

## Metallized Polypropylene (PP) Capacitors PCM 7.5 mm to 52.5 mm

### Special Features

- High volume/capacitance ratio
- Self-healing
- Very low dissipation factor
- Negative capacitance change versus temperature
- Very low dielectric absorption
- According to RoHS 2011/65/EU

### Typical Applications

For high frequency applications e.g.

- Sample and hold
- Timing
- Oscillating circuits
- High frequency coupling and decoupling

### Construction

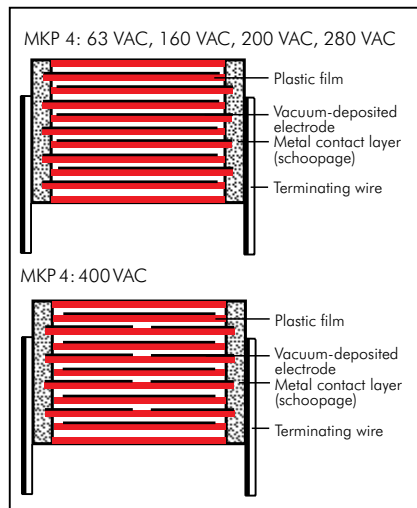
#### Dielectric:

Polypropylene (PP) film

#### Capacitor electrodes:

Vacuum-deposited

#### Internal construction:



#### Encapsulation:

Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0

#### Terminations:

Tinned wire.

#### Marking:

Colour: Red. Marking: Black.  
Epoxy resin seal: Red

### Electrical Data

#### Capacitance range:

0.01  $\mu$ F to 150  $\mu$ F (E12-values on request)

#### Rated voltages:

100 VDC, 250 VDC, 400 VDC, 630 VDC, 1000 VDC

#### Capacitance tolerances:

$\pm 20\%$ ,  $\pm 10\%$ ,  $\pm 5\%$

#### Operating temperature range:

$-55^{\circ}$  C to  $+100^{\circ}$  C

#### Climatic test category:

55/100/56 in accordance with IEC

#### Insulation resistance at $+20^{\circ}$ C:

$C \leq 0.33 \mu\text{F}$ :  $\geq 1 \times 10^5 \text{ M}\Omega$

(mean value:  $5 \times 10^5 \text{ M}\Omega$ )

$C > 0.33 \mu\text{F}$ :  $\geq 30\,000 \text{ sec (M}\Omega \times \mu\text{F)}$

(mean value: 100\,000 sec)

Measuring voltage: 100 V/1 min.

#### Dissipation factors at $+20^{\circ}$ C:

$\tan \delta \leq 10 \times 10^{-4}$  at 1 kHz ( $C \leq 50 \mu\text{F}$ )

$\tan \delta \leq 15 \times 10^{-4}$  at 1 kHz ( $C > 50 \mu\text{F}$ )

#### Maximum pulse rise time:

Capacitance $\mu\text{F}$	max. pulse rise time V/ $\mu\text{sec}$ at $T_A < 40^{\circ}$ C				
	100 VDC	250 VDC	400 VDC	630 VDC	1000 VDC
0.01 ... 0.022	450	450	450	500	550
0.033 ... 0.068	250	250	300	350	400
0.1 ... 0.22	150	150	200	250	300
0.33 ... 0.68	100	100	150	200	200
1.0 ... 2.2	75	100	100	150	150
3.3 ... 4.7	60	100	100	120	140
6.8 ... 10	40	50	60	85	100
15 ... 33	35	50	18	36	-
47 ... 150	10	13	-	-	-

for pulses equal to the rated voltage

### Mechanical Tests

#### Pull test on pins:

$d \leq 0.8 \phi$ : 10 N in direction of pins

$d > 0.8 \phi$ : 20 N in direction of pins

according to IEC 60068-2-1

#### Vibration:

6 hours at 10...2000 Hz and 0.75 mm

displacement amplitude or 10 g in

accordance with IEC 60068-2-6

#### Low air density:

1kPa = 10 mbar in accordance with

IEC 60068-2-13

#### Bump test:

4000 bumps at 390 m/sec<sup>2</sup>

in accordance with IEC 60068-2-29

#### Test specifications:

In accordance with IEC 60384-16

**Test voltage:** 1.6  $U_r$ , 2 sec.

**Dielectric absorption:** 0.05 %

#### Voltage derating:

A voltage derating factor of 1.35 % per K

must be applied from  $+85^{\circ}$  C for DC

voltages and from  $+75^{\circ}$  C for AC

voltages.

#### Reliability:

Operational life > 300\,000 hours

Failure rate < 2 fit ( $0.5 \times U_r$  and  $40^{\circ}$  C)

#### Specific dissipation:

Box size* WxHxL in mm	Specific dissipation in Watts per K above the ambient temperature
35 x 50 x 57	0.132
45 x 55 x 57	0.164
45 x 65 x 57	0.184

\* other box sizes see page 10.

### Packing

Available taped and reeled up to and

including case size 15 x 26 x 31.5 /

PCM 27.5 mm.

Detailed taping information and graphs

at the end of the catalogue.

For further details and graphs please

refer to Technical Information.



## Continuation

### General Data

Capacitance	100 VDC/63 VAC*					250 VDC/160 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 µF	3	8.5	10	7.5	MKP4D021002B	3	8.5	10	7.5	MKP4F021002B
0.015 "	3	8.5	10	7.5	MKP4D021502B	3	8.5	10	7.5	MKP4F021502B
0.022 "	3	8.5	10	7.5	MKP4D022202B	3	8.5	10	7.5	MKP4F022202B
0.033 "	3	8.5	10	7.5	MKP4D023302B	3	8.5	10	7.5	MKP4F023302B
	4	9	13	10	MKP4D023303C	4	9	13	10	MKP4F023303C
0.047 "	4	9	10	7.5	MKP4D024702C	4	9	10	7.5	MKP4F024702C
	4	9	13	10	MKP4D024703C	4	9	13	10	MKP4F024703C
0.068 "	4	9	10	7.5	MKP4D026802C	4	9	10	7.5	MKP4F026802C
	4	9	13	10	MKP4D026803C	4	9	13	10	MKP4F026803C
0.1 µF	4.5	9.5	10.3	7.5	MKP4D031002D	4.5	9.5	10.3	7.5	MKP4F031002D
	4	9	13	10	MKP4D031003C	4	9	13	10	MKP4F031003C
0.15 "	5	10.5	10.3	7.5	MKP4D031502E	5	10.5	10.3	7.5	MKP4F031502E
	5	11	13	10	MKP4D031503F	5	11	13	10	MKP4F031503F
0.22 "	6	12	13	10	MKP4D032203G	6	12	13	10	MKP4F032203G
	5	11	18	15	MKP4D032204B	5	11	18	15	MKP4F032204B
0.33 "	6	12.5	18	15	MKP4D033304C	6	12.5	18	15	MKP4F033304C
0.47 "	7	14	18	15	MKP4D034704D	7	14	18	15	MKP4F034704D
0.68 "	8	15	18	15	MKP4D036804F	8	15	18	15	MKP4F036804F
	6	15	26.5	22.5	MKP4D036805B	6	15	26.5	22.5	MKP4F036805B
1.0 µF	7	16.5	26.5	22.5	MKP4D041005D	7	16.5	26.5	22.5	MKP4F041005D
1.5 "	10.5	19	26.5	22.5	MKP4D041505G	10.5	19	26.5	22.5	MKP4F041505G
2.2 "	11	21	26.5	22.5	MKP4D042205I	11	21	26.5	22.5	MKP4F042205I
	11	21	31.5	27.5	MKP4D042206B	11	21	31.5	27.5	MKP4F042206B
3.3 "	13	24	31.5	27.5	MKP4D043306D	13	24	31.5	27.5	MKP4F043306D
4.7 "	13	24	31.5	27.5	MKP4D044706D	15	26	31.5	27.5	MKP4F044706F
6.8 "	15	26	31.5	27.5	MKP4D046806F	17	29	31.5	27.5	MKP4F046806G
	13	24	41.5	37.5	MKP4D046807C	15	26	41.5	37.5	MKP4F046807D
10 µF	17	29	41.5	37.5	MKP4D051007E	19	32	41.5	37.5	MKP4F051007F
15 "	19	32	41.5	37.5	MKP4D051507F	20	39.5	41.5	37.5	MKP4F051507G
22 "	20	39.5	41.5	37.5	MKP4D052207G	24	45.5	41.5	37.5	MKP4F052207H
33 "	24	45.5	41.5	37.5	MKP4D053307H	35	50	41.5	37.5	MKP4F053307J
47 "	35	50	41.5	37.5	MKP4D054707J	35	50	57	52.5	MKP4F054709F
68 "	40	55	41.5	37.5	MKP4D056807K	45	65	57	52.5	MKP4F056809J
	35	50	57	52.5	MKP4D056809F					
100 µF	45	55	57	52.5	MKP4D061009H					
150 "	45	65	57	52.5	MKP4D061509J					

\* AC voltage:  $f \leq 400 \text{ Hz}$ ;  $1.4 \times U_{\text{rms}} + \text{URC} \leq U_r$

New values

\*\* PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:

Version code: 2-pin = 00  
 4-pin = D4  
 Tolerance: 20 % = M  
 10 % = K  
 5 % = J  
 Packing: bulk = S  
 Pin length: 6-2 = SD  
 Taped version see page 128.

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## Continuation

### General Data

Capacitance	400 VDC/220 VAC*					630 VDC/280 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 $\mu$ F	3	8.5	10	<b>7.5</b>	MKP4G021002B_-----	3	8.5	10	<b>7.5</b>	MKP4J021002B_-----
						4	9	13	10	MKP4J021003C_-----
0.015 "	4	9	10	<b>7.5</b>	MKP4G021502C_-----	4	9	10	<b>7.5</b>	MKP4J021502C_-----
	4	9	13	10	MKP4G021503C_-----	4	9	13	10	MKP4J021503C_-----
0.022 "	4.5	9.5	10.3	<b>7.5</b>	MKP4G022202D_-----	4.5	9.5	10.3	<b>7.5</b>	MKP4J022202D_-----
	4	9	13	10	MKP4G022203C_-----	4	9	13	10	MKP4J022203C_-----
0.033 "	5	10.5	10.3	<b>7.5</b>	MKP4G023302E_-----	5	10.5	10.3	<b>7.5</b>	MKP4J023302E_-----
	4	9	13	10	MKP4G023303C_-----	4	9	13	10	MKP4J023303C_-----
0.047 "	5	10.5	10.3	<b>7.5</b>	MKP4G024702E_-----	5.7	12.5	10.3	<b>7.5</b>	MKP4J024702F_-----
	5	11	13	10	MKP4G024703F_-----	5	11	13	10	MKP4J024703F_-----
0.068 "	5.7	12.5	10.3	<b>7.5</b>	MKP4G026802F_-----	6	12	13	10	MKP4J026803G_-----
	5	11	13	10	MKP4G026803F_-----	6	12.5	18	15	MKP4J026804C_-----
0.1 $\mu$ F	6	12	13	10	MKP4G031003G_-----	7	14	18	15	MKP4J031004D_-----
	5	11	18	15	MKP4G031004B_-----					
0.15 "	6	12.5	18	15	MKP4G031504C_-----	8	15	18	15	MKP4J031504F_-----
						6	15	26.5	22.5	MKP4J031505B_-----
0.22 "	7	14	18	15	MKP4G032204D_-----	9	16	18	15	MKP4J032204J_-----
						7	16.5	26.5	22.5	MKP4J032205D_-----
0.33 "	8	15	18	15	MKP4G033304F_-----	8.5	18.5	26.5	22.5	MKP4J033305F_-----
	6	15	26.5	22.5	MKP4G033305B_-----					
0.47 "	7	16.5	26.5	22.5	MKP4G034705D_-----	10.5	19	26.5	22.5	MKP4J034705G_-----
						11	21	31.5	27.5	MKP4J034706B_-----
0.68 "	8.5	18.5	26.5	22.5	MKP4G036805F_-----	11	21	31.5	27.5	MKP4J036806B_-----
1.0 $\mu$ F	11	21	26.5	22.5	MKP4G041005I_-----	13	24	31.5	27.5	MKP4J041006D_-----
	11	21	31.5	27.5	MKP4G041006B_-----					
1.5 "	11	21	31.5	27.5	MKP4G041506B_-----	15	26	31.5	27.5	MKP4J041506F_-----
2.2 "	15	26	31.5	27.5	MKP4G042206F_-----	17	29	41.5	37.5	MKP4J042207E_-----
3.3 "	17	29	31.5	27.5	MKP4G043306G_-----	19	32	41.5	37.5	MKP4J043307F_-----
	17	29	41.5	37.5	MKP4G043307E_-----					
4.7 "	19	32	41.5	37.5	MKP4G044707F_-----	20	39.5	41.5	37.5	MKP4J044707G_-----
6.8 "	20	39.5	41.5	37.5	MKP4G046807G_-----	24	45.5	41.5	37.5	MKP4J046807H_-----
10 $\mu$ F	24	45.5	41.5	37.5	MKP4G051007H_-----	35	50	41.5	37.5	MKP4J051007J_-----
15 "	31	46	41.5	37.5	MKP4G051507I_-----	35	50	57	52.5	MKP4J051509F_-----
22 "	40	55	41.5	37.5	MKP4G052207K_-----	45	65	57	52.5	MKP4J052209J_-----
	35	50	57	52.5	MKP4G052209F_-----					
33 "	45	65	57	52.5	MKP4G053309J_-----					

\* AC voltage:  $f \leq 400$  Hz;  $1.4 \times U_{rms} + U_{DC} \leq U_r$

New values

\*\* PCM = Printed circuit module = pin spacing

Dims. in mm.

Part number completion:

Version code:	2-pin	= 00
	4-pin	= D4
Tolerance:	20 %	= M
	10 %	= K
	5 %	= J
Packing:	bulk	= S
Pin length:	6-2	= SD
Taped version see page 128.		

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## Continuation

### General Data

Capacitance	1000 VDC/400 VAC*				Part number
	W	H	L	PCM**	
0.01 $\mu\text{F}$	5.7	12.5	10.3	<b>7.5</b>	MKP4O121002F
	5	11	13	10	MKP4O121003F
0.015 "	5	11	13	10	MKP4O121503F
	5	11	18	15	MKP4O121504B
0.022 "	5	11	18	15	MKP4O122204B
0.033 "	6	12.5	18	15	MKP4O123304C
0.047 "	7	14	18	15	MKP4O124704D
0.068 "	8	15	18	15	MKP4O126804F
	6	15	26.5	22.5	MKP4O126805B
0.1 $\mu\text{F}$	9	16	18	15	MKP4O131004J
	7	16.5	26.5	22.5	MKP4O131005D
0.15 "	8.5	18.5	26.5	22.5	MKP4O131505F
0.22 "	11	21	26.5	22.5	MKP4O132205L
	11	21	31.5	27.5	MKP4O132206B
0.33 "	11	21	31.5	27.5	MKP4O133306B
0.47 "	13	24	31.5	27.5	MKP4O134706D
0.68 "	17	29	31.5	27.5	MKP4O136806G
1.0 $\mu\text{F}$	17	29	41.5	37.5	MKP4O141007E
1.5 "	20	39.5	41.5	37.5	MKP4O141507G
2.2 "	24	45.5	41.5	37.5	MKP4O142207H
3.3 "	31	46	41.5	37.5	MKP4O143307I
4.7 "	35	50	41.5	37.5	MKP4O144707J
6.8 "	35	50	57	52.5	MKP4O146809F
10 $\mu\text{F}$	45	65	57	52.5	MKP4O151009J

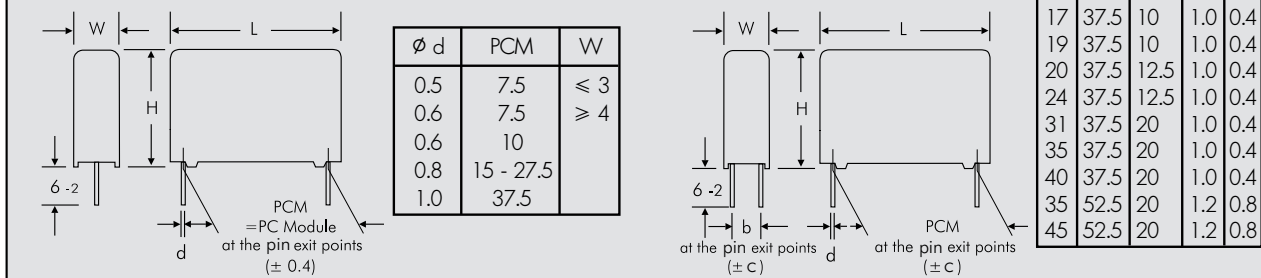
\* AC voltage:  $f \leq 400 \text{ Hz}$ ;  $1.4 \times U_{\text{rms}} + \text{UDC} \leq U_r$

New values

\*\* PCM = Printed circuit module = pin spacing

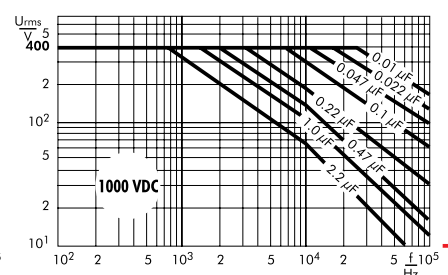
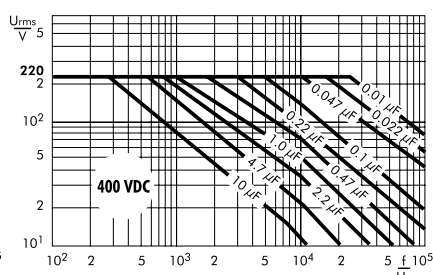
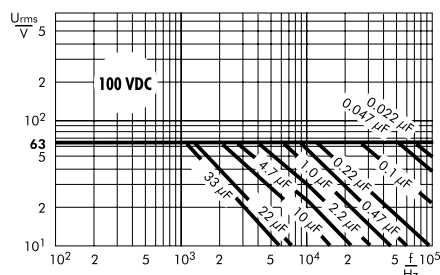
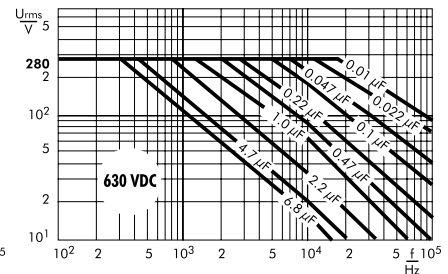
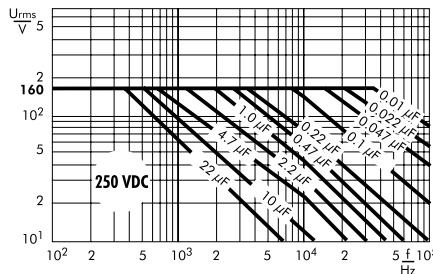
Dims. in mm.

Part number completion:	
Version code:	2-pin = 00
	4-pin = D4
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	6-2 = SD
Taped version see page 128.	



Rights reserved to amend design data without prior notification.

Permissible AC voltage in relation to frequency at 10° C internal temperature rise (general guide).



## Recommendation for Processing and Application of Through-Hole Capacitors

### Soldering Process

Internal temperature of the capacitor must be kept as follows:

Polyester: preheating:  $T_{max.} \leq 125^{\circ}C$   
soldering:  $T_{max.} \leq 135^{\circ}C$

Polypropylene: preheating:  $T_{max.} \leq 100^{\circ}C$   
soldering:  $T_{max.} \leq 110^{\circ}C$

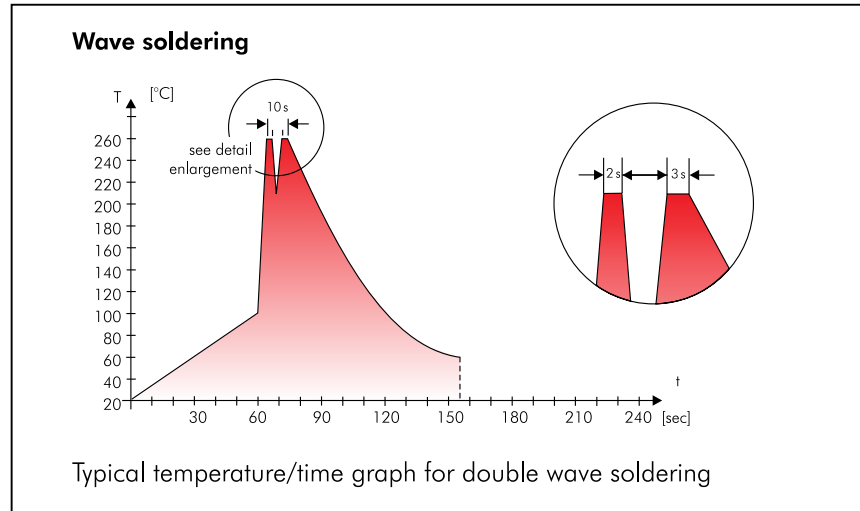
#### Single wave soldering

Soldering bath temperature:  $T < 260^{\circ}C$   
Dwell time:  $t < 5 \text{ sec}$

#### Double wave soldering

Soldering bath temperature:  $T < 260^{\circ}C$   
Dwell time:  $\Sigma t < 5 \text{ sec}$

Due to different soldering processes and heat requirements the graphs are to be regarded as a recommendation only.



## WIMA Quality and Environmental Philosophy

### ISO 9001:2008 Certification

ISO 9001:2008 is an international basic standard of quality assurance systems for all branches of industry. The approval according to ISO 9001:2008 of our factories by the VDE inspectorate certifies that organisation, equipment and monitoring of quality assurance in our factories correspond to internationally recognized standards.

### WIMA WPCS

The WIMA Process Control System (WPCS) is a quality surveillance and optimization system developed by WIMA. WPCS is a major part of the quality-oriented WIMA production. Points of application of WPCS during production process:

- incoming material inspection
- metallization
- film inspection
- schoopage
- pre-healing
- pin attachment
- cast resin preparation/encapsulation
- 100% final inspection
- AQL check

### WIMA Environmental Policy

All WIMA capacitors, irrespective of whether through-hole devices or SMD, are made of environmentally friendly materials. Neither during manufacture nor in the product itself any toxic substances are used, e.g.

- Lead
- PCB
- CFC
- Hydrocarbon chloride
- Chromium 6+
- PBB/PBDE
- Arsenic
- Cadmium
- Mercury
- etc.

We merely use pure, recyclable materials for packing our components, such as:

- carton
- cardboard
- adhesive tape made of paper
- polystyrene

We almost completely refrain from using packing materials such as:

- foamed polystyrene (Styropor®)
- adhesive tapes made of plastic
- metal clips

### RoHS Compliance

According to the RoHS Directive 2011/65/EU certain hazardous substances like e.g. lead, cadmium, mercury must not be used any longer in electronic equipment as of July 1st, 2006. For the sake of the environment WIMA has refrained from using such substances since years already.



WIMA Kondensatoren sind bleifrei konform RoHS 2011/65/EU

WIMA capacitors are lead free in accordance with RoHS 2011/65/EU

Tape for lead-free WIMA capacitors

### DIN EN ISO 14001:2004

WIMA's environmental management has been established in accordance with the guidelines of DIN EN ISO 14001:2004 to optimize the production processes with regard to energy and resources.

# Typical Dimensions for Taping Configuration

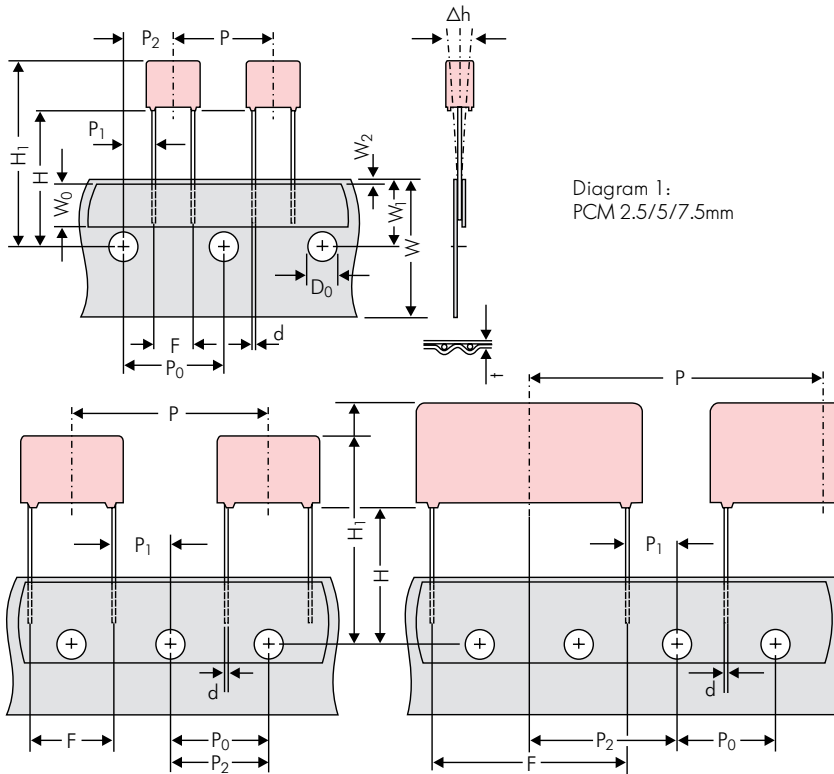


Diagram 2: PCM 10/15 mm

Diagram 3: PCM 22.5 and 27.5\*mm

\*PCM 27.5 tapping possible with two feed holes between components

Designation	Symbol	Dimensions for Radial Taping										
		PCM 2.5 tapping	PCM 5 tapping	PCM 7.5 tapping	PCM 10 tapping*	PCM 15 tapping*	PCM 22.5 tapping	PCM 27.5 tapping				
Carrier tape width	W	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5				
Hold-down tape width	W <sub>0</sub>	6.0 for hot-sealing adhesive tape	6.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape				
Hole position	W <sub>1</sub>	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5				
Hold-down tape position	W <sub>2</sub>	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.				
Feed hole diameter	D <sub>0</sub>	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2				
Pitch of component	P	12.7 ±1.0	12.7 ±1.0	12.7 ±1.0	25.4 ±1.0	25.4 ±1.0	38.1 ±1.5	38.1 ±1.5 or 50.8 ±1.5				
Feed hole pitch	P <sub>0</sub>	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch				
Feed hole centre to pin	P <sub>1</sub>	5.1 ±0.5	3.85 ±0.7	2.6 ±0.7	7.7 ±0.7	5.2 ±0.7	7.8 ±0.7	5.3 ±0.7				
Hole centre to component centre	P <sub>2</sub>	6.35 ±1.3	6.35 ±1.3	6.35 ±1.3	12.7 ±1.3	12.7 ±1.3	19.05 ±1.3	19.05 ±1.3				
Feed hole centre to bottom edge of the component	H	16.5 ±0.3 18.5 ±0.5	16.5 ±0.3 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5				
Feed hole centre to top edge of the component	H <sub>1</sub>	H+H <sub>component</sub> < H <sub>1</sub> 32.25 max.	H+H <sub>component</sub> < H <sub>1</sub> 32.25 max.	H+H <sub>component</sub> < H <sub>1</sub> 24.5 to 31.5	H+H <sub>component</sub> < H <sub>1</sub> 25.0 to 31.5	H+H <sub>component</sub> < H <sub>1</sub> 26.0 to 37.0	H+H <sub>component</sub> < H <sub>1</sub> 30.0 to 43.0	H+H <sub>component</sub> < H <sub>1</sub> 35.0 to 45.0				
Pin spacing at upper edge of carrier tape	F	2.5 ±0.5	5.0 <sup>+0.8</sup> <sub>-0.2</sub>	7.5 ±0.8	10.0 ±0.8	15 ±0.8	22.5 ±0.8	27.5 ±0.8				
Pin diameter	d	0.4 ±0.05	0.5 ±0.05	0.5 ±0.05 or 0.6 <sup>+0.06</sup> <sub>-0.05</sub>	0.5 ±0.05 or 0.6 <sup>+0.06</sup> <sub>-0.05</sub>	0.8 <sup>+0.08</sup> <sub>-0.05</sub>	0.8 <sup>+0.08</sup> <sub>-0.05</sub>	0.8 <sup>+0.08</sup> <sub>-0.05</sub>				
Component alignment	Δh	± 2.0 max.	± 2.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.				
Total tape thickness	t	0.7 ±0.2	0.7 ±0.2	0.7 ±0.2	0.7 ±0.2	0.7 ±0.2	0.7 ±0.2	0.7 ±0.2				
Package (see also page 129)	ROLL/AMMO			AMMO								
	REEL	φ 360 max. φ 30 ±1	B 52 ±2 58 ±2	depending on comp. dimensions		REEL	φ 360 max. φ 30 ±1	B 52 ±2 58 ±2 or 66 ±2	REEL	φ 500 max. φ 25 ±1	B 60 ±2 68 ±2	depending on PCM and component dimensions
Unit	see details page 130.											

Dims in mm.

\* Diameter of pins see General Data.

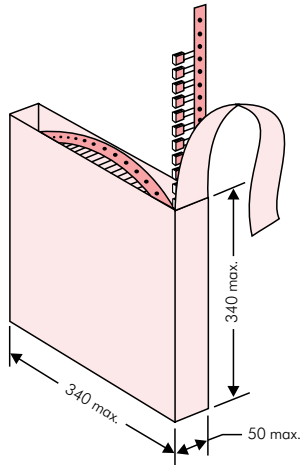
\* PCM 10 and PCM 15 can be crimped to PCM 7.5.

Position of components according to PCM 7.5 (sketch 1). P<sub>0</sub> = 12.7 or 15.0 is possible

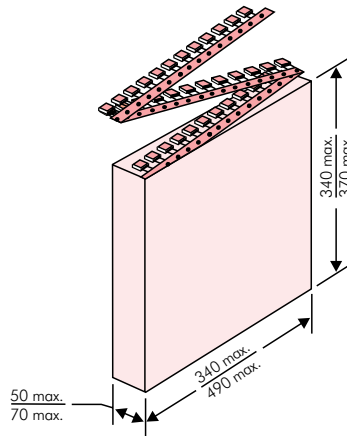
Please clarify customer-specific deviations with the manufacturer.

## Types of Tape Packaging of Capacitors for Automatic Radial Insertion

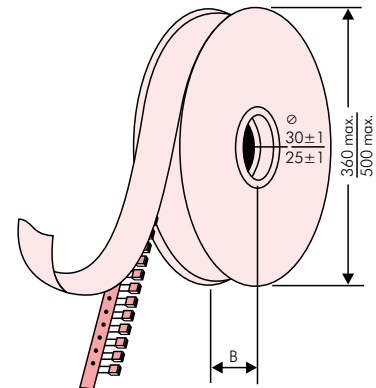
### ■ ROLL Packaging



### ■ AMMO Packaging



### ■ REEL Packaging



## BAR CODE (Labelling)

Labelling of package units in plain text and with alphanumerical Bar Code

Scanner decoding of

- WIMA supplier number
- Customer's P/O number
- Customer's part number
- WIMA confirmation number
- WIMA part number
- Lot number
- Date code
- Quantity

In addition part description of

- article
- capacitance value
- rated voltage
- dimensions
- capacitance tolerance
- packing

as well as gross weight and customer's name are indicated in plain text.

<b>WIMA</b> Best Capacitors Made in Germany		Werk Unna	
Supplier-ID: 123456789	<b>RoHS</b> 2011/65/EC	Date Code: 08.10.10	
Purchase Order No. (P/O): Bestellung xyz		Quantity: 5.000	
Customer Part No.: KUNDETEILENUMMER		Customer No.: 0000100002	
		Gross Weight [g]: 1870	
WIMA Confirmation No.: 0001004053000100	WIMA Part No.: MKS2C034701C00K89D		
Handling Unit:	MKS 2	QTY: 5.000	COO: DE
	MKS 2 0.47 µF 63 VDC 3.5x8.5x7.2 RMS		
1000067326	Standard 10% Loss - Standard	Drahte 6-2	Week 03/2011
	Vorlage Debitor Inland		

BARCODE „Code 39“





## Packing Quantities for Capacitors with Radial Pins in PCM 2.5 mm to 22.5 mm

PCM	Size				bulk	pcs. per packing unit								
						ROLL		REEL				AMMO		
	W	H	L	Codes		S	H16.5	H18.5	ø 360	ø 500	340 × 340	490 × 370		
					N	O	F	I	H	J	A	C	B	D
<b>2.5 mm</b>	2.5	7	4.6	<b>0B</b>	5000		2200	2500				2800		
	3	7.5	4.6	<b>0C</b>	5000		2000	2300				2300		
	3.8	8.5	4.6	<b>0D</b>	5000		1500	1800				1800		
	4.6	9	4.6	<b>0E</b>	5000		1200	1500				1500		
	5.5	10	4.6	<b>0F</b>	5000		900	1200				1200		
<b>5 mm</b>	2.5	6.5	7.2	<b>1A</b>	5000		2200	2500				2800		
	3	7.5	7.2	<b>1B</b>	5000		2000	2300				2300		
	3.5	8.5	7.2	<b>1C</b>	5000		1600	2000				2000		
	4.5	6	7.2	<b>1D</b>	6000		1300	1500				1500		
	4.5	9.5	7.2	<b>1E</b>	4000		1300	1500				1500		
	5	10	7.2	<b>1F</b>	3500		1100	1400				1400		
	5.5	7	7.2	<b>1G</b>	4000		1000	1200				1200		
	5.5	11.5	7.2	<b>1H</b>	2500		1000	1200				1200		
	6.5	8	7.2	<b>1I</b>	2500		800	1000				1000		
	7.2	8.5	7.2	<b>1J</b>	2500		700	1000				1000		
	7.2	13	7.2	<b>1K</b>	2000		700	950				1000		
	8.5	10	7.2	<b>1L</b>	2000		600	800				800		
	8.5	14	7.2	<b>1M</b>	1500		600	800				800		
11	16	7.2	<b>1N</b>	1000		500	600				400			
<b>7.5 mm</b>	2.5	7	10	<b>2A</b>	5000			2500	4400		2500			
	3	8.5	10	<b>2B</b>	5000			2200	4300		2300		4150	
	4	9	10	<b>2C</b>	4000			1700	3200		1700		3100	
	4.5	9.5	10.3	<b>2D</b>	3500			1500	2900		1400		2800	
	5	10.5	10.3	<b>2E</b>	3000			1300	2500		1300			
	5.7	12.5	10.3	<b>2F</b>	2000			1000	2200		1100			
	7.2	12.5	10.3	<b>2G</b>	1500			900	1800		1000			
<b>10 mm</b>	3	9	13	<b>3A</b>	3000			1100	2200				1900	
	4	8.5	13.5	<b>FA</b>	3000			900	1600				1450	
	4	9	13	<b>3C</b>	3000			900	1600				1450	
	4	9.5	13	<b>3D</b>	3000			900	1600				1400	
	5	10	13.5	<b>FB</b>	2000			700	1300				1200	
	5	11	13	<b>3F</b>	3000			700	1300				1200	
	6	12	13	<b>3G</b>	2400			550	1100				1000	
	6	12.5	13	<b>3H</b>	2400			550	1100				1000	
8	12	13	<b>3I</b>	2000			400	800				740		
<b>15 mm</b>	5	11	18	<b>4B</b>	2400			600	1200				1150	
	5	13	19	<b>FC</b>	1000			600	1200				1200	
	6	12.5	18	<b>4C</b>	2000			500	1000				1000	
	6	14	19	<b>FD</b>	1000			500	1000				1000	
	7	14	18	<b>4D</b>	1600			450	900				850	
	7	15	19	<b>FE</b>	1000			450	900				850	
	8	15	18	<b>4F</b>	1200			400	800				740	
	8	17	19	<b>FF</b>	500			400	800				740	
	9	14	18	<b>4H</b>	1200			350	700				650	
	9	16	18	<b>4J</b>	900			350	700				650	
	10	18	19	<b>FG</b>	500			300	650				590	
11	14	18	<b>4M</b>	1000			300	600				540		
<b>22.5 mm</b>	5	14	26.5	<b>5A</b>	1200				800				770	
	6	15	26.5	<b>5B</b>	1000				700				640	
	7	16.5	26.5	<b>5D</b>	760				600				550	
	8	20	28	<b>5H</b>	500				500				480	
	8.5	18.5	26.5	<b>5F</b>	500				480				450	
	10	22	28	<b>5I</b>	540*				420				380	
	10.5	19	26.5	<b>5G</b>	680*				400				360	
	10.5	20.5	26.5	<b>5H</b>	680*				400				360	
	11	21	26.5	<b>5I</b>	680*				380				350	
	12	24	28	<b>5J</b>	450*				350				310	

\* TPS (Tray-Packing-System). Plate versions may have different packing units.  
Samples and pre-production needs on request.

■ Moulded versions.

Rights reserved to amend design data without prior notification.





## Packing Quantities for Capacitors with Radial Pins in PCM 27.5 mm to 52.5 mm

PCM	Size				bulk	pcs. per packing unit										
						ROLL		REEL				AMMO				
	W	H	L	Codes		S	N	O	ø 360		ø 500		340 × 340		490 × 370	
							H16.5	H18.5	H16.5	H18.5	H16.5	H18.5	H16.5	H18.5	H16.5	H18.5
							F	I	H	J	A	C	B	D		
<b>27.5 mm</b>	9	19	31.5	<b>6A</b>	640*	–	–	–	–	460/340*	–	–	–	–	–	420
	11	21	31.5	<b>6B</b>	544*	–	–	–	–	380/280*	–	–	–	–	–	350
	13	24	31.5	<b>6D</b>	448*	–	–	–	–	300	–	–	–	–	–	290
	13	25	33	<b>FK</b>	336*	–	–	–	–	–	–	–	–	–	–	–
	15	26	31.5	<b>6F</b>	384*	–	–	–	–	270	–	–	–	–	–	250
	15	26	33	<b>FL</b>	288*	–	–	–	–	–	–	–	–	–	–	–
	17	29	31.5	<b>6G</b>	176*	–	–	–	–	–	–	–	–	–	–	–
	17	34.5	31.5	<b>6I</b>	176*	–	–	–	–	–	–	–	–	–	–	–
	20	32	33	<b>FM</b>	216*	–	–	–	–	–	–	–	–	–	–	–
	20	39.5	31.5	<b>6J</b>	144*	–	–	–	–	–	–	–	–	–	–	–
<b>37.5 mm</b>	9	19	41.5	<b>7A</b>	480*	–	–	–	–	–	–	–	–	–	–	–
	11	22	41.5	<b>7B</b>	408*	–	–	–	–	–	–	–	–	–	–	–
	13	24	41.5	<b>7C</b>	252*	–	–	–	–	–	–	–	–	–	–	–
	15	26	41.5	<b>7D</b>	144*	–	–	–	–	–	–	–	–	–	–	–
	17	29	41.5	<b>7E</b>	132*	–	–	–	–	–	–	–	–	–	–	–
	19	32	41.5	<b>7F</b>	108*	–	–	–	–	–	–	–	–	–	–	–
	20	39.5	41.5	<b>7G</b>	108*	–	–	–	–	–	–	–	–	–	–	–
	24	45.5	41.5	<b>7H</b>	84*	–	–	–	–	–	–	–	–	–	–	–
	31	46	41.5	<b>7I</b>	72*	–	–	–	–	–	–	–	–	–	–	–
	35	50	41.5	<b>7J</b>	35*	–	–	–	–	–	–	–	–	–	–	–
40	55	41.5	<b>7K</b>	28*	–	–	–	–	–	–	–	–	–	–	–	
<b>48.5 mm</b>	19	31	56	<b>8D</b>	50*	–	–	–	–	–	–	–	–	–	–	–
	23	34	56	<b>8E</b>	72*	–	–	–	–	–	–	–	–	–	–	–
	27	37.5	56	<b>8H</b>	60*	–	–	–	–	–	–	–	–	–	–	–
	33	48	56	<b>8J</b>	48*	–	–	–	–	–	–	–	–	–	–	–
	37	54	56	<b>8L</b>	25*	–	–	–	–	–	–	–	–	–	–	–
<b>52.5 mm</b>	35	50	57	<b>9F</b>	25*	–	–	–	–	–	–	–	–	–	–	–
	45	55	57	<b>9H</b>	20*	–	–	–	–	–	–	–	–	–	–	–
	45	65	57	<b>9J</b>	20*	–	–	–	–	–	–	–	–	–	–	–

\* for 2-inch transport pitches.

\* TPS (Tray-Packing-System). Plate versions may have different packing units. Samples and pre-production needs on request.

■ Moulded versions. Rights reserved to amend design data without prior notification.



# WIMA Part Number System

A WIMA part number consists of 18 digits and is composed as follows:

- Field 1 - 4: Type description
- Field 5 - 6: Rated voltage
- Field 7 - 10: Capacitance
- Field 11 - 12: Size and PCM
- Field 13 - 14: Version code (e.g. Snubber versions)
- Field 15: Capacitance tolerance
- Field 16: Packing
- Field 17 - 18: Pin length (untaped)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
M	K	S	2	C	0	2	1	0	0	1	A	0	0	M	S	S	D
MKS 2				63 VDC		0.01 $\mu$ F			2.5x6.5x7.2		-		20%	bulk	6-2		
<b>Type description:</b>				<b>Rated voltage:</b>		<b>Capacitance:</b>			<b>Size:</b>		<b>Tolerance:</b>		<b>Packing:</b>				
SMD-PET = SMDT				50 VDC = B0		22 pF = 0022			4.8x3.3x3 Size 1812 = KA		±20% = M		<b>AMMO</b> H16.5 340x340 = A AMMO H16.5 490x370 = B AMMO H18.5 340x340 = C AMMO H18.5 490x370 = D REEL H16.5 360 = F REEL H16.5 500 = H REEL H18.5 360 = I REEL H18.5 500 = J ROLL H16.5 = N ROLL H18.5 = O BLISTER W12 180 = P BLISTER W12 330 = Q BLISTER W16 330 = R BLISTER W24 330 = T Bulk/TPS Standard = S ...				
SMD-PPS = SMDI				63 VDC = C0		47 pF = 0047			4.8x3.3x4 Size 1812 = KB		±10% = K						
FKP 02 = FKPO				100 VDC = D0		100 pF = 0100			5.7x5.1x3.5 Size 2220 = QA		±5% = J						
MKS 02 = MKS0				250 VDC = F0		150 pF = 0150			5.7x5.1x4.5 Size 2220 = QB		±2.5% = H						
FKS 2 = FKS2				400 VDC = G0		220 pF = 0220			7.2x6.1x3 Size 2824 = TA		±1% = E						
FKP 2 = FKP2				450 VDC = H0		330 pF = 0330			7.2x6.1x5 Size 2824 = TB		...						
MKS 2 = MKS2				600 VDC = I0		470 pF = 0470			10.2x7.6x5 Size 4030 = VA								
MKP 2 = MKP2				630 VDC = J0		680 pF = 0680			12.7x10.2x6 Size 5040 = XA								
FKS 3 = FKS3				700 VDC = K0		1000 pF = 1100			15.3x13.7x7 Size 6054 = YA								
FKP 3 = FKP3				800 VDC = L0		1500 pF = 1150			2.5x7x4.6 PCM 2.5 = 0B								
MKS 4 = MKS4				850 VDC = M0		2200 pF = 1220			3x7.5x4.6 PCM 2.5 = 0C								
MKP 4 = MKP4				900 VDC = N0		3300 pF = 1330			2.5x6.5x7.2 PCM 5 = 1A								
MKP 10 = MKP1				1000 VDC = O1		4700 pF = 1470			3x7.5x7.2 PCM 5 = 1B								
FKP 4 = FKP4				1100 VDC = P0		6800 pF = 1680			2.5x7x10 PCM 7.5 = 2A								
FKP 1 = FKP1				1200 VDC = Q0		0.01 $\mu$ F = 2100			3x8.5x10 PCM 7.5 = 2B								
MKP-X2 = MKX2				1250 VDC = R0		0.022 $\mu$ F = 2220			3x9x13 PCM 10 = 3A								
MKP-X2 R = MKXR				1500 VDC = S0		0.047 $\mu$ F = 2470			4x9x13 PCM 10 = 3C								
MKP-Y2 = MKY2				1600 VDC = T0		0.1 $\mu$ F = 3100			5x11x18 PCM 15 = 4B								
MP 3-X2 = MPX2				2000 VDC = U0		0.22 $\mu$ F = 3220			6x12.5x18 PCM 15 = 4C								
MP 3-X1 = MPX1				2500 VDC = V0		0.47 $\mu$ F = 3470			5x14x26.5 PCM 22.5 = 5A								
MP 3-Y2 = MPY2				3000 VDC = W0		1 $\mu$ F = 4100			6x15x26.5 PCM 22.5 = 5B								
MP 3R-Y2 = MPRY				4000 VDC = X0		2.2 $\mu$ F = 4220			9x19x31.5 PCM 27.5 = 6A								
Snubber MKP = SNMP				6000 VDC = Y0		4.7 $\mu$ F = 4470			11x21x31.5 PCM 27.5 = 6B								
Snubber FKP = SNFP				250 VAC = 0W		10 $\mu$ F = 5100			9x19x41.5 PCM 37.5 = 7A								
GTO MKP = GTOM				275 VAC = 1W		22 $\mu$ F = 5220			11x22x41.5 PCM 37.5 = 7B								
DC-LINK MKP 3 = DCP3				300 VAC = 2W		47 $\mu$ F = 5470			94x49x182 DCH_ = H0								
DC-LINK MKP 4 = DCP4				400 VAC = 3W		100 $\mu$ F = 6100			94x77x182 DCH_ = H1								
DC-LINK MKP 4S = DCPS				440 VAC = 4W		220 $\mu$ F = 6220			...								
DC-LINK MKP 5 = DCP5				500 VAC = 5W		1000 $\mu$ F = 7100			...								
DC-LINK MKP 6 = DCP6				...		...			...								
DC-LINK HC = DCH_									<b>Version code:</b>		<b>Pin length (untaped)</b>						
DC-LINK HY = DCHY									Standard = 00		3.5 ±0.5 = C9						
									Version A1 = 1A		6-2 = SD						
									Version A1.1.1 = 1B		16 ±1 = P1						
									Version A2 = 2A		...						
									...								

The data on this page is not complete and serves only to explain the part number system. Part number information is listed on the pages of the respective WIMA range.