

## **Metallized Film Capacitor**

## **Power Electronic Capacitors**

**Series/Type:** MMKP Snubber - Box

**Ordering code:** C84\*

**Date:** September 2024

**Version:** 01

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**■ Features**

- Widely used in high voltage, high frequency circuit
- Low loss and small inherent temperature rise
- Excellent active and passive flame resistant abilities
- Especially designed as snubber capacitor for IGBT  
Plastics case, filled with resin

**■ Reference Standards**

- IEC61071
- IEC60068
- RoHS
- UL 810

**■ Specifications**

- |  |   |
|--|---|
| ● Capacitance range                                | 0.047 $\mu$ F~10 $\mu$ F                |
| ● Capacitance tolerance                            | $\pm$ 5%(J), $\pm$ 10%(K)               |
| ● Voltage range                                    | 630V.dc...4500V.dc                      |
| ● Dielectric dissipation factor( $\tan \delta_o$ ) | $2 \times 10^{-4}$                      |
| ● Loss factor( $\tan \delta$ )at 1KHz              | $\leq 2.0 \times 10^{-3}$               |
| ● Operating temperature range                      | -40 $^{\circ}$ C...85 $^{\circ}$ C      |
| ● Storage temperature Range                        | -40 $^{\circ}$ C...105 $^{\circ}$ C     |
| ● Maximum altitude                                 | $\leq 2000$ m                           |
| ● Frequency range                                  | $2 \times 10^3$ Hz~ $20 \times 10^3$ Hz |

**■ Test data**

- |  |   |
|--|---|
| ● Capacitance measurement                | $C_N \pm 5\%$ (J); $C_N \pm 10\%$ (K);                      |
| ● Test voltage between terminals         | 1.5 $U_{NDC}$ @10S  |
| ● Test voltage between terminals to case | (2 $\cdot U_{NDC} + 1000$ )V.ac, but no less 3000 V.ac @10S |
| ● Loss factor( $\tan \delta$ )at 100Hz   | $\leq 2.0 \times 10^{-3}$                                   |

■ **Structure of ordering code**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<b>C</b>	<b>8</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>8</b>	<b>2</b>	<b>4</b>	<b>J</b>	<b>2</b>	<b>5</b>	<b>1</b>	<b>B</b>	<b>0</b>	<b>G</b>	<b>1</b>	<b>2</b>
<b>A</b>			<b>B</b>			<b>C</b>			<b>D</b>	<b>E</b>		<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>K</b>

A: Capacitor series

C84=MMKP84

B: Rated voltage

如: 122=12\*10<sup>2</sup>=1200V

C: Rated capacitance

如: 824=82\*10<sup>4</sup>=820000pF=0.82μF

D: Capacitance tolerance

J=±5%, K=±10%

E: Terminal center distance

25=25mm

F: Terminal shape

1=type1    2=type2    3=type3    4=type4    5=type5    6=type6

G: Raw material

A=ABS    B=PBT    PPS=P

H: Product features

0=Ordinary    1=Double 85    2=Low noise    3=Low power

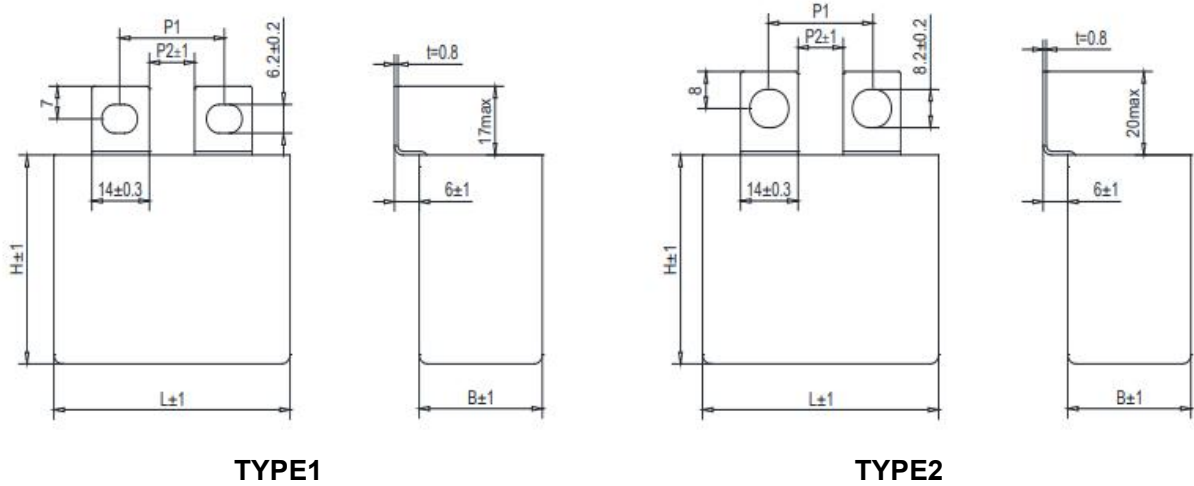
I: Product colour

Y=Yellow    G=Grey    B=Black    U=Blue    W=white    R=Red    E=Green

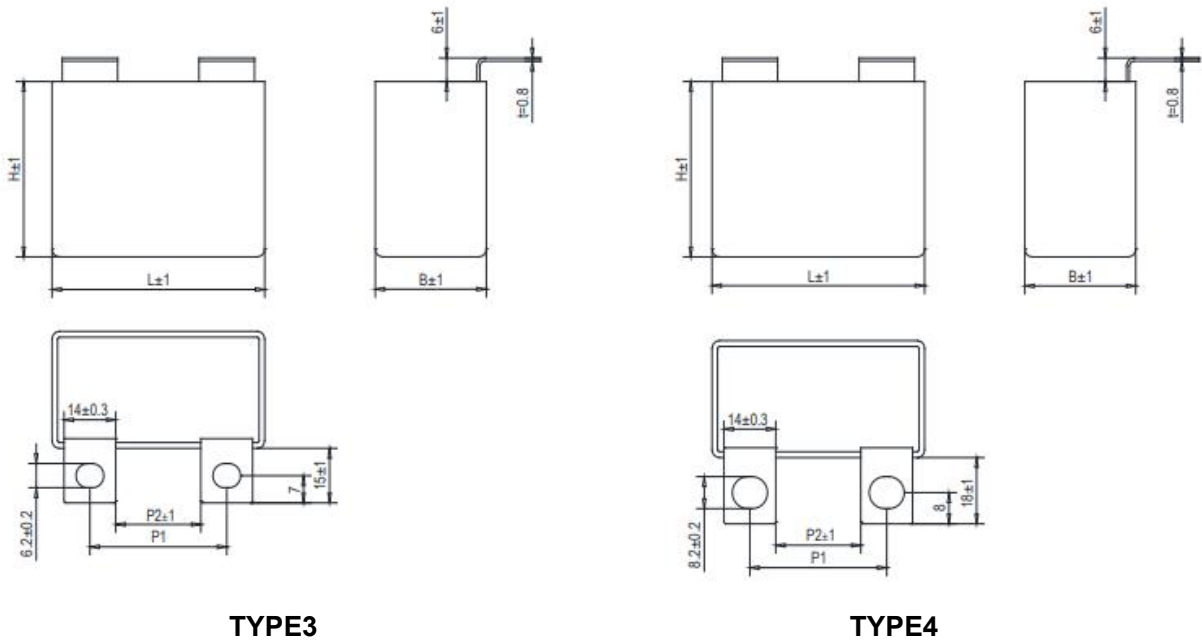
J: Inner use

K: Serial number

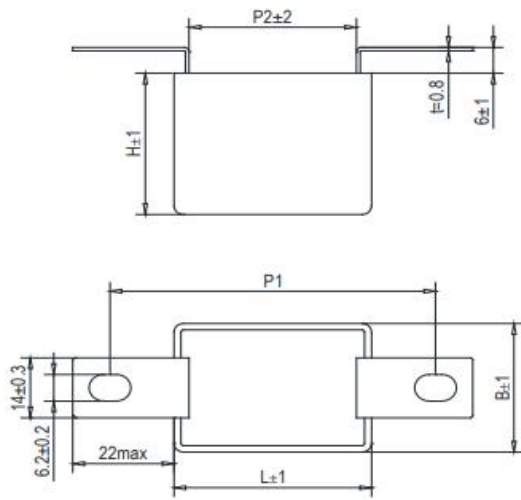
■ Outline Drawing(Specific according to customer requirements)



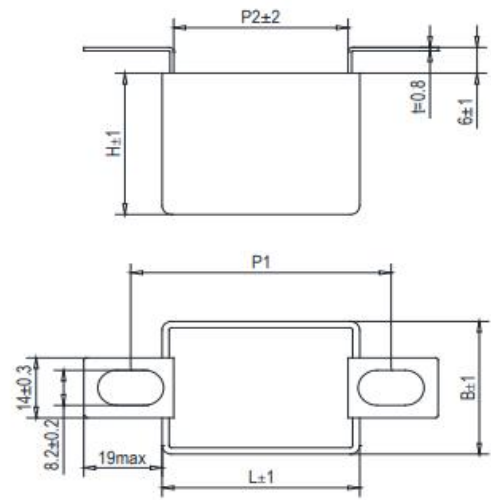
Case Long	TYPE1 Mounting Hole: M6				TYPE1 Mounting Hole: M8			
	P2	P1	P2	P1	P2	P1	P2	P1
42.5	8	20~25	11	23~28	8	21~23	11	24~26
57.5	11	23~28	24	36~41	11	24~26	24	37~39



Case Long	TYPE1 Mounting Hole: M6				TYPE1 Mounting Hole: M8			
	P2	P1	P2	P1	P2	P1	P2	P1
42.5	8	20~25	11	23~28	8	21~23	11	24~26
57.5	11	23~28	24	36~41	11	24~26	24	37~39



**TYPE5**



**TYPE6**

Case Long	TYPE5 Mounting Hole: M6				TYPE6 Mounting Hole: M8			
	P2	P1			P2	P1		
42.5	37	67~73			37	50~64		
57.5	52	82~88			52	65~79		

**Technical data**

C <sub>N</sub> (μF)	Dimension(mm)			du/dt (V/μs)	İ(A)	ESL (nH)	I <sub>MAX</sub> @60°C @100KHz(A)	ESR@100KHz (mΩ)	Part number
	L	B	H						
U <sub>NDC</sub> 700V.dc, U <sub>rms</sub> 380V.ac, U <sub>s</sub> 1050V									
1.0	42.5	17	28	325	325	25	12.9	4.3	
1.2	42.5	24.5	27.5	325	390	25	15.2	3.1	
1.5	42.5	22	30	325	487	25	16.3	3.5	
2.0	42.5	28	37	325	650	25	20.1	3.2	
2.5	42.5	30	45	325	812	25	22.6	2.5	
3.0	42.5	33	45	325	975	25	24.9	2.4	
3.5	42.5	33	45	325	1134	25	26.0	2.0	
4.0	57	30	45	230	920	35	24.3	2.3	
4.7	57	30	45	230	1081	35	28.2	2.1	
5.0	57	30	45	230	1150	35	26.0	2.5	
5.6	57	35	50	230	1288	35	28.7	2.0	
6.8	57	35	50	230	1564	35	30.2	2.0	
10	57	42.5	56	230	2300	35	35.9	1.8	
U <sub>NDC</sub> 1200V.dc, U <sub>rms</sub> 500V.ac, U <sub>s</sub> 1800V									
0.22	42.5	15	26	650	143	25	8.1	12.8	
0.33	42.5	15	26	650	215	25	9.2	8.9	
0.39	42.5	17	28	650	254	25	10.3	7.3	
0.47	42.5	22	30	650	306	25	12.1	7.0	
0.56	42.5	22	30	650	364	25	12.9	5.3	
0.68	42.5	22	30	650	442	25	13.9	4.6	
0.82	42.5	28	37	650	533	25	16.5	3.9	
1.0	42.5	28	37	650	650	25	18.0	3.4	
1.2	42.5	30	45	650	780	25	20.5	3.1	
1.5	42.5	33	45	650	975	25	22.2	4.2	
2.0	57	30	45	455	910	35	22.0	4.1	
2.2	57	35	50	455	1001	35	24.3	3.6	
2.5	57	35	50	455	1138	35	25.4	3.5	
3.0	57	35	50	455	1365	35	27.0	3.2	
4.5	57	42.5	56	455	2047	35	32.8	3.0	
U <sub>NDC</sub> 1500V.dc, U <sub>rms</sub> 570V.ac, U <sub>s</sub> 2250V									
0.39	42.5	22	30	800	312	25	13.5	7.2	
0.47	42.5	22	30	800	376	25	17.5	5.3	
0.68	42.5	28	37	800	544	25	19.0	4.6	

**Technical data**

C <sub>N</sub> (μF)	Dimension(mm)			du/dt (v/μs)	î(A)	ESL (nH)	I <sub>MAX</sub> @60°C @100KHz(A)	ESR@100KHz (mΩ)	Part number
	L	B	H						
U <sub>NDC</sub> 1500V.dc, U <sub>rms</sub> 570V.ac, U <sub>S</sub> 2250V									
1.0	42.5	30	45	800	800	25	22.5	4.5	
1.2	57	30	45	560	672	35	25.0	4.2	
1.8	57	35	50	560	1008	35	29.5	4.0	
U <sub>NDC</sub> 2000V.dc, U <sub>rms</sub> 630V.ac, U <sub>S</sub> 3000V									
0.10	42.5	15	26	1000	100	25	6.5	25.7	
0.15	42.5	17	28	1000	150	25	8.1	14.7	
0.22	42.5	22	30	1000	220	25	10.5	10.5	
0.33	42.5	28	37	1000	330	25	13.8	9.5	
0.47	42.5	28	37	1000	470	25	16.0	5.2	
0.56	42.5	30	45	1000	560	25	18.6	4.3	
0.68	42.5	30	45	1000	680	25	17.5	5.7	
0.82	57	30	45	700	574	35	19.0	4.5	
1.0	57	35	50	700	700	35	21.9	4.5	
1.2	57	35	50	700	840	35	23.2	4.2	
1.8	57	42.5	56	700	1260	35	28.3	4.0	
U <sub>NDC</sub> 3000V.dc, U <sub>rms</sub> 750V.ac, U <sub>S</sub> 4500V									
0.047	42.5	24.5	27.5	1600	75	25	6.1	31.6	
0.068	42.5	24.5	27.5	1600	108	25	7.2	22.7	
0.10	42.5	22	30	1600	160	25	8.5	15.0	
0.15	42.5	28	37	1600	240	25	11.3	10.8	
0.22	42.5	33	45	1600	352	25	16.6	6.6	
0.33	57	30	45	870	287	35	17.4	7.5	
0.47	57	35	50	870	408	35	21.4	7.5	
0.56	57	35	50	870	487	35	22.4	7.4	
0.82	57	42.5	56	870	713	35	27.8	7.0	
U <sub>NDC</sub> 4000V.dc, U <sub>rms</sub> 870V.ac, U <sub>S</sub> 6000V									
0.047	42.5	22	30	3500	165	20	7.2	16.7	
0.10	42.5	28	37	3500	350	20	11.3	8.3	
0.15	42.5	33	45	3500	525	20	14.8	5.9	
0.22	57	30	45	2000	440	35	15.6	6.2	
0.33	57	35	50	2000	660	35	19.8	4.4	
0.47	57	42.5	56	2000	940	35	24.5	3.4	

**Technical data**

C <sub>N</sub> ( $\mu$ F)	Dimension(mm)			du/dt (v/ $\mu$ s)	$\hat{i}$ (A)	ESL (nH)	I <sub>MAX</sub> @60°C @100KHz(A)	ESR@100KHz (m $\Omega$ )	Part number
	L	B	H						
U <sub>NDC</sub> 4500V.dc, U <sub>rms</sub> 1000V.ac, U <sub>S</sub> 6750V									
0.033	42.5	22	30	4000	132	20	6.3	21.8	
0.068	42.5	28	37	4000	272	20	10.3	11.0	
0.10	42.5	33	45	4000	400	20	12.8	7.8	
0.15	57	30	45	2400	360	35	13.9	7.8	
0.22	57	35	50	2400	528	35	17.5	5.6	
0.35	57	42.5	56	2400	840	35	22.9	3.9	
1.0	150	82	45	950	950	50	38.6	2.0	
1.5	150	82	45	950	1425	50	40.9	1.7	



**■ Term and characteristics**

<b>Term</b>	<b>Characteristics</b>
$C_N$	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
$\theta_{min}$	Lowest operating temperature
$\theta_{max}$	Maximum operating temperature
$\theta_{amb}$	Cooling-air temperature
$\theta_{HS}$	Hotspot temperature
$\theta_{ST}$	Storage temperature
$F_T$	Derating factor
$t_{LD}$	Inverter and charge hybrid operating load duration
$\lambda$	Failure rate (FIT)