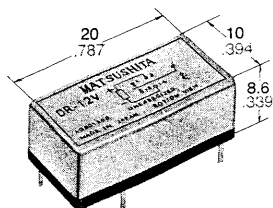


NAIS

HIGHLY RELIABLE MINIATURE DIP RELAYS

DR-RELAYS

UL File No.: E43149 CSA File No.: LR26550



mm inch

- High breakdown voltage – Between open contacts: 750 Vrms
Between contacts and coil: 1500 Vrms
- Surge voltage withstand: 1500 V (Based on part 68, FCC standard)
- 1 coil and 2 coil latching types available
- High sensitivity
- High contact pressure
- Miniature size and low profile —standing only 8.6 mm (.339 inches) including stand-offs on headers
- High speed —Operate time: Approx. 1 msec.

SPECIFICATIONS

| Contacts | |
|---------------------------------------------------------------|--------------------|
| Arrangement | 1 Form C |
| Initial contact resistance, max. (By voltage drop 6 V DC 1 A) | 60 mΩ |
| Initial contact pressure | Approx. 9 g .32 oz |
| Electrostatic capacitance | |
| Contact-Contact | 3 pF |
| N.O. contact-Coil | 4 pF |
| N.C. contact-Coil | 5 pF |
| UL-Rating (resistive) | |
| Switching power | 33 VA, 20 W |
| Switching voltage | 110 V AC, 30 V DC |
| Switching current | AC 0.3 A, DC 1 A |
| Contact material | Gold cobalt |
| Expected life (min. operations) | |
| Mechanical (at 50 cps.) | 10 ⁹ |
| Electrical | |
| 1 A 20 V DC resistive | 10 ⁶ |
| 0.3 A 110 V AC resistive | 10 ⁶ |
| 0.2 A 24 V DC resistive | 10 ⁷ |

| | |
|-------------------------------|--------------------------------------------------------------------|
| Contact bounce | |
| Single side stable | Approx. 0.5 msec. |
| 1 coil latching | Approx. 0.3 msec. |
| 2 coil latching | Approx. 0.3 msec. |
| Characteristics | |
| Max. operating speed | 60 cpm at nominal load 300 cps. at no load |
| Operate time | Approx. 1 msec. |
| Release time | Approx. 0.5 msec. |
| Initial breakdown voltage | |
| Between open contacts | 750 Vrms |
| Between live parts and ground | 1,000 Vrms |
| Between coil and contact | 1,500 Vrms |
| Initial insulation resistance | Min. 1,000 MΩ at 500 V DC |
| Max. continuous power | 0.5 W |
| Temperature rise | 20 deg. (at 120 mW application) 47 deg. (at 500 mW application) |
| Ambient temperature | -50°C to +85°C -58°F to +185°F |
| Shock resistance | More than 100 G |
| Vibration resistance | 20 G, 10 to 55 Hz at double amplitude of 3.3 mm |
| Unit weight | 4 g .14 oz |

TYPES AND COIL DATA at 20°C 68°F

| Single side stable | Pick-up voltage, V DC (max.) | Drop-out voltage, V DC (min.) | Maximum allowable voltage, V DC | Coil resistance, Ω (±10%) | Nominal Operating power, mW |
|--------------------|------------------------------|---------------------------------|-----------------------------------------------|-----------------------------|-----------------------------|
| DR-3V | 2.4 | 0.3 | 6.8 | 94 | 96 |
| DR-5V | 4.0 | 0.3 | 10.9 | 320 | 78 |
| DR-6V | 4.8 | 0.6 | 12.8 | 330 | 109 |
| DR-12V | 9.6 | 1.2 | 26.4 | 1,400 | 103 |
| DR-24V | 17.0 | 2.4 | 42.4 | 3,600 | 160 |
| DR-48V | 33.6 | 4.8 | 74.1 | 11,000 | 209 |
| 1 coil latching | Pick-up voltage, V DC (max.) | Maximum allowable voltage, V DC | Coil resistance, Ω (±10%) | Nominal operating power, mW | |
| DR-L-3V | 2.4 | 8.9 | 160 | 56 | |
| DR-L-5V | 4.0 | 14.5 | 420 | 59 | |
| DR-L-6V | 4.8 | 17.4 | 610 | 59 | |
| DR-L-12V | 9.6 | 33.9 | 2,300 | 63 | |
| DR-L-24V | 17.0 | 53.8 | 5,800 | 99 | |
| DR-L-48V | 33.6 | 102.7 | 21,100 | 110 | |
| 2 coil latching | Pick-up voltage, V DC (max.) | Maximum allowable voltage, V DC | Coil resistance, Ω (±10%) Coil I & Coil II | Nominal operating power, mW | |
| DR-L2-3V | 2.4 | 6.3 | 80 | 112 | |
| DR-L2-5V | 4.0 | 10.6 | 225 | 111 | |
| DR-L2-6V | 4.8 | 12.0 | 290 | 124 | |
| DR-L2-12V | 9.6 | 24.6 | 1,210 | 119 | |
| DR-L2-24V | 18.0 | 43.8 | 3,840 | 150 | |
| DR-L2-48V | 33.6 | 63.0 | 7,950 | 290 | |

ORDERING INFORMATION

Ex. DR — L2 — 24V

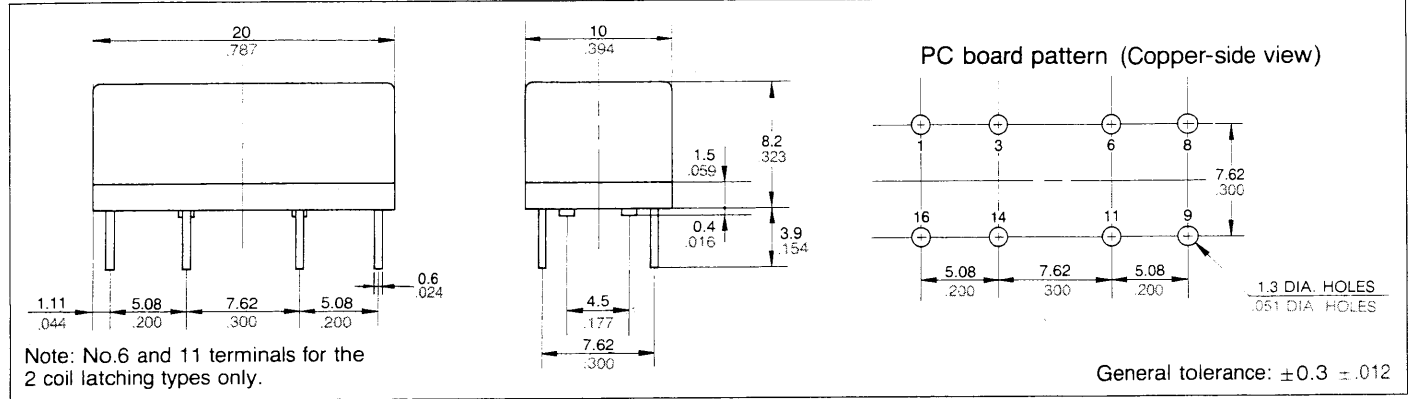
| Operating function | Coil voltage |
|-------------------------|--------------|
| Nil: Single side stable | 3, 5, 6, 12, |
| L: 1 coil latching | 24, 48 V |
| L2: 2 coil latching | |

- (Notes) 1. For UL/CSA recognized types, add suffix UL/CSA.
2. Standard packing: Carton; 50 pcs.
Case; 500 pcs.

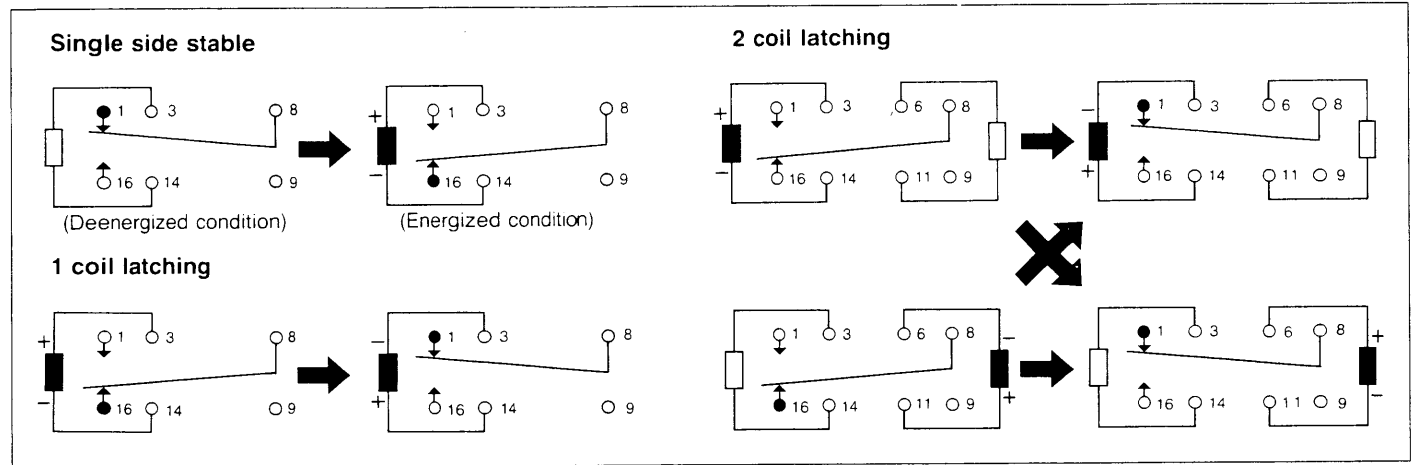
TYPICAL APPLICATIONS

Telecommunications equipment, alarm devices, machine tools, NC machines, automatic warehouse control, conveyors, air-conditioners, pressing machines, textile machinery, elevators, control panels, pin-board programmers, parking meters, industrial robots, detectors, annunciators, optical instruments, business machine, time recorders, cash registers, copiers, vending machines, medical equipment.

DIMENSIONS



SCHEMATIC (Bottom view)



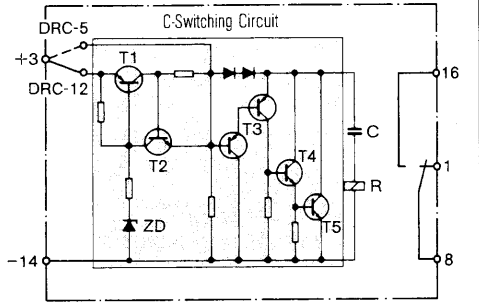
DR-C POWER SAVING RELAYS

| Rated voltage | $U_{pick\ up\ at\ +20^\circ C}$ | $U_{permis\ at\ 40^\circ C}$ | $U_{dropout}$ |
|---------------|-----------------------------------------------|------------------------------|---------------------------------------------|
| 5* | 4.5 (25°C) $\frac{du}{dt} > \frac{8V}{ms}$ | 7 | 2 (25°C) $\frac{du}{dt} > \frac{8V}{ms}$ |
| 12* | 9 (25°C) | 26 | 7.5 (25°C) |

Advantages: No coil heating or thermo voltage, resulting in increased reliability of the relay and neighbouring components. Defined pick-up and drop-out values with negative temperature co-efficient of approximately 0.028 V/°C. Thus, for example, the DR-C-12 V picks up at 7.6 V at 75°C and at 9.8 V at -5°C.

By parallel switching a capacitor it is possible to achieve drop-out relays of approximately 0.15 s/μF with the DR-C-12 V.

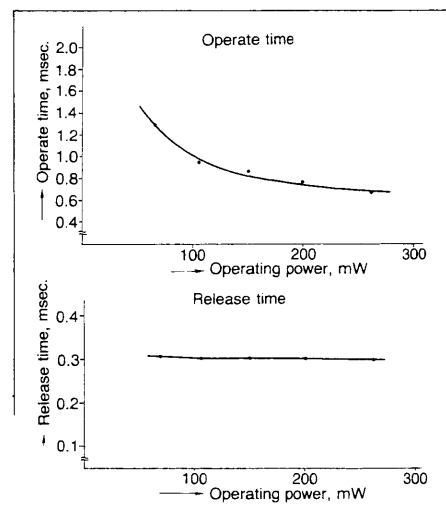
Attention! With the DR-C relay, as with the DR-L- and DR-L2- relays the position of the changeover contact is unknown. After the first control signal, the contact position is as shown in the diagram.



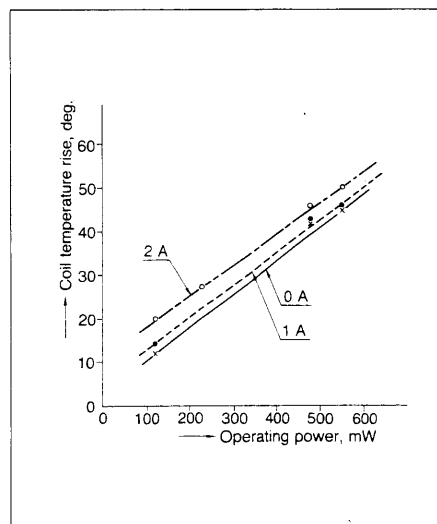
* DR-C relays have an integrated C switching circuit. Thus, after the initial pick-up time of 0.5 ms, no significant current flows through the coil. Interruption of the coil voltage (eg on switch-off) allows the capacitor to discharge via the coil and trigger circuit, resetting the relay to its deenergised condition.

DATA

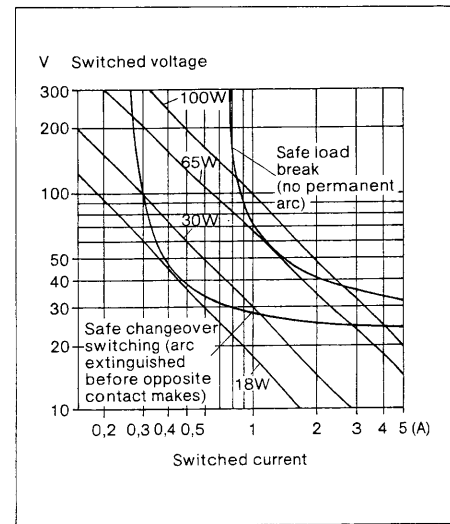
Operate and release time (Single side stable)



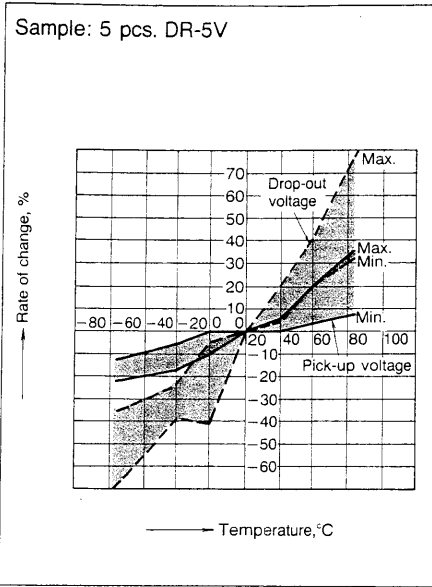
Coil temperature rise (Single side stable)



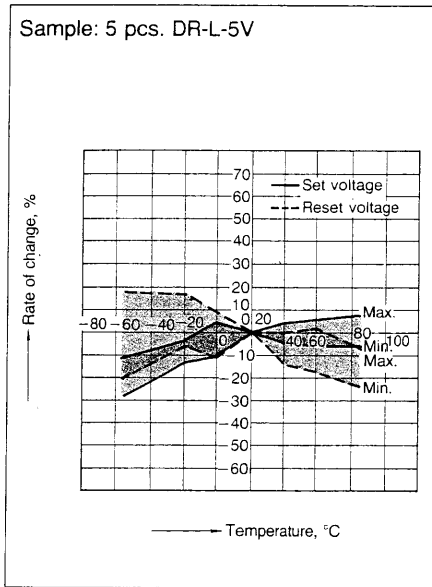
Load limit curves



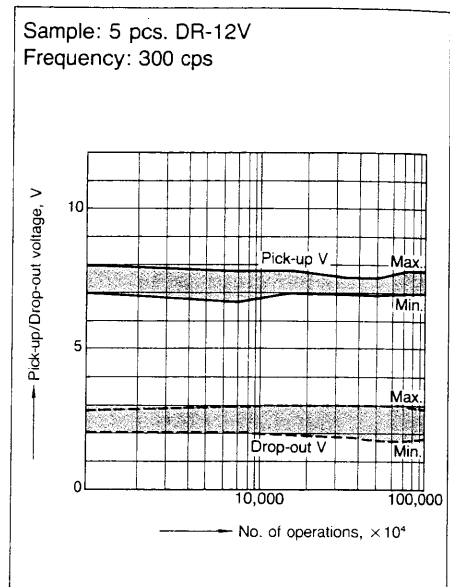
Pick-up/drop-out voltage vs. temperature (Single side stable)



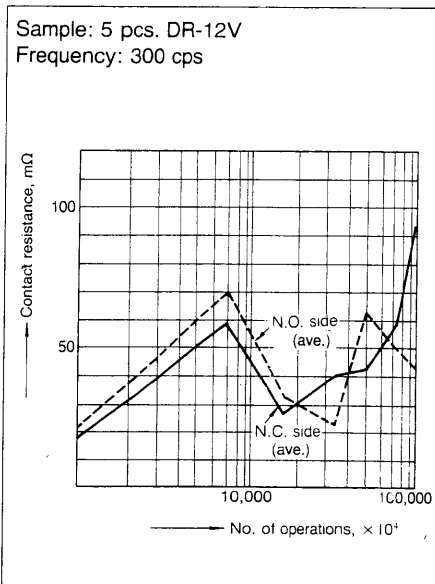
Pick-up/drop-out voltage vs. temperature (1-coil latching)



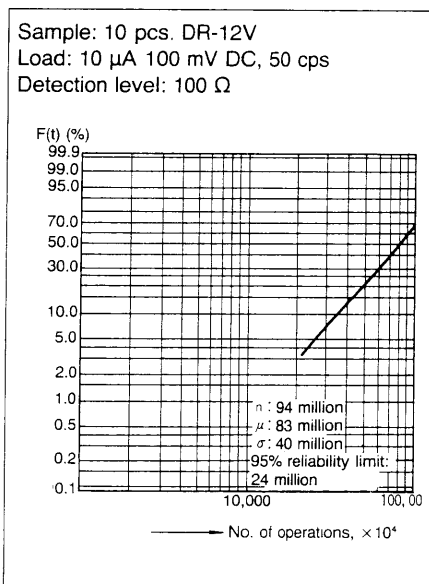
Mechanical life Change of pick-up and drop-out V



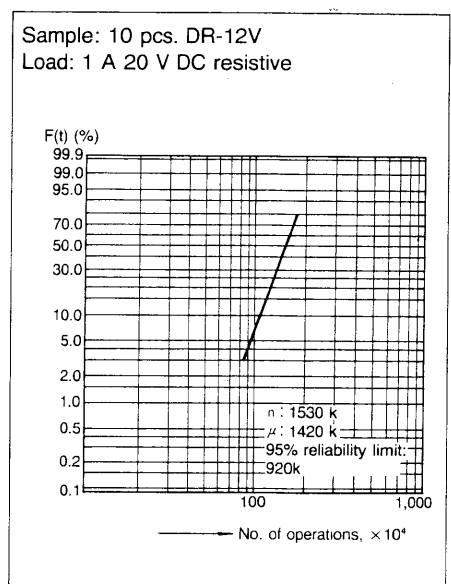
Mechanical life Change of contact resistance



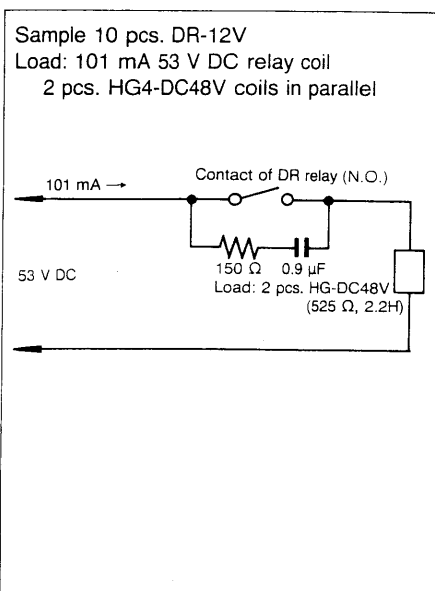
Contact reliability test



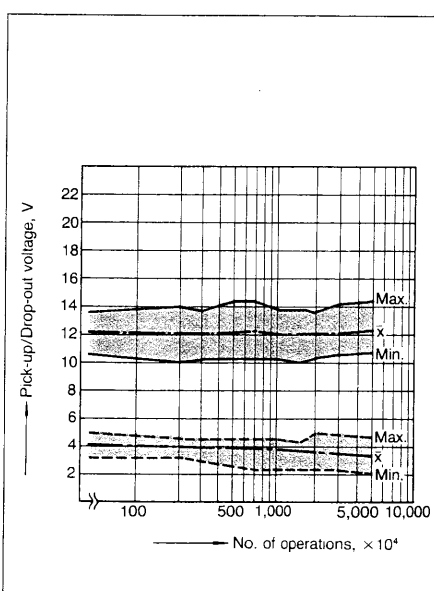
Electrical life



Electrical life test



Change of pick-up and drop-out voltage



Change of contact resistance

