

**AXICOM**

Telecom-, Signal and RF Relays

## FP2 Relay

## FP2 Relay

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The dimensions in this datasheet are for reference purpose only and are subject to change without notice. Specifications are subject to change without notice.

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## FP2 Relay

2 pole telecom / signal relay  
Through Hole Type (THT), polarized.

Relay types:                non-latching with 1 coil  
                                  latching with 1 coil  
                                  latching with 2 coils

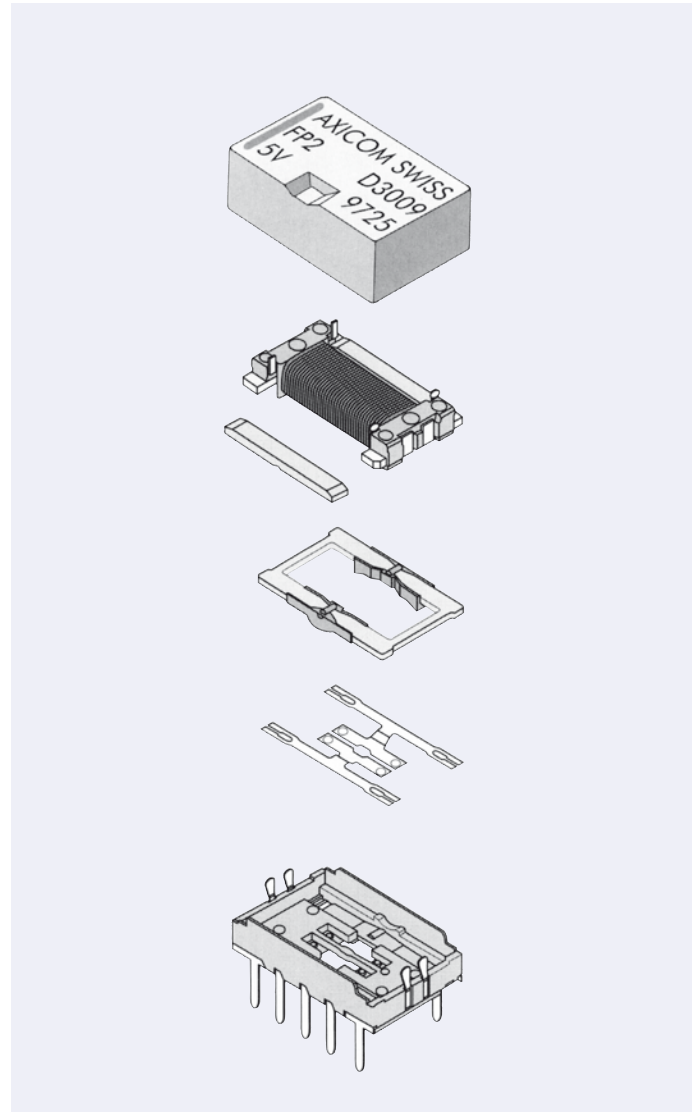
ROHS compliant (Directive 2002/95/EC) as  
per product date code 0336.

### Features

- Telecom/signal relay (dry circuit, test access, ringing)
- Slim line 14 x 9 mm, 0.551 x 0.354 inch
- Switching current 2 A
- 2 changeover contacts (2 form C / DPDT)
- Bifurcated contacts
- High sensitivity results in low nominal power consumption 80 mW for high sensitive, 140 mW for sensitive version
- High mechanical shock resistance  
up to 300 G functional  
up to 1500 G survival

### Typical applications

- Communications equipment  
Linecard application - analog, ISDN, xDSL, PABX  
Voice over IP
- Office and business equipment
- Measurement and control equipment
- Consumer electronics  
Set top boxes, HiFi
- Medical equipment



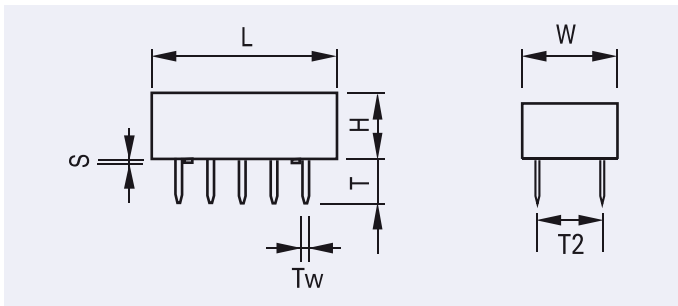
## FP2 Relay

### Dimensions

Dimensions in mm

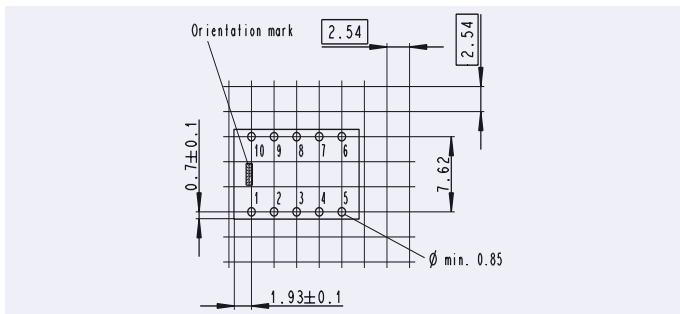
| THT |              |               |
|-----|--------------|---------------|
|     | mm           | inch          |
| L   | 14.00 ± 0.05 | 0.551 ± 0.002 |
| W   | 9.00 ± 0.05  | 0.354 ± 0.002 |
| H   | 5.00 ± 0.10  | 0.196 ± 0.004 |
| T   | 3.20 + 0.30  | 0.125 ± 0.012 |
| T1  | N/A          | N/A           |
| T2  | 7.62 ± 0.15  | 0.299 ± 0.006 |
| Tw  | 0.50         | 0.019         |
| S   | 0.25 ± 0.05  | 0.009 ± 0.002 |

### THT Version



### Mounting hole layout

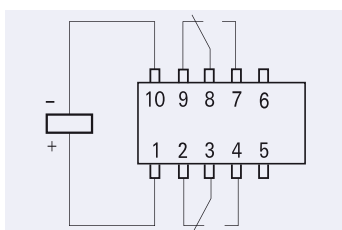
View onto the component side of the PCB (top view)



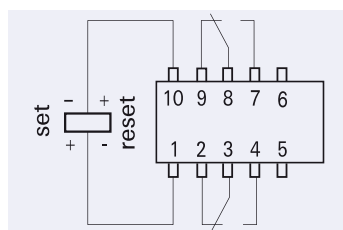
### Terminal assignment

Relay – top view

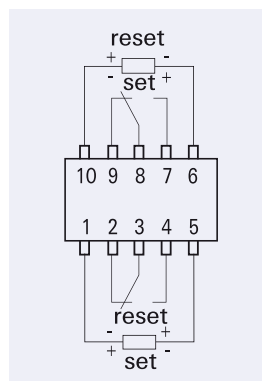
Non-latching type  
not energized condition



Latching type  
reset condition



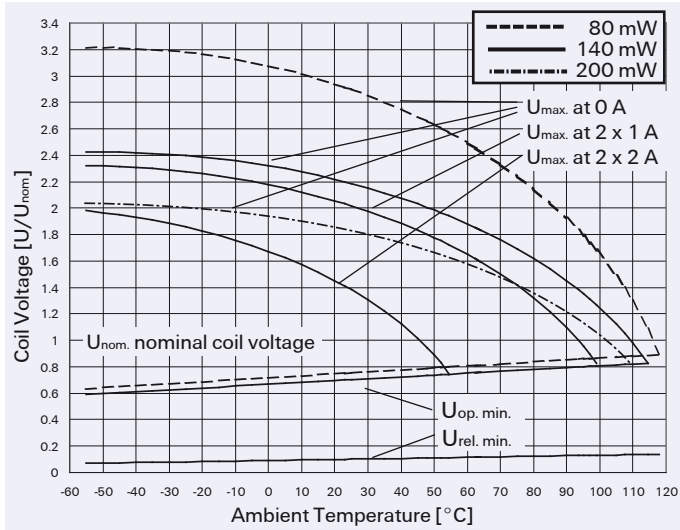
Latching, 2 coils  
reset condition



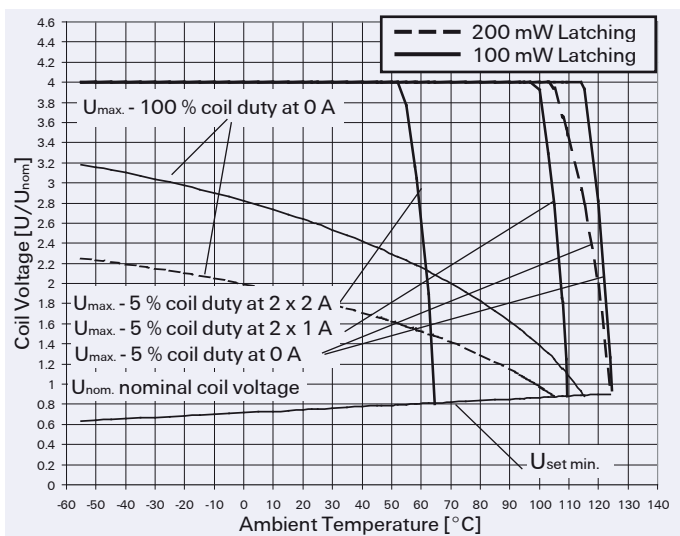
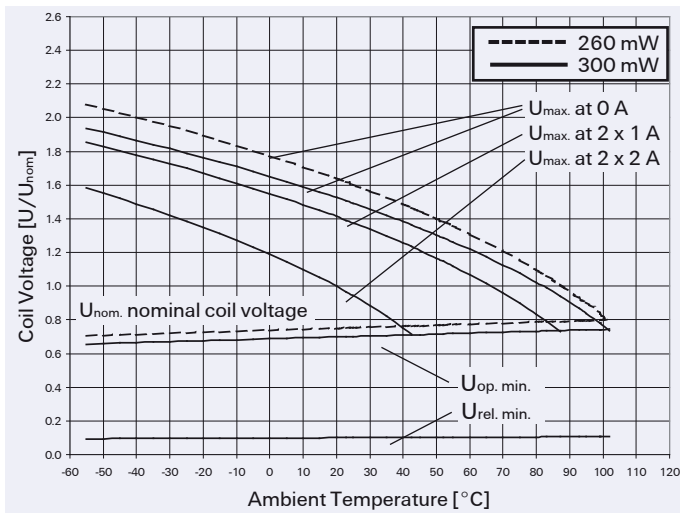
Contacts in reset  
position. Both coils can  
be used as either set or  
reset coils.

## FP2 Relay

### Coil Operating Range



- $U_{nom}$  = Nominal coil voltage
- $U_{max}$  = Upper limit of the operative range of the coil voltage (limiting voltage)
- $U_{op. min.}$  = Lower limit of the operative range of the coil voltage (reliable operate voltage)
- For latching relays  $U_{set min.}$  resp.  $U_{reset min.}$
- $U_{rel. min.}$  = Lower limit of the operative range of the coil voltage (reliable release voltage)



## FP2 Relay

### Coil Data (values at 23 °C)

### Ordering Information

| Nominal voltage<br>$U_{nom}$ | Operate/set voltage range    |                              | Release/<br>reset voltage<br>Minimum | Coil<br>power | Coil<br>Resistance  | Relay<br>code | Tyco part<br>number |
|------------------------------|------------------------------|------------------------------|--------------------------------------|---------------|---------------------|---------------|---------------------|
|                              | Minimum<br>voltage $U_{min}$ | Maximum<br>voltage $U_{max}$ |                                      |               |                     |               |                     |
| Vdc                          | Vdc                          | Vdc                          | Vdc                                  | mW            | $\Omega / \pm 10\%$ |               |                     |

#### Non-Latching, 1 coil

|     |       |       |      |     |      |        |             |
|-----|-------|-------|------|-----|------|--------|-------------|
| 3   | 2.10  | 6.60  | 0.30 | 140 | 64   | D 3006 | 1-1462033-3 |
| 4.5 | 3.15  | 9.90  | 0.45 | 140 | 145  | D 3004 | 1462033-9   |
| 5   | 3.50  | 11.00 | 0.50 | 140 | 178  | D 3009 | 1-1462033-4 |
| 6   | 4.20  | 13.20 | 0.60 | 140 | 257  | D 3005 | 1-1462033-1 |
| 9   | 6.30  | 19.80 | 0.90 | 140 | 574  | D 3010 | 2-1462033-1 |
| 12  | 8.40  | 26.40 | 1.20 | 140 | 1028 | D 3002 | 1462033-5   |
| 24  | 16.80 | 44.30 | 2.40 | 200 | 2880 | D 3012 | 2-1462033-2 |
| 48  | 33.60 | 72.30 | 4.80 | 300 | 7680 | D 3013 | 2-1462033-6 |

#### High Sensitive Version, Non-Latching 1 coil

|     |       |       |      |     |      |        |             |
|-----|-------|-------|------|-----|------|--------|-------------|
| 3   | 2.25  | 8.70  | 0.30 | 80  | 113  | D 3021 | 3-1462033-2 |
| 4.5 | 3.38  | 13.10 | 0.45 | 80  | 253  | D 3022 | 3-1462033-3 |
| 5   | 3.75  | 14.60 | 0.50 | 80  | 313  | D 3023 | 3-1462033-4 |
| 6   | 4.50  | 17.50 | 0.60 | 80  | 450  | D 3024 | 3-1462033-5 |
| 9   | 6.75  | 24.20 | 0.90 | 80  | 1013 | D 3025 | 3-1462033-6 |
| 12  | 9.00  | 35.00 | 1.20 | 80  | 1800 | D 3026 | 3-1462033-7 |
| 24  | 18.00 | 52.80 | 2.40 | 140 | 4114 | D 3027 | 3-1462033-8 |
| 48  | 36.00 | 77.60 | 4.80 | 260 | 8882 | D 3028 | 3-1462033-9 |

#### Latching, 1 coil

|     |       |       |        |     |      |        |             |
|-----|-------|-------|--------|-----|------|--------|-------------|
| 3   | 2.25  | 7.80  | -2.25  | 100 | 90   | D 3041 | 4-1462033-0 |
| 4.5 | 3.38  | 11.70 | -3.38  | 100 | 203  | D 3042 | 4-1462033-1 |
| 5   | 3.75  | 13.00 | -3.75  | 100 | 250  | D 3043 | 4-1462033-2 |
| 6   | 4.50  | 15.60 | -4.50  | 100 | 360  | D 3044 | 4-1462033-3 |
| 9   | 6.75  | 23.50 | -6.75  | 100 | 810  | D 3045 | 4-1462033-4 |
| 12  | 9.00  | 31.30 | -9.00  | 100 | 1440 | D 3046 | 4-1462033-5 |
| 24  | 18.00 | 47.50 | -18.00 | 150 | 3840 | D 3047 | 4-1462033-6 |

#### Latching, 2 coils

|     |       |       |       |     |      |        |             |
|-----|-------|-------|-------|-----|------|--------|-------------|
| 3   | 2.10  | 5.50  | 2.10  | 200 | 45   | D 3061 | 4-1462033-7 |
| 4.5 | 3.15  | 8.30  | 3.15  | 200 | 101  | D 3062 | 4-1462033-8 |
| 5   | 3.20  | 7.20  | 3.50  | 200 | 125  | D 3063 | 4-1462033-9 |
| 6   | 4.20  | 11.10 | 4.20  | 200 | 180  | D 3064 | 5-1462033-0 |
| 9   | 6.30  | 16.80 | 6.30  | 200 | 405  | D 3065 | 5-1462033-1 |
| 12  | 8.40  | 28.10 | 8.40  | 200 | 720  | D 3066 | 5-1462033-4 |
| 24  | 16.80 | 44.30 | 16.80 | 300 | 1920 | D 3067 | 5-1462033-6 |

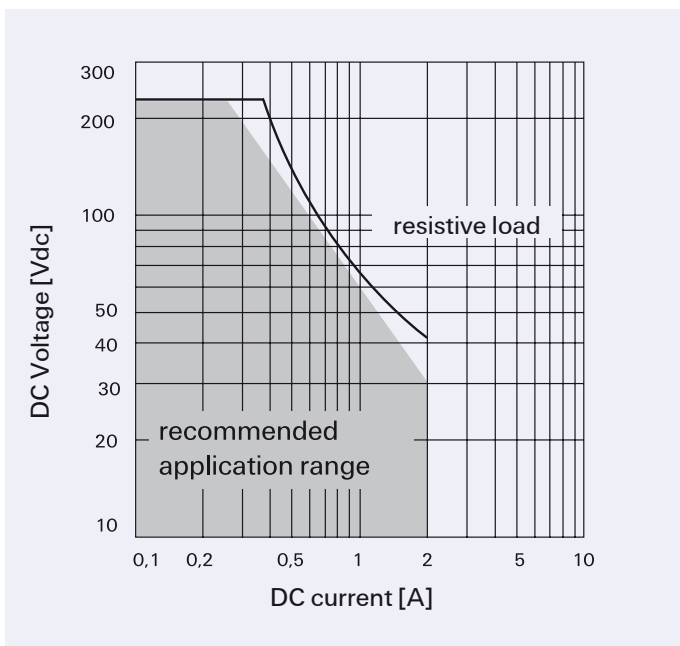
Further coil versions are available on request.

## FP2 Relay

### Contact Data

|   |   |
|---|---|
| Number of contacts and type   | 2 changeover contacts   |
| Contact assembly  | Bifurcated contacts   |
| Contact material  | Silver-nickel, gold covered   |
| Limiting continuous current at max. ambient temperature   | 2 A   |
| Maximum switching current   | 2 A   |
| Maximum switching voltage   | 220 Vdc<br>250 Vac  |
| Maximum switching capacity  | 60 W, 62.5 VA   |
| Thermoelectric potential  | < 10 $\mu$ V  |
| Minimum switching voltage   | 100 $\mu$ V   |
| Initial contact resistance / measuring condition: 10 mA / 20 mV   | < 50 m $\Omega$   |
| Electrical endurance<br>at contact application 0 ( $\leq 30$ mV / $\leq 10$ mA)<br>at cable load open end<br>at 125 Vdc / 0.24 A - 30 W<br>at 250 Vac / 0.25 A - 62.5 VA<br>at 24 V / 1.25 A - 30 W | min. 2.5 x 10 <sup>6</sup> operations<br>min. 2.0 x 10 <sup>6</sup> operations<br>min. 1.0 x 10 <sup>5</sup> operations<br>min. 1.0 x 10 <sup>5</sup> operations<br>min. 3.0 x 10 <sup>5</sup> operations |
| Mechanical endurance  | typ. 10 <sup>8</sup> operations   |
| UL contact ratings  | 220 Vdc / 0.24 A - 60 W<br>125 Vdc / 0.24 A - 30 W<br>250 Vac / 0.25 A - 62.5 VA<br>125 Vac / 0.5 A - 62.5 VA<br>30 Vdc / 2 A - 60 W  |

### Max. DC Load Breaking Capacity



## FP2 Relay

### Insulation

|                                   |                     |
|-----------------------------------|---------------------|
| Insulation resistance at 500 Vdc  | > 10 <sup>9</sup> Ω |
| Dielectric test voltage (1 min)   |                     |
| between coil and contacts         | 1000 Vrms           |
| between adjacent contact sets     | 1000 Vrms           |
| between open contacts             | 750 Vrms            |
| Surge voltage resistance          |                     |
| according IEC (10 / 700 μs)       |                     |
| between coil and contacts         | 1500 V              |
| between adjacent contact sets     | 1500 V              |
| between open contacts             | 1500 V              |
| according to FCC 68 (10 / 160 μs) |                     |
| between coil and contacts         | 1500 V              |
| between adjacent contact sets     | 1500 V              |
| between open contacts             | 1500 V              |

### High Frequency Data

|                                     |                       |
|-------------------------------------|-----------------------|
| Capacitance                         |                       |
| between coil and contacts           | max. 4 pF             |
| between adjacent contact sets       | max. 1 pF             |
| between open contacts               | max. 1 pF             |
| RF Characteristics                  |                       |
| Isolation at 100 MHz / 900 MHz      | - 40.2 dB / - 22.3 dB |
| Insertion loss at 100 MHz / 900 MHz | - 0.03 dB / - 0.25 dB |
| V.S.W.R. at 100 MHz / 900 MHz       | 1.01 / 1.07           |

### General Data

|  |  |
|--|--|
| Operate time at U <sub>nom</sub> typ. / max.                       | 3 ms / 4 ms                                  |
| Reset time (latching) at U <sub>nom</sub> , typ. / max.            | 3 ms / 4 ms                                  |
| Release time without diode in parallel (non-latching), typ. / max. | 1 ms / 3 ms                                  |
| Release time with diode in parallel (non-latching), typ. / max.    | 3 ms / 4 ms                                  |
| Bounce time at closing contact, typ. / max.                        | 1 ms / 5 ms                                  |
| Maximum switching rate without load                                | 50 operations/s                              |
| Ambient temperature  | -55 °C ... +85 °C                            |
| Thermal resistance   | < 150 K/W                                    |
| Maximum permissible coil temperature                               | 125 °C                                       |
| Vibration resistance (function)                                    | 20 G<br>10 to 500 Hz                         |
| Shock resistance, half sinus, 11 ms                                | 50 G (function)<br>1500 G (damage)           |
| Degree of protection / Environmental protection                    | immersion cleanable, IP 67 / RT III          |
| Needle flame test  | application time 20 s, no burning or glowing |
| Mounting position  | any  |
| Processing information   | Ultrasonic cleaning is not recommended       |
| Weight (mass)  | max. 2 g                                     |
| Terminal surface   | SnCu 0.7                                     |
| Resistance to soldering heat                                       | 265 °C / 10 s                                |

All data refers to 23 °C unless otherwise specified.

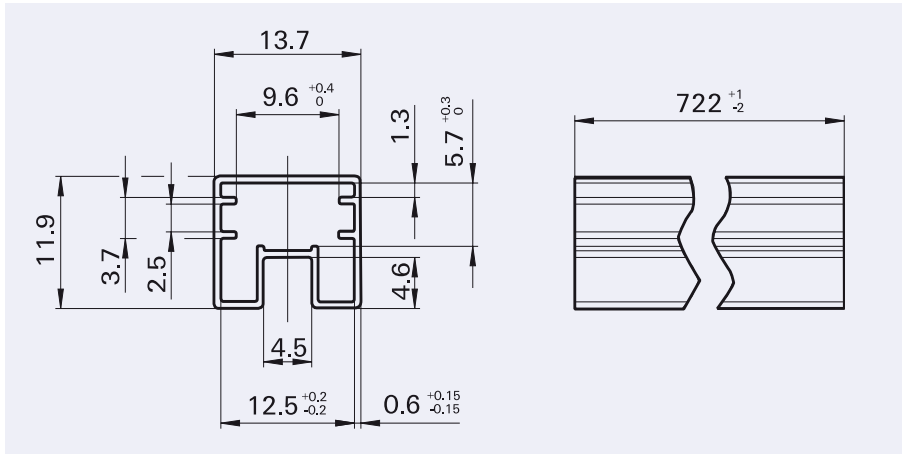


## FP2 Relay

### Packing

Dimensions in mm

### Stick dimension



Tube for THT version  
50 relays per stick  
1000 relays per box

## FP2 Relay

### IM Relays

4th generation slim line – low profile polarized 2 c/o telecom signal relay with bifurcated contacts, available as non latching or latching relay with 1 coil. Nominal voltage range from 1.5 ... 24 V, coil power consumption of 50 ... 200 mW, latching relays with 1 coil 100 mW. The IM relay is available as through hole and surface mount type (J-Legs and Gull Wings) and capable to switch loads up to 60 W/62,5 VA. It is currently the only 2 A rated 4G relay on the market. Dielectric strength fulfills the Telcordia requirements according GR 1089 (2,5 kV – 2 / 10 µs) and FCC part 68 (1,5 kV – 10 / 160 µs). The IM relay is tested according CECC/IECQ and certified in accordance with IEC/EN 60950 and UL 60950.

Dimensions approx. 10 x 6 mm board space and 5.65 mm height.

### P2 Relays

3rd generation polarized 2 c/o telecom relay with bifurcated contacts, available as non latching or latching relay with 1 or 2 coils. Nominal voltage range from 3 ... 24 V, coil power consumption 140 mW, latching relays with 1 coil 70 mW. The P2 Relay is available as through hole or surface mount type and capable to switch currents up to 5 A. Dielectric strength fulfills the Telcordia requirements according GR 1089 (2,5 kV – 2 / 10 µs) and FCC part 68 (1,5 kV – 10 / 160 µs). The P2 relay is tested according CECC/IECQ and certified in accordance with IEC/EN 60950 and UL 60950. Dimensions approx. 15 x 7,5 mm board space and 10 mm height.

### FX2 Relays

3rd generation polarized 2 c/o telecom relay with bifurcated contacts, available as non latching or latching relay with 1 coil. Nominal voltage range from 3 ... 48 V, coil power consumption of 80 ... 260 mW for the high sensitive version, 140... 300 mW for the standard version, latching relays with 1 coil 100 mW. The FX2 relay is available as through hole type and capable to switch loads up to 60 W/62,5 VA. Dielectric strength fulfills the Telcordia requirements according GR 1089 (2,5 kV – 2 / 10 µs) and FCC part 68 (1,5 kV – 10 / 160 µs). The FX2 relay is tested according CECC/IECQ and certified in accordance with IEC/EN 60950 and UL 60950. Dimensions approx. 15 x 7,5 mm board space and 10,7 mm height.

### FT2 / FU2 Relays

3rd generation non polarized, non latching 2 c/o telecom relay with bifurcated contacts. Nominal voltage range from 3 ... 48 V, coil power consumption 200 ... 300 mW. Most sensitive 48 V relay. Available as through hole and surface mount type. Dielectric strength fulfills the Telcordia requirements according GR 1089 (2,5 kV – 2 / 10 µs) and FCC part 68 (1,5 kV – 10 / 160 µs). The FT2/FU2 relay is tested according CECC/IECQ and certified in accordance with IEC/EN 60950 and UL 60950. Dimensions approx. 15 x 7,5 mm board space and 10 mm height.

### FP2 Relays

3rd generation polarized 2 c/o telecom relay with bifurcated contacts, available as non latching or latching relay with 1 or 2 coils. Nominal voltage range from 3 ... 48 V, coil power consumption of 80 ... 260 mW for the high sensitive version, 140... 300 mW for the standard version, latching relays with 1 coil 100 mW. The FP2 Relay is available as through hole type and capable to switch loads up to 60 W/62,5 VA. Dielectric strength fulfills FCC part 68 (1,5 kV – 10 / 160 µs). The FP2 is tested according CECC/IECQ approved.

Dimensions approx. 14 x 9 mm board space and 5 mm height.

### MT2

2nd generation non polarized, non latching 2 c/o telecom and signal relay with bifurcated contacts. Nominal voltage range from 3 ... 48 V, coil power consumption 150/200/300/400 and 550 mW. Dielectric strength fulfills the requirements according FCC part 68 (1,5 kV – 10 / 160 µs).

Dimensions approx. 20 x 10 mm board space and 11 mm height.

### D2n Relays

2nd generation non polarized 2 c/o relay for telecom and various other applications. Nominal voltage range from 3 ... 48 V, coil power consumption from 150 ... 500 mW. The D2n relay is capable to switch currents up to 3 A. Dielectric strength fulfills the requirements according FCC part 68 (1,5 kV – 10 / 160 µs). Dimensions approx. 20 x10 mm board space and 11 mm height.

### P1 Relays

Extremely sensitive, polarized 1 c/o relay with bifurcated contacts for a wide range of applications, available as non latching or latching relay with 1 or 2 coils. Nominal voltage range from 3 ... 24 V, coil power consumption 65 mW, latching relays with 1 coil 30 mW. The P1 relay is available as through hole or surface mount type and capable to switch currents up to 1 A. Dielectric strength fulfills the requirements according FCC part 68 (1,5 kV – 10 / 160 µs). Dimensions approx. 13 x 7,6 mm board space and 7 mm height for THT or 8 mm height for SMT version.

### W11 Relays

Low cost, non polarized 1 c/o relay for various applications. Nominal voltage range from 3 ... 24 V, coil power consumption 450 mW, sensitive versions 200 mW. The W11 relay is capable to switch currents up to 3 A. Dielectric strength 1000 Vrms.

Dimensions approx. 15,6 x 10,6 mm board space and 11,5 mm height.

### Reed Relays

High sensitive, non polarized relay for telecom and various other applications, available with 1 n/o, 2 n/o or 1c/o contacts. Nominal voltage range from 5 ... 24 V, coil power consumption 50...280 mW for 1 n/o and 125 ... 280 mW for 2 n/o or 1 c/o versions. Reedrelays are available in DIP or SIL housing and capable to switch currents up to 0,5 A. Integrated diode and/or electrostatic shield optional. Dielectric strength 1500 Vdc. Dimensions approx. 19,3 x 7 mm board space and 5 ... 7,5 mm height for DIP or 19,8 x 5 mm board space and 7,8 mm height for SIL version.

### Cradle Relays

Extremely reliable and mature relay family of 1st generation for various signal switching applications. Available as non polarized, polarized / latching and relay with AC coil. The benefit is the possibility of combining various contact sets from 1 up to 6 poles, single and bifurcated contacts, different contact materials with a coil voltage range from 1,5 Vdc to 220 Vac. Cradle relays are available as dust protected and hermetically sealed versions, with plug in or solder terminals and are capable to switch currents up to 5 A. Forcibly guided (linked) contact sets optional. Dielectric strength 500 Vrms. Dimensions from approx. 19 x 24 to 19x35 mm board space and 30 mm height.

### Other Relays

We offer a variety of different relay families for maintenance and replacement purposes. These relays are up to 60 years old now, such as Card Relay SN (V23030 series), Small General Purpose Relay (V23006 series), Small Polarized Relay (V23063 ... V23067 and V23163 ... V23167 series). Accessories like sockets, hold down springs, etc. optional.

### High Frequency Relays

HF3 / HF3S / HF6 series RF relays offering excellent RF characteristics in a small package. All HF series relays are suitable for SMD soldering processes. Available as non latching or latching versions with 1 or 2 coils and a nominal coil voltage range from 3 ... 24 V, a coil power consumption of 140 mW or 70 mW (single coil latching types).

**HF3:** Low cost RF relay suitable up to 3 GHz. Impedance 50 and 75 Ohm. 50 W hot switching and 50 W RF power carry capability. Dimensions 14.6 x 7.3 x 10.3 mm.

**HF3S:** High performance, high power RF relay suitable up to 3 GHz, 50 W hot switching and 150 W RF power carry capability. Dimensions 15 x 7.6 x 10.6 mm.

**HF6:** High performance, high power RF relay suitable up to 6 GHz, 50 W hot switching and 50 W RF power carry capability. Dimensions 15 x 7.6 x 10.6 mm.



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 **Tyco Electronics**

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