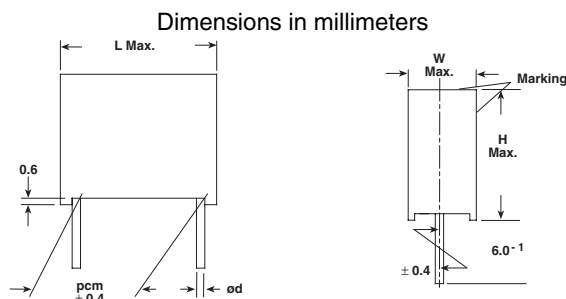


Metallized Polypropylene Capacitor, Mini-Version (-M) Related Document: IEC 60384-16



PCM	W	Ø d
7.5		0.6
10 - 37.5	< 16.0	0.8
10 - 37.5	≥ 16.0	1.0

MAIN APPLICATIONS

High voltage, high current and high pulse operations. Deflection circuits in TV-sets (S-correction and fly-back tuning). Protection circuits in SMPS's, snubber and electronic ballast circuits. Input and output filtering in SPS designs.

MARKING

Manufacturer's logo/type/C-value/rated voltage/tolerance/date of manufacture

DIELECTRIC

Polypropylene film

ELECTRODES

Vacuum deposited aluminum

COATING

Flame retardant plastic case UL-class 94 V-0, color blue, epoxy resin sealed
Flame class B according to IEC 60065 available on request

CONSTRUCTION

Extended double sided metallized polyester film, internal series connection (630 VDC/400 VAC to 2000 VDC), double sided metallized polyester carrier film.

LEADS

Tinned wire

TEST VOLTAGE (ELECTRODE/ELECTRODE)

1.6 x U_R for 2 s

IEC TEST CLASSIFICATION

55/100/56, according to IEC 60068

MAXIMUM PULSE RISE TIME

PCM (mm)	Maximum Pulse Rise Time d _v /d _t [V/µs]						
	250 VDC	400 VDC	630/250 VDC	630 VDC	1000 VDC	1600 VDC	2000 VDC
7.5	1730	—	—	—	—	—	—
10	865	1297	2162	—	—	—	—
15	432	649	—	2703	3784	6683	9610
22.5	247	360	—	1441	2018	2827	3326
27.5	192	282	—	1081	1514	2042	2544
37.5	133	200	—	—	1044	1313	1602

If the maximum pulse voltage is less than the rated voltage higher d_v/d_t values can be permitted.

FEATURES

Product is completely lead (Pb)-free.
Product is RoHS compliant.

OPERATING TEMPERATURE RANGE

- 55°C to + 100°C

CAPACITANCE RANGE

470pF to 4.7µF

CAPACITANCE TOLERANCES

± 20% (M), ± 10% (K), ± 5% (J)

RATED VOLTAGES (U_R):

250 VDC, 400 VDC, 630 VDC, 1000 VDC, 1600 VDC, 2000 VDC

PERMISSIBLE AC VOLTAGES (RMS) UP TO 60Hz

160 VAC, 220 VAC, 250 VAC, 400 VAC, 600 VAC, 650 VAC, 700 VAC

INSULATION RESISTANCE

Measured at 100 VDC after one minute

For C ≤ 0.33µF:

100,000 MΩ minimum value (150,000 MΩ typical value)

TIME CONSTANT

Measured at 100 VDC after one minute

For C > 0.33µF:

30,000 s minimum value (50,000 s typical value)

TEMPERATURE COEFFICIENT

- 250 x 10⁻⁶/°C (typical value)

CAPACITANCE DRIFT

Up to + 40°C, ± 0.5% for a period of two years

DERATING FOR DC AND AC CATEGORY VOLTAGE U_C

At + 85°C: U_C = 1.0 U_R

At + 100°C: U_C = 0.7 U_R

SELF INDUCTANCE

~ 6 nH measured with 2mm long leads

PULL TEST ON LEADS

≥ 30 N in direction of leads according to IEC 60068-2-21

RELIABILITY

Operational life > 300,000 h

Failure rate < 2 FIT (40°C and 0.5 x U_R)

For further details, please refer to the general information available at www.vishay.com/doc?26033.



RoHS
COMPLIANT

DISSIPATION FACTOR TAN δ

MEASURED AT	$C \leq 0.1\mu\text{F}$	$0.1\mu\text{F} < C \leq 1.0\mu\text{F}$	$C > 1.0\mu\text{F}$
1kHz	0.3×10^{-3}	0.3×10^{-3}	0.3×10^{-3}
10kHz	0.4×10^{-3}	0.5×10^{-3}	—
100kHz	1.5×10^{-3}	—	—
Maximum values			

CAPACITANCE	CAPACITANCE CODE	VOLTAGE CODE 25 250 VDC/160 VAC				VOLTAGE CODE 40 400 VDC/220 VAC				VOLTAGE CODE 63 630 VDC/250 VAC				VOLTAGE CODE 63 630 VDC/400 VAC			
		W	H	L	PCM	W	H	L	PCM	W	H	L	PCM	W	H	L	PCM
470pF	- 147	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
680pF	- 168	—	—	—	—	—	—	—	—	3.5	8.0	13.0	10	—	—	—	—
1000pF	- 210	—	—	—	—	—	—	—	—	3.5	8.0	13.0	10	—	—	—	—
1500pF	- 215	—	—	—	—	—	—	—	—	3.5	8.0	13.0	10	—	—	—	—
2200pF	- 222	—	—	—	—	—	—	—	—	3.5	8.0	13.0	10	—	—	—	—
3300pF	- 233	—	—	—	—	—	—	—	—	3.5	8.0	13.0	10	—	—	—	—
4700pF	- 247	—	—	—	—	—	—	—	—	4.0	9.0	13.0	10	—	—	—	—
6800pF	- 268	—	—	—	—	—	—	—	—	4.5	9.5	13.0	10	—	—	—	—
0.010 μF	- 310	4.0	9.0	10.0	7.5	4.0	9.0	13.0	10	5.5	10.5	13.0	10	—	—	—	—
0.015 μF	- 315	4.0	9.0	10.0	7.5	4.0	9.0	13.0	10	6.5	11.5	13.0	10	5.5	10.5	18.0	15*
0.022 μF	- 322	4.0	9.0	13.0	10	5.5	10.5	13.0	10	9.0	15.5	13.0	10	6.5	12.5	18.0	15*
0.033 μF	- 333	4.5	9.5	13.0	10	5.5	10.5	18.0	15	9.0	15.5	13.0	10	7.5	13.5	18.0	15*
0.047 μF	- 347	5.5	10.5	13.0	10	5.5	10.5	18.0	15	10.5	17.5	13.0	10	8.5	14.5	18.0	15*
0.068 μF	- 368	6.5	11.5	13.0	10	6.5	12.5	18.0	15	—	—	—	—	7.5	15.5	26.5	22.5
0.10 μF	- 410	5.5	10.5	18.0	15	7.5	13.5	18.0	15	—	—	—	—	8.5	16.5	26.5	22.5
0.15 μF	- 415	6.5	12.5	18.0	15	8.5	14.5	18.0	15	—	—	—	—	10.5	18.5	26.5	22.5
0.22 μF	- 422	7.5	13.5	18.0	15	7.5	15.5	26.5	22.5	—	—	—	—	11.5	20.5	31.5	27.5
0.33 μF	- 433	8.5	17.5	18.0	15	8.5	16.5	26.5	22.5	—	—	—	—	13.5	23.5	31.5	27.5
0.47 μF	- 447	8.5	16.5	26.5	22.5	10.5	18.5	26.5	22.5	—	—	—	—	18.0	28.0	31.5	27.5
0.68 μF	- 468	9.0	17.0	26.5	22.5	11.5	20.5	31.5	27.5	—	—	—	—	18.0	33.0	31.5	27.5
1.0 μF	- 510	11.0	21.0	26.5	22.5	13.5	23.5	31.5	27.5	—	—	—	—	—	—	—	—
1.5 μF	- 515	13.5	23.5	31.5	27.5	16.5	29.5	31.5	27.5	—	—	—	—	—	—	—	—
2.2 μF	- 522	15.0	24.5	31.5	27.5	16.0	28.5	41.5	37.5	—	—	—	—	—	—	—	—
3.3 μF	- 533	18.0	33.0	31.5	27.5	—	—	—	—	—	—	—	—	—	—	—	—
4.7 μF	- 547	18.0	32.5	41.5	37.5	—	—	—	—	—	—	—	—	—	—	—	—

Further C-values upon request

*Ordering Code - 2M for PCM 15 (e.g. MKP 1841-322/635-2M)

RECOMMENDED PACKAGING

LETTER CODE	TYPE OF PACKAGING	HEIGHT (H) (mm)	REEL DIAMETER (mm)	ORDERING CODE EXAMPLES	PCM ≤ 15	PCM 22.5 - 27.5	PCM 37.5
D	AMMO	16.5	—	MKP 1841-410/405-MD	X	—	—
G	AMMO	18.5	—	MKP 1841-410/405-MG	X	—	—
F	REEL	16.5	350	MKP 1841-410/405-MF	X	—	—
W	REEL	18.5	350	MKP 1841-410/405-MW	X	—	—
V	REEL	18.5	500	MKP 1841-510/254-MV	—	X	—
G	AMMO	18.5	—	MKP 1841-510/254-MG	—	X	—
—	BULK	—	—	MKP 1841-510/254-M	X	X	X

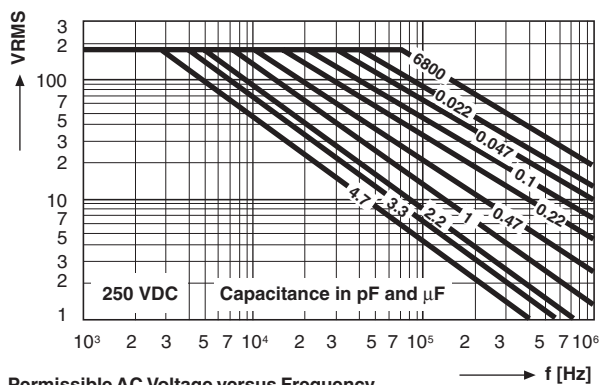


CAPACITANCE	CAPACITANCE CODE	VOLTAGE CODE 10 1000 VDC/600VAC				VOLTAGE CODE 13 1600 VDC/650 VAC				VOLTAGE CODE 20 2000 VDC/700 VAC			
		W	H	L	PCM	W	H	L	PCM	W	H	L	PCM
470pF	- 147	—	—	—	—	—	—	—	—	5.5	10.5	18.0	15
680pF	- 168	—	—	—	—	—	—	—	—	5.5	10.5	18.0	15
1000pF	- 210	—	—	—	—	—	—	—	—	5.5	10.5	18.0	15
1500pF	- 215	—	—	—	—	—	—	—	—	5.5	10.5	18.0	15
2200pF	- 222	—	—	—	—	—	—	—	—	5.5	10.5	18.0	15
3300pF	- 233	—	—	—	—	5.5	10.5	18.0	15	6.0	12.0	18.0	15
4700pF	- 247	5.5	10.5	18.0	15	6.5	12.5	18.0	15	6.0	12.0	18.0	15n
6800pF	- 268	5.5	10.5	18.0	15	7.5	13.5	18.0	15	6.5	14.5	26.5	22.5
0.010μF	- 310	6.5	12.5	18.0	15	8.5	14.5	18.0	15	6.5	14.5	26.5	22.5
0.015μF	- 315	6.5	12.5	18.0	15	8.5	17.5	18.0	15	7.5	15.5	26.5	22.5
0.022μF	- 322	8.5	14.5	18.0	15	8.5	16.5	26.5	22.5	8.5	16.5	26.5	22.5
0.033μF	- 333	6.5	14.5	26.5	22.5	8.5	16.5	26.5	22.5	9.0	18.5	31.5	27.5
0.047μF	- 347	8.5	16.5	26.5	22.5	10.5	18.5	26.5	22.5	11.5	20.5	31.5	27.5
0.068μF	- 368	10.5	18.5	26.5	22.5	12.5	20.0	26.5	22.5	13.5	23.5	31.5	27.5
0.10μF	- 410	11.0	21.0	26.5	22.5	13.5	23.5	31.5	27.5	14.5	24.5	41.5	37.5
0.15μF	- 415	13.5	23.5	31.5	27.5	16.5	29.5	31.5	27.5	16.0	28.5	41.5	37.5
0.22μF	- 422	15.0	24.5	31.5	27.5	16.0	28.5	41.5	37.5	18.0	32.5	41.5	37.5
0.33μF	- 433	16.5	29.5	31.5	27.5	—	—	—	—	—	—	—	—
0.47μF	- 447	18.0	32.5	41.5	37.5	—	—	—	—	—	—	—	—

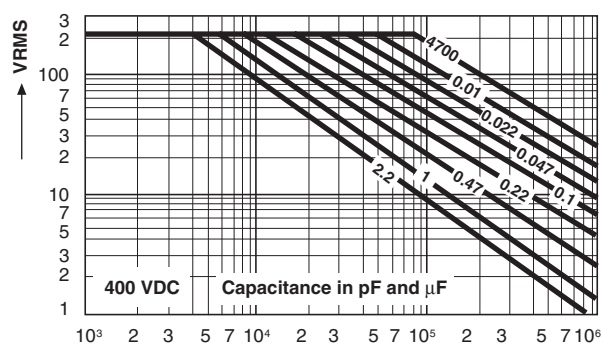
Further C-values upon request

RECOMMENDED PACKAGING

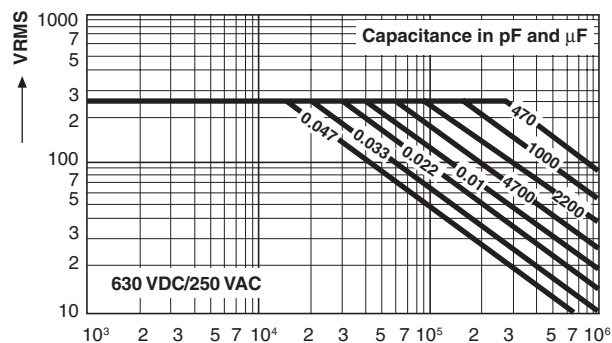
LETTER CODE	TYPE OF PACKAGING	HEIGHT (H) (mm)	REEL DIAMETER (mm)	ORDERING CODE EXAMPLES	PCM ≤ 15	PCM 22.5 - 27.5	PCM 37.5
D	AMMO	16.5	—	MKP 1841-410/404-MD	X	—	—
G	AMMO	18.5	—	MKP 1841-410/404-MG	X	—	—
F	REEL	16.5	350	MKP 1841-410/404-MF	X	—	—
W	REEL	18.5	350	MKP 1841-410/404-MW	X	—	—
V	REEL	18.5	500	MKP 1841-510/254-MV	—	X	—
G	AMMO	18.5	—	MKP 1841-510/254-MG	—	X	—
—	BULK	—	—	MKP 1841-510/254-M	X	X	X



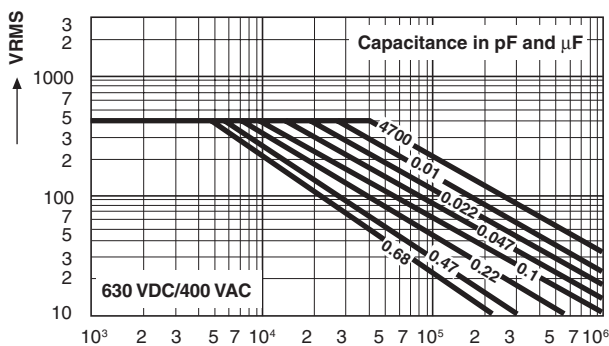
Permissible AC Voltage versus Frequency



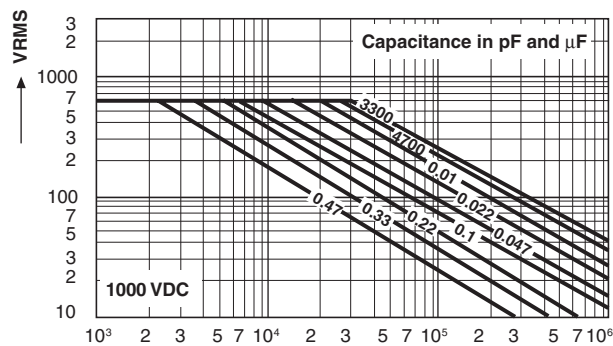
Permissible AC Voltage versus Frequency



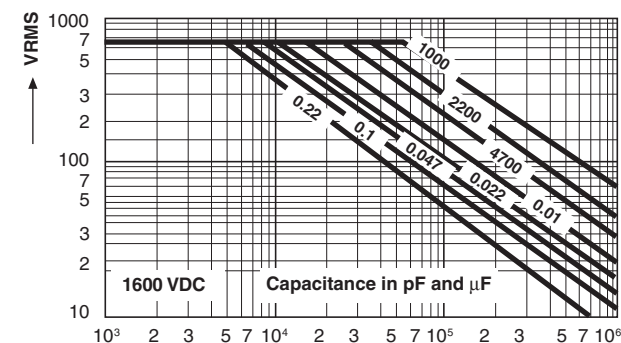
Permissible AC Voltage versus Frequency



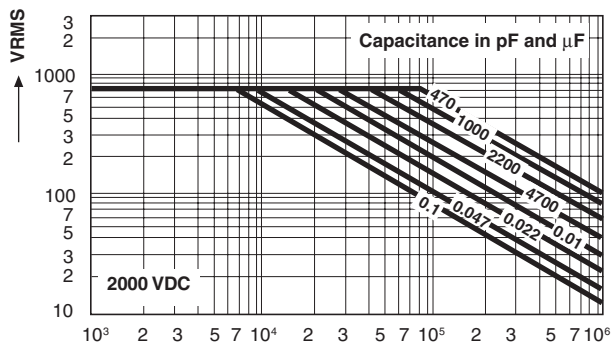
Permissible AC Voltage versus Frequency



Permissible AC Voltage versus Frequency



Permissible AC Voltage versus Frequency



Permissible AC Voltage versus Frequency



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.