

# X2Y® EMI FILTER CAPACITORS

Rev: 02/22/2002



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.

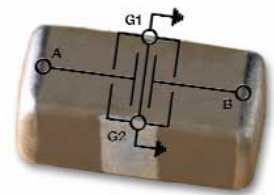
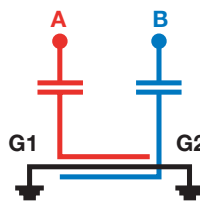
## ADVANTAGES

- 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

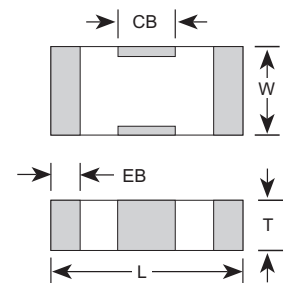
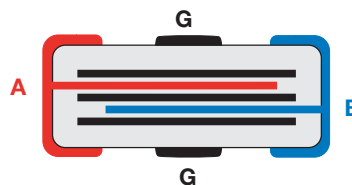
## APPLICATIONS

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

## Equivalent Circuits



## Cross-sectional View



## HOW TO ORDER X2Y® EMI FILTER CAPACITORS

<b>500</b>	<b>X18</b>	<b>W</b>	<b>473</b>	<b>M</b>	<b>V</b>	<b>4</b>	<b>E</b>									
<b>VOLTAGE (C1)</b> 250 = 25 V 500 = 50 V	<b>CASE SIZE</b> X15 = 0603 X15 = 0805 X18 = 1206 X41 = 1210 X43 = 1812 X44 = 1410	<b>DIELECTRIC</b> N = NPO W = X7R	<b>CAPACITANCE</b> 1st two digits are significant; third digit denotes number of zeros. 474 = 0.47 $\mu$ F 105 = 1.00 $\mu$ F	<b>TOLERANCE</b> M = $\pm$ 20%	<b>TERMINATION</b> V = Nickel Barrier	<b>MARKING</b> 4 = Unmarked	<b>TAPE MODIFIER</b>									
							<table border="1"> <thead> <tr> <th>Code</th> <th>Type</th> <th>Reel</th> </tr> </thead> <tbody> <tr> <td>E</td> <td>Plastic</td> <td>7"</td> </tr> <tr> <td>U</td> <td>Plastic</td> <td>13"</td> </tr> </tbody> </table> <p>Tape specifications conform to EIA RS481</p>	Code	Type	Reel	E	Plastic	7"	U	Plastic	13"
Code	Type	Reel														
E	Plastic	7"														
U	Plastic	13"														

P/N written: 500X18W473MV4E

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



## AVAILABLE CAPACITANCE & VOLTAGE RANGES

Case Size JDI / EIA		Dimensions		Dielectric	DC Rated Voltage	Available Capacitance	
		Inches	mm			Min.	Max.
<b>X14 0603</b>	L	0.064 ± 0.005	1.63 ± 0.13	<b>NPO</b>	50V	220	121
	W	0.035 ± 0.004	0.89 ± 0.10		100V	220	101
	T	0.026 max	0.66 max	<b>X7R</b>	50V	471	103
	EB	0.009 ± 0.003	0.23 ± 0.08		100V	471	562
	CB	0.018 ± 0.003	0.46 ± 0.08				
<b>X15 0805</b>	L	0.080 ± 0.008	2.03 ± 0.20	<b>NPO</b>	50V	220	471
	W	0.050 ± 0.008	1.27 ± 0.20		100V	220	391
	T	0.040 max	1.02 max	<b>X7R</b>	50V	102	473
	EB	0.009 ± 0.003	0.23 ± 0.08		100V	102	223
	CB	0.020 ± 0.004	0.51 ± 0.10				
<b>X18 1206</b>	L	0.124 ± 0.010	3.15 ± 0.25	<b>NPO</b>	50V	102	182
	W	0.063 ± 0.010	1.60 ± 0.25		100V	102	152
	T	0.050 max	1.27 max	<b>X7R</b>	50V	102	104
	EB	0.009 ± 0.004	0.23 ± 0.10		100V	102	683
	CB	0.040 ± 0.005	1.02 ± 0.13				
<b>X41 1210</b>	L	0.125 ± 0.010	3.18 ± 0.25	<b>NPO</b>	50V	222	562
	W	0.098 ± 0.010	2.49 ± 0.25		100V	222	472
	T	0.070 max	1.78 max	<b>X7R</b>	50V	222	334
	EB	0.009 ± 0.004	0.23 ± 0.10		100V	222	184
	CB	0.045 ± 0.005	1.14 ± 0.13				
<b>X43 1812</b>	L	0.174 ± 0.010	4.42 ± 0.25	<b>NPO</b>	50V	472	153
	W	0.125 ± 0.010	3.18 ± 0.25		100V	472	123
	T	0.090 max	2.29 max	<b>X7R</b>	50V	103	684
	EB	0.009 ± 0.004	0.23 ± 0.10		100V	103	564
	CB	0.045 ± 0.005	1.14 ± 0.13				
<b>X44 1410</b>	L	0.140 ± 0.010	3.56 ± 0.25	<b>NPO</b>	50V	332	682
	W	0.098 ± 0.010	2.49 ± 0.25		100V	332	562
	T	0.070 max	1.78 max	<b>X7R</b>	50V	562	474
	EB	0.009 ± 0.004	0.23 ± 0.10		100V	562	404
	CB	0.045 ± 0.005	1.14 ± 0.13				

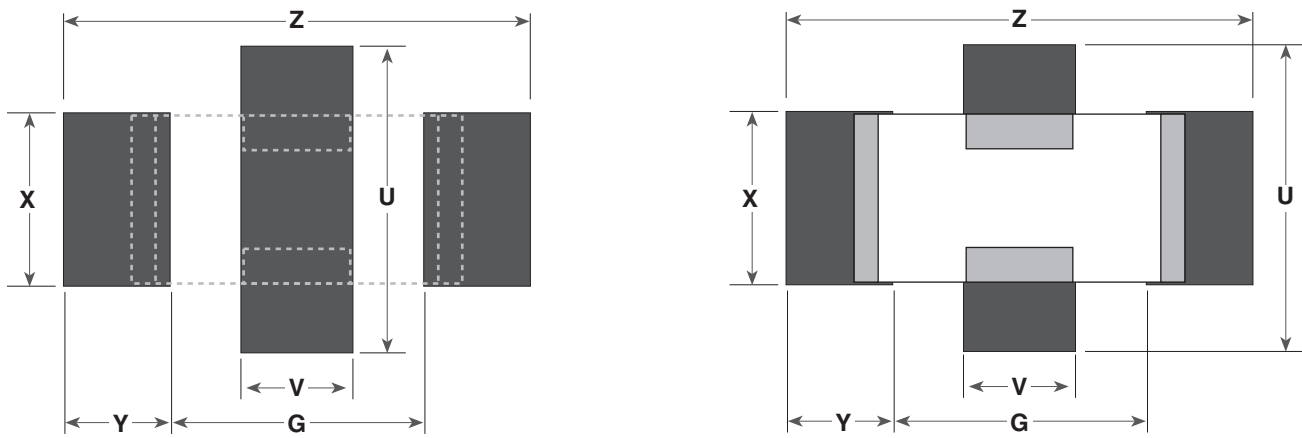
X2Y filter capacitor meet JDI standard NPO & X7R dielectric specifications listed in page 20 of our catalog.

Available capacitance listed by EIA capacitance code, see How to Order section for definition.



## MECHANICAL CHARACTERISTICS & MOUNTING RECOMMENDATIONS

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		1210		1410		1812	
	inches	mm	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	0.100	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	1.02	0.040	1.00
Z	0.100	2.54	0.125	3.18	0.175	4.45	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	0.095	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	0.150	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	0.047	1.19

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