

CERAMIC CHIP SAFETY CAPACITORS CLASS X and Y



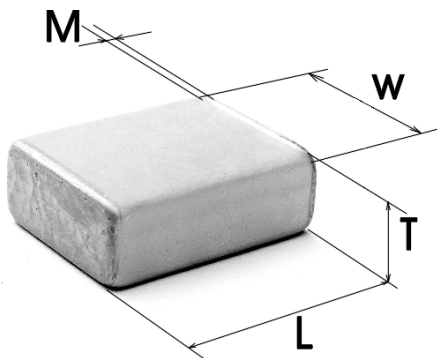
APPLICATION




- Switching power supply
- Radio and TV receiver
- Telephone, facsimile, modem
- Other electrical appliances where over voltage surge can occur



FEATURES

- Ceramic capacitor designed for radio interference suppression for AC Line
- Capacitance range: 470pF to 22nF
- Rated voltage 250 Vac
- Sizes 2220, 4032 and 5040
- Sn plated termination electrodes allow easy soldering
- X7R ($\pm 15\%$) temperature characteristics
- Operating temperature range - 55°C to +125°C
- UL 1414 approved: Across-the-Line and Line-by-Pass
- UL file : E210954
- Compliant to Standard IEC 314-14 2nd Ed: Sub - Classes X1, X2, X3, Y1, Y2, Y3



Chip Size			
	2220	4032	5040
L (mm)	5.7 ± 0.5	10.0 ± 0.6	12.7 ± 1.3
W (mm)	5.0 ± 0.5	8.0 ± 0.5	10.2 ± 1.0
Tmax(mm)	4.0	4.0	6.0
M (mm)	0.2 ± 0.15	0.2 ± 0.3	0.2 ± 0.3

Technical data

PARAMETER	Value	PARAMETER	Value
Capacitance	See Lists	Temperature Range	-55°C to +125°C
Measuring Frequency (C, tgδ)	1 kHz	Temp. Characteristics	± 15%
Capacitance Tolerance	10%, 20%	Climatic Category	55 / 125 / 56
Dissipation Factor (tgδ)	250 10 ⁻⁴	Reference Temperature	23°C
Measuring Voltage (C, tgδ)	0,3 Vrms	Ageing	<2.5% /decade hour
Rated Voltage	250 Vac	Flammability	UL 94V-0
Voltage Tests	See Tables	Termination	Ni-Sn or AgPd
Insulating Resistance (IR)	6 10 ⁹ Ω	Packaging	Bulk, Reeled
Measuring Voltage (for IR)	500 Vdc	Standards	IEC384-14 2 nd Ed UL1414

Voltage Tests for X and Y Classes Capacitors

Class / Test	Voltage Proof		Charge - Discharge	Impulse Voltage	Life test (Endurance)
Conditions	Production 2 s	Sample 1 min.	10000 Cycles 1 per s	24 Impulses 1 per 10 s	1000 hours T=125°C
X1				4.0 kV	at 312 Vac
X2	1075 Vdc	1075 Vdc	354 Vac	2.5 kV	Once every hour to 1000Vac for 0.1 s
X3				None	
Y1	4000 Vac	4000 Vac	354 Vac	8.0 kV	at 425 Vac
Y2	1500 Vac	1500 Vac	354 Vac	5.0 kV	Once every hour to 1000Vac for 0.1 s
Y3				None	

Voltage Test for Line-by-Pass and Across-the-Line Capacitors

Version / Test	Dielectric Withstand Voltage		Discharge Test	Life Test
Conditions	Production 1 s	Sample 1 min	Circuit in UL 1414	1008 hours T=85°C, RH=50%
Line-by-Pass	1500 Vac	1500 Vac	Figure 18.1 U=10 kVdc 50 discharges, interval 5 sec	U=440 Vac once every hour
Across-the-Line	1500 Vac	1500 Vac	Figure 13.2 U= (5+Cr)kV + 240Vac Cr = C Rated in nF 4 discharges, interval 5 sec	U is doubled for 0.1 s



Rated Capacitance of Class X Capacitors

C rated (nF)	X1		X2		X3	
	Size	T _{max} (mm)	Size	T _{max} (mm)	Size	T _{max} (mm)
1.0	2220	2.0	2220	2.0	2220	2.0
1.5	2220	2.0	2220	2.0	2220	2.0
2.2	2220	2.0	2220	2.0	2220	2.0
3.3	2220	3.0	2220	3.0	2220	2.0
4.7	2220	4.0	2220	3.0	2220	3.0
5.6	2220	4.0	2220	3.0	2220	3.0
6.8	2220	4.0	2220	4.0	2220	3.0
10	4032	3.0	2220	4.0	2220	4.0
15	4032	3.0	4032	4.0	2220	4.0
22	5040	4.0	4032	3.0	4032	4.0
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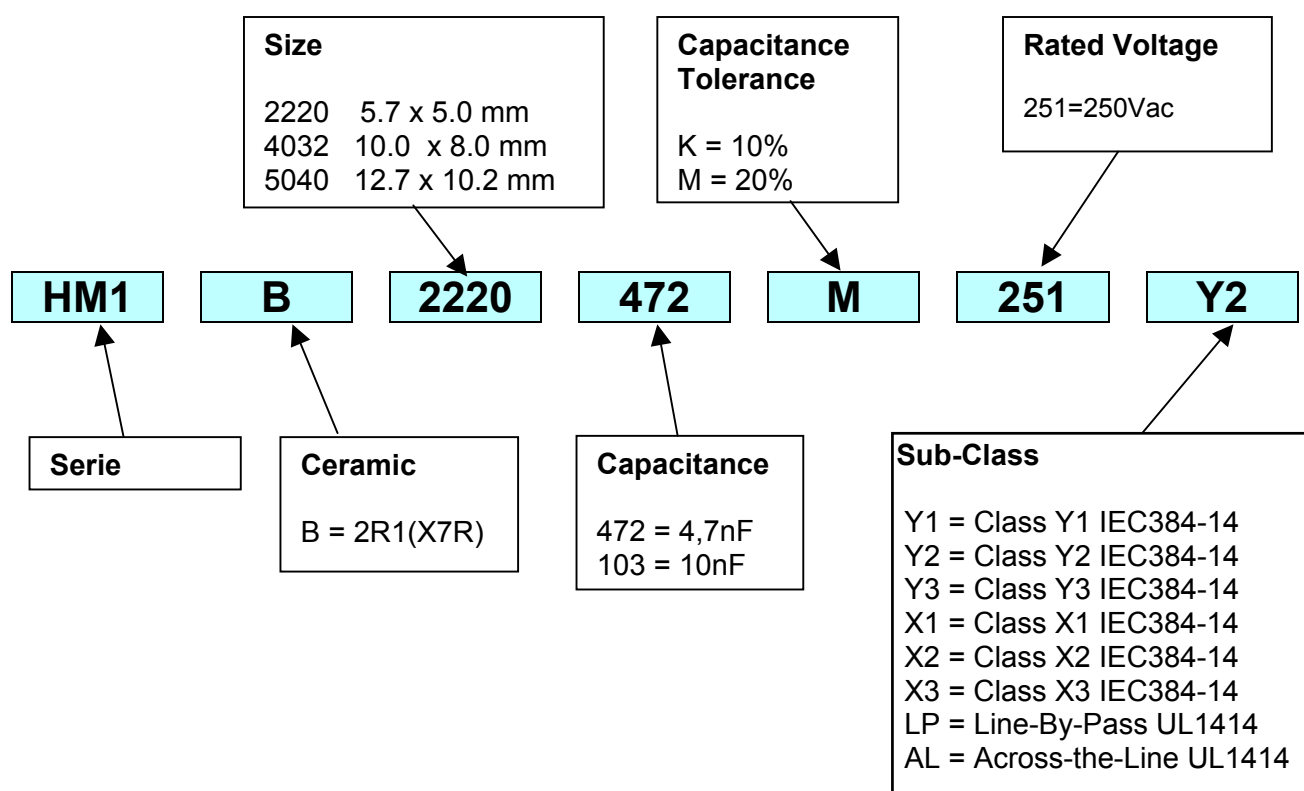
Rated Capacitance of Class Y Capacitors

C rated (nF)	Y1		Y2		Y3	
	Size	T _{max} (mm)	Size	T _{max} (mm)	Size	T _{max} (mm)
0.47	5040	3.0	2220	2.0	2220	2.0
0.68	5040	3.0	2220	2.0	2220	2.0
1.0	5040	3.0	2220	2.0	2220	2.0
1.5	5040	3.0	2220	2.0	2220	2.0
2.2	5040	4.0	2220	3.0	2220	2.0
3.3	5040	5.0	2220	3.0	2220	2.0
4.7	5040	6.0	2220	4.0	2220	3.0
5.6			4032	3.0	2220	4.0
6.8			4032	3.0	4032	3.0
10			4032	4.0	4032	3.0
15			5040	4.0	4032	4.0
22			5040	4.0	5040	4.0
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Rated Capacitance of Line-by-Pass and Across-the Line Capacitors

C rated (nF)	Line-by Pass		Across-the-Line	
	Size	T _{max} (mm)	Size	T _{max} (mm)
0.47	2220	2.0	5040	3.0
0.68	2220	2.0	5040	3.0
1.0	2220	2.0	5040	3.0
1.5	2220	2.0	5040	3.0
2.2	2220	3.0	5040	4.0
3.3	2220	3.0	5040	5.0
4.7	2220	3.0	5040	6.0
5.6	2220	3.0		
6.8	4032	3.0		
10	4032	3.0		
12	4032	3.0		
15	4032	4.0		
22	5040	5.0		
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ORDERING CODE



Marking : Trade Mark, Version, C-Code, Class

Marking Example:

K HM1
472LP

Packaging: bulk or reeled