

# S20 RELAY

## SHORI

### ◆ Features

- High rating miniature PCB relay.
- Low power consumption 400mW coil.
- Low height 15.7mm.
- 20A 277VAC/SPDT, 10A 277VAC/DPDT rating are approved.



### ◆ Coil Data [at 20°C]

#### ➤ Standard Type

| Rated voltage<br>( V ) | Coil Resistance<br>±10%<br>( Ω ) | Rated Current<br>±10%<br>( mA ) | Pick up<br>Voltage<br>(Max) | Drop out<br>Voltage<br>(Min) | Max<br>continuous<br>Voltage    | Power consumption<br>At rated<br>Voltage |
|------------------------|----------------------------------|---------------------------------|-----------------------------|------------------------------|---------------------------------|--|
| 3                      | 16.6                             | 180                             | 70% of<br>rated<br>voltage  | 10% of<br>rated<br>voltage   | 160% Max<br>of Rated<br>voltage | Approx.0.54W                             |
| 5                      | 46                               | 108                             |                             |                              |                                 |  |
| 6                      | 67                               | 90                              |                             |                              |                                 |  |
| 9                      | 150                              | 60                              |                             |                              |                                 |  |
| 12                     | 270                              | 45                              |                             |                              |                                 |  |
| 18                     | 600                              | 30                              |                             |                              |                                 |  |
| 24                     | 1060                             | 22                              |                             |                              |                                 |  |
| 36                     | 2400                             | 15                              |                             |                              |                                 |  |
| 48                     | 4360                             | 11                              |                             |                              |                                 |  |

#### ➤ High sensitivity type (B)

| Rated voltage<br>( V ) | Coil Resistance<br>±10%<br>( Ω ) | Rated Current<br>±10%<br>( mA ) | Pick up<br>Voltage<br>(Max) | Drop out<br>Voltage<br>(Min) | Max<br>continuous<br>Voltage    | Power consumption<br>At rated<br>Voltage |
|------------------------|----------------------------------|---------------------------------|-----------------------------|------------------------------|---------------------------------|--|
| 3                      | 22.5                             | 133                             | 70% of<br>rated<br>voltage  | 10% of<br>rated<br>voltage   | 160% Max<br>of Rated<br>voltage | Approx.0.4W                              |
| 5                      | 62                               | 80                              |                             |                              |                                 |  |
| 6                      | 90                               | 67                              |                             |                              |                                 |  |
| 9                      | 203                              | 44                              |                             |                              |                                 |  |
| 12                     | 360                              | 33                              |                             |                              |                                 |  |
| 18                     | 771                              | 23                              |                             |                              |                                 |  |
| 24                     | 1440                             | 17                              |                             |                              |                                 |  |
| 36                     | 3240                             | 11.1                            |                             |                              |                                 |  |
| 48                     | 5520                             | 9                               |                             |                              |                                 |  |

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➤ Ultra-sensitivity type (B1)

| Rated voltage (V) | Coil Resistance ±10% (Ω) | Rated Current ±10% (mA) | Pick up Voltage (Max) | Drop out Voltage (Min) | Max continuous Voltage    | Power consumption At rated Voltage |
|-------------------|--------------------------|-------------------------|-----------------------|------------------------|---------------------------|------------------------------------|
| 3                 | 36                       | 83                      | 70% of rated voltage  | 10% of rated voltage   | 160% Max of Rated voltage | Approx.0.25W                       |
| 5                 | 100                      | 50                      |                       |                        |                           |                                    |
| 6                 | 144                      | 42                      |                       |                        |                           |                                    |
| 9                 | 324                      | 28                      |                       |                        |                           |                                    |
| 12                | 576                      | 21                      |                       |                        |                           |                                    |
| 18                | 1296                     | 14                      |                       |                        |                           |                                    |
| 24                | 2304                     | 10                      |                       |                        |                           |                                    |
| 36                | 5184                     | 7                       |                       |                        |                           |                                    |

➤ Coil Rating (AC)

| Rated voltage (V) | Coil Resistance ±10% (Ω) | Rated Current ±10% (mA) | Pick up Voltage (Max) | Drop out Voltage (Min) | Max continuous Voltage    | Power consumption At rated Voltage |
|-------------------|--------------------------|-------------------------|-----------------------|------------------------|---------------------------|------------------------------------|
| 6                 | 18.8                     | 124                     | 80% of rated voltage  | 15% of rated voltage   | 150% Max of Rated voltage | Approx.0.75VA                      |
| 12                | 79.8                     | 62.5                    |                       |                        |                           |                                    |
| 24                | 334                      | 31.2                    |                       |                        |                           |                                    |
| 42                | 966                      | 17.9                    |                       |                        |                           |                                    |
| 48                | 1340                     | 15.5                    |                       |                        |                           |                                    |
| 100/110           | 6840                     | 7.53                    |                       |                        |                           |                                    |
| 110/120           | 7360                     | 6.7                     |                       |                        |                           |                                    |
| 200/220           | 23800                    | 3.75                    |                       |                        |                           |                                    |
| 220/240           | 27400                    | 3.4                     |                       |                        |                           |                                    |

◆ Safety Approval

|           |         |     |
|-----------|---------|-----|
| Certified | UL/CUL  | VDE |
| File No.  | E188091 |     |

◆ Safety Approval Rating

| UL/CUL |  |
|--------|--|
| S20E   | NO/NC:20A/277VAC 16A/277VAC 16A/250VAC 12A/30VDC<br>NO:1HP/480VAC TV-8/125VAC<br>NC:1/2HP 120V/240V/480VAC         |
| S20H   | NO/NC:17A/277VAC 12A/277VAC 10A/250VAC 10A/30VDC<br>NO:1HP/480VAC TV-5/125VAC<br>NC:1/2HP 120V/240V/480VAC         |
| S20M   | NO/NC:12A/277VAC 10A/277VAC 8A/250VAC 10A/30VDC 8A/30VDC<br>NO:1/2HP 120/240VAC TV-5/125VAC<br>NC:1/3HP 120/240VAC |

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### ◆ Type List

| Terminal style | Contact form | Designation(provided with) |                      |
|----------------|--------------|----------------------------|----------------------|
|                |              | Sealed type                | Sealed type washable |
| PCB terminal   | 1A(SPNO)     | S20E-12-1A                 | S20E-12-1AS          |
|                | 1B(SPNC)     | S20E-12-1B                 | S20E-12-1BS          |
|                | 1C(SPDT)     | S20E-12-1C                 | S20E-12-1CS          |
|                | 1A(SPNO)     | S20H-12-1A                 | S20H-12-1AS          |
|                | 1B(SPNC)     | S20H-12-1B                 | S20H-12-1BS          |
|                | 1C(SPDT)     | S20H-12-1C                 | S20H-12-1CS          |
|                | 2A(DPNO)     | S20M-12-2A                 | S20M-12-2AS          |
|                | 2B(DPNC)     | S20M-12-2B                 | S20M-12-2BS          |
|                | 2C(DPDT)     | S20M-12-2C                 | S20M-12-2CS          |

### ◆ Ordering information

S20 E - 12 - 1A S - F  
 1 2 3 4 5 6

1.S20 -- Basic series designation

3.12 -- Coil Voltage (3V~48VDC)

12B -- High sensitivity Type(0.40W)

12B1 -- Ultra-sensitivity Type(0.25W)

(Only for 1P type)

12VAC – Coil Voltage (6V~240VAC)

5. Blank -- Sealed type

S -- Sealed type washable

6. Blank – Standard type

F – Class F

2. E:20A H:12A M:10A

4. 1A -- Single pole normally open

1B -- Single pole normally closed

1C -- Single pole double throw

2A -- Double pole normally open

2B -- Double pole normally closed

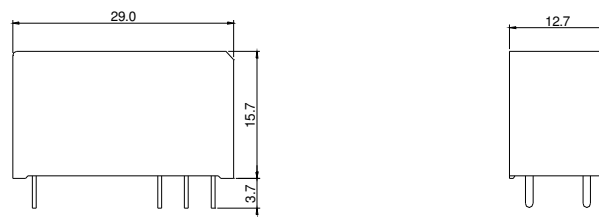
2C -- Double pole double throw

### ◆ Specification

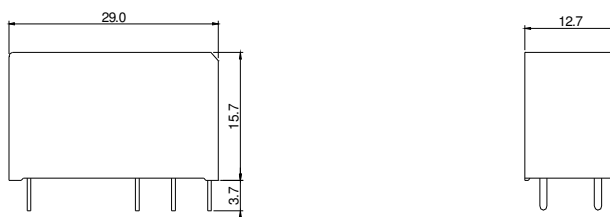
|                               |   |  |
|-------------------------------|---|--|
| Contact material              | Silver Alloy  |  |
| Contact resistance            | 100 mΩ Max  |  |
| Operate time                  | 20 ms Max   |  |
| Release time                  | 10 ms Max   |  |
| Insulation resistance         | 1000MΩ Min. (DC 500V)   |  |
| Dielectric strength           | Between open contact : AC 1000V ,50/60Hz 1 min.   |  |
|                               | Between contact and coil : AC 5000V, 50/60Hz 1 min.   |  |
|                               | Between contact circuits : AC 3000V, 50/60Hz 1 min.(for 2P DC type)<br>AC 2500V, 50/60Hz 1 min.(for 2P AC type) |  |
| Vibration resistance          | Operating extremes  | 10~50Hz, amplitude 1.5 mm  |
|                               | Damage limits   | 10~50Hz, amplitude 1.5 mm  |
| Shock resistance              | Operating extremes  | 10G  |
|                               | Damage limits   | 100G   |
| Life expectancy               | Mechanical  | 30,000,000 operations<br>(frequency 72,000 operations/hr)<br>5,000,000 operations (for 2P AC type)<br>(frequency 18,000 operations/hr) |
|                               | Electrical  | 100,000 operations (360 cycles/hr)<br>(frequency 360 operations/hr)  |
| Operating ambient temperature | DC coil: -40~+85°C (no freezing)  |  |
|                               | AC coil: -40~+70°C (no freezing)  |  |
| Weight                        | Approx .10 g  |  |

### ◆ Outline Dimension

#### ➤ S20(1P)



#### ➤ S20(2P)



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### ◆ Wiring Diagram

#### ➤ S20E (1P) BOTTOM VIEW



#### ➤ S20H(1P) BOTTOM VIEW

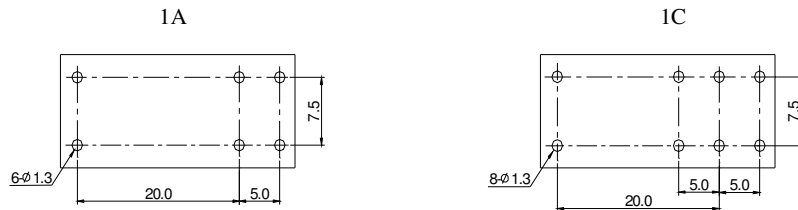


#### ➤ S20M(2P) BOTTOM VIEW

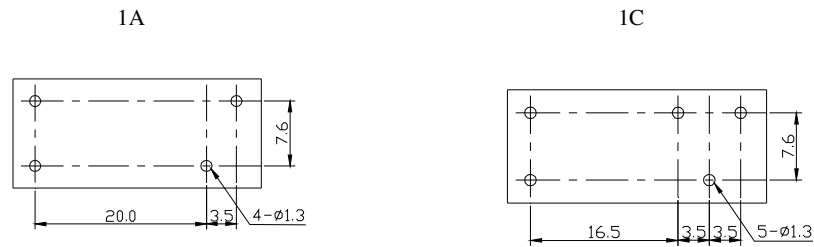


### ◆ PC BOARD LAYOUT

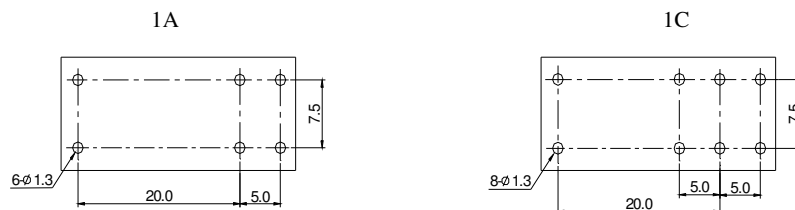
#### ➤ S20E(1P) BOTTOM VIEW



#### ➤ S20H(1P) BOTTOM VIEW

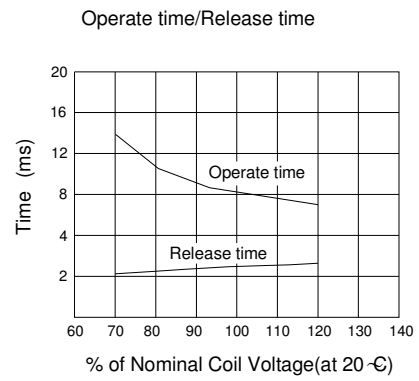
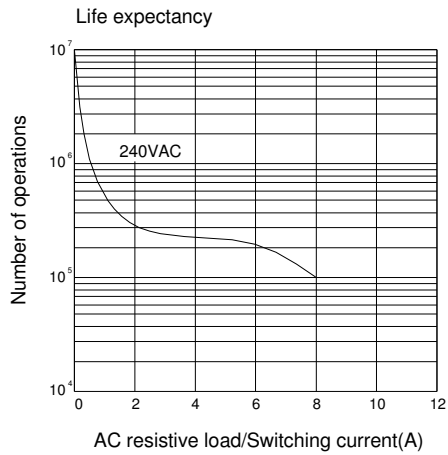
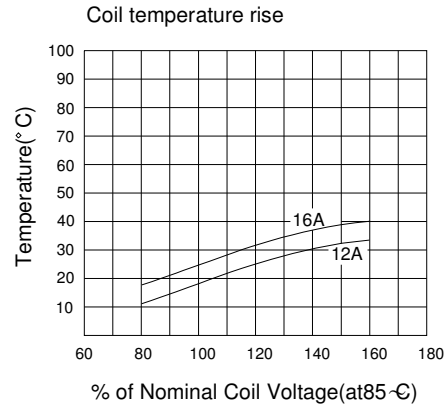
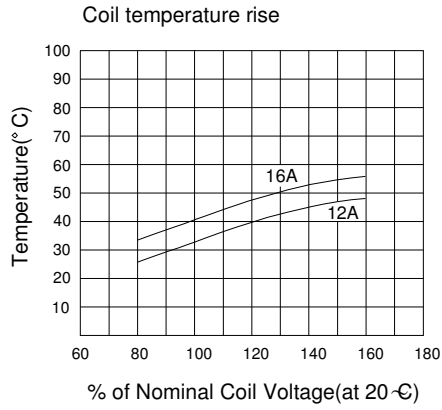


#### ➤ S20M(2P) BOTTOM VIEW



### ◆ Engineering Data

#### ➤ 1P

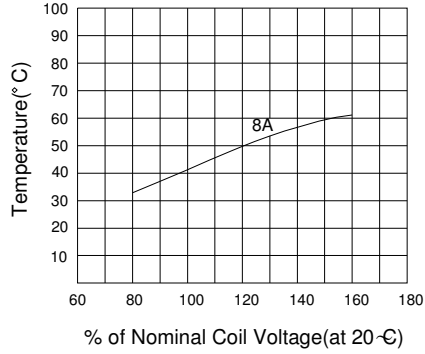


# S20 RELAY

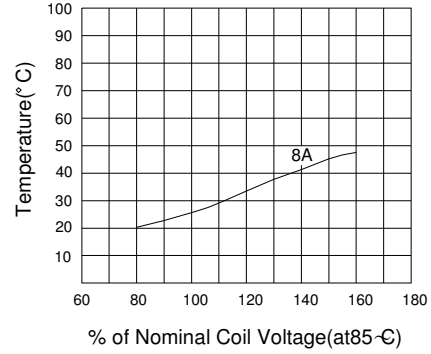
## SHORI

➤ 2P

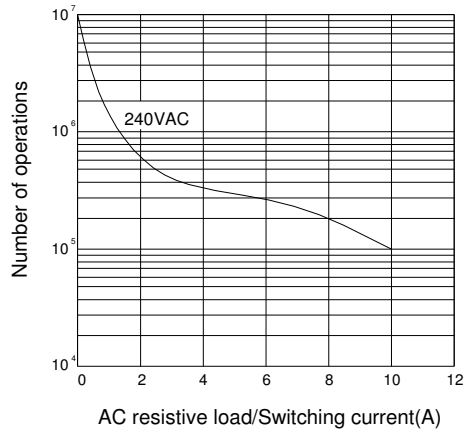
Coil temperature rise



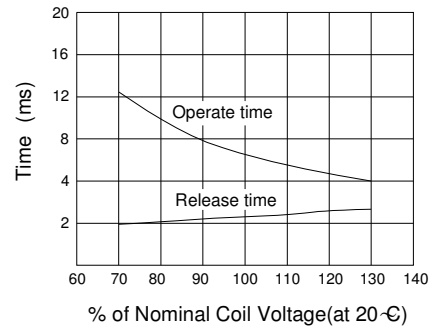
Coil temperature rise



Life expectancy



Operate time/Release time



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