

GTO MKP Capacitors for Pulse Applications with Internal Series Connection

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 2002/95/EC

Typical Applications

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

- Damping of voltage spikes on GTO-Thyristors

Construction

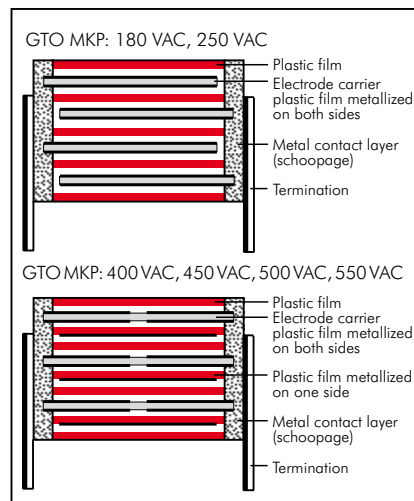
Dielectric:

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 μ F to 100 μ F

Rated voltages:

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

Capacitance tolerances:

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

Operating temperature range:

-55°C to $+85^\circ\text{C}$

Climatic test category:

55/085/56 in accordance with IEC

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

$\geq 10\,000\text{ sec (M}\Omega \times \mu\text{F)}$

(mean value: 50 000 sec)

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 $> 300\,000$ hours

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

Specific dissipation:

Box size W x L in mm	Specific dissipation in Watts per K above the ambient temperature
60 x 49	0.186
70 x 49	0.231
80 x 49	0.280
90 x 49	0.333
90 x 58	0.364
90 x 97	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

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

Continuation

General Data

Capacitance	400 VDC/180 VAC*				600 VDC/250 VAC*			
	W x L mm	du/dt V/μsec	I _{max.} A	Part number	W x L mm	du/dt V/μsec	I _{max.} 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*			
	W x L mm	du/dt V/μsec	I _{max.} A	Part number	W x L mm	du/dt V/μsec	I _{max.} 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: $f \leq 1000 \text{ Hz}$; $1.4 \times U_{\text{rms}} + U_{\text{DC}} \leq U_r$

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

Lead length: none = 00

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General Data

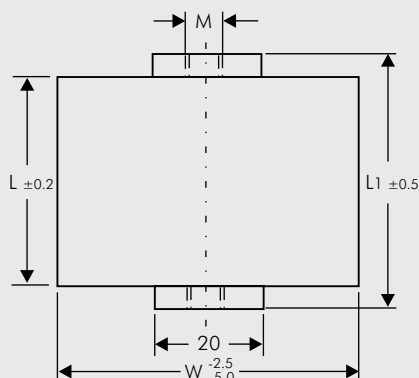
Capacitance	1200 VDC/500 VAC*				1500 VDC/550 VAC*			
	W x L mm	du/dt V/μsec	I _{max.} A	Part number	W x L mm	du/dt V/μsec	I _{max.} A	Part number
1 μF					60 x 49	400	420	GTOMS04100GA00_
1.5 "					60 x 49	400	590	GTOMS04150GA00_
2 "					60 x 49	400	820	GTOMS04200GA00_
2.5 "	60 x 49	300	770	GTOMQ04250GA00_	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_				

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

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
Lead length: none = 00

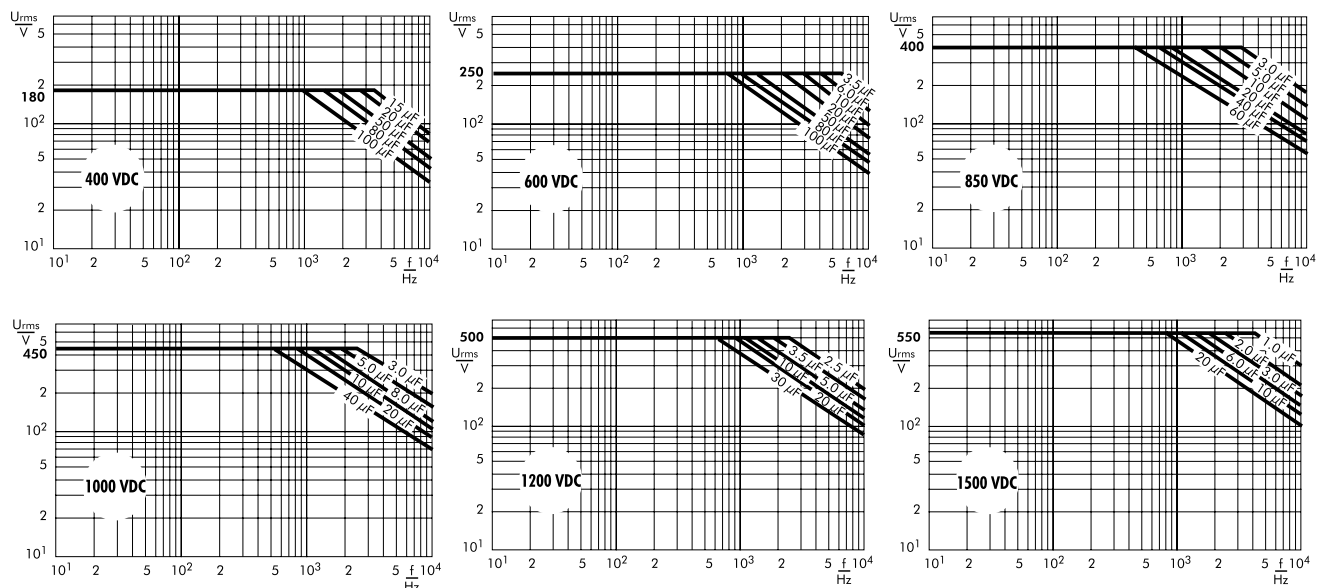


W	L	L1	M
60	49	55	M6
70	49	55	M6
80	49	55	M8
90	49	55	M8
90	58	64	M8
90	97	103	M8

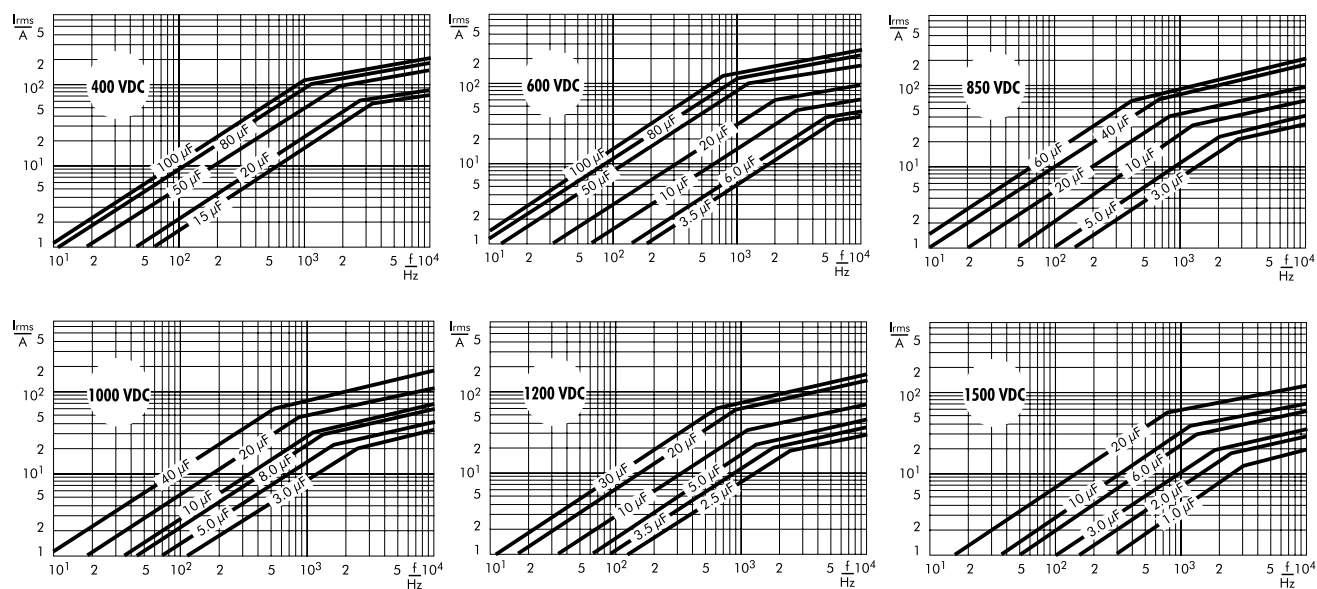
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Permissible AC voltage in relation to frequency
at 20° C internal temperature rise (general guide).



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: Special features (e.g. Snubber versions)
- Field 15: Capacitance tolerance
- Field 16: Packing
- Field 17 - 18: Lead 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	
Type description:				Rated voltage:		Capacitance:				Size:				Tolerance:			
SMD-PET = SMDT				2.5 VDC = A1		22 pF = 0022				4.8x3.3x3 Size 1812 = X1				20% = M			
SMD-PPS = SMDI				4 VDC = A2		47 pF = 0047				4.8x3.3x4 Size 1812 = X2				10% = K			
FKP 02 = FKP0				14 VDC = A3		100 pF = 0100				5.7x5.1x3.5 Size 2220 = Y1				5% = J			
MKS 02 = MKS0				28 VDC = A4		150 pF = 0150				5.7x5.1x4.5 Size 2220 = Y2				2.5% = H			
FKS 2 = FKS2				40 VDC = A5		220 pF = 0220				7.2x6.1x3 Size 2824 = T1				1% = E			
FKP 2 = FKP2				5 VDC = A6		330 pF = 0330				7.2x6.1x5 Size 2824 = T2				...			
MKS 2 = MKS2				50 VDC = B0		470 pF = 0470				10.2x7.6x5 Size 4030 = K1				Packing: 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 Mini = M Bulk Standard = S Bulk Maxi = G TPS Mini = X TPS Standard = Y ...			
MKP 2 = MKP2				63 VDC = C0		680 pF = 0680				12.7x10.2x6 Size 5040 = V1							
FKS 3 = FKS3				100 VDC = D0		1000 pF = 1100				15.3x13.7x7 Size 6054 = Q1							
FKP 3 = FKP3				160 VDC = E0		1500 pF = 1150				2.5x7x4.6 PCM 2.5 = 0B							
MKS 4 = MKS4				250 VDC = F0		2200 pF = 1220				3x7.5x4.6 PCM 2.5 = 0C							
MKP 4 = MKP4				400 VDC = G0		3300 pF = 1330				2.5x6.5x7.2 PCM 5 = 1A							
MKP 10 = MKP1				450 VDC = H0		4700 pF = 1470				3x7.5x7.2 PCM 5 = 1B							
FKP 4 = FKP4				600 VDC = I0		6800 pF = 1680				2.5x7x10 PCM 7.5 = 2A							
FKP 1 = FKP1				630 VDC = J0		0.01 µF = 2100				3x8.5x10 PCM 7.5 = 2B							
MKP-X2 = MKX2				700 VDC = K0		0.022 µF = 2220				3x9x13 PCM 10 = 3A							
MKP-X2 R = MKXR				800 VDC = L0		0.047 µF = 2470				4x9x13 PCM 10 = 3C							
MKP-Y2 = MKY2				850 VDC = M0		0.1 µF = 3100				5x11x18 PCM 15 = 4B							
MP 3-X2 = MPX2				900 VDC = N0		0.22 µF = 3220				6x12.5x18 PCM 15 = 4C							
MP 3-X1 = MPX1				1000 VDC = O1		0.47 µF = 3470				5x14x26.5 PCM 22.5 = 5A							
MP 3-Y2 = MPY2				1100 VDC = P0		1 µF = 4100				6x15x26.5 PCM 22.5 = 5B							
MP 3R-Y2 = MPRY				1200 VDC = Q0		2.2 µF = 4220				9x19x31.5 PCM 27.5 = 6A							
Snubber MKP = SNMP				1250 VDC = R0		4.7 µF = 4470				11x21x31.5 PCM 27.5 = 6B							
Snubber FKP = SNFP				1500 VDC = S0		10 µF = 5100				9x19x41.5 PCM 37.5 = 7A							
GTO MKP = GTOM				1600 VDC = T0		22 µF = 5220				11x22x41.5 PCM 37.5 = 7B							
DC-LINK MKP 4 = DCP4				2000 VDC = U0		47 µF = 5470				94x49x182 DCH_ = H0							
DC-LINK MKP C = DCPC				2500 VDC = V0		100 µF = 6100				94x77x182 DCH_ = H1							
DC-LINK HC = DCH_				3000 VDC = W0		220 µF = 6220				...							
SuperCap C = SCSC				4000 VDC = X0		1 F = A010											
SuperCap MC = SCMC				6000 VDC = Y0		2.5 F = A025											
SuperCap R = SCSR				250 VAC = 0W		50 F = A500				Special features:							
SuperCap MR = SCMR				275 VAC = 1W		100 F = B100				Standard = 00							
				300 VAC = 2W		110 F = B110				Version A1 = 1A							
				400 VAC = 3W		600 F = B600				Version A1.1.1 = 1B							
				440 VAC = 4W		1200 F = C120				Version A1.2 = 1C							
				500 VAC = 5W		...				...							