

**MPX/X2-THB3 85°C/85%RH Metallized
Polypropylene Film Interference Suppression
Capacitors (Class X2)**

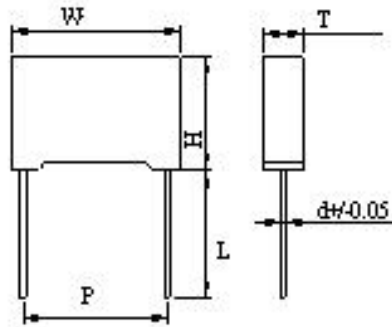
Electrical Characteristics

Climatic Category	40/110/56
Operating Temperature Range	-40°C ~ 110°C
Rated Voltage	305VAC
Nominal Capacity	0.33μF
Tolerance	±10% (K)
Dissipation Factor(tanδ)	≤0.1%
Withstand Voltage	Between terminals to case: 2U _R +1500VAC Minimum of 2000VAC
	Between terminals: 4.3U _R (DC)/5S
Insulation Resistance (I.R.)	C _R ≤0.33μF, IR≥15000MΩ C _R >0.33μF, IR≥5000S Note: T[s]=I.R.[MΩ]*CN [μF] 20°C、100V、60S

How to order:

<u>X2</u>	<u>F</u>	<u>334</u>	<u>K</u>	<u>A305</u>	<u>0150</u>	<u>B</u>	<u>050</u>	<u>T</u>
<u>Type</u>	<u>Material Code</u>	<u>Capacitance Code</u>	<u>Tolerance</u>	<u>Rated Voltage</u>	<u>Size Code</u>	<u>Package Code</u>	<u>Suffix Indicate Requirement</u>	<u>Special THB</u>
X2	F: Plastic Film Cap For X2	pF Code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow) 104 = 0.1uF 103 = 0.01uF 334 = 0.33uF 225 = 2.2uF	K: +/-10%	For AC Voltage: A275: 275VAC A300: 300VAC A305: 305VAC A310: 310VAC	Pitch Size for Standard Box 0100: pitch size 10mm 0150: pitch size 15mm 0200: pitch size 20mm 0225: pitch size 22.5mm 0275: pitch size 27.5mm	B: Bulk T: TRAY	000: Indicating Standard If for cut leads or long leg 000: mean standard LL 035: cut leads to 3.5mm 040: cut leads to 4mm 050: cut leads to 5mm 250: 25mm long leads	

Dimensions and Approval

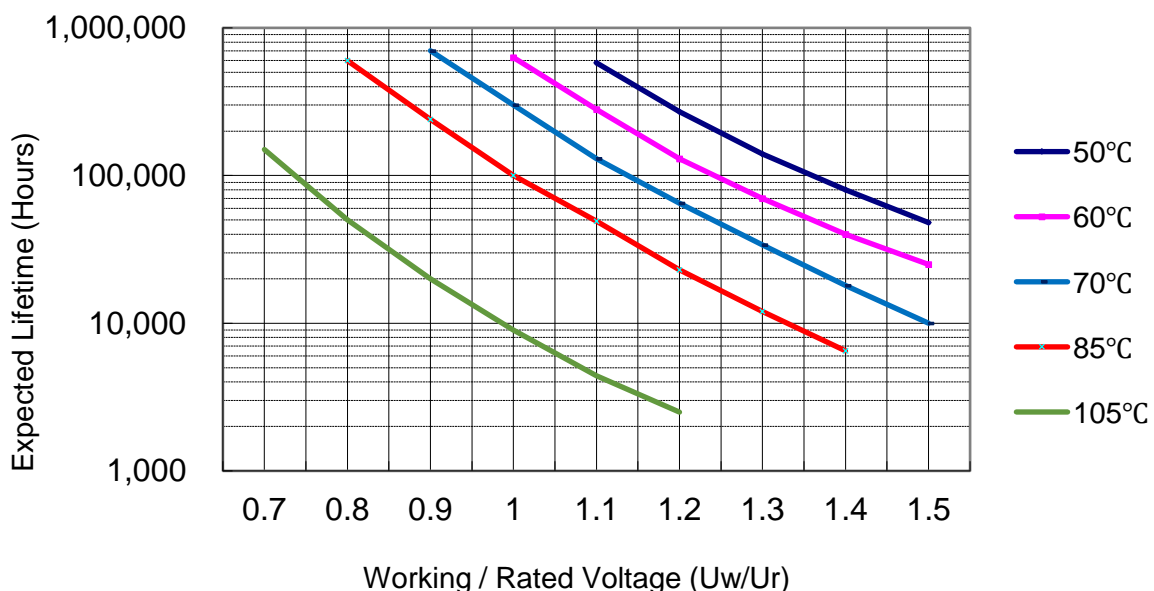


Specifications	L Min (mm)	W±0.5 (mm)	H±0.5 (mm)	T±0.5 (mm)	P±0.5 (mm)	d±0.05 (mm)
X2F334KA3050150B050T X2F334KA3050150T050T	5.0	18.0	19.0	11.0	15.0	0.8

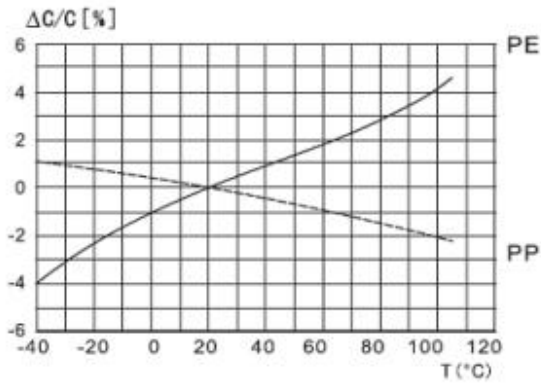
Safety Certificate

Approval	Organization	Safety Standards	Capacity Range(μ F)	Rated Voltage
USA Canada	UL/CUL	UL60384-14	0.001~2.2	250VAC 275VAC 305VAC 310VAC
Germany	VDE	EN60384-14	0.001~2.2	
EU	ENEC	EN60384-14	0.001~2.2	
Korea	KTL	K60384	0.1below	
			0.1above~0.33	
			0.33 above~1.0	
			1.0 above~2.2	
China	CQC	GB/T 6346.14-2015	0.001~2.2	

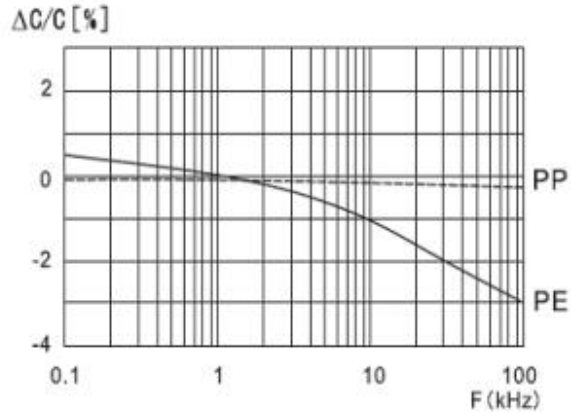
Expected Life Curve



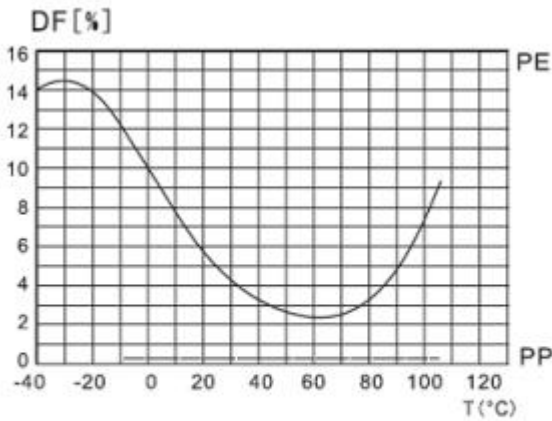
Graph Rated Value & Characteristic



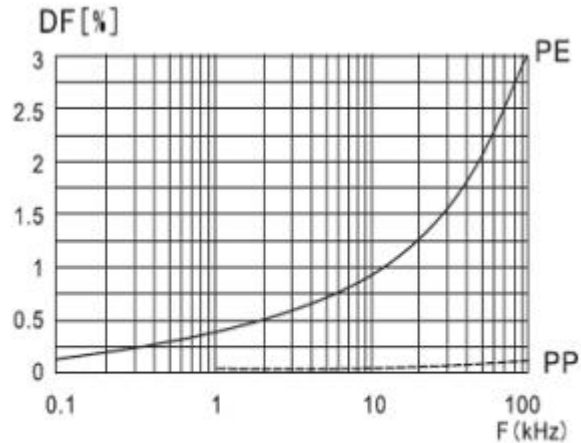
Capacitance vs. temperature at 1kHz



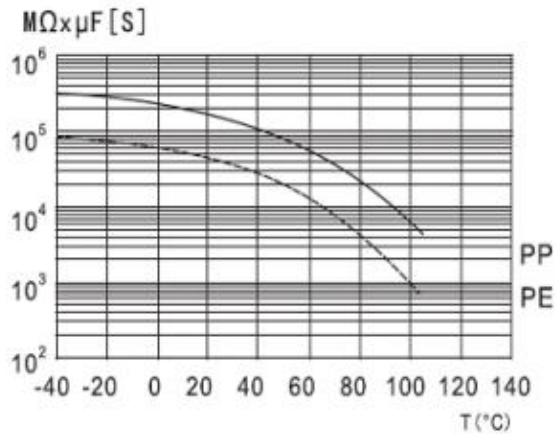
Capacitance vs. frequency (Room temperature)



Dissipation factor vs. temperature at 1kHz



Dissipation factor vs. frequency (Room temperature)

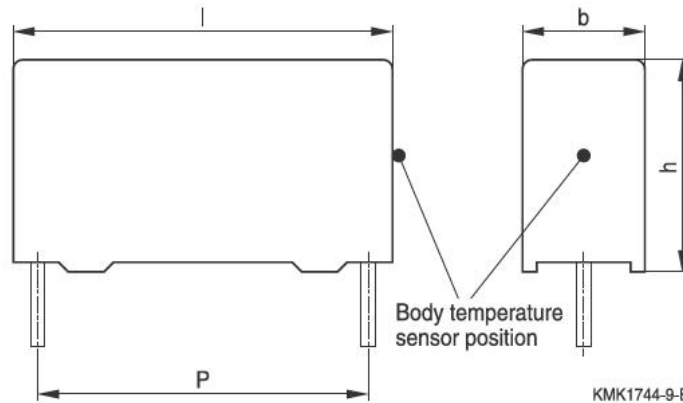
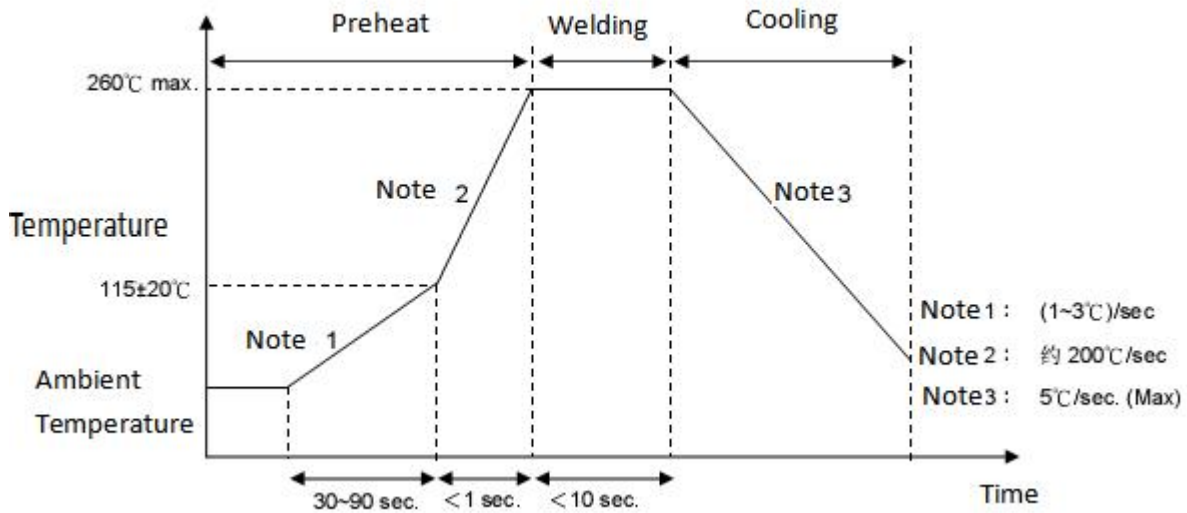


I.R. vs. temperature

----- 聚丙烯膜 (Polypropylene Film)
————— 聚酯薄膜 (Polyester Film)

Soldering Condition

Wave Soldering Graph



PP:
 During pre-heating: $T_p \leq 110^\circ\text{C}$
 During soldering: $T_s \leq 120^\circ\text{C}$, $t_s \leq 15\text{ s}$
 PE:
 During pre-heating: $T_p \leq 125^\circ\text{C}$
 During soldering: $T_s \leq 160^\circ\text{C}$, $t_s \leq 15\text{ s}$

Note: Film capacitor is not suitable for reflow soldering, because it will cause thermal contraction and affect electrical performance.

Iron Soldering Condition

Item	Condition
Temperature of soldering copper bit	360°C (max.)
Soldering duration	3sec (max.)
Space between soldering position and coating layer	2mm (min.)

Reliability Test Methods And Requirements

NO.	Item	Specifications	Test conditions / Methods								
1	Creep Age Distance and Clearance	Creep age distance > 5.0mm Clearance > 4.0mm	For the measurement between Terminals.								
2	Robustness of Terminals	Pin No visible damage	<p>Apply a specified weight to one lead of the sample, bent $\pm 90^\circ$, 2 times.</p> <table border="1"> <thead> <tr> <th>Terminal diameter (mm)</th> <th>Bending Test Apply force(N)</th> </tr> </thead> <tbody> <tr> <td>$0.5 < D \leq 0.8$</td> <td>$5 \pm 10\%$</td> </tr> </tbody> </table> <p>Gradually apply the specified force and keep the unit fixed for 10 ± 1 sec.</p> <table border="1"> <thead> <tr> <th>Terminal diameter (mm)</th> <th>Force (N)</th> </tr> </thead> <tbody> <tr> <td>$0.5 < d \leq 0.8$</td> <td>$10 \pm 10\%$</td> </tr> </tbody> </table>	Terminal diameter (mm)	Bending Test Apply force(N)	$0.5 < D \leq 0.8$	$5 \pm 10\%$	Terminal diameter (mm)	Force (N)	$0.5 < d \leq 0.8$	$10 \pm 10\%$
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3	Solderability	Lead wire shall be soldered with uniform coating on the axial direction over 95% of the circumferential direction.	$245 \pm 3^\circ\text{C}$, $3 \pm 0.3\text{s}$. Solder composition: Sn96.5Ag3.0Cu0.5								
4	Resistance To Soldering Heat	Pin No visible damage.	$260 \pm 5^\circ\text{C}$; $10 \pm 0.5\text{S}$								
5	Marking Solvent	Clearly marked, no visible damage	Immersion for 5 ± 0.5 min. in a mixture of $70 \pm 5\%$ 1,1,2-trichlorotrifluoroethane and $30 \pm 5\%$ isopropanol at $23 \pm 5^\circ\text{C}$ Wipe 10 times with absorbent cotton								

NO.	Item	Specifications	Test conditions / Methods									
6	Temperature Cycle	1) Appearance No visible damage 2) Change rate of capacitance: $\leq \pm 5\%$ 3) Dissipation factor: ≤ 0.008 ($C_R \leq 1.0\mu F$) ≤ 0.005 ($C_R > 1.0\mu F$) 4) According to initial conditions test voltage no breakdown and fly arc 5) $IR \geq$ Initial value 50%.	The capacitor shall be subjected to 5 temperature cycles <table border="1" data-bbox="1034 461 1556 629"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Time (min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40+0/-3</td> <td>30</td> </tr> <tr> <td>2</td> <td>110+3/-0</td> <td>30</td> </tr> </tbody> </table>	Step	Temperature (°C)	Time (min)	1	-40+0/-3	30	2	110+3/-0	30
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1	-40+0/-3	30										
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7	Vibration	Appearance No visible damage	10~55Hz, 0.75mm, 10Hz→55Hz→10Hz. 1min Apply for a total of 6 hours, 2 hrs each in 3 mutually perpendicular directions.									
8	Collision or Impact	1) Appearance No visible damage 2) Change rate of capacitance: $\leq \pm 5\%$ 3) Dissipation factor: ≤ 0.008 ($C_R \leq 1.0\mu F$) ≤ 0.005 ($C_R > 1.0\mu F$) 4) According to initial conditions test voltage no breakdown and fly arc. 5) $IR \geq$ Initial value 50%.	1000 times or 4000 times, acceleration $400m/s^2$, pulse duration 6ms.									
9	Damp Heat, Humidity Steady State	1) Appearance No visible damage 2) Change rate of capacitance: $\leq \pm 5\%$ 3) Dissipation factor: ≤ 0.008 ($C_R \leq 1.0\mu F$) ≤ 0.005 ($C_R > 1.0\mu F$) 4) According to initial conditions test voltage no breakdown and fly arc. 5) $IR \geq$ Initial value 50%.	No voltage applied: $40 \pm 2^\circ C$, 90~95%RH, 56 days.									
10	Pulse Voltage	Test of capacitor shall be no permanent breakdown and arcing.	Applied voltage: $C_R \leq 1.0\mu F$, 2.5KVDC $C_R > 1.0\mu F$, $2.5/\sqrt{C_R}$ Pulse frequency: 24 times Time period: Charging 9S, 2s discharge									
11	Life Test	1) Appearance No visible damage 2) Change rate of capacitance: $\leq \pm 10\%$ 3) Dissipation factor: ≤ 0.008 ($C_R \leq 1.0\mu F$) ≤ 0.005 ($C_R > 1.0\mu F$) 4) According to initial conditions test voltage no breakdown and fly arc. 5) $IR \geq$ Initial value 50%.	$110 \pm 3^\circ C$, $1.25U_R$, 1000 hours, the interval not less than the capacitor 25mm, Voltage shall be increased every 1 hour to 1000VAC, duration is 0.1s, the voltage across a $47\Omega \pm 5\%$ resistor applied to each capacitor.									

NO.	Item	Specifications	Test conditions / Methods																												
12	Passive Flammability	The burning time shall not be exceeded the standard. The tissue paper shall not ignite.	<p>The capacitor under test shall be held in the flame in the position which best promotes burning. Each specimen shall be exposed once in the flame. Specifically as follows: Level B requirements:</p> <table border="1"> <thead> <tr> <th rowspan="2">Class</th> <th colspan="4">Capacitor volume (mm³) Apply flame time (S)</th> <th rowspan="2">Maximum burning time (S)</th> </tr> <tr> <th>Volume <250</th> <th>250 < Volume ≤500</th> <th>500 < Volume ≤1750</th> <th>Volume >1750</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>15</td> <td>30</td> <td>60</td> <td>120</td> <td>3</td> </tr> <tr> <td>B</td> <td>10</td> <td>20</td> <td>30</td> <td>60</td> <td>10</td> </tr> <tr> <td>C</td> <td>5</td> <td>10</td> <td>20</td> <td>30</td> <td>30</td> </tr> </tbody> </table>	Class	Capacitor volume (mm ³) Apply flame time (S)				Maximum burning time (S)	Volume <250	250 < Volume ≤500	500 < Volume ≤1750	Volume >1750	A	15	30	60	120	3	B	10	20	30	60	10	C	5	10	20	30	30
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C	5	10	20	30	30																										
13	Active Flammability	The cheese-cloth shall not be on fire.	<p>$U=U_R, U_1=2.5KV$ Each sample shall be subjected to an energy storage capacitor 20 times, each interval between two discharge 5S.</p>																												
14	Charge and Discharge Test	<p>1) Capacity change rate: $\leq \pm 10\%$ 2) Dissipation factor: ≤ 0.008 ($CR \leq 1.0\mu F$) ≤ 0.005 ($CR > 1.0\mu F$) 3) IR insulation resistance: \geq initial value of 50%.</p>	<p>Applied Voltage: $\sqrt{2} U_R$. Charge and discharge for 10,000 cycles (one charge and one discharge for one cycle). Its rate is about 1 time / s.</p>																												
15	High Temperature and high Humidity Test	<p>1) No visible scratches on the appearance 2) Capacitance change rate $\leq 10\%$; 3) loss tangent change: ≤ 0.008 ($CR \leq 1.0\mu F$) ≤ 0.005 ($CR < 1.0\mu F$) 4) Test voltage without breakdown and arcing according to initial conditions; 5) IR \geq initial value 50%</p>	<p>Applied voltage: 240VAC Temperature: $85 \pm 2^\circ C$; Humidity: $85 \pm 2\%$; Test period: 1000 hours</p>																												