# Power PCB Relay RT1

■ 1 pole 12A/16A, 1 form C (CO) or 1 form A (NO) contact

■ DC or AC coil

■ 5kV/10mm coil-contact, reinforced insulation

■ Ambient temperature 85°C (DC coil)

■ WG version: product in accordance to IEC 60335-1

■ Reflow version: for THR (Through-Hole Reflow) soldering process

F0144-C

Typical applications
Boiler control, timers, garage door control, POS automation, interface modules

## Approvals
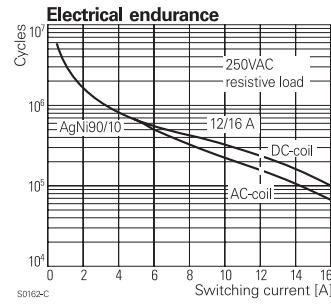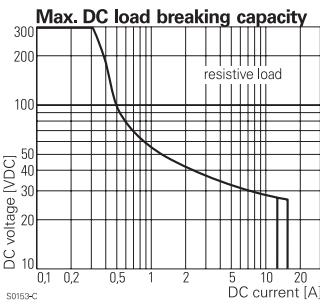
VDE Cert. No. 40007571, cULus E214025, cCSAus 1142018
CQC 20002275223 (China production), CQC 08001027262 (China production), CQC 18002197247 (monostable)
Technical data of approved types on request
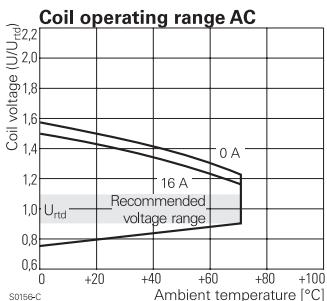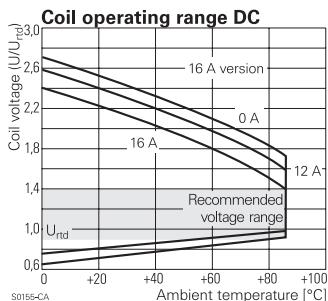
## Contact Data

| Contact Data | 12A | 16A |
|---|---|---|
| Contact arrangement | 1 form C (CO) or 1 form A (NO) | |
| Rated voltage | 250VAC | |
| Max. switching voltage | 400VAC | |
| Rated current | 12A | 16A |
| Limiting continuous current | 12A | 16A, UL: 20A |
| Limiting making current | | |
| max. 4s, duty factor 10% | 25A | 30A |
| Breaking capacity max. | 3000VA | 4000VA |
| Contact material | AgNi 90/10, AgNi 90/10 gold plated | |
| Frequency of operation, with/without load | | |
| DC coil | 360/72000h$^{-1}$ | |
| AC coil | 360/36000h$^{-1}$ | |
| Operate/release time max., DC coil | 8/6ms | |
| Bounce time max., DC coil, form A/form B | 4/6ms | |
| Electrical endurance | see electrical endurance graph[1] | |

### Contact ratings

| Type | Contact | Load | Cycles |
|---|---|---|---|
| **IEC 61810** | | | |
| RT314 DC-coil | A (NO) | 16A, 250VAC, cosφ=1, 85°C | 30x10³ |
| RT314 DC-coil | C (CO) | 16A, 250VAC, cosφ=1, 85°C | 10x10³ |
| RT314 DC-coil | A (NO) | 10A, 400VAC, cosφ=1, 85°C | 150x10³ |
| RT114 DC-coil | A (NO) | 12A, 250VAC, cosφ=1, 85°C | 50x10³ |
| RT114 AC-coil | A (NO) | 12A, 250VAC, cosφ=1, 70°C | 100x10³ |
| **UL 61810-1 (former UL 508)** | | | |
| RT314 | A/B (NO/NC) | 20A, 250VAC, general purpose, 85°C | 6x10³ |
| RT334 | A (NO) | 16A, 250VAC, gen. purpose, 85°C | 50x10³ |
| RT314 | A (NO) | 1hp, 240VAC, 40°C | 1x10³ |
| RT314 | A (NO) | FLA/LRA, 4.5/13.1A, 480VAC, 70°C | 100x10³ |
| **EN60947-4-1** | | | |
| RT314 | A (NO) | 250V/2A, AC-3 | 6.050 |

## Contact Data (continued)

| | | | |
|---|---|---|---|
| **EN60947-5-1** | | | |
| RT314 DC-coil | A/B (NO/NC) | 2A, 24VDC, DC13 | 6.050 |
| RT314 | A (NO) | 250/3A, AC-15 | 6.050 |
| **EN60730-1** | | | |
| RT314 DC-coil | A (NO) | 12(2)A, 250VAC, 85°C | 100x10³ |

1) For reflow solderable versions: actual contact performance may be influenced by the reflow soldering process.

| Mechanical endurance | |
|---|---|
| DC coil | >30x10⁶ operations |
| AC coil | >10x10⁶ operations |
| AC coil, reflow version | >5x10⁶ operations |

## Coil Data

| | |
|---|---|
| Coil voltage range, DC coil/ AC coil | 5 to 110VDC / 24 to 230VAC |
| Operative range, IEC 61810 | 2 |
| Coil insulation system according UL | class F |

### Coil versions, DC coil

| Coil code | Rated voltage VDC | Operate voltage VDC | Release voltage VDC | Coil resistance Ω±10%[2] | Rated coil power mW |
|---|---|---|---|---|---|
| 005 | 5 | 3.5 | 0.5 | 62 | 403 |
| 006 | 6 | 4.2 | 0.6 | 90 | 400 |
| 009 | 9 | 6.3 | 0.9 | 200 | 400 |
| 012 | 12 | 8.4 | 1.2 | 360 | 400 |
| 018 | 18 | 12.6 | 1.8 | 770 | 420 |
| 020 | 20 | 14.0 | 2.0 | 952 | 420 |
| 024 | 24 | 16.8 | 2.4 | 1440 | 400 |
| 048 | 48 | 33.6 | 4.8 | 5520 | 417 |
| 060 | 60 | 42.0 | 6.0 | 8570[2] | 420 |
| 110 | 110 | 77.0 | 11.0 | 28800[2] | 420 |

2) Coil resistance ±12%.
All figures are given for coil without pre-energization, at ambient temperature +23°C.
Other coil voltages on request.

### Coil versions, AC coil 50/60 Hz

| Coil code | Rated voltage VAC | Operate voltage VAC | Release voltage VAC | Coil resistance Ω±15%[3] | Rated coil power VA |
|---|---|---|---|---|---|
| 524 | 24 | 18.0 | 3.6 | 350[3] | 0.76 |
| 548 | 48 | 36.0 | 7.2 | 1420 | 0.74 |
| 615 | 115 | 86.3 | 17.3 | 8100 | 0.76 |
| 620 | 120 | 90.0 | 18.0 | 8800 | 0.75 |
| 700 | 200 | 150.0 | 30.0 | 24350 | 0.76 |
| 730 | 230 | 172.5 | 34.5 | 32500 | 0.74 |

3) Coil resistance ±10%.
All figures are given for coil without pre-energization, at ambient temperature +23°C, 50 Hz.
Other coil voltages on request.



**Max. DC load breaking capacity**

S0153-C



**Electrical endurance**

S0162-C

Datasheets and product specification according to IEC 61810-1 and to be used only together with the 'Definitions' section.

Datasheets and product data is subject to the terms of the disclaimer and all chapters of the 'Definitions' section, available at http://relays.te.com/definitions

Datasheets, product data, 'Definitions' section, application notes and all specifications are subject to change.

## Power PCB Relay RT1 (Continued)

### Coil operating range DC


S0155-CA

### Coil operating range AC


S0156-C

### Other Data (continued)

| | |
|---|---|
| Terminal type | |
| standard version | PCB-THT, plug-in |
| reflow version | PCB-THR |
| Mounting distance | AC coil: ≥2.5mm |
| Weight | 14g |
| Resistance to soldering heat  THT, IEC 60068-2-20 | |
| RTII | 270°C/10s |
| RTIII | 260°C/5s |
| Resistance to soldering heat  THR | |
| reflow soldering (for reflow version) | forced gas convection [4] or vapour phase [5] |
| temperature profile | according EN61730 |
| Packaging/unit | tube/20 pcs., box/500 pcs. |

4) infrared heating not allowed
5) recommended fluid LS/230

### Accessories

| | |
|---|---|
| For details see datasheet | Accessories Industrial Power Relay RT |

NOTE: indicated contact ratings and electrical endurance data for direct wiring of relays (according IEC 61810-1); for relays mounted on sockets deratings may apply.

### Insulation Data

| | |
|---|---|
| Initial dielectric strength | |
| between open contacts | $1000V_{rms}$ |
| between contact and coil | $5000V_{rms}$ |
| Clearance/creepage | |
| between contact and coil | ≥10/10mm |
| Material group of insulation parts | IIIa |
| Tracking index of relay base | PTI 250V |
| reflow version | PTI 175V |
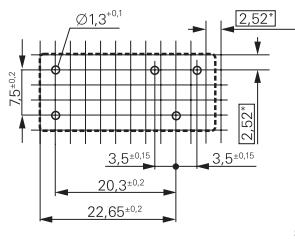
### Other Data

Material compliance: EU RoHS/ELV, China RoHS, REACH, Halogen content
refer to the Product Compliance Support Center at
www.te.com/customersupport/rohssupportcenter

| | |
|---|---|
| Resistance to heat and fire | |
| WG version or Reflow version | according EN60335, par30 |
| Ambient temperature | |
| DC coil | -40 to 85°C |
| AC coil | -40 to 70°C |
| Category of environmental protection, IEC 61810 | |
| standard version | RTII - flux proof, RTIII - wash tight |
| reflow version | RTII - flux proof |
| Vibration resistance (functional) | |
| form A/form B contact, 30 to 500Hz | 20g/5g |
| Shock resistance (destructive) | 100g |
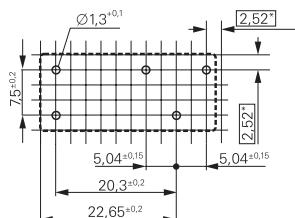
### PCB layout / terminal assignment

Bottom view on solder pins
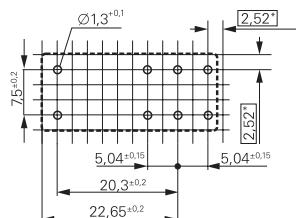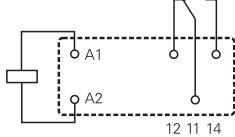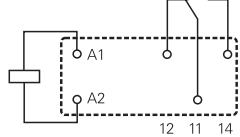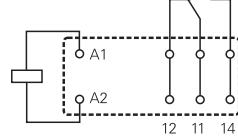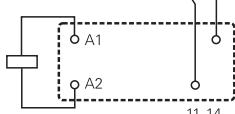
*) With the recommended PCB hole sizes a grid pattern from 2.5mm to 2.54mm can be used.

12A, pinning 3.5mm


S0418-CB

12A, pinning 5mm


S0418-CN

16A, pinning 5mm


S0418-CA

1 form C (CO) contact


S0163-BG
12 11 14

1 form C (CO) contact


S0163-BC
12 11 14

1 form C (CO) contact


S0163-BE
12 11 14

1 form A (NO) contact


S0163-BH
11 14

1 form A (NO) contact


S0163-BD
11 14

1 form A (NO) contact


S0163-BF
11 14
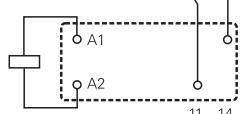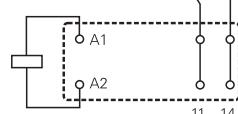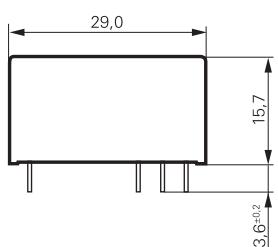
## Power PCB Relay RT1 (Continued)
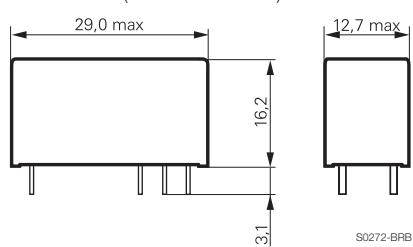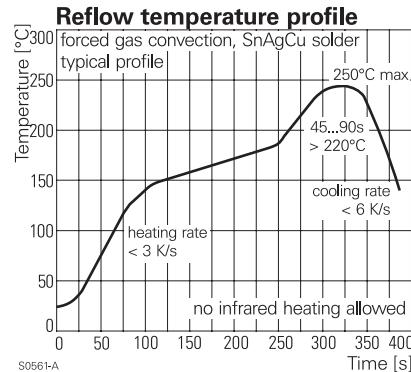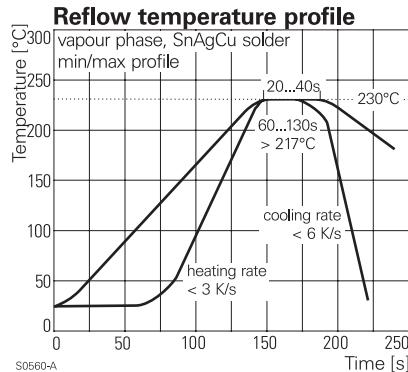
**Dimensions**

THT version

29,0
12,7
15,7
3,6±0.2
S0272-BB

THR version (reflow solderable)

29,0 max
12,7 max
16,2
3,1
S0272-BRB

**Process conditions for Reflow soldering**
according to EN61760-1

**Reflow temperature profile**
vapour phase, SnAgCu solder
min/max profile
20...40s
230°C
60...130s
> 217°C
cooling rate
< 6 K/s
heating rate
< 3 K/s
Temperature [°C]
Time [s]
S0560-A

**Reflow temperature profile**
forced gas convection, SnAgCu solder
typical profile
250°C max
45...90s
> 220°C
cooling rate
< 6 K/s
heating rate
< 3 K/s
no infrared heating allowed
Temperature [°C]
Time [s]
S0561-A

**Product code structure**    Typical product code

| | | | | | RT | 3 | 1 | 4 | 024 |
|---|---|---|---|---|---|---|---|---|---|

**Type**

| | |
|---|---|
| **RT** | Power PCB Relay RT1 |

**Version**

| | |
|---|---|
| **1** | 12A, pinning 3.5mm, flux proof |
| **2** | 12A, pinning 5mm, flux proof |
| **3** | 16A, pinning 5mm, flux proof |
| **B** | 12A, pinning 3.5mm, wash tight (not for Reflow version) |
| **C** | 12A, pinning 5mm, wash tight (not for Reflow version) |
| **D** | 16A, pinning 5mm, wash tight (not for Reflow version) |

**Contact arrangement**

| | |
|---|---|
| **1** | 1 form C (CO) contact |
| **3** | 1 form A  (NO) contact |

**Contact material**

| | |
|---|---|
| **4** | AgNi 90/10 |
| **5** | AgNi 90/10 gold plated (for type RT31.) |

**Coil**

Coil code: please refer to coil versions table

**Version**

| | |
|---|---|
| **Blank** | Standard version |
| **WG** | Product in accordance with IEC 60335-1 (domestic appliances) |
| **R** | Reflow solderable |

## Power PCB Relay RT1 (Continued)

| Product code | Version | Contacts | Contact material | Coil | Version | Part Number Austria | Part Number China |
|---|---|---|---|---|---|---|---|
| RT114009 | 12A, pinning 3.5mm, flux proof | 1 form C (CO) contact | AgNi 90/10 | 9VDC | Standard | 1393239-9 | 1-1649326-2 |
| RT114012 | | | | 12VDC | | 1419108-1 | 1-1649326-3 |
| RT114012WG | | | | 12VDC | IEC60335-1 compliant | 7-1415538-6 | |
| RT114024 | | | | 24VDC | Standard | 1-1393239-3 | 1-1649326-5 |
| RT114024WG | | | | 24VDC | IEC60335-1 compliant | 1415539-4 | |
| RT114730 | | | | 230VAC | Standard | 1-1393239-9 | |
| RT115024 | | | AgNi 90/10 gold pl. | 24VDC | | 2-1393239-1 | 3-1833000-9 |
| RT134012 | | 1 form A (NO) contact | AgNi 90/10 | 12VDC | | 2-1393239-6 | 3-1649326-1 |
| RT134024 | | | | 24VDC | | 3-1393239-0 | 3-1649326-3 |
| RT214012 | 12A, pinning 5mm, flux proof | 1 form C (CO) contact | | 12VDC | | 5-1393239-4 | 1-1649327-3 |
| RT214024 | | | | 24VDC | | 5-1393239-5 | 1-1649327-5 |
| RT214524 | | | | 24VAC | | 5-1393239-9 | |
| RT214730 | | | | 230VAC | | 1419108-6 | |
| RT314005 | 16A, pinning 5mm, flux proof | | | 5VDC | | 9-1393239-1 | 1-1649328-0 |
| RT314006 | | | | 6VDC | | 9-1393239-3 | 1-1649328-1 |
| RT314009 | | | | 9VDC | | 9-1393239-4 | |
| RT314012 | | | | 12VDC | | 9-1393239-5 | 1-1649328-3 |
| RT314012R | | | | 12VDC | Reflow solderable | 4-1415543-6 | |
| RT314012WG | | | | 12VDC | IEC60335-1 compliant | 8-1415535-6 | 5-1833002-0 |
| RT314018 | | | | 18VDC | Standard | 9-1393239-7 | 1-1649328-4 |
| RT314024 | | | | 24VDC | | 9-1393239-8 | 1-1649328-5 |
| RT314024WG | | | | 24VDC | IEC60335-1 compliant | 1415538-7 | 5-1833002-1 |
| RT314048 | | | | 48VDC | Standard | 1393240-1 | 1-1649328-6 |
| RT314060 | | | | 60VDC | | 1-1649328-7 | 1-1649328-7 |
| RT314110 | | | | 110VDC | | 1393240-3 | |
| RT314524 | | | | 24VAC | | 1393240-4 | |
| RT314548 | | | | 48VAC | | 1393240-5 | |
| RT314615 | | | | 115VAC | | 1393240-6 | |
| RT314730 | | | | 230VAC | | 1393240-7 | |
| RT314730WG | | | | 230VAC | IEC60335-1 compliant | 4-1415538-0 | |
| RT315024 | | | AgNi 90/10 gold pl. | 24VDC | Standard | 1-1393240-4 | 3-1833002-7 |
| RT334009WG | | 1 form A (NO) contact | AgNi 90/10 | 9VDC | IEC60335-1 compliant | 3-1415538-1 | |
| RT334012 | | | | 12VDC | Standard | 4-1393240-5 | 3-1649328-1 |
| RT334012WG | | | | 12VDC | IEC60335-1 compliant | 1-1415527-1 | 5-1833002-2 |
| RT334024 | | | | 24VDC | Standard | 4-1393240-8 | 3-1649328-3 |
| RT334048 | | | | 48VDC | | 5-1393240-0 | 3-1649328-4 |
| RTB14005 | 12A, pinning 3.5mm, wash tight | 1 form C (CO) contact | | 5VDC | | 1-1393238-2 | 1649326-1 |
| RTB14012 | | | | 12VDC | | 1-1393238-5 | 1649326-4 |
| RTB14024 | | | | 24VDC | | 1-1393238-9 | 1649326-6 |
| RTB14524 | | | | 24VAC | | 2-1393238-4 | |
| RTB34012 | | 1 form A (NO) | | 12VDC | | 3-1393238-0 | 2-1649326-2 |
| RTC14024 | 12A, 5mm, wash | 1 form C (CO) contact | | 24VDC | | 5-1393238-0 | 1649327-6 |
| RTD14005 | 16A, pinning 5mm, wash tight | | | 5VDC | | 5-1393238-9 | 1649328-1 |
| RTD14012 | | | | 12VDC | | 6-1393238-2 | 1649328-4 |
| RTD14024 | | | | 24VDC | | 6-1393238-8 | 1649328-6 |
| RTD14048 | | | | 48VDC | | 6-1393238-9 | 1649328-7 |
| RT114048 | 12A, pinning 3.5mm, flux proof | | | 48VDC | | | 1-1649326-6 |
| RT214005 | 12A, pinning 5mm, flux proof | | | 5VDC | | | 1-1649327-0 |
| RT234012 | | | | 12VDC | | | 1-1649327-3 |
| RT234024 | 12A, pinning 3.5mm, wash tight | | | 24VDC | IEC 60335-1 compliant standard | | 1-1649327-5 |
| RTB14048 | | | | 48VDC | | | 1649326-7 |
| RTB34005 | 16A, pinning 5mm, wash tight | | | 5VDC | | | 1-1649326-9 |
| RTD14060 | | | | 60VDC | | | 1649328-8 |
| RTD34012 | | 1 form A (NO) contact | | 12VDC | | | 2-1649328-2 |
| RTD34024WG | | | | 24VDC | | | 3-1649328-7 |
| RTD34015 | | | | 15VDC | | | 4-1833002-0 |
| RTD34024 | | | | 24VDC | | | 2-1649328-4 |

This list represents the most common types and does not show all variants covered by this datasheet.
Other types on request