

Choosing an Input Filter for a Power Supply

There are two primary functions that an input filter can perform:

- 1) Minimize outgoing electrical noise to avoid interfering with neighboring equipment
- 2) Attenuate (reduce) incoming electrical noise that could damage the system

Regarding outgoing noise, although most power supplies meet the governmental regulations for EMI, noise is additive and if there are multiple power supplies or high speed processor boards, it can result in a failing grade.

If the noise is only slightly out of specification, then a (lower cost) single stage filter may suffice. If the noise is considerably out of specification, then a higher performance, two stage filter will be required.

An example of these would be Lambda's MA (single stage) and MX (two stage) filters. Look for the terms "wideband" or "low frequency attenuation" in the features.

Incoming electrical noise is usually in the form of a spike or burst of energy. It can be generated from natural causes such as a lightning storm or man made by a large piece of industrial equipment.

This type of filter may have "high pulse attenuation" as a feature, and will have internal values optimized to reduce these potentially harmful spikes from reaching the power supply. The filter will also have some outgoing noise attenuation, but may not be as effective. An example would be Lambda's MZ series of filters.