Panasonic



1 Form C / 2 Form C, 2 A, 200 mW Nominal operating power relays

DS RELAYS



FEATURES

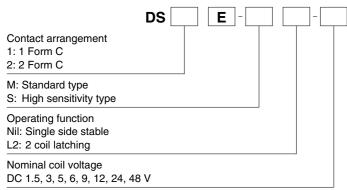
- 1. 1 Form C / 2 Form C contact
- 2. Available 2 coil latching type
- 3. DIL terminal array enables use of IC sockets

TYPICAL APPLICATIONS

- 1. Telecommunications and measuring devices
- 2. Office equipment
- 3. Computers and related equipment
- 4. Industrial equipment

RoHS compliant

ORDERING INFORMATION



Note: * Nominal coil voltage 1.5V type are 1 Form C only.

TYPES

		High sensi	itivity type	Standard type			
Contact arrangement	Nominal coil voltage	Single side stable type	2 coil latching type	Single side stable type	2 coil latching type		
anangement	voltage	Part No.	Part No.	Part No.	Part No.		
	1.5 V DC	DS1E-S-DC1.5V	DS1E-SL2-DC1.5V	DS1E-M-DC1.5V	DS1E-ML2-DC1.5V		
	3 V DC	DS1E-S-DC3V	DS1E-SL2-DC3V	DS1E-M-DC3V	DS1E-ML2-DC3V		
	5 V DC	DS1E-S-DC5V	DS1E-SL2-DC5V	DS1E-M-DC5V	DS1E-ML2-DC5V		
1 Farm C	6 V DC	DS1E-S-DC6V	DS1E-SL2-DC6V	DS1E-M-DC6V	DS1E-ML2-DC6V		
1 Form C	9 V DC	DS1E-S-DC9V	DS1E-SL2-DC9V	DS1E-M-DC9V	DS1E-ML2-DC9V		
	12 V DC	DS1E-S-DC12V	DS1E-SL2-DC12V	DS1E-M-DC12V	DS1E-ML2-DC12V		
	24 V DC	DS1E-S-DC24V	DS1E-SL2-DC24V	DS1E-M-DC24V	DS1E-ML2-DC24V		
	48 V DC	DS1E-S-DC48V	DS1E-SL2-DC48V	DS1E-M-DC48V	DS1E-ML2-DC48V		
2 Form C	3 V DC	DS2E-S-DC3V	DS2E-SL2-DC3V	_	_		
	5 V DC	DS2E-S-DC5V	DS2E-SL2-DC5V	_	_		
	6 V DC	DS2E-S-DC6V	DS2E-SL2-DC6V	_	_		
	9 V DC	DS2E-S-DC9V	DS2E-SL2-DC9V	_	_		
	12 V DC	DS2E-S-DC12V	DS2E-SL2-DC12V	_	_		
	24 V DC	DS2E-S-DC24V	DS2E-SL2-DC24V	_	_		
	48 V DC	DS2E-S-DC48V	DS2E-SL2-DC48V	_	_		

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

RATING

1. Coil data

1) Single side stable type

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)
	1.5 V DC		10%V or more of nominal voltage (Initial)	266.7 mA	5.63 Ω		1 Form C: 120%V of nominal voltage
Standard (M) type	3 V DC			133.3 mA	22.5 Ω		
	5 V DC	70%V or less of nominal voltage (Initial)		80.0 mA	62.5 Ω		
	6 V DC			66.7 mA	90 Ω	400 mW	
	9 V DC			44.4 mA	203 Ω	400 mvv	
	12 V DC			33.3 mA	360 Ω		
	24 V DC			16.7 mA	1,440 Ω		
	48 V DC			8.3 mA	5,760 Ω		
	1.5 V DC		10%V or more of nominal voltage (Initial)	133.3 mA	mA 11.3 Ω		
High sensitivity (S) type	3 V DC	1 Form C:		66.7 mA	45 Ω		1 Form C: 160%V of nominal voltage 2 Form C:
	5 V DC	80%V or less of nominal voltage		40.0 mA	125 Ω		
	6 V DC	2 Form C: 70%V or less of nominal voltage		33.3 mA	180 Ω	200 mW	
	9 V DC			22.2 mA	405 Ω	200 mvv	
	12 V DC			16.7 mA 720 Ω			220%V of
	24 V DC	(Initial)		8.3 mA	2,880 Ω		nominal voltage
	48 V DC	, , , ,		4.2 mA	11,520 Ω	1	

2) 2 coil latching type

Туре	Nominal coil voltage	Set voltage (at 20°C 68°F)	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	
				Set coil		Reset coil		Set coi	il Reset co		oil	Set coil	Reset coil	(at 50°C 122°F)
Standard (M) type	1.5 V DC	70%V or less of nominal voltage (Initial)	70%V or less of nominal voltage (Initial)	240	mA	240	mΑ	6.25	5 Ω	6.25	5Ω	360 mW	360 mW	1 Form C: 120%V of nominal voltage
	3 V DC			120	mA	120	mΑ	25	Ω	25	Ω			
	5 V DC			72	mΑ	72	mΑ	69.4	Ω	69.4	Ω			
	6 V DC			60	mΑ	60	mΑ	100	Ω	100	Ω			
	9 V DC			40	mΑ	40	mΑ	225	Ω	225	Ω			
	12 V DC			30	mΑ	30	mΑ	400	Ω	400	Ω			
	24 V DC			15	mA	15	mA	1,600	Ω	1,600	Ω			
	48 V DC			7.5	mΑ	7.5	mΑ	6,400	Ω	6,400	Ω			
High sensitivity (S) type	1.5 V DC	1 Form C: 80%V or less of nominal voltage 2 Form C: 70%V or less of nominal voltage (Initial)	1 Form C: 80%V or less of nominal voltage 2 Form C: 70%V or less of nominal voltage (Initial)	120	mΑ	120	mΑ	12.5	Ω	12.5	Ω	180 mW	180 mW	1 Form C: 160%V of nominal voltage 2 Form C: 220%V of nominal voltage
	3 V DC			60	mΑ	60	mΑ	50	Ω	50	Ω			
	5 V DC			36	mΑ	36	mΑ	139	Ω	139	Ω			
	6 V DC			30	mΑ	30	mΑ	200	Ω	200	Ω			
	9 V DC			20	mΑ	20	mΑ	450	Ω	450	Ω			
	12 V DC			15	mΑ	15	mΑ	800	Ω	800	Ω			
	24 V DC			7.5	mA	7.5	mA	3,200	Ω	3,200	Ω			
	48 V DC			3.75	5 mA	3.75	mA	12,800	Ω	12,800	Ω			

2. Specifications

Characteristics		Item	Specifications						
	Arrangement		1 Form C 2 Form C						
Contact	Initial contact resista	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	je	220 V DC, 250 V AC						
Rating	Max. carrying current	t	3 A						
	Min. switching capac	ity (Reference value)*1	10μΑ 10	Om 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. 100M Ω (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 type) (Detection current: 10mA.)						
Electrical characteristics		Between contact and coil	1,500 Vrms for 1min. (1,000 Vrms for 1min: 1 Form C 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 time	ne] (at 20°C 68°F)	Max. 10 ms [10 ms] (Nominal coil voltage applied 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/s ² (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						
Expected life	Mechanical		Min. 10 ⁸ (10 ⁷ : 1 Form C latching type) (at 600 cpm)						
	Electrical		Min. 5×10 ⁵ rated load (at 60 cpm)						
Conditions	Conditions for operat	ion, transport and storage*3	Ambient temperature: -40° C to $+70^{\circ}$ C -40° F to $+158^{\circ}$ F Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)						
	Max. operating speed	d (at rated load)	60 cpm						
Unit weight			Approx. 3 g .11 oz	Approx. 4g .14oz					

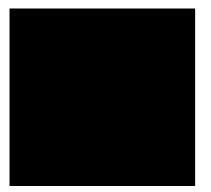
Notes: *1 This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load. TX/TX-S/TX-D relay AgPd contact type are available for low level load switching (10V DC, 10mA max. level).

*2 Half-wave pulse of sine wave: 11ms; detection time: 10µs

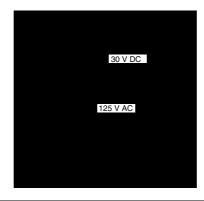
*3 Refer to "AMBIENT ENVIRONMENT" in GENERAL APPLICATION GUIDELINES.

REFERENCE DATA

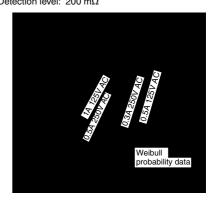
1. Maximum switching capacity



2. Life curve (Resistive load)



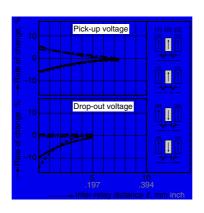
3. Contact reliability for AC loads Tested sample: DS2E-S-DC24V 10 pcs. Operating speed: 20 cpm. Detection level: 200 m Ω



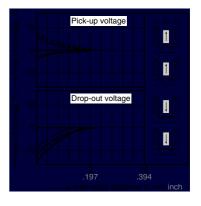
4. Operate and release time characteristics (2 Form C single side stable type) Test condition: Without diode connected to coil in parallel

Operate time (mean) Release time (mean)

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



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



DIMENSIONS (mm inch)

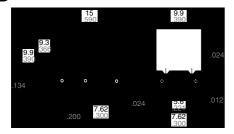
The CAD data of the products with a CAD Data mark can be downloaded from: http://industrial.panasonic.com/ac/e/

DS (1 Form C)

Single side stable, 2 coil latching

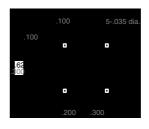
CAD Data

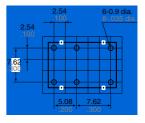
External dimensions



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

PC board pattern (Bottom view) Single side stable 2 coil latching





Schematic (Bottom view)

Single side stable



2 coil latching



(Deenergized condition)

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(Reset condition)

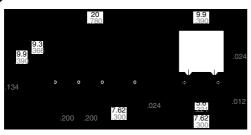
Tolerance: ±0.1 ±.004

DS (2 Form C)

Single side stable

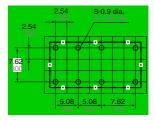


External dimensions



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

PC board pattern (Bottom view)



Schematic (Bottom view)



(Deenergized condition)

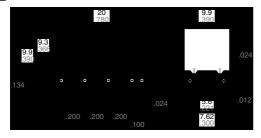
Tolerance: $\pm 0.1 \pm .004$

DS (2 Form C)

2 coil latching

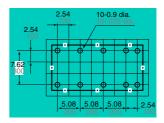
CAD Data

External dimensions



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

PC board pattern (Bottom view)



Schematic (Bottom view)



(Reset condition)

Tolerance: $\pm 0.1 \pm .004$

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".