



PRODUCT SPECIFICATION

规格书

Customer (客户名称) :
Customer P/N (客户料号) :
Aillen P/N(爱伦料号):
CATEGORY(品名):
DESCRIPTION(型号):
Spec No.(承认书编号):
Date(发行日期) :

AILLEN	
PREPARED (拟定)	CHECKED (审核)

CUSTOMER	
Please sign a copy after accepting	
APPROVAL (批准)	SIGNATURE (签名)

香港: 香港湾仔庄士敦道 181 号大有大厦 10 楼 1001 室

ADD: 1001R.10F Taiyau Building. 181 Johnston Road. Wanchai H.K

TEL: 00852-36458129

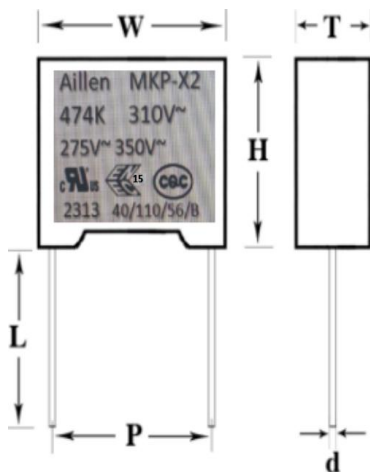
FAX: 00852-36458092

广东省东莞市沙田镇进港中路 28 号

ADD: No. 28, Jingang Middle Road, Shatian Town, Dongguan City, Guangdong Province

TEL: 0769 86059566 <http://www.aillen.com>

MKP474K310A15M350(S)



- Dimension(mm)

No.	Size(mm)					
	W	H	T	L	P	d
1	18±0.5	14.5±0.5	8.5±0.5	3.5±0.5	15±0.5	0.8±0.08

-Safety certificate:

Safety certification mark	Country or region	Certificate number
	USA/Canada	UL-US-2342956-0
	China	CQC23001404407
	European Economic Community	ENEC-04649

-Electrical performance

Climatic category and passive flammability class	40/110/56/B
Operating Temperature	-40~110°C
Capacitance	0.47μF
Tolerance	±10%
Maximum Continuous DC Voltage	310VAC 50/60Hz
Dissipation Factor	0.1%Max
Withstand Voltage Between Terminals	1333VDC /5s
Insulation resistance	≥5000S

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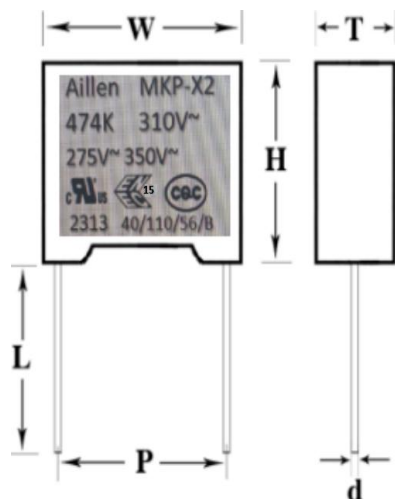
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1. Product brief introduction

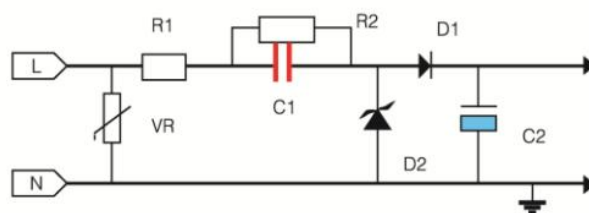


2. Feature:

- Metallized polypropylene non-induction construction;
- High moisture-resistance;
- Self-healing property ;
- Excellent active and passive flame resistant abilities (conforming to UL94-0) ;
- Withstanding over voltage stressing.

3. Applications

- X2 class for interference suppression
- Across the line" applications
- Capacitance divider where seriesed with the mains in energy meters, LED drivers and control boards in white goods and home appliances
- For the purpose of RC voltage divider, please choose "D" mark sub class model. (This "D" mark sub class model has the features of high stability in capacity and smaller in capacity drop, however it does not suitable for using crossing the line or as an EMI suppression filter)



Typical divider circuit

3. Part Number System

$\frac{\square\square\square}{1}$ $\frac{\square\square\square}{2}$ $\frac{\square}{3}$ $\frac{\square\square\square}{4}$ $\frac{\square}{5}$ $\frac{\square\square}{6}$ $\frac{\square}{7}$ $\frac{\square\square}{8}$ $\frac{\square\square\square}{9}$
 (tape) (capacitance) (tolerance) (rated voltage) (Voltage) (lead pitch) (lead forming) (lead length) (RoHS Symbol)

3-1 tape :

Code	MKP
Tape	X2 Metallized polypropylene film capacitor

3-2 Capacitance :

Code	102	103	104	105
Capacitance	0.001 μ F	0.01 μ F	0.1 μ F	1 μ F

3-3 Tolerance :

Code	K
Tolerance	$\pm 10\%$

3-4 Rated Voltage :

Code	275	310	350
Voltage	275V	310V	350V

3-5 Voltage : A \rightarrow AC

3-6 Lead Pitch :

Code	07	10	15	22	27	31
Pitch(mm)	7.5mm	10mm	15mm	22.5mm	27.5mm	31mm

3.7 Lead Style

Code	L	M	T	S
Lead Forming	Bulk	Cutting	Taping Hole space :12.7mm or 25.4mm	Taping Hole space :15.0mm

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3-8 Lead length :

Code	35	80	10	20	H8	H6	HF
Length(mm)	3.5±0.5	8.0±1.0	10.0±1.0	18.0Min	Taping Height : 18.0 mm	Taping Height : 16.0 mm	Taping Height : 18.5 mm

3.9 RoHS Symbol:

Code	0	1	2
Meaning	Environmentally friendly products (in compliance with RoHS, Reach, and do not contain PAH or phthalates).	Non environmentally friendly	In addition to being compliant with the aforementioned environmentally friendly criteria "0", it should also show that the amount of halogens contained in the product meets the criteria.

3.10 10~12Management Code
L: Straight Tapping

4. Marking:

Marking Item		Example
Manufacturer Marking	Aillen	
Type Designation	MKP	
Sub-Class Code	X2	
Capacitance, Tolerance	334	
Rated Voltage	275V~350V	
Climatic category	40/110/56B	
Safety Organization Approved Marking	UL	
	CQC	
	ENEC	

5.Specification and test methods

5.1 Test condition: Unless otherwise specified, the standard range of atmospheric Conditions for marking measurements and test is conducted in the following ambient

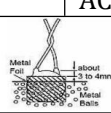
Ambient temperature : 15~35 °C, Relative humidity: 25~75%.

If there may be any doubt on the results, measurements shall be made within the Following limits.

Temperature : 20±2°C , Relative humidity :60~70%.

Default frequency of the related alternating current tests: 50Hz

5.2 Specification and test methods:

No	Item	Test method	Specification				
1	Appearance	The appearance shall be inspected by naked eyes.	No marked defect on appearance				
2	Dimensions	The dimensions shall be measured with slide calipers	Dimensions of capacitor and taping shall satisfy specified requirement.				
3	Marking	The marking shall be checked by 4x magnifying glass.	Legible marking				
4	Climatic category and passive flammability class	/	40/110/56/B				
5	Rated Temperature Range	/	-40°C~ 85°C				
6	Rated Voltage	/	275VAC、310VAC、350VAC				
7	Capacitance Range	The capacitance shall be measured at 25°C with 1KHz 1±0.2 Vrms.	0.01μF~4.7μF				
8	Capacitance Tolerance		±10%(K) 、 ±20%(M)				
9	Dissipation Factor	The dissipation factor shall be measured at 25°C with 1KHz 1±0.2 Vrms.	0.1%Max				
10	Insulation Resistance	The insulation resistance shall be measured with 100VDC within 60±5 sec of charging.	C _R ≤0.33μF, IR≥15000MΩ C _R >0.33μF, IR≥5000S(MΩ/μF)				
11	Withstand Voltage Between Terminals	2U _R +1500VAC/1min,Min: 2000VAC/1min	No breakdown or flash over				
12	Dielectric Strength (Voltage Proof)	Between Lead Wires	No failure				
		Body Insulation					
		<p>The capacitor should not be damaged when test voltages of table below are applied between the lead wires for 60 sec.</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Type</th> <th>Test Voltage</th> </tr> </thead> <tbody> <tr> <td>X2</td> <td>DC1600V(r.m.s.)</td> </tr> </tbody> </table>	Type	Test Voltage	X2	DC1600V(r.m.s.)	
Type	Test Voltage						
X2	DC1600V(r.m.s.)						
		<p>First, the terminals of the capacitor should be connected together. Then, as shown in figure below, a metal foil should be closely wrapped around the body of the capacitor to the distance of about 3 to 4mm from each terminal.</p> <p>Then, the capacitor should be inserted into a container filled with metal balls of about 1mm diameter. Finally, ac voltage of table below is applied for 60 sec. between the capacitor lead wires and metal balls.</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Type</th> <th>Test Voltage</th> </tr> </thead> <tbody> <tr> <td>X2</td> <td>AC2100V</td> </tr> </tbody> </table>	Type	Test Voltage	X2	AC2100V	
Type	Test Voltage						
X2	AC2100V						
							

No	Test items	Test method	Specification	
13	Robustness of Termination	The capacitor body shall be held in such a manner so that the axis of the lead is vertical. The tensile force of 10N(for lead of $\varnothing 0.6 \sim \varnothing 0.8\text{mm}$)shall be applied to the lead in a direction of its axis and acting in a direction away from the body of the capacitor for 10 ± 1 seconds.	The capacitor shall be no broken and the lead shall be no loosened or cut off.	
14	Solderability of leads	The lead wire of a capacitor should be dipped into molten solder for $2 \pm 0.5\text{sec}$. The depth of immersion is up to about 1.5 to 2.0mm from the root of lead wires. Temp.of solder: Lead Free solder(Sn-3Ag-0.5Cu) $245 \pm 5^\circ\text{C}$ H63 Eutectic Solder $235 \pm 5^\circ\text{C}$	A new uniform coating of solder shall cover a minimum of 95% of the surface being immersed	
15	Resistance to Soldering heat	Temperature of solder bath $260 \pm 5^\circ\text{C}$. The immersing depth of lead shall be a position 2-0.5mm from the seating plane,using a thermal screen. The thickness of the screen is $1.5 \pm 0.5\text{mm}$. The immersion time shall be 10 ± 1 seconds. Post-treatment:The capacitor shall be preserved at the standard atmospheric condition for 1 to 2 hours.	Appearance	No visible damage
			Capacitance Change	Within $\pm 5\%$
			Dissipation Factor	Refer to Item 5.2.9
			Voltage proof (between leads)	Refer to Item 5.2.12
16	Solvent Resistance	The capacitor shall be immersed into isopropyl alcohol for $30 \pm 5\text{nds}$.	Appearance: No visible damage Legible marking	
17	Damp heat steady state	The capacitor shall be stored for 56 days ($1350 \pm 8\text{hours}$) at a temperature of $40^\circ\text{C} \pm 2^\circ\text{C}$ and a relative humidity of $(93 \pm 3)\%$. Pre-treatment: the capacitor shall be stored at a temperature of $85^\circ\text{C} \pm 2^\circ\text{C}$ for 1 hour,and then the capacitor shall be recovered for 24 ± 2 hours. Post-treatment: the capacitor shall be stored for 1 to 2 hours at the standard atmospheric condition. (Temperature: 15 to 35°C ,Relative humidity: 45 to 75% ,Atmospheric pressure: 86 to 106kPa)	Capacitance Change	Within $\pm 5\%$
			Dissipation Factor	≤ 0.0 ($\text{CR} \leq 1.0\mu\text{F}$) ≤ 0.005 ($\text{CR} > 1.0\mu\text{F}$)
			IR	$\text{IR} \geq 50\%$ Spec
			Dielectric Strength	Refer to Item 5.2.12

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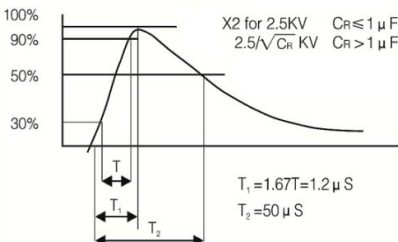
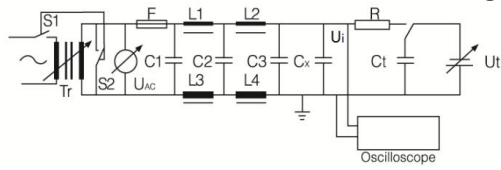
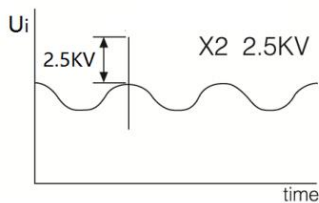
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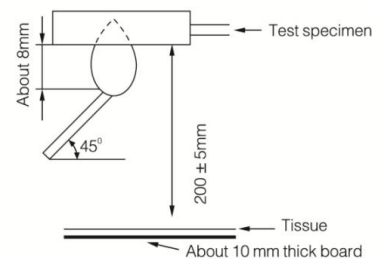
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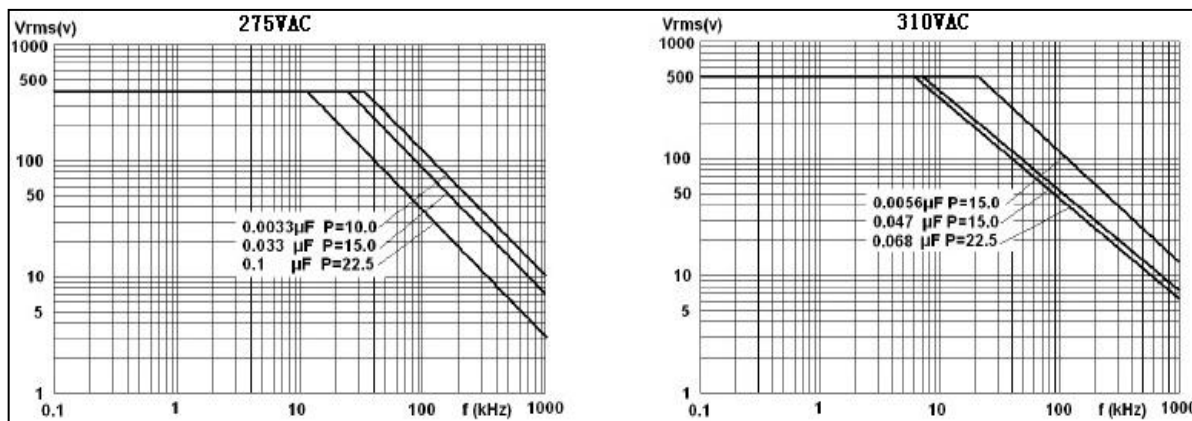
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STANDARD MANUAL

No	Test items	Test method	Specification										
18	Endurance test(life)	<p>The capacitor shall be subjected to three impulses as shown below.</p>  <p>Then the capacitors are placed at a temperature of 110°C for 1000 hours. Throughout the test, the capacitors are subjected 50Hz/60Hz , 1.25URvoltages,except that once each hour the voltage is increased to 1000 Vrms for 0.1sec. Post-treatment:the capacitor shall be preserved for 24±2 hours at standard atmospheric condition.</p>	<table border="1"> <tr> <td>Appearance</td> <td>No visible damage</td> </tr> <tr> <td>Capacitance Change</td> <td>Within±10%</td> </tr> <tr> <td>Dissipation Factor</td> <td>$\Delta tg\delta \leq 0.005$ (CR > 1μF) $\Delta tg\delta \leq 0.008$ (CR ≤ 1μF)</td> </tr> <tr> <td>Insulation resistance</td> <td>IR ≥ 50%Spec</td> </tr> <tr> <td>Voltage proof</td> <td>Refer to Item 5.2.12</td> </tr> </table>	Appearance	No visible damage	Capacitance Change	Within±10%	Dissipation Factor	$\Delta tg\delta \leq 0.005$ (CR > 1μF) $\Delta tg\delta \leq 0.008$ (CR ≤ 1μF)	Insulation resistance	IR ≥ 50%Spec	Voltage proof	Refer to Item 5.2.12
Appearance	No visible damage												
Capacitance Change	Within±10%												
Dissipation Factor	$\Delta tg\delta \leq 0.005$ (CR > 1μF) $\Delta tg\delta \leq 0.008$ (CR ≤ 1μF)												
Insulation resistance	IR ≥ 50%Spec												
Voltage proof	Refer to Item 5.2.12												
19	Flammability	<p>The capacitor should be individually wrapped in at least one but not more than two complete layers of cheese-cloth. The capacitor should be subjected to 20 discharges. The interval between successive discharges should be 5 sec. The UAC should be maintained for 2 min. after the last discharge.</p>  <p>C1,2:1uf±10% C3:0.033uf±5% 10kV L1to 4:1.5mH±20% 16A Rod core choke Ct:3uf±5% 10kV R:100Ω±2% Cx:Capacitor under test UAC:UR±5% F:Fuse,Rated 10A UR:Rated Voltage Ut:Voltage applied to Ct</p> 	<p>The cheese-cloth should not be on fire.</p>										

No	Test items	Test method	Specification																							
20	Passive flammability	 <p>Length of flame:12mm Gas burner: Length 35mm min. Inside diameter:0.5±0.1mm Outside diameter: 0.9mm min. Gas: Butane gas purity 95% min.</p>	<p>Severity and Requirements</p> <table border="1"> <thead> <tr> <th rowspan="2">Flaming Ratings</th> <th colspan="3">Severity Level</th> <th rowspan="2">Maximum flaming time(s)</th> </tr> <tr> <th colspan="3">Flame is applied for a time (S) against the capacitor volumes range (mm)</th> </tr> </thead> <tbody> <tr> <td></td> <td>250 < Volumes ≤ 500</td> <td>500 < Volumes ≤ 1750</td> <td>Volumes > 1750</td> <td></td> </tr> <tr> <td>B</td> <td>B</td> <td>B</td> <td>B</td> <td>B</td> </tr> <tr> <td>20</td> <td>20</td> <td>20</td> <td>20</td> <td>20</td> </tr> </tbody> </table>	Flaming Ratings	Severity Level			Maximum flaming time(s)	Flame is applied for a time (S) against the capacitor volumes range (mm)				250 < Volumes ≤ 500	500 < Volumes ≤ 1750	Volumes > 1750		B	B	B	B	B	20	20	20	20	20
Flaming Ratings	Severity Level				Maximum flaming time(s)																					
	Flame is applied for a time (S) against the capacitor volumes range (mm)																									
	250 < Volumes ≤ 500	500 < Volumes ≤ 1750	Volumes > 1750																							
B	B	B	B	B																						
20	20	20	20	20																						

6. Typical graphs



7. Case Size

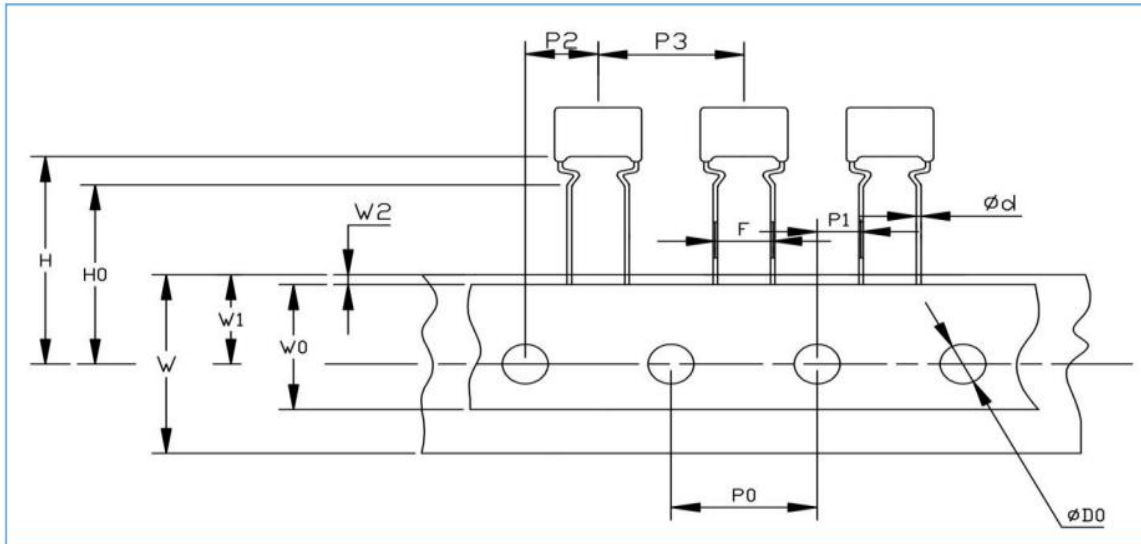
Part No.	Rated Capacitance (μF)	Tolerance (%)	Lead Space P(mm) ±0.5	Lead diameter d(mm) ±0.06	Dimensions of capacitors		
					W(mm) ±1	H(mm) ±1	T(mm) ±1
MKP103K***A10---	0.010	±10	10	0.6	13	11	5
MKP123K***A07---(S)	0.012	±10	7.5	0.6	10	9	4
MKP123K***A10---	0.012	±10	10	0.6	13	10	5
MKP153K***A07---(S)	0.015	±10	7.5	0.6	10	9	4
MKP153K***A10---	0.015	±10	10	0.6	13	11	5
MKP183K***A07---(S)	0.018	±10	7.5	0.6	10	9	4
MKP183K***A10---	0.018	±10	10	0.6	13	11	5
MKP223K***A10---	0.022	±10	10	0.6	13	11	5
MKP333K***A07---(S)	0.033	±10	7.5	0.6	10	11	5
MKP333K***A10---	0.033	±10	10	0.6	13	11	5
MKP393K***A07---(S)	0.039	±10	7.5	0.6	10	11	5
MKP393K***A10---	0.039	±10	10	0.6	13	9	4
MKP473K***A07---(S)	0.047	±10	7.5	0.6	10	11	5
MKP473K***A10---	0.047	±10	10	0.6	13	11	5
MKP473K***A15---	0.047	±10	15	0.8	18	11	5
MKP563K***A07---(S)	0.056	±10	7.5	0.6	10	12	6
MKP563K***A10---(M)	0.056	±10	10	0.6	13	11	5
MKP563K***A15---	0.056	±10	15	0.8	18	11	5
MKP683K***A10---(S)	0.068	±10	10	0.6	13	11	5
MKP683K***A15---	0.068	±10	15	0.8	18	11	5
MKP823K***A10---(S)	0.082	±10	10	0.6	13	12	6
MKP823K***A15---	0.082	±10	15	0.8	18	11	5
MKP104K***A10---(S)	0.10	±10	10	0.6	13	12	6
MKP104K***A15---	0.10	±10	15	0.8	18	11	5
MKP124K***A10---(S)	0.12	±10	10	0.6	13	13	7
MKP124K***A15---	0.12	±10	15	0.8	18	11	5
MKP154K***A10---(S)	0.15	±10	10	0.6	13	14	8
MKP154K***A15---(M)	0.15	±10	15	0.8	18	12	6
MKP154K***A22---	0.15	±10	22.5	0.8	26	14.5	6
MKP184K***A15---(S)	0.18	±10	15	0.8	18	12	6
MKP184K***A22---	0.18	±10	22.5	0.8	26	14.5	6
MKP224K***A15---(S)	0.22	±10	15	0.8	18	13	7
MKP224K***A22---	0.22	±10	22.5	0.8	26	14.5	6
MKP334K***A15---(S)	0.33	±10	15	0.8	18	15.5	8
MKP334K***A22---	0.33	±10	22.5	0.8	26	16.5	7.5
MKP394K***A15---(S)	0.39	±10	15	0.8	18	17	8
MKP394K***A22---	0.39	±10	22.5	0.8	26	16.5	7.5



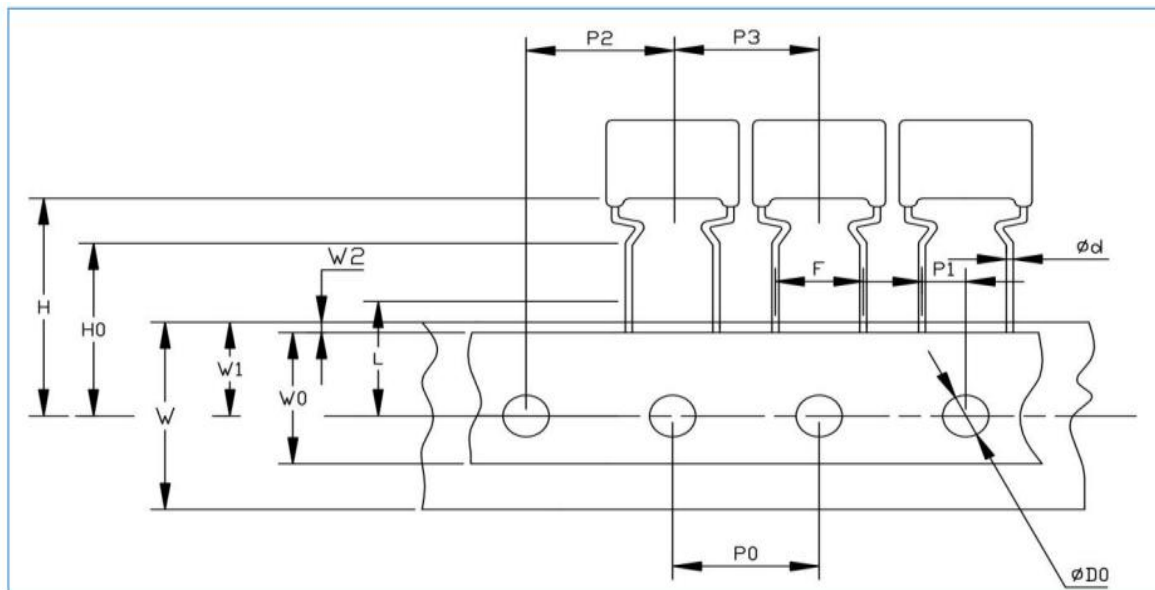
Part No.	Rated Capacitance (μF)	Tolerance (%)	Lead Space P(mm) ±0.5	Lead diameter d(mm) ±0.06	Dimensions of capacitors		
					W(mm) ±1	H(mm) ±1	T(mm) ±1
MKP474K***A15---(S)	0.47	±10	15	0.8	18	18	9
MKP474K***A22---	0.47	±10	22.5	0.8	26	16.5	7.5
MKP564K***A15---(S)	0.56	±10	15	0.8	18	19	10
MKP564K***A22---	0.56	±10	22.5	0.8	26	16.5	7.5
MKP684K***A22---(S)	0.68	±10	22.5	0.8	26	17	8.5
MKP684K***A27---	0.68	±10	27.5	0.8	31	20	10
MKP824K***A22---(S)	0.82	±10	22.5	0.8	26	18	9
MKP824K***A27---	0.82	±10	27.5	0.8	31	20	11
MKP105K***A22---(S)	1.0	±10	22.5	0.8	26	19	10
MKP105K***A27---	1.0	±10	27.5	0.8	31	22	13
MKP155K***A22---(S)	1.5	±10	22.5	0.8	26	22	12
MKP155K***A27---	1.5	±10	27.5	0.8	31	23.5	14
MKP225K***A22---(S)	2.2	±10	22.5	0.8	26	25	15
MKP225K***A27---	2.2	±10	27.5	0.8	31	26	18
MKP335K***A27---(S)	3.3	±10	27.5	0.8	31	28	18
MKP335K***A31---	3.3	±10	31	0.8	36	26	16
MKP475K***A27---	4.7	±10	27.5	0.8	31	37	22

8. Taping specification:

8.1 $F=5.0\text{mm}$ $P_0=12.7\text{mm}$



8.2 $F=7.5\text{mm}$ $P_0=12.7\text{mm}$



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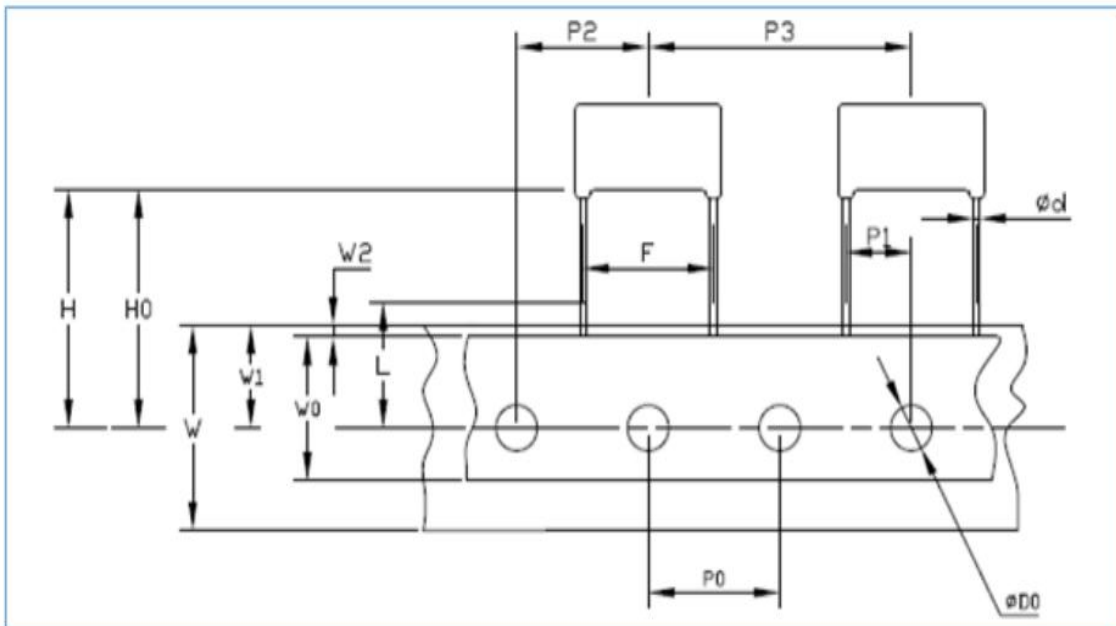
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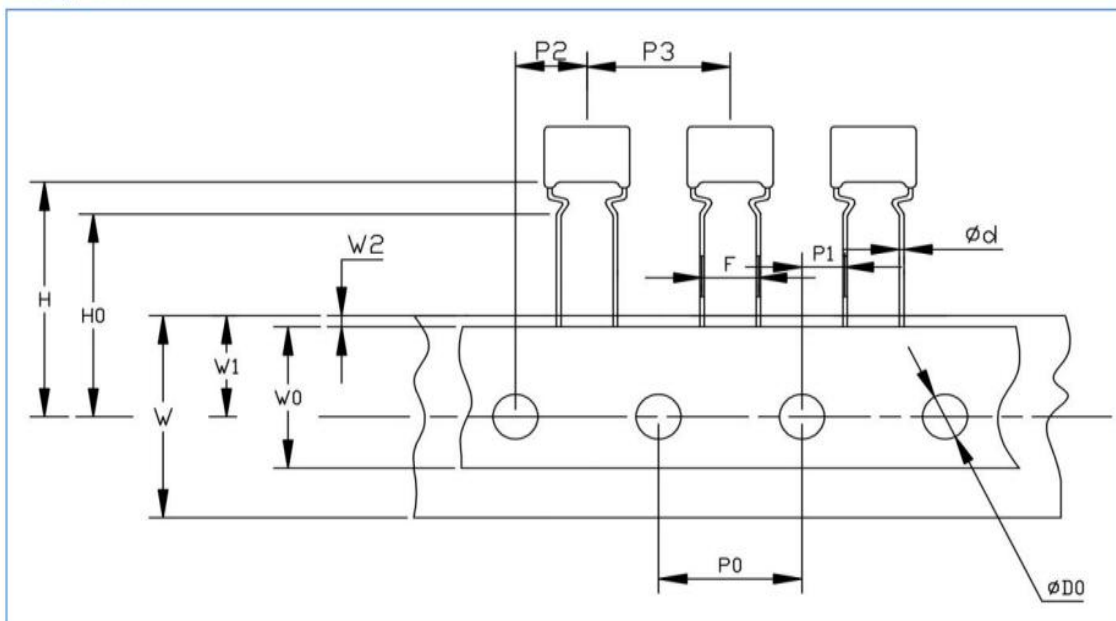
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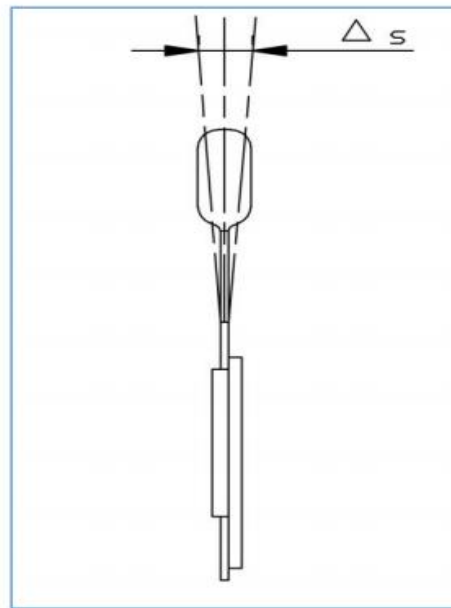
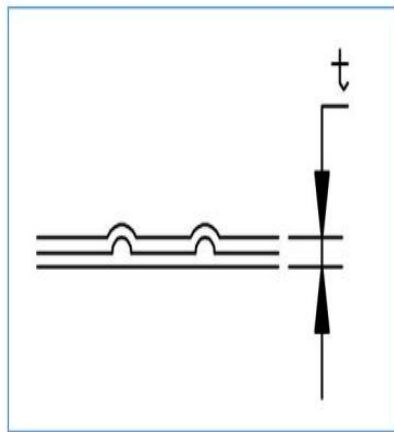
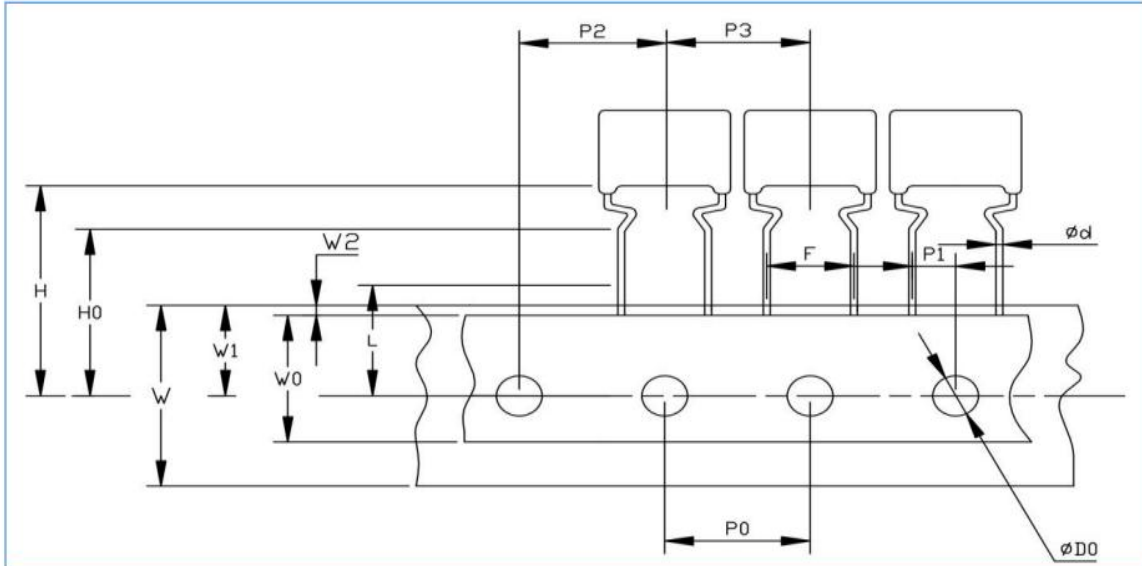
8.3 $F=10/15\text{mm}$ $P_0=12.7\text{mm}$



8.4 $F=5.0/7.5\text{mm}$ $P_0=15.0\text{mm}$



8.5 F=10mm P₀=15.0mm



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8.6 Taping size sheet:

Symbol	Item	S Taping size requirement		T Taping size requirement		
F	Lead spacing	7.5±1.0	10.0±1.0	5.0±0.8	7.5±1.0	10.0±1.0 15.0±1.0
d	Lead diameter	Refer to spec				
W	Carrier tape width	18.0±0.5				
W ₀	Hold down tape width	13.0±0.5				
W ₁	Position of sprocket hole	9.0±0.5				
W ₂	Hold down tape position	1.5±0.5				
t	Total tape thickness	0.6±0.2				
P ₀	Pitch of sprocket hole	15.0±1.0		12.7±1.0		25.4±1.0
D ₀	Diameter of sprocket hole	4.0±0.3				
P ₁	Length from hole center to	3.75±0.7	5.0±0.7	3.85±0.7		5.0±0.7
P ₂	Length from hole center to component center	7.5±1.3	15.0±1.3	6.35±1.3	12.7±1.3	12.7±1.3
P ₃	Pitch of component	15.0±1.0		12.7±1.0		25.4±1.0
H	Height from hole center to the bottom of body	18.5±1.0				
H ₀	Distance between reference	16.0±1.0				
△S	Deviation across tape	0±2.0				

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