tyco Electronics

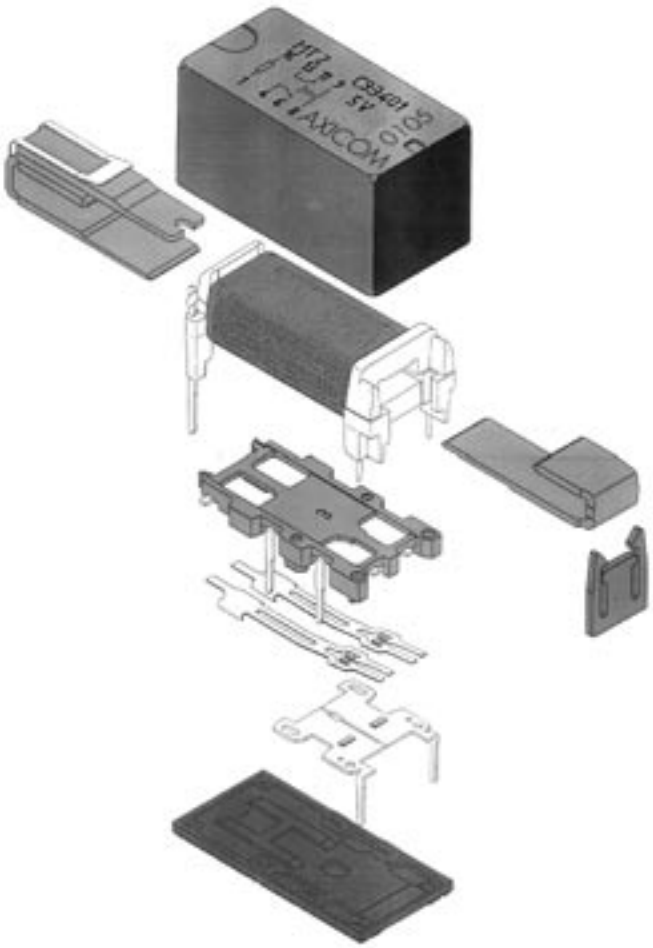
AXICOM

The Best Relaytion

MT2 Relay

108-98006
Rev. C
EC-JM00-0009-03
ECOC: JM10
1. Apr. 04

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 x 10 mm, 0.795 x 0.393 inch
- Switching current 2 A
- 2 changeover contacts (2 form C / DPDT)
- 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

UL 508 File No. E 111441

IEC 61811-52:02
(QC160504)

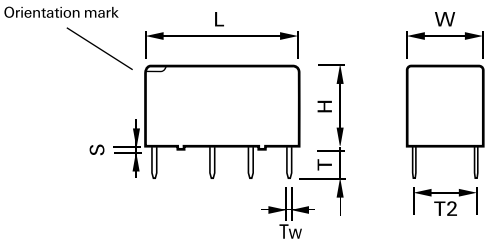
European Directive conformance:

MT2 relay product conformance according to:

- Directive 2000/53/EC: ELV (End of Life of Vehicles)
- Directive 2002/95/EC: ROHS (Restrictions of the use of certain hazardous substances in electrical and electronic equipment)

Compliance is evidenced by written declaration from all raw material suppliers.
Tyco Electronics AXICOM only has responsibility for the proper processing of these materials.
Confirmation is valid for date codes ≥ 0416

THT Version

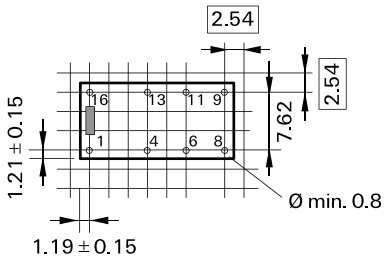


Dimension

	THT	
	mm	inch
L	20.2 + 0.05/-0.02	0.795 + 0.002/-0.0008
W	10 + 0.05/-0.02	0.393 + 0.002/-0.0008
H	11+0.1/-0.2	0.433 + 0.004/-0.008
T	3.1 ± 0.3	0.122 ± 0.011
T1	N/A	N/A
T2	7.62 ± 0.15	0.3 ± 0.005
S	0.55	0.021
Tw	0.5	0.020

Mounting hole layout

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

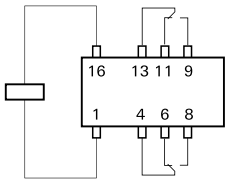


Basic grid 2.54 mm

Terminal assignment

Relay - top view

non-latching 1 coil
release condition

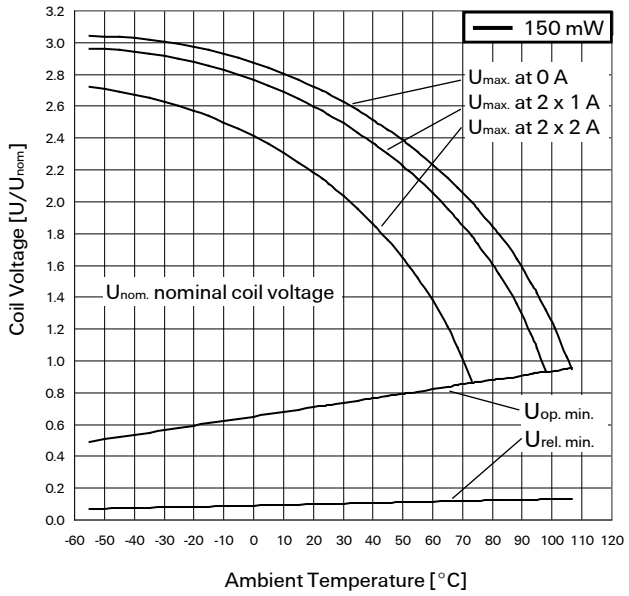


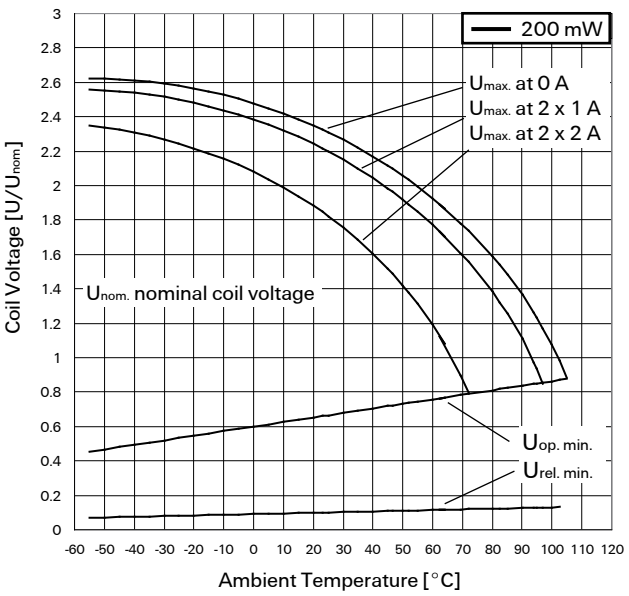
Coil Data (values at 23°C)

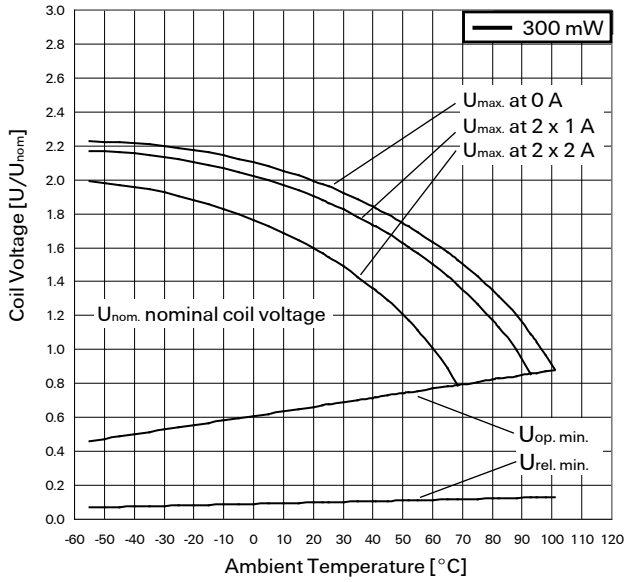
Ordering Information

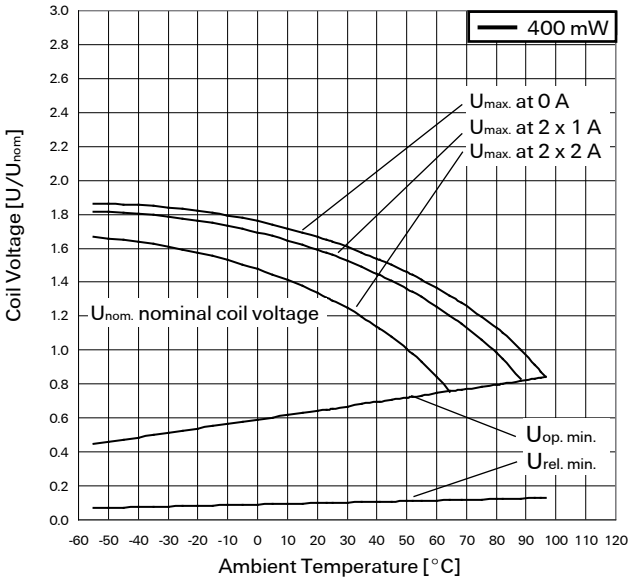
Nominal voltage *U*nom	Operate/set voltage range		Release/ reset voltage Minimum	Coil power	Coil Resistance	Relay code	Tyco part number
	Minimum voltage U_{min}	Maximum voltage U_{max}					
Vdc	Vdc	Vdc	Vdc	mW	Ω / ± 10 %		
High sensitive version (150 mW) non-latching 1 coil							
3	2.1	8.1	0.30	150	60	C 93400	1-1462001-2
4.5	3.2	12.2	0.45	150	136	C 93406	2-1462000-2
5	3.6	13.5	0.50	150	168	C 93401	0-1462000-1
6	4.3	16.2	0.60	150	240	C 93427	5-1462000-6
9	6.4	24.3	0.90	150	544	C 93405	2-1462000-0
12	8.6	32.4	1.20	150	968	C 93402	0-1462000-7
24	17.1	64.8	2.40	150	3872	C 93403	1-1462000-3
48	33.1	129.6	4.80	150	15468	C 93404	1-1462000-8
Sensitive version (200 mW) non-latching 1 coil							
3	2.0	7.0	0.30	200	45	C 93414	1-1462001-1
4.5	2.9	10.5	0.45	200	101	C 93415	3-1462000-0
5	3.3	11.6	0.50	200	125	C 93416	3-1462000-1
6	3.9	14.0	0.60	200	180	C 93428	5-1462000-7
9	5.9	21.0	0.90	200	405	C 93417	3-1462000-6
12	7.8	28.0	1.20	200	720	C 93418	3-1462000-7
24	15.6	59.9	2.40	200	2880	C 93419	4-1462000-1
48	31.2	112.0	4.80	200	11520	C 93420	4-1462000-5
Sensitive version (300 mW) non-latching 1 coil							
4.5	3.1	8.9	0.45	300	73	C 93433	6-1462000-6
5	3.4	9.9	0.50	300	90	C 93434	6-1462000-8
12	8.25	23.6	1.20	300	515	C 93412	2-1462000-6
24	16.5	47.3	2.40	300	2060	C 93435	7-1462000-0
48	32.5	54.6	4.80	300	8240	C 93436	7-1462000-2
Standard version (400 mW) non-latching 1 coil							
4.5	2.9	8.9	0.45	400	50	C 93421	4-1462000-7
5	3.3	9.9	0.50	400	63	C 93422	4-1462000-8
6	3.9	11.8	0.60	400	90	C 93429	5-1462000-8
9	5.9	17.7	0.90	400	203	C 93423	5-1462000-0
12	7.8	23.6	1.20	400	360	C 93424	5-1462000-1
24	15.6	47.3	2.40	400	1440	C 93425	5-1462000-3
48	31.2	94.6	4.80	400	5760	C 93426	5-1462000-5
Standard version (550 mW) non-latching 1 coil							
4.5	2.9	6.3	0.45	550	36	C 93438	7-1462000-7
5	3.3	7.0	0.5	550	45	C 93450	8-1462000-5
6	3.9	8.4	0.60	550	66	C 93437	7-1462000-6
12	7.8	16.8	1.20	550	280	C 93432	6-1462000-2
24	15.6	33.6	2.40	550	1050	C 93431	6-1462000-1
48	31.2	67.2	4.80	550	4100	C 93430	5-1462000-9

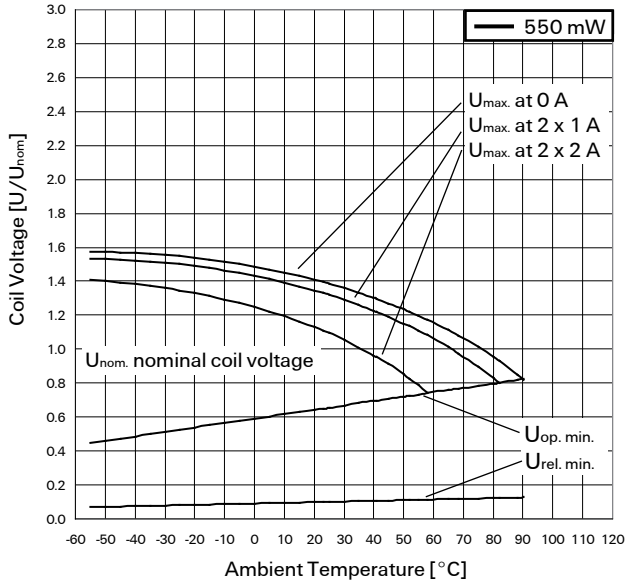
Coil operating range











U_{nom} = Nominal coil voltage

$U_{max.}$ = Upper limit of the operative range of the coil voltage (limiting voltage) when coils are continously energized

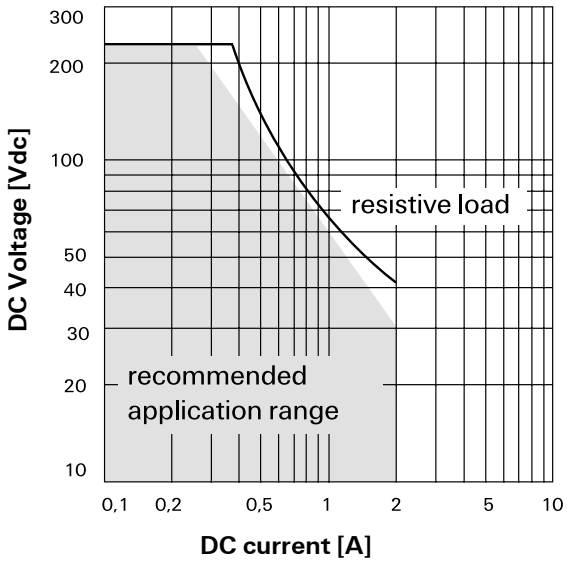
$U_{op.\ min.}$ = Lower limit of the operative range of the coil voltage (reliable operate voltage)

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

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 swichting voltage		220 Vdc 250 Vac
Maximum switching capacity		60 W, 62.5 VA
Thermoelectric potential		< 10 μV
Minimum switching voltage		100 μV
Initial contact resistance / measuring condition: 10 mA / 20 mV		< 70 mΩ
Electrical endurance	Contact application 0 (30 mV/ 10 mA)	min. 5 x 10^6 operations
	Cable load open end	min. 2.5 x 10^6 operations
	Resistive load 150 V / 0.2 A - 30 W	min. 2.0 x 10^5 operations
	24 V / 1.25 A - 30 W	min. 2.0 x 10^5 operations
Mechanical endurance		typ. 10^8 operations
UL contact ratings		220 Vdc / 0.24 A - 60 W 125 Vdc / 0.24 A - 30 W 250 Vac / 0.25 A - 62.5 VA 125 Vac / 0.5 A - 62.5 VA 30 Vdc / 2 A - 60 W

Max. DC load breaking capacity



Insulation

Insulation resistance at 500 Vdc	> 10^9 Ω
Dielectric test voltage (1 min)	
between coil and contacts	1050 Vrms
between adjacent contact sets	750 Vrms
between open contacts	750 Vrms
Surge voltage resistance	
according to FCC 68 (10 / 160 μs) and IEC (10 / 700 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. 2 pF
between open contacts	max. 2 pF
RF Characteristics	
Isolation at 100 / 900 MHz	- 31.8 dB / - 14.2 dB
Insertion loss at 100 / 900 MHz	- 0.02 dB / - 0.97 dB
V.S.W.R. at 100 / 900 MHz	1.03 / 1.31

General data

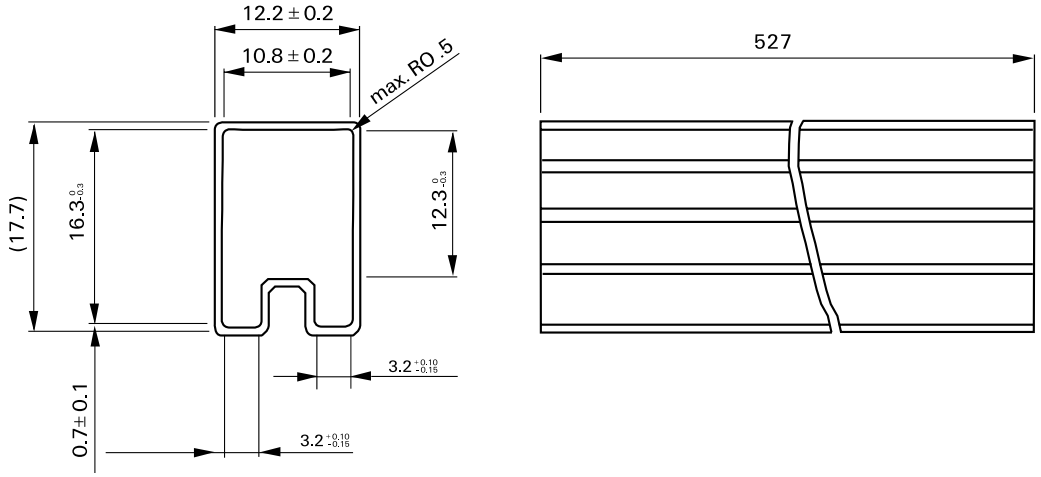
Operate time at U_{nom} typ. / max.	4 ms / 5 ms
Release time without diode in parallel (non-latching), typ. / max.	1 ms / 3 ms
Release time with diode in parallel (non-latching), typ. / max.	4 ms / 6 ms
Bounce time at closing contact, typ. / max.	1 ms / 5 ms
Maximum switching rate without load	50 operations/s
Ambient temperature	-55° C ... +85° C
Thermal resistance	< 85 K/W
Maximum permissible coil temperature	115° C
Vibration resistance (function)	10 G 10 to 500 Hz
Shock resistance, half sinus, 11 ms	10 G / 30 G (function) 30 G (damage)
Degree of protection	immersion cleanable, IP 67
Needle flame test	application time 10 s,
Mounting position	any
Processing information	Ultrasonic cleaning is not recommended
Weight (mass)	max. 5 g
Terminal surface	SnCu 0.7
Resistance to soldering heat	260° C / 10 s

All data refers to 23° C unless otherwise specified.

Packing

Dimensions in mm

Tube for THT version - 25 relays per stick, 1'000 relays per box



IM Relays

4th 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 µs) and FCC part 68 (1,5 kV – 10 / 160 µs). 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

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 Bellcore requirements according GR 1089 (2,5 kV – 2 / 10 µs) and FCC part 68 (1,5 kV – 10 / 160 µs). Dimensions approx. 15 x 7,5 mm board space and 10 mm height.

FX 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 Bellcore requirements according GR 1089 (2,5 kV – 2 / 10 µs) and FCC part 68 (1,5 kV – 10 / 160 µs). 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

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 Bellcore requirements according GR 1089 (2,5 kV – 2 / 10 µs) and FCC part 68 (1,5 kV – 10 / 160 µs). 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.

FP1 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 FP1 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 µs). The FP2 is CECC/IECQ approved. Dimensions approx. 14 x 9 mm board space and 5 mm height.

MT2 / MT4

2nd 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 µs) for both and the Bellcore requirements according GR 1089 (2,5 kV – 2 / 10 µs) the MT4 only.
Dimensions MT2 approx. 20 x 10 mm board space and 11 mm height, MT4 approx. 20 x15 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 11,5 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 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 / 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.

HF3 Relay

High performance low cost RF relay with excellent RF characteristics. Available with an impedance of 50 and 75 Ohm. Suitable for frequencies up to 3 GHz. Actually smallest RF relay available combining small size, excellent RF performance and SMD solderability. Available as non latching or latching relay with 1 or 2 coils and a nominal coil voltage range from 3 ... 24 V, coil power consumption 140 mW, latching relays with 1 coil 70 mW. Dimensions 14.6 x 7.3 x 10 mm.

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