



### FEATURES

- 1. Breakthrough height of 9.8 mm .386 inch beats the 10 mm .394 inch limit**  
1c and 2c all have the same height (9.8 mm .386 inch). The width of the relay is also the same (9.9 mm .390 inch). Since the only size variable is the length, the shared form makes mounting on printed printing wiring boards easy.
- 2. Suitable for use in difficult environments**  
Epoxy resin seals the parts and cut off the external atmosphere, thus enabling use in difficult environments.
- 3. Can be used with automatic solder and automatic wash systems**  
Automatic soldering and automatic washing can be carried out once the parts are mounted on PC boards.
- 4. Gold-clad twin contacts ensure high reliability**  
Highly stable gold cladding on the contacts ensures that contact resistance changes little over time. Furthermore, the use of twin contacts, a configuration that performs with superior contact reliability, ensures extremely low contact failure rates even under low level loads.

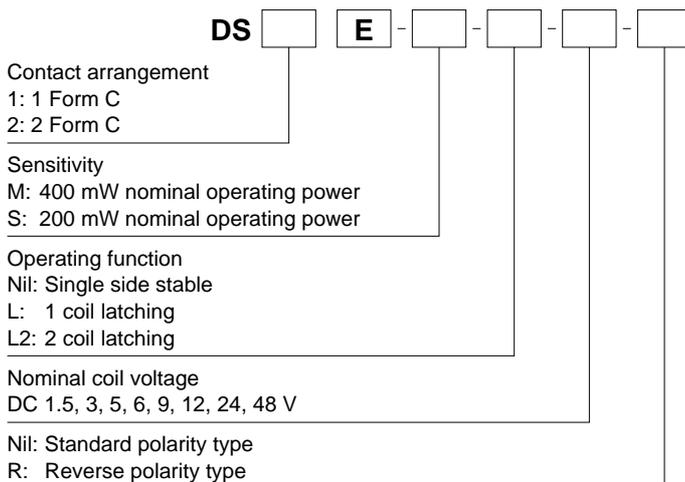
- 5. Polarized magnetic circuits realize resistance to shock and vibration**  
High-performance polarized magnetic circuits that utilize the energy of permanent magnets have made it possible to create relays with strong resistance to shock and vibration.
- 6. DIL terminal array enables use of IC sockets**
- 7. Widening scope of application with multicontact latching**  
In addition to single side stable types, you can take advantage of the memory of functions of convenient 1 coil or 2 coil latching relays.

### TYPICAL APPLICATIONS

Besides telecommunications, measuring devices, office equipment, computers and related equipment, DS relays are also recommended for a broad range of applications including business devices, audio systems, and industrial equipment.

Compliance with RoHS Directive

### ORDERING INFORMATION



Note: 1 coil latching type are manufactured by lot upon receipt of order.  
Reverse polarity types available (add suffix-R)

# DS

## TYPES

### 1. Standard type

Contact arrangement	Nominal coil voltage	Single side stable type	2 coil latching type
		Part No.	Part No.
1 Form C	1.5V DC	DS1E-M-DC1.5V	DS1E-ML2-DC1.5V
	3V DC	DS1E-M-DC3V	DS1E-ML2-DC3V
	5V DC	DS1E-M-DC5V	DS1E-ML2-DC5V
	6V DC	DS1E-M-DC6V	DS1E-ML2-DC6V
	9V DC	DS1E-M-DC9V	DS1E-ML2-DC9V
	12V DC	DS1E-M-DC12V	DS1E-ML2-DC12V
	24V DC	DS1E-M-DC24V	DS1E-ML2-DC24V
2 Form C	3V DC	DS2E-M-DC3V	DS2E-ML2-DC3V
	5V DC	DS2E-M-DC5V	DS2E-ML2-DC5V
	6V DC	DS2E-M-DC6V	DS2E-ML2-DC6V
	9V DC	DS2E-M-DC9V	DS2E-ML2-DC9V
	12V DC	DS2E-M-DC12V	DS2E-ML2-DC12V
	24V DC	DS2E-M-DC24V	DS2E-ML2-DC24V
	48V DC	DS2E-M-DC48V	DS2E-ML2-DC48V

Standard packing: Tube: 50 pcs.; Case: 500 pcs.

### 2. High sensitivity type

Contact arrangement	Nominal coil voltage	Single side stable type	2 coil latching type
		Part No.	Part No.
1 Form C	1.5V DC	DS1E-S-DC1.5V	DS1E-SL2-DC1.5V
	3V DC	DS1E-S-DC3V	DS1E-SL2-DC3V
	5V DC	DS1E-S-DC5V	DS1E-SL2-DC5V
	6V DC	DS1E-S-DC6V	DS1E-SL2-DC6V
	9V DC	DS1E-S-DC9V	DS1E-SL2-DC9V
	12V DC	DS1E-S-DC12V	DS1E-SL2-DC12V
	24V DC	DS1E-S-DC24V	DS1E-SL2-DC24V
2 Form C	3V DC	DS2E-S-DC3V	DS2E-SL2-DC3V
	5V DC	DS2E-S-DC5V	DS2E-SL2-DC5V
	6V DC	DS2E-S-DC6V	DS2E-SL2-DC6V
	9V DC	DS2E-S-DC9V	DS2E-SL2-DC9V
	12V DC	DS2E-S-DC12V	DS2E-SL2-DC12V
	24V DC	DS2E-S-DC24V	DS2E-SL2-DC24V
	48V DC	DS2E-S-DC48V	DS2E-SL2-DC48V

Standard packing: Tube: 50 pcs.; Case: 500 pcs.

Notes: 1. 1 coil latching type are manufactured by lot upon receipt of order.

2. Reverse polarity types available (add suffix-R)

## RATING

### 1. Coil data

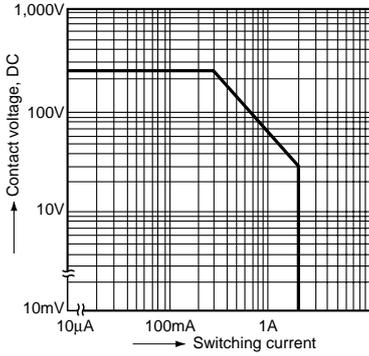
#### 1) Single side stable type

Type	Nominal coil voltage	Pick-up voltage (at 20°C 68°F)	Drop-out voltage (at 20°C 68°F)	Nominal operating current [ $\pm 10\%$ ] (at 20°C 68°F)	Coil resistance [ $\pm 10\%$ ] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 50°C 122°F)
Standard (M) type	1.5V DC	70%V or less of nominal voltage (Initial)	10%V or more of nominal voltage (Initial)	266.7mA	5.63Ω	400mW	1 Form C: 120%V of nominal voltage  2 Form C: 150%V of nominal voltage
	3V DC			133.3mA	22.5Ω		
	5V DC			80.0mA	62.5Ω		
	6V DC			66.7mA	90Ω		
	9V DC			44.4mA	203Ω		
	12V DC			33.3mA	360Ω		
	24V DC			16.7mA	1,440Ω		
High sensitivity (S) type	1.5V DC	1 Form C: 80%V or less of nominal voltage 2 Form C: 70%V or less of nominal voltage (Initial)	10%V or more of nominal voltage (Initial)	133.3mA	11.3Ω	200mW	1 Form C: 160%V of nominal voltage  2 Form C: 200%V of nominal voltage
	3V DC			66.7mA	45Ω		
	5V DC			40.0mA	125Ω		
	6V DC			33.3mA	180Ω		
	9V DC			22.2mA	405Ω		
	12V DC			16.7mA	720Ω		
	24V DC			8.3mA	2,880Ω		
48V DC	4.2mA	11,520Ω					

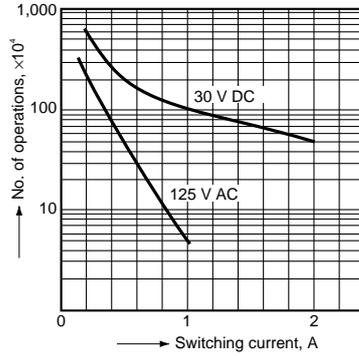


REFERENCE DATA

1. Maximum switching capacity

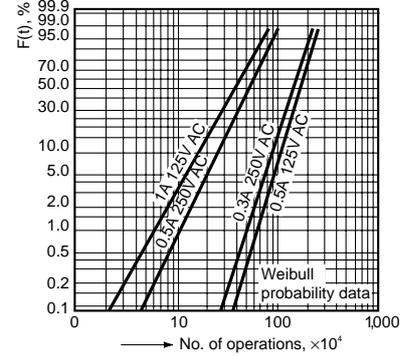


2. Life curve (Resistive load)



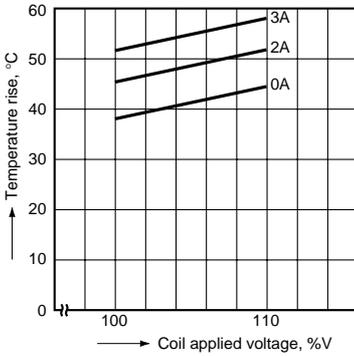
3. Contact reliability for AC loads

Tested sample: DS2E-M-DC24V 10 pcs.  
Operating speed: 20 cpm.  
Detection level: 200 mΩ



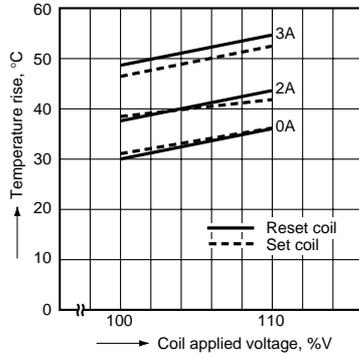
4-(1). Coil temperature rise (2 Form C single side stable type)

Tested sample: DS2E-M-DC12V  
Point measured: Inside the coil  
Ambient temperature: 18° to 19°C 64° to 66°F



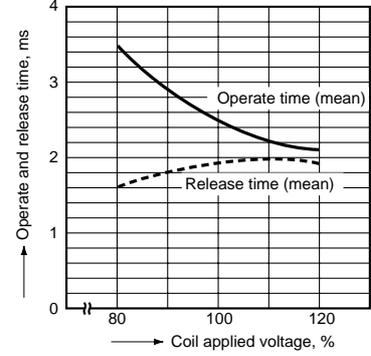
4-(2). Coil temperature rise (2 Form C 2 coil latching type)

Tested sample: DS2E-ML2-DC12V  
Point measured: Inside the coil  
Ambient temperature: 20° to 21°C 68° to 70°F

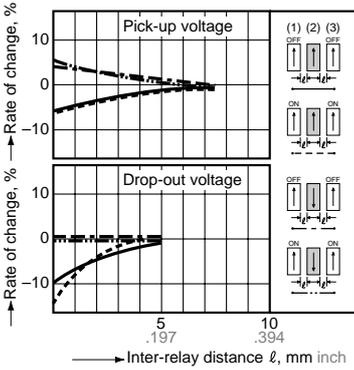


5. Operate and release time characteristics (2 Form C single side stable type)

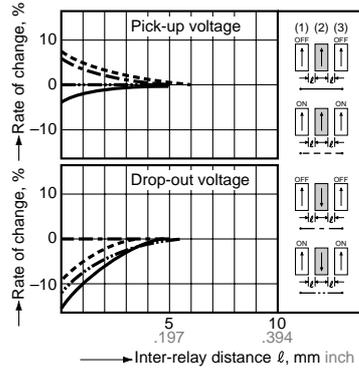
Test condition: Without diode connected to coil in parallel



6-(1). Influence of adjacent mounting (1 Form C)



6-(2). Influence of adjacent mounting (2 Form C)



**DIMENSIONS** (mm inch)

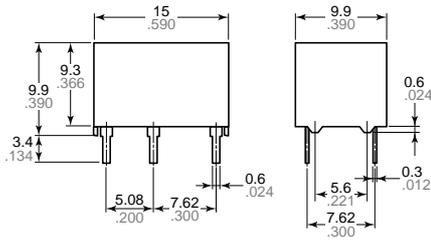
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://panasonic-electric-works.net/ac>

**DS (1 Form C)**

Single side stable, 2 coil latching

**CAD Data**

External dimensions

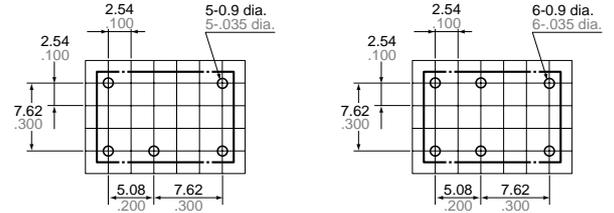


General tolerance:  $\pm 0.3 \pm 0.12$

PC board pattern (Bottom view)

Single side stable

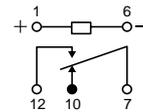
2 coil latching



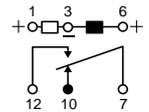
Schematic (Bottom view)

Single side stable

2 coil latching



(Deenergized condition)



(Reset condition)

Tolerance:  $\pm 0.1 \pm 0.004$

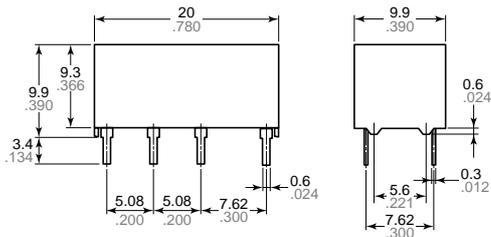
Note: External dimensions of 1 coil latching types are same as single side stable type.

**DS (2 Form C)**

Single side stable

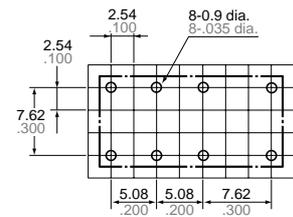
**CAD Data**

External dimensions

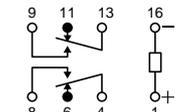


General tolerance:  $\pm 0.3 \pm 0.12$

PC board pattern (Bottom view)



Schematic (Bottom view)



(Deenergized condition)

Tolerance:  $\pm 0.1 \pm 0.004$

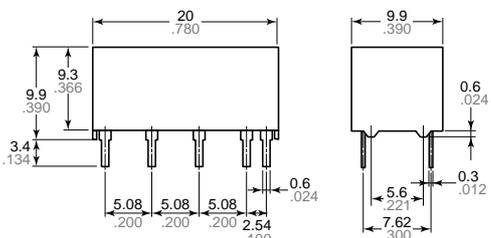
Note: External dimensions of 1 coil latching types are same as single side stable type.

**DS (2 Form C)**

2 coil latching

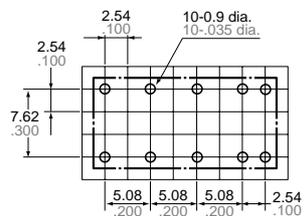
**CAD Data**

External dimensions

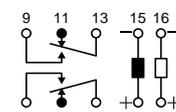


General tolerance:  $\pm 0.3 \pm 0.12$

PC board pattern (Bottom view)



Schematic (Bottom view)



(Reset condition)

Tolerance:  $\pm 0.1 \pm 0.004$

## NOTES

### 1. Coil connection

When connecting coils, refer to the wiring diagram to prevent mis-operation or malfunction.

**For general cautions for use, please refer to the “Cautions for use of Signal Relays” or “General Application Guidelines”.**