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

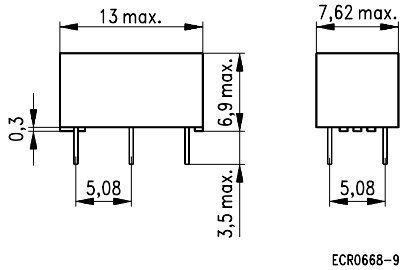
– Immersion cleanable

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

Pin version

Dimension drawing (in mm)



Orientation mark
(imprinted)

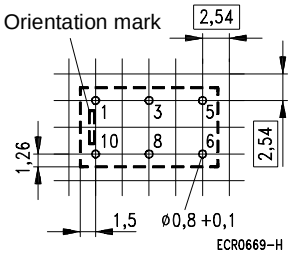


ECR0995-P

Approx. 1.5 x original size

Mounting hole layout

View on the terminals

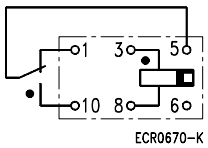


Basic grid 2.54 mm according to EN 60097 and DIN 40803

Terminal assignment

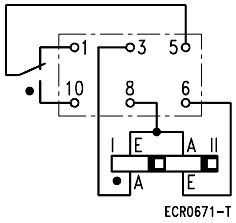
View on the terminals

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.

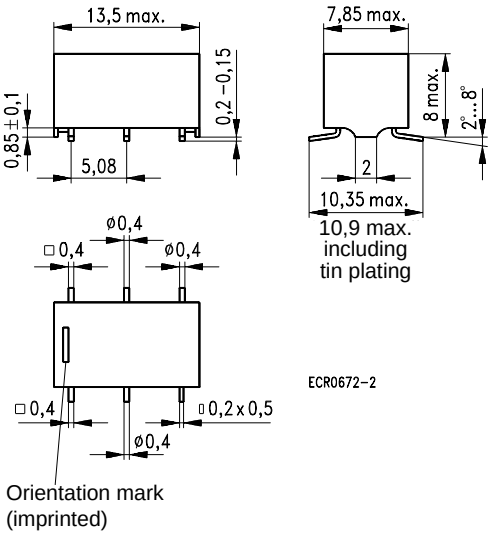
Bistable,
2 windings

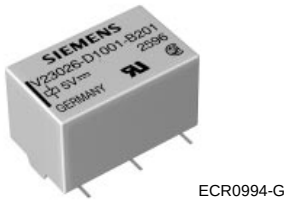


The contact position illustrated shows the release condition.
If a positive potential is applied to terminal 3 or a negative potential to terminal 6 as against terminal 8, the relay adopts the operating position.

SMD version

Dimension drawing (in mm)



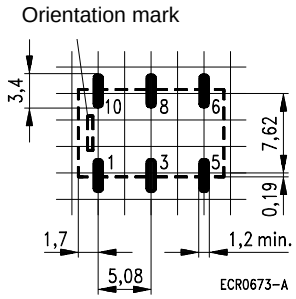


ECR0994-G

Approx. 1.5 x original size

Solder pad layout

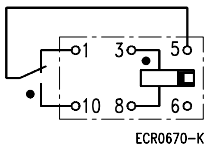
Attention: View onto the component side of the PCB!



Terminal assignment

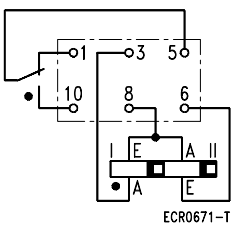
View on the terminals

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.

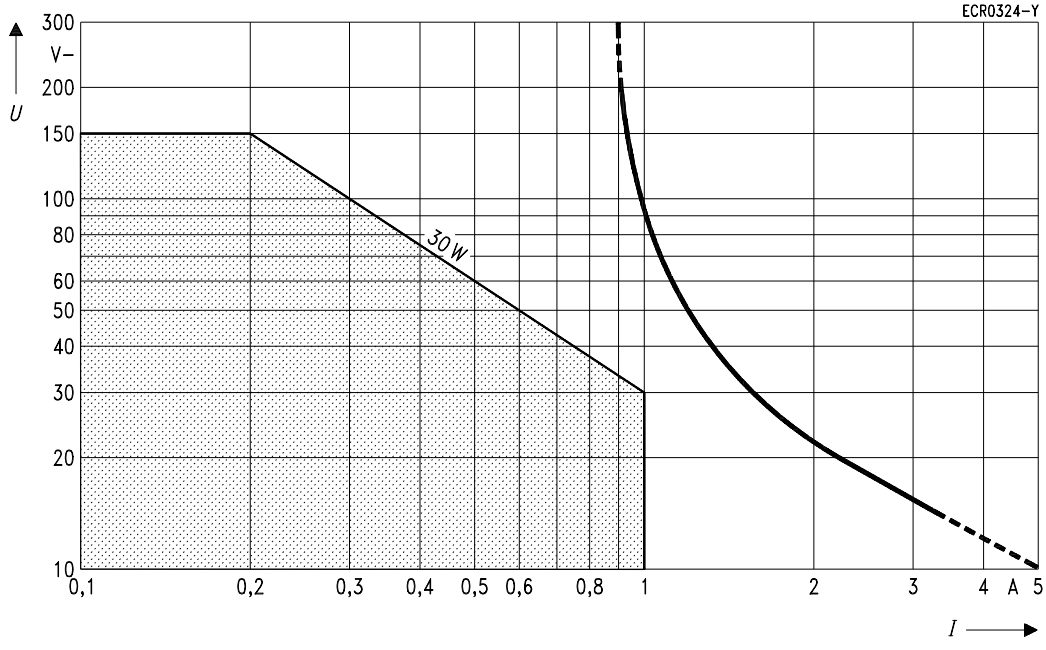
Bistable,
2 windings



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.

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 µV
Contact resistance (initial value) / measuring current / driver voltage	≤ 50 mΩ / 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

Coil data

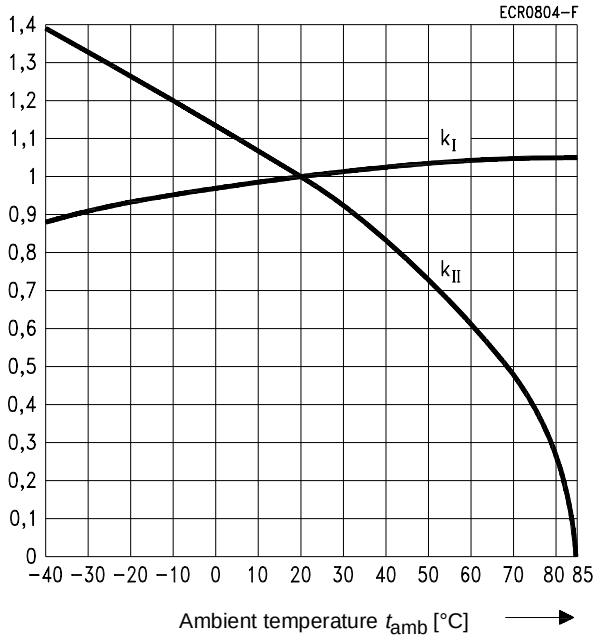
Nominal voltages	From 1.5 V– to 24 V–
Nominal power consumption monostable with 1 winding bistable with 2 windings bistable with 1 winding	 65 ... 130 mW 65 ... 150 mW 30 ... 130 mW
Operative range/pick-up class according to IEC 255-1-00 and VDE 0435 Part 201	1/a
Maximum operate voltage	75 % of nominal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

$U_{I\,tamb} = k_I \cdot U_{I\,20\,°C}$
and
$U_{II\,tamb} = k_{II} \cdot U_{II\,20\,°C}$

t_{amb} = Ambient temperature
$U_{I\,tamb}$ = Minimum voltage at ambient temperature t_{amb}
$U_{II\,tamb}$ = Maximum voltage at ambient temperature t_{amb}
k_I a. k_{II} = Factors (dependent on temperature), see diagram



Coil versions

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

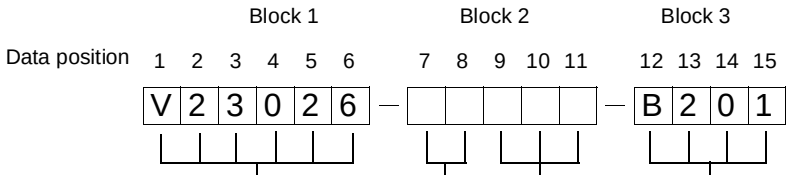
Further coil versions e.g. 1.5 V, 9 V or 15 V are available on request.

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 x 10^7 operations approx. 3 x 10^6 operations
Mechanical endurance	approx. 1 x 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 $V\sim_{rms}$ (2000 $V\sim_{rms}$ on request)
Dielectric test voltage at open contact (1 min)	500 $V\sim_{rms}$
Clearances/creepage distances coil/contact	0.75 mm / 0.75 mm

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

Ordering code



Identification of the
Miniature Relay P1

Relay type

Pin version:	SMD version:
A1 = monostable, 1 winding	D1 = monostable, 1 winding
B1 = bistable, 2 windings	E1 = bistable, 2 windings
C1 = bistable, 1 winding	F1 = bistable, 1 winding

Coil number

Pin version:	SMD version:
monostable, 1 winding	monostable, 1 winding
006 = 3 V nominal voltage	026 = 3 V nominal voltage
001 = 5 V	021 = 5 V
002 = 12 V	022 = 12 V
004 = 24 V	024 = 24 V
Pin- and SMD version:	Pin- and SMD version:
bistable, 2 windings	bistable, 1 winding
106 = 3 V nominal voltage	056 = 3 V nominal voltage
101 = 5 V	051 = 5 V
102 = 12 V	052 = 12 V
	054 = 24 V

Contact arrangement / material
B201 = 1 changeover contact; palladium nickel, gold-plated, rhodium-coated

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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