

- Metallized polyester
- According to CECC 30401-042, IEC 60384-2, DIN 44122

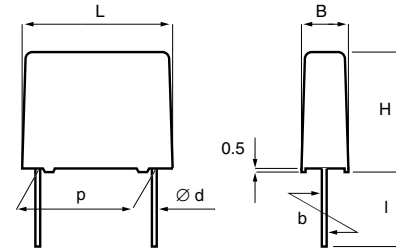


### TYPICAL APPLICATIONS

Bypassing, signal coupling. General purpose for highest reliability.

### CONSTRUCTION

Metallized polyester film capacitor. Radial leads of tinned wire are electrically welded to the contact metal layer on the ends of the capacitor winding. Encapsulation in self-extinguishing material meeting the requirements of UL 94V-0.



### TECHNICAL DATA

Rated voltage $U_R$ , VDC	50	63	100	250	400	630	1000
Rated voltage $U_R$ , VAC	30	40	63	160	200	220	250
Capacitance, $\mu$ F	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	-10.0	-82	-82	-39	-18	-6.8	-4.7

Capacitance tolerance  $\pm 20\%$ ,  $\pm 10\%$  standard,  $\pm 5\%$ .

Category temperature range  $-55 \dots +100^\circ\text{C}$

Voltage derating Above  $+85^\circ\text{C}$  DC and AC voltage derating is  $1.25\%/^\circ\text{C}$ .

Rated temperature  $+85^\circ\text{C}$

Climatic category IEC 60068-1, 55/100/56  
DIN 40040, FME  
 $-55 \dots +100^\circ\text{C}$  ( $+125^\circ\text{C}$ )  
Average relative humidity  $\leq 75\%$   
RH = 95% for 30 days per year.  
RH = 85% for further days limited by average value per year, occasional slight condensation permitted.

Test voltage  $1.6 \times U_R$  VDC for 2s

Capacitance drift Max. 2% after a 2 year storage period at a temperature of  $+10 \dots +40^\circ\text{C}$  and a relative humidity of 40...60%.

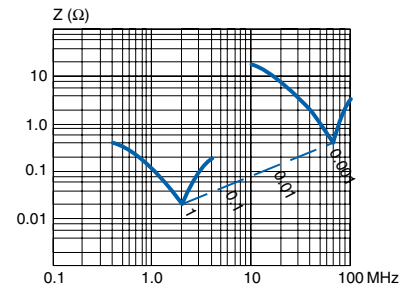
Reliability Operational life  $> 200\,000$  h.  
Failure rate  $< 3$  FIT,  $T = +40^\circ\text{C}$ ,  $U = 0.5 \times U_R$ .  
Failure criteria according to DIN 44122.

Maximum pulse steepness:  $dU/dt$  according to article table. For peak to peak voltages lower than rated voltage ( $U_{pp} < U_R$ ), the specified  $dU/dt$  can be multiplied by the factor  $U_R/U_{pp}$

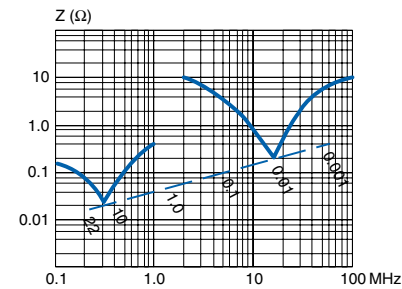
Temperature coefficient  $+400 (\pm 200)$  ppm/ $^\circ\text{C}$  at 1 kHz

Self inductance Approximately 6 nH/cm for the total length of capacitor winding and the leads.

p	d	std l	max l	b
$5.0 \pm 0.4$	0.5	$4^{+1}$	20	$\pm 0.4$
$7.5 \pm 0.4$	0.6	$4^{+1}$	20	$\pm 0.4$
$10.0 \pm 0.4$	0.6	$4^{+1}$	30	$\pm 0.4$
$15.0 \pm 0.4$	0.8	$4^{+1}$	30	$\pm 0.4$
$22.5 \pm 0.4$	0.8	$4^{+1}$	30	$\pm 0.4$
$27.5 \pm 0.4$	0.8	$4^{+1}$	30	$\pm 0.4$
$37.5 \pm 0.5$	1.0	$4^{+1}$	30	$\pm 0.7$



Resonance frequencies  
MMK 5



Resonance frequencies  
MMK7.5 ... 37.5

### ENVIRONMENTAL TEST DATA

**Damp heat test** Test conditions:  $T = +40^\circ\text{C}$ , RH = 93%,  $t = 56$  days.  
Test criteria:  $\Delta C/C \leq \pm 5\%$ ,  
 $\Delta \tan \delta \leq 0.005$  (1kHz),  
IR after test  $0.5 \times$  IR min.

**Endurance test** Test conditions:  $T = +100^\circ\text{C}$ ,  $U = 1.25 \times (0.8 \times U_R)$ ,  
 $t = 2000$  h.  
Test criteria:  $\Delta C/C \leq \pm 5\%$ ,  
 $\Delta \tan \delta \leq 0.005$  (1kHz)  
 $\Delta \tan \delta \leq 0.010$  (100kHz)  
IR after test  $0.5 \times$  IR min.

**TECHNICAL DATA**

**Dissipation factor tanδ**

Maximum values at +23°C

C ≤ 0.1 μF    0.1 μF < C ≤ 1.0 μF    C > 1.0 μF

Model	Frequency	C ≤ 0.1 μF	0.1 μF < C ≤ 1.0 μF	C > 1.0 μF
MMK5	1 kHz	0.8%	0.8%	0.8%
	10 kHz	1.2%	1.2%	1.5%
	100 kHz	2.5%	3.0%	
MMK7.5 ... 37.5	1 kHz	0.8%	0.8%	1.0%
	10 kHz	1.5%	1.5%	
	100 kHz	3.0%		

**Insulation resistance**

Minimum values between terminals.

Measured at +20°C, according to IEC 60384-2.

C ≤ 0.33 μF    C > 0.33 μF

U <sub>R</sub> ≤ 100V	U <sub>R</sub> > 100V
15000 MΩ	30000 MΩ
5000 s	10000 s

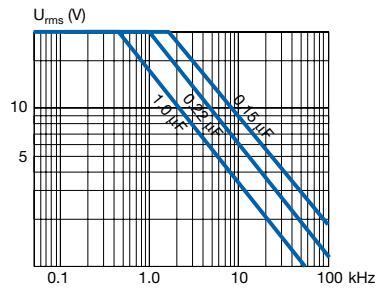
**ORDERING INFORMATION**

See article table and pages 10 to 14 for options and article code construction.

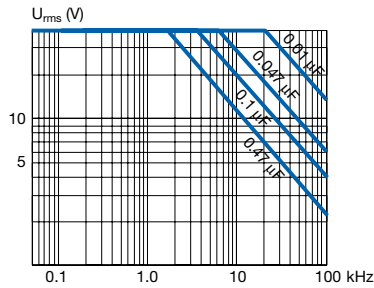
**MARKING**

- Capacitance
- Tolerance code
- Rated voltage
- Capacitor family code MMK
- Manufacturing date code

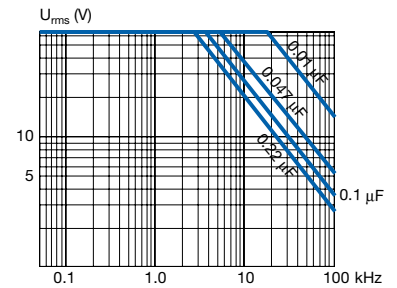
**RATED AC VOLTAGE VS. FREQUENCY**



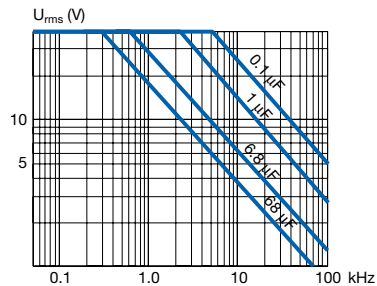
**MMK5 50/30**



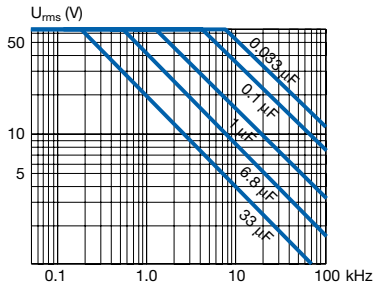
**MMK5 63/40**



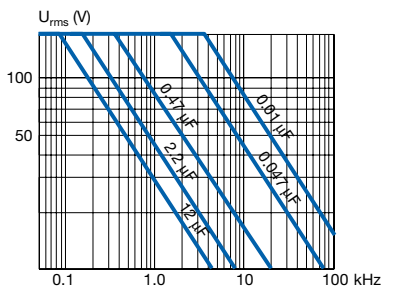
**MMK5 100/63**



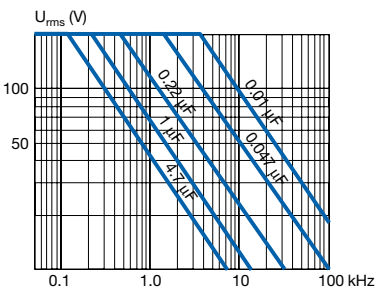
**MMK7.5 ... 37.5 63/40**



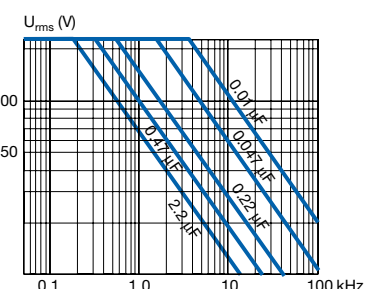
**MMK7.5 ... 37.5 100/63**



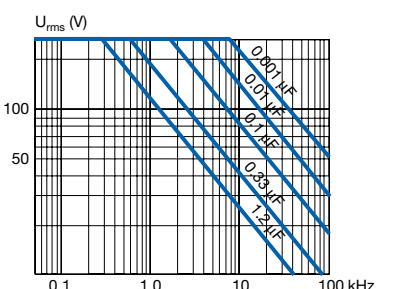
**MMK7.5 ... 37.5 250/160**



**MMK7.5 ... 37.5 400/200**



**MMK7.5 ... 37.5 630/220**



**MMK7.5 ... 37.5 1000/250**

















## ARTICLE TABLE

Capacitance $\mu\text{F}$	Box code	Max dimensions in mm			Max dU/dt V/ $\mu\text{s}$	Article code		Capacitance $\mu\text{F}$	Box code	Max dimensions in mm			Max dU/dt V/ $\mu\text{s}$	Article code
		B	H	L						B	H	L		
<b>630 VDC/220 VAC</b>							<b>630 VDC/220 VAC</b>							
<b>LEAD SPACING 7.5 MM</b>							<b>LEAD SPACING 15 MM</b>							
0.0010	K00	2.5	6.0	10.0	60	MMK7.5 102K630K00L4 BULK	0.15	B06	7.5	14.5	18.0	25	MMK15 154K630B06L4 BULK	
0.0012	K00	2.5	6.0	10.0	60	MMK7.5 122K630K00L4 BULK	0.18	B12	8.0	15.0	18.0	25	MMK15 184K630B12L4 BULK	
0.0015	K00	2.5	6.0	10.0	60	MMK7.5 152K630K00L4 BULK	0.22	B14	9.5	17.5	18.0	25	MMK15 224K630B14L4 BULK	
0.0018	K00	2.5	6.0	10.0	60	MMK7.5 182K630K00L4 BULK	<b>LEAD SPACING 22.5 MM</b>							
0.0022	K00	2.5	6.0	10.0	60	MMK7.5 222K630K00L4 BULK	0.082	D13	6.5	14.5	26.0	12	MMK22.5 823K630D13L4 TRAY	
0.0027	K00	2.5	6.0	10.0	60	MMK7.5 272K630K00L4 BULK	0.10	D13	6.5	14.5	26.0	12	MMK22.5 104K630D13L4 TRAY	
0.0033	K00	2.5	6.0	10.0	60	MMK7.5 332K630K00L4 BULK	0.12	D13	6.5	14.5	26.0	12	MMK22.5 124K630D13L4 TRAY	
0.0039	K00	2.5	6.0	10.0	60	MMK7.5 392K630K00L4 BULK	0.15	D13	6.5	14.5	26.0	12	MMK22.5 154K630D13L4 TRAY	
0.0047	K01	4.0	8.0	10.0	60	MMK7.5 472K630K01L4 BULK	0.18	D17	7.0	16.5	26.0	12	MMK22.5 184K630D17L4 TRAY	
0.0056	K01	4.0	8.0	10.0	60	MMK7.5 562K630K01L4 BULK	0.22	D17	7.0	16.5	26.0	12	MMK22.5 224K630D17L4 TRAY	
0.0068	K01	4.0	8.0	10.0	60	MMK7.5 682K630K01L4 BULK	0.27	D14	8.0	16.0	26.0	12	MMK22.5 274K630D14L4 TRAY	
0.0082	K01	4.0	8.0	10.0	60	MMK7.5 822K630K01L4 BULK	0.33	D15	9.0	18.5	26.0	12	MMK22.5 334K630D15L4 TRAY	
0.010	K01	4.0	8.0	10.0	60	MMK7.5 103K630K01L4 BULK	0.39	D18	10.5	19.0	26.0	12	MMK22.5 394K630D18L4 TRAY	
0.012	K01	4.0	8.0	10.0	60	MMK7.5 123K630K01L4 BULK	0.47	D16	11.0	21.5	26.0	12	MMK22.5 474K630D16L4 TRAY	
0.015	K03	5.0	11.0	10.0	60	MMK7.5 153K630K03L4 BULK	0.56	D20	13.5	23.0	26.0	12	MMK22.5 564K630D20L4 TRAY	
0.018	K03	5.0	11.0	10.0	60	MMK7.5 183K630K03L4 BULK	0.68	D20	13.5	23.0	26.0	12	MMK22.5 684K630D20L4 TRAY	
0.022	K03	5.0	11.0	10.0	60	MMK7.5 223K630K03L4 BULK	0.82	D19	15.5	24.5	26.0	12	MMK22.5 824K630D19L4 TRAY	
0.027	K03	5.0	11.0	10.0	60	MMK7.5 273K630K03L4 BULK	<b>LEAD SPACING 27.5 MM</b>							
0.033	K04	6.0	12.0	10.5	60	MMK7.5 333K630K04L4 BULK	0.33	F11	10.5	20.5	31.5	10	MMK27.5 334K630F11L4 TRAY	
0.039	K04	6.0	12.0	10.5	60	MMK7.5 393K630K04L4 BULK	0.39	F11	10.5	20.5	31.5	10	MMK27.5 394K630F11L4 TRAY	
<b>LEAD SPACING 10 MM</b>							0.47	F11	10.5	20.5	31.5	10	MMK27.5 474K630F11L4 TRAY	
0.0010	A01	4.0	9.0	13.0	40	MMK10 102K630A01L4 BULK	0.56	F11	10.5	20.5	31.5	10	MMK27.5 564K630F11L4 TRAY	
0.0012	A01	4.0	9.0	13.0	40	MMK10 122K630A01L4 BULK	0.56	F17	21.0	12.5	31.5	10	MMK27.5 564K630F17L4 TRAY	
0.0015	A01	4.0	9.0	13.0	40	MMK10 152K630A01L4 BULK	0.68	F12	11.5	22.5	31.5	10	MMK27.5 684K630F12L4 TRAY	
0.0018	A01	4.0	9.0	13.0	40	MMK10 182K630A01L4 BULK	0.82	F03	13.5	23.0	31.5	10	MMK27.5 824K630F03L4 TRAY	
0.0022	A01	4.0	9.0	13.0	40	MMK10 222K630A01L4 BULK	1.0	F13	14.5	24.5	31.5	10	MMK27.5 105K630F13L4 TRAY	
0.0027	A01	4.0	9.0	13.0	40	MMK10 272K630A01L4 BULK	1.2	F14	17.5	28.0	31.5	10	MMK27.5 125K630F14L4 TRAY	
0.0033	A01	4.0	9.0	13.0	40	MMK10 332K630A01L4 BULK	1.5	F14	17.5	28.0	31.5	10	MMK27.5 155K630F14L4 TRAY	
0.0039	A01	4.0	9.0	13.0	40	MMK10 392K630A01L4 BULK	1.5	F19	27.5	16.0	31.5	10	MMK27.5 155K630F19L4 TRAY	
0.0047	A01	4.0	9.0	13.0	40	MMK10 472K630A01L4 BULK	1.8	F15	19.0	29.0	31.5	10	MMK27.5 185K630F15L4 TRAY	
0.0056	A01	4.0	9.0	13.0	40	MMK10 562K630A01L4 BULK	2.2	F16	21.0	30.0	31.5	10	MMK27.5 225K630F16L4 TRAY	
0.0068	A01	4.0	9.0	13.0	40	MMK10 682K630A01L4 BULK	2.2	F18	31.0	19.0	31.5	10	MMK27.5 225K630F18L4 TRAY	
0.0078	A01	4.0	9.0	13.0	40	MMK10 782K630A01L4 BULK	<b>LEAD SPACING 37.5 MM</b>							
0.0082	A01	4.0	9.0	13.0	40	MMK10 822K630A01L4 BULK	0.82	R05	13.0	24.0	41.0	8	MMK37.5 824K630R05L4 TRAY	
0.010	A01	4.0	9.0	13.0	40	MMK10 103K630A01L4 BULK	1.0	R05	13.0	24.0	41.0	8	MMK37.5 105K630R05L4 TRAY	
0.012	A01	4.0	9.0	13.0	40	MMK10 123K630A01L4 BULK	1.2	R05	13.0	24.0	41.0	8	MMK37.5 125K630R05L4 TRAY	
0.015	A01	4.0	9.0	13.0	40	MMK10 153K630A01L4 BULK	1.5	R04	15.0	26.0	41.0	8	MMK37.5 155K630R04L4 TRAY	
0.018	A01	4.0	9.0	13.0	40	MMK10 183K630A01L4 BULK	1.8	R04	15.0	26.0	41.0	8	MMK37.5 185K630R04L4 TRAY	
0.022	A01	4.0	9.0	13.0	40	MMK10 223K630A01L4 BULK	2.2	R02	16.5	32.0	41.0	8	MMK37.5 225K630R02L4 TRAY	
0.027	A02	4.5	10.5	13.0	40	MMK10 273K630A02L4 BULK	2.7	R03	19.0	36.0	41.0	8	MMK37.5 275K630R03L4 TRAY	
0.033	A02	4.5	10.5	13.0	40	MMK10 333K630A02L4 BULK	3.3	R03	19.0	36.0	41.0	8	MMK37.5 335K630R03L4 TRAY	
0.039	A03	5.0	11.0	13.0	40	MMK10 393K630A03L4 BULK	3.9	R06	21.0	38.0	41.0	8	MMK37.5 395K630R06L4 TRAY	
0.047	A04	6.0	12.0	13.0	40	MMK10 473K630A04L4 BULK	4.7	R06	21.0	38.0	41.0	8	MMK37.5 475K630R06L4 TRAY	
0.056	A04	6.0	12.0	13.0	40	MMK10 563K630A04L4 BULK	5.6	R08	28.0	43.0	41.0	8	MMK37.5 565K630R08L4 TRAY	
<b>LEAD SPACING 15 MM</b>							6.8	R08	28.0	43.0	41.0	8	MMK37.5 685K630R08L4 TRAY	
0.027	B04	5.5	10.5	18.0	25	MMK15 273K630B04L4 BULK								
0.033	B04	5.5	10.5	18.0	25	MMK15 333K630B04L4 BULK								
0.039	B04	5.5	10.5	18.0	25	MMK15 393K630B04L4 BULK								
0.047	B04	5.5	10.5	18.0	25	MMK15 473K630B04L4 BULK								
0.056	B04	5.5	10.5	18.0	25	MMK15 563K630B04L4 BULK								
0.068	B05	5.5	12.5	18.0	25	MMK15 683K630B05L4 BULK								
0.082	B10	6.5	12.5	18.0	25	MMK15 823K630B10L4 BULK								
0.10	B10	6.5	12.5	18.0	25	MMK15 104K630B10L4 BULK								
0.12	B06	7.5	14.5	18.0	25	MMK15 124K630B06L4 BULK								

