# QUIET RELAY

# 1 POLE—20 A (FOR AUTOMOTIVE APPLICATIONS)

# CS SERIES

## ■ FEATURES

- Subminiature automotive relay with high reliability
  —Size 16.0 (W) × 22.2 (L) × 16.0 (H)
  —Weight approximately 11 g
- 1 form A (SPST-NO) or 1 form C (SPDT)
- Low-acoustic noise by air damper (quiet type)
- Wide operating temperature range
- Plastic sealed type backfilled with nitrogen

## ■ ORDERING INFORMATION

[Example] CS (a) – (*) 12 (b) M (c) N (d) – K (e)

| | | |
|---|---|---|
| (a) | Series Name | CS Series |
| (b) | Nominal Voltage | Refer to the COIL DATA CHART |
| (c) | Contact Arrangement | Nil : 1 form C (SPDT)<br>M : 1 form A (SPST-NO) |
| (d) | Sound Pressure Level | Nil : Quiet type<br>N : Standard type<br>T : Quiet type (for intermittent wiper controller) |
| (e) | Enclosure | K : Plastic sealed type |

Actual marking omits the hyphen (-) of (*)

## ■ SPECIFICATIONS

| Item | | | Specifications |
|---|---|---|---|
| Contact | Arrangement | | 1 form A (SPST-NO) or 1 form C (SPDT) |
| | Material | | Silver alloy |
| | Resistance (initial) | | Maximum 50 mΩ (at 5 A 12 VDC) |
| | Rating | | 5A 16 VDC (at 25 A inrush, motor load) |
| | Maximum Carrying Current | | 25 A (at 1 hour continuous duty) |
| | Maximum Switching Current | | 20 A |
| | Minimum Switching Load *1 | | 100 mA 5 VDC |
| Coil | Nominal Power (at 20°C) | | 0.45 W |
| | Operate Power (at 20°C) | | 0.18 W |
| | Operating Temperature | | –40°C to + 85°C (no frost) (refer to the CHARACTERISTIC DATA) |
| Time Value | Operate (at nominal voltage) | | Maximum 10 ms (with diode) |
| | Release (at nominal voltage) | | Maximum 15 ms (with diode) |
| Insulation | Resistance (at 500 VDC) | | Minimum 1,000 MΩ |
| | Dielectric Strength | between open contacts | AC 500 V 1 minute |
| | | between coil and contacts | AC 500 V 1 minute |
| | Average Acoustic Noise Level | | 57 dB (distance 10 cm) |
| Life | Mechanical | | $1 \times 10^7$ operations minimum |
| | Electrical | | $3 \times 10^5$ operations minimum (rated load) |
| Other | Vibration Resistance | Misoperation | 10 to 55 Hz (double amplitude of 1.5 mm) |
| | | Endurance | 10 to 55 Hz (double amplitude of 1.5 mm) |
| | Shock Resistance | Misoperation | 200 m/s$^2$ (11 ± 1 ms) |
| | | Endurance | 1,000 m/s$^2$ ( 6 ± 1 ms) |
| | Weight | | Approximately 11 g |

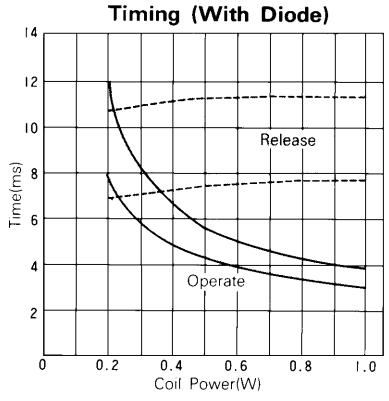
*1 Minimum switching loads mentioned above are reference values. Please perform the confirmation test with the actual load before production since reference values may vary according to switching frequencies, environmental conditions and expected reliability levels.

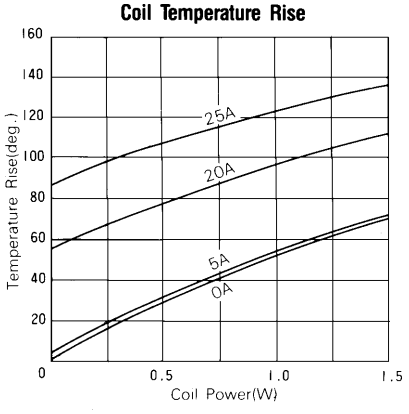
## ■ COIL RATINGS

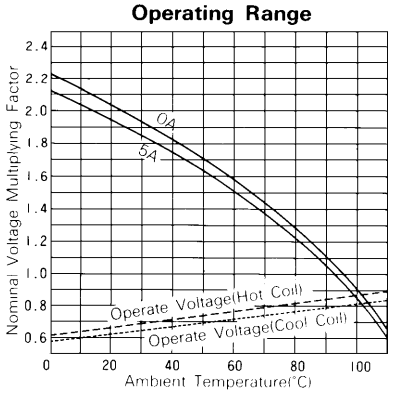
| MODEL | | Nominal voltage | Coil resistance (±10%) | Must operate voltage | Must release voltage | Nominal power |
|---|---|---|---|---|---|---|
| Quiet Type | Standard Type | | | | | |
| CS- 5 ( ) ( ) -K | CS- 5 ( ) ( ) N -K | 5 VDC | 56 Ω | 3.1 VDC | 0.5 VDC | 0.45 W |
| CS- 6 ( ) ( ) -K | CS- 6 ( ) ( ) N -K | 6 VDC | 80 Ω | 3.7 VDC | 0.6 VDC | 0.45 W |
| CS- 9 ( ) ( ) -K | CS- 9 ( ) ( ) N -K | 9 VDC | 180 Ω | 5.6 VDC | 0.9 VDC | 0.45 W |
| CS-10 ( ) ( ) -K | CS-10 ( ) ( ) N -K | 10 VDC | 222 Ω | 6.2 VDC | 1.0 VDC | 0.45 W |
| CS-12 ( ) ( ) -K | CS-12 ( ) ( ) N -K | 12 VDC | 320 Ω | 7.5 VDC | 1.2 VDC | 0.45 W |
| CS-18 ( ) ( ) -K | CS-18 ( ) ( ) N -K | 18 VDC | 720 Ω | 11.2 VDC | 1.8 VDC | 0.45 W |
| CS-24 ( ) ( ) -K | CS-24 ( ) ( ) N -K | 24 VDC | 1,280 Ω | 15.0 VDC | 2.4 VDC | 0.45 W |

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

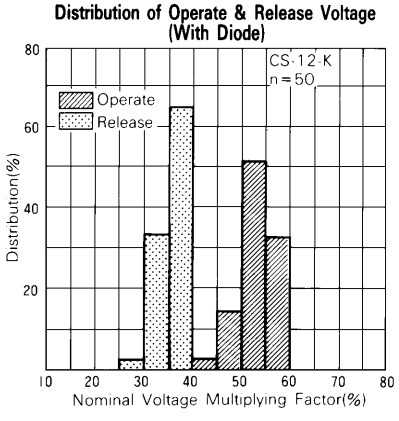
## ■ CHARACTERISTIC DATA

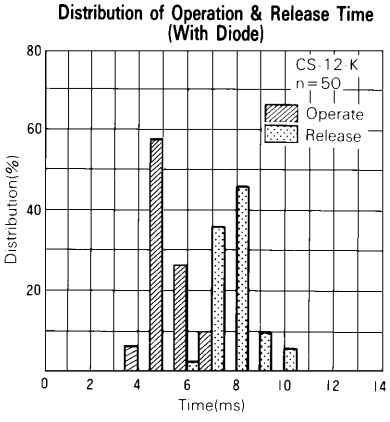


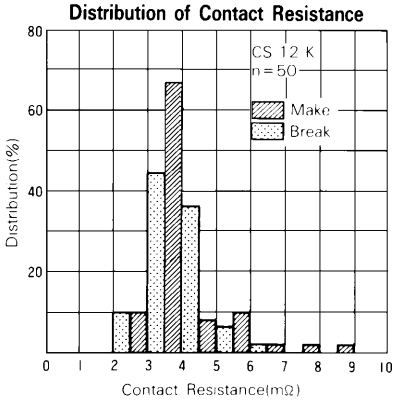



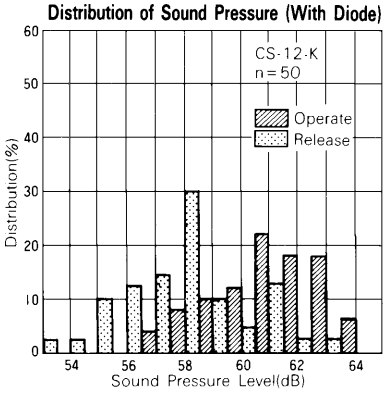



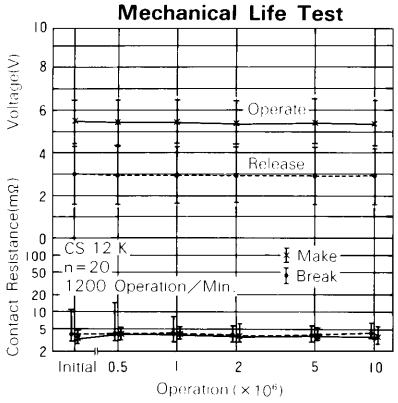

## ■ REFERENCE DATA

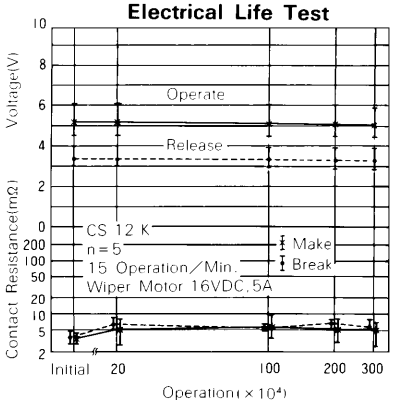




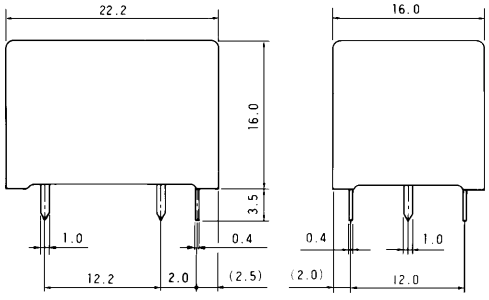



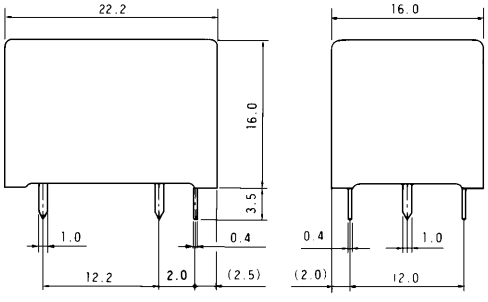

## ■ DIMENSIONS

### ● Dimensions

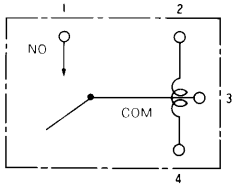
CS-M type

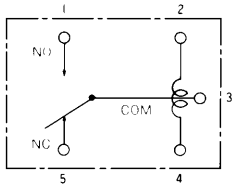



CS type

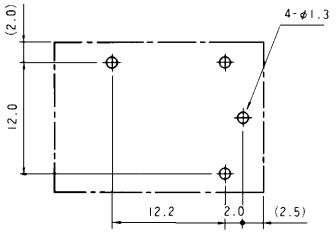


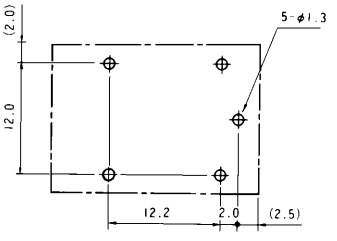

### ● Schematics
(BOTTOM VIEW)




### ● PC board mounting hole layout
(BOTTOM VIEW)




Unit: mm