

## GTO MKP Capacitors for Pulse Applications with Internal Series Connection. Capacitances from 1.0 $\mu\text{F}$ to 100 $\mu\text{F}$ . Rated Voltages from 400 VDC to 2000 VDC.

### Special Features

- Pulse duty construction
- Self-healing
- Cylindrical capacitor body with axial screw and thread connections size M6 or M8
- Internal series connection from 400 VAC
- Very low dissipation factor
- Negative capacitance change versus temperature
- According to RoHS 2015/863/EU

### Typical Applications

For high pulse and high frequency applications requiring extremely reliable contacts e.g.

- Damping of voltage spikes on GTO-Thyristors

### Construction

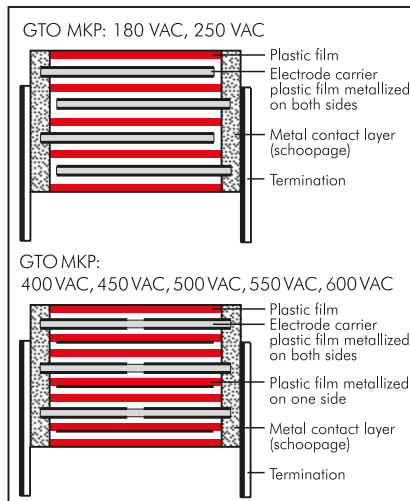
#### Dielectric:

Polypropylene (PP) film

#### Capacitor electrodes:

Double-sided metallized plastic film

#### Internal construction:



#### Encapsulation:

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

#### Terminations:

Axial screw connection M6 or M8.

#### Marking:

Colour: Red. Marking: Black on Silver.

### Electrical Data

#### Capacitance range:

1.0  $\mu\text{F}$  to 100  $\mu\text{F}$

#### Rated voltages:

400 VDC, 600 VDC, 850 VDC, 1000 VDC, 1200 VDC, 1500 VDC, 2000 VDC

#### Capacitance tolerances:

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

#### Operating temperature range:

$-55^\circ\text{C}$  to  $+85^\circ\text{C}$

#### Climatic test category:

55/085/56 in accordance with IEC

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

$\geq 10000 \text{ sec (M}\Omega \times \mu\text{F)}$

Measuring voltage: 100 V/1 min.

#### Test voltage:

$1.2 U_r$ , 2 sec.

#### Dielectric absorption:

0.05%

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

at f	$C \leq 20 \mu\text{F}$	$20 \mu\text{F} < C \leq 50 \mu\text{F}$	$C > 50 \mu\text{F}$
1 kHz	$\leq 3 \times 10^{-4}$	$\leq 5 \times 10^{-4}$	$\leq 8 \times 10^{-4}$

#### Voltage derating:

A voltage derating factor of 1.35 % per K must be applied from  $+65^\circ\text{C}$  for DC voltages and from  $+60^\circ\text{C}$  for AC voltages.

#### Reliability:

Operational life  $> 300000$  hours

Failure rate  $< 1 \text{ fit (} 0.5 \times U_r \text{ and } 40^\circ\text{C)}$

#### Specific dissipation:

Box size D x L in mm	Specific dissipation in Watts per K above the ambient temperature
60x49	0.186
70x49	0.231
80x49	0.280
90x49	0.333
90x58	0.364
90x97	0.501

### Mounting Recommendation

Excessive mechanical strain, e.g. pressure or shock onto the capacitor body, is to be avoided during mounting and usage of the capacitors. When fixing the capacitor the screw torque is to be limited to max. 5 Nm.

For further details and graphs please refer to Technical Information.

### Packing

Transportation-safe packing in cardboard boxes.

#### Packing units

D	pcs. per packing unit
60	12
70	8
80	6
90	6

## Continuation

### General Data

Capacitance	400 VDC/180 VAC*				600 VDC/250 VAC*			
	D x L mm	du/dt V/μsec	I <sub>max.</sub> A	Part number	D x L mm	du/dt V/μsec	I <sub>max.</sub> A	Part number
3.5 μF					60 x 49	200	770	GTOMI04350GA00
4 "					60 x 49	200	890	GTOMI04400GA00
4.5 "					60 x 49	200	990	GTOMI04450GA00
5 "					60 x 49	180	1090	GTOMI04500GA00
6 "					60 x 49	180	1310	GTOMI04600GA00
8 "					60 x 49	80	610	GTOMI04800GA00
10 μF					60 x 49	80	780	GTOMI05100GA00
15 "	60 x 49	50	790	GTOMG05150GA00	60 x 49	80	1150	GTOMI05150GA00
20 "	60 x 49	50	1050	GTOMG05200GA00	70 x 49	80	1540	GTOMI05200GB00
25 "	60 x 49	50	1330	GTOMG05250GA00	70 x 49	80	1940	GTOMI05250GB00
30 "	60 x 49	50	1610	GTOMG05300GA00	80 x 49	80	2340	GTOMI05300GC00
40 "	70 x 49	50	2090	GTOMG05400GB00	90 x 49	80	3080	GTOMI05400GD00
50 "	80 x 49	50	2680	GTOMG05500GC00	90 x 58	60	3050	GTOMI05500GE00
60 "	80 x 49	50	3240	GTOMG05600GC00	90 x 97	35	2140	GTOMI05600GF00
70 "	90 x 49	50	3630	GTOMG05700GD00	90 x 97	35	2520	GTOMI05700GF00
80 "	90 x 49	50	4100	GTOMG05800GD00	90 x 97	35	2810	GTOMI05800GF00
90 "	90 x 58	40	3800	GTOMG05900GE00	90 x 97	35	3200	GTOMI05900GF00
100 μF	90 x 58	40	4300	GTOMG06100GE00	90 x 97	35	3550	GTOMI06100GF00

Capacitance	850 VDC/400 VAC*				1000 VDC/450 VAC*			
	D x L mm	du/dt V/μsec	I <sub>max.</sub> A	Part number	D x L mm	du/dt V/μsec	I <sub>max.</sub> A	Part number
3 μF	60 x 49	200	770	GTOMM04300GA00	60 x 49	260	790	GTOMO14300GA00
3.5 "	60 x 49	200	770	GTOMM04350GA00	60 x 49	260	910	GTOMO14350GA00
4 "	60 x 49	200	890	GTOMM04400GA00	60 x 49	260	1050	GTOMO14400GA00
4.5 "	60 x 49	200	990	GTOMM04450GA00	60 x 49	260	1170	GTOMO14450GA00
5 "	60 x 49	200	1090	GTOMM04500GA00	60 x 49	260	1310	GTOMO14500GA00
6 "	60 x 49	200	1310	GTOMM04600GA00	60 x 49	260	1550	GTOMO14600GA00
8 "	60 x 49	200	1740	GTOMM04800GA00	70 x 49	260	2080	GTOMO14800GB00
10 μF	70 x 49	200	2190	GTOMM05100GB00	70 x 49	260	2600	GTOMO15100GB00
15 "	70 x 49	200	3230	GTOMM05150GB00	90 x 49	260	3920	GTOMO15150GD00
20 "	80 x 49	200	4310	GTOMM05200GC00	90 x 58	200	4300	GTOMO15200GE00
25 "	90 x 49	200	5390	GTOMM05250GD00	90 x 97	120	3050	GTOMO15250GF00
30 "	90 x 58	160	4800	GTOMM05300GE00	90 x 97	120	3580	GTOMO15300GF00
40 "	90 x 97	100	3780	GTOMM05400GF00	90 x 97	120	4770	GTOMO15400GF00
50 "	90 x 97	100	4790	GTOMM05500GF00				
60 "	90 x 97	100	5800	GTOMM05600GF00				

\* AC voltage:  $f \leq 1000 \text{ Hz}$ ;  $1.4 \times U_{\text{rms}} + \text{UDC} \leq U_r$

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

Part number completion:

Tolerance: 20 % = M  
 10 % = K  
 5 % = J  
 Packing: bulk = S  
 Pin length: none = 00

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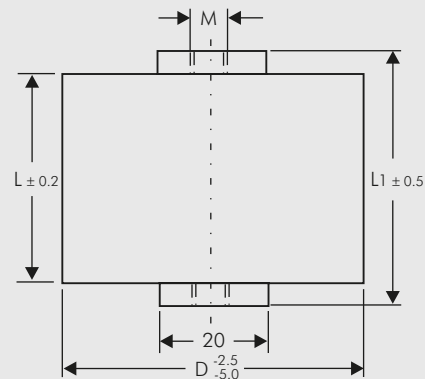
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## Continuation

### General Data

Capacitance	1200 VDC/500 VAC*				1500 VDC/550 VAC*			
	D x L mm	du/dt V/μsec	I <sub>max.</sub> A	Part number	D x L mm	du/dt V/μsec	I <sub>max.</sub> A	Part number
1 μF					60 x 49	400	420	GTOMS04100GA00
1.5 "					60 x 49	400	590	GTOMS04150GA00
2 "					60 x 49	400	820	GTOMS04200GA00
2.5 "	60 x 49	300	770	GTOMQ04250GA00	60 x 49	400	1010	GTOMS04250GA00
3 "	60 x 49	300	950	GTOMQ04300GA00	60 x 49	400	1220	GTOMS04300GA00
3.5 "	60 x 49	300	1070	GTOMQ04350GA00	60 x 49	400	1400	GTOMS04350GA00
4 "	60 x 49	300	1230	GTOMQ04400GA00	70 x 49	400	1630	GTOMS04400GB00
4.5 "	60 x 49	300	1380	GTOMQ04450GA00	70 x 49	400	1800	GTOMS04450GB00
5 "	60 x 49	300	1570	GTOMQ04500GA00	70 x 49	400	2010	GTOMS04500GB00
6 "	70 x 49	300	1840	GTOMQ04600GB00	80 x 49	400	2390	GTOMS04600GC00
8 "	70 x 49	300	2470	GTOMQ04800GB00	90 x 49	400	3210	GTOMS04800GD00
10 μF	80 x 49	300	3080	GTOMQ05100GC00	90 x 58	320	3210	GTOMS05100GE00
15 "	90 x 58	230	3550	GTOMQ05150GE00	90 x 97	180	2690	GTOMS05150GF00
20 "	90 x 97	130	2690	GTOMQ05200GF00	90 x 97	180	3600	GTOMS05200GF00
25 "	90 x 97	130	3370	GTOMQ05250GF00				
30 "	90 x 97	130	4110	GTOMQ05300GF00				

Capacitance	2000 VDC/600 VAC*			
	D x L mm	du/dt V/μsec	I <sub>max.</sub> A	Part number
1 μF	60 x 49	500	500	GTOMU04100GA00
1.5 "	60 x 49	500	750	GTOMU04150GA00
2 "	70 x 49	500	1000	GTOMU04200GB00
2.5 "	70 x 49	500	1250	GTOMU04250GB00
3 "	80 x 49	500	1500	GTOMU04300GC00
3.5 "	80 x 49	500	1750	GTOMU04350GC00
4 "	90 x 49	500	2000	GTOMU04400GD00
4.5 "	90 x 49	500	2250	GTOMU04450GD00
5 "	90 x 58	500	2500	GTOMU04500GE00
6 "	90 x 58	450	2700	GTOMU04600GE00
8 "	90 x 97	400	3200	GTOMU04800GF00
10 μF	90 x 97	300	3000	GTOMU05100GF00



D	L	L1	M
60	49	55	M6
70	49	55	M6
80	49	55	M8
90	49	55	M8
90	58	64	M8
90	97	103	M8

\* AC voltage:  $f \leq 1000 \text{ Hz}$ ;  $1.4 \times U_{\text{rms}} + \text{UDC} \leq U_{\text{r}}$

Ionisation inception level in isolated cases may be lower than admissible rated AC voltage.

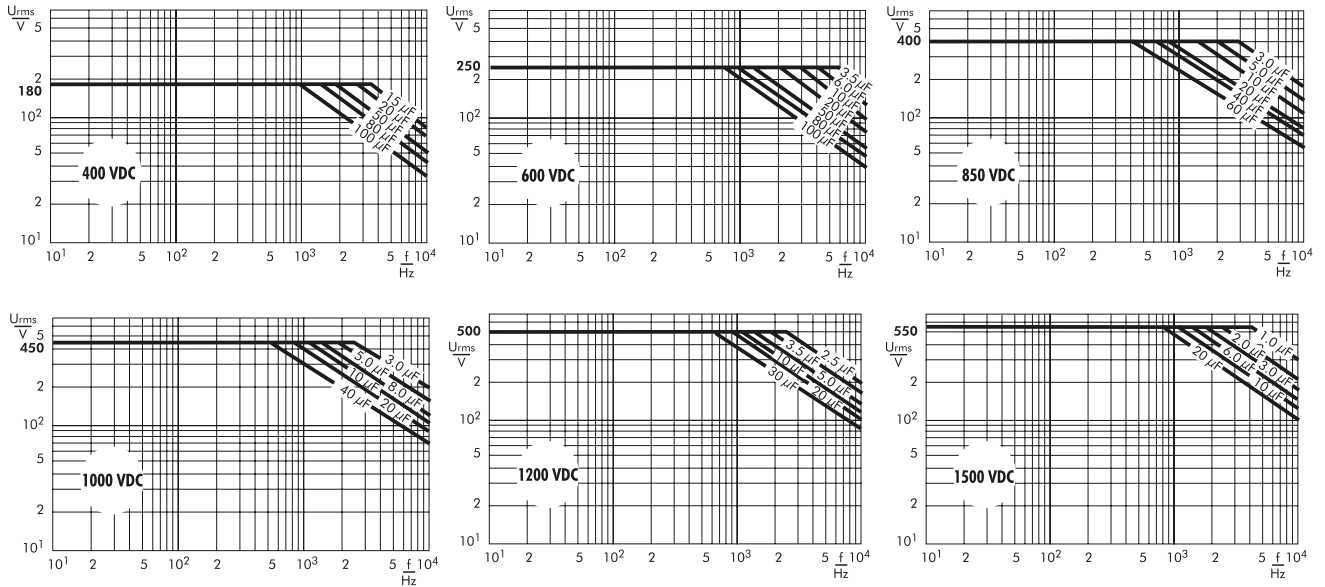
Part number completion:	
Tolerance:	20 % = M
	10 % = K
	5 % = J
Packing:	bulk = S
Pin length:	none = 00

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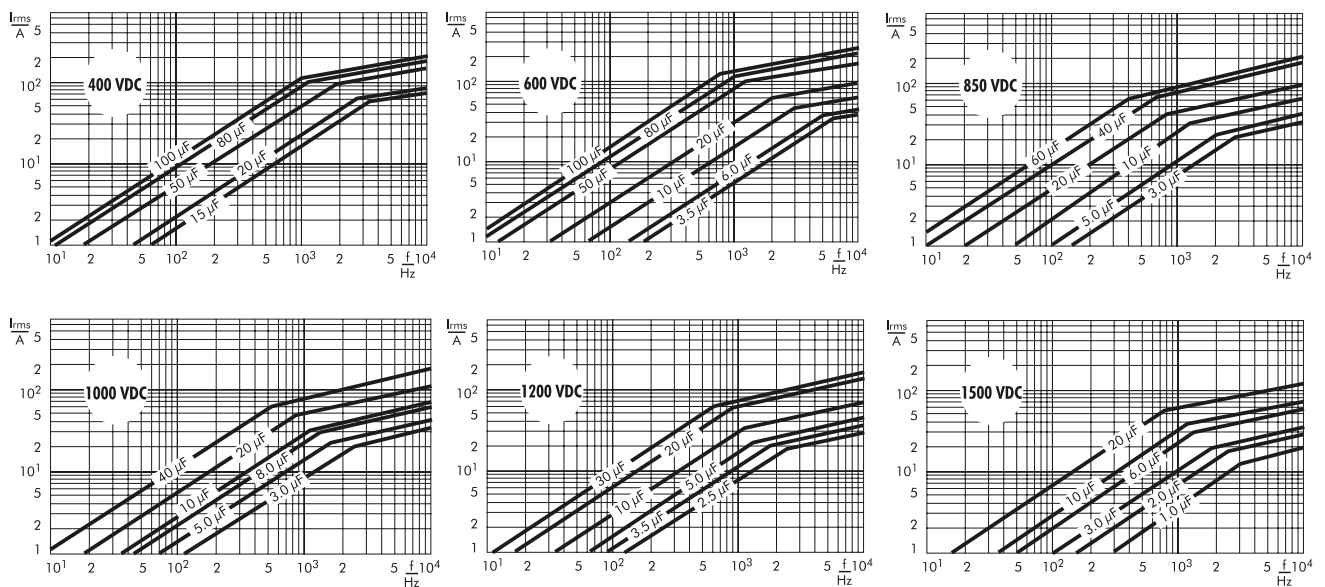
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## Continuation

Permissible AC voltage in relation to frequency at 20° C internal temperature rise (general guide).



Permissible AC current in relation to frequency at 20° C internal temperature rise (general guide).





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 µF			2.5x6.5x7.2			-		20%	bulk	6 -2	

<p><b>Type description:</b></p> <p>SMD-PET = SMDT          SMD-PEN = SMDN          SMD-PPS = SMDI          FKP 02 = FKPO          MKS 02 = MKSO          FKS 2 = FKS2          FKP 2 = FKP2          FKS 3 = FKS3          FKP 3 = FKP 3          MKS 2 = MKS2          MKP 2 = MKP2          MKS 4 = MKS4          MKP 4 = MKP4          MKP 10 = MKP1          FKP 4 = FKP4          FKP 1 = FKP1          MKP-X2 = MKX2          MKP-X1 R = MKX1          MKP-Y2 = MKY2          MKP 4F = MKPF          Snubber MKP = SNMP          Snubber FKP = SNFP          GTO MKP = GTOM          DC-LINK MKP 4 = DCP4          DC-LINK MKP 6 = DCP6          DC-LINK HC = DCHC</p>	<p><b>Rated voltage:</b></p> <p>50 VDC = B0          63 VDC = C0          100 VDC = D0          250 VDC = F0          400 VDC = G0          450 VDC = H0          520 VDC = H2          600 VDC = I0          630 VDC = J0          700 VDC = K0          800 VDC = L0          850 VDC = M0          900 VDC = N0          1000 VDC = O1          1100 VDC = P0          1200 VDC = Q0          1250 VDC = R0          1500 VDC = S0          1600 VDC = T0          1700 VDC = TA          2000 VDC = U0          2500 VDC = V0          3000 VDC = W0          4000 VDC = X0          6000 VDC = Y0          230 VAC = 3Y          275 VAC = 1W          300 VAC = 2W          305 VAC = AW          350 VAC = BW          440 VAC = 4W          ...</p>	<p><b>Capacitance:</b></p> <p>22 pF = 0022          47 pF = 0047          100 pF = 0100          150 pF = 0150          220 pF = 0220          330 pF = 0330          470 pF = 0470          680 pF = 0680          1000 pF = 1100          1500 pF = 1150          2200 pF = 1220          3300 pF = 1330          4700 pF = 1470          6800 pF = 1680          0.01 µF = 2100          0.022 µF = 2220          0.047 µF = 2470          0.1 µF = 3100          0.22 µF = 3220          0.47 µF = 3470          1 µF = 4100          2.2 µF = 4220          4.7 µF = 4470          10 µF = 5100          22 µF = 5220          47 µF = 5470          100 µF = 6100          220 µF = 6220          1000 µF = 7100          1500 µF = 7150          ...</p>	<p><b>Size:</b></p> <p>4.8x3.3x3 Size 1812 = KA          4.8x3.3x4 Size 1812 = KB          5.7x5.1x3.5 Size 2220 = QA          5.7x5.1x4.5 Size 2220 = QB          7.2x6.1x3 Size 2824 = TA          7.2x6.1x5 Size 2824 = TB          10.2x7.6x5 Size 4030 = VA          12.7x10.2x6 Size 5040 = YA          15.3x13.7x7 Size 6054 = YA          2.5x7x4.6 PCM2.5 = 0B          3x7.5x4.6 PCM2.5 = 0C          2.5x6.5x7.2 PCM5 = 1A          3x7.5x7.2 PCM5 = 1B          2.5x7x10 PCM7.5 = 2A          3x8.5x10 PCM7.5 = 2B          3x9x13 PCM10 = 3A          4x9x13 PCM10 = 3C          5x11x18 PCM15 = 4B          6x12.5x18 PCM15 = 4C          5x14x26.5 PCM22.5 = 5A          6x15x26.5 PCM22.5 = 5B          9x19x31.5 PCM27.5 = 6A          11x21x31.5 PCM27.5 = 6B          9x19x41.5 PCM37.5 = 7A          11x22x41.5 PCM37.5 = 7B          19x31x56 PCM 48.5 = 8D          25x45x57 PCM 52.5 = 9D          ...</p> <p><b>Version code:</b></p> <p>Standard = 00          Version A1 = 1A          Version A1.1.1 = 1B          Version A2 = 2A          ...</p>	<p><b>Tolerance:</b></p> <p>±20% = M          ±10% = K          ±5% = J          ±2.5% = H          ±1% = E          ...</p> <p><b>Packing:</b></p> <p>AMMO 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          ...</p> <p><b>Pin length (untaped)</b></p> <p>3.5 ±0.5 = C9          6 -2 = SD          16 ±1 = P1          ...</p> <p><b>Pin length (taped)</b></p> <p>none = 00</p>
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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.