## tyco

AXICOM

Electronics

## The Best Relaytion



## MT2 Relay

2 pole telecom/signal relay
Through Hole Type (THT)
Non-polarized. non-latching 1 coil

## Features

- Telecom/signal relay (dry circuit, test access, ringing)
- Slim line $20 \times 10 \mathrm{~mm}, 0.795 \times 0.393$ inch
- Switching current 1.25A
- 2 changeover contacts ( 2 form C )
- Bifurcated contacts
- Meets FCC Part 68 and ITU-T K20


## 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
- Automotive Equipment


## Options

CSA-C22.2 No 14-95 File No. 176679-1079886

UL 508 File No. E 111441

CECC 16502-001

## THT Version



## Mounting hole layout

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


Basic grid 2.54 mm

## Terminal assignment

Relay - top view
non-latching 1 coil
release condition


Coil Data (values at $23^{\circ} \mathrm{C}$ )

| Nominal voltage Unom | Operate/voltage range |  | Release voltage Minimum | Nominal power consumption | Resistance | Relay Code |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Minimum voltage $U_{\text {I }}$ | Maximum voltage $U_{\text {II }}$ |  |  |  |  |
| Vdc | Vdc | Vdc | Vdc | mW | $\Omega / \pm 10 \%$ |  |

High sensitive version ( 150 mW )
non-latching 1 coil

| 4.5 | 3.2 | 10.1 | 0.45 | 150 | 136 | C 93406 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 5 | 3.6 | 11.3 | 0.50 | 150 | 168 | C 93401 |
| 6 | 4.3 | 13.4 | 0.60 | 150 | 240 | C 93427 |
| 9 | 6.4 | 20.3 | 0.90 | 150 | 544 | C 93405 |
| 12 | 8.6 | 27.1 | 1.20 | 150 | 968 | C 93402 |
| 24 | 17.1 | 54.1 | 2.40 | 150 | 3872 | C 93403 |
| 48 | 33.1 | 108.3 | 4.80 | 150 | 15468 | C 93404 |

Sensitive version ( 200 mW )
non-latching 1 coil

| 4.5 | 2.9 | 8.7 | 0.45 | 200 | 101 | C 93415 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 5 | 3.3 | 9.7 | 0.50 | 200 | 125 | C 93416 |
| 6 | 3.9 | 11.6 | 0.60 | 200 | 180 | C 93428 |
| 9 | 5.9 | 17.5 | 0.90 | 200 | 405 | C 93417 |
| 12 | 7.8 | 23.3 | 1.20 | 200 | 720 | C 93418 |
| 24 | 15.6 | 46.7 | 2.40 | 200 | 2880 | C 93419 |
| 48 | 31.2 | 93.4 | 4.80 | 200 | 11520 | C 93420 |

Sensitive version ( 300 mW )
non-latching 1 coil

| 4.5 | 3.1 | 7.4 | 0.45 | 300 | $C$ C 93433 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 5 | 3.4 | 8.2 | 0.50 | 300 | $C$ | 90 |
| 12 | 8.25 | 19.7 | 1.20 | 300 | 515 | $C 93434$ |
| 24 | 16.5 | 39.5 | 2.40 | 300 | 2060 | $C 93435$ |
| 48 | 32.5 | 79.0 | 4.80 | 300 | 8240 | $C 93436$ |

Standard version ( 400 mW )
non-latching 1 coil

| 4.5 | 2.9 | 6.1 | 0.45 | 400 | 50 | $C 93421$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 5 | 3.3 | 6.9 | 0.50 | 400 | 63 | $C 93422$ |
| 6 | 3.9 | 8.2 | 0.60 | 400 | $C$ | $C$ |
| 9 | 5.9 | 12.4 | 0.90 | 400 | 203 | $C 93423$ |
| 12 | 7.8 | 16.5 | 1.20 | 400 | 360 | $C 93424$ |
| 24 | 15.6 | 33.0 | 2.40 | 400 | 1440 | $C 93425$ |
| 48 | 31.2 | 66.0 | 4.80 | 400 | 5760 | $C 93426$ |

Standard version ( 550 mW )
non-latching 1 coil

| 4.5 | 2.9 | 6.0 | 0.45 | 550 | 36 | C 93438 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 5 | 3.3 | 6.8 | 0.5 | 550 | 45 | C 93450 |
| 6 | 3.9 | 8.1 | 0.60 | 550 | 66 | C 93437 |
| 12 | 7.8 | 16.7 | 1.20 | 550 | 280 | C 93432 |
| 24 | 15.6 | 32.4 | 2.40 | 550 | 1050 | C 93431 |
| 48 | 31.2 | 64.1 | 4.80 | 550 | 4100 | C 93430 |

$U_{1}=\quad$ Minimum voltage at $23^{\circ} \mathrm{C}$ after pre-energizing with nominal voltage without contact current
$U_{\text {II }}=\quad$ Maximum continous voltage at $23^{\circ}$

The operating voltage limits $U_{1}$ and $U_{\| \|}$are dependent on the temperature according to the formulae:

| $U_{\text {Itamb }}=$ <br> and | $\mathrm{K}_{1} \cdot U_{123^{\circ} \mathrm{C}}$ |
| :--- | :--- |
| $U_{\text {II tamb }}=$ | $\mathrm{K}_{1} \cdot U_{123^{\circ} \mathrm{C}}$ |
| $t_{\text {amb }}$ | $=$ Ambient temperature |
| $U_{\text {Itamb }}$ | $=$ Minimum voltage at ambient temperature, $\mathrm{t}_{\text {amb }}$ |
| $U_{\text {II tamb }}$ | $=$ Maximum voltage at ambient temperature, $\mathrm{t}_{\mathrm{amb}}$ |
| $k_{\text {I a. }} k_{\text {II }}$ | $=$ Factors (dependent on temperature), see diagram |



## Contact Data

| Number of contacts and type | 2 changeover contacts |
| :--- | :---: |
| Contact assembly | Bifurcated contacts |
| Contact material | Silver-nickel, gold-covered |
| Limiting continous current at max. ambient temperature | 1.25 A |
| Maximum switching current | 2 A |
| Maximum swichting voltage | 150 Vdc |
| Maximum switching capacity | 150 Vac |
| Thermoelectric potential | $30 \mathrm{~W}, 62.5 \mathrm{VA}$ |
| Initial contact resictance / measuring condition: $10 \mathrm{~mA} / 20 \mathrm{mV}$ | $<10 \mu \mathrm{~V}$ |
| Electrical endurance Contact application $0(30 \mathrm{mV} / 10 \mathrm{~mA})$ | $<70 \mathrm{~m} \Omega$ |
| Cable load open end | $\mathrm{min} 5 \times 10^{6}$ operations |
|  | min. $2.5 \times 10^{6}$ operations |
| Resitive load $150 \mathrm{~V} / 0.2 \mathrm{~A}-30 \mathrm{~W}$ | $\mathrm{~min} 2.0 \times 10^{5}$ operations |
| $24 \mathrm{~V} / 1.25 \mathrm{~A}-30 \mathrm{~W}$ | $\mathrm{~min} .2 .0 \times 10^{5}$ operations |
| UL/CSA ratings | $\mathrm{typ} 10^{8}$ operations |

## Insulation

Insulation resistance at 500 Vdc
Dielectric test voltage ( 1 min )

| between coil and contacts | 1050 Vrms |
| :--- | :---: |
| between adjacend contact sets | 700 Vrms |
| between open contacts | 700 Vrms |

Surge voltage resistance
according to FCC $68(10 / 160 \mu \mathrm{~s})$ and IEC ( $10 / 700 \mu \mathrm{~s}$ )
1500 V
between coil and contacts 1500 V
between adjacend contact sets
1500 V
between open contacts
$>10^{9} \Omega$

1050 Vrms

700 Vrms

## High Frequency Data

\(\left.$$
\begin{array}{l|c}\hline \begin{array}{l}\text { Capacitance } \\
\text { between coil and contacts } \\
\text { between adjacend contact sets } \\
\text { between open contacts }\end{array}
$$ \& max. 4 \mathrm{pF} <br>
max. 2 \mathrm{pF} <br>

max. 2 \mathrm{pF}\end{array}\right]\)| RF Characteristics |
| :--- |

## General data

| Operate time at $U_{\text {nom }}$ typ. / max. | $4 \mathrm{~ms} / 5 \mathrm{~ms}$ |
| :--- | :---: |
| Release time without diode in parallel (non-latching), typ. / max. | $1 \mathrm{~ms} / 3 \mathrm{~ms}$ |
| Release time with diode in parallel (non-latching), typ. / max. | $4 \mathrm{~ms} / 6 \mathrm{~ms}$ |
| Bounce time at closing contact, typ. / max. | $1 \mathrm{~ms} / 5 \mathrm{~ms}$ |
| Maximum switching rate without load | 50 operations/s |
| Ambient temperature | $-55^{\circ} \mathrm{C} . .+85^{\circ} \mathrm{C}$ |
| Thermal resistance | $<125 \mathrm{~K} / \mathrm{W}$ |
| Maximum permissible coil temperature | $125^{\circ} \mathrm{C}$ |
| Vibration resistance (function) | 10 g |
| Shock resistance, half sinus, 11 ms | 10 to 500 Hz |
| Degree of protection | 50 g (function) |
| Needle flame test | 100 g (damage) |
| Mounting position | immersion cleanable, IP 67 |
| Processing information | application time 10 s, |
| Weight (mass) | any |
| Resistance to soldering heat | Ultrasonic cleaning is not recommended |

All data refers to $23^{\circ} \mathrm{C}$ unless otherwise specified.

## Packing

Tube for THT version - 25 relays per stick, 500 relays per box


## Ordering Information

| Relay Code | Tyco |
| :--- | :--- |
|  | Part Number |

Relay Code

| $0-1462000-1$ | C 93423 | $5-1462000-0$ |
| :--- | :--- | :--- |
| $0-1462000-7$ | C 93424 | $5-1462000-1$ |
| $1-1462000-3$ | C 93425 | $5-1462000-3$ |
| $1-1462000-8$ | C 93426 | $5-1462000-5$ |
| $2-1462000-0$ | C 93427 | $5-1462000-6$ |
| $2-1462000-2$ | C 93428 | $5-1462000-7$ |
| $2-1462000-6$ | C 93429 | $5-1462000-8$ |
| $3-1462000-0$ | C 93430 | $5-1462000-9$ |
| $3-1462000-1$ | C 93431 | $6-1462000-1$ |
| $3-1462000-6$ | C 93432 | $6-1462000-2$ |
| $3-1462000-7$ | C 93433 | $6-1462000-6$ |
| $4-1462000-1$ | C 93434 | $6-1462000-8$ |
| $4-1462000-5$ | C 93435 | $7-1462000-0$ |
| $4-1462000-7$ | C 93436 | $7-1462000-2$ |
| $4-1462000-8$ | C 93437 | $7-1462000-6$ |
|  | C 93438 | $7-1462000-7$ |
|  | C 93450 | $8-1462000-5$ |

## IM Relays

$4^{\text {th }}$ generation slim line - low profile polarized $2 \mathrm{c} / \mathrm{o}$ telecom 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 140 ... 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. Dielectric strength fulfills the Bellcore requirements according GR 1089 ( $2,5 \mathrm{kV}$ $2 / 10 \mu \mathrm{~s})$ and FCC part $68(1,5 \mathrm{kV}-10 / 160 \mu \mathrm{~s})$. The IM relay is CECC/IECO approved and certified in accordance with IEC/EN 60950 and UL1950. Dimensions approx. $10 \times 6 \mathrm{~mm}$ board space and 5.65 mm height.

## P2 Relays

$3^{\text {rd }}$ generation polarized $2 \mathrm{c} / \mathrm{o}$ 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 P 2 relay is available as through hole or surface mount type and capable to switch currents up to 5 A . Dielectric strength fulfills the Bellcore requirements according GR $1089(2,5 \mathrm{kV}-2 / 10 \mu \mathrm{~s})$ and FCC part $68(1,5 \mathrm{kV}-10 / 160 \mu \mathrm{~s})$. Dimensions approx. $15 \times 7,5 \mathrm{~mm}$ board space and 10 mm height.

## FX Relays

$3^{\text {rd }}$ generation polarized $2 \mathrm{c} / \mathrm{o}$ 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, $140 \ldots 300 \mathrm{~mW}$ 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 $60 \mathrm{~W} / 62,5 \mathrm{VA}$. Dielectric strength fulfills the Bellcore requirements according GR $1089(2,5 \mathrm{kV}-2 / 10 \mu \mathrm{~s})$ and FCC part $68(1,5 \mathrm{kV}-10 / 160 \mu \mathrm{~s})$. The FX2 is CECC/IECQ approved and certified in accordance with IEC/EN 60950 and UL1950. Dimensions approx. $15 \times 7,5 \mathrm{~mm}$ board space and $10,7 \mathrm{~mm}$ height.

## FT2 / FU2 Relays

$3^{\text {rd }}$ generation non polarized, non latching $2 \mathrm{c} / \mathrm{o}$ 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 Bellcore requirements according GR $1089(2,5 \mathrm{kV}-2 / 10 \mu \mathrm{~s})$ and FCC part $68(1,5 \mathrm{kV}-10 / 160 \mu \mathrm{~s})$. The FT2/FU2 is CECC/IECO approved and certified in accordance with IEC/EN 60950 and UL1950. Dimensions approx. $15 \times 7,5 \mathrm{~mm}$ board space and 10 mm height.

## FP2 Relays

$3^{\text {rd }}$ generation polarized $2 \mathrm{c} / \mathrm{o}$ telecom relay with bifurcated contacts, available as non latching or latching relay with 1 or 2 coils. Nominal voltage range from $3 \ldots 48 \mathrm{~V}$, coil power consumption of 80 ... 260 mW for the high sensitive version, $140 \ldots 300 \mathrm{~mW}$ 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 30 W/62,5 VA. Dielectric strength fulfills FCC part 68 (1,5 kV - 10 / $160 \mu \mathrm{~s}$ ). The FP2 is CECC/IECQ approved. Dimensions approx. $14 \times 9 \mathrm{~mm}$ board space and 5 mm height.

## MT2 / MT4

$2^{\text {nd }}$ generation non polarized, non latching $2 \mathrm{c} / \mathrm{o}$ and $4 \mathrm{c} / \mathrm{o}$ telecom and signal relay with bifurcated contacts. Nominal voltage range from 4.5 ... 48 V , coil power consumption 150/200/300/400 and 550 mW , and 300 mW (MT4). Dielectric strength fulfills the
requirements according FCC part $68(1,5 \mathrm{kV}-10 / 160 \mu \mathrm{~s})$ for both and the Bellcore requirements according GR 1089 ( $2,5 \mathrm{kV}-2 / 10 \mu \mathrm{~s}$ ) the MT4 only.
Dimensions MT2 approx. $20 \times 10 \mathrm{~mm}$ board space and 11 mm height, MT4 approx. $20 \times 15 \mathrm{~mm}$ board space and 11 mm height.

## D2n Relays

$2^{\text {nd }}$ generation non polarized $2 \mathrm{c} / \mathrm{o}$ relay for telecom and various other applications. Nominal voltage range from $3 \ldots 48 \mathrm{~V}$, coil power consumption from $150 \ldots 500 \mathrm{~mW}$. The D2n relay is capable to switch currents up to 3 A . Dielectric strength fulfills the requirements according FCC part $68(1,5 \mathrm{kV}-10 / 160 \mu \mathrm{~s})$. Dimensions approx. $20 \times 10 \mathrm{~mm}$ board space and $11,5 \mathrm{~mm}$ height.

## P1 Relays

Extremely sensitive, polarized $1 \mathrm{c} / \mathrm{o}$ 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 P 1 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 $68(1,5 \mathrm{kV}-10 / 160 \mu \mathrm{~s})$. Dimensions approx. $13 \times 7,6 \mathrm{~mm}$ board space and 7 mm height for THT or 8 mm height for SMT version.

## W11 Relays

Low cost, non polarized $1 \mathrm{c} / \mathrm{o}$ 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. $15,6 \times 10,6 \mathrm{~mm}$ board space and $11,5 \mathrm{~mm}$ height.

## Reed Relays

High sensitive, non polarized relay for telecom and various other applications, available with $1 \mathrm{n} / \mathrm{o}, 2 \mathrm{n} / \mathrm{o}$ or 1c/o contacts. Nominal voltage range from $5 \ldots 24 \mathrm{~V}$, coil power consumption $50 \ldots 280 \mathrm{~mW}$ for $1 \mathrm{n} / \mathrm{o}$ and 125 ... 280 mW for $2 \mathrm{n} / \mathrm{o}$ or $1 \mathrm{c} / \mathrm{o}$ 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. $19,3 \times 7 \mathrm{~mm}$ board space and 5 ... $7,5 \mathrm{~mm}$ height for DIP or $19,8 \times 5 \mathrm{~mm}$ board space and $7,8 \mathrm{~mm}$ height for SIL version.

## Cradle Relays

Extremely reliable and mature relay family of $1^{\text {st }}$ 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 $1,5 \mathrm{Vdc}$ 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. $19 \times 24$ to $19 \times 35 \mathrm{~mm}$ 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 / V23031 series), Small General Purpose Relay (V23006 series), Small Polarized Relay (V23063 ... V23067 and V23163 ... V23167 series). Accessories like sockets, hold down springs, etc. optional.

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