

# X2Y

The Syfer X2Y Integrated Passive Component is a 3 terminal EMI chip device.

When used in balanced line applications, the revolutionary design provides simultaneous line-to-line and line-to-ground filtering, using a single ceramic chip. In this way, differential and common mode filtering are provided in one device.

For unbalanced applications, it provides ultra low ESL (equivalent series inductance). Capable of replacing 2 or more conventional devices, it is ideal for balanced and unbalanced lines, twisted pairs and dc motors, in automotive, audio, sensor and other applications.

Available in sizes from 0603 to 2220, these filters can prove invaluable in meeting stringent EMC demands.

Manufactured in the UK by Syfer Technology Limited under licence from X2Y attenuators LLC.



**Dielectric**

X7R or COG/NPO

**Electrical configuration**

Multiple capacitance

**Capacitance measurement**

At 1000hr point

**Typical capacitance matching**

Better than 5%

**Temperature rating**

-55°C to 125°C

**Insulation resistance**

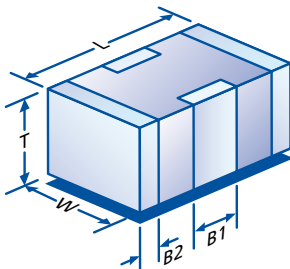
100Gohms or 1000s (whichever is the less)

**Dielectric withstand voltage**

≤200V 2.5 times rated Volts for 5 secs  
500V 1.5 times rated Volts for 5 secs  
Charging current limited to 50mA Max.

Type		E03					
Chip size		0603	0805	1206	1410	1812	2220
Rated voltage	Dielectric	Minimum and maximum capacitance values					
	COG/NPO	150pF	-	-	-	-	-
16Vdc	X7R	15nF	-	-	-	-	-
	COG/NPO	120pF	560pF - 820pF	1.8nF - 3.3nF	6.8nF - 8.2nF	12nF - 15nF	22nF - 33nF
25Vdc	X7R	12nF	56nF - 68nF	-	470nF	820nF	1.2µF
	COG/NPO	10pF - 100pF	390pF - 470pF	1.2nF - 1.5nF	4.7nF - 5.6nF	8.2nF - 10nF	18nF
50Vdc	X7R	150pF - 10nF	18nF - 47nF	56nF - 220nF	180nF - 400nF	390nF - 680nF	560nF - 1.0µF
	COG/NPO	-	10pF - 330pF	22pF - 1.0nF	100pF - 3.9nF	820pF - 6.8nF	1.0nF - 15nF
100Vdc	X7R	-	470pF - 15nF	1.5nF - 47nF	4.7nF - 150nF	8.2nF - 330nF	10nF - 470nF
	COG/NPO	-	-	22pF - 1.0nF	100pF - 3.3nF	820pF - 5.6nF	1.0nF - 15nF
200Vdc	X7R	-	-	820pF - 33nF	1.2nF - 120nF	2.7nF - 180nF	4.7nF - 470nF
	COG/NPO	-	-	-	-	820pF - 3.9nF	1.0nF - 10nF
500Vdc	X7R	-	-	-	-	2.7nF - 100nF	4.7nF - 180nF

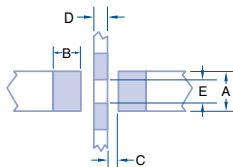
Notes: 1) For some lower capacitance parts, higher voltage rated parts may be supplied.



	0603	0805	1206	1410	1812	2220
L	1.6±0.2 (0.063±0.008)	2.0±0.3 (0.08±0.012)	3.2±0.3 (0.126±0.012)	3.6±0.3 (0.14±0.012)	4.5±0.35 (0.18±0.014)	5.7±0.4 (0.22±0.016)
W	0.8±0.2 (0.03±0.008)	1.25±0.2 (0.05±0.008)	1.60±0.2 (0.063±0.008)	2.5±0.3 (0.1±0.012)	3.2±0.3 (0.126±0.012)	5.0±0.4 (0.2±0.016)
T	0.5±0.15 (0.02±0.006)	1.0±0.15 (0.04±0.006)	1.1±0.2 (0.043±0.008)	2.0 max. (0.08 max.)	2.1 max. (0.08 max.)	2.5 max. (0.1 max.)
B1	0.4±0.15 (0.016±0.006)	0.5±0.25 (0.02±0.01)	0.95±0.3 (0.037±0.012)	1.20±0.3 (0.047±0.012)	1.4±0.35 (0.06±0.014)	2.25±0.4 (0.09±0.016)
B2	0.25±0.15 (0.010±0.006)	0.3±0.15 (0.012±0.006)	0.5±0.25 (0.02±0.01)	0.5±0.25 (0.02±0.01)	0.75±0.25 (0.03±0.01)	0.75±0.25 (0.03±0.01)

Notes: 1) All dimensions mm (inches).  
2) Pad widths less than chip width gives improved mechanical performance.  
3) The solder stencil should place 4 discrete solder pads. The un-printed distance between ground pads is shown as dim E.  
4) Insulating the earth track underneath the filters is acceptable and can help avoid displacement of filter during soldering but can result in residue entrapment under the chip.

**Recommended solder lands**

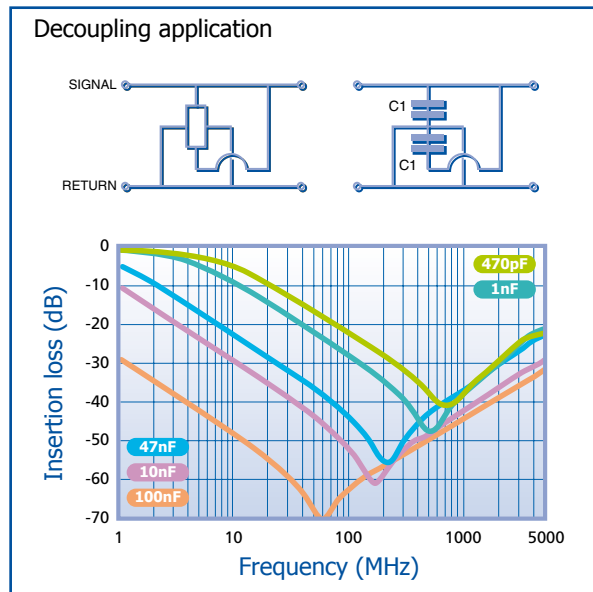
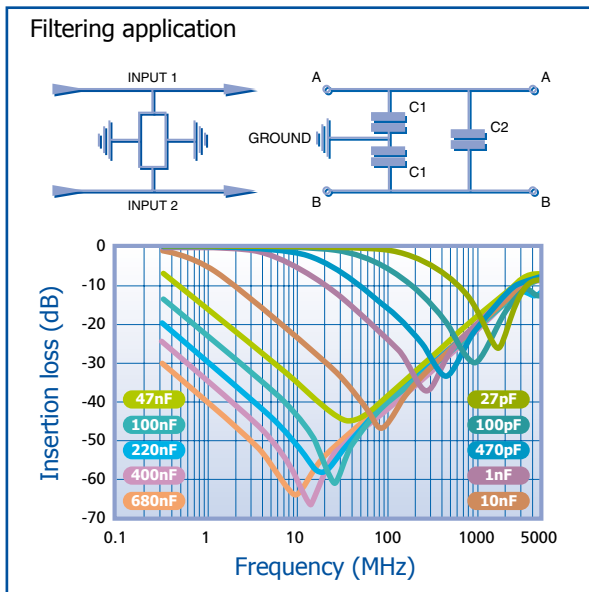


	0603	0805	1206	1410	1812	2220
A	0.6 (0.024)	0.95 (0.037)	1.2 (0.047)	2.05 (0.08)	2.65 (0.104)	4.15 (0.163)
B	0.6 (0.024)	0.9 (0.035)	0.9 (0.035)	1.0 (0.040)	1.4 (0.055)	1.4 (0.055)
C	0.4 (0.016)	0.3 (0.012)	0.6 (0.024)	0.7 (0.028)	0.8 (0.031)	1.2 (0.047)
D	0.2 (0.008)	0.4 (0.016)	0.8 (0.031)	0.9 (0.035)	1.4 (0.055)	1.8 (0.071)
E	0.4 (0.016)	0.75 (0.030)	1.0 (0.039)	1.85 (0.071)	2.05 (0.080)	3.95 (0.156)

AEC-Q200 range (E03) - capacitance values

Chip size		0805	1206	1410	1812
50Vdc	COG/NP0	390pF - 470pF	1.2nF - 1.5nF	4.7nF - 5.6nF	8.2nF - 10nF
	X7R	18nF - 33nF	56nF - 150nF	180nF - 330nF	390nF - 560nF
100Vdc	COG/NP0	10pF - 330pF	22pF - 1.0nF	100pF - 3.9nF	820pF - 6.8nF
	X7R	470pF - 15nF	1.5nF - 47nF	4.7nF - 150nF	8.2nF - 330nF

Component	Advantages	Disadvantages	Applications
Chip capacitor	Industry standard	Requires 1 per line High inductance Capacitance matching problems	By-pass Low frequency
3 terminal feedthrough	Feedthrough Lower inductance	Current limited	Feedthrough Unbalanced lines High frequency
Syfer X2Y Integrated Passive Component	Very low inductance Replaces 2 (or 3) components Negates the effects of temperature, voltage and ageing Provides both common mode and differential mode attenuation Can be used on balanced & unbalanced lines	Care must be taken to optimise circuit design	By-pass Balanced lines High frequency dc electric motors Unbalanced lines Audio amplifiers CANBUS



Ordering information

1812	Y	100	0334	M	X	T	E03
Chip Size	Termination	Voltage	Capacitance in picofarads (pF) C <sub>1</sub>	Tolerance	Dielectric	Packaging	Type
0603 0805 1206 1410 1812 2220	J = Nickel barrier Y = FlexiCap™ A = (Tin/lead) H = FlexiCap™ (Tin/lead)	016 = 16Vdc 025 = 25Vdc 050 = 50Vdc 100 = 100Vdc 200 = 200Vdc 500 = 500Vdc	First digit is 0. Second and third digits are significant figures of capacitance code. The fourth digit is number of zeros following Example: 0334=330nF. Note: C <sub>1</sub> = 2C <sub>2</sub>	M = ±20% (Tighter tolerances may be available on request).	A = COG/NP0 AEC-Q200 C = COG/NP0 E = X7R AEC-Q200 X = X7R	T = 178mm (7") reel R = 330mm (13") reel B = Bulk	Syfer X2Y Integrated Passive Component

Reeled quantities

178mm (7") reel	0603	0805	1206	1410	1812	2220	330mm (13") reel	0603	0805	1206	1410	1812	2220
	4000	3000	2500	2000	1000	1000	16000	12000	10000	8000	4000	4000	

