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

Electrical Characteristics

Climatic Category	40/110/56
Operating Temperature Range	-40℃～110℃
Rated Voltage	305VAC
Nominal Capacity	2.2μF
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(2273MΩ) Note: T[s]=I.R.[MΩ]*CN [μF]　20℃、100V、60S

How to order:

X2	F	225	K	A305	0275	B	050	T
Type	Material Code	Capacitance Code	Tolerance	Rated Voltage	Size Code	Package Code	Suffix Indicate Special Requirement	THB

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
225=2.2uF

K: +/-10%

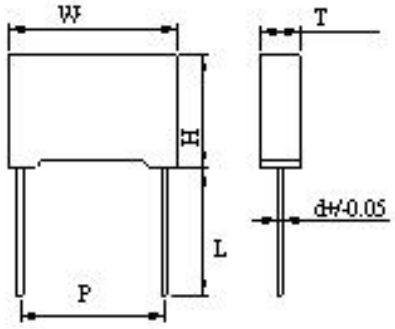
For AC Voltage:
A275: 275VAC
A300: 300VAC
A305: 305VAC
A310: 310VAC

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

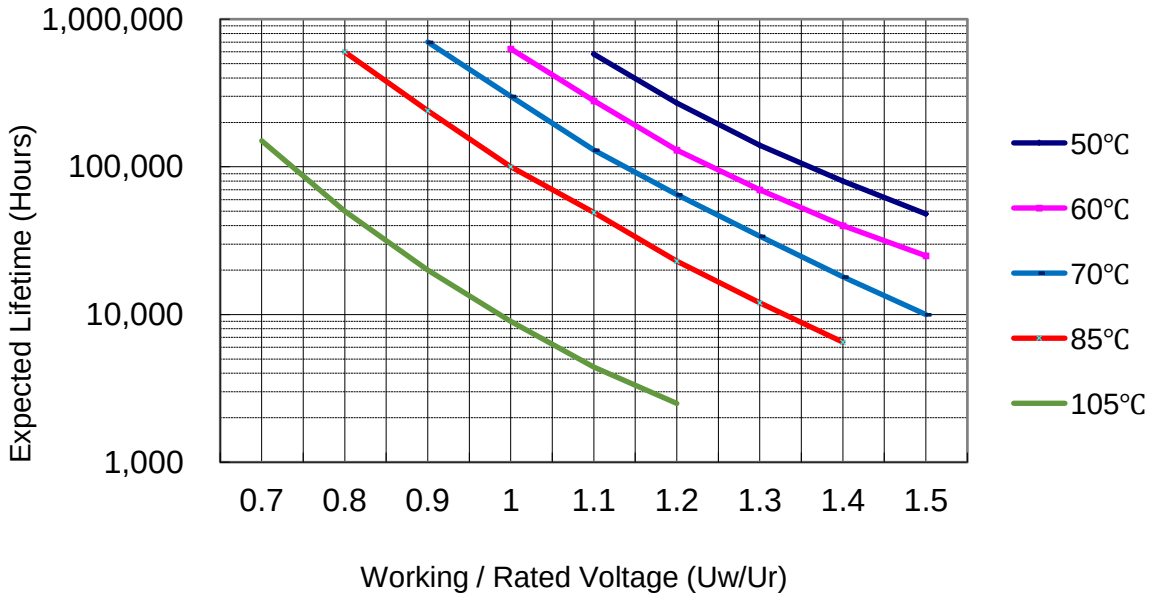


Specifications	L Min (mm)	W±0.5 (mm)	H±0.5 (mm)	T±0.5 (mm)	P±0.5 (mm)	d±0.05 (mm)
X2F225KA3050275B050T X2F225KA3050275T050T	5.0	32.0	28.0	18.0	27.5	0.8

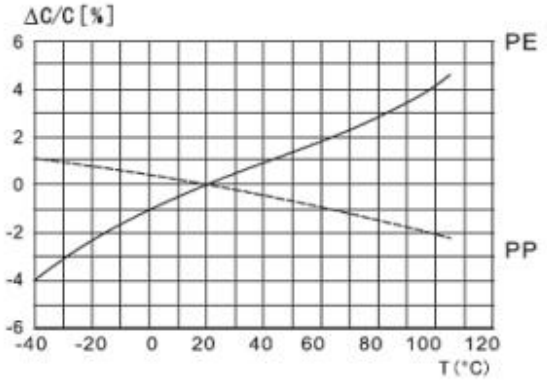
Safety Certificate

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	

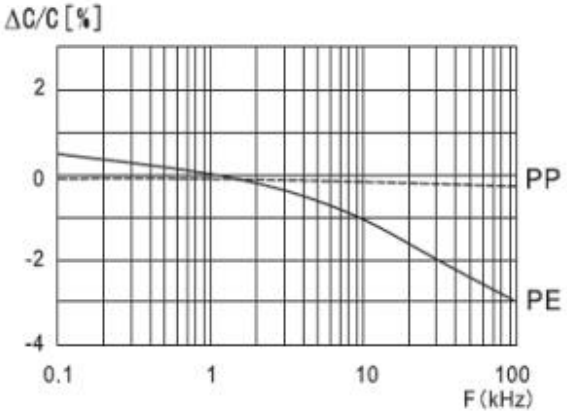
Expected Life Curve



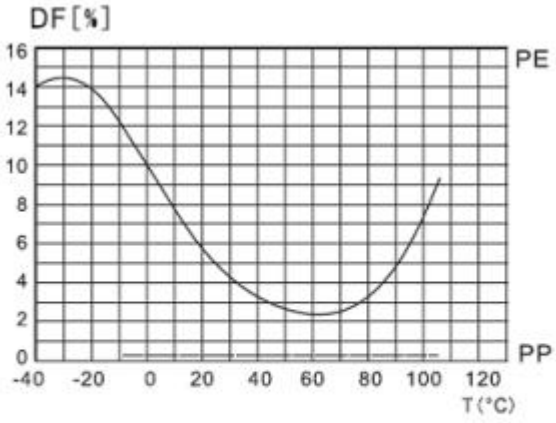
Graph Rated Value & Characteristic



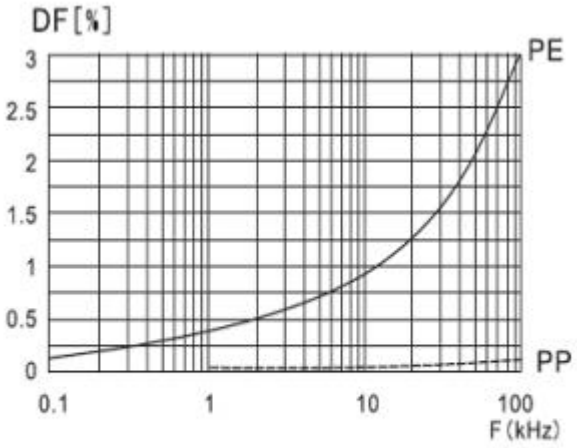
Capacitance vs. temperature at 1kHz



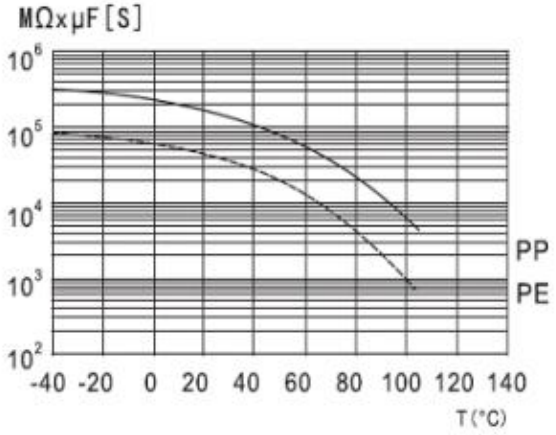
Capacitance vs. frequency (Room temperature)



Dissipation factor vs.temperature at 1KHz



Dissipation factor vs.frequency (Room temperature)



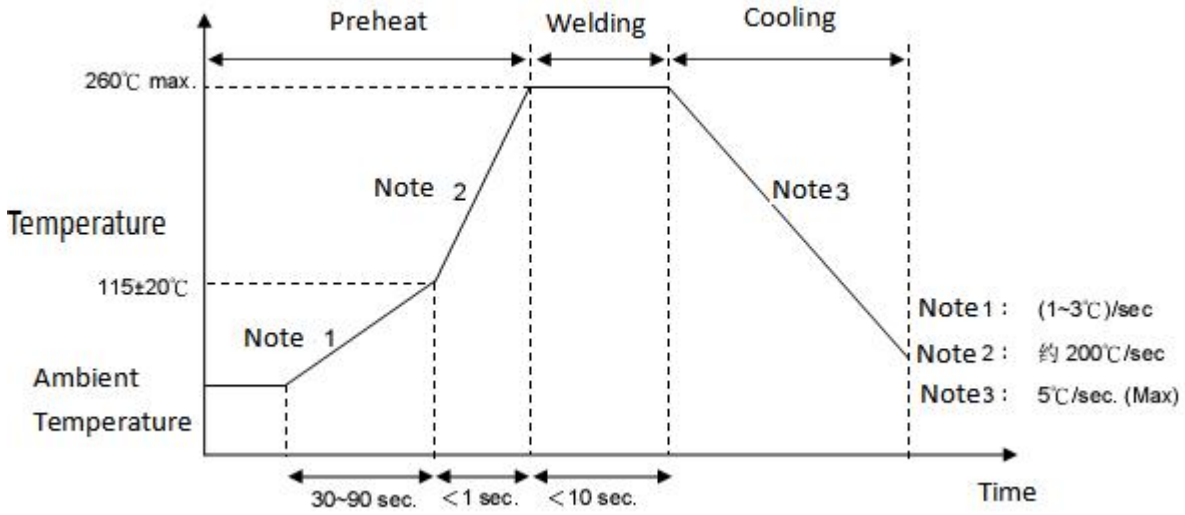
I.R. vs. temperature

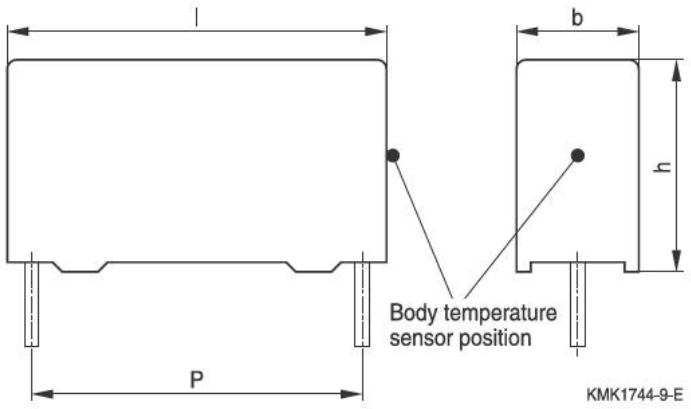
聚丙烯膜 (Polypropylene Film)

聚旨薄膜 (Polyester Film)

Soldering Condition

Wave Soldering Graph





PP:
During pre-heating: Tp ≤110℃
During soldering: Ts ≤120℃, ts ≤15 s
PE:
During pre-heating: Tp ≤125℃
During soldering: Ts ≤160℃, ts ≤15 s

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

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

Reliability Test Methods And Requirements

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

<table>
<tr><th>NO.</th><th>Item</th><th>Specifications</th><th>Test conditions / Methods</th></tr>
<tr><td>6</td><td>Temperature Cycle</td><td>1) Appearance No visible damage
2) Change rate of capacitance: ≤±5%
3) Dissipation factor:
≤0.008 (C_R≤1.0μF)
≤0.005 (C_R＞1.0μF)
4) According to initial conditions test voltage no breakdown and fly arc
5) IR≥Initial value50%.</td><td>The capacitor shall be subjected to 5 temperature cycles
<table>
<tr><th>Step</th><th>Temperature (℃)</th><th>Time (min)</th></tr>
<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>
</table></td></tr>
<tr><td>7</td><td>Vibration</td><td>Appearance No visible damage</td><td>10~55Hz, 0.75mm,
10Hz→55Hz→10Hz. 1min
Apply for a total of 6 hours, 2 hrs each in 3 mutually perpendicular directions.</td></tr>
<tr><td>8</td><td>Collision or Impact</td><td>1) Appearance No visible damage
2) Change rate of capacitance: ≤±5%
3) Dissipation factor:
≤0.008 (C_R≤1.0μF)
≤0.005 (C_R＞1.0μF)
4) According to initial conditions test voltage no breakdown and fly arc.
5) IR≥Initial value50%.</td><td>1000 times or 4000 times,
acceleration 400m/s^2,
pulse duration 6ms.</td></tr>
<tr><td>9</td><td>Damp Heat, Humidity Steady State</td><td>1) Appearance No visible damage
2) Change rate of capacitance: ≤±5%
3) Dissipation factor：
≤0.008 (C_R≤1.0μF)
≤0.005 (C_R>1.0μF)
4) According to initial conditions test voltage no breakdown and fly arc.
5) IR≥Initial value50%.</td><td>No voltage applied:
40±2℃, 90~95%RH,56 days.</td></tr>
<tr><td>10</td><td>Pulse Voltage</td><td>Test of capacitor shall be no permanent breakdown and arcing.</td><td>Applied voltage:
C_R≤1.0μF, 2.5KVDC
C_R＞1.0μF, 2.5/$\sqrt{C_R}$
Pulse frequency: 24 times
Time period:
Charging 9S, 2s discharge</td></tr>
<tr><td>11</td><td>Life Test</td><td>1) Appearance No visible damage
2) Change rate of capacitance:
≤ ±10%
3) Dissipation factor：
≤0.008 (C_R≤1.0μF)
≤0.005 (C_R＞1.0μF)
4) According to initial conditions test voltage no breakdown and fly arc.
5) IR ≥ Initial value50%.</td><td>110±3℃,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
47Ω ± 5% resistor applied to each capacitor.</td></tr>
</table>

<table>
<tr><th>NO.</th><th>Item</th><th>Specifications</th><th>Test conditions / Methods</th></tr>
<tr><td>12</td><td>Passive Flammability</td><td>The burning time shall not be exceeded the standard. The tissue paper shall not ignite.</td><td>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:
<table>
<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>
<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>
</table></td></tr>
<tr><td>13</td><td>Active Flammability</td><td>The cheese-cloth shall not be on fire.</td><td>U=U_R,U1=2.5KV
Each sample shall be subjected to an energy storage capacitor 20 times, each interval between two discharge 5S.</td></tr>
<tr><td>14</td><td>Charge and Discharge Test</td><td>1) Capacity change rate: ≤±10%
2)Dissipation factor:
≤0.008 (CR≤1.0μF)
≤0.005(CR＞1.0μF)
3)IR insulation resistance: ≥ initial value of 50%.</td><td>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.</td></tr>
<tr><td>15</td><td>High Temperature and high Humidity Test</td><td>1) No visible scratches on the app earance
2)Capacitance change rate ≤10%;
3)loss tangent change:
≤0.008 (CR≤1.0μF)
≤0.005(CR<1.0μF)
4)Test voltage without breakdown and arcing according to initial con ditions;
5)IR ≥ initial value 50%</td><td>Applied voltage:240VAC
Temperature: 85 ± 2 ° C;
Humidity: 85±2%;
Test period: 1000 hours</td></tr>
</table>