PCB relay – THT (Pin) or SMT * – for DC voltage, polarized, mono- or bistable

Features

- Miniaturized universal relay with 2 changeover contacts for a wide variety of switching functions
- Optimized for minimum space on the printed circuit board
- Extremely compact structure
- Packaged in a sealed plastic DIP housing
- High sensitivity results in low power consumption
- In the version with 1 winding:
  - surge voltage resistance of up to 2.5 kV (2/10 µs) between contact and winding; meets the Bellcore Requirements for Telecommunications Equipment (USA)
  - high-voltage resistance according to FCC Part 68: 1.5 kV (10/700 µs)

Versions

- Relay types: monostable with 1 winding or bistable with 2 windings or bistable with 1 winding
- With 2 changeover contacts
- With bifurcated contacts
- For printed circuit assembling
- Immersion cleanable
- Basic insulation coil/contacts according to EN 60950

Typical applications

- Communications technology
- Telecommunications terminal and accessories
- Measurement and control equipment
- Automobile technology
- Medical equipment
- Entertainment electronics

Approvals

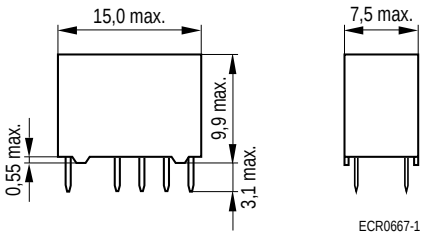
CSA File LR 45064-23

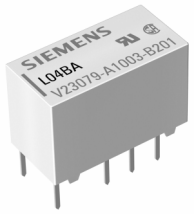
UL File E 48393

* SMT: Surface Mount Technology
THT: Through Hole Technology

THT Version

Dimension drawing (in mm)



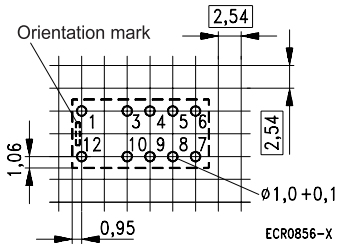


ECR0978-Z

Approx. 1.5 x original size

Mounting hole layout

View on the terminals

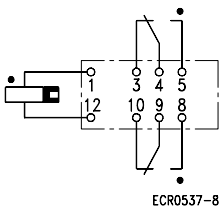


Note: Hole for pins 6 and 7 only for bistable with 2 windings
Basic grid 2.54 mm according to EN 60097 and DIN 40803

Terminal assignment

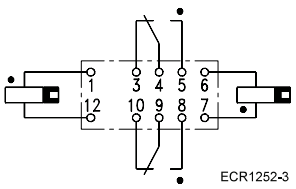
View on the terminals

Monostable and bistable,
1 winding



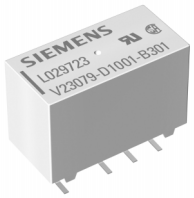
The contact position illustrated shows the release condition.
If a positive potential is applied to terminal 1, the relay adopts the operating position.

Bistable,
2 windings



The contact position illustrated shows the release condition.
If a positive potential is applied to terminal 1 or 7, the relay adopts the operating position.

SMT Version

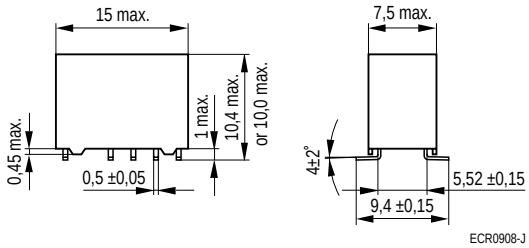


ECR1026-2

Approx. 1.5 x original size

Dimension drawing (in mm)

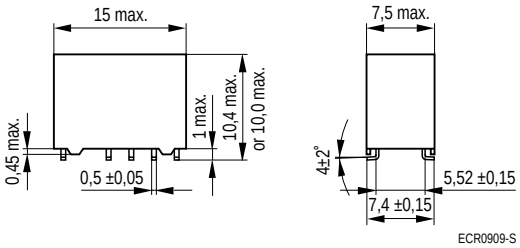
Long terminals



ECR0908-J

New:
2 mounting heights available
Standard mounting height:10.4 max.
Reduced mounting height:10.0 max.

Short terminals



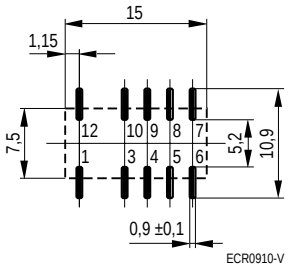
ECR0909-S

New:
2 mounting heights available
Standard mounting height:10.4 max.
Reduced mounting height:10.0 max.

Solder pad layout

Note: View onto the component side of the PCB

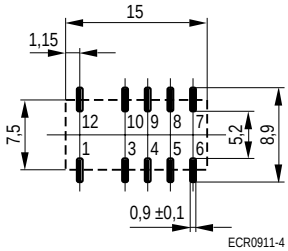
Long terminals



ECR0910-V

Note: Solder pad for pins 6 and 7 only for bistable with 2 windings

Short terminals



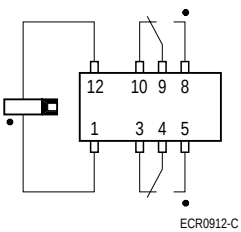
ECR0911-4

Note: Solder pad for pins 6 and 7 only for bistable with 2 windings

Terminal assignment

Relay - viewed from top

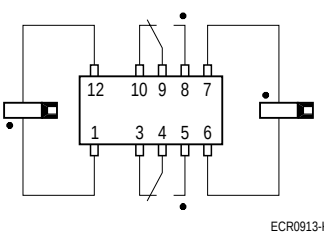
Monostable and bistable, 1 winding



ECR0912-C

The contact position illustrated shows the release condition.
If a positive potential is applied to terminal 1, the relay adopts the operating position.

Bistable, 2 windings

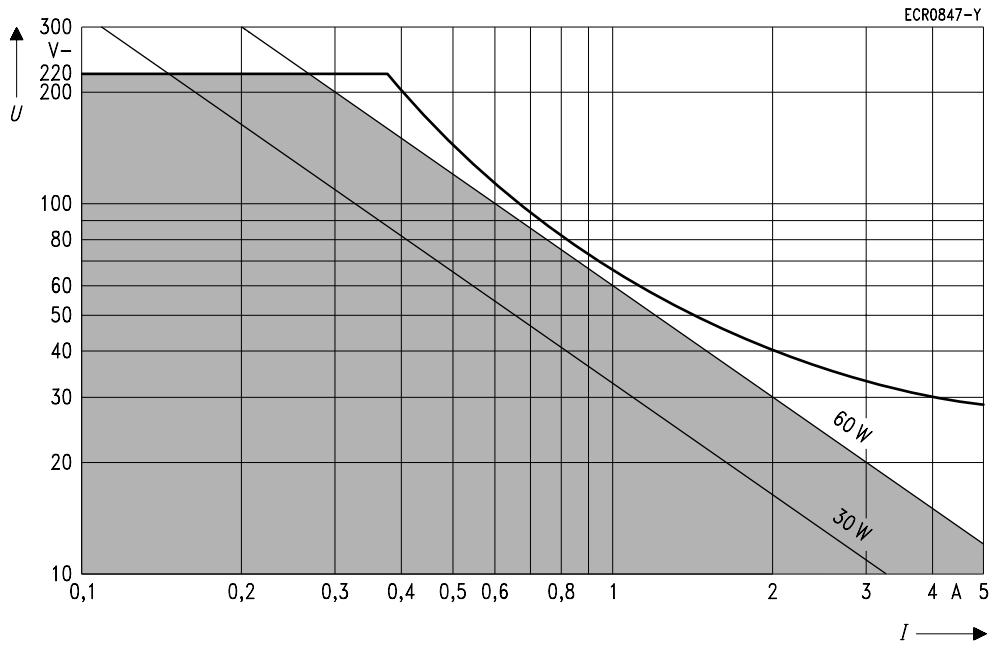


ECR0913-K

The contact position illustrated shows the release condition.
If a positive potential is applied to terminal 1 or 7, the relay adopts the operating position.

Contact data	
Number of contacts and type	2 changeover contacts
Contact assembly	Bifurcated contacts
Contact material	Silver nickel, gold-plated, against silver nickel, gold-plated
Limiting continuous current at max. ambient temperature	2 A
Maximum switching current	5 A
Maximum switching voltage	220 VDC 250 VAC
Maximum switching voltage according to VDE 0110-1	150 VDC 150 VAC
Maximum switching capacity DC voltage AC voltage	 ≥ 60 W, see load limit curve 62.5 VA
Recommended for load voltages greater than	100 µV
Thermoelectric potential	< 10 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: Quenching of the arc during the transit time

Coil data	
Nominal voltages	From 3 VDC to 24 VDC
Nominal power consumption, typical monostable with 1 winding bistable with 2 windings bistable with 1 winding	 140 mW 140 mW 70 mW
Operative range/pick-up class according to IEC 61810-1 and VDE 0435 Part 201	Class 2
Maximum operating voltage	75% of nominal voltage
Maximum release voltage (bistable)	75% of nominal voltage
Minimum release voltage (monostable)	10% of nominal voltage
Maximum non-release voltage (monostable)	40% of nominal voltage

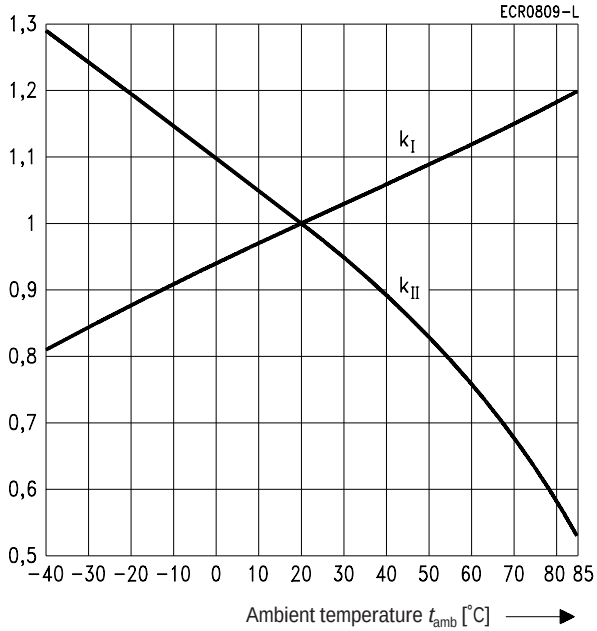
U_I = Minimum voltage at 20 °C after pre-energizing with nominal voltage without contact current

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}	Operating voltage range at 20 °C		Resistance at 20 °C	Coil number Ordering code
	Minimum voltage U_I	Maximum voltage U_{II}		
VDC	VDC	VDC	Ω	
monostable, 1 winding				A1✶✶✶/D1✶✶✶/G1✶✶✶ A2✶✶✶/D2✶✶✶/G2✶✶✶
3	2.25	6.50	64.3 ± 6.4	008
4.5	3.375	9.80	145 ± 14.5	011
5	3.75	10.90	178 ± 17.8	001
6	4.50	13.00	257 ± 25.7	002
9	6.75	19.60	578 ± 57.8	006
12	9.00	26.15	1029 ± 103	003
24	18.00	52.30	4114 ± 411	005
bistable, 2 windings				B1✶✶✶/E1✶✶✶/H1✶✶✶
3	2.25	6.50	64.3 ± 6.4	208
4.5	3.375	9.80	145 ± 14.5	211
5	3.75	10.90	178 ± 17.8	201
6	4.50	13.00	257 ± 25.7	202
9	6.75	19.60	578 ± 57.8	206
12	9.00	26.15	1029 ± 103	203
24	18.00	52.30	4114 ± 411	205
bistable, 1 winding				C1✶✶✶/F1✶✶✶/J1✶✶✶
3	2.25	9.20	128 ± 12.8	108
4.5	3.375	13.85	289 ± 28.9	111
5	3.75	15.33	357 ± 35.7	101
6	4.50	18.50	514 ± 51.4	102
9	6.75	27.75	1157 ± 115.7	106
12	9.00	37.00	2057 ± 205.7	103
24	18.00	74.00	8228 ± 822.8	105

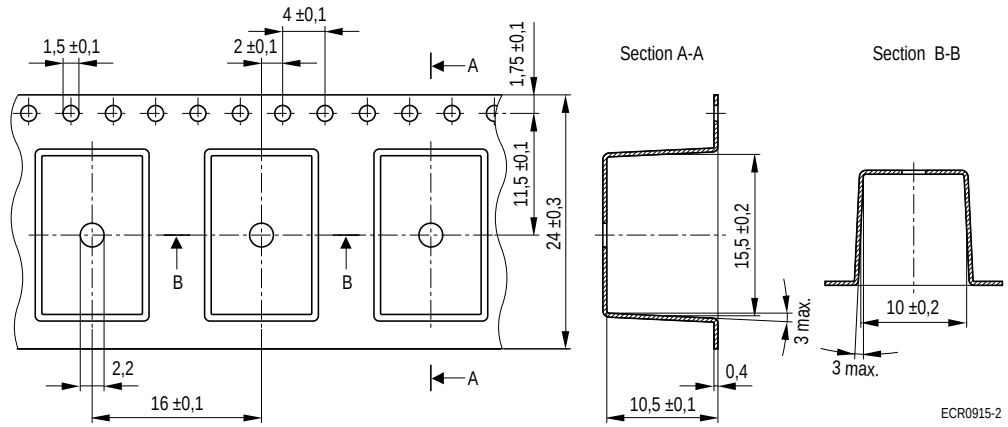
Further coil versions are available on request.

General data	
Operate time at U_{nom} and at 20 °C, typ.	3 ms
Release time at U_{nom} and at 20 °C (bistable), typ.	3 ms
Release time without/with diode in parallel (monostable), typ.	2/4 ms
Bounce time, typ.	1 ms
Maximum switching rate without load	50 operations/s
Ambient temperature according to IEC 61810-1 and VDE 0435 Part 201	 -40 °C … +85 °C
Thermal resistance	< 165 K/W
Maximum permissible coil temperature	110 °C
Vibration resistance (function) Frequency range according to IEC 60068-2-6	35 g 10 up to 1000 Hz
Shock resistance, half sinus, 11 ms according to IEC 60068-2-27	50 g (function) 150 g (damage)
Degree of protection according to VDE 0470 Part 1 EN 60529 / IEC 60529	immersion cleanable, IP 67 sealing corresponds to IEC 60068-2-17, method Qc 2
Electrical endurance at 12 V/10 mA at 6 V/100 mA at 60 V/500 mA at 30 V/1000 mA at 30 V/2000 mA	approx. 5×10^7 operations approx. 1×10^7 operations approx. 5×10^5 operations approx. 1×10^6 operations approx. 2×10^5 operations
Mechanical endurance	approx. 10^8 operations
Needle flame test	according to IEC 60695-2-2 / EN 60695-2-2
Mounting position	any
Processing information	Ultrasonic cleaning is not recommended
Weight (mass)	approx. 2.5 g

Insulation	
Insulation resistance at 500 VDC	10^9 Ω
Dielectric test voltage (1 min) Contact / winding Changeover contact / changeover contact At open contact	 1500 VAC_{rms} 1000 VAC_{rms} 1000 VAC_{rms}
Surge voltage resistance according to FCC 68 (10/700 µs) Contact / winding (Relay with 1 winding) Changeover contact / changeover contact At open contact according to Bellcore TR-NWT-001089 (2/10 µs) Contact / winding (Relay with 1 winding) Changeover contact / changeover contact At open contact	 1500 V 1500 V 1000 V 2500 V 2500 V 2000 V
Insulation according to IEC / EN 60950 Clearance Creepage distance	Basic insulation > 1.0 mm ≥ 2.5 mm

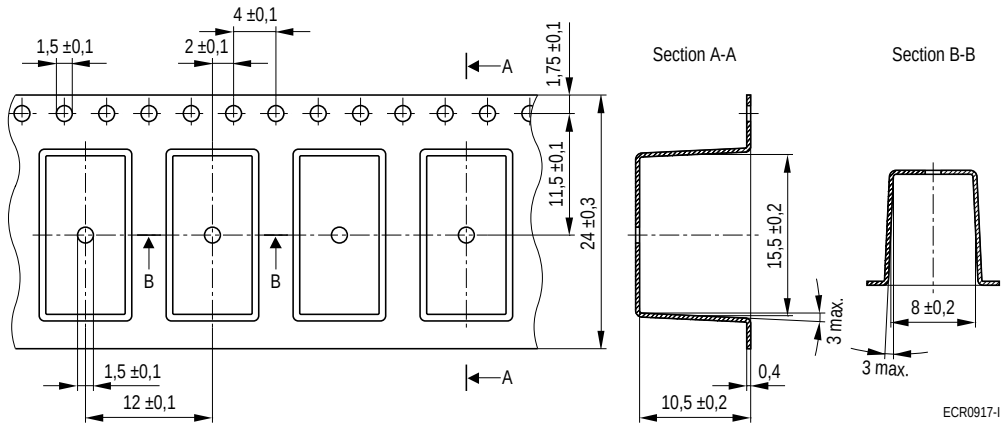
Packaging

Tape and reel for SMT version with long terminals



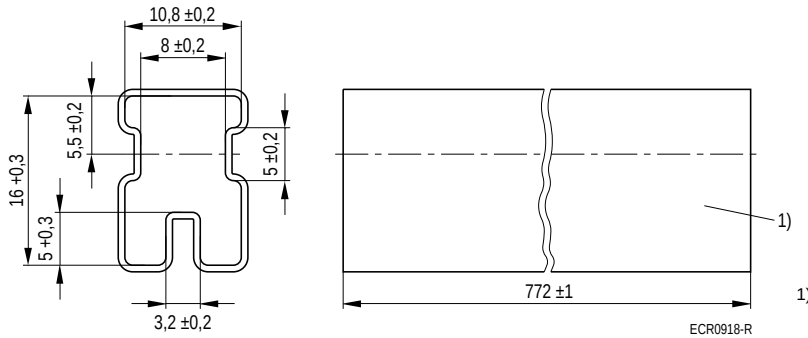
Reel: 330 mm diameter, 400 items
Note: Orientation mark towards strap perforation

Tape and reel for SMT version with short terminals



Reel: 330 mm diameter, 500 items
Note: Orientation mark towards strap perforation

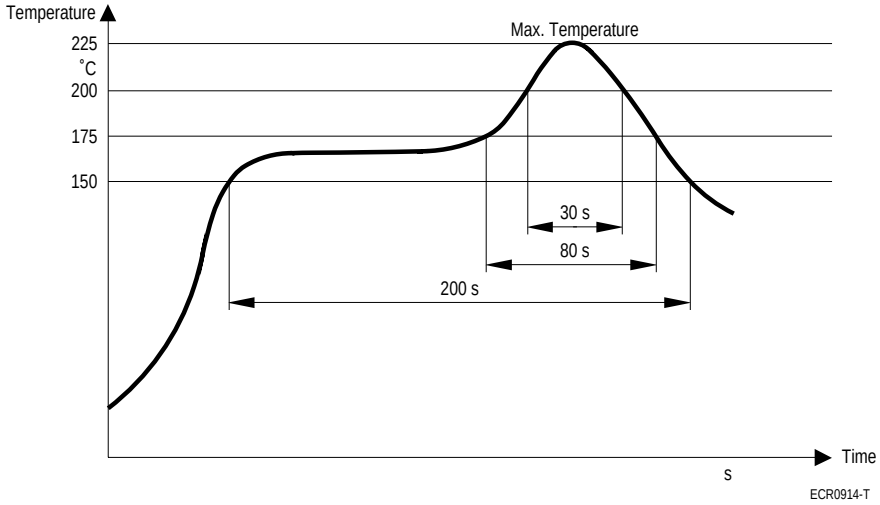
Tube for THT version



1) Label:
MR P2 returnable packaging, antistatic, SIEMENS

50 items / tube

Recommended soldering profile (Convections soldering)



Ordering code

Identification of the Miniature Relay P2

Relay type

THT version
A = monostable, 1 winding
B = bistable, 2 windings
C = bistable, 1 winding

SMT version with *long* terminals
D = monostable, 1 winding
E = bistable, 2 windings
F = bistable, 1 winding

SMT version with *short* terminals
G = monostable, 1 winding
H = bistable, 2 windings
J = bistable, 1 winding

Mounting height
1 = mounting height max. 10.4 mm SMT, max. 9.9 mm THT
2 = mounting height max. 10.0 mm SMT, max. 9.9 mm THT
(only monostable versions, i.e. relay type A, D, G)

Coil number

Monostable, 1 winding	Bistable, 1 winding	Bistable, 2 windings
008 = 3 V nominal voltage	108 = 3 V nominal voltage	208 = 3 V nominal voltage
011= 4.5 V	111 = 4.5 V	211 = 4.5 V
001 = 5 V	101 = 5 V	201 = 5 V
002 = 6 V	102 = 6 V	202 = 6 V
006 = 9 V	106 = 9 V	206 = 9 V
003 = 12 V	103 = 12 V	203 = 12 V
005 = 24 V	105 = 24 V	205 = 24 V

Contact arrangement / material
B301 = 2 changeover contacts; silver nickel, gold-plated, against silver nickel, gold-plated

Ordering example: V23079-D1001-B301
Miniature relay P2 SMT version with long terminals (standard mounting height), monostable, 1 winding, 5 V nominal voltage, 2 changeover contacts, silver nickel contacts

Note:

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