MMK

RoHS Compliant

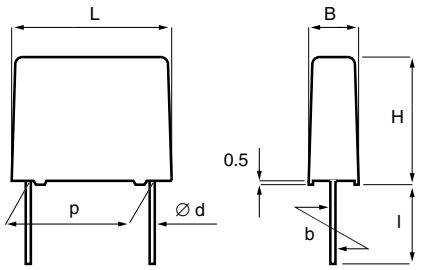
- Metallized polyester
- According to CECC 30401-042, IEC 60384-2, DIN 44122

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.



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

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, µF	0.001 –10.0	0.001 –82	0.001 –82	0.001 –39	0.001 –18	0.001 –6.8	0.001 –4.7

Capacitance tolerance
±20%, ±10% standard, ±5%.

Category temperature range
–55 ... +100°C

Voltage derating
Above +85°C DC and AC voltage derating is 1.25%/°C.

Rated temperature
+85°C

Climatic category
IEC 60068-1, 55/100/56
DIN 40040, FME
–55 ... +100°C
Average relative humidity ≤ 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 x U_R VDC for 2s

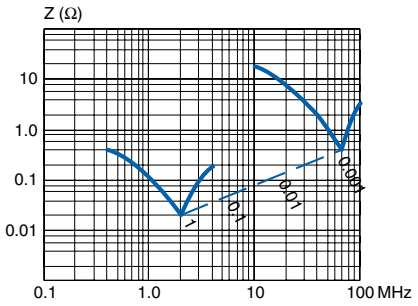
Capacitance drift
Max. 2% after a 2 year storage period at a temperature of +10 ... +40°C and a relative humidity of 40...60%.

Reliability
Operational life > 200 000 h.
Failure rate < 3 FIT, T = +40°C, U = 0.5 x U_R.
Failure criteria according to DIN 44122.

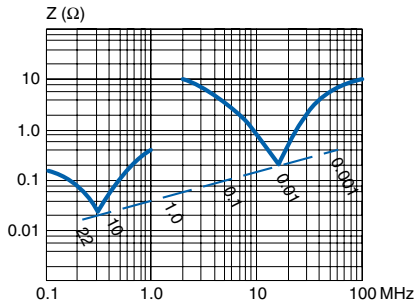
Maximum pulse steepness:
dU/dt according to article table. For peak to peak voltages lower than rated voltage (U_{PP} < U_R), the specified dU/dt can be multiplied by the factor U_R/U_{PP}.

Temperature coefficient
+400 (±200) ppm/°C at 1 kHz

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



Resonance frequencies MMK 5



Resonance frequencies MMK7.5 ... 37.5

ENVIRONMENTAL TEST DATA

Damp heat test	**Test conditions:**	T = +40°C, RH = 93%, t = 56 days.
	Test criteria:	Δ C/C ≤ ±5%, Δ tanδ ≤ 0.005 (1kHz), IR after test 0.5 x IR min.
Endurance test	**Test conditions:**	T = +100°C, U = 1.25 x (0.8 x U_R),
	Test criteria:	t = 2000 h. Δ C/C ≤ ±5%, Δ tanδ ≤ 0.005 (1kHz) Δ tanδ ≤ 0.010 (100kHz) IR after test 0.5 x 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
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
$U_R \leq 100V$	15000 MΩ	5000 s
$U_R > 100V$	30000 MΩ	10000 s

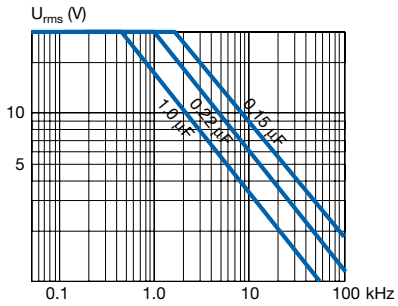
ORDERING INFORMATION

See article table and pages 11 to 15 for options and article code construction.

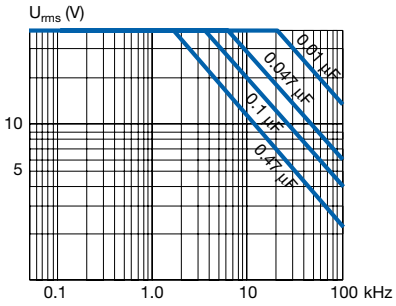
MARKING

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

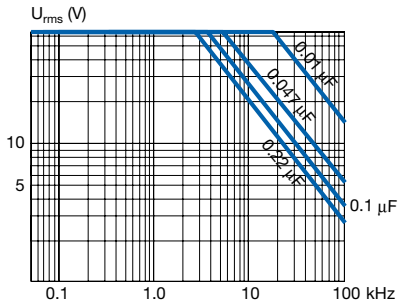
RATED AC VOLTAGE VS. FREQUENCY



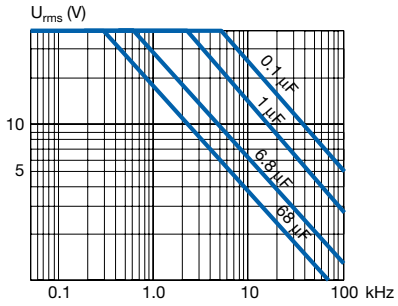
MMK5 50/30



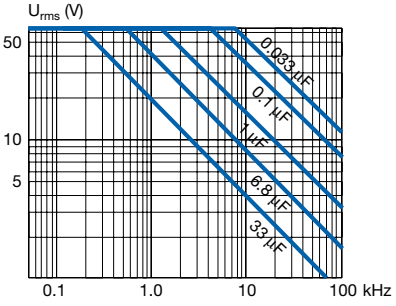
MMK5 63/40



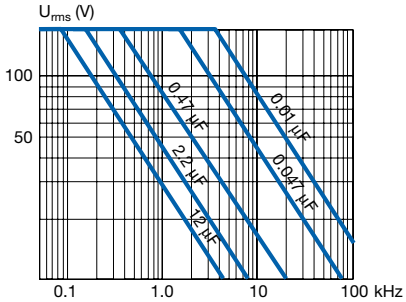
MMK5 100/63



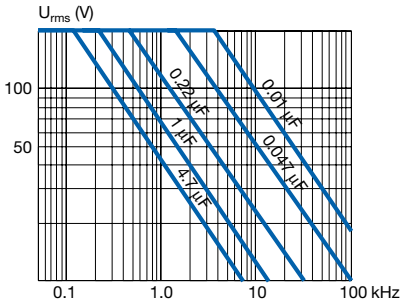
MMK7.5 ... 37.5 63/40



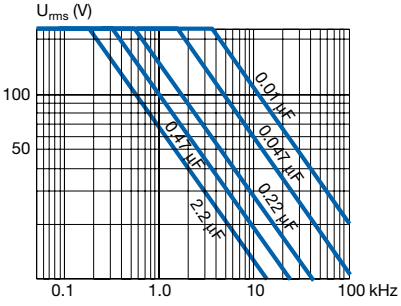
MMK7.5 ... 37.5 100/63



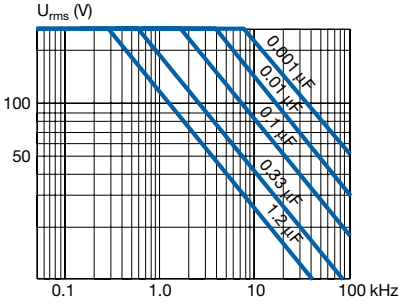
MMK7.5 ... 37.5 250/160



MMK7.5 ... 37.5 400/200



MMK7.5 ... 37.5 630/220



MMK7.5 ... 37.5 1000/250

ARTICLE TABLE

50 VDC/30 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	J01	2.5	6.5	7.2	12	MMK5 102K50J01L4 BULK
0.0012	J01	2.5	6.5	7.2	12	MMK5 122K50J01L4 BULK
0.0015	J01	2.5	6.5	7.2	12	MMK5 152K50J01L4 BULK
0.0018	J01	2.5	6.5	7.2	12	MMK5 182K50J01L4 BULK
0.0022	J01	2.5	6.5	7.2	12	MMK5 222K50J01L4 BULK
0.0027	J01	2.5	6.5	7.2	12	MMK5 272K50J01L4 BULK
0.0033	J01	2.5	6.5	7.2	12	MMK5 332K50J01L4 BULK
0.0039	J01	2.5	6.5	7.2	12	MMK5 392K50J01L4 BULK
0.0047	J01	2.5	6.5	7.2	12	MMK5 472K50J01L4 BULK
0.0056	J01	2.5	6.5	7.2	12	MMK5 562K50J01L4 BULK
0.0068	J01	2.5	6.5	7.2	12	MMK5 682K50J01L4 BULK
0.0082	J01	2.5	6.5	7.2	12	MMK5 822K50J01L4 BULK
0.010	J01	2.5	6.5	7.2	12	MMK5 103K50J01L4 BULK
0.012	J01	2.5	6.5	7.2	12	MMK5 123K50J01L4 BULK
0.015	J01	2.5	6.5	7.2	12	MMK5 153K50J01L4 BULK
0.018	J01	2.5	6.5	7.2	12	MMK5 183K50J01L4 BULK
0.022	J01	2.5	6.5	7.2	12	MMK5 223K50J01L4 BULK
0.027	J01	2.5	6.5	7.2	12	MMK5 273K50J01L4 BULK
0.033	J01	2.5	6.5	7.2	12	MMK5 333K50J01L4 BULK
0.039	J01	2.5	6.5	7.2	12	MMK5 393K50J01L4 BULK
0.047	J01	2.5	6.5	7.2	12	MMK5 473K50J01L4 BULK
0.056	J01	2.5	6.5	7.2	12	MMK5 563K50J01L4 BULK
0.068	J01	2.5	6.5	7.2	12	MMK5 683K50J01L4 BULK
0.082	J01	2.5	6.5	7.2	12	MMK5 823K50J01L4 BULK
0.10	J01	2.5	6.5	7.2	12	MMK5 104K50J01L4 BULK
0.12	J01	2.5	6.5	7.2	12	MMK5 124K50J01L4 BULK
0.15	J01	2.5	6.5	7.2	12	MMK5 154K50J01L4 BULK
0.18	J01	2.5	6.5	7.2	12	MMK5 184K50J01L4 BULK
0.22	J01	2.5	6.5	7.2	12	MMK5 224K50J01L4 BULK
0.27	J01	2.5	6.5	7.2	12	MMK5 274K50J01L4 BULK
0.33	J01	2.5	6.5	7.2	12	MMK5 334K50J01L4 BULK
0.39	J01	2.5	6.5	7.2	12	MMK5 394K50J01L4 BULK
0.47	J01	2.5	6.5	7.2	12	MMK5 474K50J01L4 BULK
0.56	J02	3.5	8.0	7.2	12	MMK5 564K50J02L4 BULK
0.68	J02	3.5	8.0	7.2	12	MMK5 684K50J02L4 BULK
0.82	J02	3.5	8.0	7.2	12	MMK5 824K50J02L4 BULK
1.0	J02	3.5	8.0	7.2	12	MMK5 105K50J02L4 BULK
1.2	J03	4.5	9.0	7.2	12	MMK5 125K50J03L4 BULK
1.5	J03	4.5	9.0	7.2	12	MMK5 155K50J03L4 BULK
1.8	J04	5.0	10.0	7.2	12	MMK5 185K50J04L4 BULK
2.2	J04	5.0	10.0	7.2	12	MMK5 225K50J04L4 BULK
2.7	J05	6.0	11.0	7.2	12	MMK5 275K50J05L4 BULK
3.3	J05	6.0	11.0	7.2	12	MMK5 335K50J05L4 BULK
3.9	J06	7.2	13.0	7.2	12	MMK5 395K50J06L4 BULK
4.7	J06	7.2	13.0	7.2	12	MMK5 475K50J06L4 BULK
5.6	J06	7.2	13.0	7.2	12	MMK5 565K50J06L4 BULK
6.0	J06	7.2	13.0	7.2	12	MMK5 605K50J06L4 BULK

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	K00	2.5	6.0	10.0	5	MMK7,5 102K50K00L4 BULK
0.0012	K00	2.5	6.0	10.0	5	MMK7,5 122K50K00L4 BULK
0.0015	K00	2.5	6.0	10.0	5	MMK7,5 152K50K00L4 BULK
0.0018	K00	2.5	6.0	10.0	5	MMK7,5 182K50K00L4 BULK
0.0022	K00	2.5	6.0	10.0	5	MMK7,5 222K50K00L4 BULK
0.0027	K00	2.5	6.0	10.0	5	MMK7,5 272K50K00L4 BULK
0.0033	K00	2.5	6.0	10.0	5	MMK7,5 332K50K00L4 BULK
0.0039	K00	2.5	6.0	10.0	5	MMK7,5 392K50K00L4 BULK
0.0047	K00	2.5	6.0	10.0	5	MMK7,5 472K50K00L4 BULK
0.0056	K00	2.5	6.0	10.0	5	MMK7,5 562K50K00L4 BULK

50 VDC/30 VAC

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0068	K00	2.5	6.0	10.0	5	MMK7,5 682K50K00L4 BULK
0.0082	K00	2.5	6.0	10.0	5	MMK7,5 822K50K00L4 BULK
0.010	K00	2.5	6.0	10.0	5	MMK7,5 103K50K00L4 BULK
0.012	K00	2.5	6.0	10.0	5	MMK7,5 123K50K00L4 BULK
0.015	K00	2.5	6.0	10.0	5	MMK7,5 153K50K00L4 BULK
0.018	K00	2.5	6.0	10.0	5	MMK7,5 183K50K00L4 BULK
0.022	K00	2.5	6.0	10.0	5	MMK7,5 223K50K00L4 BULK
0.027	K00	2.5	6.0	10.0	5	MMK7,5 273K50K00L4 BULK
0.033	K00	2.5	6.0	10.0	5	MMK7,5 333K50K00L4 BULK
0.039	K00	2.5	6.0	10.0	5	MMK7,5 393K50K00L4 BULK
0.047	K00	2.5	6.0	10.0	5	MMK7,5 473K50K00L4 BULK
0.056	K00	2.5	6.0	10.0	5	MMK7,5 563K50K00L4 BULK
0.068	K00	2.5	6.0	10.0	5	MMK7,5 683K50K00L4 BULK
0.082	K00	2.5	6.0	10.0	5	MMK7,5 823K50K00L4 BULK
0.10	K00	2.5	6.0	10.0	5	MMK7,5 104K50K00L4 BULK
0.12	K00	2.5	6.0	10.0	5	MMK7,5 124K50K00L4 BULK
0.15	K00	2.5	6.0	10.0	5	MMK7,5 154K50K00L4 BULK
0.18	K00	2.5	6.0	10.0	5	MMK7,5 184K50K00L4 BULK
0.22	K00	2.5	6.0	10.0	5	MMK7,5 224K50K00L4 BULK
0.27	K00	2.5	6.0	10.0	5	MMK7,5 274K50K00L4 BULK
0.33	K00	2.5	6.0	10.0	5	MMK7,5 334K50K00L4 BULK
0.39	K01	4.0	8.0	10.0	5	MMK7,5 394K50K01L4 BULK
0.47	K01	4.0	8.0	10.0	5	MMK7,5 474K50K01L4 BULK
0.56	K01	4.0	8.0	10.0	5	MMK7,5 564K50K01L4 BULK
0.68	K01	4.0	8.0	10.0	5	MMK7,5 684K50K01L4 BULK
0.82	K01	4.0	8.0	10.0	5	MMK7,5 824K50K01L4 BULK
1.0	K01	4.0	8.0	10.0	5	MMK7,5 105K50K01L4 BULK
1.2	K03	5.0	11.0	10.0	5	MMK7,5 125K50K03L4 BULK
1.5	K03	5.0	11.0	10.0	5	MMK7,5 155K50K03L4 BULK
1.8	K03	5.0	11.0	10.0	5	MMK7,5 185K50K03L4 BULK
2.2	K04	6.0	12.0	10.5	5	MMK7,5 225K50K04L4 BULK
2.7	K04	6.0	12.0	10.5	5	MMK7,5 275K50K04L4 BULK
3.3	K04	6.0	12.0	10.5	5	MMK7,5 335K50K04L4 BULK

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
1.0	A01	4.0	9.0	13.0	4	MMK10 105K50A01L4 BULK
1.2	A01	4.0	9.0	13.0	4	MMK10 125K50A01L4 BULK
1.5	A02	4.5	10.5	13.0	4	MMK10 155K50A02L4 BULK
1.8	A03	5.0	11.0	13.0	4	MMK10 185K50A03L4 BULK
2.2	A03	5.0	11.0	13.0	4	MMK10 225K50A03L4 BULK
2.7	A04	6.0	12.0	13.0	4	MMK10 275K50A04L4 BULK

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
2.0	B04	5.5	10.5	18.0	3	MMK15 205K50B04L4 BULK
2.2	B04	5.5	10.5	18.0	3	MMK15 225K50B04L4 BULK
2.7	B05	5.5	12.5	18.0	3	MMK15 275K50B05L4 BULK
3.3	B05	5.5	12.5	18.0	3	MMK15 335K50B05L4 BULK
3.9	B10	6.5	12.5	18.0	3	MMK15 395K50B10L4 BULK
4.7	B06	7.5	14.5	18.0	3	MMK15 475K50B06L4 BULK
5.6	B06	7.5	14.5	18.0	3	MMK15 565K50B06L4 BULK
6.8	B12	8.0	15.0	18.0	3	MMK15 685K50B12L4 BULK
8.2	B11	8.5	16.0	18.0	3	MMK15 825K50B11L4 BULK
10.0	B14	9.5	17.5	18.0	3	MMK15 106K50B14L4 BULK

ARTICLE TABLE

63 VDC/40 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	J01	2.5	6.5	7.2	25	MMK5 102K63J01L4 BULK
0.0012	J01	2.5	6.5	7.2	25	MMK5 122K63J01L4 BULK
0.0015	J01	2.5	6.5	7.2	25	MMK5 152K63J01L4 BULK
0.0018	J01	2.5	6.5	7.2	25	MMK5 182K63J01L4 BULK
0.0022	J01	2.5	6.5	7.2	25	MMK5 222K63J01L4 BULK
0.0027	J01	2.5	6.5	7.2	25	MMK5 272K63J01L4 BULK
0.0033	J01	2.5	6.5	7.2	25	MMK5 332K63J01L4 BULK
0.0039	J01	2.5	6.5	7.2	25	MMK5 392K63J01L4 BULK
0.0047	J01	2.5	6.5	7.2	25	MMK5 472K63J01L4 BULK
0.0056	J01	2.5	6.5	7.2	25	MMK5 562K63J01L4 BULK
0.0068	J01	2.5	6.5	7.2	25	MMK5 682K63J01L4 BULK
0.0082	J01	2.5	6.5	7.2	25	MMK5 822K63J01L4 BULK
0.010	J01	2.5	6.5	7.2	25	MMK5 103K63J01L4 BULK
0.012	J01	2.5	6.5	7.2	25	MMK5 123K63J01L4 BULK
0.015	J01	2.5	6.5	7.2	25	MMK5 153K63J01L4 BULK
0.018	J01	2.5	6.5	7.2	25	MMK5 183K63J01L4 BULK
0.022	J01	2.5	6.5	7.2	25	MMK5 223K63J01L4 BULK
0.027	J01	2.5	6.5	7.2	25	MMK5 273K63J01L4 BULK
0.033	J01	2.5	6.5	7.2	25	MMK5 333K63J01L4 BULK
0.039	J01	2.5	6.5	7.2	25	MMK5 393K63J01L4 BULK
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0.056	J01	2.5	6.5	7.2	25	MMK5 563K63J01L4 BULK
0.068	J01	2.5	6.5	7.2	25	MMK5 683K63J01L4 BULK
0.082	J01	2.5	6.5	7.2	25	MMK5 823K63J01L4 BULK
0.10	J01	2.5	6.5	7.2	25	MMK5 104K63J01L4 BULK
0.12	J01	2.5	6.5	7.2	25	MMK5 124K63J01L4 BULK
0.15	J01	2.5	6.5	7.2	25	MMK5 154K63J01L4 BULK
0.18	J01	2.5	6.5	7.2	25	MMK5 184K63J01L4 BULK
0.22	J01	2.5	6.5	7.2	25	MMK5 224K63J01L4 BULK
0.27	J02	3.5	8.0	7.2	25	MMK5 274K63J02L4 BULK
0.33	J02	3.5	8.0	7.2	25	MMK5 334K63J02L4 BULK
0.39	J02	3.5	8.0	7.2	25	MMK5 394K63J02L4 BULK
0.47	J02	3.5	8.0	7.2	25	MMK5 474K63J02L4 BULK
0.56	J03	4.5	9.0	7.2	25	MMK5 564K63J03L4 BULK
0.68	J03	4.5	9.0	7.2	25	MMK5 684K63J03L4 BULK
0.82	J04	5.0	10.0	7.2	25	MMK5 824K63J04L4 BULK
1.0	J04	5.0	10.0	7.2	25	MMK5 105K63J04L4 BULK
1.2	J05	6.0	11.0	7.2	25	MMK5 125K63J05L4 BULK
1.5	J05	6.0	11.0	7.2	25	MMK5 155K63J05L4 BULK
1.8	J06	7.2	13.0	7.2	25	MMK5 185K63J06L4 BULK
2.2	J06	7.2	13.0	7.2	25	MMK5 225K63J06L4 BULK

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	K00	2.5	6.0	10.0	10	MMK7,5 102K63K00L4 BULK
0.0012	K00	2.5	6.0	10.0	10	MMK7,5 122K63K00L4 BULK
0.0015	K00	2.5	6.0	10.0	10	MMK7,5 152K63K00L4 BULK
0.0018	K00	2.5	6.0	10.0	10	MMK7,5 182K63K00L4 BULK
0.0022	K00	2.5	6.0	10.0	10	MMK7,5 222K63K00L4 BULK
0.0027	K00	2.5	6.0	10.0	10	MMK7,5 272K63K00L4 BULK
0.0033	K00	2.5	6.0	10.0	10	MMK7,5 332K63K00L4 BULK
0.0039	K00	2.5	6.0	10.0	10	MMK7,5 392K63K00L4 BULK
0.0047	K00	2.5	6.0	10.0	10	MMK7,5 472K63K00L4 BULK
0.0056	K00	2.5	6.0	10.0	10	MMK7,5 562K63K00L4 BULK
0.0068	K00	2.5	6.0	10.0	10	MMK7,5 682K63K00L4 BULK
0.0082	K00	2.5	6.0	10.0	10	MMK7,5 822K63K00L4 BULK
0.010	K00	2.5	6.0	10.0	10	MMK7,5 103K63K00L4 BULK
0.012	K00	2.5	6.0	10.0	10	MMK7,5 123K63K00L4 BULK
0.015	K00	2.5	6.0	10.0	10	MMK7,5 153K63K00L4 BULK
0.018	K00	2.5	6.0	10.0	10	MMK7,5 183K63K00L4 BULK

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LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.022	K00	2.5	6.0	10.0	10	MMK7,5 223K63K00L4 BULK
0.027	K00	2.5	6.0	10.0	10	MMK7,5 273K63K00L4 BULK
0.033	K00	2.5	6.0	10.0	10	MMK7,5 333K63K00L4 BULK
0.039	K00	2.5	6.0	10.0	10	MMK7,5 393K63K00L4 BULK
0.047	K00	2.5	6.0	10.0	10	MMK7,5 473K63K00L4 BULK
0.056	K00	2.5	6.0	10.0	10	MMK7,5 563K63K00L4 BULK
0.068	K00	2.5	6.0	10.0	10	MMK7,5 683K63K00L4 BULK
0.082	K00	2.5	6.0	10.0	10	MMK7,5 823K63K00L4 BULK
0.10	K00	2.5	6.0	10.0	10	MMK7,5 104K63K00L4 BULK
0.12	K00	2.5	6.0	10.0	10	MMK7,5 124K63K00L4 BULK
0.15	K00	2.5	6.0	10.0	10	MMK7,5 154K63K00L4 BULK
0.18	K00	2.5	6.0	10.0	10	MMK7,5 184K63K00L4 BULK
0.22	K01	4.0	8.0	10.0	10	MMK7,5 224K63K01L4 BULK
0.27	K01	4.0	8.0	10.0	10	MMK7,5 274K63K01L4 BULK
0.33	K01	4.0	8.0	10.0	10	MMK7,5 334K63K01L4 BULK
0.39	K01	4.0	8.0	10.0	10	MMK7,5 394K63K01L4 BULK
0.47	K01	4.0	8.0	10.0	10	MMK7,5 474K63K01L4 BULK
0.56	K03	5.0	11.0	10.0	10	MMK7,5 564K63K03L4 BULK
0.68	K03	5.0	11.0	10.0	10	MMK7,5 684K63K03L4 BULK
0.82	K03	5.0	11.0	10.0	10	MMK7,5 824K63K03L4 BULK
1.0	K03	5.0	11.0	10.0	10	MMK7,5 105K63K03L4 BULK
1.2	K04	6.0	12.0	10.5	10	MMK7,5 125K63K04L4 BULK
1.5	K04	6.0	12.0	10.5	10	MMK7,5 155K63K04L4 BULK

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	A01	4.0	9.0	13.0	8	MMK10 102K63A01L4 BULK
0.0012	A01	4.0	9.0	13.0	8	MMK10 122K63A01L4 BULK
0.0015	A01	4.0	9.0	13.0	8	MMK10 152K63A01L4 BULK
0.0018	A01	4.0	9.0	13.0	8	MMK10 182K63A01L4 BULK
0.0022	A01	4.0	9.0	13.0	8	MMK10 222K63A01L4 BULK
0.0027	A01	4.0	9.0	13.0	8	MMK10 272K63A01L4 BULK
0.0033	A01	4.0	9.0	13.0	8	MMK10 332K63A01L4 BULK
0.0039	A01	4.0	9.0	13.0	8	MMK10 392K63A01L4 BULK
0.0047	A01	4.0	9.0	13.0	8	MMK10 472K63A01L4 BULK
0.0056	A01	4.0	9.0	13.0	8	MMK10 562K63A01L4 BULK
0.0068	A01	4.0	9.0	13.0	8	MMK10 682K63A01L4 BULK
0.0078	A01	4.0	9.0	13.0	8	MMK10 782K63A01L4 BULK
0.0082	A01	4.0	9.0	13.0	8	MMK10 822K63A01L4 BULK
0.010	A01	4.0	9.0	13.0	8	MMK10 103K63A01L4 BULK
0.012	A01	4.0	9.0	13.0	8	MMK10 123K63A01L4 BULK
0.015	A01	4.0	9.0	13.0	8	MMK10 153K63A01L4 BULK
0.018	A01	4.0	9.0	13.0	8	MMK10 183K63A01L4 BULK
0.022	A01	4.0	9.0	13.0	8	MMK10 223K63A01L4 BULK
0.027	A01	4.0	9.0	13.0	8	MMK10 273K63A01L4 BULK
0.033	A01	4.0	9.0	13.0	8	MMK10 333K63A01L4 BULK
0.039	A01	4.0	9.0	13.0	8	MMK10 393K63A01L4 BULK
0.047	A01	4.0	9.0	13.0	8	MMK10 473K63A01L4 BULK
0.056	A01	4.0	9.0	13.0	8	MMK10 563K63A01L4 BULK
0.068	A01	4.0	9.0	13.0	8	MMK10 683K63A01L4 BULK
0.082	A01	4.0	9.0	13.0	8	MMK10 823K63A01L4 BULK
0.10	A01	4.0	9.0	13.0	8	MMK10 104K63A01L4 BULK
0.12	A01	4.0	9.0	13.0	8	MMK10 124K63A01L4 BULK
0.15	A01	4.0	9.0	13.0	8	MMK10 154K63A01L4 BULK
0.18	A01	4.0	9.0	13.0	8	MMK10 184K63A01L4 BULK
0.22	A01	4.0	9.0	13.0	8	MMK10 224K63A01L4 BULK
0.27	A01	4.0	9.0	13.0	8	MMK10 274K63A01L4 BULK
0.33	A01	4.0	9.0	13.0	8	MMK10 334K63A01L4 BULK
0.39	A01	4.0	9.0	13.0	8	MMK10 394K63A01L4 BULK
0.47	A01	4.0	9.0	13.0	8	MMK10 474K63A01L4 BULK

ARTICLE TABLE

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LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.56	A01	4.0	9.0	13.0	8	MMK10 564K63A01L4 BULK
0.68	A01	4.0	9.0	13.0	8	MMK10 684K63A01L4 BULK
0.82	A01	4.0	9.0	13.0	8	MMK10 824K63A01L4 BULK
1.0	A02	4.5	10.5	13.0	8	MMK10 105K63A02L4 BULK
1.2	A02	4.5	10.5	13.0	8	MMK10 125K63A02L4 BULK
1.5	A03	5.0	11.0	13.0	8	MMK10 155K63A03L4 BULK
1.8	A04	6.0	12.0	13.0	8	MMK10 185K63A04L4 BULK
2.2	A04	6.0	12.0	13.0	8	MMK10 225K63A04L4 BULK

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.68	B04	5.5	10.5	18.0	5	MMK15 684K63B04L4 BULK
0.82	B04	5.5	10.5	18.0	5	MMK15 824K63B04L4 BULK
1.0	B04	5.5	10.5	18.0	5	MMK15 105K63B04L4 BULK
1.2	B04	5.5	10.5	18.0	5	MMK15 125K63B04L4 BULK
1.5	B04	5.5	10.5	18.0	5	MMK15 155K63B04L4 BULK
1.8	B04	5.5	10.5	18.0	5	MMK15 185K63B04L4 BULK
2.0	B05	5.5	12.5	18.0	5	MMK15 205K63B05L4 BULK
2.2	B05	5.5	12.5	18.0	5	MMK15 225K63B05L4 BULK
2.7	B10	6.5	12.5	18.0	5	MMK15 275K63B10L4 BULK
3.3	B10	6.5	12.5	18.0	5	MMK15 335K63B10L4 BULK
3.9	B06	7.5	14.5	18.0	5	MMK15 395K63B06L4 BULK
4.7	B06	7.5	14.5	18.0	5	MMK15 475K63B06L4 BULK
5.6	B11	8.5	16.0	18.0	5	MMK15 565K63B11L4 BULK
6.8	B14	9.5	17.5	18.0	5	MMK15 685K63B14L4 BULK

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
3.3	D13	6.5	14.5	26.0	3	MMK22,5 335K63D13L4 TRAY
3.9	D13	6.5	14.5	26.0	3	MMK22,5 395K63D13L4 TRAY
4.7	D13	6.5	14.5	26.0	3	MMK22,5 475K63D13L4 TRAY
5.6	D17	7.0	16.5	26.0	3	MMK22,5 565K63D17L4 TRAY
6.8	D17	7.0	16.5	26.0	3	MMK22,5 685K63D17L4 TRAY
8.2	D14	8.0	16.0	26.0	3	MMK22,5 825K63D14L4 TRAY
10	D15	9.0	18.5	26.0	3	MMK22,5 106K63D15L4 TRAY
12	D18	10.5	19.0	26.0	3	MMK22,5 126K63D18L4 TRAY
15	D16	11.0	21.5	26.0	3	MMK22,5 156K63D16L4 TRAY
18	D20	13.5	23.0	26.0	3	MMK22,5 186K63D20L4 TRAY
22	D19	15.5	24.5	26.0	3	MMK22,5 226K63D19L4 TRAY

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
8.2	F11	10.5	20.5	31.5	2	MMK27,5 825K63F11L4 TRAY
10	F11	10.5	20.5	31.5	2	MMK27,5 106K63F11L4 TRAY
12	F11	10.5	20.5	31.5	2	MMK27,5 126K63F11L4 TRAY
15	F12	11.5	22.5	31.5	2	MMK27,5 156K63F12L4 TRAY
15	F17	21.0	12.5	31.5	2	MMK27,5 156K63F17L4 TRAY
18	F12	11.5	22.5	31.5	2	MMK27,5 186K63F12L4 TRAY
22	F13	14.5	24.5	31.5	2	MMK27,5 226K63F13L4 TRAY
27	F14	17.5	28.0	31.5	2	MMK27,5 276K63F14L4 TRAY
33	F14	17.5	28.0	31.5	2	MMK27,5 336K63F14L4 TRAY
33	F19	27.5	16.0	31.5	2	MMK27,5 336K63F19L4 TRAY
39	F15	19.0	29.0	31.5	2	MMK27,5 396K63F15L4 TRAY
47	F16	21.0	30.0	31.5	2	MMK27,5 476K63F16L4 TRAY
47	F18	31.0	19.0	31.5	2	MMK27,5 476K63F18L4 TRAY

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LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
27	R05	13.0	24.0	41.0	1	MMK37,5 276K63R05L4 TRAY
33	R04	15.0	26.0	41.0	1	MMK37,5 336K63R04L4 TRAY
39	R04	15.0	26.0	41.0	1	MMK37,5 396K63R04L4 TRAY
47	R02	16.5	32.0	41.0	1	MMK37,5 476K63R02L4 TRAY
56	R03	19.0	36.0	41.0	1	MMK37,5 566K63R03L4 TRAY
68	R03	19.0	36.0	41.0	1	MMK37,5 686K63R03L4 TRAY
82	R06	21.0	38.0	41.0	1	MMK37,5 826K63R06L4 TRAY

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LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	J01	2.5	6.5	7.2	30	MMK5 102K100J01L4 BULK
0.0012	J01	2.5	6.5	7.2	30	MMK5 122K100J01L4 BULK
0.0015	J01	2.5	6.5	7.2	30	MMK5 152K100J01L4 BULK
0.0018	J01	2.5	6.5	7.2	30	MMK5 182K100J01L4 BULK
0.0022	J01	2.5	6.5	7.2	30	MMK5 222K100J01L4 BULK
0.0027	J01	2.5	6.5	7.2	30	MMK5 272K100J01L4 BULK
0.0033	J01	2.5	6.5	7.2	30	MMK5 332K100J01L4 BULK
0.0039	J01	2.5	6.5	7.2	30	MMK5 392K100J01L4 BULK
0.0047	J01	2.5	6.5	7.2	30	MMK5 472K100J01L4 BULK
0.0056	J01	2.5	6.5	7.2	30	MMK5 562K100J01L4 BULK
0.0068	J01	2.5	6.5	7.2	30	MMK5 682K100J01L4 BULK
0.0082	J01	2.5	6.5	7.2	30	MMK5 822K100J01L4 BULK
0.010	J01	2.5	6.5	7.2	30	MMK5 103K100J01L4 BULK
0.012	J01	2.5	6.5	7.2	30	MMK5 123K100J01L4 BULK
0.015	J01	2.5	6.5	7.2	30	MMK5 153K100J01L4 BULK
0.018	J01	2.5	6.5	7.2	30	MMK5 183K100J01L4 BULK
0.022	J01	2.5	6.5	7.2	30	MMK5 223K100J01L4 BULK
0.027	J01	2.5	6.5	7.2	30	MMK5 273K100J01L4 BULK
0.033	J01	2.5	6.5	7.2	30	MMK5 333K100J01L4 BULK
0.039	J01	2.5	6.5	7.2	30	MMK5 393K100J01L4 BULK
0.047	J01	2.5	6.5	7.2	30	MMK5 473K100J01L4 BULK
0.056	J01	2.5	6.5	7.2	30	MMK5 563K100J01L4 BULK
0.068	J01	2.5	6.5	7.2	30	MMK5 683K100J01L4 BULK
0.082	J01	2.5	6.5	7.2	30	MMK5 823K100J01L4 BULK
0.10	J01	2.5	6.5	7.2	30	MMK5 104K100J01L4 BULK
0.12	J02	3.5	8.0	7.2	30	MMK5 124K100J02L4 BULK
0.15	J02	3.5	8.0	7.2	30	MMK5 154K100J02L4 BULK
0.18	J02	3.5	8.0	7.2	30	MMK5 184K100J02L4 BULK
0.22	J02	3.5	8.0	7.2	30	MMK5 224K100J02L4 BULK
0.27	J03	4.5	9.0	7.2	30	MMK5 274K100J03L4 BULK
0.33	J03	4.5	9.0	7.2	30	MMK5 334K100J03L4 BULK
0.39	J04	5.0	10.0	7.2	30	MMK5 394K100J04L4 BULK
0.47	J04	5.0	10.0	7.2	30	MMK5 474K100J04L4 BULK
0.56	J05	6.0	11.0	7.2	30	MMK5 564K100J05L4 BULK
0.68	J05	6.0	11.0	7.2	30	MMK5 684K100J05L4 BULK
0.82	J06	7.2	13.0	7.2	30	MMK5 824K100J06L4 BULK
1.0	J06	7.2	13.0	7.2	30	MMK5 105K100J06L4 BULK

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	K00	2.5	6.0	10.0	20	MMK7,5 102K100K00L4 BULK
0.0012	K00	2.5	6.0	10.0	20	MMK7,5 122K100K00L4 BULK
0.0015	K00	2.5	6.0	10.0	20	MMK7,5 152K100K00L4 BULK
0.0018	K00	2.5	6.0	10.0	20	MMK7,5 182K100K00L4 BULK
0.0022	K00	2.5	6.0	10.0	20	MMK7,5 222K100K00L4 BULK
0.0027	K00	2.5	6.0	10.0	20	MMK7,5 272K100K00L4 BULK
0.0033	K00	2.5	6.0	10.0	20	MMK7,5 332K100K00L4 BULK
0.0039	K00	2.5	6.0	10.0	20	MMK7,5 392K100K00L4 BULK
0.0047	K00	2.5	6.0	10.0	20	MMK7,5 472K100K00L4 BULK
0.0056	K00	2.5	6.0	10.0	20	MMK7,5 562K100K00L4 BULK

ARTICLE TABLE

100 VDC/63 VAC

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0068	K00	2.5	6.0	10.0	20	MMK7,5 682K100K00L4 BULK
0.0082	K00	2.5	6.0	10.0	20	MMK7,5 822K100K00L4 BULK
0.010	K00	2.5	6.0	10.0	20	MMK7,5 103K100K00L4 BULK
0.012	K00	2.5	6.0	10.0	20	MMK7,5 123K100K00L4 BULK
0.015	K00	2.5	6.0	10.0	20	MMK7,5 153K100K00L4 BULK
0.018	K00	2.5	6.0	10.0	20	MMK7,5 183K100K00L4 BULK
0.022	K00	2.5	6.0	10.0	20	MMK7,5 223K100K00L4 BULK
0.027	K00	2.5	6.0	10.0	20	MMK7,5 273K100K00L4 BULK
0.033	K00	2.5	6.0	10.0	20	MMK7,5 333K100K00L4 BULK
0.039	K00	2.5	6.0	10.0	20	MMK7,5 393K100K00L4 BULK
0.047	K00	2.5	6.0	10.0	20	MMK7,5 473K100K00L4 BULK
0.056	K00	2.5	6.0	10.0	20	MMK7,5 563K100K00L4 BULK
0.068	K00	2.5	6.0	10.0	20	MMK7,5 683K100K00L4 BULK
0.082	K00	2.5	6.0	10.0	20	MMK7,5 823K100K00L4 BULK
0.10	K00	2.5	6.0	10.0	20	MMK7,5 104K100K00L4 BULK
0.12	K01	4.0	8.0	10.0	20	MMK7,5 124K100K01L4 BULK
0.15	K01	4.0	8.0	10.0	20	MMK7,5 154K100K01L4 BULK
0.18	K01	4.0	8.0	10.0	20	MMK7,5 184K100K01L4 BULK
0.22	K01	4.0	8.0	10.0	20	MMK7,5 224K100K01L4 BULK
0.27	K01	4.0	8.0	10.0	20	MMK7,5 274K100K01L4 BULK
0.33	K03	5.0	11.0	10.0	20	MMK7,5 334K100K03L4 BULK
0.39	K03	5.0	11.0	10.0	20	MMK7,5 394K100K03L4 BULK
0.47	K03	5.0	11.0	10.0	20	MMK7,5 474K100K03L4 BULK
0.56	K03	5.0	11.0	10.0	20	MMK7,5 564K100K03L4 BULK
0.68	K03	5.0	11.0	10.0	20	MMK7,5 684K100K03L4 BULK
0.82	K04	6.0	12.0	10.5	20	MMK7,5 824K100K04L4 BULK
1.0	K04	6.0	12.0	10.5	20	MMK7,5 105K100K04L4 BULK

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	A01	4.0	9.0	13.0	12	MMK10 102K100A01L4 BULK
0.0012	A01	4.0	9.0	13.0	12	MMK10 122K100A01L4 BULK
0.0015	A01	4.0	9.0	13.0	12	MMK10 152K100A01L4 BULK
0.0018	A01	4.0	9.0	13.0	12	MMK10 182K100A01L4 BULK
0.0022	A01	4.0	9.0	13.0	12	MMK10 222K100A01L4 BULK
0.0027	A01	4.0	9.0	13.0	12	MMK10 272K100A01L4 BULK
0.0033	A01	4.0	9.0	13.0	12	MMK10 332K100A01L4 BULK
0.0039	A01	4.0	9.0	13.0	12	MMK10 392K100A01L4 BULK
0.0047	A01	4.0	9.0	13.0	12	MMK10 472K100A01L4 BULK
0.0056	A01	4.0	9.0	13.0	12	MMK10 562K100A01L4 BULK
0.0068	A01	4.0	9.0	13.0	12	MMK10 682K100A01L4 BULK
0.0078	A01	4.0	9.0	13.0	12	MMK10 782K100A01L4 BULK
0.0082	A01	4.0	9.0	13.0	12	MMK10 822K100A01L4 BULK
0.010	A01	4.0	9.0	13.0	12	MMK10 103K100A01L4 BULK
0.012	A01	4.0	9.0	13.0	12	MMK10 123K100A01L4 BULK
0.015	A01	4.0	9.0	13.0	12	MMK10 153K100A01L4 BULK
0.018	A01	4.0	9.0	13.0	12	MMK10 183K100A01L4 BULK
0.022	A01	4.0	9.0	13.0	12	MMK10 223K100A01L4 BULK
0.027	A01	4.0	9.0	13.0	12	MMK10 273K100A01L4 BULK
0.033	A01	4.0	9.0	13.0	12	MMK10 333K100A01L4 BULK
0.039	A01	4.0	9.0	13.0	12	MMK10 393K100A01L4 BULK
0.047	A01	4.0	9.0	13.0	12	MMK10 473K100A01L4 BULK
0.056	A01	4.0	9.0	13.0	12	MMK10 563K100A01L4 BULK
0.068	A01	4.0	9.0	13.0	12	MMK10 683K100A01L4 BULK
0.082	A01	4.0	9.0	13.0	12	MMK10 823K100A01L4 BULK
0.10	A01	4.0	9.0	13.0	12	MMK10 104K100A01L4 BULK
0.12	A01	4.0	9.0	13.0	12	MMK10 124K100A01L4 BULK
0.15	A01	4.0	9.0	13.0	12	MMK10 154K100A01L4 BULK
0.18	A01	4.0	9.0	13.0	12	MMK10 184K100A01L4 BULK
0.22	A01	4.0	9.0	13.0	12	MMK10 224K100A01L4 BULK
0.27	A01	4.0	9.0	13.0	12	MMK10 274K100A01L4 BULK
0.33	A01	4.0	9.0	13.0	12	MMK10 334K100A01L4 BULK

100 VDC/63 VAC

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.39	A01	4.0	9.0	13.0	12	MMK10 394K100A01L4 BULK
0.47	A01	4.0	9.0	13.0	12	MMK10 474K100A01L4 BULK
0.56	A02	4.5	10.5	13.0	12	MMK10 564K100A02L4 BULK
0.68	A02	4.5	10.5	13.0	12	MMK10 684K100A02L4 BULK
0.82	A02	4.5	10.5	13.0	12	MMK10 824K100A02L4 BULK
1.0	A04	6.0	12.0	13.0	12	MMK10 105K100A04L4 BULK

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.27	B04	5.5	10.5	18.0	8	MMK15 274K100B04L4 BULK
0.33	B04	5.5	10.5	18.0	8	MMK15 334K100B04L4 BULK
0.39	B04	5.5	10.5	18.0	8	MMK15 394K100B04L4 BULK
0.47	B04	5.5	10.5	18.0	8	MMK15 474K100B04L4 BULK
0.56	B04	5.5	10.5	18.0	8	MMK15 564K100B04L4 BULK
0.68	B04	5.5	10.5	18.0	8	MMK15 684K100B04L4 BULK
0.82	B04	5.5	10.5	18.0	8	MMK15 824K100B04L4 BULK
1.0	B04	5.5	10.5	18.0	8	MMK15 105K100B04L4 BULK
1.2	B05	5.5	12.5	18.0	8	MMK15 125K100B05L4 BULK
1.5	B10	6.5	12.5	18.0	8	MMK15 155K100B10L4 BULK
1.8	B06	7.5	14.5	18.0	8	MMK15 185K100B06L4 BULK
2.2	B06	7.5	14.5	18.0	8	MMK15 225K100B06L4 BULK
2.7	B12	8.0	15.0	18.0	8	MMK15 275K100B12L4 BULK
3.3	B11	8.5	16.0	18.0	8	MMK15 335K100B11L4 BULK
3.9	B14	9.5	17.5	18.0	8	MMK15 395K100B14L4 BULK

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
1.2	D13	6.5	14.5	26.0	5	MMK22,5 125K100D13L4 TRAY
1.5	D13	6.5	14.5	26.0	5	MMK22,5 155K100D13L4 TRAY
1.8	D13	6.5	14.5	26.0	5	MMK22,5 185K100D13L4 TRAY
2.0	D13	6.5	14.5	26.0	5	MMK22,5 205K100D13L4 TRAY
2.2	D13	6.5	14.5	26.0	5	MMK22,5 225K100D13L4 TRAY
2.7	D13	6.5	14.5	26.0	5	MMK22,5 275K100D13L4 TRAY
3.3	D17	7.0	16.5	26.0	5	MMK22,5 335K100D17L4 TRAY
3.9	D14	8.0	16.0	26.0	5	MMK22,5 395K100D14L4 TRAY
4.7	D15	9.0	18.5	26.0	5	MMK22,5 475K100D15L4 TRAY
5.6	D15	9.0	18.5	26.0	5	MMK22,5 565K100D15L4 TRAY
6.8	D18	10.5	19.0	26.0	5	MMK22,5 685K100D18L4 TRAY
8.2	D16	11.0	21.5	26.0	5	MMK22,5 825K100D16L4 TRAY
10.0	D20	13.5	23.0	26.0	5	MMK22,5 106K100D20L4 TRAY
12.0	D19	15.5	24.5	26.0	5	MMK22,5 126K100D19L4 TRAY
15.0	D19	15.5	24.5	26.0	5	MMK22,5 156K100D19L4 TRAY

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
3.9	F11	10.5	20.5	31.5	3	MMK27,5 395K100F11L4 TRAY
4.7	F11	10.5	20.5	31.5	3	MMK27,5 475K100F11L4 TRAY
5.6	F11	10.5	20.5	31.5	3	MMK27,5 565K100F11L4 TRAY
6.8	F11	10.5	20.5	31.5	3	MMK27,5 685K100F11L4 TRAY
8.2	F11	10.5	20.5	31.5	3	MMK27,5 825K100F11L4 TRAY
10	F12	11.5	22.5	31.5	3	MMK27,5 106K100F12L4 TRAY
10	F17	21.0	12.5	31.5	3	MMK27,5 106K100F17L4 TRAY
12	F12	11.5	22.5	31.5	3	MMK27,5 126K100F12L4 TRAY
15	F13	14.5	24.5	31.5	3	MMK27,5 156K100F13L4 TRAY
18	F14	17.5	28.0	31.5	3	MMK27,5 186K100F14L4 TRAY
22	F14	17.5	28.0	31.5	3	MMK27,5 226K100F14L4 TRAY
22	F19	27.5	16.0	31.5	3	MMK27,5 226K100F19L4 TRAY
27	F15	19.0	29.0	31.5	3	MMK27,5 276K100F15L4 TRAY
27	F18	31.0	19.0	31.5	3	MMK27,5 276K100F18L4 TRAY
33	F16	21.0	30.0	31.5	3	MMK27,5 336K100F16L4 TRAY

ARTICLE TABLE

100 VDC/63 VAC

LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
12	R05	13.0	24.0	41.0	2	MMK37,5 126K100R05L4 TRAY
15	R05	13.0	24.0	41.0	2	MMK37,5 156K100R05L4 TRAY
18	R05	13.0	24.0	41.0	2	MMK37,5 186K100R05L4 TRAY
22	R04	15.0	26.0	41.0	2	MMK37,5 226K100R04L4 TRAY
27	R04	15.0	26.0	41.0	2	MMK37,5 276K100R04L4 TRAY
33	R02	16.5	32.0	41.0	2	MMK37,5 336K100R02L4 TRAY
39	R03	19.0	36.0	41.0	2	MMK37,5 396K100R03L4 TRAY
47	R03	19.0	36.0	41.0	2	MMK37,5 476K100R03L4 TRAY
56	R06	21.0	38.0	41.0	2	MMK37,5 566K100R06L4 TRAY
68	R08	28.0	43.0	41.0	2	MMK37,5 686K100R08L4 TRAY
82	R08	28.0	43.0	41.0	2	MMK37,5 826K100R08L4 TRAY

250 VDC/160 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	J01	2.5	6.5	7.2	40	MMK5 102K250J01L4 BULK
0.0012	J01	2.5	6.5	7.2	40	MMK5 122K250J01L4 BULK
0.0015	J01	2.5	6.5	7.2	40	MMK5 152K250J01L4 BULK
0.0018	J01	2.5	6.5	7.2	40	MMK5 182K250J01L4 BULK
0.0022	J01	2.5	6.5	7.2	40	MMK5 222K250J01L4 BULK
0.0027	J01	2.5	6.5	7.2	40	MMK5 272K250J01L4 BULK
0.0033	J01	2.5	6.5	7.2	40	MMK5 332K250J01L4 BULK
0.0039	J01	2.5	6.5	7.2	40	MMK5 392K250J01L4 BULK
0.0047	J01	2.5	6.5	7.2	40	MMK5 472K250J01L4 BULK
0.0056	J01	2.5	6.5	7.2	40	MMK5 562K250J01L4 BULK
0.0068	J01	2.5	6.5	7.2	40	MMK5 682K250J01L4 BULK
0.0082	J01	2.5	6.5	7.2	40	MMK5 822K250J01L4 BULK
0.010	J01	2.5	6.5	7.2	40	MMK5 103K250J01L4 BULK
0.012	J01	2.5	6.5	7.2	40	MMK5 123K250J01L4 BULK
0.015	J01	2.5	6.5	7.2	40	MMK5 153K250J01L4 BULK
0.018	J01	2.5	6.5	7.2	40	MMK5 183K250J01L4 BULK
0.022	J01	2.5	6.5	7.2	40	MMK5 223K250J01L4 BULK
0.027	J02	3.5	8.0	7.2	40	MMK5 273K250J02L4 BULK
0.033	J02	3.5	8.0	7.2	40	MMK5 333K250J02L4 BULK
0.039	J02	3.5	8.0	7.2	40	MMK5 393K250J02L4 BULK
0.047	J02	3.5	8.0	7.2	40	MMK5 473K250J02L4 BULK
0.056	J02	3.5	8.0	7.2	40	MMK5 563K250J02L4 BULK
0.068	J02	3.5	8.0	7.2	40	MMK5 683K250J02L4 BULK
0.082	J03	4.5	9.0	7.2	40	MMK5 823K250J03L4 BULK
0.10	J03	4.5	9.0	7.2	40	MMK5 104K250J03L4 BULK
0.12	J04	5.0	10.0	7.2	40	MMK5 124K250J04L4 BULK
0.15	J04	5.0	10.0	7.2	40	MMK5 154K250J04L4 BULK
0.18	J05	6.0	11.0	7.2	40	MMK5 184K250J05L4 BULK
0.22	J05	6.0	11.0	7.2	40	MMK5 224K250J05L4 BULK

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	K00	2.5	6.0	10.0	30	MMK7,5 102K250K00L4 BULK
0.0012	K00	2.5	6.0	10.0	30	MMK7,5 122K250K00L4 BULK
0.0015	K00	2.5	6.0	10.0	30	MMK7,5 152K250K00L4 BULK
0.0018	K00	2.5	6.0	10.0	30	MMK7,5 182K250K00L4 BULK
0.0022	K00	2.5	6.0	10.0	30	MMK7,5 222K250K00L4 BULK
0.0027	K00	2.5	6.0	10.0	30	MMK7,5 272K250K00L4 BULK
0.0033	K00	2.5	6.0	10.0	30	MMK7,5 332K250K00L4 BULK
0.0039	K00	2.5	6.0	10.0	30	MMK7,5 392K250K00L4 BULK
0.0047	K00	2.5	6.0	10.0	30	MMK7,5 472K250K00L4 BULK
0.0056	K00	2.5	6.0	10.0	30	MMK7,5 562K250K00L4 BULK
0.0068	K00	2.5	6.0	10.0	30	MMK7,5 682K250K00L4 BULK
0.0082	K00	2.5	6.0	10.0	30	MMK7,5 822K250K00L4 BULK
0.010	K00	2.5	6.0	10.0	30	MMK7,5 103K250K00L4 BULK
0.012	K00	2.5	6.0	10.0	30	MMK7,5 123K250K00L4 BULK

250 VDC/160 VAC

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.015	K00	2.5	6.0	10.0	30	MMK7,5 153K250K00L4 BULK
0.018	K00	2.5	6.0	10.0	30	MMK7,5 183K250K00L4 BULK
0.022	K00	2.5	6.0	10.0	30	MMK7,5 223K250K00L4 BULK
0.027	K00	2.5	6.0	10.0	30	MMK7,5 273K250K00L4 BULK
0.033	K00	2.5	6.0	10.0	30	MMK7,5 333K250K00L4 BULK
0.039	K01	4.0	8.0	10.0	30	MMK7,5 393K250K01L4 BULK
0.047	K01	4.0	8.0	10.0	30	MMK7,5 473K250K01L4 BULK
0.056	K01	4.0	8.0	10.0	30	MMK7,5 563K250K01L4 BULK
0.068	K01	4.0	8.0	10.0	30	MMK7,5 683K250K01L4 BULK
0.082	K01	4.0	8.0	10.0	30	MMK7,5 823K250K01L4 BULK
0.10	K01	4.0	8.0	10.0	30	MMK7,5 104K250K01L4 BULK
0.12	K03	5.0	11.0	10.0	30	MMK7,5 124K250K03L4 BULK
0.15	K03	5.0	11.0	10.0	30	MMK7,5 154K250K03L4 BULK
0.18	K03	5.0	11.0	10.0	30	MMK7,5 184K250K03L4 BULK
0.22	K03	5.0	11.0	10.0	30	MMK7,5 224K250K03L4 BULK
0.27	K04	6.0	12.0	10.5	30	MMK7,5 274K250K04L4 BULK
0.33	K04	6.0	12.0	10.5	30	MMK7,5 334K250K04L4 BULK

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	A01	4.0	9.0	13.0	20	MMK10 102K250A01L4 BULK
0.0012	A01	4.0	9.0	13.0	20	MMK10 122K250A01L4 BULK
0.0015	A01	4.0	9.0	13.0	20	MMK10 152K250A01L4 BULK
0.0018	A01	4.0	9.0	13.0	20	MMK10 182K250A01L4 BULK
0.0022	A01	4.0	9.0	13.0	20	MMK10 222K250A01L4 BULK
0.0027	A01	4.0	9.0	13.0	20	MMK10 272K250A01L4 BULK
0.0033	A01	4.0	9.0	13.0	20	MMK10 332K250A01L4 BULK
0.0039	A01	4.0	9.0	13.0	20	MMK10 392K250A01L4 BULK
0.0047	A01	4.0	9.0	13.0	20	MMK10 472K250A01L4 BULK
0.0056	A01	4.0	9.0	13.0	20	MMK10 562K250A01L4 BULK
0.0068	A01	4.0	9.0	13.0	20	MMK10 682K250A01L4 BULK
0.0082	A01	4.0	9.0	13.0	20	MMK10 822K250A01L4 BULK
0.010	A01	4.0	9.0	13.0	20	MMK10 103K250A01L4 BULK
0.012	A01	4.0	9.0	13.0	20	MMK10 123K250A01L4 BULK
0.015	A01	4.0	9.0	13.0	20	MMK10 153K250A01L4 BULK
0.018	A01	4.0	9.0	13.0	20	MMK10 183K250A01L4 BULK
0.022	A01	4.0	9.0	13.0	20	MMK10 223K250A01L4 BULK
0.027	A01	4.0	9.0	13.0	20	MMK10 273K250A01L4 BULK
0.033	A01	4.0	9.0	13.0	20	MMK10 333K250A01L4 BULK
0.039	A01	4.0	9.0	13.0	20	MMK10 393K250A01L4 BULK
0.047	A01	4.0	9.0	13.0	20	MMK10 473K250A01L4 BULK
0.056	A01	4.0	9.0	13.0	20	MMK10 563K250A01L4 BULK
0.068	A01	4.0	9.0	13.0	20	MMK10 683K250A01L4 BULK
0.082	A01	4.0	9.0	13.0	20	MMK10 823K250A01L4 BULK
0.10	A01	4.0	9.0	13.0	20	MMK10 104K250A01L4 BULK
0.12	A01	4.0	9.0	13.0	20	MMK10 124K250A01L4 BULK
0.15	A01	4.0	9.0	13.0	20	MMK10 154K250A01L4 BULK
0.18	A01	4.0	9.0	13.0	20	MMK10 184K250A01L4 BULK
0.22	A02	4.5	10.5	13.0	20	MMK10 224K250A02L4 BULK
0.27	A03	5.0	11.0	13.0	20	MMK10 274K250A03L4 BULK
0.33	A04	6.0	12.0	13.0	20	MMK10 334K250A04L4 BULK
0.39	A04	6.0	12.0	13.0	20	MMK10 394K250A04L4 BULK

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.082	B04	5.5	10.5	18.0	12	MMK15 823K250B04L4 BULK
0.10	B04	5.5	10.5	18.0	12	MMK15 104K250B04L4 BULK
0.12	B04	5.5	10.5	18.0	12	MMK15 124K250B04L4 BULK
0.15	B04	5.5	10.5	18.0	12	MMK15 154K250B04L4 BULK
0.18	B04	5.5	10.5	18.0	12	MMK15 184K250B04L4 BULK
0.22	B04	5.5	10.5	18.0	12	MMK15 224K250B04L4 BULK
0.27	B04	5.5	10.5	18.0	12	MMK15 274K250B04L4 BULK

ARTICLE TABLE

250 VDC/160 VA

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.33	B04	5.5	10.5	18.0	12	MMK15 334K250B04L4 BULK
0.39	B04	5.5	10.5	18.0	12	MMK15 394K250B04L4 BULK
0.47	B05	5.5	12.5	18.0	12	MMK15 474K250B05L4 BULK
0.56	B10	6.5	12.5	18.0	12	MMK15 564K250B10L4 BULK
0.68	B10	6.5	12.5	18.0	12	MMK15 684K250B10L4 BULK
0.82	B06	7.5	14.5	18.0	12	MMK15 824K250B06L4 BULK
1.0	B06	7.5	14.5	18.0	12	MMK15 105K250B06L4 BULK
1.2	B12	8.0	15.0	18.0	12	MMK15 125K250B12L4 BULK
1.5	B14	9.5	17.5	18.0	12	MMK15 155K250B14L4 BULK
1.8	B14	9.5	17.5	18.0	12	MMK15 185K250B14L4 BULK

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.47	D13	6.5	14.5	26.0	8	MMK22,5 474K250D13L4 TRAY
0.56	D13	6.5	14.5	26.0	8	MMK22,5 564K250D13L4 TRAY
0.68	D13	6.5	14.5	26.0	8	MMK22,5 684K250D13L4 TRAY
0.82	D13	6.5	14.5	26.0	8	MMK22,5 824K250D13L4 TRAY
1.0	D13	6.5	14.5	26.0	8	MMK22,5 105K250D13L4 TRAY
1.2	D17	7.0	16.5	26.0	8	MMK22,5 125K250D17L4 TRAY
1.5	D14	8.0	16.0	26.0	8	MMK22,5 155K250D14L4 TRAY
1.8	D15	9.0	18.5	26.0	8	MMK22,5 185K250D15L4 TRAY
2.0	D15	9.0	18.5	26.0	8	MMK22,5 205K250D15L4 TRAY
2.2	D15	9.0	18.5	26.0	8	MMK22,5 225K250D15L4 TRAY
2.7	D18	10.5	19.0	26.0	8	MMK22,5 275K250D18L4 TRAY
3.3	D16	11.0	21.5	26.0	8	MMK22,5 335K250D16L4 TRAY
3.9	D20	13.5	23.0	26.0	8	MMK22,5 395K250D20L4 TRAY
4.7	D19	15.5	24.5	26.0	8	MMK22,5 475K250D19L4 TRAY
5.6	D19	15.5	24.5	26.0	8	MMK22,5 565K250D19L4 TRAY

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
1.5	F11	10.5	20.5	31.5	5	MMK27,5 155K250F11L4 TRAY
1.8	F11	10.5	20.5	31.5	5	MMK27,5 185K250F11L4 TRAY
2.0	F11	10.5	20.5	31.5	5	MMK27,5 205K250F11L4 TRAY
2.2	F11	10.5	20.5	31.5	5	MMK27,5 225K250F11L4 TRAY
2.5	F11	10.5	20.5	31.5	5	MMK27,5 255K250F11L4 TRAY
2.7	F11	10.5	20.5	31.5	5	MMK27,5 275K250F11L4 TRAY
3.3	F11	10.5	20.5	31.5	5	MMK27,5 335K250F11L4 TRAY
3.3	F17	21.0	12.5	31.5	5	MMK27,5 335K250F17L4 TRAY
3.9	F12	11.5	22.5	31.5	5	MMK27,5 395K250F12L4 TRAY
4.7	F03	13.5	23.0	31.5	5	MMK27,5 475K250F03L4 TRAY
5.6	F13	14.5	24.5	31.5	5	MMK27,5 565K250F13L4 TRAY
6.8	F14	17.5	28.0	31.5	5	MMK27,5 685K250F14L4 TRAY
8.2	F15	19.0	29.0	31.5	5	MMK27,5 825K250F15L4 TRAY
8.2	F19	27.5	16.0	31.5	5	MMK27,5 825K250F19L4 TRAY
10	F16	21.0	30.0	31.5	5	MMK27,5 106K250F16L4 TRAY
10	F18	31.0	19.0	31.5	5	MMK27,5 106K250F18L4 TRAY

LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
4.7	R05	13.0	24.0	41.0	3	MMK37,5 475K250R05L4 TRAY
5.6	R05	13.0	24.0	41.0	3	MMK37,5 565K250R05L4 TRAY
6.8	R05	13.0	24.0	41.0	3	MMK37,5 685K250R05L4 TRAY
8.2	R04	15.0	26.0	41.0	3	MMK37,5 825K250R04L4 TRAY
10	R04	15.0	26.0	41.0	3	MMK37,5 106K250R04L4 TRAY
12	R02	16.5	32.0	41.0	3	MMK37,5 126K250R02L4 TRAY
15	R02	16.5	32.0	41.0	3	MMK37,5 156K250R02L4 TRAY
18	R03	19.0	36.0	41.0	3	MMK37,5 186K250R03L4 TRAY
22	R06	21.0	38.0	41.0	3	MMK37,5 226K250R06L4 TRAY
27	R08	28.0	43.0	41.0	3	MMK37,5 276K250R08L4 TRAY
33	R08	28.0	43.0	41.0	3	MMK37,5 336K250R08L4 TRAY
39	R08	28.0	43.0	41.0	3	MMK37,5 396K250R08L4 TRAY

400 VDC/200 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	J01	2.5	6.5	7.2	50	MMK5 102K400J01L4 BULK
0.0012	J01	2.5	6.5	7.2	50	MMK5 122K400J01L4 BULK
0.0015	J01	2.5	6.5	7.2	50	MMK5 152K400J01L4 BULK
0.0018	J01	2.5	6.5	7.2	50	MMK5 182K400J01L4 BULK
0.0022	J01	2.5	6.5	7.2	50	MMK5 222K400J01L4 BULK
0.0027	J01	2.5	6.5	7.2	50	MMK5 272K400J01L4 BULK
0.0033	J01	2.5	6.5	7.2	50	MMK5 332K400J01L4 BULK
0.0039	J01	2.5	6.5	7.2	50	MMK5 392K400J01L4 BULK
0.0047	J01	2.5	6.5	7.2	50	MMK5 472K400J01L4 BULK
0.0056	J01	2.5	6.5	7.2	50	MMK5 562K400J01L4 BULK
0.0068	J01	2.5	6.5	7.2	50	MMK5 682K400J01L4 BULK
0.0082	J01	2.5	6.5	7.2	50	MMK5 822K400J01L4 BULK
0.010	J01	2.5	6.5	7.2	50	MMK5 103K400J01L4 BULK
0.012	J01	2.5	6.5	7.2	50	MMK5 123K400J01L4 BULK
0.015	J01	2.5	6.5	7.2	50	MMK5 153K400J01L4 BULK
0.018	J02	3.5	8.0	7.2	50	MMK5 183K400J02L4 BULK
0.022	J02	3.5	8.0	7.2	50	MMK5 223K400J02L4 BULK
0.027	J03	4.5	9.0	7.2	50	MMK5 273K400J03L4 BULK
0.033	J03	4.5	9.0	7.2	50	MMK5 333K400J03L4 BULK
0.039	J03	4.5	9.0	7.2	50	MMK5 393K400J03L4 BULK
0.047	J03	4.5	9.0	7.2	50	MMK5 473K400J03L4 BULK
0.056	J05	6.0	11.0	7.2	50	MMK5 563K400J05L4 BULK
0.068	J05	6.0	11.0	7.2	50	MMK5 683K400J05L4 BULK
0.082	J06	7.2	13.0	7.2	50	MMK5 823K400J06L4 BULK
0.10	J06	7.2	13.0	7.2	50	MMK5 104K400J06L4 BULK
0.12	J06	7.2	13.0	7.2	50	MMK5 124K400J06L4 BULK

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	K00	2.5	6.0	10.0	40	MMK7,5 102K400K00L4 BULK
0.0012	K00	2.5	6.0	10.0	40	MMK7,5 122K400K00L4 BULK
0.0015	K00	2.5	6.0	10.0	40	MMK7,5 152K400K00L4 BULK
0.0018	K00	2.5	6.0	10.0	40	MMK7,5 182K400K00L4 BULK
0.0022	K00	2.5	6.0	10.0	40	MMK7,5 222K400K00L4 BULK
0.0027	K00	2.5	6.0	10.0	40	MMK7,5 272K400K00L4 BULK
0.0033	K00	2.5	6.0	10.0	40	MMK7,5 332K400K00L4 BULK
0.0039	K00	2.5	6.0	10.0	40	MMK7,5 392K400K00L4 BULK
0.0047	K00	2.5	6.0	10.0	40	MMK7,5 472K400K00L4 BULK
0.0056	K00	2.5	6.0	10.0	40	MMK7,5 562K400K00L4 BULK
0.0068	K00	2.5	6.0	10.0	40	MMK7,5 682K400K00L4 BULK
0.0082	K00	2.5	6.0	10.0	40	MMK7,5 822K400K00L4 BULK
0.010	K00	2.5	6.0	10.0	40	MMK7,5 103K400K00L4 BULK
0.012	K00	2.5	6.0	10.0	40	MMK7,5 123K400K00L4 BULK
0.015	K00	2.5	6.0	10.0	40	MMK7,5 153K400K00L4 BULK
0.018	K01	4.0	8.0	10.0	40	MMK7,5 183K400K01L4 BULK
0.022	K01	4.0	8.0	10.0	40	MMK7,5 223K400K01L4 BULK
0.027	K01	4.0	8.0	10.0	40	MMK7,5 273K400K01L4 BULK
0.033	K01	4.0	8.0	10.0	40	MMK7,5 333K400K01L4 BULK
0.039	K01	4.0	8.0	10.0	40	MMK7,5 393K400K01L4 BULK
0.047	K03	5.0	11.0	10.0	40	MMK7,5 473K400K03L4 BULK
0.056	K03	5.0	11.0	10.0	40	MMK7,5 563K400K03L4 BULK
0.068	K03	5.0	11.0	10.0	40	MMK7,5 683K400K03L4 BULK
0.082	K03	5.0	11.0	10.0	40	MMK7,5 823K400K03L4 BULK
0.10	K03	5.0	11.0	10.0	40	MMK7,5 104K400K03L4 BULK
0.12	K04	6.0	12.0	10.5	40	MMK7,5 124K400K04L4 BULK
0.15	K04	6.0	12.0	10.5	40	MMK7,5 154K400K04L4 BULK

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	A01	4.0	9.0	13.0	30	MMK10 102K400A01L4 BULK
0.0012	A01	4.0	9.0	13.0	30	MMK10 122K400A01L4 BULK
0.0015	A01	4.0	9.0	13.0	30	MMK10 152K400A01L4 BULK

ARTICLE TABLE

400 VDC/200 VAC

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0018	A01	4.0	9.0	13.0	30	MMK10 182K400A01L4 BULK
0.0022	A01	4.0	9.0	13.0	30	MMK10 222K400A01L4 BULK
0.0027	A01	4.0	9.0	13.0	30	MMK10 272K400A01L4 BULK
0.0033	A01	4.0	9.0	13.0	30	MMK10 332K400A01L4 BULK
0.0039	A01	4.0	9.0	13.0	30	MMK10 392K400A01L4 BULK
0.0047	A01	4.0	9.0	13.0	30	MMK10 472K400A01L4 BULK
0.0056	A01	4.0	9.0	13.0	30	MMK10 562K400A01L4 BULK
0.0068	A01	4.0	9.0	13.0	30	MMK10 682K400A01L4 BULK
0.0078	A01	4.0	9.0	13.0	30	MMK10 782K400A01L4 BULK
0.0082	A01	4.0	9.0	13.0	30	MMK10 822K400A01L4 BULK
0.010	A01	4.0	9.0	13.0	30	MMK10 103K400A01L4 BULK
0.012	A01	4.0	9.0	13.0	30	MMK10 123K400A01L4 BULK
0.015	A01	4.0	9.0	13.0	30	MMK10 153K400A01L4 BULK
0.018	A01	4.0	9.0	13.0	30	MMK10 183K400A01L4 BULK
0.022	A01	4.0	9.0	13.0	30	MMK10 223K400A01L4 BULK
0.027	A01	4.0	9.0	13.0	30	MMK10 273K400A01L4 BULK
0.033	A01	4.0	9.0	13.0	30	MMK10 333K400A01L4 BULK
0.039	A01	4.0	9.0	13.0	30	MMK10 393K400A01L4 BULK
0.047	A01	4.0	9.0	13.0	30	MMK10 473K400A01L4 BULK
0.056	A01	4.0	9.0	13.0	30	MMK10 563K400A01L4 BULK
0.068	A01	4.0	9.0	13.0	30	MMK10 683K400A01L4 BULK
0.082	A02	4.5	10.5	13.0	30	MMK10 823K400A02L4 BULK
0.10	A03	5.0	11.0	13.0	30	MMK10 104K400A03L4 BULK
0.12	A03	5.0	11.0	13.0	30	MMK10 124K400A03L4 BULK
0.15	A04	6.0	12.0	13.0	30	MMK10 154K400A04L4 BULK

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.047	B04	5.5	10.5	18.0	20	MMK15 473K400B04L4 BULK
0.056	B04	5.5	10.5	18.0	20	MMK15 563K400B04L4 BULK
0.068	B04	5.5	10.5	18.0	20	MMK15 683K400B04L4 BULK
0.082	B04	5.5	10.5	18.0	20	MMK15 823K400B04L4 BULK
0.10	B04	5.5	10.5	18.0	20	MMK15 104K400B04L4 BULK
0.12	B04	5.5	10.5	18.0	20	MMK15 124K400B04L4 BULK
0.15	B04	5.5	10.5	18.0	20	MMK15 154K400B04L4 BULK
0.18	B05	5.5	12.5	18.0	20	MMK15 184K400B05L4 BULK
0.22	B05	5.5	12.5	18.0	20	MMK15 224K400B05L4 BULK
0.27	B10	6.5	12.5	18.0	20	MMK15 274K400B10L4 BULK
0.33	B06	7.5	14.5	18.0	20	MMK15 334K400B06L4 BULK
0.39	B06	7.5	14.5	18.0	20	MMK15 394K400B06L4 BULK
0.47	B11	8.5	16.0	18.0	20	MMK15 474K400B11L4 BULK
0.56	B11	8.5	16.0	18.0	20	MMK15 564K400B11L4 BULK
0.68	B14	9.5	17.5	18.0	20	MMK15 684K400B14L4 BULK

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.18	D13	6.5	14.5	26.0	10	MMK22,5 184K400D13L4 TRAY
0.22	D13	6.5	14.5	26.0	10	MMK22,5 224K400D13L4 TRAY
0.27	D13	6.5	14.5	26.0	10	MMK22,5 274K400D13L4 TRAY
0.33	D13	6.5	14.5	26.0	10	MMK22,5 334K400D13L4 TRAY
0.39	D13	6.5	14.5	26.0	10	MMK22,5 394K400D13L4 TRAY
0.47	D13	6.5	14.5	26.0	10	MMK22,5 474K400D13L4 TRAY
0.56	D17	7.0	16.5	26.0	10	MMK22,5 564K400D17L4 TRAY
0.68	D14	8.0	16.0	26.0	10	MMK22,5 684K400D14L4 TRAY
0.82	D15	9.0	18.5	26.0	10	MMK22,5 824K400D15L4 TRAY
1.0	D15	9.0	18.5	26.0	10	MMK22,5 105K400D15L4 TRAY
1.2	D18	10.5	19.0	26.0	10	MMK22,5 125K400D18L4 TRAY
1.5	D16	11.0	21.5	26.0	10	MMK22,5 155K400D16L4 TRAY
1.8	D20	13.5	23.0	26.0	10	MMK22,5 185K400D20L4 TRAY
2.2	D19	15.5	24.5	26.0	10	MMK22,5 225K400D19L4 TRAY
2.7	D19	15.5	24.5	26.0	10	MMK22,5 275K400D19L4 TRAY

400 VDC/200 VAC

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.68	F11	10.5	20.5	31.5	8	MMK27,5 684K400F11L4 TRAY
0.82	F11	10.5	20.5	31.5	8	MMK27,5 824K400F11L4 TRAY
1.0	F11	10.5	20.5	31.5	8	MMK27,5 105K400F11L4 TRAY
1.2	F11	10.5	20.5	31.5	8	MMK27,5 125K400F11L4 TRAY
1.5	F11	10.5	20.5	31.5	8	MMK27,5 155K400F11L4 TRAY
1.8	F11	10.5	20.5	31.5	8	MMK27,5 185K400F11L4 TRAY
1.8	F17	21.0	12.5	31.5	8	MMK27,5 185K400F17L4 TRAY
2.2	F12	11.5	22.5	31.5	8	MMK27,5 225K400F12L4 TRAY
2.7	F03	13.5	23.0	31.5	8	MMK27,5 275K400F03L4 TRAY
3.3	F14	17.5	28.0	31.5	8	MMK27,5 335K400F14L4 TRAY
3.9	F14	17.5	28.0	31.5	8	MMK27,5 395K400F14L4 TRAY
3.9	F19	27.5	16.0	31.5	8	MMK27,5 395K400F19L4 TRAY
4.7	F15	19.0	29.0	31.5	8	MMK27,5 475K400F15L4 TRAY
5.6	F16	21.0	30.0	31.5	8	MMK27,5 565K400F16L4 TRAY
5.6	F18	31.0	19.0	31.5	8	MMK27,5 565K400F18L4 TRAY

LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
1.8	R05	13.0	24.0	41.0	5	MMK37,5 185K400R05L4 TRAY
2.2	R05	13.0	24.0	41.0	5	MMK37,5 225K400R05L4 TRAY
2.7	R05	13.0	24.0	41.0	5	MMK37,5 275K400R05L4 TRAY
3.3	R05	13.0	24.0	41.0	5	MMK37,5 335K400R05L4 TRAY
3.9	R04	15.0	26.0	41.0	5	MMK37,5 395K400R04L4 TRAY
4.7	R04	15.0	26.0	41.0	5	MMK37,5 475K400R04L4 TRAY
5.6	R02	16.5	32.0	41.0	5	MMK37,5 565K400R02L4 TRAY
6.8	R03	19.0	36.0	41.0	5	MMK37,5 685K400R03L4 TRAY
8.2	R03	19.0	36.0	41.0	5	MMK37,5 825K400R03L4 TRAY
10	R06	21.0	38.0	41.0	5	MMK37,5 106K400R06L4 TRAY
12	R08	28.0	43.0	41.0	5	MMK37,5 126K400R08L4 TRAY
15	R08	28.0	43.0	41.0	5	MMK37,5 156K400R08L4 TRAY
18	R08	28.0	43.0	41.0	5	MMK37,5 186K400R08L4 TRAY

630 VDC/220 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	J01	2.5	6.5	7.2	80	MMK5 102K630J01L4 BULK
0.0012	J01	2.5	6.5	7.2	80	MMK5 122K630J01L4 BULK
0.0015	J01	2.5	6.5	7.2	80	MMK5 152K630J01L4 BULK
0.0018	J01	2.5	6.5	7.2	80	MMK5 182K630J01L4 BULK
0.0022	J01	2.5	6.5	7.2	80	MMK5 222K630J01L4 BULK
0.0027	J01	2.5	6.5	7.2	80	MMK5 272K630J01L4 BULK
0.0033	J01	2.5	6.5	7.2	80	MMK5 332K630J01L4 BULK
0.0039	J01	2.5	6.5	7.2	80	MMK5 392K630J01L4 BULK
0.0047	J02	3.5	8.0	7.2	80	MMK5 472K630J02L4 BULK
0.0056	J02	3.5	8.0	7.2	80	MMK5 562K630J02L4 BULK
0.0068	J02	3.5	8.0	7.2	80	MMK5 682K630J02L4 BULK
0.0082	J02	3.5	8.0	7.2	80	MMK5 822K630J02L4 BULK
0.010	J02	3.5	8.0	7.2	80	MMK5 103K630J02L4 BULK
0.012	J03	4.5	9.0	7.2	80	MMK5 123K630J03L4 BULK
0.015	J03	4.5	9.0	7.2	80	MMK5 153K630J03L4 BULK
0.018	J03	4.5	9.0	7.2	80	MMK5 183K630J03L4 BULK
0.022	J04	5.0	10.0	7.2	80	MMK5 223K630J04L4 BULK
0.027	J05	6.0	11.0	7.2	80	MMK5 273K630J05L4 BULK
0.033	J05	6.0	11.0	7.2	80	MMK5 333K630J05L4 BULK
0.039	J06	7.2	13.0	7.2	80	MMK5 393K630J06L4 BULK
0.047	J06	7.2	13.0	7.2	80	MMK5 473K630J06L4 BULK

ARTICLE TABLE

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

ARTICLE TABLE

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
1000 VDC/250 VAC						
LEAD SPACING 5 MM						
0.0010	J01	2.5	6.5	7.2	100	MMK5 102K1000J01L4 BULK
0.0012	J02	3.5	8.0	7.2	100	MMK5 122K1000J02L4 BULK
0.0015	J02	3.5	8.0	7.2	100	MMK5 152K1000J02L4 BULK
0.0018	J02	3.5	8.0	7.2	100	MMK5 182K1000J02L4 BULK
0.0022	J02	3.5	8.0	7.2	100	MMK5 222K1000J02L4 BULK
0.0027	J02	3.5	8.0	7.2	100	MMK5 272K1000J02L4 BULK
0.0033	J02	3.5	8.0	7.2	100	MMK5 332K1000J02L4 BULK
0.0039	J03	4.5	9.0	7.2	100	MMK5 392K1000J03L4 BULK
0.0047	J03	4.5	9.0	7.2	100	MMK5 472K1000J03L4 BULK
0.0056	J03	4.5	9.0	7.2	100	MMK5 562K1000J03L4 BULK
0.0068	J04	5.0	10.0	7.2	100	MMK5 682K1000J04L4 BULK
0.0082	J05	6.0	11.0	7.2	100	MMK5 822K1000J05L4 BULK
0.010	J05	6.0	11.0	7.2	100	MMK5 103K1000J05L4 BULK
0.012	J06	7.2	13.0	7.2	100	MMK5 123K1000J06L4 BULK
0.015	J06	7.2	13.0	7.2	100	MMK5 153K1000J06L4 BULK
LEAD SPACING 7.5 MM						
0.0010	K00	2.5	6.0	10.0	80	MMK7,5 102K1000K00L4 BULK
0.0012	K00	2.5	6.0	10.0	80	MMK7,5 122K1000K00L4 BULK
0.0015	K00	2.5	6.0	10.0	80	MMK7,5 152K1000K00L4 BULK
0.0015	K01	4.0	8.0	10.0	80	MMK7,5 152K1000K01L4 BULK
0.0018	K01	4.0	8.0	10.0	80	MMK7,5 182K1000K01L4 BULK
0.0022	K01	4.0	8.0	10.0	80	MMK7,5 222K1000K01L4 BULK
0.0027	K01	4.0	8.0	10.0	80	MMK7,5 272K1000K01L4 BULK
0.0033	K01	4.0	8.0	10.0	80	MMK7,5 332K1000K01L4 BULK
0.0039	K01	4.0	8.0	10.0	80	MMK7,5 392K1000K01L4 BULK
0.0047	K01	4.0	8.0	10.0	80	MMK7,5 472K1000K01L4 BULK
0.0056	K01	4.0	8.0	10.0	80	MMK7,5 562K1000K01L4 BULK
0.0068	K03	5.0	11.0	10.0	80	MMK7,5 682K1000K03L4 BULK
0.0082	K03	5.0	11.0	10.0	80	MMK7,5 822K1000K03L4 BULK
0.010	K03	5.0	11.0	10.0	80	MMK7,5 103K1000K03L4 BULK
0.012	K03	5.0	11.0	10.0	80	MMK7,5 123K1000K03L4 BULK
0.015	K04	6.0	12.0	10.5	80	MMK7,5 153K1000K04L4 BULK
0.018	K04	6.0	12.0	10.5	80	MMK7,5 183K1000K04L4 BULK
LEAD SPACING 10 MM						
0.0010	A01	4.0	9.0	13.0	60	MMK10 102K1000A01L4 BULK
0.0012	A01	4.0	9.0	13.0	60	MMK10 122K1000A01L4 BULK
0.0015	A01	4.0	9.0	13.0	60	MMK10 152K1000A01L4 BULK
0.0018	A01	4.0	9.0	13.0	60	MMK10 182K1000A01L4 BULK
0.0022	A01	4.0	9.0	13.0	60	MMK10 222K1000A01L4 BULK
0.0027	A01	4.0	9.0	13.0	60	MMK10 272K1000A01L4 BULK
0.0033	A01	4.0	9.0	13.0	60	MMK10 332K1000A01L4 BULK
0.0039	A01	4.0	9.0	13.0	60	MMK10 392K1000A01L4 BULK
0.0047	A01	4.0	9.0	13.0	60	MMK10 472K1000A01L4 BULK
0.0056	A01	4.0	9.0	13.0	60	MMK10 562K1000A01L4 BULK
0.0068	A01	4.0	9.0	13.0	60	MMK10 682K1000A01L4 BULK
0.0082	A01	4.0	9.0	13.0	60	MMK10 822K1000A01L4 BULK
0.010	A02	4.5	10.5	13.0	60	MMK10 103K1000A02L4 BULK
0.012	A02	4.5	10.5	13.0	60	MMK10 123K1000A02L4 BULK
0.015	A03	5.0	11.0	13.0	60	MMK10 153K1000A03L4 BULK
0.018	A04	6.0	12.0	13.0	60	MMK10 183K1000A04L4 BULK
0.022	A04	6.0	12.0	13.0	60	MMK10 223K1000A04L4 BULK
LEAD SPACING 15 MM						
0.0082	B04	5.5	10.5	18.0	30	MMK15 822K1000B04L4 BULK
0.010	B04	5.5	10.5	18.0	30	MMK15 103K1000B04L4 BULK
0.012	B04	5.5	10.5	18.0	30	MMK15 123K1000B04L4 BULK
0.015	B04	5.5	10.5	18.0	30	MMK15 153K1000B04L4 BULK

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
1000 VDC/250 VAC						
LEAD SPACING 15 MM						
0.018	B04	5.5	10.5	18.0	30	MMK15 183K1000B04L4 BULK
0.022	B04	5.5	10.5	18.0	30	MMK15 223K1000B04L4 BULK
0.027	B05	5.5	12.5	18.0	30	MMK15 273K1000B05L4 BULK
0.033	B10	6.5	12.5	18.0	30	MMK15 333K1000B10L4 BULK
0.039	B10	6.5	12.5	18.0	30	MMK15 393K1000B10L4 BULK
0.047	B06	7.5	14.5	18.0	30	MMK15 473K1000B06L4 BULK
0.056	B06	7.5	14.5	18.0	30	MMK15 563K1000B06L4 BULK
0.068	B11	8.5	16.0	18.0	30	MMK15 683K1000B11L4 BULK
0.082	B14	9.5	17.5	18.0	30	MMK15 823K1000B14L4 BULK
0.10	B14	9.5	17.5	18.0	30	MMK15 104K1000B14L4 BULK
LEAD SPACING 22.5 MM						
0.033	D13	6.5	14.5	26.0	15	MMK22,5 333K1000D13L4 TRAY
0.039	D13	6.5	14.5	26.0	15	MMK22,5 393K1000D13L4 TRAY
0.047	D13	6.5	14.5	26.0	15	MMK22,5 473K1000D13L4 TRAY
0.056	D13	6.5	14.5	26.0	15	MMK22,5 563K1000D13L4 TRAY
0.068	D13	6.5	14.5	26.0	15	MMK22,5 683K1000D13L4 TRAY
0.082	D13	6.5	14.5	26.0	15	MMK22,5 823K1000D13L4 TRAY
0.10	D13	6.5	14.5	26.0	15	MMK22,5 104K1000D13L4 TRAY
0.12	D17	7.0	16.5	26.0	15	MMK22,5 124K1000D17L4 TRAY
0.15	D17	7.0	16.5	26.0	15	MMK22,5 154K1000D17L4 TRAY
0.18	D14	8.0	16.0	26.0	15	MMK22,5 184K1000D14L4 TRAY
0.22	D15	9.0	18.5	26.0	15	MMK22,5 224K1000D15L4 TRAY
0.27	D18	10.5	19.0	26.0	15	MMK22,5 274K1000D18L4 TRAY
0.33	D16	11.0	21.5	26.0	15	MMK22,5 334K1000D16L4 TRAY
0.39	D20	13.5	23.0	26.0	15	MMK22,5 394K1000D20L4 TRAY
0.47	D20	13.5	23.0	26.0	15	MMK22,5 474K1000D20L4 TRAY
0.56	D19	15.5	24.5	26.0	15	MMK22,5 564K1000D19L4 TRAY
LEAD SPACING 27.5 MM						
0.33	F11	10.5	20.5	31.5	12	MMK27,5 334K1000F11L4 TRAY
0.39	F11	10.5	20.5	31.5	12	MMK27,5 394K1000F11L4 TRAY
0.39	F17	21.0	12.5	31.5	12	MMK27,5 394K1000F17L4 TRAY
0.47	F12	11.5	22.5	31.5	12	MMK27,5 474K1000F12L4 TRAY
0.56	F03	13.5	23.0	31.5	12	MMK27,5 564K1000F03L4 TRAY
0.68	F13	14.5	24.5	31.5	12	MMK27,5 684K1000F13L4 TRAY
0.82	F14	17.5	28.0	31.5	12	MMK27,5 824K1000F14L4 TRAY
0.82	F19	27.5	16.0	31.5	12	MMK27,5 824K1000F19L4 TRAY
1.0	F14	17.5	28.0	31.5	12	MMK27,5 105K1000F14L4 TRAY
1.2	F15	19.0	29.0	31.5	12	MMK27,5 125K1000F15L4 TRAY
1.2	F18	31.0	19.0	31.5	12	MMK27,5 125K1000F18L4 TRAY
1.5	F16	21.0	30.0	31.5	12	MMK27,5 155K1000F16L4 TRAY
LEAD SPACING 37.5 MM						
0.68	R05	13.0	24.0	41.0	10	MMK37,5 684K1000R05L4 TRAY
0.82	R05	13.0	24.0	41.0	10	MMK37,5 824K1000R05L4 TRAY
1.0	R04	15.0	26.0	41.0	10	MMK37,5 105K1000R04L4 TRAY
1.2	R04	15.0	26.0	41.0	10	MMK37,5 125K1000R04L4 TRAY
1.5	R02	16.5	32.0	41.0	10	MMK37,5 155K1000R02L4 TRAY
1.8	R02	16.5	32.0	41.0	10	MMK37,5 185K1000R02L4 TRAY
2.2	R03	19.0	36.0	41.0	10	MMK37,5 225K1000R03L4 TRAY
2.7	R06	21.0	38.0	41.0	10	MMK37,5 275K1000R06L4 TRAY
3.3	R08	28.0	43.0	41.0	10	MMK37,5 335K1000R08L4 TRAY
3.9	R08	28.0	43.0	41.0	10	MMK37,5 395K1000R08L4 TRAY
4.7	R08	28.0	43.0	41.0	10	MMK37,5 475K1000R08L4 TRAY

HOW TO ORDER EVOX CAPACITORS

The **Evox** article code includes all the information needed to specify the product characteristics and type of packing. This article code construction applies for the following products in this catalogue: **MMK, SMR** and **PFR**. The following articles have the same article code system except for the size code: **CQ**.

MMK **5** **104** **K** **63** **J01** **L16,5** **TA18**

Capacitor type
The first letter specifies the dielectric material:
M = Polyester (PET)
P = Polypropylene (PP)
G = Polyethylene naphthalate (PEN)
S = Polyphenylene sulphide (PPS)
The second letter indicates the electrode construction:
M = Metallized film
F = Metal foil

Lead spacing in mm

Capacitance tolerance
M = ± 20 %
V = -0%, +20 %
P = -0%, +10 %
L = -10%, +0 %
K = ± 10 %
J = ± 5 %
X = ± 3.5 %
H = ± 2.5 %
G = ± 2 %
F = ± 1 %

Rated capacitance
Expressed in picofarads. Three digit code where the first two digits indicate the two most significant digits of the capacitance value in pF. The third digit is the number of following zeroes.
103 = 10000 pF = 10 nF = 0.01 µF
104 = 100000 pF = 100 nF = 0.1 µF
106 = 10000000 pF = 10000 nF = 10 µF
When three significant digits are needed to express the capacitance value, a four digit code is used. The last digit gives the amount of numbers after the two most significant digits. Example:
4582 = 4580 pF = 4.58 nF = 0.00458 µF
= 146000 pF = 146 nF = 0.146 µF

Rated voltage in DC Volts

Capacitor size code
See size codes on page 13.

Lead length
Letter L followed by lead length in mm and a tolerance code according to the table below. L3,5E = lead length 3.5 +0/-0.7 mm.

Exceptions:
- Only L4 for std 4 mm lead length and std tolerance.
- L16,5 for taped parts on reel or ammo. L16,5C for bulk parts with 16.5 ±0.5 mm leads.

Tolerance Code	mm	
A	+1, -0	Std for Evox parts in bulk and tray
B	+0.3, -0.1	
C	±0.5	
E	+0, -0.7	
F	±3.2	
G	±0.4	
J	+0, -1	
K	+0.3, -0.2	
L	+5, -0	
M	±0.25	
P	+2, -0	

Packaging

BULK [1]	Loose capacitors in a box
TRAY [1]	Capacitors with 22.5 to 37.5 mm lead spacing on a tray.
TR16 [1]	Taped on reel; ∅ 360 mm, H*)=16.5 mm
TR18 [1]	Taped on reel; ∅ 360 mm, H*)=18.5 mm
LR18 [2]	Taped on reel; ∅ 500 mm, H*)=18.5 mm
XR18 [3]	Taped on reel; ∅ 360 mm, H*)=18.5 mm, crimped leads with F*)=7.5 mm
XA18 [3]	Taped, packed in ammo, H*)=18.5 mm, crimped leads with F*)=7.5 mm
TA16 [1]	Taped, packed in ammo, H*)=16.5 mm
TA18 [1]	Taped, packed in ammo, H*)=18.5 mm

[1] Quantity/package according to article table
[2] Quantity/package according to article table x 2
[3] Quantity/package according to table below
*) See figure on page 14.

Size code **)	Quantity/package XR18	XA18
B04	550	570
B05	550	570
B15	450	520
B10	450	480
B06	350	378
B12	350	351
B11	350	324
B14	250	297
B16	250	252
B17	200	216

**) See page 13.

Standard lead length and packaging

Part	Lead spacing mm	Standard lead length mm	Standard packaging	Taping lead length mm
Evox capacitors	≤ 15.0	4	bulk	16.5 [1]
Evox capacitors	22.5-27.5	4	tray	16.5

[1] 24.5 mm lead length for capacitors with crimped leads and taped

HOW TO ORDER RIFA CAPACITORS

The **Rifa** article code includes all the information needed to specify the product characteristics and type of packing. This article code construction applies for the following products in this catalogue: **PHE820, PHE840E, PHE840M, PHE841, PHE844, PHE845, PHE846, PHE850, PME261, PME264, PME271, PME278, PME295, PZB300, PMZ2074, PHZ9004, PMR205, PMR209, PMR210, PMZ2035, PHE426, PHE448, PHE450**.

PHE450 **H** **B** **6470** **J** **(B14)** **R17** **T0**

Capacitor type

Rated voltage

C	= 63 VDC	**EMI capacitors**	
D	= 100 VDC	**have the rated**	
F	= 160 VDC	**voltage expressed**	
H	= 250 VDC	**in volts AC:**	
J	= 300 VDC	**A**	= 125 VAC
K	= 400 VDC	**K**	= 220 VAC
M	= 630 VDC	**M**	= 250-275 VAC
P	= 1000 VDC	**E**	= 300-330 VAC
R	= 1600 VDC	**R**	= 440VAC
S	= 2000 VDC	**J**	= 500 VAC
T	= 2500 VDC	**N**	= 660 VAC
		V	= 760 VAC

Lead spacing

J	= 5.0 mm
K	= 7.5 mm
A	= 10.0 or 10.2 mm
B	= 15.0 or 15.2 mm
C	= 20.3 mm
D	= 22.5 mm
E	= 25.4 mm
F	= 27.5 mm
R	= 37.5 mm

Rated capacitance

Expressed in picofarads. Four digit code where the first digit is the number of digits in the capacitance value in pF. The next three digits are the three significant digits in the capacitance value.
6100 = 100000 pF = 0.1 µF
4625 = 6250 pF = 0.00625 µF

Capacitance tolerance

M	= ± 20 %
V	= -0%, +20 %
P	= -0%, +10 %
L	= -10%, +0 %
K	= ± 10 %
J	= ± 5 %
X	= ± 3.5 % *)
H	= ± 2.5 %
G	= ± 2 %
R	= ± 1.25 %
F	= ± 1 %
D	= ± 0.5 %

*) For paper capacitors (PME series), the X as tolerance code can have other meanings than ± 3.5 %.

Capacitor size code

See size codes on page 13.

Lead length

Letter R followed by a 3 digit integer, lead length in tenths of millimetres, and a tolerance code according to the table below. R035E = lead length 3.5 +0/-0.7 mm.
Exception:
- When std tolerance and the lead length is an integer in mm, only 2 digits for the length and no tolerance code. R05 = lead length 5 +0/-1 mm.

Tolerance Code	mm	
A	+1, -0	
B	+0.3, -0.1	
C	±0.5	
E	+0, -0.7	
F	±3.2	
G	±0.4	
J	+0, -1	Std for Rifa parts with lead length < 30 mm
K	+0.3, -0.2	
L	+5, -0	Std for Rifa parts with lead length = 30 mm
M	±0.25	
P	+2, -0	

Packaging

No code [1]	Bulk; loose parts in a box
L2 [1]	PHE parts in 22.5 to 37.5 mm lead spacing on tray.
T0 [1]	Taped on reel; ∅ 360 mm, H*)=18.0 mm
T1 [2]	Taped on reel; ∅ 500 mm, H*)=18.0 mm
TA [3]	Taped, packed in ammo
X2 [4]	Taped on reel; ∅ 360 mm, crimped leads with F*)=7.5 mm
X3 [4]	As for code X2, but P_0*)=12.7 mm
XA [4]	Taped, packed in ammo, crimped leads with F*)=7.5 mm

[1] Quantity/package according to article table
[2] Quantity/package according to article table x 2
[3] Quantity per package according to table on page 13.
[4] Quantity/package according to table below
*) See figure on page 14

Size code **)	Quantity/package X2, X3	XA
B04	550	570
B05	550	570
B15	450	520
B10	450	480
B06	350	378
B12	350	351
B11	350	324
B14	250	297
B16	250	252
B17	200	216

**) See page 13.

Standard lead length and packaging

Part	Lead spacing mm	Standard lead length mm	Standard packaging	Taping lead length mm [3]
PME, PMR	≤ 15.2	30	bulk	19
PME, PMR	≥ 20.3	30	bulk [1]	19
PHE426-PHE450	5.0 to 10.0	5	bulk	17
PHE426-PHE450	15.0	6	bulk	17
PHE820-PHE845	≤ 15.0	17	bulk	17
All PHE	≥ 22.5	6	tray [2]	17

[1] packed on tray if lead length ≤ 6 mm
[2] max lead length 6 mm for tray packaging in 22.5 mm lead spacing, bulk for longer leads
[3] 25 mm lead length for capacitors with crimped leads and taped

SIZE CODES OF LEADED CAPACITORS

A size code has been added to the following leaded Evox Rifa capacitors: **MMK, SMR, PHE840E, PHE840M, PHE846, PHE850, PFR**. The size code determines the size of the component and the packing quantities. The size codes are as follows:

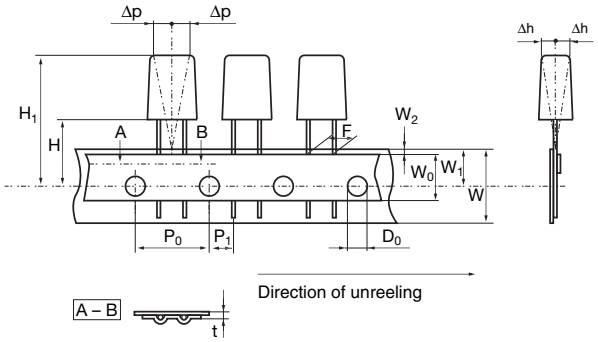
Size code in Article Code	Box dimensions in mm B_{max}	H_{max}	L_{max}	p	Typical weight [1] g	Quantity per package Bulk [1]	Bulk [2]	Bulk [3]	Tray	Reel ∅360	Reel ∅500	Ammo [4]
A01	4.0	9.0	13.0	10.0	0.6	1000	1000			900	1800	
A02	4.5	10.5	13.0	10.0	0.9	1000	1000			800	1600	
A03	5.0	11.0	13.0	10.0	1.0	800	800			700	1400	
A04	6.0	12.0	13.0	10.0	1.3	600	600			500	1000	
A05	9.5	7.5	13.0	10.0	1.2	600	600			350	700	
A06	4.0	8.0	13.0	10.0	0.5	1000	1000			900	1800	
B01	5.5	10.5	18.0	15.0	1.7 [3]			500				
B02	5.5	14.0	18.0	15.0	1.9 [3]			500				
B03	6.5	12.5	18.0	15.0	2.2 [3]			250				
B04	5.5	10.5	18.0	15.0	1.5	1000	800			600	1200	
B05	5.5	12.5	18.0	15.0	1.7	1000	800			600	1200	
B06	7.5	14.5	18.0	15.0	2.7	800	400			400	800	
B07	8.5	14.5	18.0	15.0	2.8 [3]			250				
B10	6.5	12.5	18.0	15.0	2.0	1000	600			500	1000	
B11	8.5	16.0	18.0	15.0	3.4	600	400			400	800	
B12	8.0	15.0	18.0	15.0	3.0	600	400			400	800	
B14	9.5	17.5	18.0	15.0	4.2	500	300			350	700	
B15	6.0	12.0	18.0	15.0	1.7	1000	800			500	1000	
B16	11.0	19.0	18.0	15.0	4.4	450	250			300	600	
B17	13.0	12.5	18.0	15.0	3.4	400	300			250	500	
D01	7.5	15.5	26.5	22.5	3.6 [3]			250				
D02	8.5	16.5	26.5	22.5	4.2 [3]			200				
D03	10.5	18.5	26.5	22.5	6.2 [3]			200				
D13	6.5	14.5	26.0	22.5	2.7				234	300	600	
D14	8.0	16.0	26.0	22.5	3.8				186	250	500	
D15	9.0	18.5	26.0	22.5	5.0				308	250	500	
D16	11.0	21.5	26.0	22.5	6.6				253			
D17	7.0	16.5	26.0	22.5	3.2				216	300	600	
D18	10.5	19.0	26.0	22.5	5.8				264			
D19	15.5	24.5	26.0	22.5	10.0				176			
D20	13.5	23.0	26.0	22.5	8.2				209			
F03	13.5	23.0	31.5	27.5	10.8				171			
F11	10.5	20.5	31.5	27.5	8.0				216			
F12	11.5	22.5	31.5	27.5	9.1				198			
F13	14.5	24.5	31.5	27.5	14.5				153			
F14	17.5	28.0	31.5	27.5	17.0				126			
F15	19.0	29.0	31.5	27.5	19.5				117			
F16	21.0	30.0	31.5	27.5	22.6				108			
F17	21.0	12.5	31.5	27.5	9.0				108			
F18	31.0	19.0	31.5	27.5	20.0				72			
F19	27.5	16.0	31.5	27.5	17.0				81			
J01	2.5	6.5	7.2	5.0	0.2	2000	2000			2500	5000	3000
J02	3.5	8.0	7.2	5.0	0.3	2000	2000			2000	4000	2000
J03	4.5	9.0	7.2	5.0	0.4	1000	1000			1500	3000	1700
J04	5.0	10.0	7.2	5.0	0.5	1000	1000			1300	2600	1500
J05	6.0	11.0	7.2	5.0	0.6	1000	1000			1000	2000	1200
J06	7.2	13.0	7.2	5.0	0.9	1000	1000			800	1600	
J11	4.5	6.0	7.2	5.0	0.3	1000				1500	3000	1700
J12	5.5	7.0	7.2	5.0	0.4	1000				1200	2400	1300
J13	6.5	8.0	7.2	5.0	0.5	1000				900	1800	1100
K00	2.5	6.0	10.0	7.5	0.3	2000	2000			2500	5000	3000
K01	4.0	8.0	10.0	7.5	0.5	1000	1000			1700	3400	1900
K03	5.0	11.0	10.0	7.5	0.8	1000	1000			1300	2600	1500
K04	6.0	12.0	10.5	7.5	1.0	1000	1000			1000	2000	1200
R02	16.5	32.0	41.0	37.5	23.0				105			
R03	19.0	36.0	41.0	37.5	28.5				91			
R04	15.0	26.0	41.0	37.5	17.0				119			
R05	13.0	24.0	41.0	37.5	14.0				140			
R06	21.0	38.0	41.0	37.5	34.4				84			
R08	28.0	43.0	41.0	37.5	53.0				54 [1]			

[1] Capacitors with lead length of 4 to 6 mm according to the data sheet.
[2] Capacitors with lead length of 16.5 mm or 17.0 mm according to the data sheet.
[3] Capacitors with lead length of 30 mm and insulated leads.
[4] For Ammo packaging of parts in 10 mm and 15 mm lead spacing, please ask Evox Rifa Customer Service.

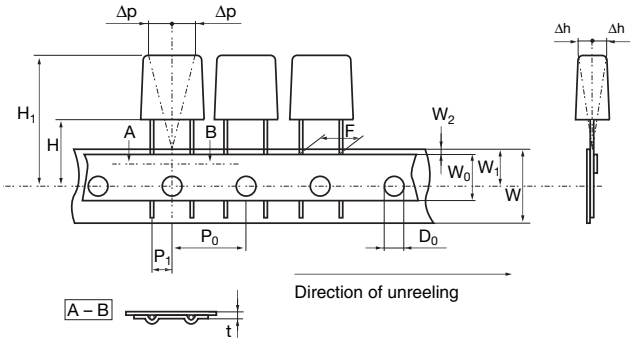
TAPING OF EVOX RIFA RADIAL CAPACITORS

The taping is carried out in accordance with IEC 60286-2.

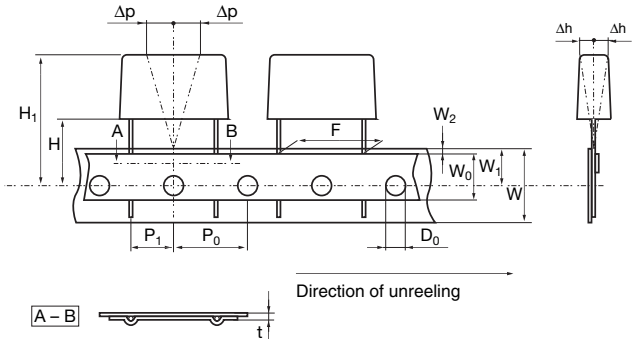
Lead spacing 5 mm



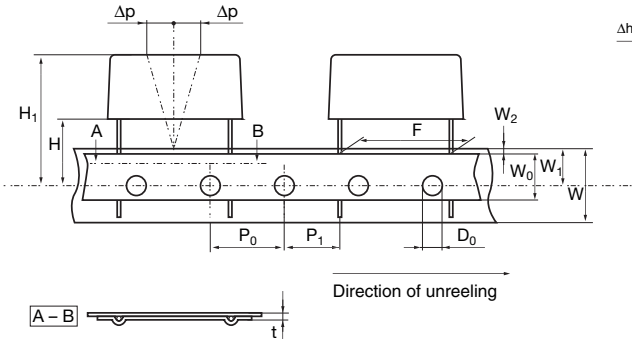
Lead spacing 7.5 mm



Lead spacing 10 and 15 mm



Lead spacing 22.5 and 27.5 mm

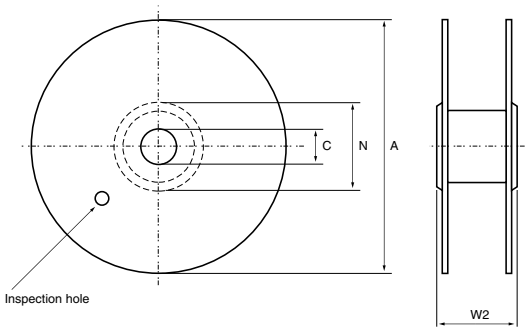


Taping specification Dimensions in mm						Standard IEC 60286-2
Lead spacing, $^{+0.6}_{-0.1}$	F	5.0/7.5[4]	10.0/15.0	22.5/27.5	10.2/15.2/20.3 Paper capacitors	F
Carrier tape width, ±0.5	W	18	18	18	18	18 $^{+1.0}_{-0.5}$
Hold-down tape width, ±0.3	W_0	9	12	12	12	
Position of sprocket hole, ±0.5	W_1	9	9	9	9	9 $^{+0.75}_{-0.5}$
Distance between tapes, max	W_2	3	3	3	3	3
Sprocket hole diameter, ±0.2	D_0	4	4	4	4	4
Feed hole pitch, ±0.3	P_0 [1]	12.7	12.7	12.7	12.7	12.7
Distance lead – feed hole, ±0.7	P_1	3.85/3.75	7.7/5.2	5.3	7.6/5.1/8.9	P_1
Max deviation tape – plane	Δp	1.3	1.3	1.3	1.3	1.3
Max lateral deviation	Δh	2	2	2	2	2
Total thickness, ±0.2	t	0.7	0.7	0.9 max	0.7	0.9 max
Sprocket hole/cap body	H [2]	18.5 ±0.5 16.5 ±0.5	18.5 ±0.5 16.5 ±0.5	18.5 ±0.5	18.0 $^{+2}_{-0}$	18.0 $^{+2}_{-0}$
Sprocket hole/top of cap body, max	H_1 [3]	32/31 max	43 max	58	35 max	58 max

[1] Cumulative pitch error
[2] Alternatives for different insertion machines
[3] Depending on case size
[4] Crimped leads available on request

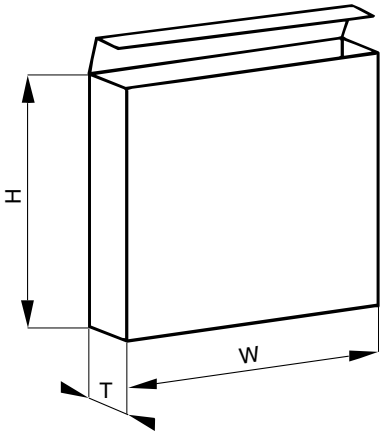
TAPING OF EVOX RIFA RADIAL CAPACITORS

Reel specification			
Reel dimensions in mm			Tol.
Reel diameter	A	360/500	max
Hub diameter	N	80	min
Arbor hole	C	30	± 1
Total reel width measured at hub	W2	58	max
The standard packing for lead space ≤ 15 mm is 360 mm reel and for lead space > 15 mm 500 mm reel.			



Ammo pack specification

Ammo pack dimensions in mm		Lead spacing, mm 5, 7.5 10	15, 22.5, 27.5, 37.5
Height	H	330	(135 or 200 for CQ depending on capacitance value)
Width	W	330	(335 for CQ)
Thickness	T	50	



THE MANUFACTURING CODE Y Z, ACCORDING TO IEC 60062

where Y = year, Z = month.

Year	Code	Year	Code	Year	Code	Month	Code	Month	Code
1990	A	1997	J	2004	S	Jan	1	July	7
1991	B	1998	K	2005	T	Febr	2	Aug	8
1992	C	1999	L	2006	U	March	3	Sept	9
1993	D	2000	M	2007	V	April	4	Oct	O
1994	E	2001	N	2008	W	May	5	Nov	N
1995	F	2002	P	2009	X	June	6	Dec	D
1996	H	2003	R	2010	Y				

TERMS AND DEFINITIONS

Rated capacitance (C_R)
The rated capacitance of a capacitor is the value which is indicated upon it. The capacitance is measured at 1 kHz and +23°C.

Rated voltage (U_R)
The rated voltage is the maximum direct voltage or the maximum RMS alternating voltage which may be applied continuously to the terminals of the capacitor at any temperature within the rated temperature range.

Rated temperature
The rated temperature is the maximum ambient temperature at which the rated voltage can be continuously applied.

Climatic category
The climatic category states the category temperature range and the humidity class. For example 40/085/56 stands for –40°C to +85°C; 56 states that the steady state humidity test should take 56 days.

Tangent of the loss angle (Dissipation factor, tanδ)
The tangent of the loss angle is the power loss of the capacitor divided by the reactive power of the capacitor at a sinusoidal voltage of specified frequency. The tangent of loss angle is given in percent (Eg 0.01 tanδ=1%).
The dissipation factor is of interest especially when the capacitor is operated on AC. The dielectric loss causes heating of the capacitor which under unfavourable circumstances may lead to a destructive breakdown. This will not happen if the capacitor is used within specified limits. The ability to withstand short duration thermal and voltage overload is greater for small capacitors than for large ones.

Insulation resistance
The values given in the catalogue indicate the insulation resistance after one minute of electrification at +23°C with the following voltages: 100 VDC for capacitors rated at 100 to 500 VDC and 500 VDC for capacitors rated at 500 VDC. Insulation resistance is temperature dependent and is approximately halved for each 7 °C of temperature rise. Multilayer construction provides insulation resistance higher than that of single-layer types.

Temperature derated voltage
For any temperature between the rated temperature and the upper category temperature, the temperature derated voltage is the maximum voltage that may be applied continuously to the terminals of the capacitor.

Pulse operation
Capacitors loaded with pulses with fast rise or fall times (high dU/dt) will be exposed to high current pulses. In order not to overload the internal connections the current must be limited. The current limits for a specific type are dependent upon:
- Amplitude and form of the pulse
- Rated voltage of the capacitor
- Capacitance
- Geometrical configuration of the winding

$dU/dt = U_R/(R \times C)$

U_R = Rated voltage
R = Discharge resistor
C = Rated capacitance

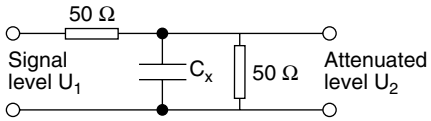
At repeated pulse operation, self-heating, ambient temperature and cooling set the load limit.
Pulse current limits are commonly expressed in the form of maximum permitted dU/dt in volts per microsecond. The figures stated in the type specifications refer to an unlimited number of pulses charging or discharging from rated voltage U_R.

Self-healing
A break-through in a plastic film/foil capacitor leads to a permanent short circuit of the capacitor due to a carbon bridge which is built up in the break-down channel due to the high temperature rise and carbon content of the dielectric. A metallized capacitor can withstand a break-through without a permanent short circuit because of its self-healing ability. The metallized layer is between 0.02 – 0.1 µm. At a weak point in the dielectric, or because of a transient, a break-down may occur. The thin metal layer around the weak point is evaporated and the weak point is isolated. The capacitor has self-healed thereby.

Active flammability
The ability of a capacitor to burn with a flame as a consequence of electrical loading.

Passive flammability
The ability of a capacitor to burn with a flame as a consequence of the application of an external source of heat.

Attenuation
The attenuation of a capacitor is measured in a 50 Ω system.
The highest attenuation is achieved at the resonant frequency.



Attenuation a = 20 log $U_1/2U_2$ dB

Resonance frequency
The resonance frequency of a capacitor is reached when

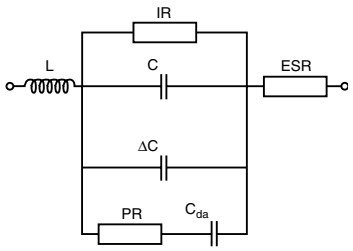
$\omega L = 1/\omega C$

$\omega = 2\pi f$ (f = frequency)
L = inductance caused by the winding and the length of the leads
C = the capacitance at f.

Dielectric absorption (DA)
Dielectric absorption describes the dielectric material's properties to "remember" the applied voltage. One method to define DA is:
The capacitor is to be charged for one hour at rated voltage DC (U_R) then discharged through a resistor of 5 ohms for 10 seconds. The discharge resistor must then be disconnected and the recovery voltage U_r measured 15 minutes after disconnection. The dielectric absorption is defined by:
$DA = (U_r/U_R) \times 100\%$

More specific terms and definitions for EMI, RC and Pulse capacitors can be found in the beginning of respective sections.

CAPACITOR EQUIVALENT DIAGRAM



C = nominal value of the capacitor
L = inductance (leads, metallization, winding)
ESR = equivalent series resistance (leads, metallization, metal spraying)
IR = insulation resistance (properties of the dielectric material)
ΔC = capacitance change (depending on changes in temperature, DC voltage and/or frequency)
PR = dielectric polarization resistance
C_{da} = dielectric absorption

PROPERTIES OF DIELECTRICS

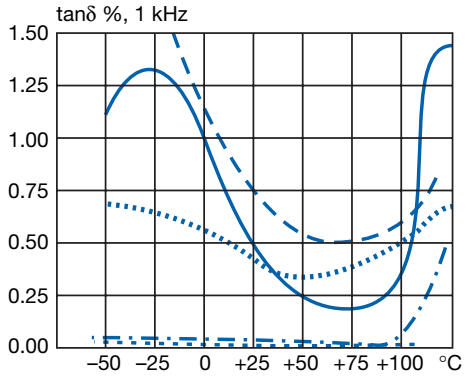
POLYESTER
(Polyethylene Terephthalate, PET)
Metallized and Film/foil
High dielectric constant and high dielectric strength provides good volumetric efficiency for metallized polyester film capacitors. Metallized polyester film has excellent self-healing properties.
Typical applications: Bypassing, coupling, filtering.

POLYESTER
(Polyethylene Naphthalate, PEN)
Metallized
High temperature Polyester. Relatively high dielectric constant and dielectric strength, and availability of thin films, provide good volymeric efficiency for metallized construction. High melting point allowes SMD constructions and service in high ambient temperatures. General purpose capacitor.

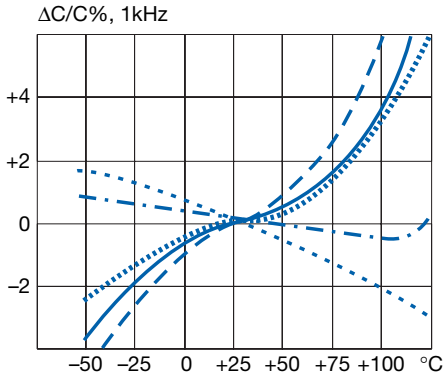
POLYPROPYLENE (PP)
Metallized and Film/foil
Very low losses, low dielectric absorption, high dielectric strength, very high insulation resistance, and negative temperature coefficient.
Typical applications: Stable oscillators and filters. Sample & hold circuits, pulse handling circuits, AC applications and mains filtering.

POLYPHENYLENE SULPHIDE (PPS)
Metallized
Low losses, wide operating temperature range, low temperature coefficient, good stability.
Typical applications: Timers and filters. Automotive and other applications in high ambient temperatures.

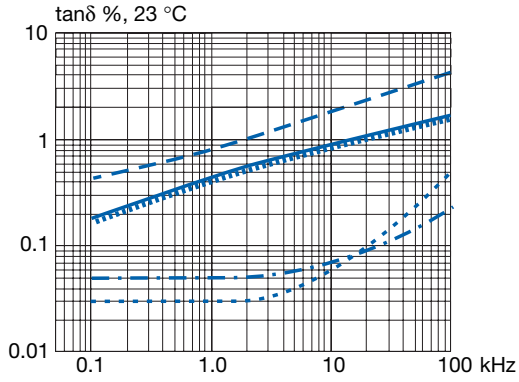
PAPER
Metallized
High dielectric constant. Excellent self-healing properties and transient handling capability. High ionisation level due to impregnated dielectric material. Outstanding reliability in mains connected and other low frequency applications.



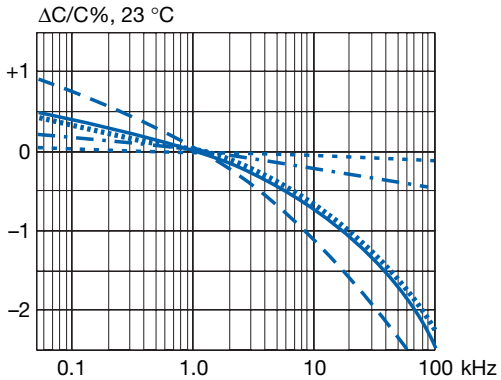
Dissipation factor vs. temperature



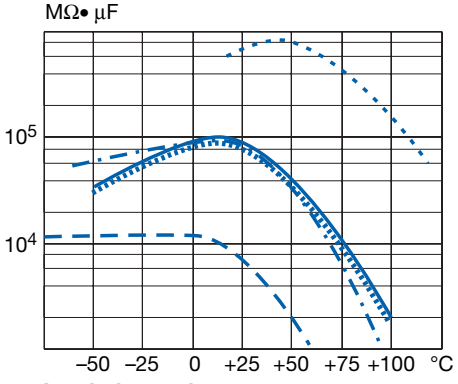
Capacitance vs. temperature



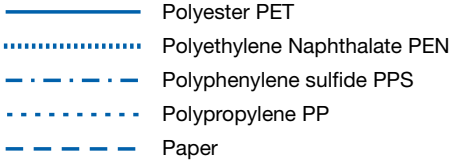
Dissipation factor vs. frequency



Capacitance vs. frequency



Insulation resistance vs. temperature



RELIABILITY

The reliability of a capacitor is mainly a function of:
- The construction; dielectric material and its thickness
- The manufacturing process
- The application; electrical stress and temperature

The failure rate, λ, vs. voltage and temperature for the most common dielectric materials is shown in the diagrams below. U_R = rated voltage.

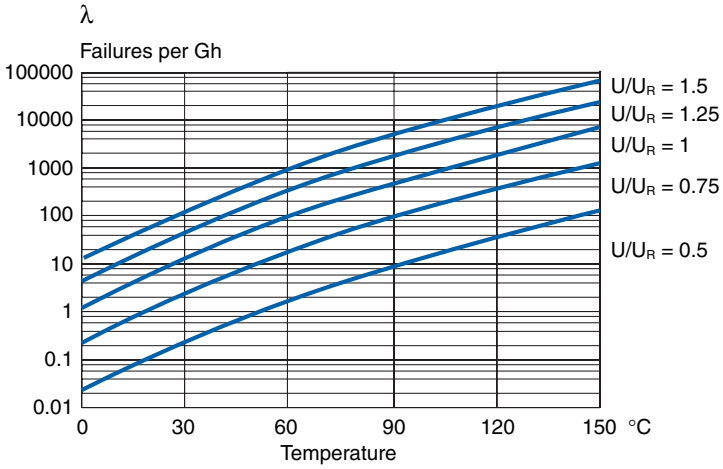
The operating life (L) can be calculated as:

$$L = \frac{1}{\lambda} \times \ln \frac{1}{1 - F}$$

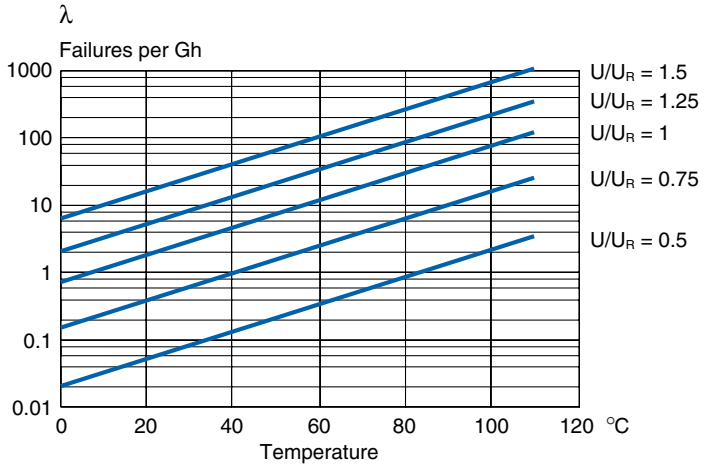
where F is the expected probability of failures.
Example: If $\lambda = 20 \times 10^{-9}$ it takes 6 years to have
F = 0.001 (0.1% failures)
and 300 years to have
F = 0.05 (5% failures)

MTBF (mean time between failures) = 1 / λ

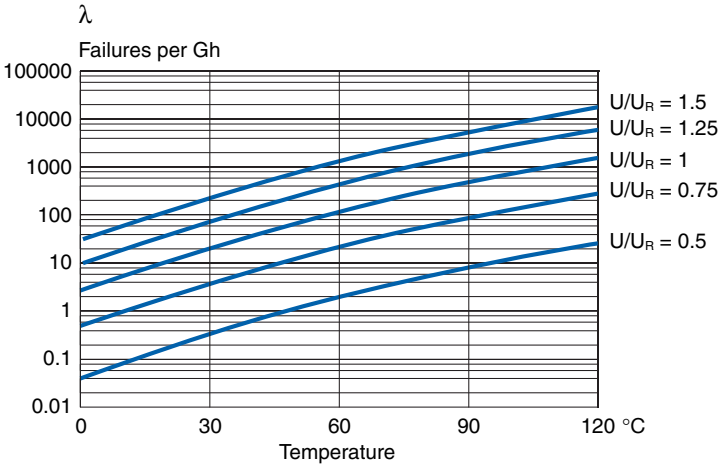
Failure rates vs. temperature and voltage Polyethylene Naphthalate (PEN)



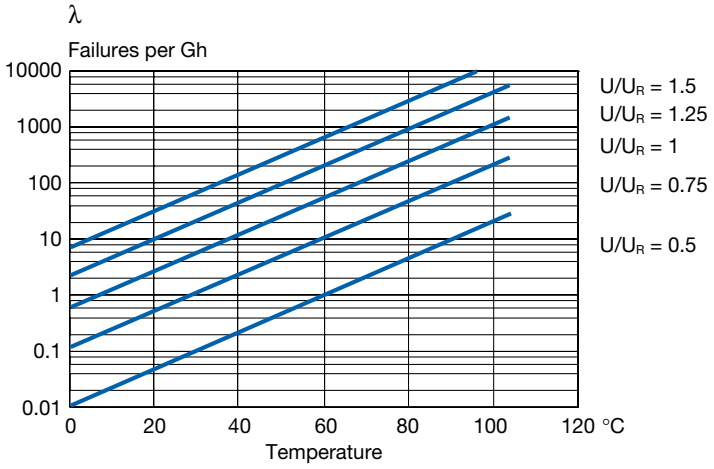
Failure rates vs. temperature and voltage Paper



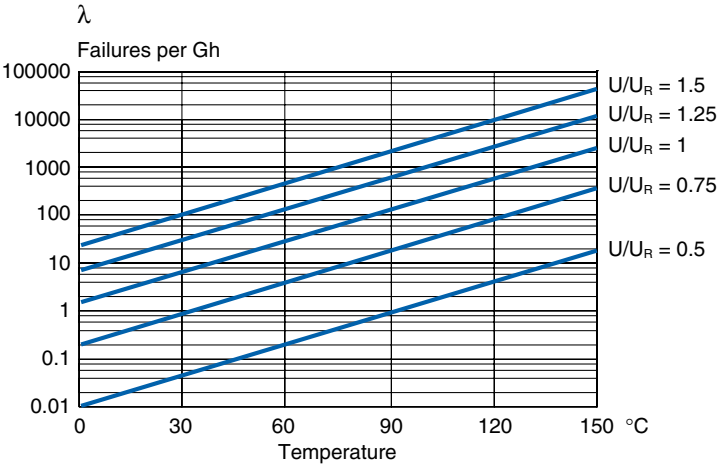
Failure rates vs. temperature and voltage Polyester



Failure rates vs. temperature and voltage Polypropylene



Failure rates vs. temperature and voltage Polyphenylene sulfide



NUMERICAL COMPARISON OF FILM MATERIALS

Material (Trade names)	Abbreviation	Min. film thickness (µm)	Dielectric constant at 1 kHz, +23°C	Operating temperature (°C)	Temperature coefficient (ppm/°C)	Dissipation factor at 1 kHz, +23°C	Insulation time constant (s) at +23°C	Dielectric absorption %
Polyester (Mylar, Lumirror, Hostaphan, Diafoil)	PET	0.9	3.3	–55 ... +100 (... +125)	+400 (±200)	0.5%	25 000	0.5
Polyethylene Naphthalate (Teonex)	PEN	1.4	3.0	–55 ... +125 (... +150)	+200 (±150)	0.4%	25 000	1.2
Polyphenylene sulfide (Torelina)	PPS	1.2	3.0	–55 ... +125 (... +150)	0 (–50) up to +100 °C	0.06%	25 000	0.05
Polypropylene (Torayfan, Trespaphan)	PP	3.0	2.2	–55 ... +110	–200 almost linear	0.03% (–100, +50)	100 000	0.01
Paper Impregnated	P	7.0	5.5	–40 ... +115	+1200 (±200)	0.8%	15 000	

ENVIRONMENTAL COMMITMENT

As an environmentally conscious company, Evox Rifa (including BHC Components) is working continuously with improvements concerning the environmental effects of both our capacitors and the production of them.

In Europe (RoHS Directive) and in some other geographical areas like China, legislation has been put on place to prevent the use of some hazardous materials, like Lead (Pb), in electronic equipment. All products in this catalogue are produced to help our customer's obligations to guarantee their products to fulfil these legislative requirements. The only material of concern in our products has been Lead (Pb), which has been removed from all designs to fulfil the requirement of containing less than 0,1% of Lead in any homogeneous material.

Evox Rifa will follow closely any changes in legislation world wide, and makes any necessary changes in its products, whenever needed.

Some customer segments like Medical, Military and Automotive Electronics may still require e.g. the use of Lead in electrode coatings. To clarify the situation, and to distinguish products from each other, a special symbol is used on the packaging labels for RoHS compatible capacitors. See pictures to the right.

Because of customer requirements there may appear additional markings like LF = Lead Free or LFW = Lead Free Wires on the label.

Examples of RoHS Compliance markings on packaging labels

WARNING

The implementation of RoHS Directive has forced to select SnAuCu (SAC) alloys or SnCu alloys as primary solder. This has increased the liquidus temperature from that of 183 ºC for SnPb eutectic alloy to 217 – 221 ºC for the new alloys. This means that the heat stress to components, even in Wave Soldering, has increased considerably due to higher pre-heat and wave temperatures.

The Polypropylene Capacitors are especially sensitive to heat (melting point of Polypropylene is 160 – 170 ºC). The Wave Soldering can be destructive especially for mechanically small Polypropylene Capacitors (Lead spacings 5-10 mm), and great care has to be taken when soldering them. The recommended solder profiles from Evox Rifa should be used. In case of doubt, Evox Rifa should be consulted. In general the Wave Soldering curve from IEC Publ. 61760-1 edition 2 gives a good guideline for successful soldering. See Figure 1.

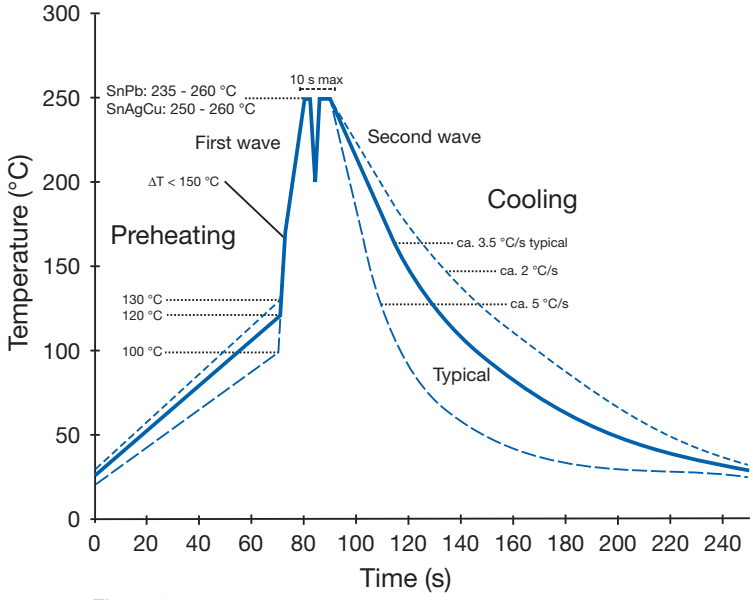


Figure 1

EVOX RIFA QUALITY

The quality of Evox Rifa's products and services is based on a continuous strive towards excellency throughout the whole organization. Skilled and motivated personnel, technical know-how and modern equipment combined with extensive quality assurance make Evox Rifa the supplier of components of the highest quality.

The up-to date quality tools like Statistical Process Control (SPC) in various forms, Failure Mode and Effect Analysis (FMEA), Accelerated Reliability Testing and Zero Defect Acceptance concept in final testing are the corner stones of the every day quality work. Cross-functional teams are routinely used in Problem Solving (8D method) with effective Failure Analysis support.

As a visible evidence of our quality, all the manufacturing units world wide are certified according to ISO 9001. In addition to that, the relevant factories have the automotive industry's QS9000 certifications, which is in process to be upgraded to ISO TS 16949 during 2006. The Finnish factory has also IECQ approval. Our well known EMI suppression capacitors carry the important safety marks for world wide applications.

Evox Rifa companies have the following certificates:

ISO 14001
P.T. Evox Rifa, Batam, Indonesia
ISO 9001
BHC Components
Evox Rifa AB, Gränna, Sweden
Evox Rifa Oy, Suomussalmi, Finland
Nantong Evox Rifa Electrolytics, P.R. China
P.T. Evox Rifa, Batam, Indonesia
ISO TS 16949
Evox Rifa AB, Gränna, Sweden
QS9000 (TS 16949 pending at the time of printing of this catalogue)
Evox Rifa Oy, Suomussalmi, Finland
Nantong Evox Rifa Electrolytics, P.R. China
P.T. Evox Rifa, Batam, Indonesia
IECQ
Evox Rifa Oy, Suomussalmi Finland

Customer in Focus

The only real measure of our total quality performance is the acceptance of our customers.

Evox Rifa's quality work has always been focused on the customer. We have actively made quality agreements with ambitious goal settings with World-Class Companies – small and large.

This active quality cooperation has been most fruitful to Evox Rifa by bringing in most modern quality tools, but especially by providing us with reliable feedback on the performance quality of our products and services.

The cooperation has not only lead to continuous improvement of the quality of our products, but sometimes also helped our customers to spot some weaknesses in their designs. A visible sign of these close links between Evox Rifa and various customers is the numerous prestigious customer approvals and the performance awards addressed to Evox Rifa and BHC Components.

IN-HOUSE RESEARCH AND DEVELOPMENT FOR TOMORROW'S NEEDS

Evox Rifa has over sixty years accumulated experience in developing a wide range of world-class capacitor products. Our leading position in the market with a wide product range is based on our deep knowledge of the materials and ways in which they can be used in capacitor designs to provide the best possible solutions.

Evox Rifa invests substantial human and financial resources in finding new highly reliable and cost effective solutions for today's and tomorrow's needs. Our R&D department can simulate most operational conditions and apply our products to the envisaged working environment, giving to the customer optimized capacitors for a particular specification.

The simulation capabilities substantially shorten the design cycle of capacitors.

To assist in shortening the design cycle of our customers, we have brought our R&D department to our customers by providing them with a CAD software, which allows them to select the most suitable capacitors for their application (Fig. 1). For easy calculation of signal stresses, there is also a fast Fourier transform software available. In this software complicated signal forms can easily be simulated and analysed (Fig. 2 and 3).

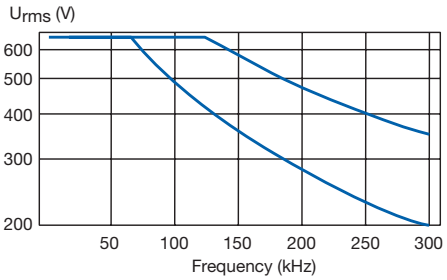


Fig. 1. From CAD software, showing max U_{rms} vs. frequency for two different capacitors

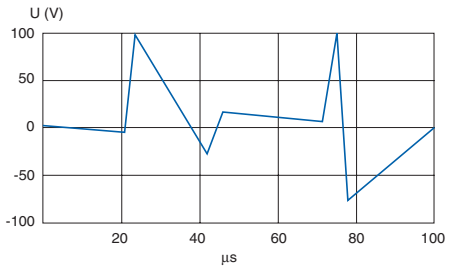


Fig. 2. Signal s (t)

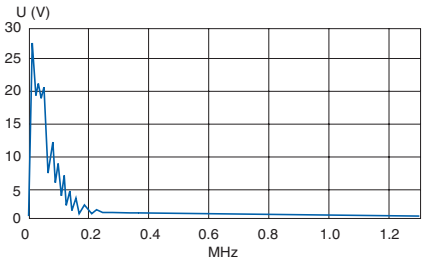


Fig. 3. Frequency spectrum

PRODUCT SPECIFICATION

All descriptions, drawings and other particulars (including dimensions, materials and performance data) given by Evox Rifa are as accurate as possible but, being given for general information, are not binding on Evox Rifa unless specifically agreed in writing. All dimensions and materials are, unless otherwise stated, subject to reasonable variations resulting from the raw material available or arising in the ordinary course of manufacture. Any performance data are based upon Evox Rifa's experience and are such as Evox Rifa normally expects to achieve.

WARRANTY, PRODUCT LIABILITY

Evox Rifa warrants that the goods manufactured by Evox Rifa are free from defects in design, material and workmanship.

Evox Rifa's liability under this warranty shall be limited to replacement or repair free of charge, at one of Evox Rifa's factories selected by Evox Rifa, provided that notification of such failure or defect is given to Evox Rifa immediately upon the same becoming apparent and that on Evox Rifa's request and instruction the goods are promptly returned to Evox Rifa carriage paid by buyer.

In case the goods thus returned as defective, prove to be without fault or defect, Evox Rifa is entitled to charge buyer 100% of the value of the returned goods.

If the goods supplied or part thereof are not manufactured by or branded Evox Rifa, Evox Rifa will only extend to the buyer the benefit of the warranty granted by the manufacturer of the goods.

Evox Rifa's liability is further limited to a period of 12 months from the date of shipment to buyer.

Evox Rifa shall not be liable for any defect which is due to accident, fair wear and tear, negligent use, tampering, improper handling, improper use, improper operation or improper storage or any other default on the part of any person other than Evox Rifa.

Evox Rifa shall have no other liabilities in case of defective goods than those stated above and shall under no circumstances be liable for any consequential loss or damage arising from the use of goods sold by Evox Rifa. Liability under paragraph 823 BGB is expressly excluded.

The above limitations of Evox Rifa's liability for defective goods shall apply also with regard to product liability, and Evox Rifa shall have no responsibility for injury to persons or for damage to goods or property of any kind.

In case of product liability claims from third parties against Evox Rifa, not falling within Evox Rifa's liability in accordance with the above, buyer shall hold Evox Rifa harmless.