



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

## DS RELAYS



**RoHS compliant**

### 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

## ORDERING INFORMATION

DS  E -  -

Contact arrangement

- 1: 1 Form C
- 2: 2 Form C

M: Standard type

S: High sensitivity type

Operating function

- Nil: Single side stable
- L2: 2 coil latching

Nominal coil voltage

DC 1.5, 3, 5, 6, 9, 12, 24, 48 V

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

## TYPES

Contact arrangement	Nominal coil voltage	High sensitivity type		Standard type	
		Single side stable type	2 coil latching type	Single side stable type	2 coil latching type
		Part No.	Part No.	Part No.	Part No.
1 Form C	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
	6 V DC	DS1E-S-DC6V	DS1E-SL2-DC6V	DS1E-M-DC6V	DS1E-ML2-DC6V
	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

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

## 2) 2 coil latching type

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

## 2. Specifications

Characteristics	Item		Specifications	
Contact	Arrangement		1 Form C	2 Form C
	Initial contact resistance, max.		Max. 50 mΩ (By voltage drop 6 V DC 1A)	
	Contact material		Ag+Au clad	
Rating	Nominal switching capacity		2 A 30 V DC (resistive load)	
	Max. switching power		60 W, 125 VA (resistive load)	
	Max. switching voltage		220 V DC, 250 V AC	
	Max. carrying current		3 A	
	Min. switching capacity (Reference value)*1		10μA 10m V DC	
	Nominal operating power		Single side stable (M type: 400 mW, S type: 200 mW); latching (M type: 360 mW, S type: 180 mW)	
Electrical characteristics	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 type) (Detection current: 10mA.)	
		Between contact and coil	1,500 Vrms for 1min. (1,000 Vrms for 1min: 1 Form C type) (Detection current: 10mA.)	
	Temperature rise		Max. 65°C (By resistive method, nominal coil voltage applied to the coil, contact carrying current: 2A.)	
	Operate time [Set time] (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)	
Mechanical characteristics	Shock resistance	Functional*2	Min. 490 m/s <sup>2</sup>	Min. 490 m/s <sup>2</sup>
		Destructive	Min. 980 m/s <sup>2</sup> (Half-wave pulse of sine wave: 6 ms.)	
	Vibration resistance	Functional	10 to 55 Hz at double amplitude of 3.3 mm (Detection time: 10μs.)	
		Destructive	10 to 55 Hz at double amplitude of 5 mm	
Expected life	Mechanical		Min. 10 <sup>8</sup> (10 <sup>7</sup> : 1 Form C latching type) (at 600 cpm)	
	Electrical		Min. 5×10 <sup>5</sup> 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)	
	Max. operating speed (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: 1 ms; 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 mΩ



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

Test condition: Without diode connected to coil in parallel



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



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



# DIMENSIONS (mm inch)

## DS (1 Form C)

Single side stable, 2 coil latching

**CAD Data**

External dimensions



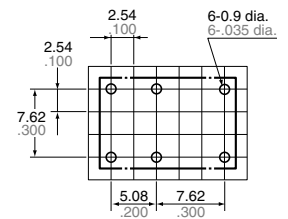
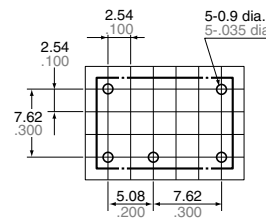
General tolerance:  $\pm 0.3 \pm 0.012$

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

## PC board pattern (Bottom view)

Single side stable

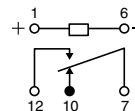
2 coil latching



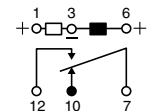
## Schematic (Bottom view)

Single side stable

2 coil latching



(Deenergized condition)



(Reset condition)

Tolerance:  $\pm 0.1 \pm 0.004$

**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)



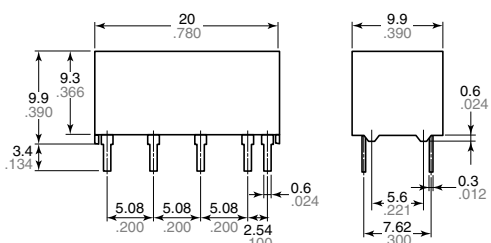
(Deenergized condition)

Tolerance:  $\pm 0.1 \pm 0.04$

**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:  $\pm 0.1 \pm 0.04$

**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".**

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## Panasonic:

[DS1E-M-DC5V](#) [DS1E-S-DC5V](#) [DS2E-S-DC5V](#) [DS1E-M-DC12V](#) [DS1E-S-DC12V](#) [DS2E-S-DC12V](#) [DS2E-SL2-DC12V](#) [DS1E-M-DC24V](#) [DS1E-S-DC24V](#) [DS2E-S-DC24V](#) [DS2E-S-DC48V](#) [DS2E-S-DC3V](#) [DS2E-S-DC9V](#) [DS1E-M-DC1.5V](#) [DS1E-M-DC6V](#) [DS1E-S-DC1.5V](#) [DS1E-S-DC3V](#) [DS1E-SL2-DC1.5V](#) [DS1E-SL2-DC12V](#) [DS1E-SL2-DC24V](#) [DS1E-SL2-DC48V](#) [DS1E-SL2-DC5V](#) [DS1E-SL2-DC6V](#) [DS1E-SL2-DC9V](#) [DS2E-SL2-DC5V](#) [DS1E-M-DC12V-TB](#) [DS2E-SL2-DC24V](#) [DS1E-M-DC48V](#) [DS1E-S-DC9V](#) [DS2E-SL2-DC9V](#) [DS1E-S-DC6V](#) [DS1E-S-DC48V](#) [DS2E-SL2-DC6V](#) [DS1E-M-DC3V](#) [DS2E-S-DC6V](#) [DS1E-M-DC9V](#) [DS1E-SL2-DC3V](#) [DS1E-M-DC1.5V-R](#) [DS1E-M-DC12V-R](#) [DS1E-M-DC24V-R](#) [DS1E-M-DC24V-TB](#) [DS1E-M-DC5V-R](#) [DS1E-M-DC9V-R](#) [DS1E-S-DC12V-R](#) [DS1E-S-DC12V-TB](#) [DS1E-S-DC24V-R](#) [DS1E-S-DC5V-R](#) [DS1E-S-DC5V-TB](#) [DS1E-SL2-DC12V-R](#) [DS1E-SL2-DC3V-R](#) [DS1E-SL2-DC5V-R](#) [DS1E-SL2-DC9V-R](#) [DS1E-SL-DC1.5V](#) [DS1E-SL-DC12V](#) [DS1E-SL-DC24V](#) [DS1E-SL-DC3V](#) [DS1E-SL-DC48V](#) [DS1E-SL-DC5V](#) [DS1E-SL-DC5V-R](#) [DS1E-SL-DC6V](#) [DS2E-S-DC12V-TB](#) [DS2E-S-DC6V-TB](#) [DS2E-S-DC9V-TB](#)



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.