

- **Filter Types**
 - **Surface Mount EMI Filter**
 - **Panel Mount EMI Filter**



We are offering the following manufacturer



15 years cooperation of Syfer and wts//electronic components enables us to support our customers with high quality products and logistical competence.

EMI-FILTER

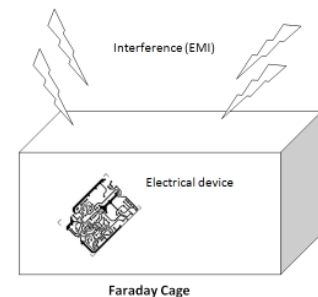
Wherever electronic equipment is used the chance to meet Electro-Magnetic-Interference (EMI) increases.

What is EMI?

An unwanted effect which occurs when electrical devices disturb each other. Those disturbances usually are due to electromagnetic conduction or electromagnetic radiation.

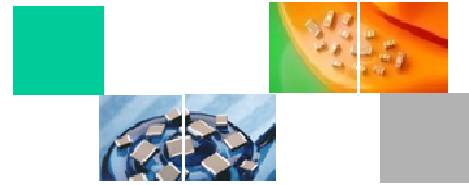
What to do against EMI?

The perfect way to protect an electronic circuit from EMI is to put it into a Faraday Cage.



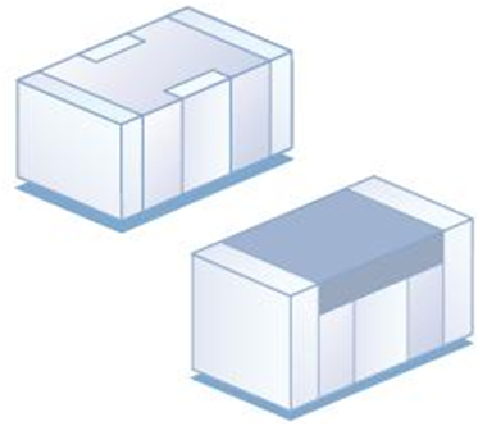
However in reality it is hard to create such an isolated system as there are usually connections (e.g. cables) to the outside.







Therefore EMI Filters will be used.



SURFACE MOUNT EMI FILTER

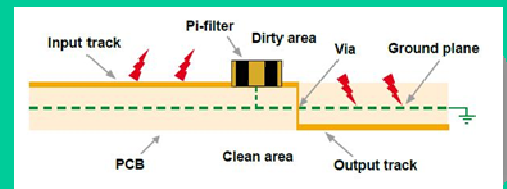
Surface mount EMI Filters can be mounted to the PCBs by using a standard SMD-Pick & Place Solder Process which obviously reduces the assembly costs for the PCB. Surface mount EMI filter become especially interesting when it comes to limited space on a board. They will be mounted to both – the signal as well as the ground track. However it has to be noted, that they might lose some performance compared to their panel mount colleagues when used at high frequencies. This may be reduced using special shielding methods.

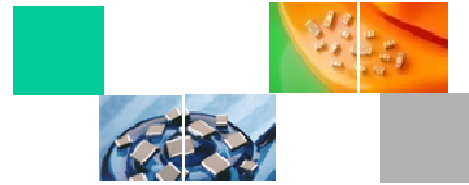


Surface Mount EMI Filter Capabilities			
3 Terminal Chip	E01		22pF...200nF
X2Y	E03		10pF...1.2µF
High Current	E07		3.3nF, 22nF, 200nF
1A SM Pi-Filter	SBSP		22pF...150nF
5A SM Pi-Filter	SBSG		1nF...220nF
10A SM Pi-Filter	SBSM		1nF...470nF

Shielding Methods

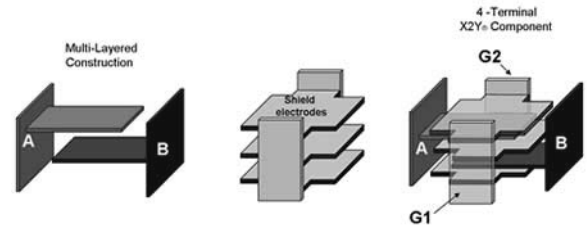
e.g. the use of a through hole to lead the output track on the opposite side of the input track after filtering in order to use the ground line as a "shield".





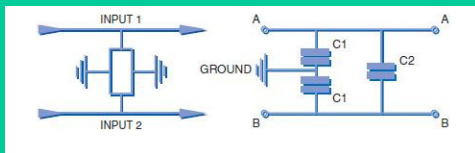
SPECIAL FEATURE: X2Y TECHNOLOGY

X2Y Filters have an additional set of shield electrode layers which surround the electrodes within the stack of the two terminal capacitors. The result are two identical capacitors which are shielded against ground. What happens is that the shielding creates basically a faraday cage which keeps the parasitic inductive and capacitive rates within the cage.

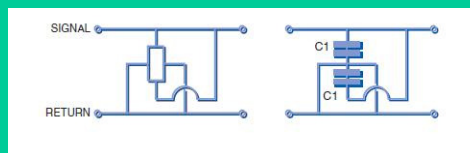


Circuit Diagram for different applications:

Filtering applications



De-coupling applications



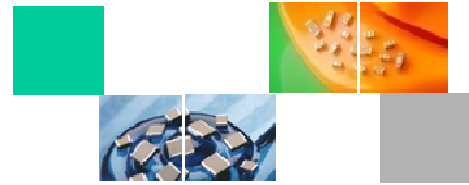
MAJOR ADVANTAGES OF X2Y EMI FILTERS

Where to use X2Y EMI-Filters ?

- Single/ended/unbalanced lines
- Balanced lines and twisted pairs
- EMI suppression on dc motors
- Sensor/transducer applications
- Wireless applications
- Audio amplifiers
- CANBUS systems

- Replace inductors and feedthrough capacitors
- Add no DC resistance
- Superior filtering for AC-DC power or high speed datalines
- Allow differential and common mode filtering with one device
- High current capability
- Aging effect equal on both lines
- Effects Temperature & Voltage variation are eliminated

Capabilities X2Y EMI Filters						
Case size	0603	0805	1206	1410	1812	2220
Temperature Range	-55°C ... 125°C					
Dielectric	X7R or COG/NP0					
Voltage	16Vcd ... 100Vdc					
AEC-Q200	-	available	available	available	available	-



PANEL MOUNT EMI FILTERS

Panel mount EMI filters do also house a ceramic multilayer element using high quality dielectric materials. They pass the signal from one side of the panel to the other one. To assure a proper and effective performance the input and the out put filter should be screened against each other.

Panel mounted EMI filters are available in solder-in and threaded versions.

CAPABILITIES PANEL MOUNT EMI FILTERS

- Solder-In Panel Mount EMI Filters
- Screw Mount EMI Filters
- Hermetic Panel mount EMI Filters
- EMI Power Filters
- ⇒ Safety Range Class Y2
- ⇒ Safety Range Class Y4



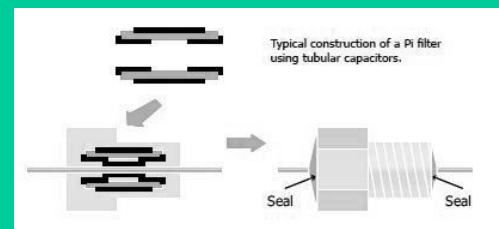
When it comes to high current applications (e.g. IT Servers, telecom base stations, radar) EMI Power Filters will be the right choice. They use a plastic film technology which is self-healing and offering very low series inductance as well as very high self resonant frequency. They are available with max. 40µF at voltages up to 600Vdc or 250Vac.



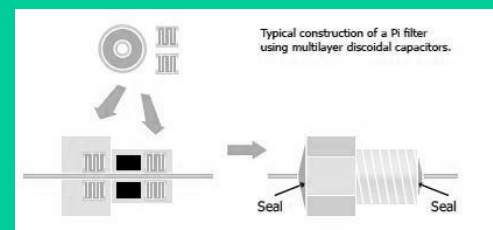
Construction of panel mount EMI Filters

Originally panel mount EMI filters used tubular capacitors which had a PI filter construction. Due to the increasing performance demands discoidal capacitors were used in the filters. They use the MLCC chip technology to achieve better inductance as well as higher capacitance and voltage ratings. However tubular capacitors are still used when it comes to cost reasons.

Tubular Capacitor



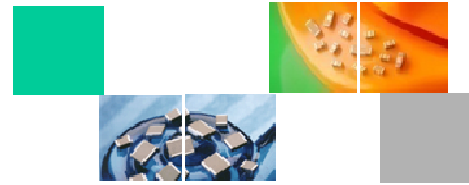
ML discoidal Capacitor



Customer specific designs available !

Multi-Way assemblies with different filter types and values, which allow several lines to be filtered and allow a compact design which is especially important as more and more applications tend to become smaller.

Different housing designs according to customers needs– e.g. Multiple mounting locations for use in vibration critical



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We are looking forward to hear from you!