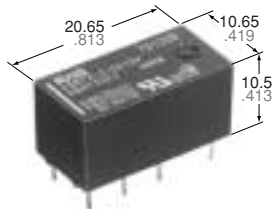


NAIS

4,000 V BREAKDOWN VOLTAGE DS RELAYS

DSBT RELAYS



mm inch

FEATURES

- 4,000 V breakdown voltage
- Reinforced insulation between coil and contacts
- Surge voltage withstand: 1500 V FCC Parts 68

SPECIFICATIONS

Contact

| Arrangement | | 2 Form C | 2 Form D |
|---|----------------------------|--------------------|-----------------|
| Initial contact resistance, max. (By voltage drop 6 V DC 1 A) | | 50 mΩ | |
| Contact material | | Gold-clad silver | |
| Rating (resistive load) | Nominal switching capacity | 2 A 30 V DC | 1 A 30 V DC |
| | Max. switching power | 60 W, 125 VA | 30 W, 62.5 VA |
| | Max. switching voltage | 220 V DC, 250 V AC | |
| | Max. switching current | 2 A | 1 A |
| | Min. switching capacity**1 | 10 μA 10 mV DC | |
| Electrical life (min. ope.) | Mechanical (at 180 cpm) | 2×10 ⁷ | 10 ⁶ |
| | Electrical (at 20 cpm) | 2×10 ⁵ | |

**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.

Coil

| Arrangement | 2 Form C | 2 Form D |
|-------------------------|----------|----------|
| Nominal operating power | 360 mW | 540 mW |

Remarks

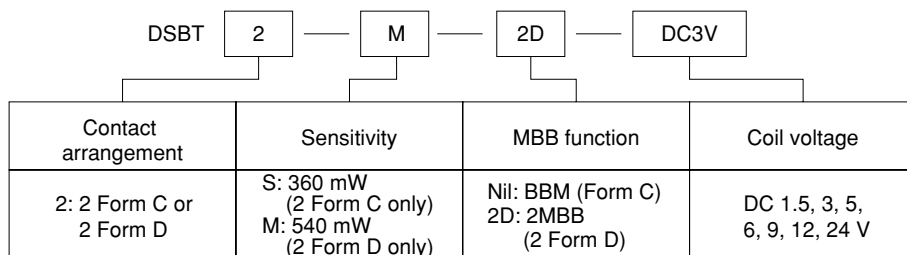
- * Specifications will vary with foreign standards certification ratings.
- *1 Measurement at same location as "Initial breakdown voltage" section
- *2 Detection current: 10mA
- *3 Excluding contact bounce time
- *4 Half-wave pulse of sine wave: 11ms, detection time: 10μs
- *5 Half-wave pulse of sine wave: 6ms
- *6 Detection time: 10μs
- *7 Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT.

Characteristics

| Arrangement | | 2 Form C | 2 Form D |
|--|---------------------------|---|-----------------------------------|
| Max. operating speed | | 60 cpm at rated load | |
| Initial insulation resistance*1 | | Min. 100 MΩ (at 500 V DC) | |
| Initial break-down voltage*2 | Between open contacts | 750 Vrms for 1 min. | 500 Vrms for 1 min. |
| | Between contacts and coil | 4,000 Vrms for 1 min. | |
| | Between contacts sets | 750 V | 500 V |
| FCC surge voltage between open contacts | | 1,500 V | |
| Operate time*3 (at nominal voltage) | | Approx. 3 ms | |
| Release time (without diode)*3 (at nominal voltage) | | Approx. 2 ms | |
| Temperature rise | | Max. 65°C | |
| Vibration resistance | Functional*4 | 10 to 55 Hz at double amplitude of 3.3 mm | |
| | Destruction*5 | 10 to 55 Hz at double amplitude of 5 mm | |
| Shock resistance | Functional*6 | Min. 294 m/s ² (30 G) | |
| | Destruction | Min. 980 m/s ² (100 G) | |
| Conditions for operation, transport and storage*7 (Not freezing and condensing at low temperature) | Ambient temp. | -40°C to +70°C -40°F to +158°F | -40°C to +60°C -40°F to +140°F |
| | Humidity | 5 to 85%R.H. | |
| Unit weight | | Approx. 4.0 g 0.14 oz | |

TYPICAL APPLICATIONS ORDERING INFORMATION

Modem
Facsimile
Telecommunication equipment



Note: Standard packing; Carton: 25 pcs. Case 1,000 pcs.

DSBT

TYPES AND COIL DATA (at 20°C 68°F)

1) 2 Form C type

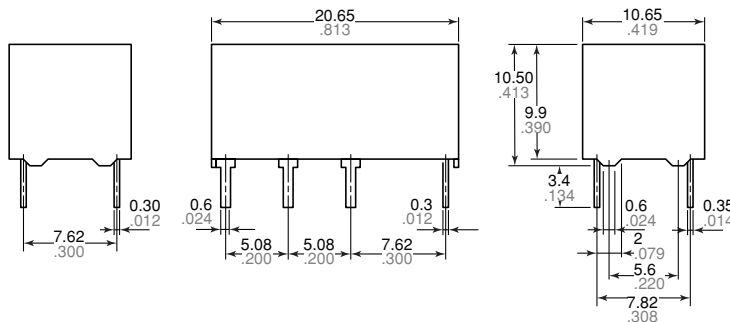
| Operating function | Part No. | Coil voltage, V DC | Pick-up voltage, V DC (max.) | Drop-out voltage, V DC (min.) | Nominal operating current, mA (±10%) | Coil resistance, Ω (±10%) | Nominal operating power, mW | Max. allowable voltage, V DC (at 50°C 122°F) |
|--------------------|----------------|--------------------|------------------------------|-------------------------------|--------------------------------------|---------------------------|-----------------------------|--|
| Single side stable | DSBT2-S-DC1.5V | 1.5 | 1.125 | 0.15 | 240 | 6.25 | 360 | 1.95 |
| | DSBT2-S-DC3V | 3 | 2.25 | 0.3 | 120 | 25 | | 3.9 |
| | DSBT2-S-DC5V | 5 | 3.75 | 0.5 | 72 | 69.4 | | 6.5 |
| | DSBT2-S-DC6V | 6 | 4.5 | 0.6 | 60 | 100 | | 7.8 |
| | DSBT2-S-DC9V | 9 | 6.75 | 0.9 | 40 | 225 | | 11.7 |
| | DSBT2-S-DC12V | 12 | 9 | 1.2 | 30 | 400 | | 15.6 |
| | DSBT2-S-DC24V | 24 | 18 | 2.4 | 15 | 1,600 | | 31.2 |

2) 2 Form D type

| Operating function | Part No. | Coil voltage, V DC | Pick-up voltage, V DC (max.) | Drop-out voltage, V DC (min.) | Nominal operating current, mA (±10%) | Coil resistance, Ω (±10%) | Nominal operating power, mW | Max. allowable voltage, V DC (at 50°C 122°F) |
|--------------------|-------------------|--------------------|------------------------------|-------------------------------|--------------------------------------|---------------------------|-----------------------------|--|
| Single side stable | DSBT2-M-2D-DC1.5V | 1.5 | 1.125 | 0.15 | 360 | 4.2 | 540 | 1.8 |
| | DSBT2-M-2D-DC3V | 3 | 2.25 | 0.3 | 180 | 16.7 | | 3.6 |
| | DSBT2-M-2D-DC5V | 5 | 3.75 | 0.5 | 108 | 46.3 | | 6 |
| | DSBT2-M-2D-DC6V | 6 | 4.5 | 0.6 | 90 | 66.7 | | 7.2 |
| | DSBT2-M-2D-DC9V | 9 | 6.75 | 0.9 | 60 | 150 | | 10.8 |
| | DSBT2-M-2D-DC12V | 12 | 9 | 1.2 | 45 | 266.7 | | 14.4 |
| | DSBT2-M-2D-DC24V | 24 | 18 | 2.4 | 22.5 | 1,066.7 | | 28.8 |

Note: Standard packing Tube: 25 pcs. Case: 1,000 pcs.

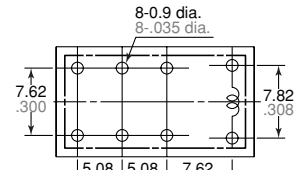
DIMENSIONS



General tolerance: $\pm 0.3 \pm .012$

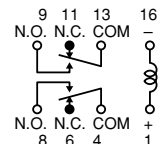
mm inch

PC board pattern (Bottom view)



Tolerance: $\pm 0.1 \pm .004$

Schematic (Bottom view)

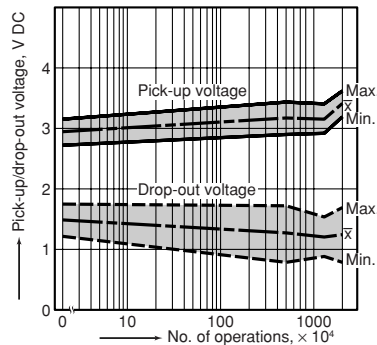


REFERENCE DATA

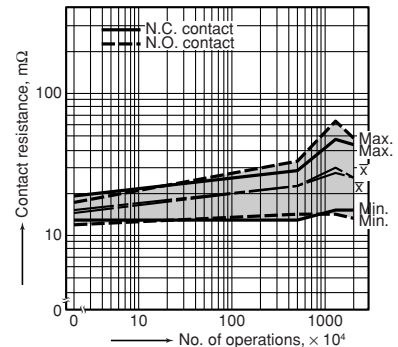
1. Mechanical life test

Tested sample: DSBT2-S-DC5V, 10 pcs.
Coil applied voltage: 5 V DC
Operating frequency: 30 cpm

Change of pick-up and drop-out voltage

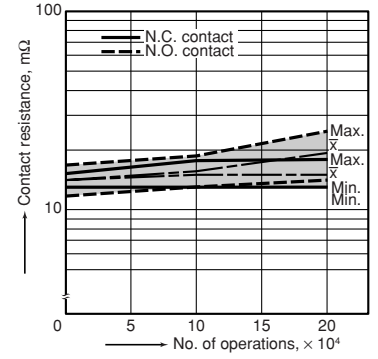
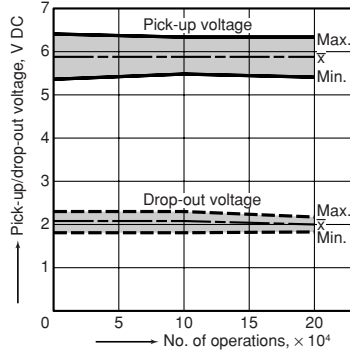
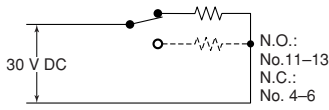


Change of contact resistance



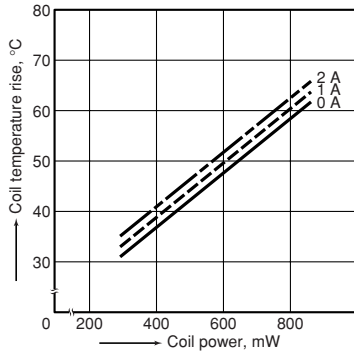
2. Electrical life test (resistive)

Tested sample: DSBT2-S-DC12V, 6 pcs.
 Condition: 2 A 30 V DC resistive load, 30 cpm
 Circuit



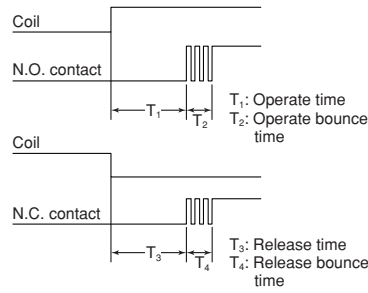
3. Coil temperature rise

Tested sample: DSBT2-S-DC12V, 5 pcs.
 Measured portion: Inside the coil

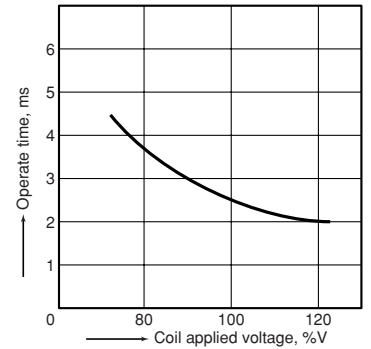


4. Operate and release time characteristics

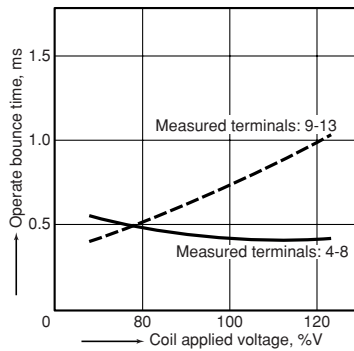
Tested sample: DSBT2-S-DC5V, 10 pcs.
 Ambient temperature: 23°C 73°F



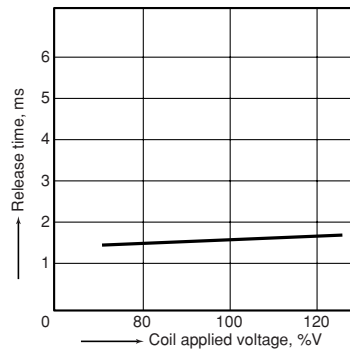
Without diode (T₁)



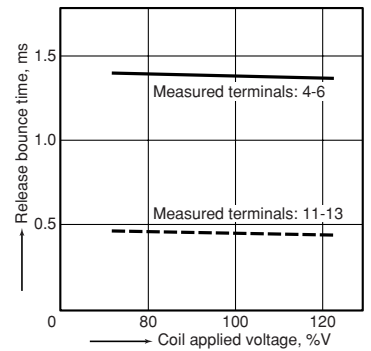
Without diode (T₂)



Without diode (T₃)

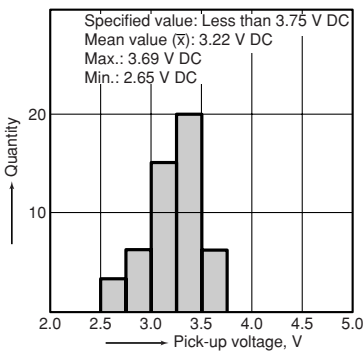


Without diode (T₄)

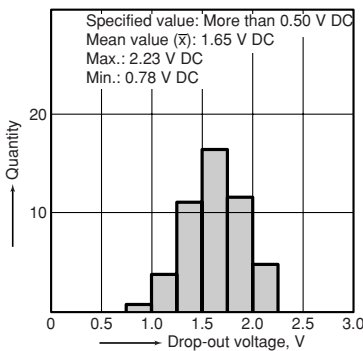


5. Distribution of pick-up and drop-out voltage

Tested sample: DSBT2-S-DC5V, 50 pcs.
 Pick-up voltage

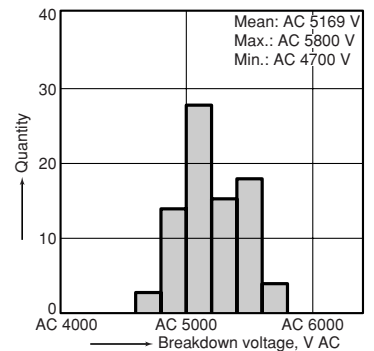


Drop-out voltage



6. Distribution of breakdown voltage (between contacts and coil)

Tested sample: DSBT2-S-DC5V, 100 pcs.



For Cautions for Use, see Relay Technical Information.