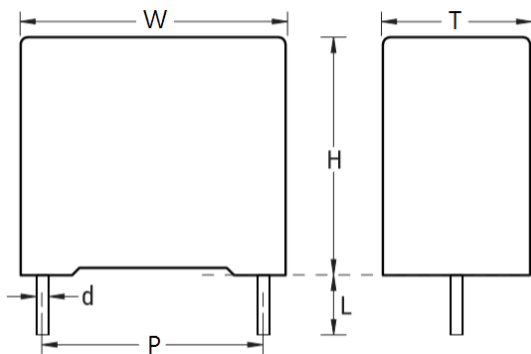
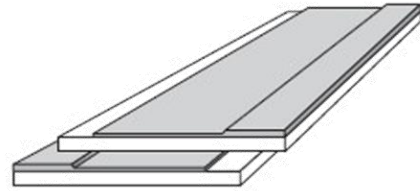


## AXX2 Series

### ■ Outline Drawing ( For Example)



### ■ Construction



### ■ Typical Applications

For worldwide use in electromagnetic interference (EMI) suppression in across-the-line applications requiring X2 safety classification. Intended for use in situations where capacitor failure would not result in exposure to electric shock. Not for use in "series with mains" type applications.

### ■ Features

Metallized polypropylene film with radial leads of tinned wire. The capacitor is encapsulated in a self-extinguishing solvent resistant plastic case with thermosetting resin material meeting UL 94 V-0 requirements.

### ■ Specifications

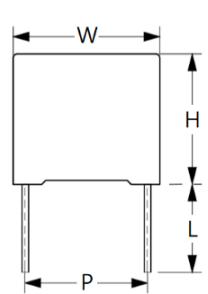
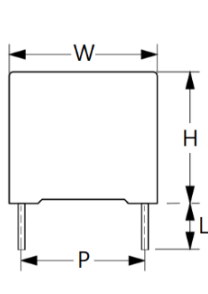
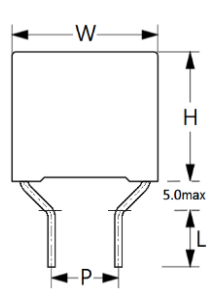
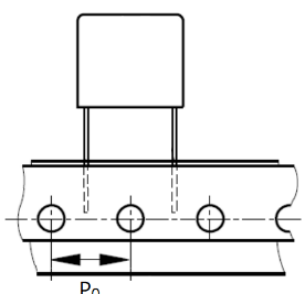
Reference Standard		GB/T 6346.14 (IEC 60384-14)
Capacitance Range		0.001 $\mu$ F ~ 4.7 $\mu$ F
Capacitance Tolerance		$\pm$ 10% (K)
Rated Voltage ( $U_N$ )		275Vac (SMXW)      310Vac (SMXV)
Climatic Category		40/100/21      40/110/56
Operating Temperature Range		-40°C~100°C      -40°C~110°C
Passive Flammability Class		C      B
Voltage Proof	Between Terminals	$U_N \times 4.3$ (DC), 60s
	Between Terminal and Case	$U_N \times 200\% + 1500$ Vac, 60sec.
Dissipation Factor		$\leq 10 \times 10^{-4}$ at 1kHz, (1Vrms Max. at 20°C)
Insulation Resistance		$C_R \leq 0.33\mu$ F, IR $\geq 15000$ M $\Omega$ $C_R > 0.33\mu$ F, IR $\times C_R \geq 5000$ s (100Vdc, 60sec / 20°C)

## AXX2 Series



### Product code system (For Example)

SMXV	G	104	K	D2X5	A	B	15	15
Type	Internal Use	Capacitance	Tolerance	Case Code	AC/DC	Lead Forming	Lead Pitch	Lead Length
SMXW= X2 275Vac	--	104 =100nF	K=±10%	D2X5=18*12*6 D3XX=18*13.5*7.5 D4XX=18*14.5*8.5 E4XX=26.5*19*10 F3XX=31*25*14	A=AC	Shown as Table I	08=7.5mm 10=10mm 15=15mm 23=22.5mm 28=27.5mm	04=3.5mm 15=15mm 23=23mm
SMXV= X2 310Vac		=0.1μF						

Table I

Lead Forming			
B (Straight 15mm)	K (Short)	U (Vertical Kink)	T (Taping)
			

### Marking (For Example)

Marking	
SMXW (275Vac)	SMXV (310Vac)
	
1. Capacitance: .22μF indicates 0.22μF or 220nF	2. Capacitors Tolerance: K=±10%
3. Rated Voltage: 250V~/275V~ and 310V~	4. Capacitors Class: X2
5. Type of the Capacitors: MPX	6. Climatic Category: GMF 40/100/21 and 40/110/56
7. Passive flammability category: B	8. Recognized Approval Mark

AXX2 Series

■ Dimensions (mm)

275Vac (SMXW) / 310Vac (SMXV)						
Cap. μF	W	H	T	P	d	Part number
0.0010	10	9	4	7.5	0.6	SMXVI102KB3LTA*08**
0.0022	10	9	4	7.5	0.6	SMXVI222KB3LTA*08**
0.0033	10	9	4	7.5	0.6	SMXVF332KB3LTA*08**
0.0047	10	9	4	7.5	0.6	SMXVJ472KB3LTA*08**
0.0068	10	9	4	7.5	0.6	SMXVI682KB3LTA*08**
0.010	10	9	4	7.5	0.6	SMXVI103KB3LTA*08**
0.022	10	10	5	7.5	0.6	SMXVH223KB7LTA*08**
0.033	10	12	6	7.5	0.6	SMXVI333KB5LTA*08**
0.047	10	12	6	7.5	0.6	SMXVG473KB5LTA*08**
0.068	10	12	6	7.5	0.6	SMXVG683KB5LTA*08**
0.1	10	12	6	7.5	0.6	SMXVF104KB5LTA*08**
0.0010	13	9	4	10	0.6	SMXVJ102KC1XXA*10**
0.0010	13	11	5	10	0.6	SMXVJ102KC2X1A*10**
0.0022	13	9	4	10	0.6	SMXVI222KC1XXA*10**
0.0022	13	11	5	10	0.6	SMXVJ222KC2X1A*10**
0.0033	13	9	4	10	0.6	SMXVJ332KC1XXA*10**
0.0033	13	11	5	10	0.6	SMXVJ332KC2X1A*10**
0.0047	13	9	4	10	0.6	SMXVJ472KC1XXA*10**
0.0047	13	11	5	10	0.6	SMXVJ472KC2X1A*10**
0.0068	13	9	4	10	0.6	SMXVJ682KC1XXA*10**
0.0068	13	11	5	10	0.6	SMXVI682KC2X1A*10**
0.010	13	9	4	10	0.6	SMXVI103KC1XXA*10**
0.010	13	11	5	10	0.6	SMXVJ103KC2X1A*10**
0.022	13	9	4	10	0.6	SMXVH223KC1XXA*10**
0.022	13	11	5	10	0.6	SMXVI223KC2X1A*10**
0.033	13	9	4	10	0.6	SMXVG333KC1XXA*10**
0.033	13	11	5	10	0.6	SMXVH333KC2X1A*10**
0.047	13	9	4	10	0.6	SMXVF473KC1XXA*10**
0.047	13	11	5	10	0.6	SMXVG473KC2X1A*10**
0.068	13	11	5	10	0.6	SMXVG683KC2X1A*10**
0.068	13	12	6	10	0.6	SMXVG683KC3XXA*10**
0.10	13	11	5	10	0.6	SMXVF104KC2X1A*10**

275Vac (SMXW) / 310Vac (SMXV)						
Cap. μF	W	H	T	P	d	Part number
0.10	13	12	6	10	0.6	SMXVG104KC3XXA*10**
0.15	13	12	6	10	0.6	SMXVF154KC3XXA*10**
0.15	13	14	8	10	0.6	SMXVG154KC5LTA*10**
0.22	13	12	6	10	0.6	SMXVE224KC3XXA*10**
0.22	13	14	8	10	0.6	SMXVF224KC5LTA*10**
0.33	13	14	8	10	0.6	SMXVE334KC5LTA*10**
0.33	12.5	16.5	10.5	10	0.6	SMXVF334KC9XXA*10**
0.47	13	14	8	10	0.6	SMXVE474KC5LTA*10**
0.47	12.5	16.5	10.5	10	0.6	SMXVF474KC9XXA*10**
0.010	18	11	5	15	0.8	SMXVJ103KD1XXA*15**
0.022	18	11	5	15	0.8	SMXVJ223KD1XXA*15**
0.033	18	11	5	15	0.8	SMXVI333KD1XXA*15**
0.047	18	11	5	15	0.8	SMXVI473KD1XXA*15**
0.068	18	11	5	15	0.8	SMXVH683KD1XXA*15**
0.10	18	11	5	15	0.8	SMXVG104KD1XXA*15**
0.10	18	12	6	15	0.8	SMXVG104KD2X5A*15**
0.15	18	11	5	15	0.8	SMXVF154KD1XXA*15**
0.15	18	12	6	15	0.8	SMXVG154KD2XXA*15**
0.22	18	12	6	15	0.8	SMXVF224KD2XXA*15**
0.22	18	13.5	7.5	15	0.8	SMXVG224KD3X5A*15**
0.22	18	14.5	8.5	15	0.8	SMXVG224KD4X5A*15**
0.33	18	12	6	15	0.8	SMXVE334KD2XXA*15**
0.33	18	13.5	7.5	15	0.8	SMXVF334KD3XXA*15**
0.33	18	14.5	8.5	15	0.8	SMXVG334KD4XXA*15**
0.33	18	15.5	9.5	15	0.8	SMXVG334KD5XXA*15**
0.47	18	14.5	8.5	15	0.8	SMXVF474KD4XXA*15**
0.47	18	15.5	9.5	15	0.8	SMXVG474KD5XXA*15**
0.47	18	19	10.8	15	0.8	SMXVG474KD7XXA*15**
0.68	18	15.5	9.5	15	0.8	SMXVF684KD5XXA*15**
0.68	18	19	10.8	15	0.8	SMXVG684KD7XXA*15**
0.82	18	19	10.8	15	0.8	SMXVF824KD7XXA*15**
1.0	18	19.2	11.2	15	0.8	SMXVF105KD8X3A*15**

## AXX2 Series

### ■ Dimensions (mm)

275Vac (SMXW) / 310Vac (SMXV)						
Cap. μF	W	H	T	P	d	Part number
0.22	26.5	15	6	22.5	0.8	SMXVH224KE1XXA*23**
0.22	26.5	16.5	7	22.5	0.8	SMXVH224KE2XXA*23**
0.33	26.5	16.5	7	22.5	0.8	SMXVH334KE2XXA*23**
0.33	26.5	17	8.5	22.5	0.8	SMXVH334KE3X5A*23**
0.47	26.5	15	6	22.5	0.8	SMXVF474KE1XXA*23**
0.47	26.5	16.5	7	22.5	0.8	SMXVG474KE2XXA*23**
0.47	26.5	17	8.5	22.5	0.8	SMXVG474KE3X5A*23**
0.47	26.5	19	10	22.5	0.8	SMXVH474KE4X5A*23**
0.68	26.5	16.5	7	22.5	0.8	SMXVF684KE2XXA*23**
0.68	26.5	17	8.5	22.5	0.8	SMXVG684KE3XXA*23**
0.68	26.5	19	10	22.5	0.8	SMXVH684KE4XXA*23**
0.82	26.5	19	10	22.5	0.8	SMXVG824KE4XXA*23**
0.82	26	21.5	12	22.5	0.8	SMXVH824KE6XXA*23**
1.0	26.5	17	8.5	22.5	0.8	SMXVF105KE3XXA*23**
1.0	26.5	19	10	22.5	0.8	SMXVG105KE4XXA*23**
1.0	26	21.5	12	22.5	0.8	SMXVH105KE6XXA*23**
1.2	26.5	19	10	22.5	0.8	SMXVF125KE4XXA*23**
1.2	26	21.5	12	22.5	0.8	SMXVG125KE6XXA*23**
1.5	26.5	19	10	22.5	0.8	SMXVF155KE4XXA*23**
1.5	26	20	11	22.5	0.8	SMXVF155KE5XXA*23**
1.5	26	21.5	12	22.5	0.8	SMXVF155KE6XXA*23**
1.5	26.5	23	13	22.5	0.8	SMXVG155KE7XXA*23**
1.8	26	21.5	12	22.5	0.8	SMXVF185KE6XXA*23**
1.8	26	25	15	22.5	0.8	SMXVG185KE24LA*23**
2.2	26.5	23	13	22.5	0.8	SMXVF225KE7XXA*23**
2.2	26	25	15	22.5	0.8	SMXVG225KE24LA*23**

275Vac (SMXW) / 310Vac (SMXV)						
Cap. μF	W	H	T	P	d	Part number
0.47	31	16	10	27.5	0.8	SMXVI474KF15XA*28**
0.47	31.5	19.5	10.8	27.5	0.8	SMXVI474KF1X5A*28**
0.68	31.5	19.5	10.8	27.5	0.8	SMXVH684KF1X5A*28**
0.82	31.5	19.5	10.8	27.5	0.8	SMXVH824KF1X5A*28**
0.82	31.5	21.5	13	27.5	0.8	SMXVH824KF2X5A*28**
1.0	31.5	19.5	10.8	27.5	0.8	SMXVG105KF1X5A*28**
1.0	31.5	21.6	13	27.5	0.8	SMXVH105KF2XXA*28**
1.0	31	25	14	27.5	0.8	SMXVI105KF3XXA*28**
1.2	31.5	19.5	10.8	27.5	0.8	SMXVG125KF1X5A*28**
1.2	31.5	21.6	13	27.5	0.8	SMXVH125KF2XXA*28**
1.5	31.5	19.5	10.8	27.5	0.8	SMXVG155KF1XXA*28**
1.5	31.5	21.6	13	27.5	0.8	SMXVG155KF2XXA*28**
1.5	31	25	14	27.5	0.8	SMXVH155KF3XXA*28**
1.8	31	25	14	27.5	0.8	SMXVG185KF3XXA*28**
2.0	31.5	19.5	10.8	27.5	0.8	SMXVF205KF1XXA*28**
2.0	31.5	21.6	13	27.5	0.8	SMXVF205KF2XXA*28**
2.0	31	25	14	27.5	0.8	SMXVG205KF3XXA*28**
2.2	31.5	21.6	13	27.5	0.8	SMXVF225KF2XXA*28**
2.2	31	25	14	27.5	0.8	SMXVG225KF3XXA*28**
2.2	31	29	15.5	27.5	0.8	SMXVH225KF31LA*28**
2.2	32	28	18	27.5	0.8	SMXVH225KF13XA*28**
2.5	31	25	14	27.5	0.8	SMXVG255KF3XXA*28**
3.0	31	25	14	27.5	0.8	SMXVF305KF3XXA*28**
3.3	32	28	18	27.5	0.8	SMXVG335KF13XA*28**
3.3	31	31	22	27.5	0.8	SMXVH335KF8XXA*28**
4.0	31	25	14	27.5	0.8	SMXVF405KF3XXA*28**
4.7	32	28	18	27.5	0.8	SMXVF475KF13XA*28**
4.7	31	31	22	27.5	0.8	SMXVG475KF8XXA*28**
4.7	41	28.5	16	37.5	0.8	SMXVF475KT855A*38**
4.7	41.5	35.5	22.5	37.5	0.8	SMXVH475KJ20LA*38**

(1) The symbol \* means style of lead forming

(2) The symbol \*\* means the lead length

AXX2 Series

■ Inspection requirements

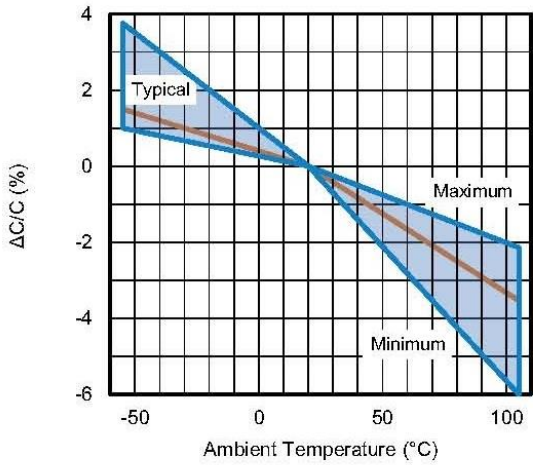
Test items	Performance requirements	Conditions of test	
4.3 Robustness of terminations	No wire breakage and no damage of capacitor Final measurements (1) No visible damage (2) $\Delta C/C \leq 5\%$ of the initial value	Tensile $U_{a1}$ (Duration : 10s $\pm$ 1s)	
		Wire diameter	Load
		$d \leq 0.8\text{mm}$	10N ( $\pm 10\%$ )
		$d \leq 1.25\text{mm}$	20N ( $\pm 10\%$ )
		Bending $U_b$ (4*90°, duration : 2 times/bend)	
		Wire diameter	oad
4.4 Resistance to soldering heat		$d \leq 0.8\text{mm}$	5N ( $\pm 10\%$ )
		$d \leq 1.25\text{mm}$	10N ( $\pm 10\%$ )
		No pre-drying, Solder bath: 260 $\pm$ 5°C Solder time: 5 $\pm$ 0.5sec	
4.5 Solderability		Solder temperature: 235 $\pm$ 5°C Solder time: 2 $\pm$ 0.5sec	
4.20 Solvent resistance of the marking		Solvent: Isopropyl alcohol Solvent temperature: 25°C Rubbing material: Cotton wool Immersion time: 5 min	
4.6 Rapid change of temperature	No visible damage, Legible marking Final measurements $\Delta C/C \leq 5\%$ of the initial value	Lower temperature: -40°C Upper temperature: 100 or 110°C Number of cycles: 5 times Duration $t_1 = 30$ min	
4.7 Vibration		Frequency range: 10~55Hz Course: X · Y · Z (axis) 2h / axis ( 6h in total) Displacement amplitude: 0.75mm	
4.8 Bump		Acceleration: 400m/s <sup>2</sup> , 4000 times Pulse duration: 6ms	
4.11 Climatic sequence	No visible damage, Legible marking Final measurements (1) $\Delta C/C \leq 5\%$ of the initial value (2) Increase of tan $\delta$ over: $\leq 0.008$ for $C_N \leq 1\mu\text{F}$ or $\leq 0.005$ for $C_N > 1\mu\text{F}$ (3) Voltage proof: No permanent breakdown or flashover IR $\geq 50\%$ of the applicable limits	Dry Heat Upper temperature: 100 or 110°C Duration: 16Hrs Damp heat, cyclic, Test Db, First cycle	
		Cold Lower temperature: -40°C Duration: 2Hrs Damp heat, cyclic, Test Db, Remaining cycle	

■ Inspection requirements

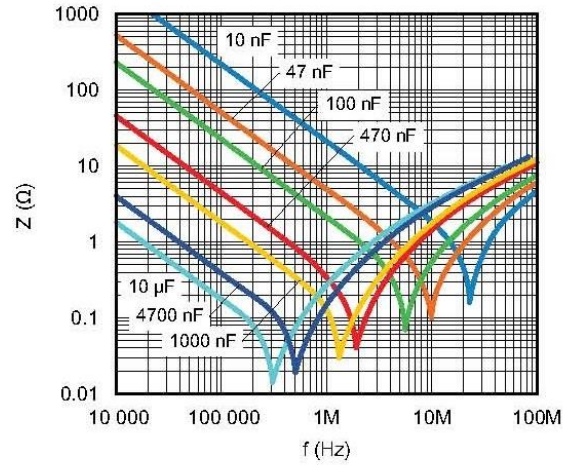
Test items	Performance requirements	Conditions of test												
4.12 Damp Heat, Steady State	No visible damage, Legible marking Final measurements (1) $\Delta C/C \leq 5\%$ of the initial value (2) Increase of $\tan \delta$ over: $\leq 0.008$ for $C_N \leq 1\mu F$ or $\leq 0.005$ for $C_N > 1\mu F$ (3) Voltage proof: No permanent breakdown or flashover (4) $IR \geq 50\%$ of the applicable limits	Temperature: $40^\circ C \pm 2^\circ C$ Relative humidity: $93 \pm 3\%$ Duration: 21 or 56 days												
4.14 Endurance	No visible damage, Legible marking Final measurements (1) $\Delta C/C \leq 10\%$ of the initial value (2) Increase of $\tan \delta$ over: $\leq 0.008$ for $C_N \leq 1\mu F$ or $\leq 0.005$ for $C_N > 1\mu F$ (3) Voltage proof: No permanent breakdown or flashover (4) $IR \geq 50\%$ of the applicable limits	$1.25 \times U_R$ VAC 50 Hz, once every hour increase to 1,000VAC for 0.1 second, 1,000 hours at upper category temperature												
4.15 Charge and discharge	Final measurements (1) $\Delta C/C \leq 10\%$ of the initial value (2) Increase of $\tan \delta$ over: $\leq 0.008$ for $C_N \leq 1\mu F$ or $\leq 0.005$ for $C_N > 1\mu F$ (3) $IR \geq 50\%$ of the applicable limits	Test voltage : $\sqrt{2} \times U_R$ VDC Charge and discharge: 1 sec/time Repeated for 10000 cycles												
4.17 Passive flammability test	After removing test flame from capacitor, The capacitor must not continue to burn for more than 10s for Class B, To 30s for Class C The tissue paper shall not ignite	Test duration for actual volume V in mm <sup>3</sup> :												
		<table border="1"> <thead> <tr> <th>Class</th> <th>250&lt;V≤500</th> <th>500&lt;V≤1750</th> <th>V&gt;1750</th> </tr> </thead> <tbody> <tr> <td>B</td> <td>20</td> <td>30</td> <td>60</td> </tr> <tr> <td>C</td> <td>10</td> <td>20</td> <td>30</td> </tr> </tbody> </table>	Class	250<V≤500	500<V≤1750	V>1750	B	20	30	60	C	10	20	30
		Class	250<V≤500	500<V≤1750	V>1750									
B	20	30	60											
C	10	20	30											
4.18 Active flammability test	20 cycles of 2.5kV discharges on the test capacitor connected to $U_{RAC}$	The cheese cloth around the capacitors shall not burn with a flame												

AXX2 Series

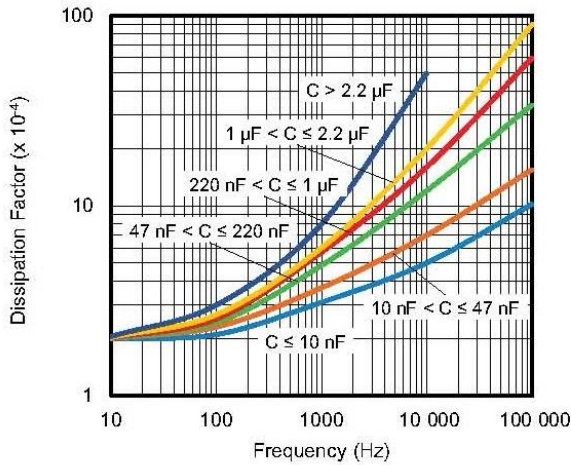
■ Characteristics



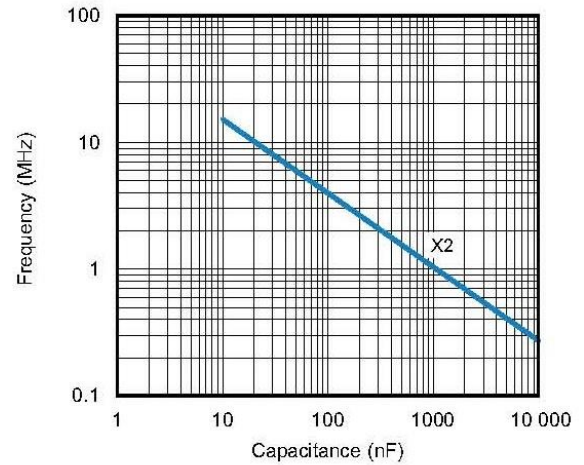
Capacitance as a function of ambient temperature (typical curve)



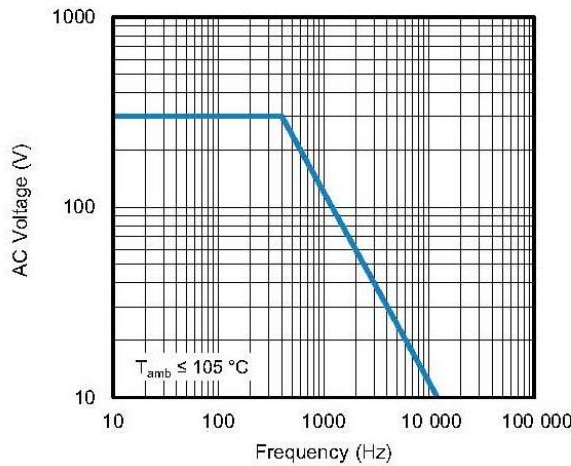
Impedance as a function of frequency (typical curve)



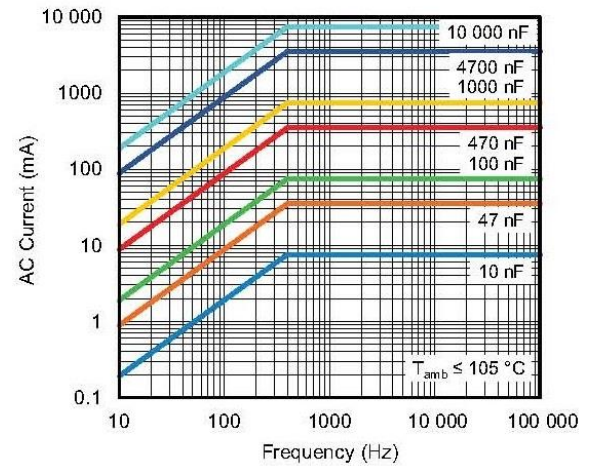
Tangent of loss angle as a function of frequency (typical curve)



Resonant frequency as a function of capacitance (typical curve)



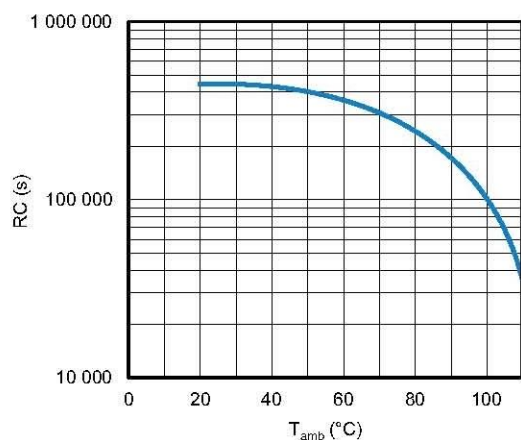
Max. RMS voltage as a function of frequency



Max. RMS current as a function of frequency





AXX2 Series

■ Characteristics



Insulation resistance as a function of ambient temperature

■ Approval sheets for safety standard of type MPX-X2

Approval marks	Standards	Certificate	Climatic Category	Capacitance Range	Rated Voltage
	IEC 60384-14:2013	E302125	40/100/21	0.001 ~ 4.7μF	275Vac
			40/110/56		310Vac
	IEC 60384-14:2013	40030283	40/100/21	0.001 ~ 4.7μF	275Vac
			40/110/56		310Vac
	GB/T6346.14-2015	CQC13001096493	40/100/21	0.001 ~ 4.7μF	275Vac
			40/110/56		310Vac
	KC60384-14	SU03034-12001C SU03034-12002C	40/100/21	0.001 ~ 4.7μF	275Vac
		SU03034-12003D SU03034-12004D SU03034-17001A	40/110/56		310Vac



## AXX2 Series

### ■ Soldering Guidelines for Film Capacitors

Polypropylene capacitors are especially sensitive to heat (the melting point of polypropylene is 160 – 170°C).

Wave soldering can be destructive, especially for mechanically small polypropylene capacitors (with lead spacing of 5 – 15 mm), and great care must be taken during soldering. In general, the wave soldering curve from IEC Publication 61760–1 Edition 2 serves as a solid guideline for successful soldering. See Figure 1.

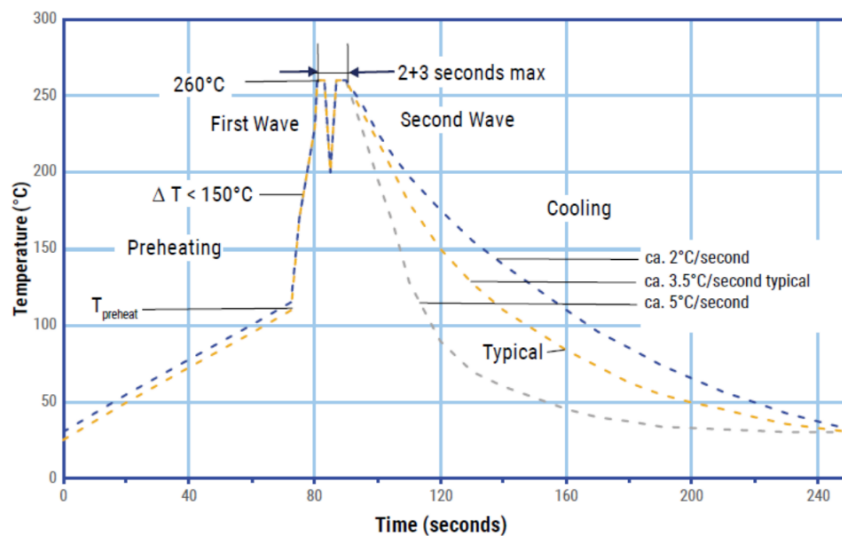
Reflow soldering is not recommended for through-hole film capacitors. Exposing capacitors to a soldering profile in excess of the recommended limits may result in degradation or permanent damage to the capacitors.

Do not place the polypropylene capacitor through an adhesive curing oven to cure resin for surface mount components. Insert through-hole parts after curing the surface mount parts. Contact AnXon to discuss the actual temperature profile in the oven, if through-hole components must pass through the adhesive curing process.

A maximum two soldering cycles is recommended.

Allow time for the capacitor surface temperature to return to normal before the second soldering cycle.

### ■ Wave Soldering Recommendations (Figure 1)



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 AXX2 Series

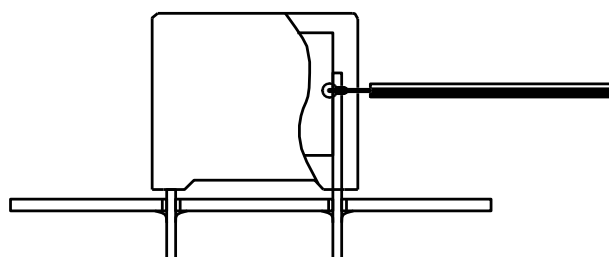
**■ Wave Soldering Recommendations (Continue)**

1. The tables indicates the maximum set-up temperature of the soldering process

Dielectric Film Material	Max. Preheat Temperature		Max. Peak Soldering Temperature	
	Pitch $\leq$ 15 mm	Pitch $>$ 15 mm	Pitch $\leq$ 15 mm	Pitch $>$ 15 mm
Polyester	130°C	130°C	270°C	270°C
Polypropylene	110°C	130°C	260°C	270°C

2. The maximum temperature measured inside the capacitor

Dielectric Film Material	Maximum Temperature Measured Inside the Element
Polyester	160°C
Polypropylene	110°C



Set the temperature so that inside the element the maximum temperature is below the limit.

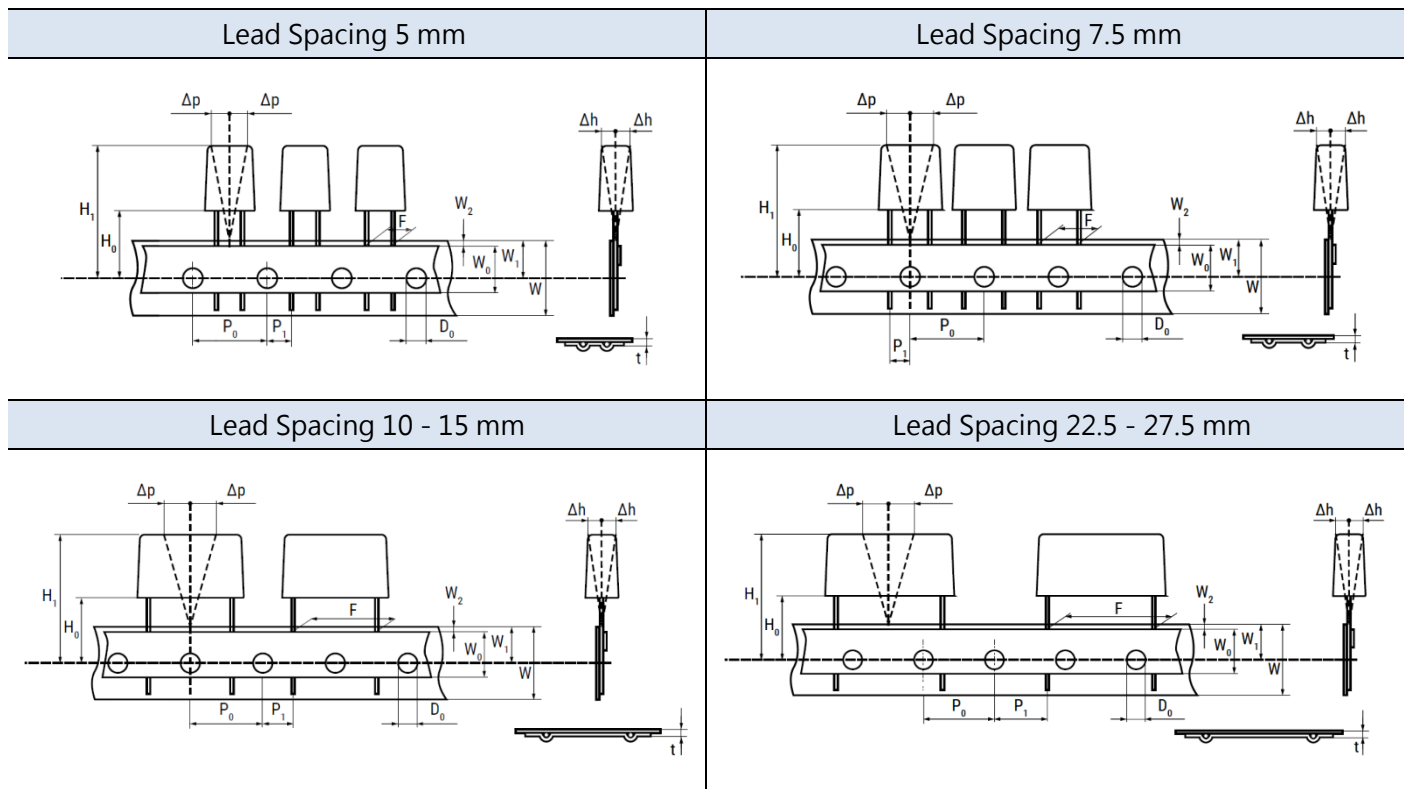
**■ Storage conditions and duration**

Packaged capacitors should be kept in clean, ventilated, dry coffers, not near the heat source, not subject to direct sunlight, is strictly prohibited and chemical reagents, acid and harmful gas storage together.

 $T_{stg} = +5^{\circ}\text{C}$  to  $+35^{\circ}\text{C}$  with relative humidity of maximum 75% without condensation, storage for one year.

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■ Lead Taping (IEC 60286-2) Table II



■ Taping Specification

Dimensions in mm								
Lead Spacing	+0.8/-0.2	F	5	7.5	10	15	22.5	27.5
Carrier Tape Width	+1/-0.5	W	18	18	18	18	18	18
Hold-down Tape Width	Minimum	W <sub>0</sub>	9.5	9.5	9.5	9.5	9.5	9.5
Position of Sprocket Hole	±0.5	W <sub>1</sub>	9	9	9	9	9	9
Distance Between Tapes	Minimum	W <sub>2</sub>	3	3	3	3	3	3
Sprocket Hole Diameter	±0.2	D <sub>0</sub>	4	4	4	4	4	4
Feed Hole Lead Spacing	±0.2 <sup>(1)</sup>	P <sub>0</sub> <sup>(3)</sup>	12.7	12.7	12.7	12.7	12.7	12.7
Distance Lead-Feed Hole	±0.7	P <sub>1</sub>	3.85	3.75	7.7	5.2	7.8	5.3
Deviation Tape - Plane	Minimum	Δp	1.3	1.3	1.3	1.3	1.3	1.3
Lateral Deviation	±2	Δh	2	2	2	2	2	2
Total Thickness	±0.2	T	0.7	0.7	0.7	0.7	0.7	0.7
Sprocket Hole/Cap Body	±0.5	H <sub>0</sub> <sup>(2)</sup>	18.5	18.5	18.5	18.5	18.5	18.5

(1) 1mm / Maximum cumulative feed hole error, 1 mm per 20 parts.

(2) 16.5 mm available on request.

(3) 15.0 mm available on request (F ≥ 10mm).