                                                                      |                       |

# Relay Series

| Kind                                  |                                                                                     | ISO relay                                                                           |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
|---------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|
| Type                                  |                                                                                     | G8HL                                                                                |                                                                                     | G8HN                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     | G8JN                                                                                  |                                                                                       | G8JR                                                                                  |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       |                                                                                     | G8HL-1A4T-R                                                                         |                                                                                     | G8HN-1A2T-RJ                                                                        |                                                                                     | G8HN-1C2T-RJ                                                                        |                                                                                     | G8HN-1A2T-RH                                                                        | G8HN-1C2T-RH                                                                          | G8JN-1C2T-R                                                                           | G8JR-1A2T-R                                                                           |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| Model                                 |                                                                                     | Standard                                                                            |                                                                                     | Standard                                                                            |                                                                                     | Standard                                                                            |                                                                                     | High wattage                                                                        |                                                                                       | Standard                                                                              |                                                                                       | Standard                                                                              |                                                                                      |  |  |  |  |  |  |  |  |  |
| Appearance                            |                                                                                     |    |                                                                                     |   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |    |                                                                                       |    |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| Purpose                               |                                                                                     | Head lamp, Blower fan, Defogger, etc.                                               |                                                                                     | Head lamp, Blower fan, Defogger, etc.                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     | Blower fan, Defogger, etc.                                                            |                                                                                       | Blower fan, etc.                                                                      |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| Contact                               | Contact configuration                                                               | 1a(SPST)                                                                            |                                                                                     |                                                                                     | 1c(SPDT)                                                                            |                                                                                     |                                                                                     | 1a(SPST)                                                                            | 1c(SPDT)                                                                              | 1a(SPST)<br>1c(SPDT)                                                                  |                                                                                       | 1a(SPST)                                                                              |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       | Contact material                                                                    | AgSn type (non-cadmium)                                                             |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       | Rated load                                                                          |                                                                                     | 12 VDC<br>20 A<br>Resistance load                                                   | 12 VDC<br>20 A<br>Resistance load                                                   | 24 VDC<br>10 A<br>Resistance load                                                   | 12 VDC<br>20 A/10 A<br>Resistance load                                              | 24 VDC<br>10 A/5 A<br>Resistance load                                               | 12 VDC<br>35 A<br>Resistance load                                                   | 12 VDC<br>35 A/20 A<br>Resistance load                                                | 12 VDC<br>35 A/20 A<br>Resistance load                                                | 12 VDC<br>50 A<br>Resistance load                                                     |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       | Max switching current                                                               | 180 A                                                                               |   |                                                                                     |   |                                                                                     |   |                                                                                     |     |                                                                                       |   |                                                                                       |  |  |  |  |  |  |  |  |  |  |
|                                       |                                                                                     | 160 A                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       |                                                                                     | 140 A                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       |                                                                                     | 120 A                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| Continuous carry current              | 100 A                                                                               |  |                                                                                     |  |                                                                                     |  |                                                                                     |  |                                                                                       |  |                                                                                       |  |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       | 80 A                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       | 60 A                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       | 40 A                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| 20 A                                  |  |                                                                                     |  |                                                                                     |  |                                                                                     |  |                                                                                     |  |                                                                                       |  |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| 10 A                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| 20 A                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| 30 A                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| 40 A                                  |  |                                                                                     |  |                                                                                     |  |                                                                                     |  |                                                                                     |  |                                                                                       |  |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| 50 A                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| Min applicable load (Reference value) |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| 5 VDC 1 A                             |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| Endurance (Lifetime)                  | Electrical (Rated load)                                                             | 100,000 times                                                                       |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       | Mechanical                                                                          | 1,000,000 times                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| Coil                                  | Rated coil voltage                                                                  | 12 VDC                                                                              |                                                                                     | 24 VDC                                                                              | 12 VDC                                                                              | 12 VDC                                                                              | 12 VDC                                                                              |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       | Coil resistant                                                                      | Between terminals<br>150 Ω                                                          | Between terminals<br>95.9 Ω                                                         | Between terminals<br>315.1 Ω                                                        | Between terminals<br>95.9 Ω                                                         | Between terminals<br>315.1 Ω                                                        | Between terminals<br>124.2 Ω                                                        |                                                                                     | Between terminals<br>70 Ω                                                             |                                                                                       | Between terminals<br>62.7 Ω                                                           |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       | Rated power consumption                                                             | 0.96 W                                                                              | 1.51 W                                                                              | 1.83 W                                                                              | 1.51 W                                                                              | 1.83 W                                                                              | 1.16 W                                                                              |                                                                                     | 2.06 W                                                                                |                                                                                       | 2.30 W                                                                                |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       | Operating voltage                                                                   | 8.0 V or less                                                                       | 8.0 V or less                                                                       | 16.0 V or less                                                                      | 8.0 V or less                                                                       | 16.0 V or less                                                                      | 8.0 V or less                                                                       |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       | Release voltage                                                                     | 0.7 V or more                                                                       | 1.2 V or more                                                                       | 2.4 V or more                                                                       | 1.2 V or more                                                                       | 2.4 V or more                                                                       | 1.2 V or more                                                                       |                                                                                     | 1.0 V or more                                                                         |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| Withstand voltage                     | Between a coil and contact                                                          | 500 VAC: 1 minute                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       | Between contacts                                                                    | 500 VAC: 1 minute                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| Ambient temperature                   |                                                                                     | -40~-+100°C                                                                         |                                                                                     | -40~-+125°C                                                                         |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       | -40~-+135°C                                                                           |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| Protection structure                  | Unsealed type (In a case)                                                           |                                                                                     |                                                                                     | ○                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       | ○                                                                                     |                                                                                       | ○                                                                                     |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       | Flux protection type                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       | Fully sealed type                                                                   | ○                                                                                   |                                                                                     | ○                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
| Terminal                              | Surface mount terminal                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       | PCB terminal                                                                        |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |                                                                                      |  |  |  |  |  |  |  |  |  |
|                                       | Plug-in terminal                                                                    | ○                                                                                   |                                                                                     | ○                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       | ○                                                                                     |                                                                                       | ○                                                                                     |                                                                                      |  |  |  |  |  |  |  |  |  |
| Weight (about)                        |                                                                                     | 14 g                                                                                |                                                                                     | 20 g                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       | 34 g                                                                                  |                                                                                       | 39 g                                                                                  |                                                                                      |  |  |  |  |  |  |  |  |  |

| 280 relay                                                                          |                                                                                    |                                                                                   |                                                                                    |                                                                                    | JASO relay                                                                         |                                                                                     |                                                                                     |                                                                                    |                                                                                      |                                                                                      | Kind                                                                                 |                                                                                                                                                                                     |                          |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| G8V                                                                                |                                                                                    | G8VA                                                                              | G8W                                                                                |                                                                                    | G4R                                                                                | G8MS                                                                                | G4L                                                                                 |                                                                                    |                                                                                      | Type                                                                                 |                                                                                      |                                                                                                                                                                                     |                          |
| G8V-1A2T-R                                                                         | G8V-1C2T-R                                                                         | G8VA-1A4T-R                                                                       | G8W-1A2T-R                                                                         | G8W-1C2T-R                                                                         |                                                                                    |                                                                                     |                                                                                     |                                                                                    |                                                                                      |                                                                                      |                                                                                      |                                                                                                                                                                                     |                          |
| Standard                                                                           |                                                                                    | Standard                                                                          | Standard                                                                           |                                                                                    | Standard                                                                           | Standard                                                                            | Low operation sound                                                                 |                                                                                    |                                                                                      | Model                                                                                |                                                                                      |                                                                                                                                                                                     |                          |
|   |                                                                                    |  |   |                                                                                    |   |  |  |                                                                                    |                                                                                      | Appearance                                                                           |                                                                                      |                                                                                                                                                                                     |                          |
| Head lamp, Fog lamp, Horn lamp, etc.                                               |                                                                                    |                                                                                   | Motor, Fan, Solenoid, etc.                                                         |                                                                                    | Head lamp, Blower fan, Defogger, etc.                                              |                                                                                     | Head lamp, Blower fan, etc.                                                         |                                                                                    | Air conditioner and magnet clutch etc.                                               |                                                                                      | Purpose                                                                              |                                                                                                                                                                                     |                          |
| 1a(SPST)                                                                           | 1c(SPDT)                                                                           |                                                                                   | 1a(SPST)                                                                           |                                                                                    | 1c(SPDT)                                                                           |                                                                                     | 1a(SPST)                                                                            |                                                                                    | 1b(SPST)                                                                             | 1a(SPST)                                                                             | Contact configuration                                                                |                                                                                                                                                                                     |                          |
| AgSn type (non-cadmium)                                                            |                                                                                    |                                                                                   |                                                                                    |                                                                                    |                                                                                    | AgSn type (non-cadmium)                                                             |                                                                                     |                                                                                    |                                                                                      |                                                                                      | Contact material                                                                     |                                                                                                                                                                                     |                          |
| 12 VDC<br>20 A<br>Resistance load                                                  | 12 VDC<br>20 A/10 A<br>Resistance load                                             |                                                                                   | 14 VDC<br>15 A<br>Resistance load                                                  | 12 VDC<br>35 A<br>Resistance load                                                  | 12 VDC<br>35 A/20 A<br>Resistance load                                             |                                                                                     | 12 VDC<br>25 A<br>Resistance load                                                   | 24 VDC<br>15 A<br>Resistance load                                                  | 12 VDC<br>20 A<br>Resistance load                                                    | 12 VDC<br>10 A<br>Resistance load                                                    | 12 VDC<br>20 A<br>Resistance load                                                    | Rated load                                                                                                                                                                          |                          |
|  |  |                                                                                   |  |  |  |                                                                                     |   |  |  |  |  | <div>180 A</div> <div>160 A</div> <div>140 A</div> <div>120 A</div> <div>100 A</div> <div>80 A</div> <div>60 A</div> <div>40 A</div> <div>20 A</div> <th>Max switching current</th> | Max switching current    |
|                                                                                    |                                                                                    |                                                                                   |                                                                                    |                                                                                    |                                                                                    |                                                                                     |                                                                                     |                                                                                    |                                                                                      |                                                                                      |                                                                                      | <div>10 A</div> <div>20 A</div> <div>30 A</div> <div>40 A</div> <div>50 A</div> <th>Continuous carry current</th>                                                                   | Continuous carry current |
| 5 VDC 1 A                                                                          |                                                                                    |                                                                                   |                                                                                    |                                                                                    | 5 VDC 1 A                                                                          |                                                                                     |                                                                                     |                                                                                    |                                                                                      | Min applicable load (Reference value)                                                |                                                                                      |                                                                                                                                                                                     |                          |
| 100,000 times                                                                      |                                                                                    |                                                                                   |                                                                                    |                                                                                    | 100,000 times                                                                      |                                                                                     |                                                                                     |                                                                                    |                                                                                      | Electrical (Rated load)                                                              |                                                                                      |                                                                                                                                                                                     |                          |
| 1,000,000 times                                                                    |                                                                                    |                                                                                   |                                                                                    |                                                                                    | 1,000,000 times                                                                    |                                                                                     |                                                                                     |                                                                                    |                                                                                      | Mechanical                                                                           |                                                                                      |                                                                                                                                                                                     |                          |
| 12 VDC                                                                             |                                                                                    |                                                                                   |                                                                                    |                                                                                    | 12 VDC                                                                             | 24 VDC                                                                              | 12 VDC                                                                              |                                                                                    | Rated coil voltage                                                                   |                                                                                      |                                                                                      |                                                                                                                                                                                     |                          |
| Between terminals 62.7 Ω                                                           |                                                                                    | Between terminals 132 Ω                                                           | Between terminals 78 Ω                                                             |                                                                                    | Between terminals 100 Ω                                                            | Between terminals 400 Ω                                                             | Between terminals 100 Ω                                                             |                                                                                    | Between terminals 130 Ω                                                              | Coil resistant                                                                       |                                                                                      |                                                                                                                                                                                     |                          |
| 2.30 W                                                                             |                                                                                    | 1.10 W                                                                            | 1.85 W                                                                             |                                                                                    | 1.44 W                                                                             |                                                                                     |                                                                                     | 1.11 W                                                                             |                                                                                      | Rated power consumption                                                              |                                                                                      |                                                                                                                                                                                     |                          |
| 8.0 V or less                                                                      |                                                                                    | 7.5V or less                                                                      | 8.0 V or less                                                                      |                                                                                    | 8.0 V or less                                                                      | 16.0 V or less                                                                      | 8.0 V or less                                                                       |                                                                                    | 8.0 V or less                                                                        |                                                                                      | Operating voltage                                                                    |                                                                                                                                                                                     |                          |
| 1.0 V or more                                                                      |                                                                                    | 1.0V or more                                                                      | 1.0 V or more                                                                      |                                                                                    | 0.6 V or more                                                                      | 1.2 V or more                                                                       | 0.6 V or more                                                                       |                                                                                    | 1.2 V or more                                                                        |                                                                                      | Release voltage                                                                      |                                                                                                                                                                                     |                          |
| 500 VAC: 1 minute                                                                  |                                                                                    |                                                                                   |                                                                                    |                                                                                    | 500 VAC: 1 minute                                                                  |                                                                                     |                                                                                     |                                                                                    |                                                                                      | Between a coil and contact                                                           |                                                                                      |                                                                                                                                                                                     |                          |
| 500 VAC: 1 minute                                                                  |                                                                                    |                                                                                   |                                                                                    |                                                                                    | 500 VAC: 1 minute                                                                  |                                                                                     |                                                                                     |                                                                                    |                                                                                      | Between contacts                                                                     |                                                                                      |                                                                                                                                                                                     |                          |
| -40~+125°C                                                                         |                                                                                    | -30~+100°C                                                                        | -40~+125°C                                                                         |                                                                                    | -40~+80°C                                                                          |                                                                                     | -40~+100°C                                                                          |                                                                                    | -40~+80°C                                                                            |                                                                                      | Ambient temperature                                                                  |                                                                                                                                                                                     |                          |
| ○                                                                                  |                                                                                    |                                                                                   | ○                                                                                  |                                                                                    | ○                                                                                  |                                                                                     | ○                                                                                   |                                                                                    | ○                                                                                    |                                                                                      | Unsealed type (In a case)                                                            |                                                                                                                                                                                     |                          |
|                                                                                    |                                                                                    |                                                                                   |                                                                                    |                                                                                    |                                                                                    |                                                                                     |                                                                                     |                                                                                    |                                                                                      |                                                                                      | Flux protection type                                                                 |                                                                                                                                                                                     |                          |
|                                                                                    |                                                                                    | ○                                                                                 |                                                                                    |                                                                                    |                                                                                    |                                                                                     | ○                                                                                   |                                                                                    |                                                                                      |                                                                                      | Fully sealed type                                                                    |                                                                                                                                                                                     |                          |
|                                                                                    |                                                                                    |                                                                                   |                                                                                    |                                                                                    |                                                                                    |                                                                                     |                                                                                     |                                                                                    |                                                                                      |                                                                                      | Surface mount terminal                                                               |                                                                                                                                                                                     |                          |
| ○                                                                                  |                                                                                    | ○                                                                                 | ○                                                                                  |                                                                                    | ○                                                                                  |                                                                                     | ○                                                                                   |                                                                                    | ○                                                                                    |                                                                                      | PCB terminal                                                                         |                                                                                                                                                                                     |                          |
|                                                                                    |                                                                                    |                                                                                   |                                                                                    |                                                                                    |                                                                                    |                                                                                     |                                                                                     |                                                                                    |                                                                                      |                                                                                      | Plug-in terminal                                                                     |                                                                                                                                                                                     |                          |
| 19.3 g                                                                             |                                                                                    | 10 g                                                                              | 34 g                                                                               |                                                                                    | 53 g                                                                               |                                                                                     | 32 g                                                                                |                                                                                    | 30 g                                                                                 |                                                                                      | Weight (about)                                                                       |                                                                                                                                                                                     |                          |

# Glossary: Terms related to relays

The meaning of terms used in this catalog are stated below.

## 1 Coil

### ● Coil Symbol

Coil drive types are displayed as below.

| mono -stable |               |
|--------------|---------------|
| Polarized    | Non-polarized |
|              |               |

### ● Rated Coil Voltage

A reference voltage applied to the coil when the relay is used under the normal operating conditions.

### ● Rated Coil Current

The current which flows through the coil when the rated voltage is applied at a temperature of 20°C. The tolerance is +15°C/−20°C unless otherwise specified.

### ● Coil Resistance

The resistance of the coil, measured at a temperature of 20°C. A tolerance of ±10% shall apply unless otherwise noted.

### ● Coil Power Consumption

The power dissipated by the coil when the rated voltage is applied to it. The coil power consumption is equal to the Rated Coil Voltage multiplied by the Rated Coil Current.

### ● Pull In Voltage (Must Operate Voltage)

The minimum coil voltage required to pull-in the relay contacts at a temperature of 20°C.

### ● Drop Out Voltage (Release Voltage)

The minimum coil voltage at which a relay's contacts will drop-out at a temperature of 20°C.

### ● Hot Start

The Minimum Operate Voltage when measured immediately following a pre-determined operating condition.

### ● Voltage Range

The region of safe operating potential applied to the coil.

### ● Maximum Continuous Coil Voltage

The voltage that can be continuously applied to the coil without exceeding the maximum temperature limits.

## 2 Contacts

### ● Contact Form

The contact mechanism of the relay. Classification of the relay contact configuration. The most common types in automotive applications are "A-Form" (SPST) and "C-Form" (SPDT).

### ● Contact Symbol

The symbol for each contact mechanism is displayed as below.

|                               | a-contact | b-contact | c-contact |
|-------------------------------|-----------|-----------|-----------|
| Contact symbol in the catalog |           |           |           |
| Contact symbol in the JIS     |           |           |           |

Note: JIS contact symbol is used in "Glossary: Terms related to relays" and "Notice related to relays" except for special cases.

### ● Contact Rating

An expression of the voltage, current, or ambient temperature (or any combination thereof) that a relay's contacts may be exposed to while being expected to retain acceptable operating characteristics.

### ● Maximum Continuous Current Rating

The current that can be continuously carried through the contacts without exceeding the maximum temperature limits.

### ● Maximum Switching Power

The maximum wattage that can be switched without exceeding the design parameters of the relay. Care should be taken to not exceed this value. (VA is used in the case of AC. W is used in the case of DC.)

### ● Contact Resistance

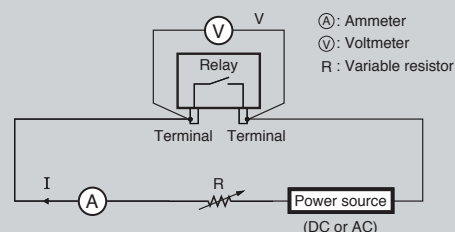
The total electrical resistance of a pair of closed contacts measured at their associated contact terminals. The contact resistance values in this catalog are initial rated values; therefore they are not an indicator of pass or fail after actual use in the application circuitry.

Contact resistance is determined by measuring the voltage drop across the contacts using the appropriate test current shown below.

$$\text{Contact Resistance} = \frac{E}{I} (\Omega) \left( \begin{array}{l} \text{DC measurements are obtained by} \\ \text{testing with alternating polarities and} \\ \text{adopting the mean value.} \end{array} \right)$$

### Contact Resistance Test Current

| Rated current or switched current (A) | Test current (mA) |
|---------------------------------------|-------------------|
| 0.1 or higher but less than 1         | 100               |
| 1 or higher                           | 1,000             |



### ● Maximum Contact Voltage

The maximum value of contact voltage that the contact can withstand. Do not apply a voltage that exceeds the maximum contact voltage of the relay.

### ● Maximum Switching Current (contact)

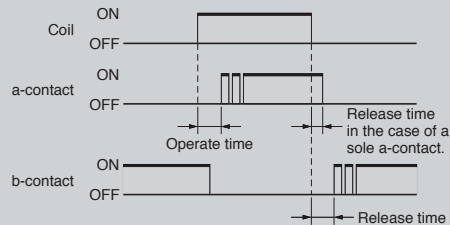
The maximum value of the contact current that the contact can safely switch. Do not apply a current that exceeds the maximum contact switching rating of the relay (this includes inrush.)

# Glossary: Terms related to relays

## 3 Electrical Characteristics

### ● Operate Time

The time that elapses between the instant power is applied to a relay coil and the moment the contacts have closed. In case the relay has several contacts, the duration of the operate time shall be considered to end when the last contact has closed unless otherwise specified. Release time is always specified at 20°C unless otherwise noted. Operate bounce time is not included in the operate time of a relay.



### ● Release Time

For an SPDT relay, the release time is the time that elapses between the instant a relay coil is de-energized, and closure of the NC contacts. For an SPST relay, the release time concludes at the opening of the NO contacts. Release time is specified at 20°C unless otherwise noted. Release bounce time is not included in the release time of a relay.

### ● Bounce

Intermittent opening and closing of contacts caused by vibration or shock resulting from the collision of the relay's moving parts.

### Operate Bounce Time

The time interval between the initial closure of the NO contact and when the bounce ceases.

### Release Bounce Time

The time interval between the initial closure of the NC contact and when the bounce ceases.

### ● Insulation Resistance

The resistance between any two electrically conductive parts within the relay that are intended to be electrically isolated from each other.

Typical examples would include:

1. Between the coil and contact: Between the coil terminal and all contact terminals
2. Between contacts of a different polarity: Between contact terminals of a different polarity
3. Between contacts of the same polarity: Between contact terminals of the same polarity

### ● Dielectric Strength

The ability of electrically isolated parts within the relay to withstand high voltage applied across them without arcing. Typically, an acceptable leakage current is established at a particular voltage for a specified duration.

## 4 Mechanical Characteristics

### ● Vibration Resistance

Vibration resistance of a relay is characterized by two values:

Malfunction Durability, refers to the maximum vibration the relay can withstand without changing state (vibration doesn't cause closed contacts to open or open contacts to close).

Mechanical Durability, refers to the maximum vibration the relay can withstand without causing it to permanently change its operating characteristics.

### ● Shock Resistance

Shock Resistance of a relay is characterized by two values:

Malfunction Durability, refers to the maximum shock the relay can withstand without changing state (vibration doesn't cause closed contacts to open or open contacts to close.)

Mechanical Durability, refers to the maximum shock the relay can withstand without causing it to permanently change its operating characteristics.

## 5 Endurance (Lifetime)

### ● Mechanical Endurance (Lifetime)

The number of operations the relay can successfully complete without any electrical load.

### ● Electrical Endurance (Lifetime)

The number of operations the relay can successfully complete with the rated load applied. Electrical endurance is not indicative of relay performance for loads other than the rated load.

### ● Minimum Carry or Switching Current

The smallest acceptable value of carry or switching current that maintains reliable electrical performance of the contacts.

### ● Maximum Operating Frequency

The maximum frequency at which the relay coil may be energized and de-energized while maintaining consistent and predictable operation.

## 6 Ambient Temperature Range (When using, transporting and storing the relay)

The temperature limits under which the relay can predictably operate are indicated on the data sheet. However, any freezing condition is excluded.

This does not guarantee to meet the values given on the data sheet for the entire operating temperature range.

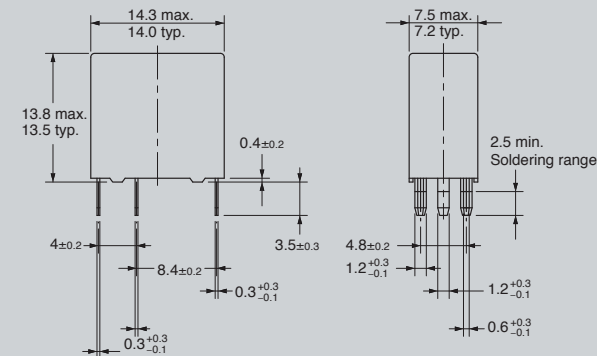
# Glossary: Terms related to relays

## 7 Contour and Shape

### ● Contour Dimension

#### Relay for automobile PCB

For miniature relays, dimensions (either nominal or maximum) are provided to aid the customer in the design process.



#### General purpose relay

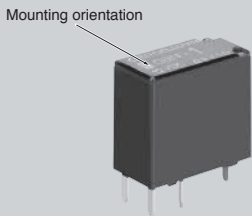
Maximum dimensions are shown as a reference for design.

### ● Marking

Various markings are used such as relay type, voltage rating, internal connection diagram, etc. Because of space restrictions on the surface of smaller relays, they may not display all of the information found on larger relays.

### ● Mounting Orientation Mark

The top of all Omron relays are marked to indicate the location of the relay coil. Knowing the terminal location aids in designing PCB patterns, and when spacing components. Also, the printing makes it easy to discern pin orientation when automatic or hand-mounting the relay.



### ● Terminal Layout/Internal Connection

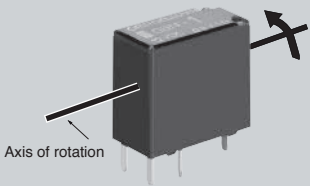
#### (1) Bottom View

When a relay's terminals can not be seen from top view (such as in the example below), the BOTTOM VIEW is shown in the catalog.



#### (2) Rotation direction to BOTTOM VIEW

The bottom view shown in the catalog or data sheet is rotated in the direction indicated by the arrow, with the coil always on the left.



|         | PCB processing dimension | Terminal layout/Internal Connection |
|---------|--------------------------|-------------------------------------|
| Symbol  |                          |                                     |
| Example | <br>(BOTTOM VIEW)        | <br>(BOTTOM VIEW)                   |

Note: In a contour dimensional drawing, PCB process dimensional drawing or terminal layout/internal connection diagram, the directional mark is found on the left. JIS contact symbol is not inscribed to match with case marking.

# Switch Series

## Technical Considerations

Omron Electronic Components has a great variety of standard options. We can deliver a snap action switch that will drop right into your application. Saving you time, component counts, & cost while improving your products overall quality.

## These options include:

### Actuators:

- Long & short panel mount plungers
- Long & short spring plungers
- Hinge levers in various lengths & orientation
- Roller levers in various lengths & orientations
- Simulated roller
- Leaf

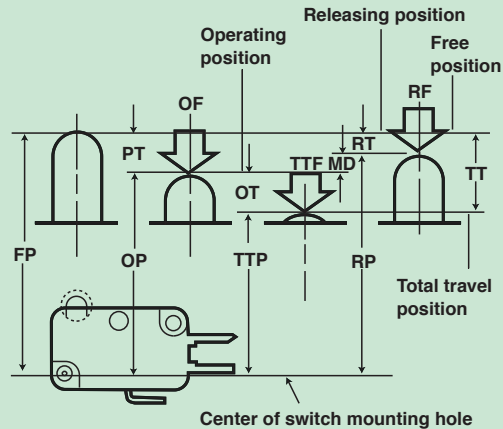
### Termination styles:

- PCB
- Solder
- Quick Connect
- Screw
- Wire Leads
- Connector

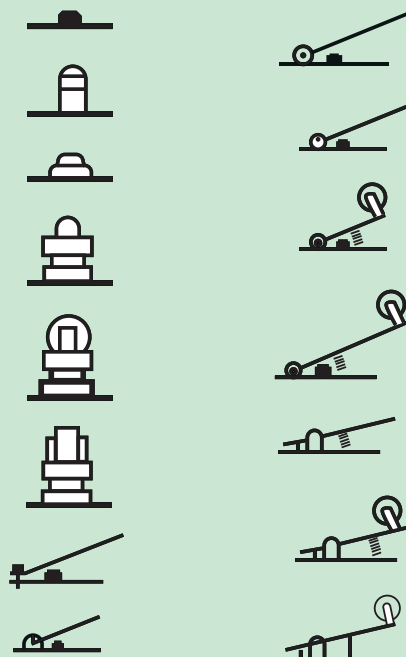
### Additional Features:

- Sealed / Unsealed versions available.
- Class N (200C) types available. (D3V-T)

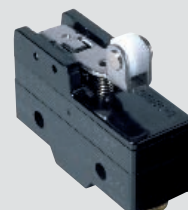
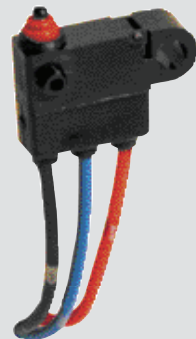
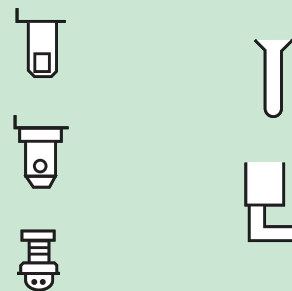
**Contact Omron Components and have it your way. Configure a switch that meets your application needs.**



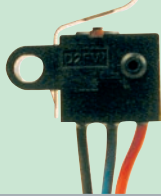
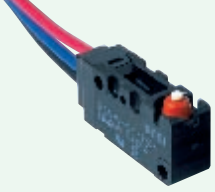
## Plunger & Lever Options



## Terminal Options



# Switch Series

|                                     |                                                                                                                                                                                            |                                                                                                                                                                                   |                                                                                                                                                                |                                                                                                                                                   |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     |                                                                                                           |                                                                                                  |                                                                             |                                                                |
|                                     | <b>D2HW</b>                                                                                                                                                                                | <b>D2JW</b>                                                                                                                                                                       | <b>D2FW-G</b>                                                                                                                                                  | <b>D2VW</b>                                                                                                                                       |
| Dimensions mm (in)                  | 7 H x 5.3 D x 13.3/18.5 W<br>(0.28 x 0.21 x 0.52/0.73)                                                                                                                                     | 9.4 H x 5.3 D x 12.7 W<br>(0.37 x 0.21 x 0.50)                                                                                                                                    | 13.5 H x 8.0 D x 23.5 W<br>(0.53 x 0.31 x 0.93)                                                                                                                | 15.9 H x 10.3 D x 33 W<br>(0.63 x 0.41 x 1.29)                                                                                                    |
| Features                            | <ul style="list-style-type: none"> <li>• Subminiature Snap Action Switch</li> <li>• Small sealed switch with long stroke for reliable ON/OFF action</li> <li>• Conforms to IP67</li> </ul> | <ul style="list-style-type: none"> <li>• Small size</li> <li>• Gold crossbar contact and coilspring for long life</li> <li>• IP67 rating for molded lead wire versions</li> </ul> | <ul style="list-style-type: none"> <li>• Subminiature Snap Action Switch</li> <li>• Small sealed switch with lead wires</li> <li>• Conforms to IP67</li> </ul> | <ul style="list-style-type: none"> <li>• Miniature Snap Action Switch</li> <li>• Sealed water-tight switch conforms to IP67 &amp; IP68</li> </ul> |
| Contact Rating(s)<br>Resistive load | 2A @ 12VDC/ 1A @ 24VDC/<br>0.5A @ 42VDC                                                                                                                                                    | 0.1A @ 30VDC                                                                                                                                                                      | 0.5A @ 30VDC or 50mA @<br>30VDC                                                                                                                                | 0.1A @ 125VAC or 5A @ 125/250VAC                                                                                                                  |
| Contact form                        | SPDT, SPST-NC, SPST-NO                                                                                                                                                                     | SPDT                                                                                                                                                                              | SPDT, SPST-NC, SPST-NO                                                                                                                                         | SPDT (SPST-NC, SPST-NO per request)                                                                                                               |
| Operating force (OF)*               | 76g                                                                                                                                                                                        | 250g                                                                                                                                                                              | 120g                                                                                                                                                           | 200g                                                                                                                                              |
| Mechanical service life             | 1,000,000 operations min.                                                                                                                                                                  | 1,000,000 operations min.                                                                                                                                                         | 300,000 operations min.                                                                                                                                        | 10,000,000 operations min.                                                                                                                        |
| Electrical service life             | 100,000 operations min.                                                                                                                                                                    | 500,000 operations min.                                                                                                                                                           | 100,000 operations min.                                                                                                                                        | 1,000,000 operations min.<br>(0.1A, 125VAC)<br>100,000 operations min.<br>(3A, 125/250VAC)                                                        |
| Mounting pitch mm (in)              | 8 (0.32) posts, 13 (0.51) screw                                                                                                                                                            | 4.8                                                                                                                                                                               | 16 (0.63)                                                                                                                                                      | 10.3 x 22.2 (0.41 x 0.87)                                                                                                                         |
| Actuator types                      | Pin plunger, hinge lever, long hinge lever, simulated roller lever, leaf lever, simulated leaf lever, long leaf lever                                                                      | Pin plunger, short hinge lever, hinge lever, simulated roller lever, hinge roller lever                                                                                           | Leaf lever, Long leaf lever                                                                                                                                    | Pin plunger, short hinge lever, hinge lever, long hinge lever, simulated roller lever, short hinge roller lever, hinge roller lever               |
| Terminal choices                    | PCB (straight, angled), Solder, Lead wire (bottom, right side, left side)                                                                                                                  | Solder, molded lead wire                                                                                                                                                          | Lead wires                                                                                                                                                     | Solder/Quick connect (#187 tab terminals) lead wires                                                                                              |
| Approved standards                  | UL, CSA                                                                                                                                                                                    | UL, CSA, VDE                                                                                                                                                                      | –                                                                                                                                                              | UL, CSA (refer to "Ratings" section of data sheet)                                                                                                |

\* Values are for pin plunger type only

# Switch Series

|                                     |                                                               |                                                                         |                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | D2SW                                                                                                                                           | D2QW                                                                                                                                                     | D2F                                                                                                                                                                                                                              | SS-P/SS                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Dimensions mm (in)                  | 10.1 H x 6.4 D x 19.8 W<br>(0.40 x 0.25 x 0.78)                                                                                                | 9.3 H x 5.3 D x 13.3 W<br>(0.37 x 0.21 x 0.53)                                                                                                           | 6.5 H x 5.8 D x 12.8 W<br>(0.26 x 0.23 x 0.50)                                                                                                                                                                                   | 10.2 H x 6.4 D x 19.8 W<br>(0.40 x 0.25 x 0.78)                                                                                                                                                                                                                                                                                                                                                                                                  |
| Features                            | <ul style="list-style-type: none"> <li>• Subminiature snap action switch</li> <li>• Small sealed switch conforms to IP67 &amp; IP68</li> </ul> | <ul style="list-style-type: none"> <li>• Sealed Long-travel Detection switch</li> <li>• Quite operating sound by sliding contact construction</li> </ul> | <ul style="list-style-type: none"> <li>• Subminiature Snap Action Switch</li> <li>• Switches microvoltage/micro-current loads</li> <li>• Long lifespan assured by high-precision dual spring reverse-action mechanism</li> </ul> | <ul style="list-style-type: none"> <li>• Subminiature Snap Action Switch</li> <li>• SS-01: Switches microcurrent/microvoltage load with cross-bar contacts</li> <li>• SS-3: Single-leaf movable spring</li> <li>• SS-5: Split double spring mechanism for a long life of up to 30 million operations</li> <li>• SS-10: Split double spring mechanism for a long life of up to 10 million operations</li> <li>• Internal lever options</li> </ul> |
| Contact Rating(s)<br>Resistive load | 0.1A @ 125VAC or 3A @ 125VAC                                                                                                                   | 0.1A @ 30VDC                                                                                                                                             | 0.1A @ 30VDC (D2F-01)<br>3A @ 125VAC (D2F)<br>1A @ 125VAC (D2F-F)                                                                                                                                                                | 0.1A @ 125VAC (SS-01)<br>3A @ 125VAC (SS-3)<br>5A @ 125VAC (SS-5)<br>10.1A @ 125/250VAC (SS-10)                                                                                                                                                                                                                                                                                                                                                  |
| Contact form                        | SPDT (SPST-NC, SPST-NO per request)                                                                                                            | SPST-NO                                                                                                                                                  | SPDT                                                                                                                                                                                                                             | SPDT (SPST-NC, SPST-NO per request)                                                                                                                                                                                                                                                                                                                                                                                                              |
| Operating force (OF)*               | 180g                                                                                                                                           | 1.5g                                                                                                                                                     | 75g (D2F-01)<br>150g (D2F)<br>75g (D2F-F)                                                                                                                                                                                        | 25g, 50g, or 150g (SS-01)<br>150g (SS-3)<br>50g or 150g (SS-5)<br>150g (SS-10)                                                                                                                                                                                                                                                                                                                                                                   |
| Mechanical service life             | 5,000,000 operations min.                                                                                                                      | 1,000,000 operations min.                                                                                                                                | 1,000,000 operations min.                                                                                                                                                                                                        | 30,000,000 ops.min. (SS-01, SS-05)*<br>1,000,000 ops.min. (SS-01P, SS-3)<br>10,000,000 ops.min. (SS-10)*                                                                                                                                                                                                                                                                                                                                         |
| Electrical service life             | 200,000 operations min.<br>(0.1 or 3A, 125VAC)<br>100,000 operations min.<br>(2A, 250VAC)                                                      | 100,000 operations min.<br>(OT; full stroke)                                                                                                             | 30,000 operations min.<br>(OT: full stroke)                                                                                                                                                                                      | 200,000 operations min.<br>(SS-01, SS-5)**<br>70,000 operations min. (SS-3)<br>50,000 operations min. (SS-10)**                                                                                                                                                                                                                                                                                                                                  |
| Mounting pitch mm (in)              | 9.5 (0.37)                                                                                                                                     | 4.38 (0.17)                                                                                                                                              | 6.5 (0.26)                                                                                                                                                                                                                       | 9.5 (0.37)                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Actuator types                      | Pin plunger, hinge lever, simulated roller lever, hinge roller lever                                                                           | Pin plunger, hinge lever, simulated roller lever, roller lever                                                                                           | Pin plunger, hinge lever, simulated roller lever, roller lever                                                                                                                                                                   | Pin plunger, hinge lever, simulated roller lever, formed hinge lever, hinge roller lever                                                                                                                                                                                                                                                                                                                                                         |
| Terminal choices                    | Solder, Quick connect (#110), PCB, lead wires                                                                                                  | PCB, Solder, Lead Wire                                                                                                                                   | PCB (straight, self-supporting, right and left angle), Solder                                                                                                                                                                    | SS-01, SS-3, SS-5: PCB (straight, parallel left, parallel right), Solder, Quick connect<br>SS-10: PCB (straight), Solder, Quick connect (#110)                                                                                                                                                                                                                                                                                                   |
| Approved standards                  | UL, CSA                                                                                                                                        | —                                                                                                                                                        | UL, CSA                                                                                                                                                                                                                          | UL, CSA                                                                                                                                                                                                                                                                                                                                                                                                                                          |

\* Values are for pin plunger type only

\*at rated OT value

\*\*at rated load

# Switch Series

## Snap Action

|                                     |                                                                                                                                                                                                                  |                                                                                                           |                                                                                                                                                   |                                                                                                                                        |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | Z                                                                                                                                                                                                                                                                                                 | A                                                                                                                                                                                          | X                                                                                                                                                                                                                                    | DZ                                                                                                                                                                                                                        |
| Dimensions mm (in)                  | 24.2 H x 17.45 D x 49.2 W<br>(0.95 x 0.69 x 1.93)                                                                                                                                                                                                                                                 | 24.2 H x 17.45 D x 49.2 W<br>(0.95 x 0.69 x 1.93)                                                                                                                                          | 24.2 H x 17.45 D x 49.2 W<br>(0.95 x 0.69 x 1.93)                                                                                                                                                                                    | 22.7 H x 17.45 D x 49.2 W<br>(0.89 x 0.69 x 1.93)                                                                                                                                                                         |
| Features                            | <ul style="list-style-type: none"> <li>• General Purpose Snap Action Switch</li> <li>• High precision 15 A switch available in a variety of styles</li> </ul>                                                                                                                                     | <ul style="list-style-type: none"> <li>• General Purpose Snap Action Switch</li> <li>• High capacity switch handles loads with large inrush currents</li> </ul>                            | <ul style="list-style-type: none"> <li>• DC switch</li> <li>• Magnetic blowout to extinguish arc</li> </ul>                                                                                                                          | <ul style="list-style-type: none"> <li>• DPDT basic switch</li> <li>• Incorporates two completely independent built-in switches</li> <li>• Can switch two independent circuits operating on different voltages</li> </ul> |
| Contact Rating(s)<br>Resistive load | 0.1A @ 125VAC<br>15A @ 250VAC*                                                                                                                                                                                                                                                                    | 20A @ 250VAC                                                                                                                                                                               | 10A @ 125VDC<br>3 A @ 250VDC                                                                                                                                                                                                         | 10A @ 250VAC                                                                                                                                                                                                              |
| Contact form                        | SPDT                                                                                                                                                                                                                                                                                              | SPDT                                                                                                                                                                                       | SPDT                                                                                                                                                                                                                                 | DPDT                                                                                                                                                                                                                      |
| Operating force (OF)*               | 250g to 350g                                                                                                                                                                                                                                                                                      | 400g to 625g                                                                                                                                                                               | 510g                                                                                                                                                                                                                                 | 570g                                                                                                                                                                                                                      |
| Mechanical service life             | Refer to "SPECIFICATIONS" section of data sheet for detailed service life information                                                                                                                                                                                                             | 1,000,000 ops. min.<br>(at rated OT load)                                                                                                                                                  | 1,000,000 operations min.                                                                                                                                                                                                            | 1,000,000 operations min.                                                                                                                                                                                                 |
| Electrical service life             | Refer to "SPECIFICATIONS" section of data sheet for detailed service life information                                                                                                                                                                                                             | 500,000 ops. min.<br>(at rated OT load)                                                                                                                                                    | 100,000 operations min.                                                                                                                                                                                                              | 500,000 operations min.                                                                                                                                                                                                   |
| Mounting pitch mm (in)              | 25.4 (1.0)                                                                                                                                                                                                                                                                                        | 25.4 (1.0)                                                                                                                                                                                 | 25.4 (1.0)                                                                                                                                                                                                                           | 25.4 (1.0)                                                                                                                                                                                                                |
| Actuator types                      | Pin plunger, slim spring plunger, short spring plunger, panel mount plunger, panel mount roller plunger, panel mount cross roller plunger, hinge lever, low force hinge lever, short hinge roller lever, hinge roller lever,unidirectional short hinge roller lever, spring plunger, flexible rod | Pin plunger, short spring plunger, panel mount plunger, panel mount roller plunger, panel mount cross roller, short hinge lever, hinge lever, short hinge roller lever, hinge roller lever | Pin plunger, short spring plunger, slim spring plunger, panel mount plunger, panel mount cross-roller plunger, panel mount roller plunger, leaf spring, hinge lever, hinge roller lever, short hinge lever, short hinge roller lever | Pin plunger, hinge lever, short hinge roller lever, hinge roller lever                                                                                                                                                    |
| Terminal choices                    | Solder, Screw                                                                                                                                                                                                                                                                                     | Solder, Screw, or Quick connect (#250)                                                                                                                                                     | Solder, Screw                                                                                                                                                                                                                        | Solder, Screw                                                                                                                                                                                                             |
| Approved standards                  | UL, CSA, SEV                                                                                                                                                                                                                                                                                      | UL, CSA, SEV                                                                                                                                                                               | UL, CSA                                                                                                                                                                                                                              | UL, CSA                                                                                                                                                                                                                   |

\* Values are for pin plunger type only

# World-Wide Headquarter Locations

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