

Metallized Film Capacitor

Power Electronic Capacitors

Series/Type: MKP AC Filter – Box

Ordering code: 230A*

Date: September 2023

Version: 01

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Metallized Film Capacitor

C230A*

Power Electronic Capacitors

MKP AC Filter – Box

■ **Features**

- **Metallized polypropylene film design,excellent self-healing property**
- **Excellent electric property**
- **Plastics case(UL94 V-0), filled with resin**

- Suitable for small power AC output filter, i.e. UPS, Solar photovoltaic DC/AC inverter with LCL filter
- The capacitors are designed for mounting on printed-circuit boards (PCB)

■ Reference Standards

- IEC61071
- IEC60831
- RoHS
- UL 810

■ Specifications

- | | |
|---|--|
| ● Capacitance range | 0.1μF~60μF |
| ● Capacitance tolerance | ±5%(J), ±10%(K) |
| ● Rated RMS Voltage | AC180V~AC500V |
| ● Dielectric dissipation factor(tanδ _o) | 2◇10 ⁻⁴ |
| ● Loss factor(tanδ)at 100Hz | ≤1.0◇10 ⁻³ |
| ● Operating temperature range | -40℃...105℃ |
| ● Storage temperature Range | -40℃...105℃ |
| ● Maximum altitude | ≤2000m |
| ● Rated frequency | 50Hz/60Hz |
| ● Service life expectancy | 100,000h @≤1.0U _N @θ _{HS} ≤70 °C |
| ● Failure rate | 50Fit |

■ Test data

- | | |
|--|--|
| ● Capacitance measurement | C _N ±5%(J); C _N ±10%(K); |
| ● Test voltage between terminals | 1.5U _N @10S or 2.15U _{rms} @10S |
| ● Test voltage between terminals to case | (2•U _N +1000)V.ac, but no less 3000 V.ac @10S |
| ● Loss factor(tanδ)at 100Hz | 1.0◇10 ⁻³ |

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■ Installation

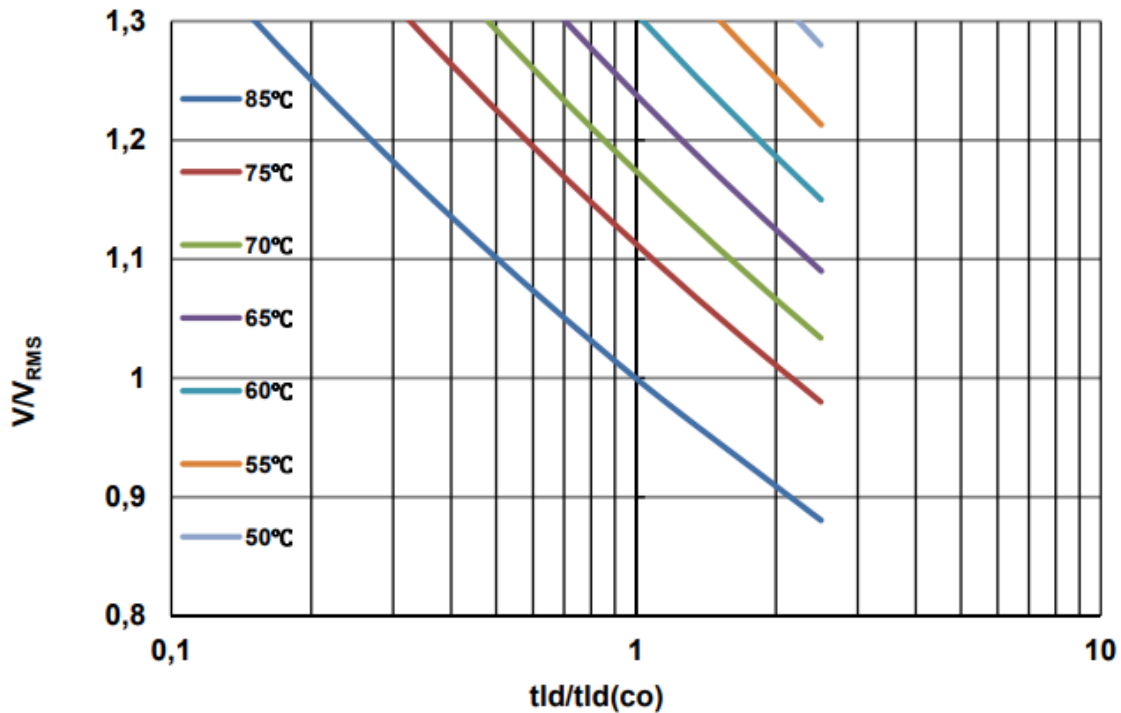
- | | |
|--------------------------|---|
| ● Mounting and grounding | M8/M10/M12 threaded bolt on bottom of the aluminum case |
| ● Terminal form | Tab or Male terminals |
| ● Max. torque(case) | M8:5N.m; M10:7N.m; M12:10N.m |

- Max. torque terminal **M6:3N.m; M8:6N.m; M10:8N.m**

■ **Expected lifetime curve**

The lifetime estimations below show the standard expected lifetime of 100,000 hours(at +85°C hotspot) are only theoretical calculations based on endurance test results performed according to IEC61071 standard.

Expected life time at T_{hs}



Services life t_{LD} at different hot-spot temperature(T_{hs})and rated voltage

■ **Structure of ordering code**

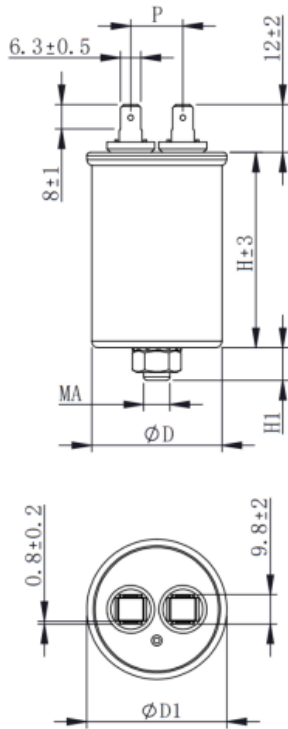
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
C	5	0	0	A	4	4	1	1	5	6	J	0	0	1	1
Capacitor series				Rated RMS voltage			Rated Capacitance			Capacitance tolerance		Internal use			

C500A—Capacitor series
 441—Rated RMS voltage 440V
 156J0—Rated capacitance 15µF
 J—Capacitance tolerance ±5%
 011—Internal use

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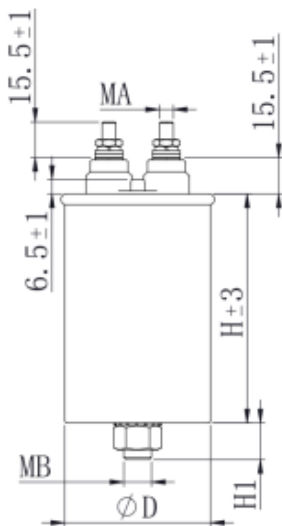
■ **Outline Drawing(Specific according to customer requirements)**

- Tab type design(Without channeling)

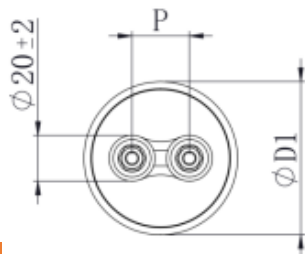


D±1	40	45/50	55	60
H1±1	10	10	12	16
P±1.5	16	18	20	20
MA	M8	M8	M10	M12

● Bolt type design(Without channeling)



D±1	63.5/65	76/86/96	106/116
H1±1	16	16	16
P±1	25	30	35
MA	M6	M8	M10
MB	M12	M12	M12



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Technical data(Tab type)

C_N	D	D1	H	P	\hat{I}	I_{MA}	ESR	ESL	R_{th}	W	Part number
(μF)	(mm)	(mm)	(mm)	(mm)	(KA)	(A)	(m Ω)	(nH)	(K/W)	(kg)	

U_N AC350V, U_{RMS} AC250V

15	40	44	65	16	0.2	10	7.1	80	21.4	0.1	C500A251156***
								0		0	**
25	45	49	75	18	0.3	12	6.6	10	17.1	0.1	C500A251256***
								0		4	**
35	50	54	75	20	0.4	14	5.1	10	15.1	0.1	C500A251356***
								0		7	**
50	55	59	80	20	0.6	16	4.0	10	12.9	0.2	C500A251506***
								0		2	**
60	60	64	80	20	0.7	16	3.5	10	11.4	0.2	C500A251606***
								0		6	**
80	60	64	90	20	0.8	16	3.7	12	10.6	0.2	C500A251806***
								0		9	**
10	60	64	105	20	0.7	16	4.3	15	9.4	0.3	C500A251107***
0								0		4	**
12	60	64	115	20	0.8	16	4.6	17	8.6	0.3	C500A251127***
0								0		8	**
14	60	64	130	20	0.8	16	5.1	21	7.8	0.4	C500A251147***
0								0		3	**
15	60	64	130	20	0.8	16	4.9	21	7.8	0.4	C500A251157***
0								0		3	**

U_N AC460V, U_{RMS} AC330V

15	45	49	65	18	0.3	11	5.8	80	18.7	0.1	C500A331156***
										2	**
20	45	49	75	18	0.3	12	6.5	10	16.5	0.1	C500A331206***
								0		4	**
25	50	54	75	18	0.4	13	5.5	10	15.0	0.1	C500A331256***
								0		7	**
30	55	59	75	18	0.5	14	4.8	10	14.3	0.1	C500A331306***
								0		7	**
35	60	64	80	20	0.6	16	4.3	10	12.9	0.2	C500A331356***
								0		2	**
40	60	64	80	20	0.6	16	3.9	10	12.1	0.2	C500A331406***
								0		6	**
50	60	64	90	20	0.7	16	4.3	12	10.9	0.2	C500A331506***
								0		9	**
60	60	64	09	20	0.8	16	3.8	12	10.3	0.2	C500A331606***
								0		9	**
80	60	64	115	20	0.7	16	5.2	17	8.7	0.3	C500A331806***
								0		8	**
10	60	64	130	20	0.8	16	5.5	21	7.7	0.4	C500A331107***
0								0		3	**

U_N AC700V, U_{RMS} AC500V

10	45	49	75	18	0.3	11	5.3	10	16.7	0.1	C500A501106***
								0		4	**
12	45	49	75	18	0.4	12	4.6	10	15.9	0.1	C500A501126***
								0		4	**
15	50	54	75	20	0.5	14	4.0	10	14.5	0.1	C500A501156***
								0		7	**
20	55	59	80	20	0.7	16	3.3	10	12.5	0.2	C500A501206***
								0		2	**
25	60	64	80	20	0.9	16	2.9	10	11.4	0.2	C500A501256***
								0		6	**
30	60	64	90	20	0.8	16	3.3	12	10.5	0.2	C500A501306***
								0		9	**
35	60	64	105	20	0.7	16	3.9	15	9.6	0.3	C500A501356***
								0		4	**
40	60	64	105	20	0.9	16	3.6	15	9.1	0.3	C500A501406***
								0		4	**
45	60	64	115	20	0.8	16	4.0	17	8.5	0.3	C500A501456***
								0		8	**
50	60	64	130	20	0.8	16	4.6	21	7.9	0.4	C500A501506***
								0		3	**

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Technical data(Bolt type)

C_N	D	$D1$	H	P	\hat{I}	I_{MA}	ESR	ESL	R_{th}	W	Part number
(μ F)	(mm)	(mm)	(mm)	(mm)	(KA)	x	(m Ω)	(nH)	(K/W)	(kg)	
))))))	(A)))))	

U_N AC350V, U_{RMS} AC250V

15 0	76	80	120	30	2.4	35	2.8	14 0	7.3	0.6 0	C500A251157*** **
16 0	76	80	120	30	2.6	36	2.6	14 0	7.1	0.6 0	C500A251167*** **
18 0	76	80	130	30	2.4	35	2.9	16 0	6.7	0.6 0	C500A251187*** **
20 0	76	80	130	30	2.7	37	2.7	16 0	6.5	0.6 0	C500A251207*** **
23 0	76	80	145	30	2.4	36	3.0	19 0	6.0	0.7 0	C500A251237*** **
25 0	76	80	170	30	2.6	47	2.0	11 0	5.3	0.8 0	C500A251257*** **
30 0	76	80	200	30	4.8	51	1.9	14 0	4.7	1.0	C500A251307*** **
35 0	76	80	200	30	5.6	54	1.8	14 0	4.4	1.0	C500A251357*** **
40 0	86	90	200	30	6.4	57	1.6	14 0	4.3	1.3	C500A251407*** **
50 0	86	90	220	30	6.6	59	1.7	16 0	3.8	1.4	C500A251507*** **
60 0	86	90	250	30	6.2	59	1.8	19 0	3.4	1.6	C500A251607*** **

U_N AC460V, U_{RMS} AC330V

80 0	63.5	57.5	110	25	1.2	25	3.7	14 0	8.7	0.4	C500A331806*** **
10 0	76	80	120	30	1.6	31	3.1	14 0	7.4	0.6	C500A331107*** **
12 0	76	80	120	30	1.9	34	2.8	14 0	6.9	0.6	C500A331127*** **
14 0	76	80	145	30	1.4	31	3.7	19 0	6.3	0.7	C500A331147*** **
15 0	76	80	145	30	1.6	32	3.5	19 0	6.1	0.7	C500A331157*** **
16 0	76	80	145	30	1.7	33	3.4	19 0	6.0	0.7	C500A331167*** **
18 0	76	80	170	30	1.9	49	1.7	11 0	5.2	0.8	C500A331187*** **
20 0	76	80	200	30	3.2	51	2.0	14 0	4.8	1.0	C500A331207*** **
23 0	76	80	200	30	3.7	54	2.0	14 0	4.6	1.0	C500A331237*** **
25 0	76	80	200	30	4.0	55	1.9	14 0	4.4	1.0	C500A331257*** **

30	86	90	200	30	4.8	54	1.7	14	4.1	1.3	C500A331307***
0								0			**
35	86	90	220	30	4.6	55	1.7	16	4.8	1.4	C500A331357***
0								0			**
40	86	90	250	30	4.1	54	2.0	19	4.5	1.6	C500A331407***
0								0			**

U_N AC700V, U_{RMS} AC500V

20	76	80	75	30	1.2	22	1.9	80	9.8	0.4	C500A501206***
											**
50	76	80	120	30	1.2	32	2.6	14	7.5	0.6	C500A501506***
								0			**
60	76	80	120	30	1.4	34	2.3	14	7.1	0.6	C500A501606***
								0			**
70	76	80	145	30	1.1	32	3.1	19	6.4	0.8	C500A501706***
								0			**
80	76	80	145	30	1.2	34	2.8	19	6.1	0.8	C500A501806***
								0			**
90	76	80	145	30	1.4	36	2.6	19	5.8	0.8	C500A501906***
								0			**
10	76	80	200	30	2.3	48	1.7	14	4.9	1.1	C500A501107***
0								0			**
13	86	90	200	30	3.1	53	1.5	14	4.4	1.1	C500A501137*3*
3								0			**
15	86	90	200	30	3.5	55	1.4	14	4.2	1.1	C500A501157***
0								0			**
20	86	90	220	30	3.9	58	1.4	16	3.7	1.2	C500A501207***
0								0			**
25	86	90	250	30	3.8	59	1.5	19	3.2	1.4	C500A501257***
0								0			**

U_N AC760V, U_{RMS} AC540V

22	76	80	85	30	1.4	29	1.8	80	9.6	0.4	C500A541226***
											**
33	76	80	105	30	1.4	33	1.8	12	8.3	0.5	C500A541336***
								0			**
47	76	80	120	30	1.1	33	2.4	14	7.1	0.6	C500A541476***
								0			**
60	76	80	145	30	0.9	33	3.1	19	6.2	0.7	C500A541606***
								0			**
68	76	80	145	30	1.0	35	2.8	19	5.9	0.7	C500A541686***
								0			**
82	76	80	170	30	2.7	50	1.4	11	4.9	0.8	C500A541826***
								0			**

10 0	86	90	170	30	3.3	54	1.3	11	4.6	1.0	C500A541107***	**
12 0	86	90	250	30	1.8	49	2.1	19	3.8	1.2	C500A541127***	**
15 0	86	90	250	30	2.3	53	1.9	19	3.6	1.5	C500A541157***	**
20 0	96	101	250	30	3.0	58	1.6	19	3.2	1.9	C500A541207***	**
25 0	106	111	250	35	3.8	62	1.4	19	2.9	2.3	C500A541257***	**
30 0	106	111	250	35	4.5	64	1.3	19	2.7	2.3	C500A541307***	**

Metallized Film Capacitor **C230A***

Power Electronic Capacitors **MKP AC Filter – Box**

Technical data(Bolt type)

C_N (μF)	D (mm)	D1 (mm)	H (mm)	P (mm)	\hat{I} (KA)	I_{MA} x (A)	ESR (m Ω)	ESL (nH)	R_{th} (K/W)	W (kg)	Part number
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U_N AC850V, U_{RMS} AC600V

22 0	76	80	105	30	0.8	28	2.6	120	8.2	0.5	C500A601226***	**
33 0	76	80	120	30	0.8	31	2.7	140	7.1	0.6	C500A601336***	**
47 0	76	80	170	30	1.7	41	2.1	120	5.3	0.8	C500A601476***	**
50 0	76	80	170	30	1.8	42	2.1	120	5.2	0.8	C500A601506***	**
60 0	86	90	170	30	2.2	45	1.9	110	4.8	1.0	C500A601606***	**
68 0	86	90	170	30	2.4	51	1.4	110	4.7	1.0	C500A601686***	**
82 0	86	90	170	30	2.1	52	1.7	140	4.1	1.2	C500A601826***	**
10 0	76	80	200	30	1.6	51	2.2	190	3.5	1.2	C500A601107***	**
12 0	86	90	250	30	2.0	54	1.9	190	3.4	1.5	C500A601127***	**
15 0	96	101	250	30	2.4	57	1.7	190	3.1	1.9	C500A601157***	**
18 0	106	111	250	35	2.9	62	1.6	190	2.8	2.3	C500A601187***	**
20 0	116	121	250	35	3.3	64	1.4	190	2.8	2.8	C500A601207***	**

0											**
U_N AC980V, U_{RMS} AC690V											
15	76	80	95	30	0.8	25	2.4	100	9.4	0.5	C500A691156***
											**
22	76	80	105	30	0.9	28	2.4	120	8.2	0.5	C500A691226***
											**
33	76	80	170	30	1.3	36	2.1	120	6.1	0.8	C500A691336***
											**
47	86	90	170	30	1.9	42	2.1	110	5.3	1.0	C500A691476***
											**
60	86	90	200	30	1.7	43	1.8	140	4.6	1.2	C500A691606***
											**
68	86	90	200	30	1.9	49	2.0	140	4.4	1.2	C500A691686***
											**
82	86	90	250	30	1.5	48	1.6	190	3.8	1.5	C500A691826***
											**
10	86	90	250	30	1.8	52	2.0	190	3.5	1.5	C500A691107***
0											**
12	96	101	250	30	2.2	55	1.9	190	3.4	1.9	C500A691127***
0											**
15	106	111	250	35	2.7	59	1.7	190	3.1	2.3	C500A691157***
0											**
20	116	121	250	35	3.3	64	1.4	190	2.8	2.8	C500A691207***
0											**
U_N AC1070V/AC1200V, U_{RMS} AC760V/AC850V											
10	76	80	95	30	0.6	22	2.7	100	8.8	0.5	C230A***106****
											*
15	76	80	105	30	0.7	26	2.7	120	7.6	0.5	C230A***156****
											*
22	76	80	145	30	0.5	25	4.4	190	6.3	0.7	C230A***226****
											*
33	76	80	170	30	1.5	40	1.9	110	4.9	0.8	C230A***336****
											*
47	86	90	200	30	1.7	43	2.1	140	4.2	1.2	C230A***476****
											*
68	86	90	250	30	1.4	49	2.0	190	3.4	1.5	C230A***686****
											*
82	96	111	250	30	1.7	52	1.8	190	3.2	1.9	C230A***826****
											*
10	96	111	250	30	2.1	56	1.6	190	2.9	1.9	C230A***107****
0											*
15	116	121	250	35	2.9	62	1.5	190	2.6	2.8	C230A***157****

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■ Term and characteristics

Term	Characteristics
C_N	Rated capacitance
U_N	Rated AC voltage
U_{NDC}	Rated DC voltage
U_r	Ripple voltage
U_s	Non- recurrent surge voltage
U_{T-T}	Test voltage between terminals
U_{T-C}	Test voltage between terminals to case
\hat{I}	Maximum peak current
I_{max}	Maximum current
\hat{I}_s	Maximum surge current
$\tan\delta_0$	Dielectric dissipation factor
$\tan\delta$	Loss factor
ESL	Self inductance
ESR	Equivalent series inductance of a capacitor
R_{ins}	Insulation resistance
f_r	Resonance frequency
W_R	Rated power

θ_{min}	Lowest operating temperature
θ_{max}	Maximum operating temperature
θ_{amb}	Cooling-air temperature
θ_{HS}	Hotspot temperature
θ_{ST}	Storage temperature
F_T	Derating factor
t_{LD}	Inverter and charge hybrid operating load duration
λ	Failure rate (FIT)