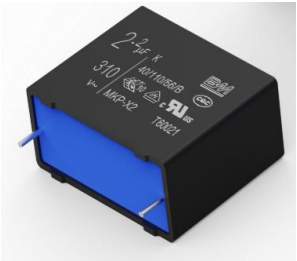
BX2 Series – Class X2 275 / 310 VAC

Metallized polypropylene film Interference Suppression capacitor (X2)
Information datasheet



Overview

The X2 series is constructed of metallized polypropylene film encapsulated with self-extinguishing resin in a box of material meeting the requirement of UL94V-0.
Interference suppression, across-the-line capacitor, EMI filter and spark-killer in class X2 applications. Suitable for use in situations where failure of the capacitor would not lead to danger of electric shock.

Scope of Application

- Widely used in household appliances, consumer electronics, power supplies, etc., used between the L and N lines, for suppressing electromagnetic interference (EMI)
- Recommended for grid-rated voltages ≤250VAC
- Do not use in series with power supplies (e.g., RC-Step down circuits)
- Not suitable for applications requiring high ripple current tolerance
- If used in outdoor environments, continuous power supply, or high-temperature and high-humidity conditions, it is recommended to select THB moisture-proof series products

Capacitor characteristics

- Metallized film, non-inductive structure
- Strong self-healing capability
- High pulse voltage resistance
- Excellent flame retardancy

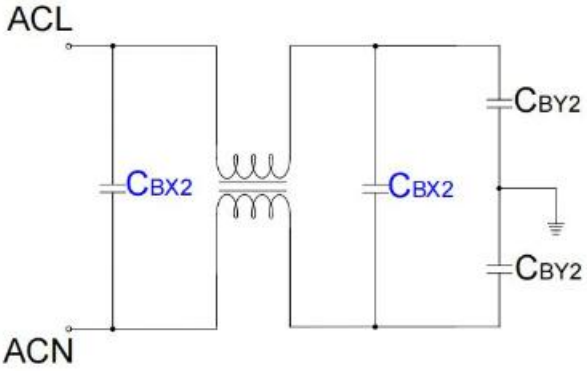
Benefits

- Approvals: ENEC, UL, cUL, CQC
- X2 CLASS (IEC 60384-14)
- Rated voltage: 275 / 310 VAC 50/60 Hz
- Capacitance range: 0.01 – 10 μF
- Lead spacing: 10.0 – 37.5 mm
- Capacitance tolerance: ±20%, ±10%
- Climatic category 40/110/56
- RoHS compliant and lead-free terminations
- Operating temperature range of −40°C to +110°C
- 100% screening factory test at 1,600 VDC
- Self healing properties

1 Specification

Reference Standards	GB/T 6346.14, IEC 60384-14, UL 60384-14, EN 60384-14					
Operating temperature range	-40℃~+110℃					
Rated voltage UR	310VAC					
Max. continuous DC voltage URDC	630VDC 50/60Hz					
Operating Frequency	0.01μF~10μF （Custom sizes available）					
Capacitance Range CR	±10 %（K）, ±20%（M）					
Capacitance Tolerance	Terminal-Terminal T-T ： 4.3UR(dc) (1333VDC /2s)					
Withstand Voltage	Terminal-Case T-C ： 2120VAC /60s					
	CR≤0.33μF, IR≥15000MΩ ；					
Insulation Resistance	CR＞0.33μF, IR×CR≥5000s ；(Test Condition ： 20℃, 100VDC, 60s)					
	0.01μF≤CR≤0.47μF		≤0.0010（1kHz, 20℃）		≤0.0020（10kHz, 20℃）	
Dissipation Factor (tanδ)	0.47μF＜CR≤1.0μF		≤0.0020（1kHz, 20℃）		≤0.0040（10kHz, 20℃）	
	CR＞1μF		≤0.0030（1kHz, 20℃）		/	
	Pitch	P=7.5	P=10	P=15	P=22.5	P=27.5
Voltage Rate dv/dt (v/μs)	dv/dt	500	400	300	180	120

2 Typical Application Circuit（X2）



Note: Do not use in RC-Step down circuits.

3 Safety Approvals

Certification	Certification Body	Certificate No.
CQC	CQC	CQC04001010677
EN 60384-14 10 VDE	VDE	40025702
c UL us	UL	E345487
KC	KC	SU03048-10004B/10003B/10002 B/10001B/13001A/13002A

4 Part Number System

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
B	X	2	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□

Digit 1: The first letter of BM;

Digit 2: A number “X” stands for class X2 ;

Digit 3: A number “2” the representative product is “X2 capacitor” series

Digit 4: Environmental Codes, “G”: Environmental Protection, “N”: Non-environmental

Digit 5-7: Capacitance, consisting of 3 to 4 numbers,
103=10×103 pF= 0.01μF, 104=10×104 pF= 0.1μF,
2055=20.5*105 pF= 2.05μF,2056=20.5*106 pF= 20.5μF ;

Digit 8: Capacitance tolerance ±5%=J ±10%=K ±20%=M Special tolerance=S;

Digit 9-11: Rated voltage, consisting of 3 numbers;

Digit 12: Type of voltage ”D” is the DC voltage, the peak DC voltage. “A” is the effective value of AC voltage;

Digit 13: Lead space = ”P”

Pitch	7.5	10	15	22.5	27.5	30.5	31	Special Pitch
Code	A	B	C	D	E	F	G	S
Pitch	32	32.5	34	37.5	38	42	52.5	
Code	H	J	K	L	M	N	P	

Digit 14: Side Pitch P1

4 Pins	Side Pitch P1 (mm)	10	10.2	12.7	20.3	Special Pitch	Non Side Pitch
	Code	1	A	B	C	S	N
6 Pins	Side Pitch P1 (mm)	5	10			Special Pitch	Non Side Pitch
	Code	D	E			S	N

Digit 15:“—” Internal use;

Digit 16: Packaging

Packaging	
A	AMMO-pack
B	Bulk

Digit 17: Lead Length (depending from packaging)

Packaging	Lead Length					
A	A	H0=18,5 mm	+/-0,5			
	B					
	C					
B	A	4mm	+/-0,5	G	3.5 mm	+0.5/−0
	B	6 mm	+/-0,5	H	3.2 mm	+0.3/−0.2
	C	12 mm	+/-0,5	I	4.0 mm	+0.5/−0
	D	15mm	+/-0,5	J	18 mm	±1
	E	22 mm	+/-2	K	25 mm	+2/−1
	F	2.7 mm	+0.5/−0	L	30 mm	+5/−0

Digit 18: Internal code

5 Size and Part Number Reference

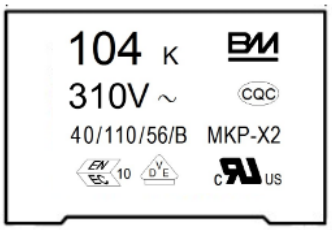
310VAC						
C_R µF	L (mm)	B (mm)	H (mm)	P (mm)	Φd (mm)	Product Part Number
0,01	13	5	11	10	0,6	BX2G103+310ABN-***
0,012	13	4	9	10	0,6	BX2G123+310ABN-***
0,015	13	4	9	10	0,6	BX2G153+310ABN-***
0,018	13	4	9	10	0,6	BX2G183+310ABN-***
0,02	13	5	11	10	0,6	BX2G203+310ABN-***
0,022	13	4	9	10	0,6	BX2G223+310ABN-***
0,027	13	4	9	10	0,6	BX2G273+310ABN-***
0,033	13	4	9	10	0,6	BX2G333+310ABN-***
0,039	13	4	9	10	0,6	BX2G393+310ABN-***
0,047	13	4	9	10	0,6	BX2G473+310ABN-***
0,056	13	5	11	10	0,6	BX2G563+310ABN-***
0,068	13	5	11	10	0,6	BX2G683+310ABN-***
0,082	13	5	11	10	0,6	BX2G683+310ABN-***
0,1	13	6	12	10	0,6	BX2G104+310ABN-***
0,12	13	6	12	10	0,6	BX2G124+310ABN-***
0,15	13	7	13	10	0,6	BX2G154+310ABN-***
0,18	13	8	14	10	0,6	BX2G184+310ABN-***
0,01	18	5	11	15	0,6	BX2G103+310ACN-***
0,012	18	5	11	15	0,6	BX2G123+310ACN-***
0,015	18	5	11	15	0,6	BX2G153+310ACN-***
0,018	18	5	11	15	0,6	BX2G183+310ACN-***
0,022	18	5	11	15	0,6	BX2G223+310ACN-***
0,027	18	5	11	15	0,6	BX2G273+310ACN-***
0,033	18	5	11	15	0,6	BX2G333+310ACN-***
0,039	18	5	11	15	0,6	BX2G393+310ACN-***
0,047	18	5	11	15	0,6	BX2G473+310ACN-***
0,056	18	5	11	15	0,6	BX2G563+310ACN-***
0,068	18	5	11	15	0,6	BX2G683+310ACN-***
0,082	18	5	11	15	0,6	BX2G823+310ACN-***
0,1	18	5	11	15	0,6	BX2G104+310ACN-***
0,12	18	5	11	15	0,6	BX2G124+310ACN-***
0,15	18	6	12	15	0,8	BX2G154+310ACN-***
0,18	18	6	12	15	0,6	BX2G184+310ACN-***
0,2	18	7,5	13,5	15	0,8	BX2G204+310ACN-***
0,22	18	7	13,5	15	0,8	BX2G224+310ACN-***
0,27	18	8,5	14,5	15	0,8	BX2G274+310ACN-***
0,3	18	8,5	14,5	15	0,8	BX2G304+310ACN-***
0,33	18	8,5	14,5	15	0,8	BX2G334+310ACN-***
0,39	18	9,5	15,5	15	0,8	BX2G394+310ACN-***
0,47	18	10	16	15	0,8	BX2G474+310ACN-***
0,56	18	10	18	15	0,8	BX2G564+310ACN-***
0,68	18	11	19	15	0,8	BX2G684+310ACN-***

310VAC						
C_R µF	L (mm)	B (mm)	H (mm)	P (mm)	Φd (mm)	Product Part Number
0,12	26,5	6	15	22,5	0,8	BX2G124+310ADN-***
0,1	26,5	6	15	22,5	0,8	BX2G104+310ADN-***
0,15	26,5	6	15	22,5	0,8	BX2G154+310ADN-***
0,18	26,5	6	15	22,5	0,8	BX2G184+310ADN-***
0,2	26,5	6	15	22,5	0,8	BX2G204+310ADN-***
0,22	26,5	6	15	22,5	0,8	BX2G224+310ADN-***
0,27	26,5	6	15	22,5	0,8	BX2G274+310ADN-***
0,33	26,5	6	15	22,5	0,8	BX2G334+310ADN-***
0,39	26,5	6	15	22,5	0,8	BX2G394+310ADN-***
0,47	26,5	7	16	22,5	0,8	BX2G474+310ADN-***
0,47	31	9	18	22,5	0,8	BX2G474+310AEN-***
0,56	26,5	7	16,5	22,5	0,8	BX2G564+310ADN-***
0,56	31	9	18	22,5	0,8	BX2G564+310AEN-***
0,68	26,5	8,5	17	22,5	0,8	BX2G684+310ADN-***
0,68	31	9	18	22,5	0,8	BX2G684+310AEN-***
0,82	26,5	10	19	22,5	0,8	BX2G824+310ADN-***
0,82	31	9	18	22,5	0,8	BX2G824+310AEN-***
1	26,5	10	19	22,5	0,8	BX2G105+310ADN-***
1,2	26	12	21,5	22,5	0,8	BX2G125+310ADN-***
1,5	26	12	21,5	22,5	0,8	BX2G155+310ADN-***
1,8	26	15	25	22,5	0,8	BX2G185+310ADN-***
2	26,5	13	23	22,5	0,8	BX2G205+310ADN-***
2	26	15	25	22,5	0,8	BX2G225+310ADN-***
0,39	31	9	18	27,5	0,8	BX2G394+310AEN-***
0,68	32	9	18	27,5	0,8	BX2G684+310AEN-***
0,82	32	9	18	27,5	0,8	BX2G824+310AEN-***
1	32	11	20	27,5	0,8	BX2G105+310AEN-***
1	32	11	20	27,5	0,8	BX2G125+310AEN-***
1,5	32	11	23,5	27,5	0,8	BX2G155+310AEN-***
2,2	32	15	24,5	27,5	0,8	BX2G225+310AEN-***
3	32	18	28	27,5	0,8	BX2G335+310AEN-***
3,3	32	16,5	30,5	27,5	0,8	BX2G335+310AEN-***
4	32	18	38	27,5	0,8	BX2G475+310AEN-***
4,7	32	20	34	27,5	0,8	BX2G475+310AEN-***
5,6	32	22	37	27,5	0,8	BX2G565+310AEN-***
6,8	41	20	34	37,5	1	BX2G685+310ALN-***
10	41,5	24	44	37,5	1	BX2G106+310ALN-***

6 Structure and components

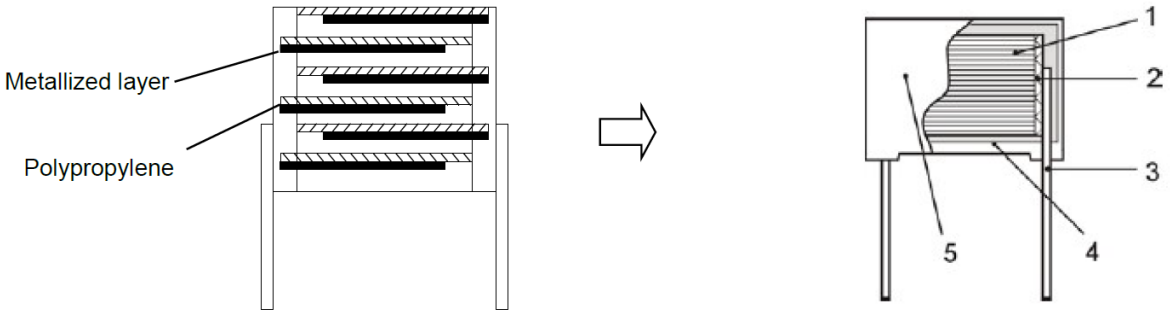
6.1 Marking

For example



NO.	ITEM	EXPLAIN
1	BM	LOGO: BM LOGO
2	104 K	Capacitance and tolerance: 0.1μF, K=±10%
3	310V~	Rated voltage: 310VAC
4	40/110/56	Climatic category: 40/110/56
5	B	Passive Flammability Category: Volume(L×B×H)≤1750 for C Volume(L×B×H)>1750 for B
6	MKP-X2	Product type: MKP-X2
7		Safety approval: VDE/ENEC/CQC/UL/CUL

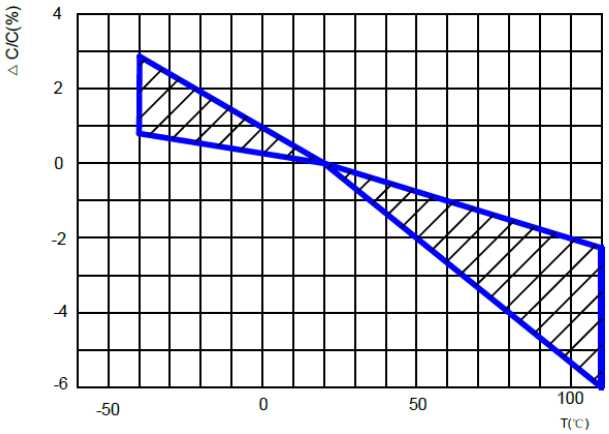
6.2 Structure



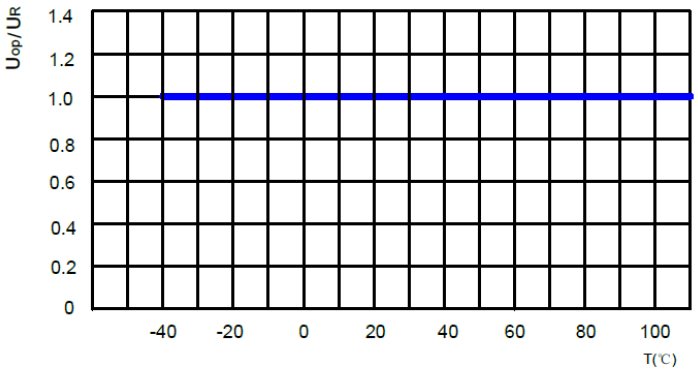
6.3 Components

Item	Component	Material
1	Element	Metallized PP film
2	Metal spray layer	Zn and Zn-Tin alloy wire
3	Leads	Tinned wire
4	Potting compound	Flame retardant epoxy resin(UL94V-0)
5	Enclosure	Flame retardant PBT plastic(UL94V-0)
6	Marking	Laser

7 Characteristic curve (Ambient temperature)



Relationship between capacitance and ambient temperature at 1kHz (typical)



Relationship between voltage and ambient temperature (typical)
Note: The operating frequency must not exceed 100Hz.

8 Compliance with environment requirement

- Compliance with the requirement of RoHS
- Compliance with the requirement of REACH

Halogen-free products can be provide

9 Storage Conditions

Long-term storage must comply with the following conditions:

- Products should be kept away from places containing moisture, dust, corrosive gases (hydrogen chloride, hydrogen sulfide, sulfur dioxide, ammonia, etc.), acid, alkali, salt, etc, to avoid poor solderability of lead pins (causing false welding, no tin,etc.).
- Products should be kept away from high-temperature and high-humidity places, and must be kept in the following environments (without unpacking the original packaging) :
  - Temperature: -40℃ to +40℃.
  - Humidity: the relative humidity is less than 80%RH, and there is no condensation on the capacitor surface.
  - Storage time: no more than 12 months from the date of product packaging.

10 Installation Guidelines

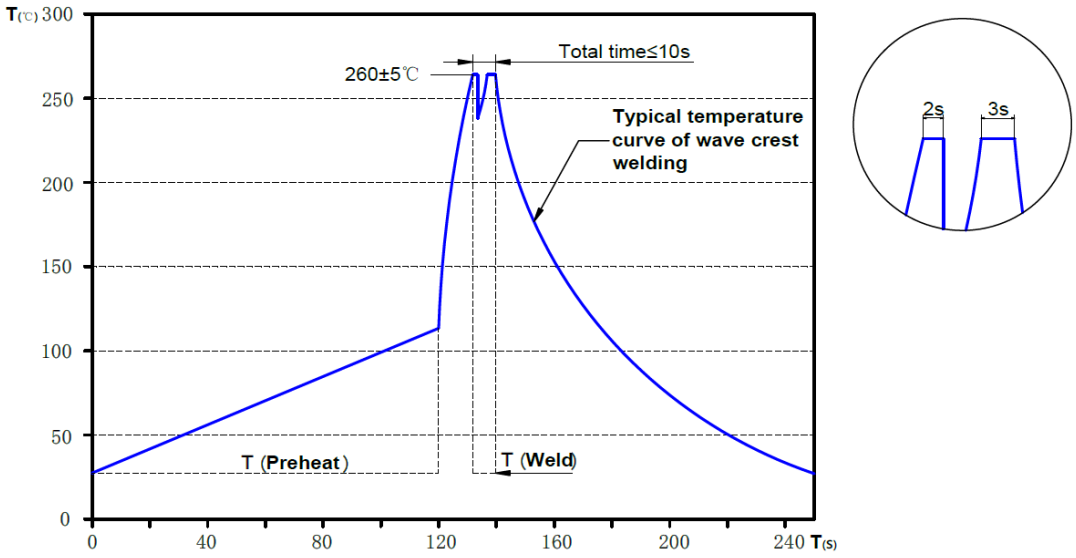
In order to achieve better soldering results and avoid damage to the capacitor, we recommend referring to the following soldering conditions.

10.1 Manual Soldering

The soldering iron tip temperature should be set at 350°C ±5°C, with the soldering duration not to exceed more than 3 seconds.

10.2 Wave Soldering

Multiple factors during wave soldering may affect the thermal exposure of film capacitors, such as preheating temperature,preheating duration,solder bath temperature,total solder bath contact time,conveyor speed, etc. The recommended wave soldering profile is as follows:



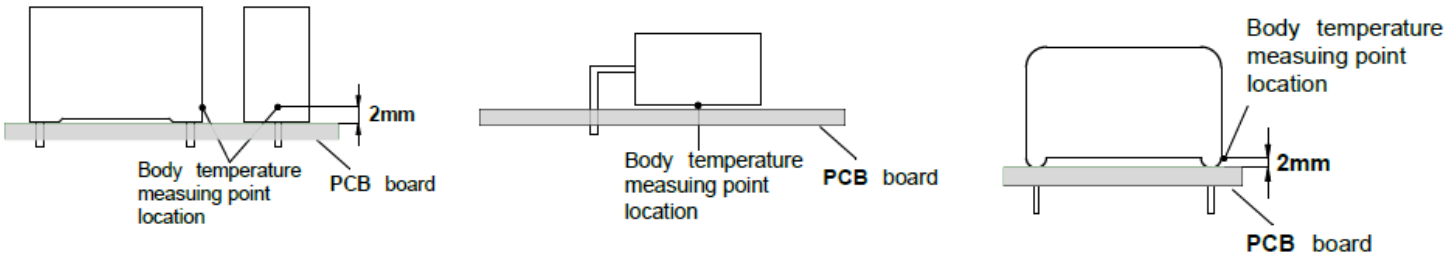
Whether it is manual soldering with a soldering iron or wave soldering, the body temperature of the capacitor must meet the following conditions:

Item	Capacitor/Pitch	Temperature	Note
Capacitor body temperature	Plastic	T≤110℃	Pitch≤10mm
	Plastic	T≤120℃	Pitch > 10mm
Wave soldering temperature	Plastic	T≤260℃	Pitch≤15mm
	Plastic	T≤265℃	Pitch > 15mm

Notes:

1) Total solder bath contact time: ≤5 seconds.
2) Secondary manual soldering: After the first soldering, the capacitor must cool to room temperature before performing a second soldering operation.
3) Capacitor removal from PCB pads: Exercise extreme caution to avoid thermal damage from excessive soldering iron heat. Capacitors removed from double-sided copper-clad PCB pads should not be reused.
4) Plastic-case pin capacitors (P≤10mm): Prioritize designs with K-type raised leads to enhance soldering reliability.

10.3 Schematic diagram of capacitor body temperature measurement points location:



Leaded type film capacitors are not suitable for reflow soldering processes.

When SMD components are used together with film capacitors, the film capacitors must not undergo reflow soldering. They should be assembled via wave soldering or manual soldering iron after the SMD reflow process.

Distributor for Italy: