

## 2. Specifications (relay)

| Characteristics                                                                          | Item                                              |                                                                                          | Specifications                                                                                                                                       |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|------------------------------------------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|
|                                                                                          |                                                   |                                                                                          | 4 poles                                                                                                                                              |                                                                                  |                                               | 6 poles  |                                                                                                                                                                                        |          |          |          |          |          |
| Contact                                                                                  | Contact arrangement                               |                                                                                          | 2 Form A                                                                                                                                             | 2 Form B                                                                         | 3 Form A                                      | 1 Form B | 4 Form A                                                                                                                                                                               | 2 Form B | 5 Form A | 1 Form B | 3 Form A | 3 Form B |
|                                                                                          | Contact resistance (Initial)                      |                                                                                          | Max. 100 mΩ (By voltage drop 6 V DC 1A)                                                                                                              |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          | Contact material                                  |                                                                                          | Au flashed AgSnO <sub>2</sub> type                                                                                                                   |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
| Rating                                                                                   | Nominal switching capacity (resistive load)       |                                                                                          | 6A 250V AC, 6A 30V DC                                                                                                                                |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          | Max. switching power (resistive load)             |                                                                                          | 1,500VA, 180W                                                                                                                                        |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          | Max. switching voltage                            |                                                                                          | 250V AC, 125V DC                                                                                                                                     |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          | Max. switching current                            |                                                                                          | 6 A (Reduce by 0.1 A/°C for temperatures 70 to 85°C 158 to 185°F)                                                                                    |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          | Min. switching capacity (Reference value)*1       |                                                                                          | 1mA 5V DC                                                                                                                                            |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          | Nominal operating power                           |                                                                                          | Approx. 360mW                                                                                                                                        |                                                                                  |                                               |          | Approx. 500mW                                                                                                                                                                          |          |          |          |          |          |
| Electrical characteristics                                                               | Insulation resistance (Initial)                   |                                                                                          | Min. 1,000MΩ (at 500V DC) Measurement at same location as “Breakdown voltage” section.                                                               |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          | Breakdown voltage (Initial)                       | Between open contacts                                                                    | 1,500 Vrms for 1 min. (Detection current: 10mA)                                                                                                      |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          |                                                   | Between contact sets                                                                     | 2,500 Vrms for 1 min. (Detection current: 10mA);<br>7-8/9-10 between open contacts                                                                   |                                                                                  |                                               |          | 2,500 Vrms for 1 min. (Detection current: 10mA);<br>7-8/11-12 between open contacts<br>9-10/13-14 between open contacts<br>11-12/13-14 between open contacts                           |          |          |          |          |          |
|                                                                                          |                                                   |                                                                                          | 4,000 Vrms for 1 min. (Detection current: 10mA);<br>3-4/5-6 between open contacts<br>3-4/7-8 between open contacts<br>5-6/9-10 between open contacts |                                                                                  |                                               |          | 4,000 Vrms for 1 min. (Detection current: 10mA);<br>3-4/5-6 between open contacts<br>3-4/7-8 between open contacts<br>5-6/9-10 between open contacts<br>7-8/9-10 between open contacts |          |          |          |          |          |
|                                                                                          |                                                   |                                                                                          | Between contact and coil                                                                                                                             |                                                                                  | 4,000 Vrms for 1min (Detection current: 10mA) |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          | Operate time (at 20°C 68°F)                       |                                                                                          | Max. 20ms (Nominal coil voltage applied to the coil, excluding contact bounce time)                                                                  |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          | Response time (at 20°C 68°F)*2                    |                                                                                          | Max. 8ms (Nominal coil voltage applied to the coil, excluding contact bounce time and without diode)*4                                               |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          | Release time (at 20°C 68°F)                       |                                                                                          | Max. 20ms (Nominal coil voltage applied to the coil, excluding contact bounce time)                                                                  |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          | Mechanical characteristics                        | Shock resistance                                                                         | Functional                                                                                                                                           | 200 m/s <sup>2</sup> (Half-wave pulse of sine wave: 11 ms; detection time: 10μs) |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
| Destructive                                                                              |                                                   |                                                                                          | 1,000 m/s <sup>2</sup> (Half-wave pulse of sine wave: 6 ms)                                                                                          |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
| Vibration resistance                                                                     |                                                   | Functional                                                                               | 10 to 55 Hz at double amplitude of 1.5 mm (Detection time: 10μs)                                                                                     |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          |                                                   | Destructive                                                                              | 10 to 55 Hz at double amplitude of 1.5 mm                                                                                                            |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
| Expected life                                                                            | Mechanical                                        |                                                                                          | Min. 10 <sup>7</sup> (at 180 times/min.)                                                                                                             |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          | Electrical                                        | 250 V AC 6 A resistive load: Min. 10 <sup>5</sup> (at 20 times/min.)                     |                                                                                                                                                      |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          |                                                   | 30 V DC 6 A resistive load: Min. 10 <sup>5</sup> (at 20 times/min.)                      |                                                                                                                                                      |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          |                                                   | 250 V AC 1 A resistive load: Min. 5×10 <sup>5</sup> (at 30 times/min.)                   |                                                                                                                                                      |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          |                                                   | 30 V DC 1 A resistive load: Min. 5×10 <sup>5</sup> (at 30 times/min.)                    |                                                                                                                                                      |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          |                                                   | [AC 15] 240 V AC 2 A inductive load: Min. 10 <sup>5</sup> (at 20 times/min., cosφ = 0.3) |                                                                                                                                                      |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
| [DC 13] 24 V DC 1 A inductive load: Min. 10 <sup>5</sup> (at 20 times/min., L/R = 48 ms) |                                                   |                                                                                          |                                                                                                                                                      |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
| Conditions                                                                               | Conditions for operation, transport and storage*3 |                                                                                          | Ambient temperature: -40°C to +85°C -40°F to +185°F<br>Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)                      |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
|                                                                                          | Max. operating speed                              |                                                                                          | 20 times/min. (at max. rating)                                                                                                                       |                                                                                  |                                               |          |                                                                                                                                                                                        |          |          |          |          |          |
| Unit weight                                                                              |                                                   |                                                                                          | Approx. 20 g .71 oz                                                                                                                                  |                                                                                  |                                               |          | Approx. 23 g .81 oz                                                                                                                                                                    |          |          |          |          |          |

Notes: \*1. This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.

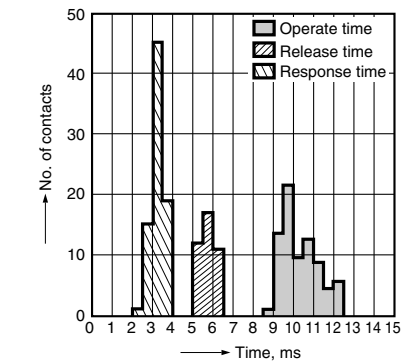
\*2. Response time is the time after the coil voltage turns off until the time when "a" contact turns off.

\*3. The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to Usage, transport and storage conditions in NOTES.

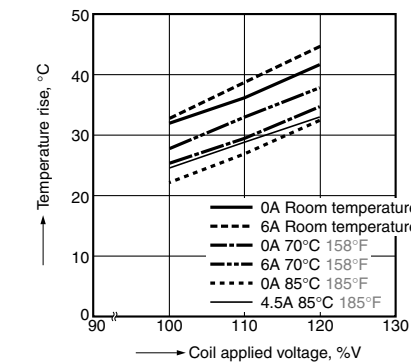
\*4. Response time of built-in diode type is 12 ms or less (excluding contact bounce time when nominal coil voltage is applied to the coil).

REFERENCE DATA

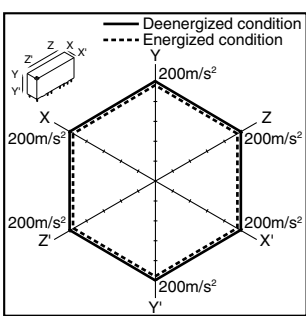
1. Operate/response/release time  
Tested sample: SFS4-DC24V (4 Form A 2 Form B),  
20pcs. (a contacts: 80, b contacts: 40)



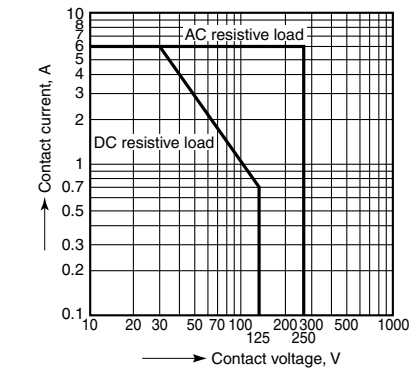
2. Coil temperature rise  
Tested sample: SFS4-DC24V (4 Form A 2 Form B),  
3pcs.  
Measured portion: Inside the coil  
Ambient temperature: Room temperature  
(27°C 80.6°F), 70°C 158°F, 85°C 185°F



3. Malfunctional shock  
Tested sample: SFS4-DC24V (4 Form A 2 Form B),  
3pcs.



4. Max, switching capacity



Other contact gaps when contacts are welded

Sample: SFS4-DC24V (4 Form A 2 Form B)  
The table below shows the state of the other contacts.  
In case of form “NO” contact weld the coil applied voltage is 0 V.  
In case of form “NC” contact weld the coil applied voltage is nominal.

|                    |            | State of other contacts |          |          |           |            |            |
|--------------------|------------|-------------------------|----------|----------|-----------|------------|------------|
|                    |            | 3-4 (NC)                | 5-6 (NC) | 7-8 (NO) | 9-10 (NO) | 11-12 (NO) | 13-14 (NO) |
| Welded contact No. | 3-4 (NC)   |                         |          | >0.5     | >0.5      | >0.5       | >0.5       |
|                    | 5-6 (NC)   |                         |          | >0.5     | >0.5      | >0.5       | >0.5       |
|                    | 7-8 (NO)   | >0.5                    | >0.5     |          |           |            |            |
|                    | 9-10 (NO)  | >0.5                    | >0.5     |          |           |            |            |
|                    | 11-12 (NO) | >0.5                    | >0.5     |          |           |            |            |
|                    | 13-14 (NO) | >0.5                    | >0.5     |          |           |            |            |

>0.5: contact gap is kept at min. 0.5 mm .020inch  
Empty cells: either ON or OFF  
Note: Contact gaps are shown at the initial state.  
If the contact transfer is caused by load switching, it is necessary to check the actual loading.