

# MINIATURE RELAY

## 1 POLE—1 to 2 A (FOR SIGNAL SWITCHING)

### MZ SERIES

#### ■ FEATURES

- Subminiature size
- Standard and high sensitivity types available
- UL, CSA recognized
- FCC rules and regulations part 68  
—Dielectric strength 1,500 V between coil and contacts
- High reliability-bifurcated contacts available
- DIL pitch terminals
- Plastic sealed type

#### ■ ORDERING INFORMATION

[Example]       $\frac{MZ}{(a)} \frac{F}{(b)} - \frac{12}{(c)} \frac{W}{(d)} \frac{HG}{(e)} - \frac{K}{(f)} - \frac{U}{(g)}$



|     |                     |                                                                                    |
|-----|---------------------|------------------------------------------------------------------------------------|
| (a) | Series Name         | MZ : MZ Series                                                                     |
| (b) | Dielectric Function | Nil : Standard type<br>F : High dielectric strength type                           |
| (c) | Nominal Voltage     | Refer to the COIL DATA CHART                                                       |
| (d) | Contact             | Nil : 1 A single<br>D : 2 A single (without MZF)<br>W : 1 A bifurcated type        |
| (e) | Coil Type           | HG : Standard type (without MZ-D)<br>HS : High sensitivity type (without MZF/MZ-D) |
| (f) | Enclosure           | Nil : Flux free type<br>K : Plastic sealed type                                    |
| (g) | UL, CSA Standard    | Nil : Non UL, • CSA approved type<br>U : UL • CSA approved type                    |

Note: For movable and stationary contact with gold overlay type, add suffix “-OH”.

#### ■ SAFETY STANDARD AND FILE NUMBERS

UL478, 508 (File No. E45026)

C22.2 No. 14 (File No. LR35579)

Please request when the approval markings are required on the cover.

| Nominal voltage | Contact rating                      |
|-----------------|-------------------------------------|
| 1.5 to 48 VDC   | 0.5 A 120 VAC, 1 A 24 VDC resistive |
|                 | 1 A 120 VDC, 2 A 30 VDC resistive   |

## ■ SPECIFICATIONS

| Item       |                              |                           | Standard                                                                                                            |                               |                                                                                                           | High Sensitivity Type |                 |  |
|------------|------------------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------|-----------------------|-----------------|--|
|            |                              |                           | Single                                                                                                              |                               | Bifurcated                                                                                                | Single                | Bifurcated      |  |
|            |                              |                           | MZ-( ) D                                                                                                            | MZ-( ) HG                     | MZ-( ) WHG                                                                                                | MZ-( ) HS             | MZ-( ) WHS      |  |
| Contact    | Arrangement                  |                           | 1 form C (SPDT)                                                                                                     |                               |                                                                                                           |                       |                 |  |
|            | Material                     |                           | Gold-overlay silver-alloy                                                                                           | Gold overlay silver-palladium |                                                                                                           |                       |                 |  |
|            | Resistance (initial)         |                           | Maximum 100 mΩ (at 1 A 6 VDC)                                                                                       |                               |                                                                                                           |                       |                 |  |
|            | Rating (resistive)           |                           | 2 A 24 VDC<br>1 A 120 VAC                                                                                           | 1 A 24 VDC<br>0.5 A 120 VAC   |                                                                                                           |                       |                 |  |
|            | Maximum Carrying Current     |                           | 2 A                                                                                                                 |                               |                                                                                                           |                       |                 |  |
|            | Maximum Switching Power      |                           | 120 VA/48 W                                                                                                         | 60 AV/24 W                    |                                                                                                           |                       |                 |  |
|            | Maximum Switching Voltage    |                           | 120 VAC, 60 VDC                                                                                                     |                               |                                                                                                           |                       |                 |  |
|            | Maximum Switching Current    |                           | 2 A                                                                                                                 | 1 A                           |                                                                                                           |                       |                 |  |
|            | Minimum Switching Load*      |                           | 1 mA 1 VDC                                                                                                          |                               | 0.1 mA 100 mVDC                                                                                           | 1 mA 1 VDC            | 0.1 mA 100 mVDC |  |
|            | Capacitance (at 10 MHz)      |                           | Approximately 0.8 pF (between open contacts, adjacent contacts)<br>Approximately 7.5 pF (between coil and contacts) |                               |                                                                                                           |                       |                 |  |
| Coil       | Nominal Power (at 20°C)      |                           | 0.45 to 0.50 W                                                                                                      |                               |                                                                                                           | 0.19 to 0.27 W        |                 |  |
|            | Operate Power (at 20°C)      |                           | 0.22 to 0.25 W                                                                                                      |                               |                                                                                                           | 0.10 to 0.13 W        |                 |  |
|            | Operating Temperature        |                           | -30°C to +55°C (no frost) (refer to the CHARACTERISTIC DATA)                                                        |                               |                                                                                                           |                       |                 |  |
| Time Value | Operate (at nominal voltage) |                           | Maximum 6 ms                                                                                                        |                               |                                                                                                           |                       |                 |  |
|            | Release (at nominal voltage) |                           | Maximum 3 ms                                                                                                        |                               |                                                                                                           |                       |                 |  |
| Insulation | Resistance (at 500 VDC)      |                           | Minimum 100 MΩ                                                                                                      |                               |                                                                                                           |                       |                 |  |
|            | Dielectric Strength          | between open contacts     | AC 500 V 1 minute (standard type)<br>AC 1,000 V 1 minute (high dielectric strength type, MZF)                       |                               |                                                                                                           |                       |                 |  |
|            |                              | between coil and contacts | AC 500 V 1 minute (standard type)<br>AC 1,500 V 1 minute (high dielectric strength type, MZF)                       |                               |                                                                                                           |                       |                 |  |
|            | Surge Strength               |                           | 1,500 V (between coil and contacts)                                                                                 |                               |                                                                                                           |                       |                 |  |
| Life       | Mechanical                   |                           | 2 × 10 <sup>7</sup> operations minimum                                                                              |                               |                                                                                                           |                       |                 |  |
|            | Electrical (at rating)       |                           | 1 A 120 VAC 1 × 10 <sup>5</sup> ops. min.<br>2 A 24 VDC 2 × 10 <sup>5</sup> ops. min.                               |                               | 0.5 A 120 VAC 2 × 10 <sup>5</sup> operations minimum<br>1 A 24 VAC 5 × 10 <sup>5</sup> operations minimum |                       |                 |  |
| Other      | Vibration Resistance         | Misoperation              | 10 to 55 Hz (double amplitude of 3.28 mm)                                                                           |                               |                                                                                                           |                       |                 |  |
|            |                              | Endurance                 | 10 to 55 Hz (double amplitude of 3.28 mm)                                                                           |                               |                                                                                                           |                       |                 |  |
|            | Shock Resistance             | Misoperation              | 100 m/s <sup>2</sup> (11±1 ms)                                                                                      |                               |                                                                                                           |                       |                 |  |
|            |                              | Endurance                 | 1,000 m/s <sup>2</sup> ( 6±1 ms)                                                                                    |                               |                                                                                                           |                       |                 |  |
|            | Weight                       |                           | Approximately 3.5 g                                                                                                 |                               |                                                                                                           |                       |                 |  |

\*1 Minimum switching loads mentioned above are reference values. Please perform the confirmation test with the actual load before production since reference values may vary according to switching frequencies, environmental conditions and expected reliability levels.

# MZ SERIES

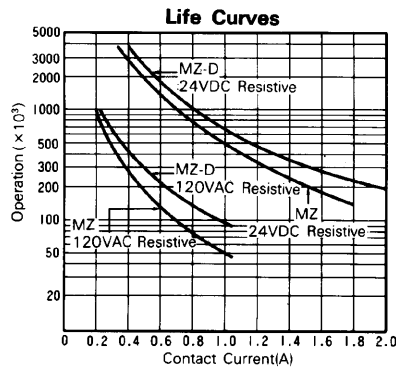
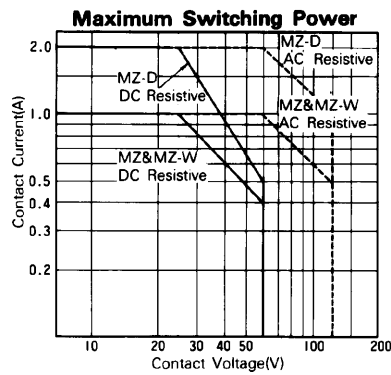
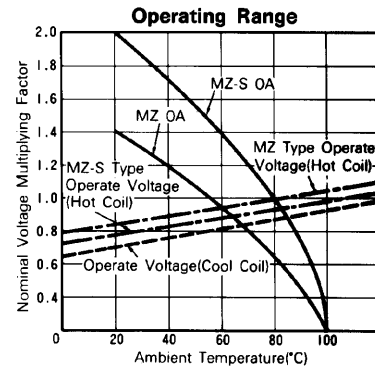
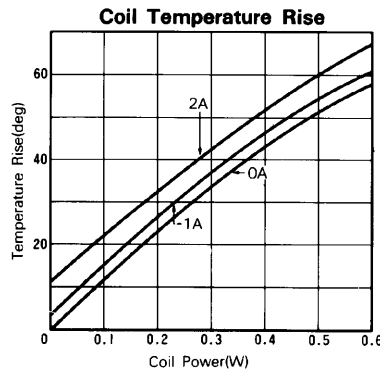
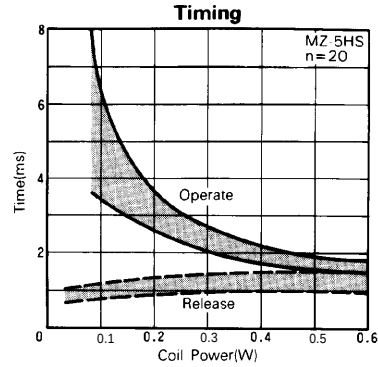
## ■ COIL DATA CHART

|                       | MODEL       |                  |               | Nominal voltage | Coil resistance ( $\pm 10\%$ ) | Must operate voltage | Must release voltage | Nominal power |
|-----------------------|-------------|------------------|---------------|-----------------|--------------------------------|----------------------|----------------------|---------------|
|                       | Single      |                  | Bifurcated    |                 |                                |                      |                      |               |
|                       | 2 A Type    | 1 A Type         | 1 A Type      |                 |                                |                      |                      |               |
| Standard Type         | MZ-1.5D-(K) | MZ (F)-1.5HG-(K) | MZ-1.5WHG-(K) | 1.5 VDC         | 5 $\Omega$                     | 1.05 VDC             | 0.08 VDC             | 450 mW        |
|                       | MZ- 3 D-(K) | MZ (F)- 3 HG-(K) | MZ- 3 WHG-(K) | 3 VDC           | 20 $\Omega$                    | 2.1 VDC              | 0.15 VDC             | 450 mW        |
|                       | MZ-4.5D-(K) | MZ (F)-4.5HG-(K) | MZ-4.5WHG-(K) | 4.5 VDC         | 45 $\Omega$                    | 3.15 VDC             | 0.23 VDC             | 450 mW        |
|                       | MZ- 5 D-(K) | MZ (F)- 5 HG-(K) | MZ- 5 WHG-(K) | 5 VDC           | 56 $\Omega$                    | 3.5 VDC              | 0.25 VDC             | 450 mW        |
|                       | MZ- 6 D-(K) | MZ (F)- 6 HG-(K) | MZ- 6 WHG-(K) | 6 VDC           | 80 $\Omega$                    | 4.2 VDC              | 0.3 VDC              | 450 mW        |
|                       | MZ- 9 D-(K) | MZ (F)- 9 HG-(K) | MZ- 9 WHG-(K) | 9 VDC           | 180 $\Omega$                   | 6.3 VDC              | 0.45 VDC             | 450 mW        |
|                       | MZ-12 D-(K) | MZ (F)-12 HG-(K) | MZ-12 WHG-(K) | 12 VDC          | 320 $\Omega$                   | 8.4 VDC              | 0.6 VDC              | 450 mW        |
|                       | MZ-18 D-(K) | MZ (F)-18 HG-(K) | MZ-18 WHG-(K) | 18 VDC          | 720 $\Omega$                   | 12.6 VDC             | 0.9 VDC              | 450 mW        |
|                       | MZ-24 D-(K) | MZ (F)-24 HG-(K) | MZ-24 WHG-(K) | 24 VDC          | 1,280 $\Omega$                 | 16.8 VDC             | 1.2 VDC              | 450 mW        |
|                       | MZ-48 D-(K) | MZ (F)-48 HG-(K) | MZ-48 WHG-(K) | 48 VDC          | 4,600 $\Omega$                 | 33.6 VDC             | 2.4 VDC              | 500 mW        |
| High Sensitivity Type |             | MZ-1.5HS-(K)     | MZ-1.5WHS-(K) | 1.5 VDC         | 12 $\Omega$                    | 1.05 VDC             | 0.08 VDC             | 190 mW        |
|                       |             | MZ- 3 HS-(K)     | MZ- 3 WHS-(K) | 3 VDC           | 45 $\Omega$                    | 2.1 VDC              | 0.15 VDC             | 200 mW        |
|                       |             | MZ-4.5HS-(K)     | MZ-4.5WHS-(K) | 4.5 VDC         | 100 $\Omega$                   | 3.15 VDC             | 0.23 VDC             | 200 mW        |
|                       |             | MZ- 5 HS-(K)     | MZ- 5 WHS-(K) | 5 VDC           | 120 $\Omega$                   | 3.5 VDC              | 0.25 VDC             | 200 mW        |
|                       |             | MZ- 6 HS-(K)     | MZ- 6 WHS-(K) | 6 VDC           | 180 $\Omega$                   | 4.2 VDC              | 0.3 VDC              | 200 mW        |
|                       |             | MZ- 9 HS-(K)     | MZ- 9 WHS-(K) | 9 VDC           | 400 $\Omega$                   | 6.3 VDC              | 0.45 VDC             | 200 mW        |
|                       |             | MZ-12 HS-(K)     | MZ-12 WHS-(K) | 12 VDC          | 700 $\Omega$                   | 8.4 VDC              | 0.6 VDC              | 200 mW        |
|                       |             | MZ-15 HS-(K)     | MZ-15 WHS-(K) | 15 VDC          | 1,100 $\Omega$                 | 10.5 VDC             | 0.75 VDC             | 200 mW        |
|                       |             | MZ-18 HS-(K)     | MZ-18 WHS-(K) | 18 VDC          | 1,600 $\Omega$                 | 12.6 VDC             | 0.9 VDC              | 200 mW        |
|                       |             | MZ-24 HS-(K)     | MZ-24 WHS-(K) | 24 VDC          | 2,800 $\Omega$                 | 16.8 VDC             | 1.2 VDC              | 200 mW        |
|                       |             | MZ-48 HS-(K)     | MZ-48 WHS-(K) | 48 VDC          | 8,500 $\Omega$                 | 33.6 VDC             | 2.4 VDC              | 270 mW        |

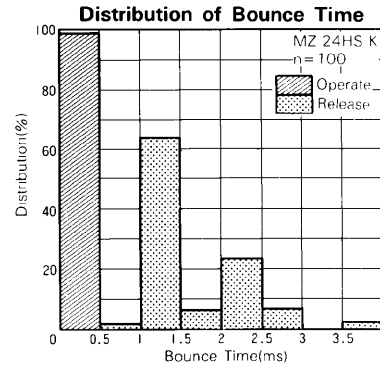
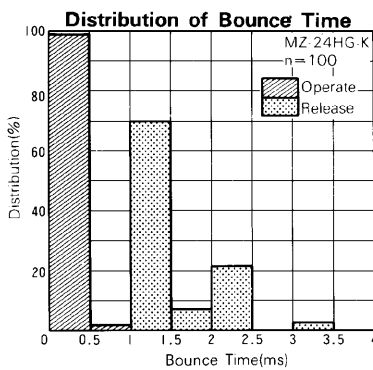
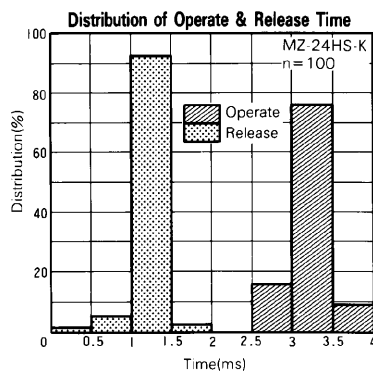
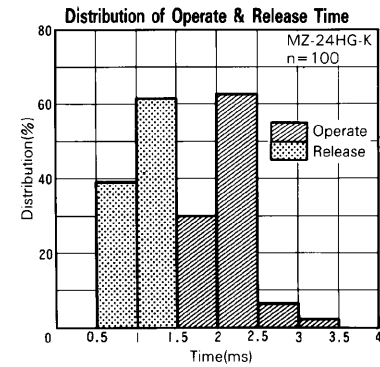
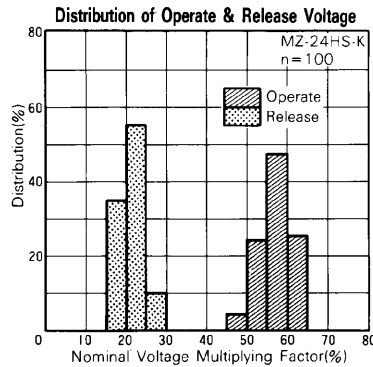
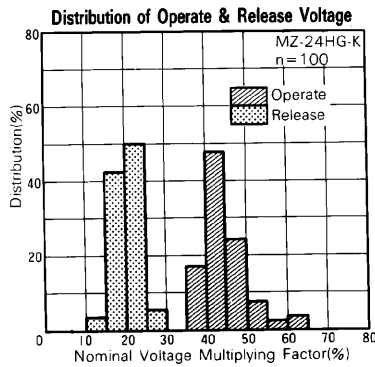
Note: All values in the table are measured at 20°C.

# MZ SERIES

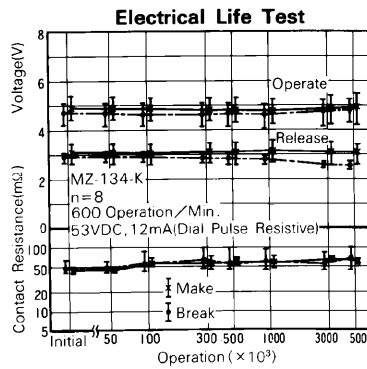
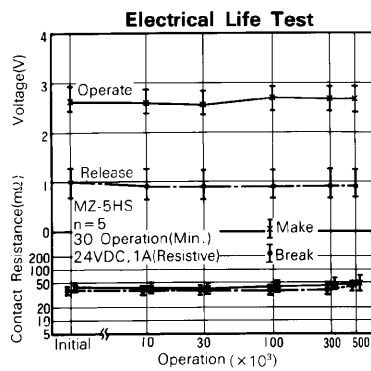
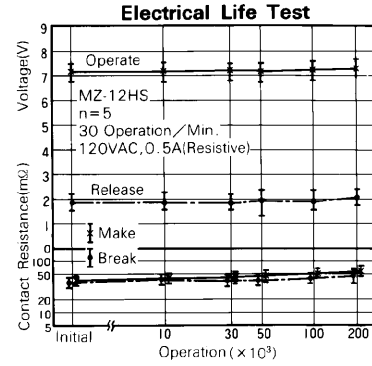
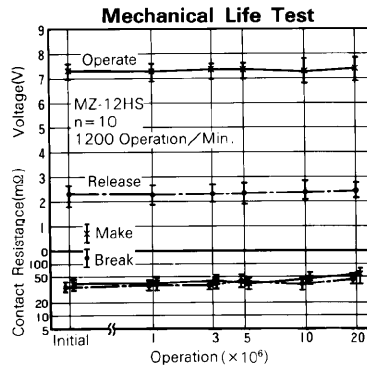
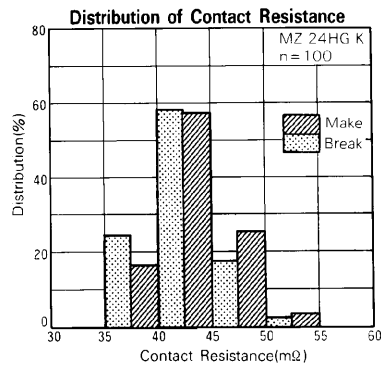
## CHARACTERISTIC DATA



## REFERENCE DATA



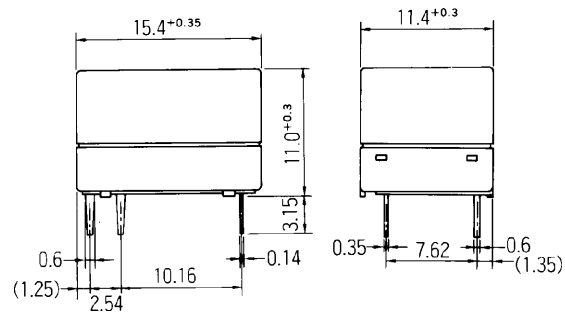
# MZ SERIES



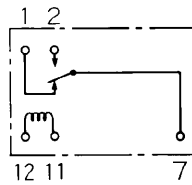
## ■ DIMENSIONS

### ● Dimensions

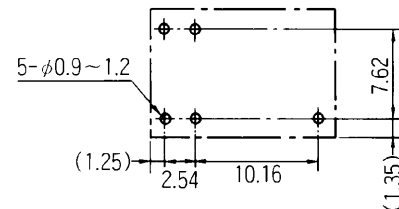
MZ (F) type (Flux free type)



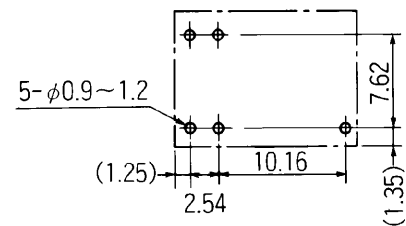
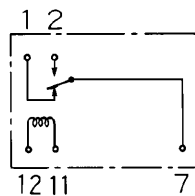
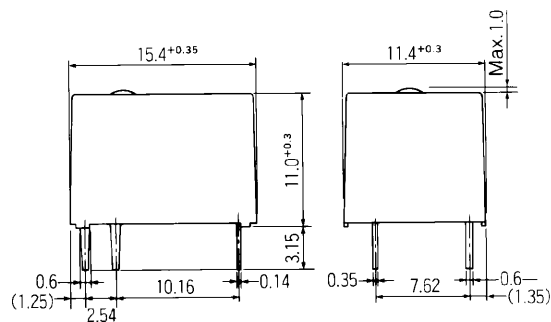
### ● Schematics (Bottom View)



### ● PC board mounting hole layout (Bottom View)



MZ (F)-K type (Plastic sealed type)



Unit: mm

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