

PCB relays – Pin or SMD – for DC operation, polarised, monostable or bistable

Features

- Universal ultra miniature relay with optimum capabilities
- Directly triggerable with TTL standard modules such as ALS, HCT and ACT
- Especially high sensitivity
- Extremely small size:
base area only 0.98 cm² or 1.07 cm²
volume only 0.68 cm³ or 0.85 cm³
- Relay system encapsulated in epoxy resin, thus especially immune to environmental influences
- Very high grade of shock resistance

Typical applications

- Storage element for input and output equipment
- Data and communication technology
- Medical equipment
- Measurement and control equipment
- Automobile technology
- Safety engineering
- Toy engineering

Versions

- Relay types: monostable, 1 winding or bistable, 2 windings or bistable, 1 winding
- With 1 changeover contact
- With bifurcated contacts
- FCC version on request. Testing of open contacts with surge voltage in accordance with FCC 68.302 (1.5 kV, 10/160 µs) passed
- Automatically placeable from bar magazines (e.g. on Siemens HS-180)
- For SMD configuration, strap packaging possible on request
- For printed circuit assembling
- Immersion cleanable

Approvals



CECC

Option: with qualification approval in accordance with CECC 16501-002/ VDE 400.74/04.90 for pin version



CSA

File LR 45064-5



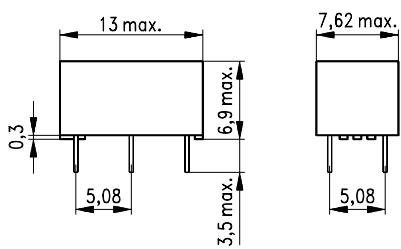
UL

File E 48393

Miniature Relay P1

Pin version

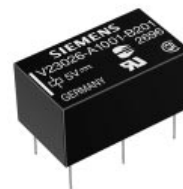
Dimension drawing (in mm)



ECR0668-9



Orientation mark (imprinted)

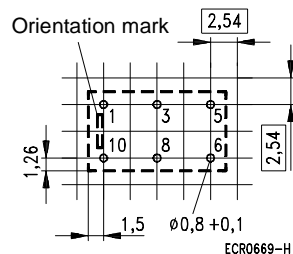


ECR0995-P

Approx. 1.5 x original size

Mounting hole layout

View on the terminals



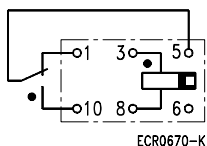
ECR0669-H

Basic grid 2.54 mm according to EN 60097 and DIN 40803

Terminal assignment

View on the terminals

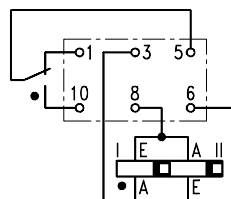
Monostable and bistable,
1 winding



ECR0670-K

The contact position illustrated shows the release condition. If a positive potential is applied to terminal 3, the relay adopts the operating position.

Bistable,
2 windings



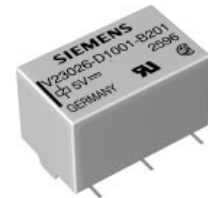
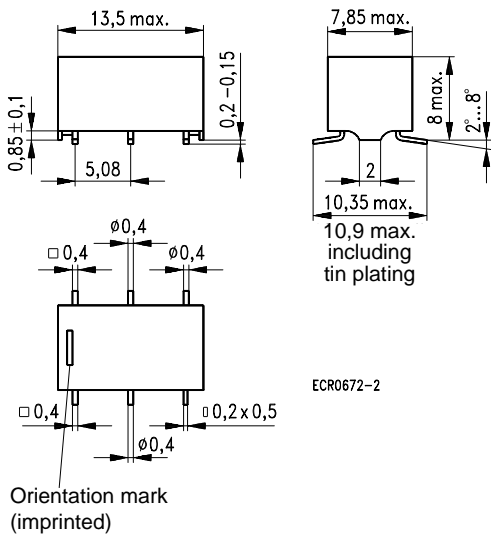
ECR0671-T

The contact position illustrated shows the release condition. If a positive potential is applied to terminal 3 or a negative potential to terminal 6 as against terminal 8, the relay adopts the operating position.

Miniature Relay P1

SMD version

Dimension drawing (in mm)

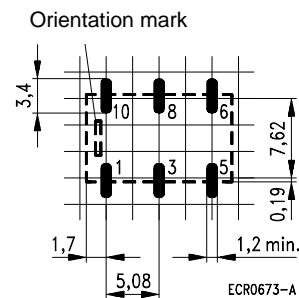


ECR0994-G

Approx. 1.5 x original size

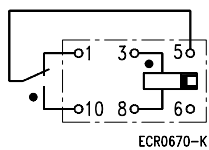
Solder pad layout

Attention: View onto the component side of the PCB!



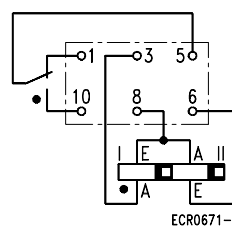
Terminal assignment

View on the terminals
Monostable and bistable,
1 winding



The contact position illustrated shows the release condition. If a positive potential is applied to terminal 3, the relay adopts the operating position.

Bistable,
2 windings



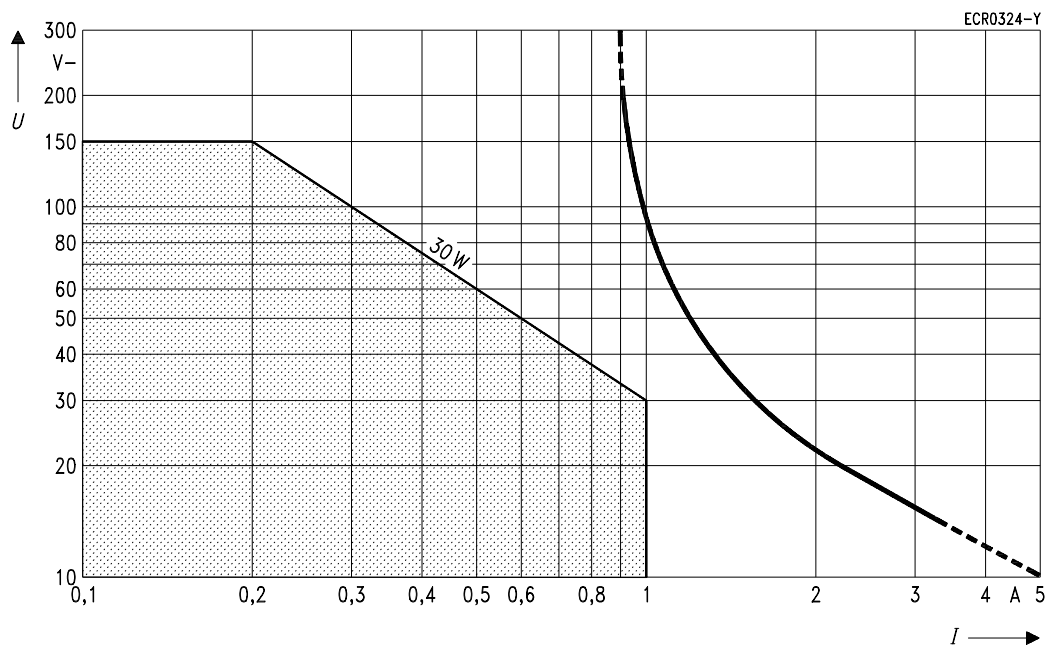
The contact position illustrated shows the release condition. If a positive potential is applied to terminal 3 or a negative potential to terminal 6 as against terminal 8, the relay adopts the operating position.

Miniature Relay P1

Contact data

Number of contacts and type	1 changeover contact
Contact assembly	Bifurcated contacts
Contact material	Pd Ni, Au Rh coated
Limiting continuous current at max. ambient temperature	1 A
Maximum switching current	1 A
Maximum switching voltage	125 V~ 150 V-
Maximum switching capacity DC voltage AC voltage	30 W, see load limit curve 60 VA
Recommended for load voltages greater than	100 μ V
Contact resistance (initial value) / measuring current / driver voltage	$\leq 50 \text{ m}\Omega$ / 10 mA / 20 mV

Load limit curve



I = switching current

U = switching voltage

■ = recommended application field

Load limit curve: Safe shutdown, no stationary arc > 10 ms

Miniature Relay P1

Coil data	
Nominal voltages	From 1.5 V– to 24 V–
Nominal power consumption monostable with 1 winding bistable with 2 windings bistable with 1 winding	65 ... 130 mW 65 ... 150 mW 30 ... 130 mW
Operative range/pick-up class according to IEC 255-1-00 and VDE 0435 Part 201	1/a
Maximum operate voltage	75 % of nominal voltage
Maximum release voltage (bistable)	75 % of nominal voltage
Minimum release voltage (monostable)	10 % of nominal voltage

U_I = Minimum voltage at 20 °C after pre-energizing with nominal voltage without contact current
 U_{II} = Maximum continuous voltage at 20 °C

The operating voltage limits U_I and U_{II} are dependent on the temperature according to the formulae:

$$U_{I \text{ tamb}} = k_I \cdot U_{I \text{ 20 °C}}$$

and

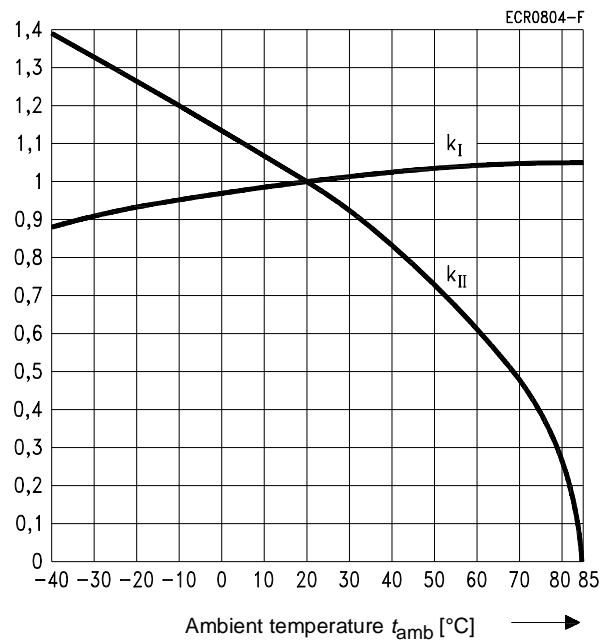
$$U_{II \text{ tamb}} = k_{II} \cdot U_{II \text{ 20 °C}}$$

t_{amb} = Ambient temperature

$U_{I \text{ tamb}}$ = Minimum voltage at ambient temperature t_{amb}

$U_{II \text{ tamb}}$ = Maximum voltage at ambient temperature t_{amb}

k_I a. k_{II} = Factors (dependent on temperature), see diagram



Miniature Relay P1

Coil versions

Nominal voltage U_{nom} V-	Operating voltage range at 20 °C		Resistance at 20 °C Ω	Coil number Ordering code block 2
	Minimum voltage, U_{I} V-	Maximum voltage, U_{II} V-		

Pin version

monostable, 1 winding				-A1***
3	2.25	8.8	137 ± 14	006
5	3.75	14.5	370 ± 37	001
12	9	35	2250 ± 225	002
24	18	50	4500 ± 450	004
bistable, 2 windings (windings I and II identical)				-B1***
3	2.25	8.55	130 ± 13	106
5	3.75	14.75	390 ± 39	101
12	9	29	1500 ± 150	102
24	A nominal voltage of 24 V is feasible with a 12 V winding with a series resistor (1500 Ω)			
bistable, 1 winding				-C1***
3	2.25	13	300 ± 30	056
5	3.75	20	740 ± 74	051
12	9	50	4500 ± 450	052
24 ¹⁾	18	50	4500 ± 450	054

SMD version

monostable, 1 winding				-D1***
3	2.25	8	113 ± 11	026
5	3.75	13.3	313 ± 31	021
12	9	35	1800 ± 180	022
24	18	50	4500 ± 450	024
bistable, 2 windings (windings I and II identical)				-E1***
3	2.25	8.55	130 ± 13	106
5	3.75	14.75	390 ± 39	101
12	9	29	1500 ± 150	102
24	A nominal voltage of 24 V is feasible with a 12 V winding with a series resistor (1500 Ω)			
bistable, 1 winding				-F1***
3	2.25	13	300 ± 30	056
5	3.75	20	740 ± 74	051
12	9	50	4500 ± 450	052
24 ¹⁾	18	50	4500 ± 450	054

1) At 24 V operation of the 12 V winding with a series resistor of 4500 Ω results in reduced power consumption.

Further coil versions e.g. 1.5 V, 9 V or 15 V are available on request.

Miniature Relay P1

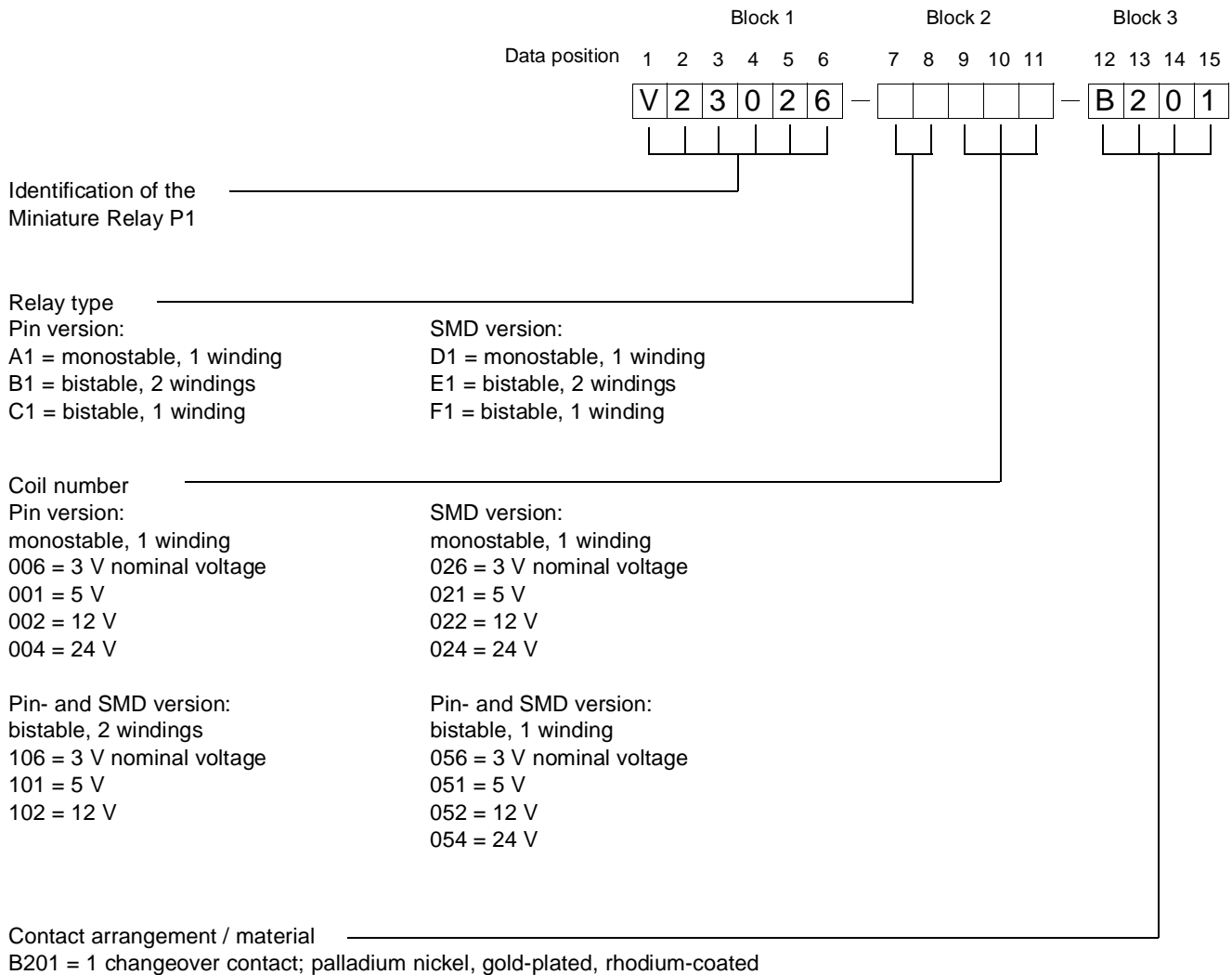
General data	
Operate time at U_{nom} and at 20 °C, typ.	1 ms
Release time at U_{nom} and at 20 °C (bistable), typ.	1 ms
Release time without/with diode in parallel (monostable), typ.	0.4 ms/1.2 ms
Maximum switching rate without load	200 operations/s
Ambient temperature according to IEC 255-1-00 / VDE 0435 Part 201	-40 °C ... +70 °C (... +85 °C on request)
Thermal resistance	130 K/W
Maximum permissible coil temperature	85 °C
Vibration resistance (function), frequency range according to IEC 68-2-6	20 g, 200 - 2000 Hz 40 g, 10 - 200 Hz
Shock resistance (function), half sinus, 11 ms according to IEC 68-2-27	50 g
Degree of protection according to IEC 529 / VDE 0470 Part 1	immersion cleanable, IP 67 sealing corresponds to IEC 68-2-17, method Qc 2
Electrical endurance for resistive load: 6 V-, 100 mA 24 V-, 1 A	approx. 5×10^7 operations approx. 3×10^6 operations
Mechanical endurance	approx. 1×10^9 operations
Flammability	flame resistance according to IEC 695-2-2
Mounting position	any
Processing information	ultrasonic cleanable
Weight (mass)	approx. 1.8 g

Insulation	
Insulation resistance at 500 V	$\geq 10^9 \Omega$
Dielectric test voltage contact / winding (1 min)	1500 V _{rms} (2000 V _{rms} on request)
Dielectric test voltage at open contact (1 min)	500 V _{rms}
Clearances/creepage distances coil/contact	0.75 mm / 0.75 mm

Note: Relays with surge voltage resistance of 2.5 kV, 2/10 μ s on request

Miniature Relay P1

Ordering code



Ordering example: V23026-B1102-B201

Miniature relay P1, Pin version, bistable, coil with 2 windings, 12 V nominal voltage

Note:

The ordering scheme enables a multitude of variations. However, not all variations are defined as construction specifications (ordering code) and thus in the current delivery program.

Special designs can be carried out to customer specifications. Please contact your local representative. The addresses are given on the back page.

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