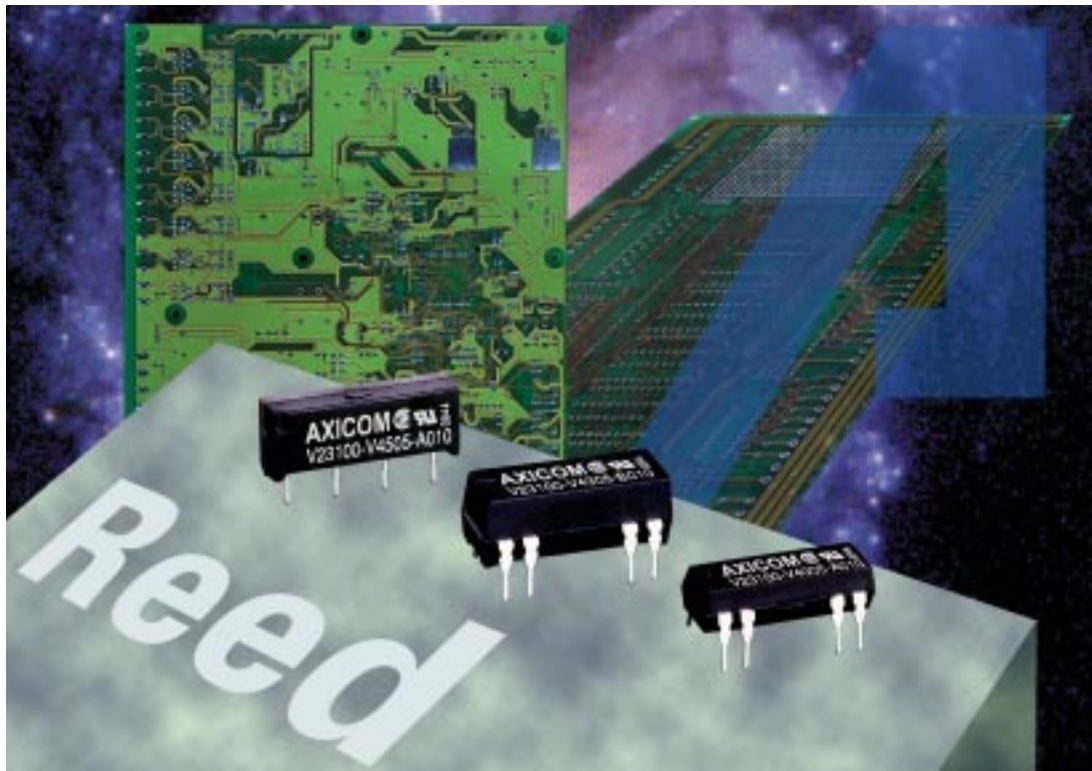


## The Best Relaytion



## Reed Relays



1 and 2 pole relays  
non-polarized, non-latching

**Features**

- Direct coil control with TTL-signals possible
- Highly reliable switching
- High switching rates
- Ultrasonic cleanable
- High vibration and shock resistance

**Typical applications**

- Incircuit tester
- Measuring and control systems
- Telecom equipment
- Alarm and security equipment

**Relay Types**  
DIP version (flat)

- Standard version
- Electrostatic shield between coil and contact
- Protective diode
- Electrostatic shield and protective diode
- Contact arrangement: 1 form a (1 normally open contact) or 1 form c (1 changeover contact)



DIP version (high)

- Standard version
- Electrostatic shield between coil and contact
- Protective diode
- Electrostatic shield and protective diode
- Contact arrangement: 2 form a (2 normally open contacts) or 1 form c (1 changeover contact)



SIL version

- Standard version
- Protective diode
- Electrostatic shield and protective diode
- Contact arrangement: 1 form a (1 normally open contact)

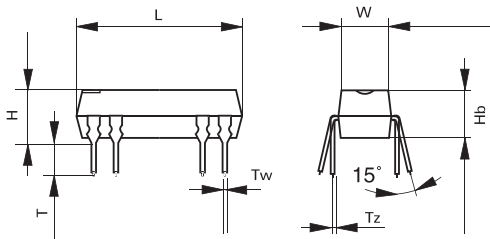


E 48393

DIP version (flat)



Dimensions drawing (in mm)

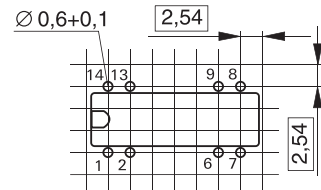


Dimensions

	DIP-flat version	
	mm	inch
L	19.3 - 0.2	0.760 - 0.008
W	6.40 - 0.2	0.252 - 0.008
H	5.70 - 0.2	0.224 - 0.008
Hb	5.10 - 0.2	0.201 - 0.008
T	3.20 ± 0.1	0.126 ± 0.004
Tw	0.50 ± 0.1	0.020 ± 0.004
Tz	0.25 ± 0.1	0.010 ± 0.004

Mounting hole layout

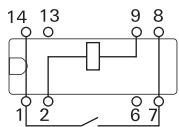
Top view



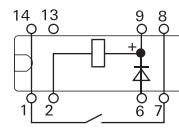
Terminal assignment

Relay - top view

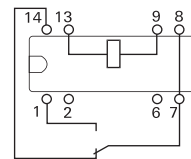
1 form a, standard



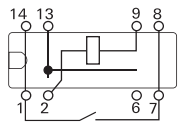
1 form a, with diode



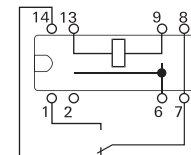
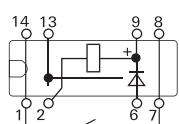
1 form c, standard



1 form a, with electrostatic shield



1 form a, with electrostatic shield and diode



Ordering Information

1 form a, standard	V23100-V40** - A000
1 form a, with electrostatic shield	V23100-V40** - A001
1 form a, with diode	V23100-V40** - A010
1 form a, with electrostatic shield and diode	V23100-V40** - A011
1 form c, standard	V23100-V43** - C000
1 form c, with electrostatic shield	V23100-V43** - C001

- 05 = 5 Vdc coil
- 12 = 12 Vdc coil
- 15 = 15 Vdc coil
- 24 = 24 Vdc coil

Ordering Code

Tyco Part Number

Ordering Code

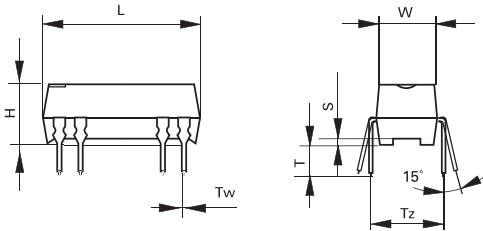
Tyco Part Number

V23100-V4005-A000	0-1393763-1	V23100-V4024-A000	1-1393763-4
V23100-V4005-A001	0-1393763-3	V23100-V4024-A001	1-1393763-5
V23100-V4005-A010	0-1393763-4	V23100-V4024-A010	1-1393763-6
V23100-V4005-A011	0-1393763-5	V23100-V4024-A011	1-1393763-7
V23100-V4012-A000	0-1393763-6	V23100-V4305-C000	2-1393763-0
V23100-V4012-A001	0-1393763-7	V23100-V4305-C001	2-1393763-1
V23100-V4012-A010	0-1393763-8	V23100-V4312-C000	2-1393763-8
V23100-V4012-A011	0-1393763-9	V23100-V4312-C001	2-1393763-9
V23100-V4015-A000	1-1393763-0	V23100-V4315-C000	3-1393763-4
V23100-V4015-A001	1-1393763-1	V23100-V4315-C001	3-1393763-5
V23100-V4015-A010	1-1393763-2	V23100-V4324-C000	4-1393763-0
V23100-V4015-A011	1-1393763-3	V23100-V4324-C001	4-1393763-1

DIP version (high)



Dimensions drawing (in mm)

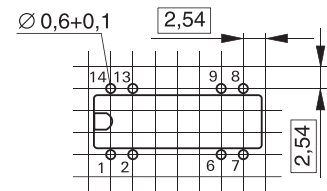


Dimensions

	DIP-flat version	
	mm	inch
L	19.3 - 0.2	0.760 - 0.008
W	7.00 - 0.2	0.276 - 0.008
H	7.50 - 0.2	0.295 - 0.008
S	0.50 ± 0.1	0.200 ± 0.004
T	3.20 ± 0.1	0.126 ± 0.004
Tw	0.50 ± 0.1	0.020 ± 0.004
Tz	0.25 ± 0.1	0.010 ± 0.004

Mounting hole layout

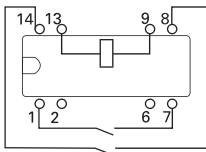
Top view



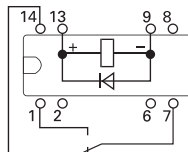
Terminal assignment

Top view

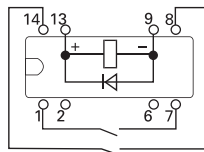
2 form a, standard



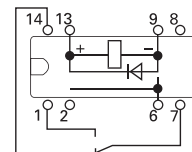
1 form c, with diode



2 form a, with diode



1 form c, with electrostatic shield and diode



**Ordering Information**

2 form a, standard

V23 100-V43\*\* - B000

2 form a, with diode

V23 100-V43\*\* - B001

1 form c, with diode

V23 100-V43\*\* - C010

1 form c, with electrostatic shield and diode

V23 100-V43\*\* - C011

05 = 5 Vdc coil

12 = 12 Vdc coil

15 = 15 Vdc coil

24 = 24 Vdc coil

Ordering Code

Tyco Part Number

Ordering Code

Tyco Part Number

V23100-V4305-B000

1-1393763-8

V23100-V4315-B000

3-1393763-2

V23100-V4305-B010

1-1393763-9

V23100-V4315-B010

3-1393763-3

V23100-V4305-C010

2-1393763-2

V23100-V4315-C010

3-1393763-6

V23100-V4305-C011

2-1393763-3

V23100-V4315-C011

3-1393763-7

V23100-V4312-B000

2-1393763-6

V23100-V4324-B000

3-1393763-8

V23100-V4312-B010

2-1393763-7

V23100-V4324-B010

3-1393763-9

V23100-V4312-C010

3-1393763-0

V23100-V4324-C010

4-1393763-2

V23100-V4312-C011

3-1393763-1

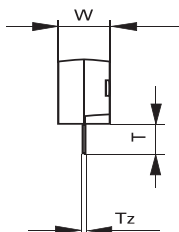
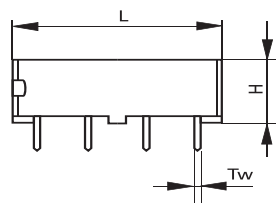
V23100-V4324-C011

4-1393763-3

SIL version



Dimensions drawing (in mm)

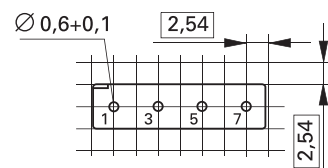


Dimensions

	DIP-flat version	
	mm	inch
L	19.8 - 0.2	0.780 - 0.008
W	5.08 - 0.2	0.200 - 0.008
H	7.80 - 0.2	0.307 - 0.008
T	3.50 ± 0.2	0.138 ± 0.008
Tw	0.60 ± 0.1	0.024 ± 0.004
Tz	0.25 ± 0.1	0.010 ± 0.004

Mounting hole layout

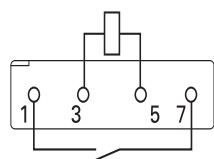
Top view



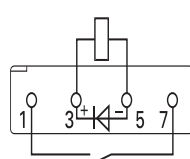
Terminal assignment

Top view

2 form a, standard



1 form a, with diode



### Ordering Information

1 form a, standard  
1 form a, with diode

V23100-V45\*\* - A000  
V23100-V45\*\* - A010

Coil version: 05 = 5 Vdc coil  
12 = 12 Vdc coil  
15 = 15 Vdc coil  
24 = 24 Vdc coil

Ordering Code

Tyco  
Part Number

V23100-V4505-A000	4-1393763-4
V23100-V4505-A010	4-1393763-5
V23100-V4512-A000	4-1393763-7
V23100-V4512-A010	4-1393763-8
V23100-V4515-A000	4-1393763-9
V23100-V4515-A010	5-1393763-0
V23100-V4524-A000	5-1393763-1
V23100-V4524-A010	5-1393763-2

**Coil Data (values at 23°C)**

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

DIP and SIL version: 1 form a contact

5	3.5	22	0.75	50	500
12	8.4	33	1.80	144	1'000
15	10.5	44	2.25	112	2'000
24	16.8	44	3.60	288	2'000

DIP version: 2 form a contacts

5	3.5	14	0.75	125	200
12	8.4	25	1.80	288	500
15	10.5	47	2.25	112	2'000
24	16.8	47	3.60	288	2'000

DIP version: 1 form c contact

5	3.5	13 (14.5) *	0.75	125	200
12	8.4	22 (23.5) *	1.80	288	500
15	10.5	44 (14.5) *	2.25	112	2'000
24	16.8	44 (49) *	3.60	288	2'000

\* Value in brackets refer to high relay with protective diode

$U_I$  = 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:

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

and

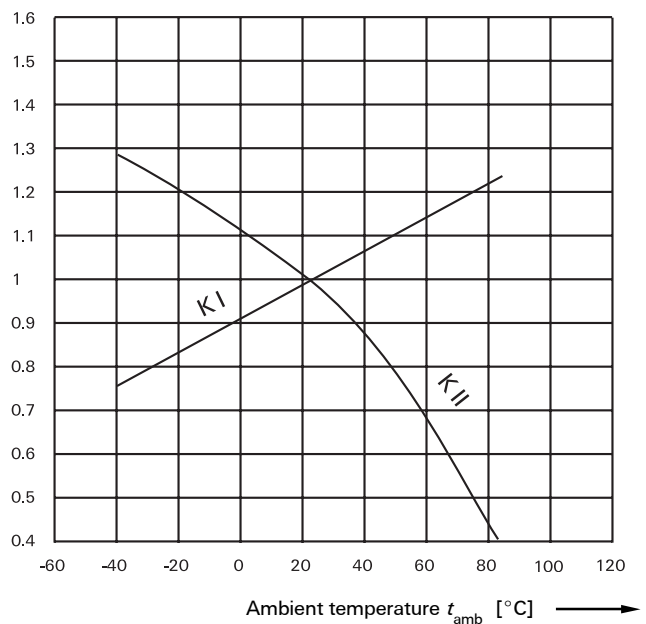
$$U_{II\text{tamb}} = K_{II} \cdot U_{II\text{23}^\circ\text{C}}$$

$t_{amb}$  = 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



**General data**

Type of relay	DIP version		SIL version	
	1 form a	2 form a	1 form c	1 form a
Type of contact/s				
Maximum operate time (including bounce)	0.5 ms		0.7 ms	0.5 ms
Maximum release time (including bounce)	0.2 ms		1.0 ms	0.2 ms
Maximum switching load without load	650 operations/s	500 operations/s	150 operations/s	650 operations/s
Operating temperature range	-40° ...+70° C, + 85° C on request			
Storage temperature	-40° C ... + 95° C			
Thermal resistance	Approx. 75 K / W			
Maximum permissible coil temperature	105° C			
Vibration resistance (function)	10 G 10 to 2000 Hz		30 G 50 to 2000 Hz	10 G 10 to 2000 Hz
Shock resistance, half sinus, 11 ms	150 G		50 G	150 G
Degree of protection	immersion cleanable, IP 67			
Typical mechanical endurance	5 x 10 <sup>6</sup> operations		4 x 10 <sup>6</sup> operations	5 x 10 <sup>6</sup> operations
Mounting position	any			
Resistance to soldering heat	10 s/ 260° C			

**Contact data**

Type of relay	DIP version		SIL version	
	1 form a	2 form a	1 form c	1 form a
Type of contact/s				
Contact material	Gold covered with Rhodium			
Maximum continuous current	1 A		1.2 A	1 A
Maximum switching current	0.5 A		0.25 A	0.5 A
Maximum switching voltage at nominal voltage:       5 Vdc 12-24 Vdc	180 Vdc / Vac 200 Vdc / Vac		175 Vdc	180 Vdc / Vac 200 Vdc / Vac
Maximum switching capacity				
DC voltage	10 W		3 W	10 W
AC voltage	10 VA		3 VA	10 VA
Thermoelectric potential	< 100 µV			
Initial contact resistance / measuring condition:	<150 mΩ			
Electrical endurance 12 V / 10 mA 24 V / 400 mA			5 x 10 <sup>7</sup> 5 x 10 <sup>6</sup>	
Mechanical endurance, typ.	5 x 10 <sup>6</sup> operations		4 x 10 <sup>6</sup> operations	5 x 10 <sup>6</sup> operations

**Insulation**

Insulation resistance at 500 VDC	contact coil > 10 <sup>11</sup> Ω		
Dielectric test voltage (1 min)			
contact / coil	1500 Vdc	1500 Vdc	1500 Vdc
contact / contact	250 Vdc	200 Vdc	250 Vdc

**High Frequency Data**

Capacitance	
between coil and contacts	max. 2 pF
between adjacent contact sets	max. 1 pF
between open contacts	max. 1 pF

## 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.

## FP1 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 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  $\mu$ 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 x15 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 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  $\mu$ 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.





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