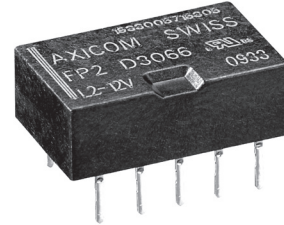


## FP2 Relay

- Telecom/signal relay (dry circuit, test access, ringing)
- Slim line 14x9mm (.551x.354")
- Switching current 2A
- 2 form C bifurcated contacts (2 CO)
- High sensitivity results in low nominal power consumption, 80mW for high sensitive, 140mW for sensitive version
- High mechanical shock resistance, up to 300g functional, up to 1500g survival

### Typical applications

Communications equipment linecard application (ringing and test access), PABX, voice over IP, office equipment, measurement and control equipment, automotive equipment as CAN bus, keyless entry, speaker switch, medical equipment, consumer electronics, set top boxes, HiFi.



### Approvals

UL 508 File No. E 111441, UL 60950,  
Technical data of approved types on request

### Contact Data

|                                      |                                                            |
|--------------------------------------|------------------------------------------------------------|
| Contact arrangement                  | 2 form C (CO)                                              |
| Max. switching voltage               | 220VDC, 250VAC                                             |
| Rated current                        | 2A                                                         |
| Limiting continuous current, 85°C    | 2A                                                         |
| Switching Power                      | 60W, 62.5VA                                                |
| Contact material                     | AgNi, gold-covered                                         |
| Contact style                        | bifurcated contact                                         |
| Minimum switching voltage            | 100µV                                                      |
| Thermoelectrical potential           | <10µV                                                      |
| Initial contact resistance           | <50mΩ at 10mA, 20mV                                        |
| Frequency of operation, without load | 50 operations/s                                            |
| Operate time                         | typ. 2ms, max. 4ms                                         |
| Set/reset time                       | typ. 2ms, max. 4ms                                         |
| Release time                         |                                                            |
| without diode in parallel            | typ. 2ms, max. 4ms                                         |
| with diode in parallel               | typ. 4ms, max. 6ms                                         |
| Bounce time                          | typ. 1ms, max. 3ms                                         |
| Electrical endurance                 |                                                            |
| at 12V / 10mA                        | typ. 5x10 <sup>7</sup> operations                          |
| at 6V / 100mA                        | typ. 1x10 <sup>7</sup> operations                          |
| at 60V / 500mA                       | typ. 5x10 <sup>5</sup> operations                          |
| at 30V / 1000mA                      | typ. 1x10 <sup>6</sup> operations                          |
| at 30V / 2000mA                      | typ. 2x10 <sup>5</sup> operations                          |
| UL contact rating                    | 50VDC / 2A - 100W<br>50VAC / 2A - 100W<br>30VDC / 2A - 60W |
| Mechanical endurance                 | typ. 100x10 <sup>6</sup> operations                        |

### Coil Data

|                       |            |
|-----------------------|------------|
| Magnetic system       | polarized  |
| Coil voltage range    | 2 to 24VDC |
| Max. coil temperature | 125°C      |
| Thermal resistance    | < 125K/W   |

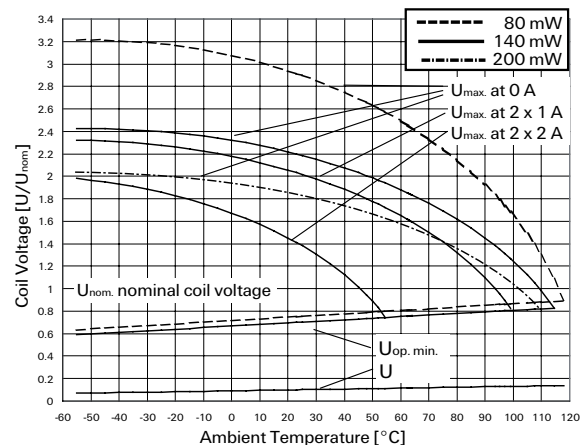
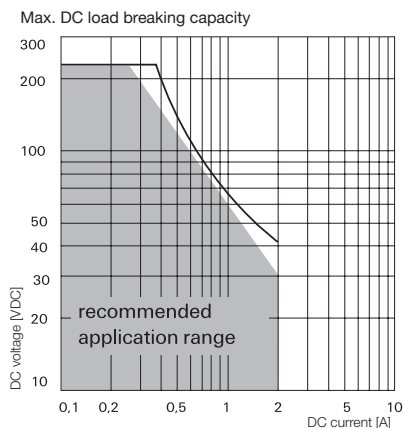
### Coil versions, monostable

| Coil code                           | Rated voltage VDC | Operate voltage VDC | Limiting Voltage VDC | Release voltage VDC | Coil resistance Ω±10% | Rated coil power mW |
|-------------------------------------|-------------------|---------------------|----------------------|---------------------|-----------------------|---------------------|
| <b>Standard version, monostable</b> |                   |                     |                      |                     |                       |                     |
| 06                                  | 3                 | 2.10                | 6.60                 | 0.30                | 64                    | 140                 |
| 04                                  | 4.5               | 3.15                | 9.90                 | 0.45                | 145                   | 140                 |
| 09                                  | 5                 | 3.50                | 11.00                | 0.50                | 178                   | 140                 |
| 05                                  | 6                 | 4.20                | 13.20                | 0.60                | 257                   | 140                 |
| 10                                  | 9                 | 6.30                | 19.80                | 0.90                | 574                   | 140                 |
| 02                                  | 12                | 8.40                | 26.40                | 1.20                | 1028                  | 140                 |
| 12                                  | 24                | 16.80               | 44.30                | 2.40                | 2880                  | 200                 |
| 13                                  | 48                | 33.60               | 72.30                | 4.80                | 7680                  | 300                 |

### High sensitive version, monostable

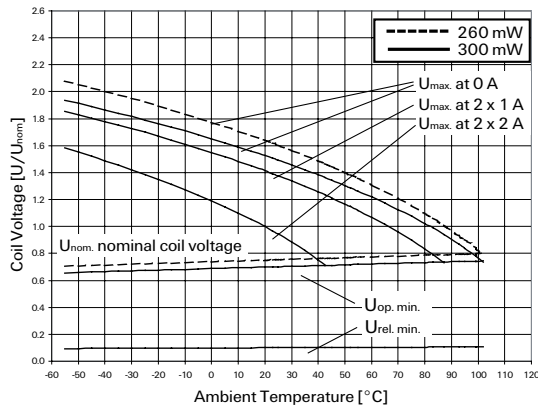
|                                           |     |       |       |      |      |     |
|-------------------------------------------|-----|-------|-------|------|------|-----|
| <b>High sensitive version, monostable</b> |     |       |       |      |      |     |
| 21                                        | 3   | 2.10  | 8.70  | 0.30 | 113  | 80  |
| 22                                        | 4.5 | 3.15  | 13.10 | 0.45 | 353  | 80  |
| 23                                        | 5   | 3.50  | 14.60 | 0.50 | 313  | 80  |
| 24                                        | 6   | 4.20  | 17.50 | 0.60 | 450  | 80  |
| 25                                        | 9   | 6.30  | 24.20 | 0.90 | 1013 | 80  |
| 26                                        | 12  | 8.40  | 35.00 | 1.20 | 1800 | 80  |
| 27                                        | 24  | 16.80 | 52.80 | 2.40 | 4114 | 140 |
| 28                                        | 48  | 36.00 | 77.60 | 4.80 | 8882 | 260 |

All figures are given for coil without pre-energization, at ambient temperature +23°C.



## FP2 Relay (Continued)

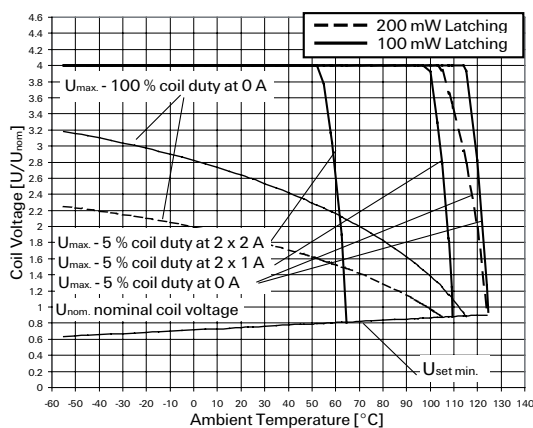
### Coil Data (continued)



### Coil versions, bistable

| Coil code                         | Rated voltage VDC | Set voltage VDC | Max. set voltage VDC | Reset voltage VDC | Coil resistance $\Omega \pm 10\%$ | Rated coil power mW |
|-----------------------------------|-------------------|-----------------|----------------------|-------------------|-----------------------------------|---------------------|
| <b>Standard, bistable 1 coil</b>  |                   |                 |                      |                   |                                   |                     |
| 41                                | 3                 | 2.25            | 7.80                 | -2.25             | 90                                | 100                 |
| 42                                | 4.5               | 3.38            | 11.70                | -3.38             | 203                               | 100                 |
| 43                                | 5                 | 3.75            | 13.00                | -3.75             | 250                               | 100                 |
| 44                                | 6                 | 4.50            | 15.60                | -4.50             | 360                               | 100                 |
| 45                                | 9                 | 6.75            | 23.50                | -6.75             | 810                               | 100                 |
| 46                                | 12                | 9.00            | 31.30                | -9.00             | 1440                              | 100                 |
| 47                                | 24                | 18.00           | 47.50                | -18.00            | 3840                              | 150                 |
| <b>Standard, bistable 2 coils</b> |                   |                 |                      |                   |                                   |                     |
| 61                                | 3                 | 2.10            | 5.50                 | -2.10             | 45                                | 200                 |
| 62                                | 4.5               | 3.15            | 8.30                 | -3.15             | 101                               | 200                 |
| 63                                | 5                 | 3.20            | 7.20                 | -3.20             | 125                               | 200                 |
| 64                                | 6                 | 4.20            | 11.10                | -4.20             | 180                               | 200                 |
| 65                                | 9                 | 6.30            | 16.80                | -6.30             | 405                               | 200                 |
| 66                                | 12                | 8.40            | 28.10                | -8.40             | 720                               | 200                 |
| 67                                | 24                | 16.80           | 44.30                | -16.80            | 1920                              | 300                 |

All figures are given for coil without pre-energization, at ambient temperature +23°C.



All figures are given for coil without pre-energization, at ambient temperature +23°C.

$U_{max}$  upper limit of the operative range of the coil voltage (limiting voltage) when coils are continuously energized

$U_{op.min}$  lower limit of the operative range of the coil voltage (reliable operate voltage)

$U_{rel.min}$  lower limit of the operative range of the coil voltage (reliable release voltage)

### Insulation

|                                    |                      |
|------------------------------------|----------------------|
| Initial dielectric strength        |                      |
| between open contacts              | 750V <sub>rms</sub>  |
| between contact and coil           | 1000V <sub>rms</sub> |
| between adjacent contacts          | 1000V <sub>rms</sub> |
| Initial surge withstand voltage    |                      |
| between open contacts              | 1100V                |
| between contact and coil           | 1500V                |
| between adjacent contacts          | 1500V                |
| Initial insulation resistance      |                      |
| between insulated elements         | >10 <sup>9</sup> Ω   |
| Capacitance                        |                      |
| between open contacts              | max. 4pF             |
| between contact and coil           | max. 1pF             |
| between adjacent contacts          | max. 1pF             |
| Cross talk at 100MHz/900MHz        | -40.2dB/-22.3dB      |
| Insertion loss at 100MHz/900MHz    | 0.03dB/0.25dB        |
| Voltage standing wave ratio (VSWR) |                      |
| at 100MHz/900MHz                   | 1.01/1.07            |

### Other Data

Material compliance: EU RoHS/ELV, China RoHS, REACH, Halogen content refer to the Product Compliance Support Center at [www.te.com/customer-support/rohssupportcenter](http://www.te.com/customer-support/rohssupportcenter)

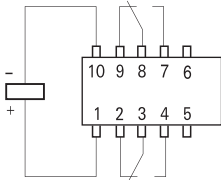
|                                                  |                              |
|--------------------------------------------------|------------------------------|
| Ambient temperature                              | -40°C to +85°C               |
| Thermal resistance                               | <150K/W                      |
| Category of environmental protection             |                              |
| IEC 61810                                        | RT III - immersion cleanable |
| Degree of protection, IEC 60529                  | IP 67, immersion cleanable   |
| Vibration resistance (functional)                | 20g, 10 to 500Hz             |
| Shock resistance (functional), half sinus 11ms   | 50g                          |
| Shock resistance (destructive), half sinus 0.5ms | 1500g                        |
| Terminal type                                    | PCB-THT                      |
| Weight                                           | max. 2g                      |
| Resistance to soldering heat THT                 |                              |
| IEC 60068-2-20                                   | 265°C/10s                    |
| Ultrasonic cleaning                              | not recommended              |
| Packaging unit                                   | tube/50 pcs., box/1000 pcs.  |

## FP2 Relay (Continued)

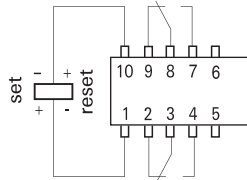
### Terminal assignment

TOP view on component side of PCB

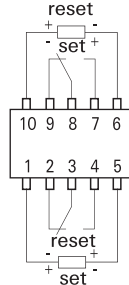
Monostable version



Bistable version, 1-coil



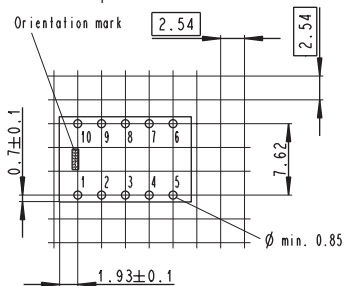
Bistable version, 2-coils



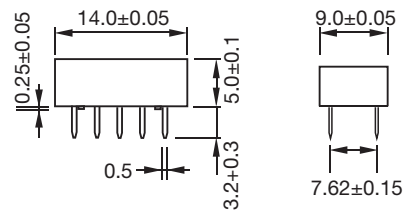
Contacts are shown in reset condition.  
Both coils can be used as either set or reset coils.  
Contact position might change during transportation and must be reset before use.

### PCB layout

TOP view on component side of PCB



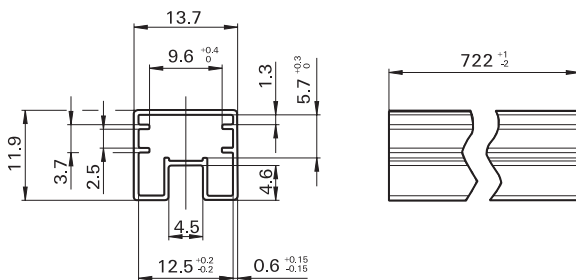
### Dimensions



### Packing

Tube for THT version

50 relays per tube, 1000 relays per box



**FP2 Relay** (Continued)

**Product code structure**

Typical product code

**D30**
**02**
**Type**
**D30** Signal Relays FP2  
2 form C, 2 CO

**Coil**

Coil code: please refer to coil versions table

Performance and coil type

**0x,1x** Standard version, monostable

**2x** High sensitive version, monostable

**4x** Standard version, bistable 1 coil

**6x** Standard version, bistable 2 coils

| Product code | Arrangement     | Perf. type     | Coil type        | Coil   | Part number |
|--------------|-----------------|----------------|------------------|--------|-------------|
| D3006        | 2 form C (2 CO) | Standard       | Monostable       | 3VDC   | 1-1462033-3 |
| D3004        |                 |                |                  | 4.5VDC | 1462033-9   |
| D3009        |                 |                |                  | 5VDC   | 1-1462033-4 |
| D3010        |                 |                |                  | 9VDC   | 2-1462033-1 |
| D3002        |                 |                |                  | 12VDC  | 1462033-5   |
| D3012        |                 |                |                  | 24VDC  | 2-1462033-2 |
| D3013        | 2 form C (2 CO) | High sensitive | Monostable       | 48VDC  | 2-1462033-6 |
| D3021        |                 |                |                  | 3VDC   | 3-1462033-2 |
| D3022        |                 |                |                  | 4.5VDC | 3-1462033-3 |
| D3023        |                 |                |                  | 5VDC   | 3-1462033-4 |
| D3025        |                 |                |                  | 9VDC   | 3-1462033-6 |
| D3026        |                 |                |                  | 12VDC  | 3-1462033-7 |
| D3027        | 2 form C (2 CO) | Standard       | Bistable 1 coil  | 24VDC  | 3-1462033-8 |
| D3041        |                 |                |                  | 3VDC   | 4-1462033-0 |
| D3042        |                 |                |                  | 4.5VDC | 4-1462033-1 |
| D3043        |                 |                |                  | 5VDC   | 4-1462033-2 |
| D3046        |                 |                |                  | 12VDC  | 4-1462033-5 |
| D3047        |                 |                |                  | 24VDC  | 4-1462033-6 |
| D3061        | 2 form C (2 CO) | Standard       | Bistable 2 coils | 3VDC   | 4-1462033-7 |
| D3062        |                 |                |                  | 4.5VDC | 4-1462033-8 |
| D3063        |                 |                |                  | 5VDC   | 4-1462033-9 |
| D3066        |                 |                |                  | 12VDC  | 5-1462033-4 |
| D3067        |                 |                |                  | 24VDC  | 5-1462033-6 |

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

Other types on request.