

Panasonic ideas for life

Long seller backed by product variety and high reliability

DS RELAYS



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.

- 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.

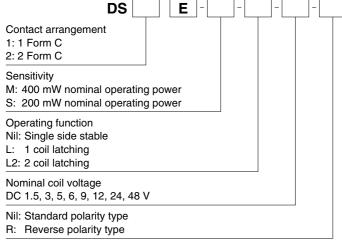
- 5. Polarized magnetic circuits realize resistance to shock and vibration High-performance polarized magnetic circuits that utilize the energy of permanent magnets have made it possible to create relays with strong resistance to shock and vibration.
- 6. DIL terminal array enables use of IC sockets7. 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)

TYPES

1. Standard type

Contact	Nominal coil	Single side stable type	2 coil latching type		
arrangement	voltage	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		
	48V DC	DS1E-M-DC48V	DS1E-ML2-DC48V		
2 Form C	1.5V DC	⚠ DS2E-M-DC1.5V	⚠ DS2E-ML2-DC1.5V		
	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	Nominal coil	Single side stable type	2 coil latching type			
arrangement	voltage	Part No.	Part No.			
15.0	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			
1 Form C	9V DC	DS1E-S-DC9V	DS1E-SL2-DC9V			
	12V DC	DS1E-S-DC12V	DS1E-SL2-DC12V			
	24V DC	DS1E-S-DC24V	DS1E-SL2-DC24V			
	48V DC	DS1E-S-DC48V	DS1E-SL2-DC48V			
	1.5V DC	DS2E-S-DC1.5V	DS2E-SL2-DC1.5V			
	3V DC	DS2E-S-DC3V	DS2E-SL2-DC3V			
2 Form C	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

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Туре	Nominal coil voltage	Pick-up voltage (at 20°C 68°F)	Drop-out voltage (at 20°C 68°F)	Nominal operating current [±10%] (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 50°C 122°F)
Standard (M) type	1.5V DC		10%V or more of nominal voltage (Initial)	266.7mA	5.63Ω		1 Form C: 120%V of nominal voltage 2 Form C: 150%V of nominal voltage
	3V DC			133.3mA	22.5Ω		
	5V DC	70%V or less of nominal voltage (Initial)		80.0mA	62.5Ω		
	6V DC			66.7mA	90Ω	400mW	
	9V DC			44.4mA	203Ω		
	12V DC			33.3mA	360Ω		
	24V DC			16.7mA	1,440Ω		
	48V DC			8.3mA	5,760Ω		
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		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	200mW	
	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		



2) 2 coil latching type

Type	Nominal coil voltage		Reset voltage (at 20°C 68°F)	Nominal operating current [±10%] (at 20°C 68°F)		Coil resistance [±10%] (at 20°C 68°F)		Nominal operating power		Max. applied voltage (at 50°C 122°F)
				Set coil	Reset coil	Set coil	Reset coil	Set coil	Reset coil	,
	1.5V DC			240mA	240mA	6.25Ω	6.25Ω	360mW	360mW	1 Form C: 120%V of nominal voltage 2 Form C: 150%V of nominal voltage
	3V DC	70%V or less of nominal voltage (Initial)		120mA	120mA	25Ω	25Ω			
	5V DC			72mA	72mA	69.4Ω	69.4Ω			
Standard	6V DC			60mA	60mA	100Ω	100Ω			
(M) type	9V DC			40mA	40mA	225Ω	225Ω			
	12V DC			30mA	30mA	400Ω	400Ω			
	24V DC			15mA	15mA	1,600Ω	1,600Ω			
	48V DC			7.5mA	7.5mA	6,400Ω	6,400Ω			
	1.5V DC			120mA	120mA	12.5Ω	12.5Ω			
	3V DC	1 Form C: 80%V or less of nominal voltage 2 Form C: 70%V or less of nominal voltage (Initial)	nominal voltage 2 Form C: 70%V or less of	60mA	60mA	50Ω	50Ω	180mW 180mW	400\	1 Form C: 160%V of nominal voltage 2 Form C: 200%V of nominal voltage
High sensitivity (S) type	5V DC			36mA	36mA	139Ω	139Ω			
	6V DC			30mA	30mA	200Ω	200Ω			
	9V DC			20mA	20mA	450Ω	450Ω		TOUTIVV	
	12V DC			15mA	15mA	2008	2008			
	24V DC			7.5mA	7.5mA	3,200Ω	3,200Ω			
	48V DC			3.75mA	3.75mA	12.800Ω	12.800Ω			

2. Specifications

Characteristics		Item	Specifications				
	Arrangement		1 Form C 2 Form C				
Contact	Initial contact resistar	nce, max.	Max. 50 mΩ (By voltage drop 6 V DC 1A)				
	Contact material		Ag+Au clad				
	Nominal switching ca	pacity	2 A 30 V DC (resistive load)				
	Max. switching powe	r	60 W, 125 VA (resistive load)				
	Max. switching voltage	ge	220 V DC, 250 V AC				
Rating	Max. carrying current	t	3 A				
	Min. switching capac	ity (Reference value)*1	10μΑ 1	0m V DC			
	Nominal operating po	ower	Single side stable (M type: 400 mW, S type: 200 mW); latching (M type: 360 mW, S type: 180 mW)				
	Insulation resistance	(Initial)	Min. 100MΩ (at 500V DC) Measurement at same location as "Initial breakdown voltage" section.				
	Breakdown voltage (Initial)	Between open contacts	1,000 Vrms for 1min. (500 Vrms for 1min: 1 Form C high sensitivity type) (Detection current: 10mA.)				
Electrical		Between contact and coil	1,500 Vrms for 1min. (1,000 Vrms for 1min: 1 Form C high sensitivity type) (Detection current: 10mA.)				
characteristics	Temperature rise			Max. 65°C (By resistive method, nominal coil voltage applied to the coil, contact carrying current: 2A.)			
	Operate time [Set tim	ne] (at 20°C 68°F)	Max. 10 ms [10 ms] (Nominal coil voltage app	lied to the coil, excluding contact bounce time.)			
	Release time [Reset	time] (at 20°C 68°F)	Max. 5 ms [10 ms] (Nominal coil voltage applied to the coil, excluding contact bounce time. (without diode)				
	Shock resistance	Functional*2	Min. 490 m/s ²	Min. 490 m/s ²			
Mechanical	Shock resistance	Destructive	Min. 980 m/s² (Half-wave pulse of sine wave: 6 ms.)				
characteristics	Vibration resistance	Functional	10 to 55 Hz at double amplitude	of 3.3 mm (Detection time: 10µs.)			
	Vibration resistance	Destructive	10 to 55 Hz at double amplitude of 5 mm				
Exported life	Mechanical		Min. 10 ⁸ (10 ⁷ : 1 Form C latching type) (at 600 cpm)				
Expected life	Electrical		Min. 5×10 ⁵ rated load (at 60 cpm)				
Conditions	Conditions for operation, transport and storage*3		Ambient temperature: -40°C to +70°C -40°F to +158°F Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)				
Conditions				<u> </u>			
Conditions	Max. operating speed	d (at rated load)	,	cpm			

Notes: *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.

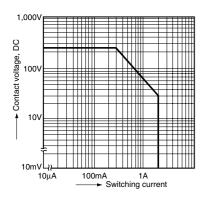
⁽SX relays are available for low level load switching [10V DC, 10mA max. level])
*2 Half-wave pulse of sine wave: 11ms; detection time: 10µs

^{*3} Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 25).

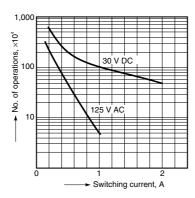
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REFERENCE DATA

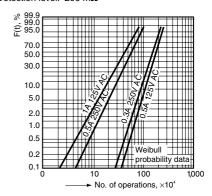
1. Maximum switching capacity



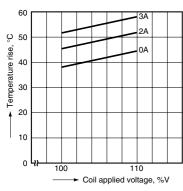
2. Life curve (Resistive load)



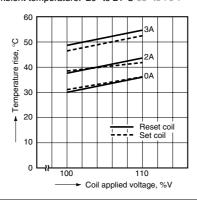
3. Contact reliability for AC loads Tested sample: DS2E-M-DC24V 10 pcs. Operating speed: 20 cpm. Detection level: 200 m Ω



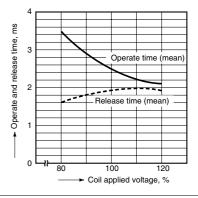
4-(1). Coil termperature rise (2 Form C single side stable type) Tested sample: DS2E-M-DC12V Point measured: Inside the coil Ambient temperature: 18° to 19°C 64° to 66°F



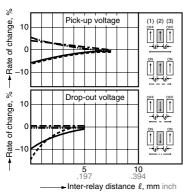
4-(2). Coil temperature rise (2 Form C 2 coil latching type) Tested sample: DS2E-ML2-DC12V Point measured: Inside the coil Ambient temperature: 20° to 21°C 68° to 70°F



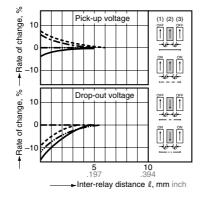
Operate and release time characteristics
 Form C single side stable type)
 Test condition: Without diode connected to coil in parallel



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



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



DIMENSIONS (mm inch)

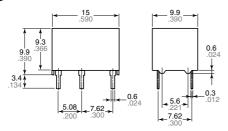
The CAD data of the products with a CAD Data mark can be downloaded from: http://panasonic-electric-works.net/ac

DS (1 Form C)

Single side stable, 2 coil latching

CAD Data

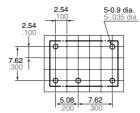
External dimensions

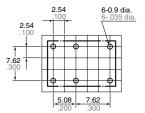


General tolerance: ±0.3 ±.012

PC board pattern (Bottom view)

2 coil latching Single side stable





Schematic (Bottom view)

Single side stable

2 coil latching



(Deenergized condition)



(Reset condition)

Tolerance: ±0.1 ±.004

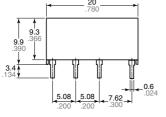
DS (2 Form C)

Single side stable

CAD Data

External dimensions

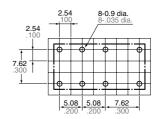
Note: External dimensions of 1 coil latching types are same as single side stable type.



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

_7.62

PC board pattern (Bottom view)



Schematic (Bottom view)



(Deenergized condition)

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

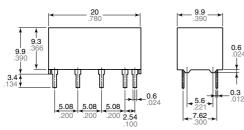
Tolerance: ±0.1 ±.004

DS (2 Form C)

2 coil latching

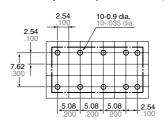
CAD Data

External dimensions



General tolerance: ±0.3 ±.012

PC board pattern (Bottom view)



Schematic (Bottom view)



(Reset condition)

Tolerance: ±0.1 ±.004

DS

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".