











## SINGLE AND TWIN PCB RELAYS

Relay Type	Power K (V23133/076)	Mini K (V23072-A/C)	DMR THT/THR (V23084-C/R)	PK2 THT/THR (V23201-C/R)	PK2 Latching (V23201-L)
					
Special Feature	High current version Power K-S (V23071) available		New Through-Hole-Reflow (THR) version available	THT and THR versions available	
ELV / RoHS / WEEE status	Compliant	Compliant	Compliant	Compliant	Compliant
<b>Contacts</b> <sup>1)</sup>					
Configuration	1 Form A, 1 Form C	1 Form A/C/U/X	2 Form C	1 Form A	1 Form A
Max. switching current - ON	30 A N/C, 100 A N/O	12 A N/C, 60 A N/O	35 A	200 A	200 A
Max. switching current - OFF	30 A N/C, 60 A N/O	10 A N/C, 20 A N/O	35 A	40 A	40 A
Continuous current at 23°C	30 A N/C, 45 A N/O <sup>2)</sup>	10 A N/C, 15 A N/O <sup>2)</sup>	30 A <sup>3)</sup> motor reverse	40 A	50 A
Continuous current at 85°C	25 A N/C, 30 A N/O <sup>2)</sup>	5 A N/C, 10 A N/O <sup>2)</sup>	30 A <sup>3)</sup> motor reverse	33 A	40 A
Contact material options	Silver based	Silver based	Silver based	Silver based	Silver based
<b>Coil</b>					
Coil voltage range (V)	12, 24	12, 24	12	12	12
Nominal coil power (W)	1.6	1.1	0.56, 0.81	0.82	Pulsed driving
<b>General Data</b>					
Operate time (ms) - typ. <sup>4)</sup>	5	3	3	3	1.5
Release time (ms) - typ. <sup>4)</sup>	3	1.5	1.3	1.5	1.5
Temperature range (°C)	- 40 to + 85	- 40 to + 85	- 40 to + 85	- 40 to + 105	- 40 to + 125
Sealing	Open or sealed	Open or sealed	THT - IP67/THR - IP54 <sup>5)</sup>	THT - IP67/THR - IP54 <sup>5)</sup>	Sealed
Termination method	PCB	PCB	PCB	PCB	PCB
Dimensions (mm) - L x W x H	Open - 24 x 19.25 x 18.5 Sealed - 26.5 x 21.5 x 21.5	Open - 16 x 13.2 x 18 Sealed - 17.5 x 15 x 19.5	THT - 17.6 x 17 x 13.4 THR - 17.9 x 17.2 x 14	THT/THR - 18.5 x 16.2 x 16.1	18.5 x 16.2 x 16.1

Relay Type	Micro K (V23086-C1/C2)	Micro K SMD (V23086-M1/M2)	Micro K THR (V23086-R1/R2)	Micro K Latching (V23086-L)	Nano Relay (V23138-C/R1 and C/R2)
					
Special Feature			Through-Hole-Reflow (THR)	versions of Micro K	THT and THR versions available
ELV / RoHS / WEEE status	Compliant	Compliant	Compliant	Compliant	Compliant
<b>Contacts</b> <sup>1)</sup>					
Configuration	1 Form A/C   2 Form C	1 Form C   2 Form C	1 Form C   2 Form C	1 Form C	1 Form C   2 Form C
Max. switching current - ON	40 A (100 A Form A)	40 A	40 A	50 A on set contact 20 A on reset contact	30 A
Max. switching current - OFF	30 A	30 A	30 A   30 A	30 A on set contact 20 A on reset contact	30 A
Continuous current at 23°C	25 A N/C, 30 A N/O	25 A N/C, 30 A N/O	25 A N/C, 30 A N/O	35 A on set contact 20 A on reset contact	15 A N/C, 20 A N/O
Continuous current at 85°C	15 A N/C, 20 A N/O	15 A N/C, 20 A N/O	15 A N/C, 20 A N/O	30 A on set contact 15 A on reset contact	
Contact material options	Silver based	Silver based	Silver based	Silver based	Silver based
<b>Coil</b>					
Coil voltage range (V)	10, 12	10, 12   12	12	12	12
Nominal coil power (W)	0.55   0.57	0.64	0.55	Pulsed driving	0.72
<b>General Data</b>					
Operate time (ms) - typ. <sup>4)</sup>	3	3	3	1.5	3
Release time (ms) - typ. <sup>4)</sup>	1.5	1.5	1.5	1.5	1.5
Temperature range (°C)	-40 to + 105	-40 to + 105	-40 to + 105	-40 to + 125	-40 to + 125
Sealing	Sealed	Sealed	THT - IP67/THR - IP54 <sup>5)</sup>	Sealed	THT - IP67 / THR - IP54 <sup>5)</sup>
Termination method	PCB	PCB - SMD	PCB	PCB	PCB
Dimensions (mm) - L x W x H	Single - 13.2 x 12.2 x 10.1 Twin - 23.8 x 13.2 x 10.1	Single - 13.2 x 12.2 x 11.5 Twin - 23.8 x 13.2 x 11.5	Single - 13.2 x 12.2 x 10.4 Twin - 23.8 x 13.2 x 10.4	13.2 x 12.2 x 10.1	Single - 7.9 x 14.0 x 10.2 Twin - 15.6 x 10.2 x 14.2

1) Contact data: current values are for the 12 V versions





2) Valid for contacts with AgNi015 contact material

3) At 50% on period: max. make time 15 s





4) Operate and release time measured at nominal voltage without coil suppression circuit

5) THT: sealed according to protection class IP67, THR: sealed with open vent hole according to protection class IP54

## PLUG-IN RELAYS

Relay Type	Power F4 (V23134)	Power F7 (V23134-J)	Micro A (V23074)	Power FA 4/7 (shrouded) (V23136)
				
Special Feature	Terminal dimensions and allocations similar to ISO 7588-1	Terminal dimensions and allocations similar to ISO 7588-2	Terminal dimensions and allocations similar to ISO 7588-3	Terminal dimensions and allocations similar to ISO 7588-2
ELV / RoHS / WEEE status	Compliant	Compliant	Compliant	Compliant
<b>Contacts</b> <sup>1)</sup>				
Configuration	1 Form U/C/A/A with 2 terminals 87	1 Form A	1 Form A, 1 Form C	1 Form A/C   1 Form A
Max. switching current – ON	45 A N/C, 120 A N/O	240 A	20 A N/C, 90 A N/O	45 A N/C, 120 A N/O   240 A
Max. switching current – OFF	40 A N/C, 60 A N/O	70 A	15 A N/C, 30 A N/O	40 A N/C, 60 A N/O   70 A
Continuous current at 23°C	40 A N/C, 60 A N/O	70 A	20 A N/C, 30 A N/O	40 A N/C, 60 A N/O   70 A
Continuous current at 85°C	30 A N/C, 40 A N/O	50 A	15 A N/C, 25 A N/O	30 A N/C, 40 A N/O   50 A
Contact material options	Silver based	Silver based	Silver based	Silver based
<b>Coil</b>				
Coil voltage range (V)	12, 24	12, 24	12, 24	12
Nominal coil power (W)	1.6	1.6	1.4, 1.6	1.5   1.9
<b>General Data</b>				
Operate time (ms) - typ. <sup>4)</sup>	7	7	5	8.5
Release time (ms) - typ. <sup>4)</sup>	2	2	2	4
Temperature range (°C)	-40 to +125	-40 to +125	-40 to +125	-40 to +85
Sealing	Dustproof	Dustproof	Dustproof	Sealed <sup>3)</sup>
Termination method	Quick connect, PCB	Quick connect, PCB	Quick connect	Quick connect
Dimensions (mm) - L x W x H	26.2 x 26.2 x 25.2	26.2 x 26.2 x 25.2	23 x 15.5 x 25.4	34.0 x 46.0 x 55.0

## HIGH CURRENT DEVICES

Relay Type	HCR 150 (V23132)	HCR 75 (V23232)	BDS-A (V23130-C)	SPR (V23135)
				
Special Feature			Electrically settable and re-settable bistable device	Full, symmetric disconnection of the star-point of an EPS motor
ELV / RoHS / WEEE status	Compliant	Compliant	Compliant	Compliant
<b>Contacts</b> <sup>1)</sup>				
Configuration	1 Form A / C / X	1 Form A	1 Form X	1 Triple contact
Max. switching current – ON	300 A	100 A	190 A - 50k / 100 A - 100k	
Max. switching current – OFF	300 A	100 A	190 A - 50k / 100 A - 100k	200 A / > 10 cycles
Max. switching current – ON / OFF / ON at 23°C			1000 A - 5 times	
Max. limiting current at 23°C	180 A with cable 25 mm <sup>2</sup>		1500 A for 200 ms, 1000 A for 1 s	120 A <sup>2)</sup>
Continuous current at 23°C			Approx. 280 A	
Continuous current at 85°C	130 A with cable 25 mm <sup>2</sup>		190 A	90 A <sup>2)</sup> (60 A at 125°C) <sup>2)</sup>
Contact material options	Silver based	Silver based	Silver based	Silver based
<b>Coil</b>				
Coil voltage range / V	12, 24	12, 24	12, 24, 42	10, 12, 24
Nominal coil power (W)	4.1	3.1, 4.4	Excitation with pulses (15...100 ms)	1.48
<b>General Data</b>				
Operate time (ms) - typ. <sup>4)</sup>	< 30	< 15	< 15	< 20
Release time (ms) - typ. <sup>4)</sup>	< 15	< 15	< 15	< 10
Temperature range (°C)	-40 to +125		-40 to +120	-40 to +135
Sealing	Dustproof	Dustproof	Sealed	Sealed
Termination method	M6 stud bolts + superseal	M5 screws + coil terminals	M8 screws + connector	Leadframe assembly
Dimensions (mm) - L x W x H	63.0 x 40.0 x 71.0	44.0 x 36.0 x 39.0	35.0 x 35.0 x 60.0 <sup>5)</sup>	32.3 x 18.3 x 18.8 <sup>5)</sup>

1) Contact data: current values are for the 12 V versions

2) Max. terminal temperatures up to 180°C are possible. Final temperatures depend on the leadframe layout

3) Using special sockets the relay is sealed according to protection class: IP67

4) Operate and release time measured at nominal voltage without coil suppression circuit

5) Dimensions without connector