

Description

The smart power relay ESR10 Micro (Electronic Standard Relay) is a solid state relay which can replace electro-mechanical relays.

The ESR10 is a plus switching (high side switch) closing relay (NO) in an ISO Micro automotive relay enclosure.

It allows bipolar control by a positive voltage. This space-saving relay is available in three power classes:

- 10 A for max. 85° C / (12 and 24) Vdc
- 17 A for max. 105° C / (12 and 24) Vdc
- 30 A for max. 85° C / 12 Vdc

Applications

The ESR10 helps to switch loads whose current demand is too high to be connected directly to the controlgear. The switching function of the ESR10 is completely noiseless. This allows installation in the vehicle's interior.

The ESR10 Micro is suitable for all applications in DC 12 V or 24 V electrical systems where valves, motors, lamps etc. have to be switched:

- Road vehicles (passenger cars, bicycles, trucks, buses, working vehicles and emergency cars, special vehicles)
- Construction vehicles and agricultural vehicles
- Watercraft (ships, sailing boats, motor yachts etc.)

Benefits

- The low current consumption, particularly in the ON condition, helps to reduce gas consumption as well as CO₂ emissions.
- The solid state relay switches silently and features wear-free operation of all loads with an extremely long life span.

Order numbering code

| Type No. | Description |
|------------------------------------|--|
| ESR10 | electronic standard relay |
| N | Protection (characteristic curve) not protected, only short circuit protection |
| C2 | Type of enclosure Micro enclosure with hexagonal latching lugs |
| A4 | Terminals (pins) standard automotive, 4-pole (ISO) |
| HB | Load and control high-side-switch (HSS), bipolar control |
| 00 | Sub type standard |
| D1 | System voltage DC 12 V |
| D2 | DC 24 V |
| 10 A | Current rating (at 25°C) 10 A |
| 17 A | 17 A |
| 30 A * | 30 A * (12 V only) |
| ESR10 - N C2 A4 HB - 00 - D1 - 10A | ordering example |

* The 30A version of the ESR10 Micro will only be available upon request and for high volume projects (> 5000 pcs). Small quantities cannot be ordered.



ESR10 Micro

Technical data (25 °C) – ESR10 Micro 10 A

Voltage supply LINE+

| | | |
|------------------------------|----------------|----------------------|
| System voltage | U _B | DC 12 V / DC 24 V |
| Operating voltage | | 6...16 V / 10...32 V |
| Closed current ¹⁾ | OFF | 8 µA |

Load circuit LOAD

| | | |
|----------------------------|-----------------|--|
| Load output | | MOSFET, high side switching (HSS) |
| Load types | | resistive, inductive and capacitive |
| Protective function | | short circuit proof, temperature disconnection (pulsing) |
| Current rating | I _N | 10 A |
| Voltage drop ¹⁾ | U _{ON} | 75 mV |
| Max. short circuit current | | 60 A (L/R = 3 ms) |

Control input IN+

| | | |
|----------------------------------|------|--|
| Control voltage | ON | 12 V: ±6...16 V; 24 V: ±10...32 V |
| | OFF | 12 V: ±0...2 V; 24 V: ±0...4 V |
| Control current ^{1) 2)} | | 10 mA (at 13.5 V respectively 27 V) (derating see chart) |
| Switching frequency | max. | see chart |
| Rising edge | | < 5 ms |

General data

| | | |
|---|--------------------|---|
| Reverse polarity protection circuit, load circuit | load | yes (reverse polarity conductive) ³⁾ |
| Cycle times ¹⁾ | t _{ON} | 0.5 ms |
| | t _{OFF} | 0.5 ms |
| Temperature range | | -40 °C...85 °C |
| Dimensions | | ISO Standard Micro (with retaining lugs) |
| | plugged in | 26 x 15.5 x 26 mm |
| | including contacts | 26 x 15.5 x 37 mm |
| Mass ¹⁾ | | 15 g |

¹⁾ typically

²⁾ The upstream controlgear may misconstrue the situation as "wire break" due to the extremely low control current. In this case the trigger threshold should be adjusted.

³⁾ In the event of reverse polarity connection, the MOSFET will switch through automatically for self-protection.

Technical data (25 °C) – ESR10 Micro 17 A

| Voltage supply LINE+ | | |
|---|-------------------------------------|---|
| System voltage | U _B | DC 12 V / DC 24 V |
| Operating voltage | | 6...16 V / 10...32 V |
| Closed current ¹⁾ | OFF | 8 µA |
| Load circuit LOAD | | |
| Load output | | MOSFET, high side switching (HSS) |
| Load types | | resistive, inductive and capacitive |
| Protective function | | short circuit proof, temperature disconnection (pulsing) |
| Current rating | I _N | 17 A |
| Voltage drop ¹⁾ | U _{ON} | 75 mV |
| Max. short circuit current | | 100 A (L/R = 3 ms) |
| Control input IN+ | | |
| Control voltage | ON OFF | 12 V: ±6...16 V; 24 V: ±10...32 V 12 V: ±0...2 V; 24 V: ±0...4 V |
| Control current ^{1) 2)} | | 10 mA (at 13.5 V respectively 27 V) (derating see chart) |
| Switching frequency | max. | see chart |
| Rising edge | | < 5 ms |
| General data | | |
| Reverse polarity protection circuit, load circuit | load | yes (reverse polarity conductive) ³⁾ |
| Cycle times ¹⁾ | t _{ON} t _{OFF} | 0.5 ms 0.5 ms |
| Temperature range | | -40 °C...105 °C |
| Dimensions | | ISO Standard Micro (with retaining lugs) |
| | plugged in | 26 x 15.5 x 26 mm |
| | including contacts | 26 x 15.5 x 37 mm |
| Mass ¹⁾ | | 15 g |

Technical data (25 °C) – ESR10 Micro 30 A

| Voltage supply LINE+ | | |
|---|-------------------------------------|--|
| System voltage | U _B | DC 12 V |
| Operating voltage | | 6...16 V |
| Closed current ¹⁾ | OFF | 5 µA |
| Load circuit LOAD | | |
| Load output | | MOSFET, high side switching (HSS) |
| Load types | | resistive, inductive and capacitive |
| Protective function | | short circuit proof, temperature disconnection (pulsing) |
| Current rating | I _N | 30 A |
| Voltage drop ¹⁾ | U _{ON} | 50 mV |
| Max. short circuit current | | 100 A (L/R = 3 ms) |
| Control input IN+ | | |
| Control voltage | ON OFF | 12 V: ±6...16 V 12 V: ±0...2 V |
| Control current ^{1) 2)} | | 10 mA (at 13.5 V respectively 27 V) (derating see chart) |
| Switching frequency | max. | see chart |
| Rising edge | | < 5 ms |
| General data | | |
| Reverse polarity protection circuit, load circuit | load | yes (reverse polarity conductive) ³⁾ |
| Cycle times ¹⁾ | t _{ON} t _{OFF} | 0.5 ms 3.5 ms |
| Temperature range | | -40 °C...85 °C |
| Dimensions | | ISO Standard Micro (with retaining lugs) |
| | plugged in | 26 x 15.5 x 26 mm |
| | including contacts | 26 x 15.5 x 37 mm |
| Mass ¹⁾ | | 15 g |

Important: The 30A version of the ESR10 Micro will only be available upon request and for high volume projects (> 5000 pcs). Small quantities cannot be ordered.

Approvals

| Authority | Approval mark | Regulation |
|-----------|---------------|------------|
| KBA | E1 | ECE R 10 |

Qualifications

ESR10 Micro 10 A/12 V variant, VW

VW80000:2013-06 (LV124)
TL81000:2013-02

ESR10 Micro 10 A/12 V variant, GM

GMW 15267
GMW 3097

ESR10 Micro 10 A, 17 A, 30 A / 24 V

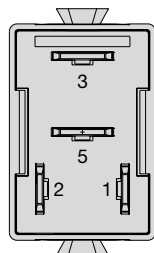
Environmental tests to LV124
(Specification and severity to VW80000: 2013-06)

Electrical tests to ISO 16750-2

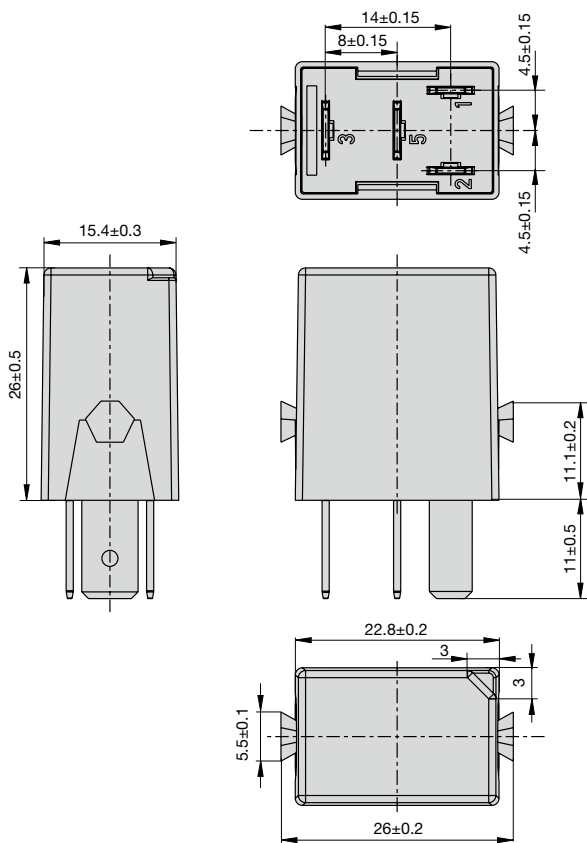
Pin assignment

| ESR10 Micro | | | |
|-------------|---|---------|---------------|
| LINE + | 3 | (30) | U_B |
| IN_a | 1 | (86/31) | control input |
| IN_b | 2 | (31/86) | ground |
| LOAD | 5 | (88a) | load output |

() $\hat{=}$ Automotive terminal designation



Dimensions



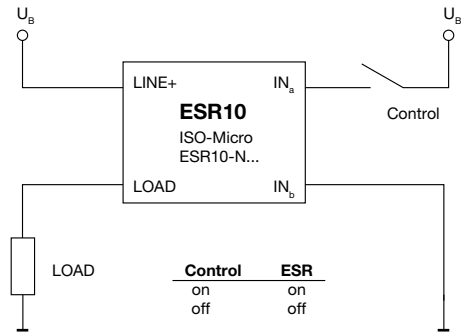
Pin assignment is in accordance with ISO 7588
3 and 5 - blade terminals 6.3 x 0.8 [mm]
1 and 2 - blade terminals 4.8 x 0.8 [mm]

Schematic diagram

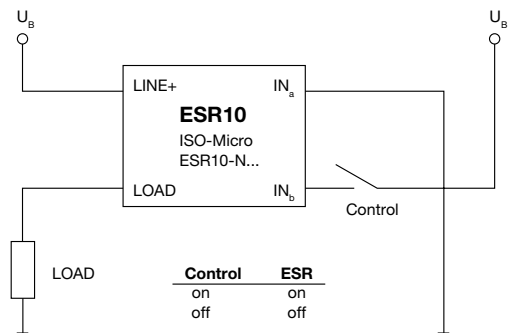
Alternative control of bipolar control inputs

| Control inputs | IN_a | IN_b |
|----------------|--------|--------|
| alternative 1 | U_B | GND |
| alternative 2 | GND | U_B |

alternative 1

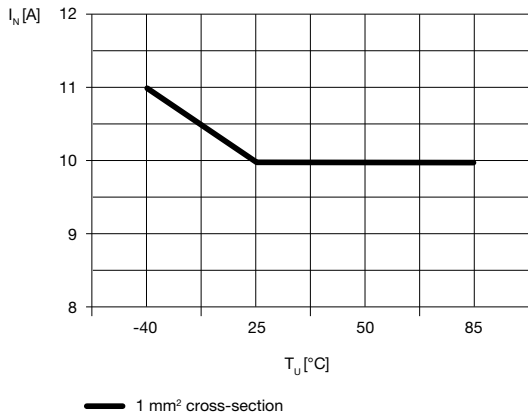


alternative 2

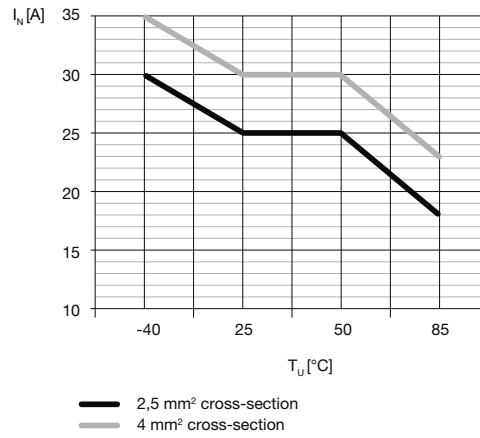


Derating

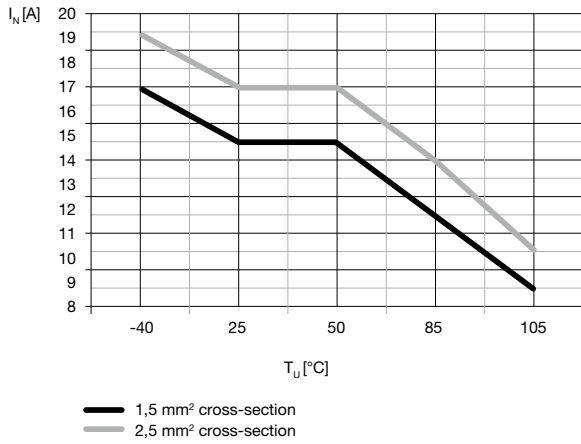
Load current for – 10 A variant



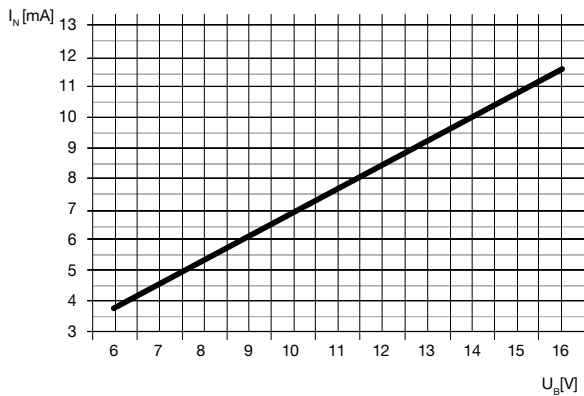
Load current for – 30 A variant



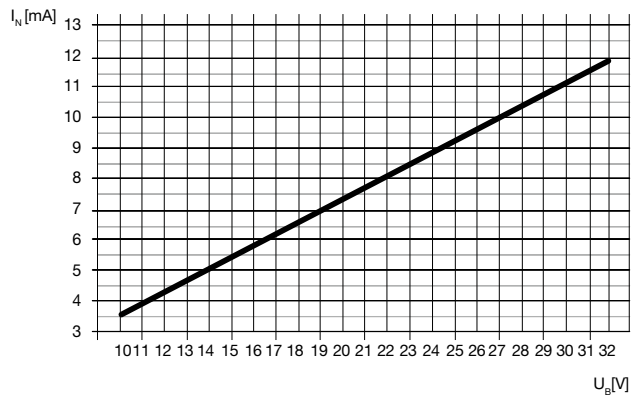
Load current for 17 A variant



Control current for 12 V – 10 A / 17 A / 30 A variant



Control current for 24 V – 10 A / 17 A / 30 A variant

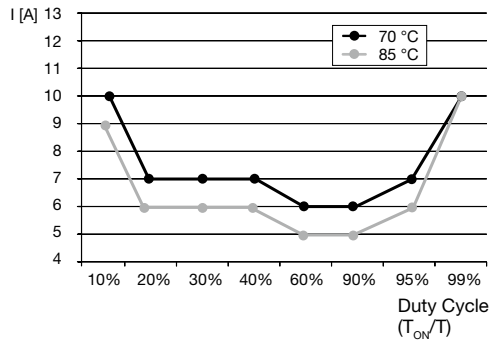


5

Frequency control 10 A

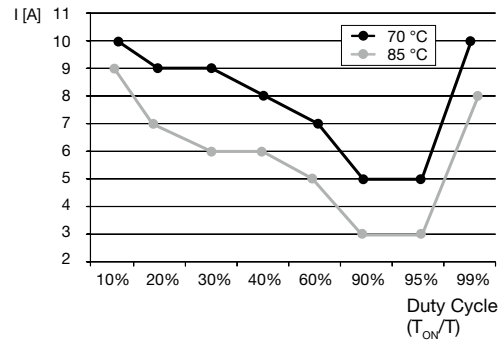
10 A / 12 V variant

Frequency measurement with 100 Hz

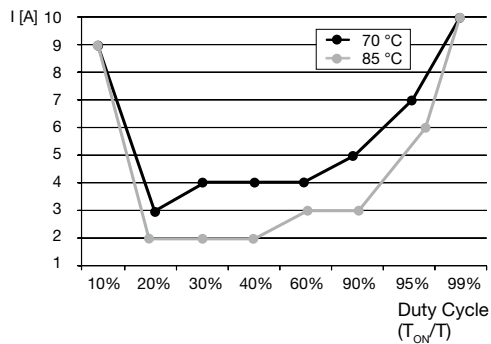


10 A / 24 V variant

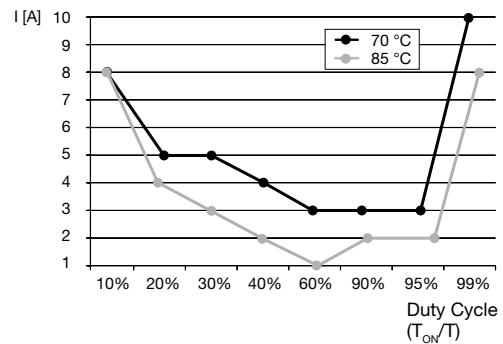
Frequency measurement with 50 Hz



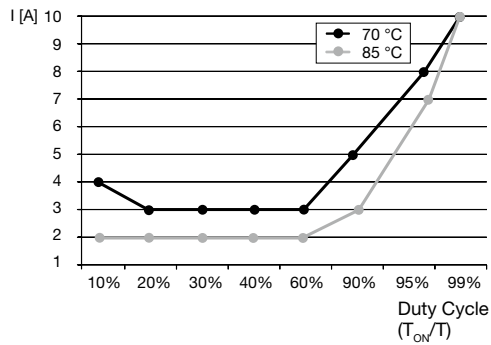
Frequency measurement with 150 Hz



Frequency measurement with 100 Hz

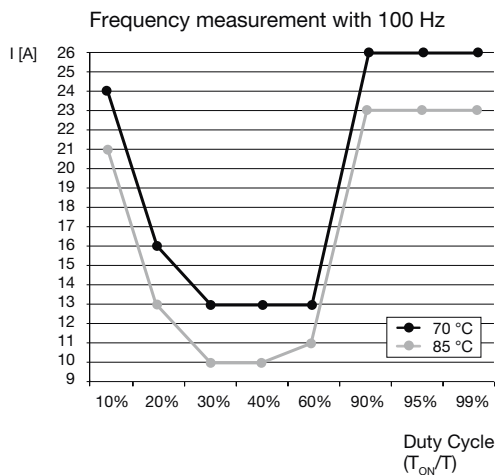
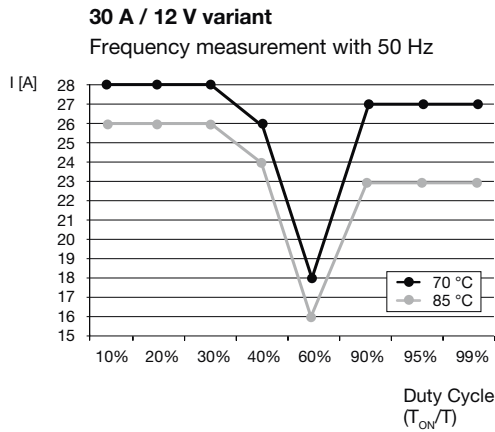
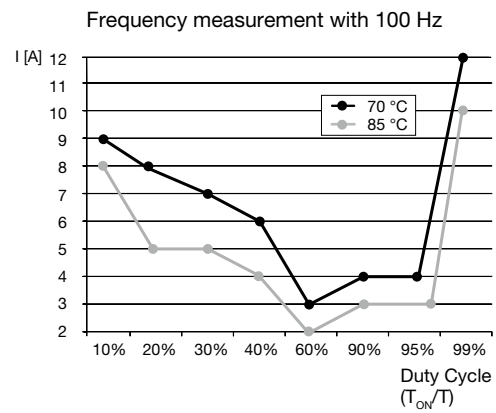
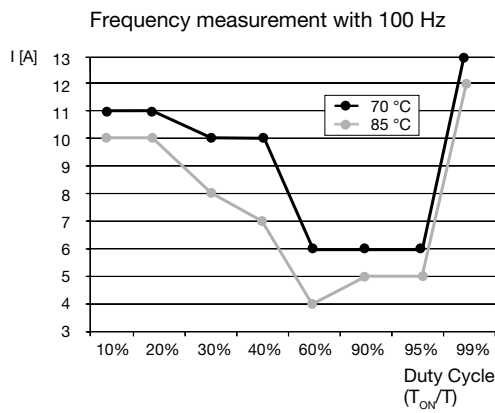
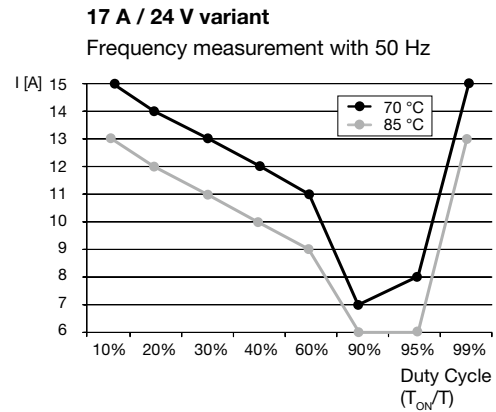
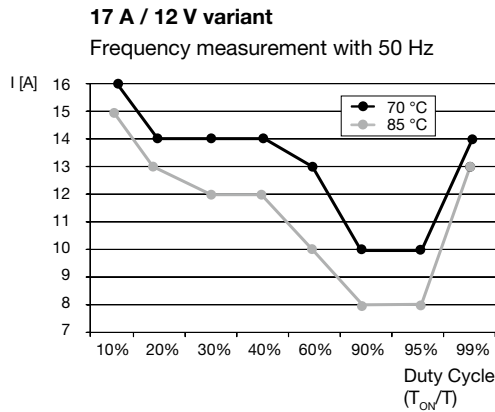


Frequency measurement with 200 Hz



The max. load current depends on the load type. Please contact the manufacturer of the load if the limit values shown above are reached. E-T-A is able to test whether the relay works in the limit range.

Frequency control 17 A / 30 A



The max. load current depends on the load type. Please contact the manufacturer of the load if the limit values shown above are reached. E-T-A is able to test whether the relay works in the limit range.

5

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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