

**tyco**  
Electronics

**AXICOM**

## The Best Relaytion



## P2 Relay

ISO  
9001



# P2 Relay

# V23079

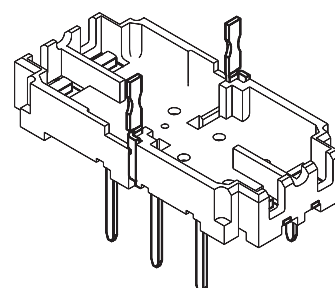
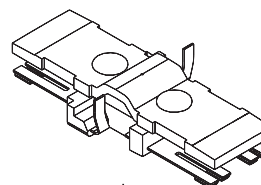
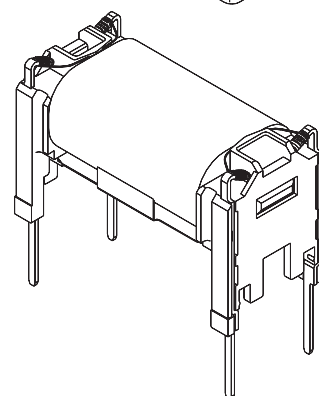
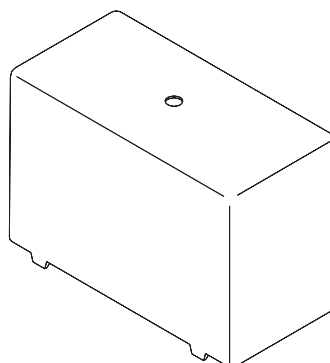
**AXICOM**

2 pole telecom relay, polarized,  
Through Hole Type (THT) or  
Surface Mount Technology (SMT),

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

## Features

- Standard telecom relay (ringing and test access)
- Slim line 15 x 7.5 mm, 0.590 x 0.295 inch
- Switching current 5 A
- 2 changeover contacts (2 form C / DPDT)
- Bifurcated contacts
- Immersion cleanable
- High sensitivity results in low nominal power consumption  
140 mW for non-latching and latching with 2 coils  
70 mW for latching with 1 coil
- For single coil version:
  - Surge voltage resistance between contact and coil for single coil version:
    - 2.5 kV (2 / 10 μsec) meets the Bellcore Requirement GR-1089
    - 1.5 kV (10 / 160 μsec) meets FCC Part 68



## Typical applications

- Communications equipment  
linecard application (ringing and test access)  
PABX  
Voice over IP
- Office equipment
- Measurement and control equipment
- Automotive equipment  
CAN bus, keyless entry, speaker switch
- Medical equipment
- Consumer electronics  
Set Top Boxes, HiFi

## Options

- 1500 Vrms between open contacts
- Temperature range up to 105° C



LR 45064-23



E 48393

Basic insulation coil/contacts according to IEC/EN 60950

Clearance > 1 mm

Creepage distance > 2.5 mm

# P2 Relay

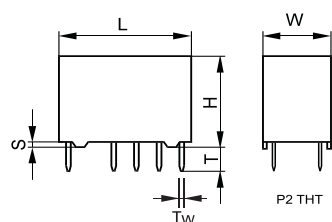
# V23079



## Dimensions

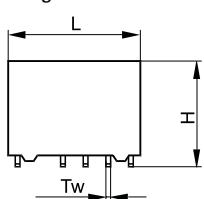
	THT V23079-x1xxx-B301 standard coil		THT V23079-x2xxx-B301 overmolded coil		SMT long terminals V23079-x1xxx-B301 standard coil		SMT long terminals V23079-x2xxx-B301 overmolded coil		SMT short terminals V23079-x1xxx-B301 standard coil		SMT short terminals V23079-x2xxx-B301 overmolded coil	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
L	14.5±0.1	0.570±0.004	14.5±0.1	0.570±0.004	14.5±0.1	0.570±0.004	14.5±0.1	0.570±0.004	14.5±0.1	0.570±0.004	14.5±0.1	0.570±0.004
W	7.2±0.1	0.283±0.004	7.2±0.1	0.283±0.004	7.2-0.15	0.283±0.004	7.2-0.15	0.283±0.004	7.2-0.15	0.283±0.004	7.2-0.15	0.283±0.004
H	9.8±0.1	0.385±0.004	9.5±0.1	0.374±0.004	10.4±0.15	0.409±0.006	9.9±0.1	0.390±0.004	10.4±0.15	0.409±0.006	9.9±0.1	0.390±0.004
T	3.25-0.25	0.128-0.010	3.25-0.25	0.128-0.010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
T1	N/A	N/A	N/A	N/A	5.52±0.15	0.217±0.006	5.52	0.217±0.006	5.52	0.217±0.006	5.52	0.217±0.006
T2	N/A	N/A	N/A	N/A	9.4±0.15	0.370±0.006	9.4±0.15	0.370±0.006	7.4±0.15	0.291±0.006	7.4±0.15	0.291±0.006
Tw	0.5±0.05	0.020±0.002	0.5±0.05	0.020±0.002	0.5±0.05	0.020±0.002	0.5±0.05	0.020±0.002	0.5±0.05	0.020±0.002	0.5±0.05	0.020±0.002
S	0.55-0.15	0.022-0.006	0.45	0.018±0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

### THT Version

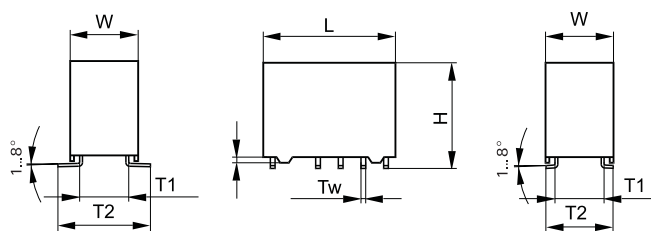


### SMT Version

Long terminals

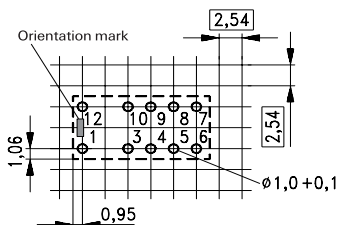


Short terminals



### Mounting hole layout

View onto the component side of the PCB

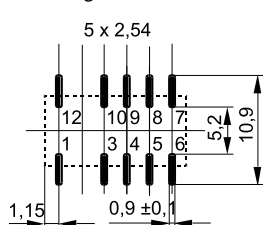


Note: Hole for pin 6 and 7 only for latching with 2 coils  
Basic grid 2.54 mm

### Solder pad layout

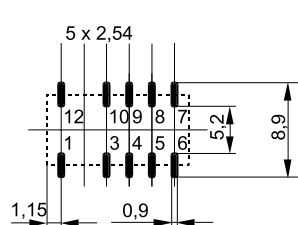
View onto the component side of the PCB

Long terminals



Note: Solder pad for pin 6 and 7 only for latching with 2 coils

Short terminals

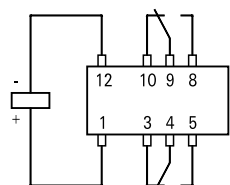


Note: Solder pad for pin 6 and 7 only for latching with 2 coils

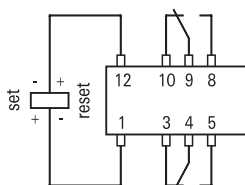
### Terminal assignment

Relay - top view

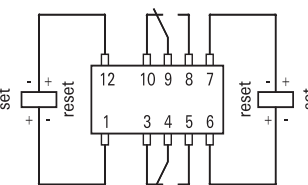
Non-latching type, not energized condition



Latching type, 1 coil reset condition



Latching type, 2 coils reset condition



# P2 Relay

# V23079



## Coil Data (values at 23°C)

Nominal voltage $U_{nom}$	Operate/set voltage range		Release/ reset voltage Minimum	Nominal power consumption	Resistance	Coil number
	Minimum voltage $U_I$	Maximum voltage $U_{II}$				
Vdc	Vdc	Vdc	Vdc	mW	$\Omega / \pm 10\%$	
non-latching 1 coil						A1xxx/D1xxx/G1xxx A2xxx/D2xxx/G2xxx
3	2.25	6.50	0.30	140	64.3	008
4	3.00	8.70	0.40	140	114	016
4.5	3.375	9.80	0.45	140	145	011
5	3.75	10.90	0.50	140	178	001
6	4.5	13.00	0.60	140	257	002
9	6.75	19.60	0.90	140	578	006
12	9.00	26.15	1.20	140	1029	003
24*	18.00	52.30	2.40	140	4114	005
latching 2 coils						B1xxx/E1xxx/H1xxx
3	2.25	6.50	2.25	140	64.3	208
4.5	3.375	9.80	3.375	140	145	211
5	3.75	10.90	3.75	140	178	201
6	4.5	13.00	4.50	140	257	202
9	6.75	19.60	6.75	140	578	206
12	9.00	26.15	9.00	140	1029	203
24	18.00	52.30	18.00	140	4114	205
latching 1 coil						C1xxx/F1xxx/J1xxx
3	2.25	9.20	2.25	70	128	108
4.5	3.375	13.85	3.375	70	289	111
5	3.75	15.33	3.75	70	357	101
6	4.5	18.50	4.50	70	514	102
9	6.75	27.75	6.75	70	1157	106
12	9.00	37.00	9.00	70	2057	103
24	18.00	74.00	18.00	70	8228	105

\* 24 V only in A1xxx/D1xxx/G1xxx  
Further coil versions are available on request.

$U_I$  = Minimum voltage at 23°C after pre-energizing with nominal voltage without contact current

$U_{II}$  = Maximum continuous voltage at 23°C

The operating voltage limits  $U_I$  and  $U_{II}$  depend on the temperature according to the formula:

$$U_{I\text{tamb}} = K_I \cdot U_{I\ 23^\circ\text{C}}$$

and

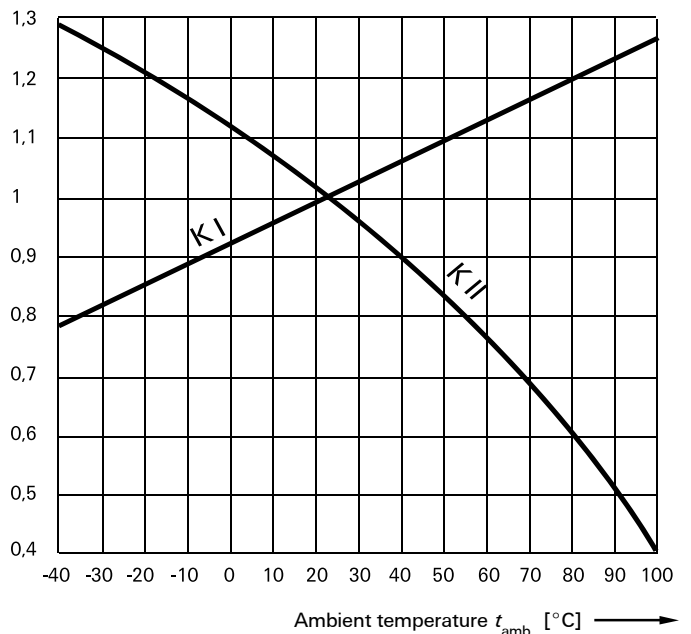
$$U_{II\text{tamb}} = K_{II} \cdot U_{II\ 23^\circ\text{C}}$$

$t_{amb}$  = Ambient temperature

$U_{I\text{tamb}}$  = Minimum voltage at ambient temperature,  $t_{amb}$

$U_{II\text{tamb}}$  = Maximum voltage at ambient temperature,  $t_{amb}$

$k_r, k_{II}$  = Factors (dependent on temperature), see diagram



## P2 Relay

V23079

**AXICOM****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	5 A
Maximum switching voltage	220 Vdc 250 Vac
Maximum switching capacity	60 W, 60 VA
Thermoelectric potential	< 10 $\mu$ V
Initial contact resistance / measuring condition: 10 mA / 20 mV	< 50 m $\Omega$
Electrical endurance	at 12 V / 10 mA typ. 5 x 10 <sup>7</sup> operations at 6 V / 100 mA typ. 1 x 10 <sup>7</sup> operations at 60 V / 500 mA typ. 5 x 10 <sup>5</sup> operations at 30 V / 1000 mA typ. 1 x 10 <sup>6</sup> operations at 30 V / 2000 mA typ. 2 x 10 <sup>5</sup> operations
Mechanical endurance	typ. 10 <sup>9</sup> operations
UL/CSA ratings	30 Vdc / 1 A 110 Vdc / 0.3 A 120 Vac / 0.5 A 240 Vac / 0.25 A

**Insulation**

Insulation resistance at 500 VDC	> 10 <sup>9</sup> $\Omega$
Dielectric test voltage (1 min)	
between coil and contacts (Relay with 1 coil)	1500 Vrms
between adjacent contact sets	1000 Vrms
between open contacts	1000 Vrms (1500 Vrms on request)
Surge voltage resistance	
according to Bellcore TR-NWT-001089 (2 / 10 $\mu$ s)	
between coil and contacts (Relay with 1 coil)	2500 V
between adjacent contact sets	2500 V
between open contacts	2000 V
according to FCC 68 (10 / 160 $\mu$ s)	
between coil and contacts (Relay with 1 coil)	1500 V
between adjacent contact sets	1500 V
between open contacts	1500 V

**High Frequency Data**

Capacitance	
between coil and contacts	max. 2 pF
between adjacent contact sets	max. 1.5 pF
between open contacts	max. 1 pF
RF Characteristics	
Isolation at 100 / 900 MHz	-39.0 dB / -20.7 dB
Insertion loss at 100 / 900 MHz	-0.02 dB / -0.27 dB
V.S.W.R. at 100 / 900 MHz	1.04 / 1.40

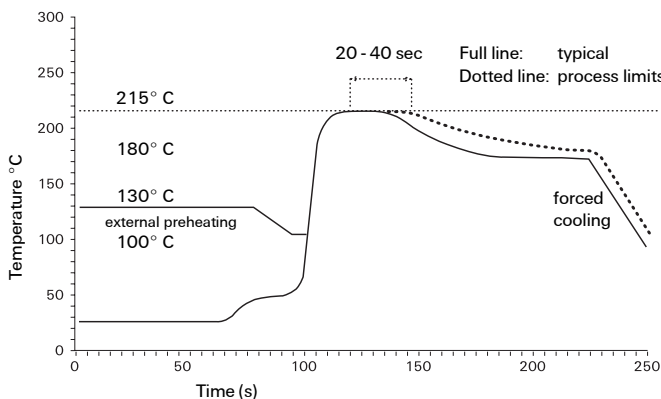
**General data**

Operate time at $U_{nom}$ typ. / max.	3 ms / 5 ms
Reset time (latching) at $U_{nom}$ , typ. / max.	3 ms / 5 ms
Release time without diode in parallel (non-latching), typ. / max.	2 ms / 4 ms
Release time with diode in parallel (non-latching), typ. / max.	4 ms / 6 ms
Bounce time at closing contact, typ. / max.	1 ms / 3 ms
Maximum switching rate without load	50 operations/s
Ambient temperature	-40° C ... +85° C (105° C on request)
Thermal resistance	< 165 K/W
Maximum permissible coil temperature	110° C
Vibration resistance (function)	35 g 10 to 1000 Hz
Shock resistance, half sinus, 11 ms	50 g (function) 150 g (damage)
Degree of protection	immersion cleanable, IP 67
Needle flame test	application time 20 s, burning time < 15 s
Mounting position	any
Processing information	Ultrasonic cleaning is not recommended
Weight (mass)	max. 2.5 g
Resistance to soldering heat	260° C / 10 s

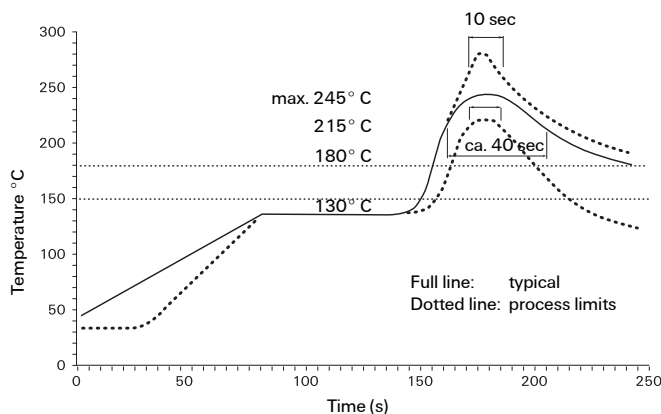
All data refers to 23° C unless otherwise specified.

**Recommended soldering conditions**

Soldering conditions according CECC 00802



Vapor Phase Soldering: Temperature/Time Profile (Lead Temperature)



Infrared Soldering: Temperature/Time Profile (Lead Temperature)

# P2 Relay

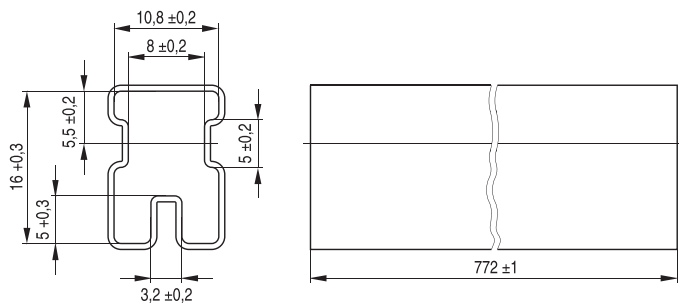
# V23079



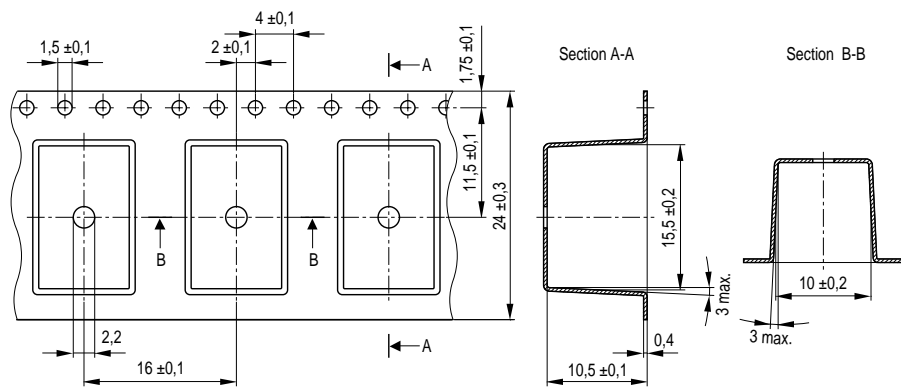
## Packing

Dimensions in mm

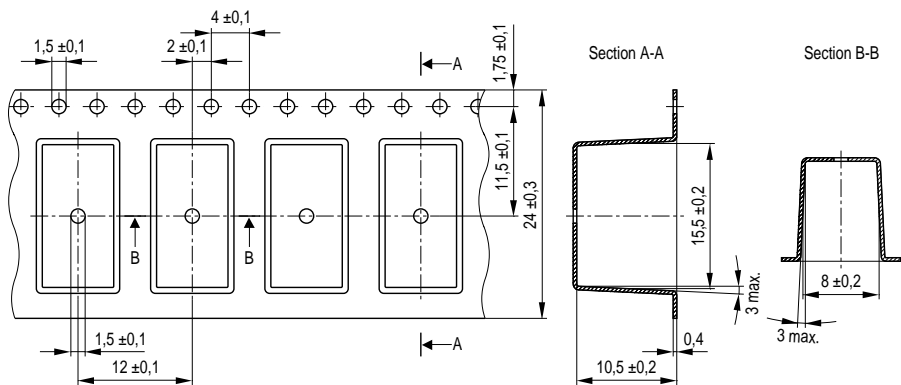
Tube for THT version - 50 relays per tube, 2000 relays per box



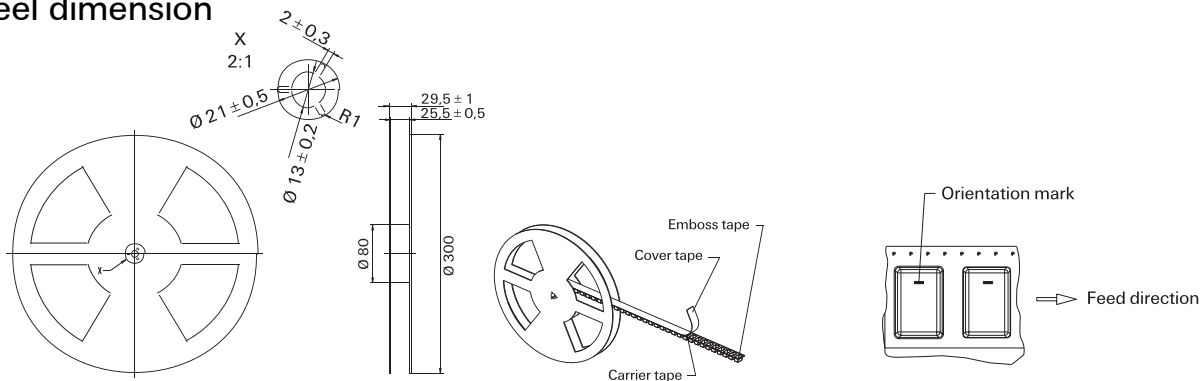
Tape and reel for SMT version with long terminals - 400 relays per reel, 2000 relays per box



Tape and reel for SMT version with short terminals - 500 relays per reel, 2500 relays per box



## Reel dimension



## Ordering Information

Relay Code	Tyco Part Number	Relay Code	Tyco Part Number
V23079-A1001-B301	0-1393788-3	V23079-E1201-B301	6-1393788-8
V23079-A1002-B301	0-1393788-8	V23079-E1202-B301	0-1393789-5
V23079-A1003-B301	1-1393788-1	V23079-E1203-B301	6-1393788-9
V23079-A1005-B301	1-1393788-6	V23079-E1205-B301	7-1393788-0
V23079-A1006-B301	2-1393788-0	V23079-E1206-B301	0-1393789-9
V23079-A1008-B301	2-1393788-2	V23079-E1208-B301	7-1393788-1
V23079-A1011-B301	2-1393788-4	V23079-E1211-B301	7-1393788-2
V23079-A2001-B301	3-1393789-5	V23079-F1101-B301	7-1393788-3
V23079-A2002-B301	3-1393789-6	V23079-F1102-B301	1-1393789-0
V23079-A2003-B301	3-1393789-7	V23079-F1103-B301	7-1393788-4
V23079-A2005-B301	0-1393790-2	V23079-F1105-B301	1-1393789-1
V23079-A2006-B301	3-1393789-8	V23079-F1106-B301	1-1393789-2
V23079-A2008-B301	6-1419120-6	V23079-F1108-B301	7-1393788-5
V23079-A2011-B301	3-1393789-9	V23079-F1111-B301	1-1393789-4
V23079-B1201-B301	3-1393788-3	V23079-G1001-B301	7-1393788-6
V23079-B1202-B301	3-1393788-5	V23079-G1002-B301	1-1393789-5
V23079-B1203-B301	3-1393788-6	V23079-G1003-B301	7-1393788-7
V23079-B1205-B301	3-1393788-7	V23079-G1005-B301	7-1393788-8
V23079-B1206-B301	3-1393788-9	V23079-G1006-B301	1-1393789-6
V23079-B1208-B301	4-1393788-1	V23079-G1008-B301	8-1393788-0
V23079-B1211-B301	4-1393788-2	V23079-G1011-B301	1-1393789-7
V23079-C1101-B301	4-1393788-5	V23079-G2001-B301	4-1393789-9
V23079-C1102-B301	4-1393788-7	V23079-G2002-B301	5-1393789-0
V23079-C1103-B301	4-1393788-8	V23079-G2003-B301	5-1393789-1
V23079-C1105-B301	5-1393788-0	V23079-G2006-B301	5-1393789-3
V23079-C1106-B301	5-1393788-1	V23079-G2008-B301	5-1393789-4
V23079-C1108-B301	5-1393788-3	V23079-G2011-B301	5-1393789-5
V23079-C1111-B301	5-1393788-4		
V23079-D1001-B301	5-1393788-5	V23079-H1201-B301	2-1393789-0
V23079-D1002-B301	5-1393788-6	V23079-H1202-B301	2-1393789-1
V23079-D1003-B301	5-1393788-7	V23079-H1203-B301	8-1393788-3
V23079-D1005-B301	5-1393788-8	V23079-H1205-B301	2-1393789-2
V23079-D1006-B301	5-1393788-9	V23079-H1206-B301	2-1393789-3
V23079-D1008-B301	6-1393788-1	V23079-H1208-B301	2-1393789-4
V23079-D1011-B301	6-1393788-2	V23079-H1211-B301	8-1393788-4
V23079-D2001-B301	4-1393789-3	V23079-J1101-B301	2-1393789-5
V23079-D2002-B301	4-1393789-4	V23079-J1102-B301	2-1393789-6
V23079-D2003-B301	4-1393789-5	V23079-J1103-B301	2-1393789-7
V23079-D2006-B301	4-1393789-6	V23079-J1105-B301	2-1393789-8
V23079-D2008-B301	4-1393789-7	V23079-J1108-B301	2-1393789-9
V23079-D2011-B301	4-1393789-8	V23079-J1111-B301	3-1393789-0

## Middle block of relay code

V23079-yyxxx-B301  
yy : See table below  
xxx : See coil table on page 4

yy	Description
A1	THT, non latching, standard coil
A2	THT, non latching, overmolded coil
B1	THT, latching, 2 standard coils
C1	THT, latching, 1 standard coil

D1	SMT, long pins, non latching, standard coil
D2	SMT, long pins, non latching, overmolded coil
E1	SMT, long pins, latching, 2 standard coils
F1	SMT, long pins, latching, 1 standard coil
G1	SMT, short pins, non latching, standard coil
G2	SMT, short pins, non latching, overmolded coil
H1	SMT, short pins, latching, 2 standard coils
J1	SMT, short pins, latching, 1 standard coil



## IM Relays

4<sup>th</sup> generation slim line – low profile polarized 2 c/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 kV – 2 / 10  $\mu$ s) and FCC part 68 (1,5 kV – 10 / 160  $\mu$ s). The IM relay is CECC/IECQ approved and certified in accordance with IEC/EN 60950 and UL1950. Dimensions approx. 10 x 6 mm board space and 5,65 mm height.

## P2 Relays

3<sup>rd</sup> 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 Bellcore requirements according GR 1089 (2,5 kV – 2 / 10  $\mu$ s) and FCC part 68 (1,5 kV – 10 / 160  $\mu$ s). Dimensions approx. 15 x 7,5 mm board space and 10 mm height.

## FX Relays

3<sup>rd</sup> 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 Bellcore requirements according GR 1089 (2,5 kV – 2 / 10  $\mu$ s) and FCC part 68 (1,5 kV – 10 / 160  $\mu$ s). The FX2 is CECC/IECQ approved and certified in accordance with IEC/EN 60950 and UL1950. Dimensions approx. 15 x 7,5 mm board space and 10,7 mm height.

## FT2 / FU2 Relays

3<sup>rd</sup> 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 Bellcore requirements according GR 1089 (2,5 kV – 2 / 10  $\mu$ s) and FCC part 68 (1,5 kV – 10 / 160  $\mu$ s). The FT2/FU2 is CECC/IECQ approved and certified in accordance with IEC/EN 60950 and UL1950. Dimensions approx. 15 x 7,5 mm board space and 10 mm height.

## FP2 Relays

3<sup>rd</sup> 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 30 W/62,5 VA. Dielectric strength fulfills FCC part 68 (1,5 kV – 10 / 160  $\mu$ s). The FP2 is CECC/IECQ approved. Dimensions approx. 14 x 9 mm board space and 5 mm height.

## MT2 / MT4

2<sup>nd</sup> generation non polarized, non latching 2 c/o and 4 c/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 kV – 10 / 160  $\mu$ s) for both and the Bellcore requirements according GR 1089 (2,5 kV – 2 / 10  $\mu$ s) the MT4 only.

Dimensions MT2 approx. 20 x 10 mm board space and 11 mm height, MT4 approx. 20 x 15 mm board space and 11 mm height.

## D2n Relays

2<sup>nd</sup> 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  $\mu$ s). Dimensions approx. 20 x 10 mm board space and 11,5 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  $\mu$ s). 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 1<sup>st</sup> 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 / 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.

**tyco**

*Electronics*

**AXICOM**



Tyco Electronics AXICOM Ltd.  
Seestrasse 295 - P.O. Box 220  
CH-8804 Au-Wädenswil / Switzerland  
Phone +41 1 782 9111  
Fax +41 1 782 9080  
E-mail: [axicom@tycoelectronics.com](mailto:axicom@tycoelectronics.com)



Tyco Electronics AMP GmbH  
Paulsternstrasse 26  
D-13629 Berlin / Germany  
Phone +49 30 386 38260  
Fax +49 30 386 38569  
E-mail: [axicom@tycoelectronics.com](mailto:axicom@tycoelectronics.com)



Tyco Electronics EC Trutnov s.r.o.  
Komenského 821  
CZ-541 01 Trutnov / Czech Republic  
E-mail: [axicom@tycoelectronics.com](mailto:axicom@tycoelectronics.com)

Tyco Electronics Corporation  
POB 3608,  
Harrisburg, PA 17105, USA  
Phone +001 800-522-6752