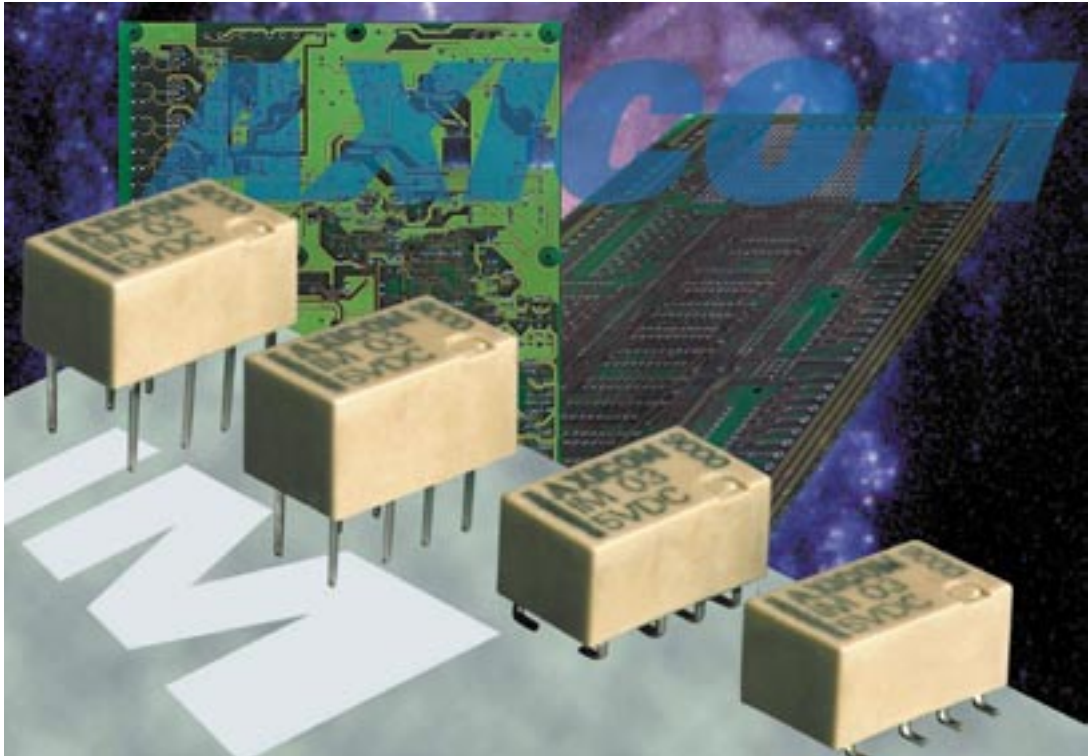


tyco
Electronics

AXICOM

The Best Relaytion



IM Relay



Slim line AND low profile
2 pole telecom/signal relay, polarized
Through Hole Types (THT), standard version
with 5.08 mm, narrow version with 3.2 mm between
the terminal rows

or

Surface Mount Type (SMT)

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

Features

- Telecom/signal relay (dry circuit, test access, ringing)
- Slim line 10 x 6 mm, 0.39 x 0.24 inch
- Low profile 5.65 mm, 0.222 inch
- Minimum board-space 60 mm²
- Switching current 2 A
- 2 changeover contacts (2 form C / DPDT)
- Bifurcated contacts, gold plated
- High sensitivity results in low nominal power consumption
140 mW for non latching
100 mW for latching version
- High surge capability (1.2/50 µs and 10/700 µs) meets
Bellcore GR 1089, FCC Part 68 and ITU-T K20, 21, 45
≥ 1500 V between open contacts
≥ 2500 V between coil and contacts
- High mechanical shock resistance
up to 300 G functional
up to 500 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

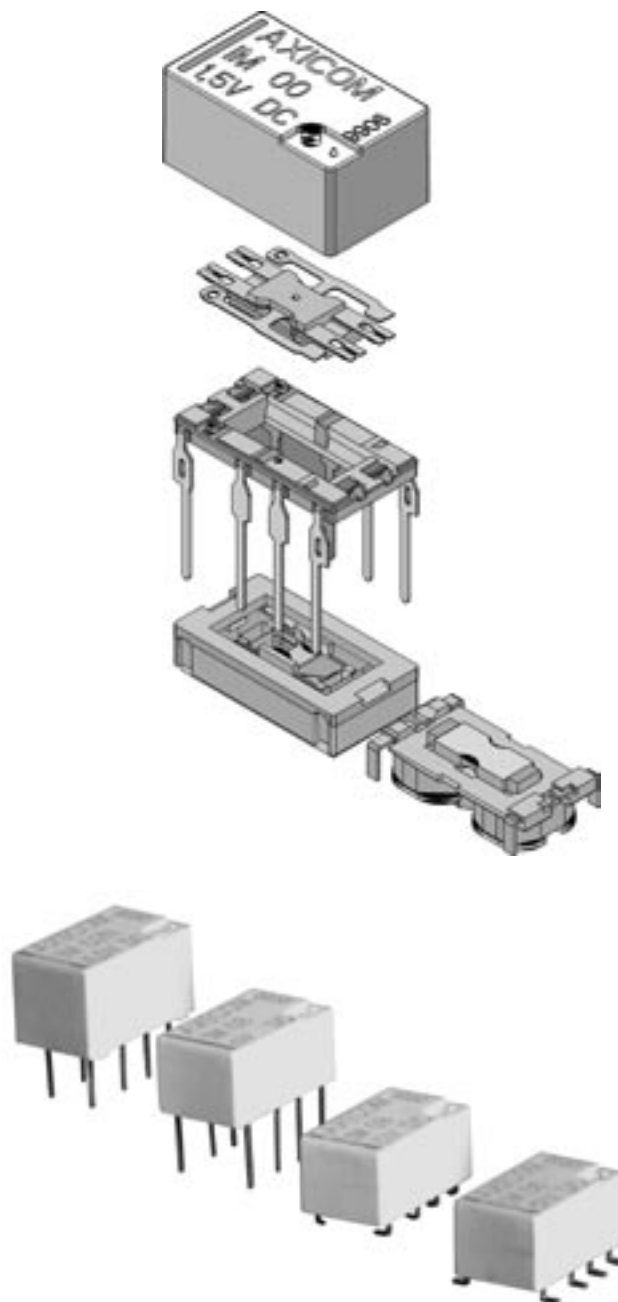
Options:

Surge capability ≥ 2500 V between open contacts

Insulation category:

Supplementary insulation according IEC/EN 60950

Working voltage	≤ 300 Vrms
Mains supply voltage	SMT: 250 Vrms THT: 200 Vrms
Repetitive peak voltage	2500 V
Pollution degree:	External: 2 Internal: 1
Flammability classification:	V-0
Maximum operating temperature:	85°C



UL 508 File No. E111441
UL 60950



CECC 61811-51-001



QC 160501-CH0001

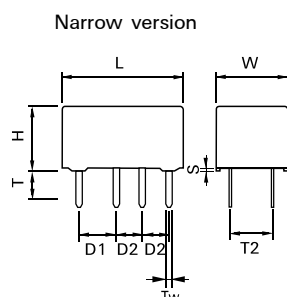
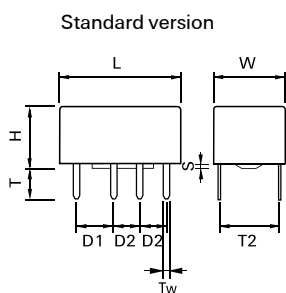
IEC/EN60950

IEC Ref. Cert. No. 2170

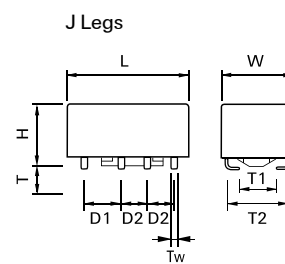
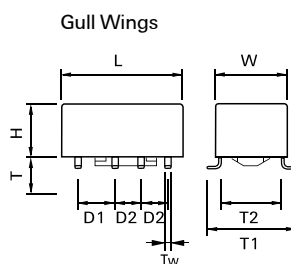
Dimensions

	IM THT Standard		IM THT Narrow		IM SMT Gull Wings		IM SMT J-Legs	
	mm	inch	mm	inch	mm	inch		
L	10 ±0.08	0.393 ±0.003	10 ±0.08	0.393 ±0.003	10 ±0.08	0.393 ±0.003	10 ±0.08	0.393 ±0.003
W	6 ±0.08	0.236 ±0.003	5.7 ±0.3	0.224 ±0.012	6 ±0.08	0.236 ±0.003	6 ±0.08	0.236 ±0.003
H	5.65 -0.2	0.222 -0.008	5.85 -0.15	0.230 -0.006	5.65 -0.2	0.222 -0.008	5.65 -0.2	0.222 -0.008
T	3.2	0.125	3.2	0.125	N/A	N/A	N/A	N/A
T1	N/A	N/A	N/A	N/A	7.5 ±0.3	0.295 ±0.011	2.8 ±0.2	0.110 ±0.007
T2	5.08 ±0.1	0.200 ±0.004	3.2 ±0.1	0.126 ±0.006	5.08 ±0.1	0.200 ±0.004	5.08 ±0.1	0.200 ±0.004
D1	3.2 ±0.15	0.126 ±0.006	3.2 ±0.15	0.126 ±0.006	3.2 ±0.15	0.126 ±0.006	3.2 ±0.15	0.126 ±0.006
D2	2.2 ±0.15	0.087 ±0.006	2.2 ±0.15	0.087 ±0.006	2.2 ±0.15	0.087 ±0.006	2.2 ±0.15	0.087 ±0.006
Tw	0.4	0.015	0.4	0.015	0.4	0.015	0.4	0.015
S	0.3 ±0.05	0.011 ±0.002	0.3 ±0.05	0.011 ±0.002	N/A	N/A	N/A	N/A

THT Version

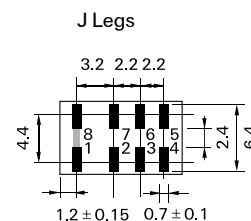
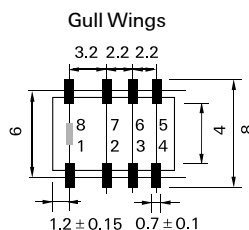
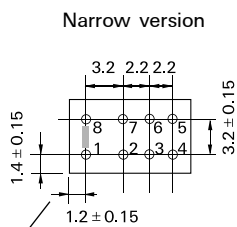
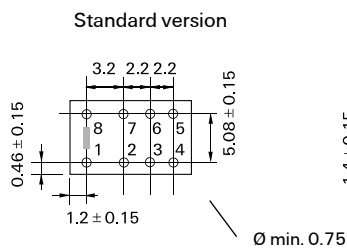


SMT Version



Mounting hole layout

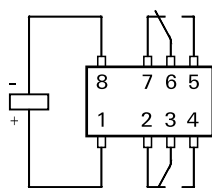
View onto the component side of the PCB
(top view)



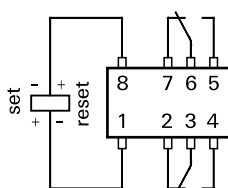
Terminal assignment

Relay - top view

Non-latching type,
not energized condition



Latching type, 1 coil
reset condition



Coil Data (values at 23°C)

Nominal voltage U_{nom}	Operate/set voltage range		Release/ reset voltage Minimum	Nominal power consumption	Resistance	Relay code
	Minimum voltage U_I	Maximum voltage U_{II}				
Vdc	Vdc	Vdc	Vdc	mW	$\Omega / \pm 10\%$	

non-latching

1 coil

1.5	1.13	3.4	0.15	140	16	IM00
3	2.25	6.8	0.30	140	64	IM01
4.5	3.38	10.3	0.45	140	145	IM02
5	3.75	11.4	0.50	140	178	IM03
6	4.50	13.7	0.60	140	257	IM04
9	6.75	20.4	0.90	140	574	IM05
12	9.00	27.3	1.20	140	1028	IM06
24	18.00	45.6	2.40	200	2880	IM07

latching

1 coil

1.5	1.13	4.1	- 1.13	100	23	IM40
3	2.25	8.1	- 2.25	100	90	IM41
4.5	3.38	12.1	- 3.38	100	203	IM42
5	3.75	13.5	- 3.75	100	250	IM43
6	4.5	16.2	- 4.50	100	360	IM44
9	6.75	24.2	- 6.75	100	810	IM45
12	9.00	32.3	- 9.00	100	1440	IM46
24	18.00	41.9	- 18.00	200	2880	IM47

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°

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

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

and

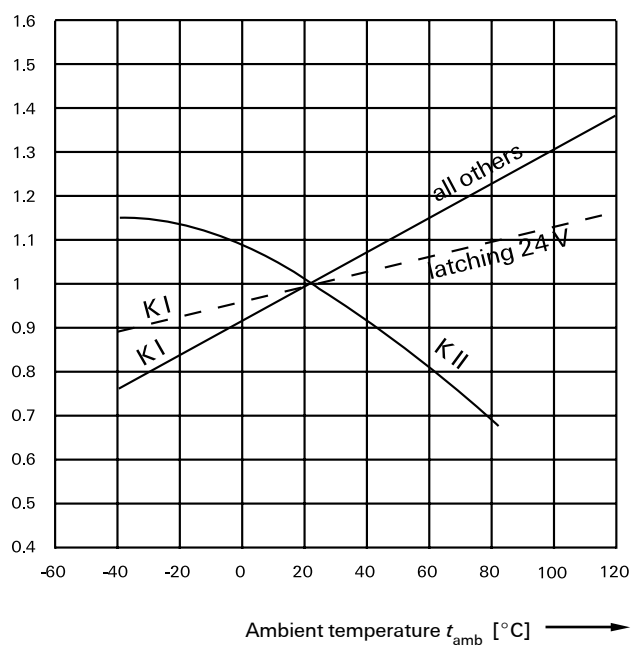
$$U_{II \text{ tamb}} = K_{II} \cdot U_{II \text{ 23}^\circ \text{ C}}$$

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_I, K_{II} = Factors (dependent on temperature), see diagram



Contact Data

Number of contacts and type	2 changeover contacts
Contact assembly	Bifurcated contacts
Contact material	Palladium-ruthenium, gold-covered
Limiting continuous current at max. ambient temperature	2 A
Maximum switching current	2 A
Maximum switching voltage	220 Vdc 250 Vac
Maximum switching capacity	60 W, 62.5 VA
Thermoelectric potential	< 10 μ V
Minimum switching voltage	100 μ V
Initial contact resistance / measuring condition: 10 mA / 20 mV	< 50 m Ω
Electrical endurance	at contact application 0 (≤ 30 mV / ≤ 10 mA) cable load open end min. 2.5 x 10 ⁶ operations
Resistive load	at 125Vdc / 0.24 A - 30 W min. 2.0 x 10 ⁶ operations at 220 Vdc / 0.27 A - 60 W min. 5 x 10 ⁵ operations at 250 Vac / 0.25 A - 62.5 VA min. 1 x 10 ⁵ operations at 30 Vdc / 1 A - 30 W min. 1 x 10 ⁵ operations at 30 Vdc / 2 A - 60 W min. 1 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

Insulation

	Standard Version	High Dielectric Version
Insulation resistance at 500 VDC	> 10 ⁹ Ω	> 10 ⁹ Ω
Dielectric test voltage (1 min)		
between coil and contacts	1800 Vrms	1800 Vrms
between adjacent contact sets	1000 Vrms	1800 Vrms
between open contacts	1000 Vrms	1500 Vrms
Surge voltage resistance		
according to Bellcore TR-NWT-001089 (2 / 10 μ s)		
between coil and contacts	2500 V	2500 V
between adjacent contact sets	1500 V	2500 V
between open contacts	1500 V	2500 V
according to FCC 68 (10 / 160 μ s)		
between coil and contacts	2500 V	2500 V
between adjacent contact sets	1500 V	2500 V
between open contacts	1500 V	2500 V

High Frequency Data

Capacitance	
between coil and contacts	max. 2 pF
between adjacent contact sets	max. 2 pF
between open contacts	max. 1 pF
RF Characteristics	
Isolation at 100 / 900 MHz	- 37.0 dB / - 18.8 dB
Insertion loss at 100 / 900 MHz	- 0.03 dB / - 0.33 dB
V.S.W.R. at 100 / 900 MHz	1.06 / 1.49

* High Dielectric Version „C“

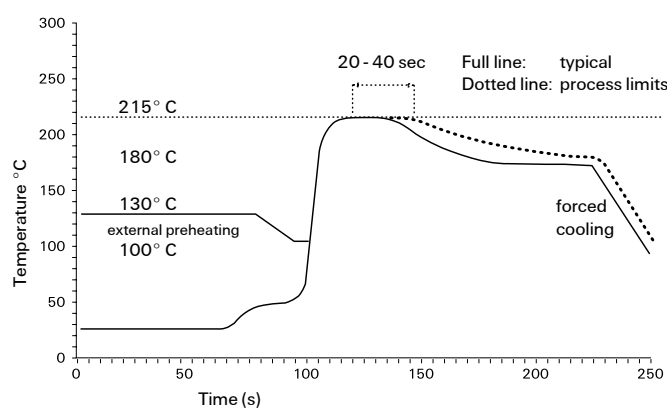
General data

Operate time at U_{nom} , typ. / max.	1 ms / 3 ms
Reset time (latching) at U_{nom} , typ. / max.	1 ms / 3 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 / 5 ms
Bounce time at closing contact, typ. / max.	1 ms / 5 ms
Maximum switching rate without load	50 operations/s
Ambient temperature	-40° C ... +85° C
Thermal resistance	< 150 K/W
Maximum permissible coil temperature	125° C
Vibration resistance (function)	20 G
	10 to 1000 Hz
Shock resistance, half sinus, 11 ms	50 G (function)
half sinus, 0.5 ms	500 G (damage)
Degree of protection / Environmental protection	immersion cleanable, IP 67 / RT V
Needle flame test	application time 20 s, no burning and glowing
Mounting position	any
Processing information	Ultrasonic cleaning is not recommended
Weight (mass)	max. 0.75 g
Resistance to soldering heat	260° C / 10 s

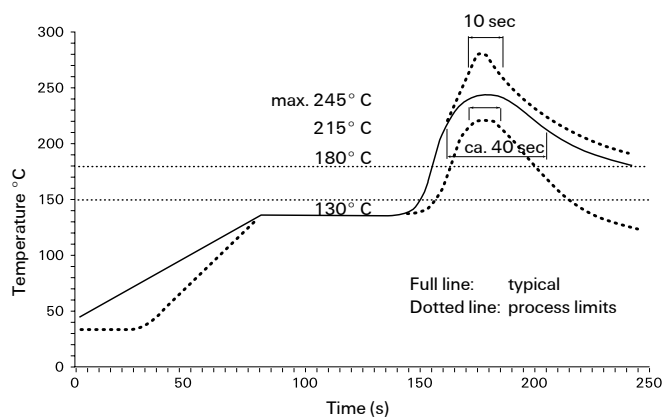
All data refers to 23° C unless otherwise specified.

Recommended soldering conditions

Soldering conditions according CECC 00802



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



Infrared Soldering: Temperature/Time Profile
(Lead Temperature)

Dimensions in mm

Technical drawing of a mechanical part, showing a side view and a cross-section view. The side view includes the following dimensions:

- Overall width: 9.6
- Top flange width: 8.6
- Top flange thickness: $6.6^{+0.1}_{-0.1}$
- Internal feature width: $6.6^{+0.1}_{-0.1}$
- Radius: $R0.5$
- Bottom flange thickness: $5.96^{+0.1}_{-0.1}$
- Overall height: 12
- Top flange height: 6.46
- Internal feature height: 1.2
- Internal feature width: 0.8
- Internal feature depth: 2.5
- Internal feature width: $2.2^{+0.1}_{-0.1}$
- Internal feature depth: $0.5^{+0.1}_{-0.1}$
- Bottom flange height: 5.54

The cross-section view shows a part with a width of 520^{+1}_{-2} .

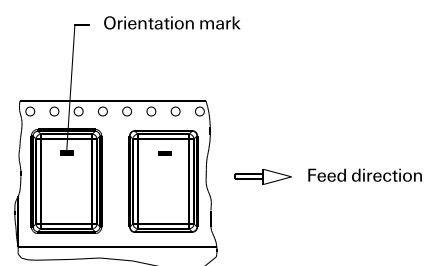
The drawing consists of two parts: a front view on the left and a cross-section B-B on the right.

Front View:

- The overall width is $10 \times 4 = (40 \pm 0.2)$.
- The overall height is $24^{+0.3}_{-0.1}$.
- There are four rectangular features arranged horizontally, each with a central circular hole. The distance between the centers of these features is 12 ± 0.1 .
- The distance from the left edge to the center of the first rectangular feature is 11.5 ± 0.1 .
- The distance from the top edge to the center of the first rectangular feature is 1.75 ± 0.1 .
- The diameter of the central circular holes is $\varnothing 1.5^{+0.1}_{-0.1}$.
- The distance from the right edge to the center of the last rectangular feature is 4 ± 0.1 .
- The distance from the right edge to the center of the last circular hole is 2 ± 0.1 .
- The cross-section line B-B is indicated by a horizontal line with arrows pointing to the right.

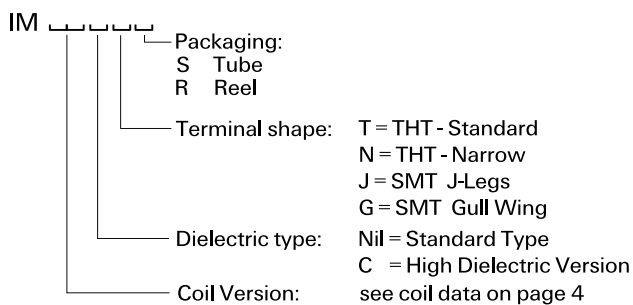
Cross-section B-B:

- The overall width is 5.85 ± 0.2 .
- The overall height is 10.4 ± 0.2 .
- The distance from the top edge to the center of the rectangular feature is 3° .
- The distance from the bottom edge to the center of the rectangular feature is 0.9 ± 0.2 .
- The distance from the right edge to the center of the rectangular feature is 0.4 .
- The cross-section shows a rectangular feature with a central circular hole. The diameter of the central circular hole is $\varnothing 1.5^{+0.1}_{-0.1}$.
- The cross-section line B-B is indicated by a horizontal line with arrows pointing to the left.



Ordering Information

Relay Code	Tyco Part Number	Relay Code	Tyco Part Number
IM00GR	3-1462037-7	IM07TS	3-1462037-0
IM00JR	3-1462037-9	IM07NS	1-1462038-7
IM00TS	3-1462037-5	IM40GR	5-1462037-1
IM00NS	1-1462038-0	IM40JR	5-1462037-2
IM01GR	0-1462037-1	IM40TS	5-1462037-0
IM01CGR	0-1462038-4	IM40NS	1-1462038-8
IM01JR	4-1462037-0	IM41GR	5-1462037-4
IM01TS	0-1462037-4	IM41JR	5-1462037-5
IM01NS	1-1462038-1	IM41TS	5-1462037-3
IM02GR	0-1462037-9	IM41NS	1-1462038-9
IM02CGR	0-1462038-1	IM42GR	3-1462037-1
IM02JR	1-1462037-1	IM42JR	5-1462037-7
IM02TS	1-1462037-3	IM42TS	5-1462037-6
IM02NS	1-1462038-2	IM42NS	2-1462038-0
IM03GR	1-1462037-4	IM43GR	5-1462037-9
IM03CGR	0-1462038-2	IM43JR	6-1462037-0
IM03JR	1-1462037-6	IM43TS	5-1462037-8
IM03TS	1-1462037-8	IM43NS	2-1462038-1
IM03NS	1-1462038-3	IM44GR	6-1462037-2
IM04GR	4-1462037-2	IM44JR	6-1462037-3
IM04JR	4-1462037-4	IM44TS	6-1462037-1
IM04TS	4-1462037-1	IM44NS	2-1462038-2
IM04NS	1-1462038-4	IM45GR	6-1462037-4
IM05GR	3-1462037-4	IM45JR	6-1462037-5
IM05CGR	0-1462038-3	IM45TS	3-1462037-2
IM05JR	4-1462037-5	IM45NS	2-1462038-3
IM05TS	2-1462037-2	IM46GR	6-1462037-7
IM05NS	1-1462038-5	IM46JR	6-1462037-8
IM06GR	2-1462037-3	IM46TS	6-1462037-6
IM06CGR	9-1462037-9	IM46NS	2-1462038-4
IM06JR	4-1462037-6	IM47GR	7-1462037-0
IM06TS	2-1462037-7	IM47JR	7-1462037-1
IM06NS	1-1462038-6	IM47TS	6-1462037-9
IM07GR	4-1462037-7	IM47NS	2-1462038-5
IM07JR	4-1462037-8		



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 UL 1950. 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 UL 1950. 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 UL 1950. 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 x 15 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 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 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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