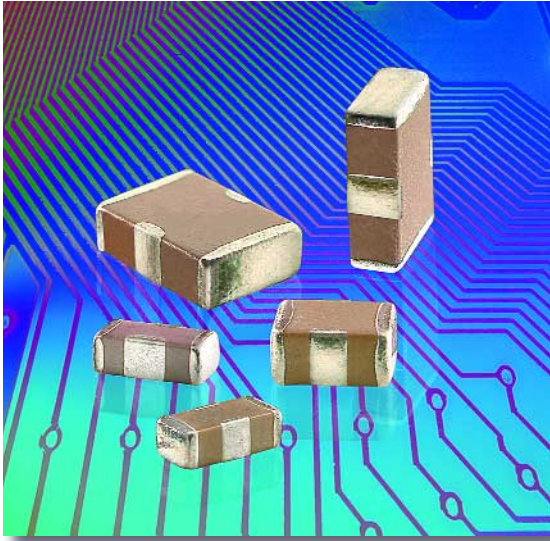


X2Y® EMI FILTER CAPACITORS



X2Y® filter capacitors employ a unique, patented design in which common shielding electrodes form a Faraday Cage around traditional capacitor electrodes. This creates two matched or balanced capacitors that are immune to temperature, voltage and aging performance differences.

These components offer superior filter and decoupling performance and virtually eliminate parasitics. One X2Y® filter capacitor can replace multiple capacitors and inductors saving board space and reducing assembly costs.

X2Y® filters provide optimal filtering and noise suppression solutions for DC motors, broadband filtering, filtered connectors, fiber optic and cellular applications.

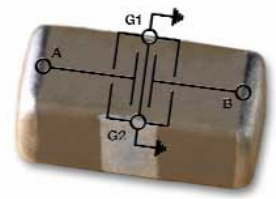
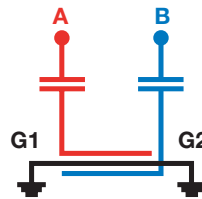
ADVANTAGES

- Superior noise suppression
- Differential and common mode attenuation
- Replace multiple components with one device
- Matched capacitance line to ground, both lines
- Low inductance due to cancellation effect

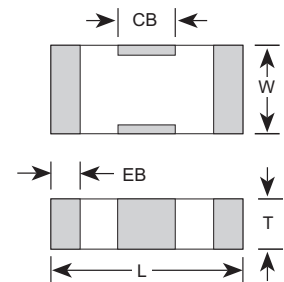
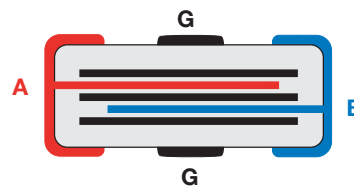
APPLICATIONS

- DC Motor Suppression
- Filtered Connectors
- Fiber Optic Components
- Cellular Handsets
- Broadband Filtering

Equivalent Circuits



Cross-sectional View



X2Y® technology patents and registered trademark under license from X2Y ATTENUATORS, LLC

X2Y® EMI FILTER CAPACITORS

AVAILABLE CAPACITANCE & VOLTAGE RANGES

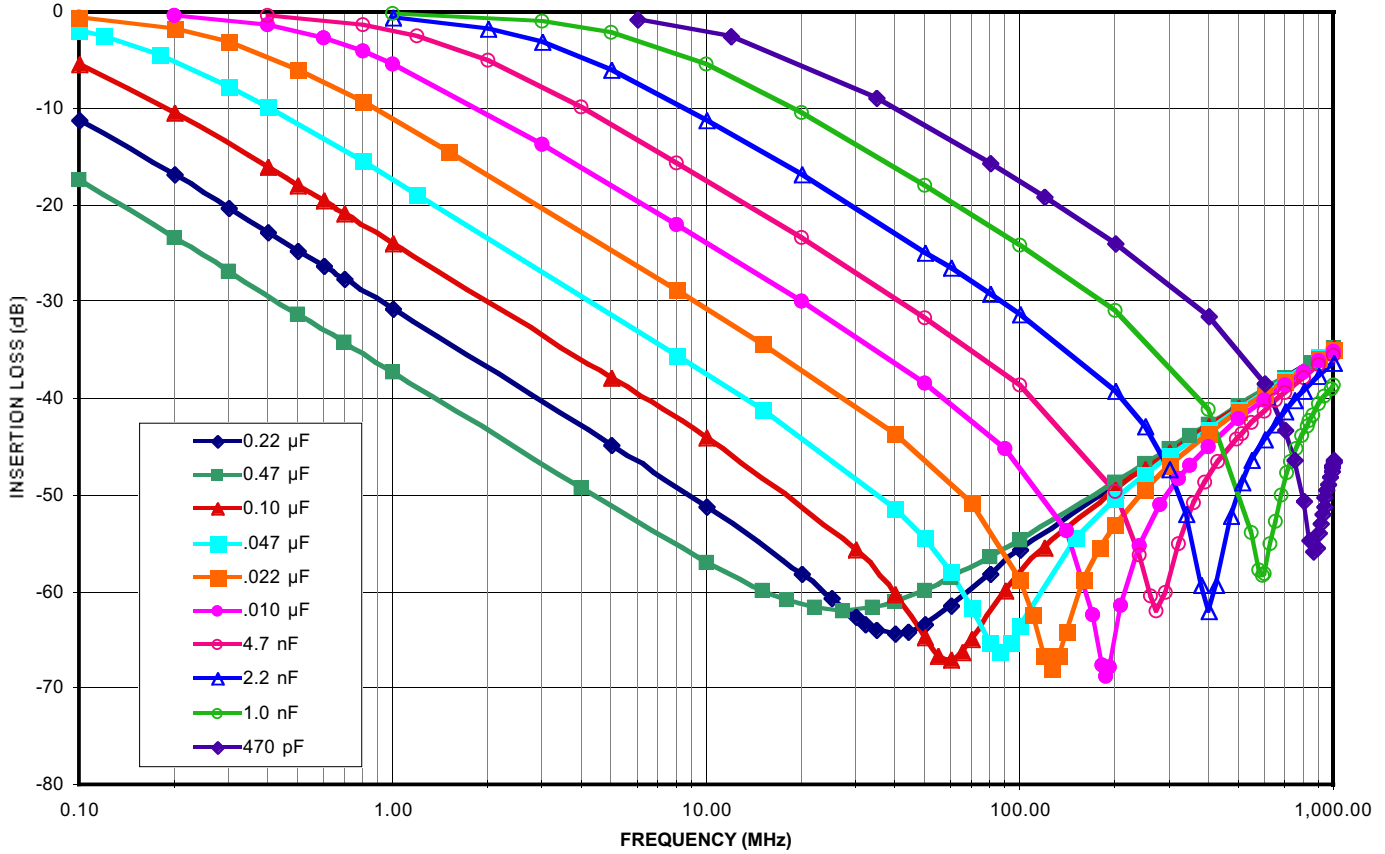
JOHANSON PART NUMBER	CHIP SIZE	AVAILABLE VOLTAGE (VDC)	DIELECTRIC TYPE	CAPACITANCE	
				C1	C2
500X14N220MV4	0603	50 & 100	NPO	22pF	11pF
500X14N470MV4	0603	50 & 100	NPO	47pF	23.5pF
500X14N101MV4	0603	50 & 100	NPO	100pF	50pF
500X14N221KV4	0603	50	NPO	220pF	110pF
500X14W471MV4	0603	50 & 100	X7R	470pF	235pF
500X14W102MV4	0603	50 & 100	X7R	1nF	.5nF
500X14W222MV4	0603	50 & 100	X7R	2.2nF	1.1nF
500X14W472MV4	0603	50 & 100	X7R	4.7nF	2.35nF
500X14W103MV4	0603	50	X7R	10nF	5nF
500X15N220KV4	0805	50 & 100	NPO	22pF	11pF
500X15N470KV4	0805	50 & 100	NPO	47pF	23.5pF
500X15N101MV4	0805	50 & 100	NPO	100pF	50pF
500X15N221MV4	0805	50 & 100	NPO	220pF	110pF
500X15N471MV4	0805	50	NPO	470pF	235pF
500X15W102MV4	0805	50 & 100	X7R	1nF	.5nF
500X15W222MV4	0805	50 & 100	X7R	2.2nF	1.1nF
500X15W472MV4	0805	50 & 100	X7R	4.7nF	2.35nF
500X15W103MV4	0805	50 & 100	X7R	10nF	5nF
500X15W223MV4	0805	50 & 100	X7R	22nF	11nF
500X15W473MV4	0805	50	X7R	47nF	23.5nF
500X18N102MV4	1206	50	NPO	1nF	.5nF
500X18W222MV4	1206	50 & 100	X7R	2.2nF	1.1nF
500X18W472MV4	1206	50 & 100	X7R	4.7nF	2.35nF
500X18W103MV4	1206	50 & 100	X7R	10nF	5nF
500X18W223MV4	1206	50 & 100	X7R	22nF	11nF
500X18W473MV4	1206	50 & 100	X7R	47nF	23.5nF
500X18W683MV4	1206	50 & 100	X7R	68nF	34nF
500X18W104MV4	1206	50	X7R	.10uF	.05uF
500X44W224MV4	1410	50 & 100	X7R	.22uF	.11uF
500X44W404MV4	1410	50 & 100	X7R	.40uF	.20uF
500X44W474MV4	1410	50	X7R	.47uF	.235uF
500X43W224MV4	1812	50 & 100	X7R	.22uF	.11uF
500X43W474MV4	1812	50 & 100	X7R	.47uF	.235uF
500X43W684MV4	1812	50	X7R	.68uF	.34uF

NOTES: C1 = A or B to ground , C2 = A to B. Voltage rating is for A or B to ground.
 X2Y filter capacitor meet JDI standard NPO & X7R dielectric specifications listed on page 28.



X2Y® EMI FILTER CAPACITORS

X2Y INSERTION LOSS vs FREQUENCY



HOW TO ORDER X2Y® EMI FILTER CAPACITORS

500	X18	W	473	M	V	4	E															
VOLTAGE (C1) 500 = 50 V 101 = 100 V	CASE SIZE X14 = 0603 X15 = 0805 X18 = 1206 X43 = 1812 X44 = 1410	DIELECTRIC N = NPO W = X7R	CAPACITANCE 1st two digits are significant; third digit denotes number of zeros. 474 = 0.47 µF 105 = 1.00 µF	TOLERANCE M = ± 20%	TERMINATION V = Ni barrier w/ 100% Sn Plating	MARKING 4 = Unmarked	TAPE MODIFIER															
							<table border="1"> <thead> <tr> <th>Code</th> <th>Tape</th> <th>Reel</th> </tr> </thead> <tbody> <tr> <td>E</td> <td>Embossed</td> <td>7"</td> </tr> <tr> <td>U</td> <td>Embossed</td> <td>13"</td> </tr> <tr> <td>T</td> <td>Paper</td> <td>7"</td> </tr> <tr> <td>R</td> <td>Paper</td> <td>13"</td> </tr> </tbody> </table> <p>Tape specs. per EIA RS481</p>	Code	Tape	Reel	E	Embossed	7"	U	Embossed	13"	T	Paper	7"	R	Paper	13"
Code	Tape	Reel																				
E	Embossed	7"																				
U	Embossed	13"																				
T	Paper	7"																				
R	Paper	13"																				

P/N written: 500X18W473MV4E

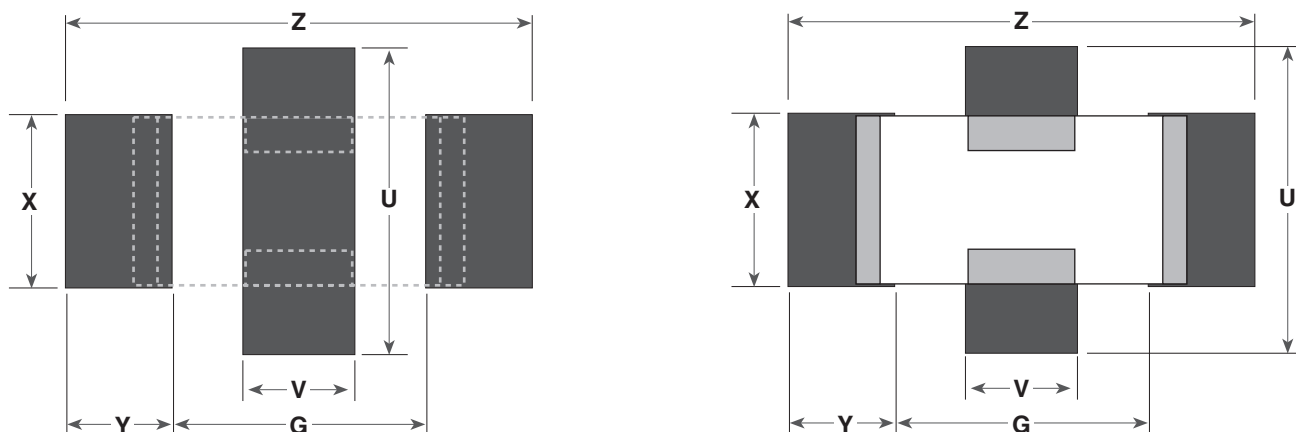


X2Y® EMI FILTER CAPACITORS

MECHANICAL CHARACTERISTICS & MOUNTING RECOMMENDATIONS

	X14 / 0603		X15 / 0805		X18 / 1206		X43 / 1812		X44 / 1410	
	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters
L	.064 ± .005	1.63 ± 0.13	.080 ± .008	2.03 ± 0.20	0.124 ± .010	3.15 ± 0.25	0.174 ± .010	4.42 ± 0.25	0.140 ± .010	3.56 ± 0.25
W	.035 ± .004	0.89 ± 0.10	.050 ± .008	1.27 ± 0.20	.063 ± .010	1.60 ± 0.25	0.125 ± .010	3.18 ± 0.25	.098 ± .010	2.49 ± 0.25
T	.026 max	0.66 max	.040 max	1.02 max	.050 max	1.27 max	.090 max	2.29 max	.070 max	1.78 max
EB	.009 ± .003	0.23 ± .08	.009 ± .003	0.23 ± .08	.009 ± .004	0.23 ± 0.10	.009 ± .004	0.23 ± 0.10	.009 ± .004	0.23 ± 0.10
CB	.018 ± .003	0.46 ± .08	.020 ± .004	0.51 ± 0.10	.040 ± .005	1.02 ± 0.13	.045 ± .005	1.14 ± 0.13	.045 ± .005	1.14 ± 0.13

For optimized X2Y device performance it is essential that each ground terminal be connected to system ground with the lowest resistance, shortest path possible. Recommended pad dimensions are typical. Individual manufacturing processes and application design requirements may necessitate modification of these dimensions.



SOLDER PAD RECOMMENDATIONS

	0603		0805		1206		1410		1812	
	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
X	0.037	0.94	0.052	1.32	0.065	1.65	0.100	2.54	0.127	3.23
Y	0.029	0.74	0.035	0.89	0.040	1.02	0.040	1.02	0.040	1.00
Z	0.100	2.54	0.125	3.18	0.175	4.45	0.190	4.60	0.225	5.72
G	0.042	1.07	0.055	1.40	0.095	2.41	0.110	2.79	0.146	3.71
U	0.080	2.03	0.100	2.54	0.115	2.92	0.150	3.81	0.175	4.45
V	0.020	0.51	0.022	0.56	0.042	1.07	0.047	1.19	0.047	1.19

