

Different Types of Noise

The noise generated in power supply are divided according to the conduction pathway as shown below.

There are two main types of electrical emissions generated in power supply--conducted emission and radiated emission.

1. Conducted noise

1) Input side (Line conduction)

Differential-mode noise ----- ①

Common-mode noise ----- ②

2) Output side

Differential-mode noise ----- ③

Common-mode noise ----- ④

2. Radiated noise (Radiated emission) ----- ⑤

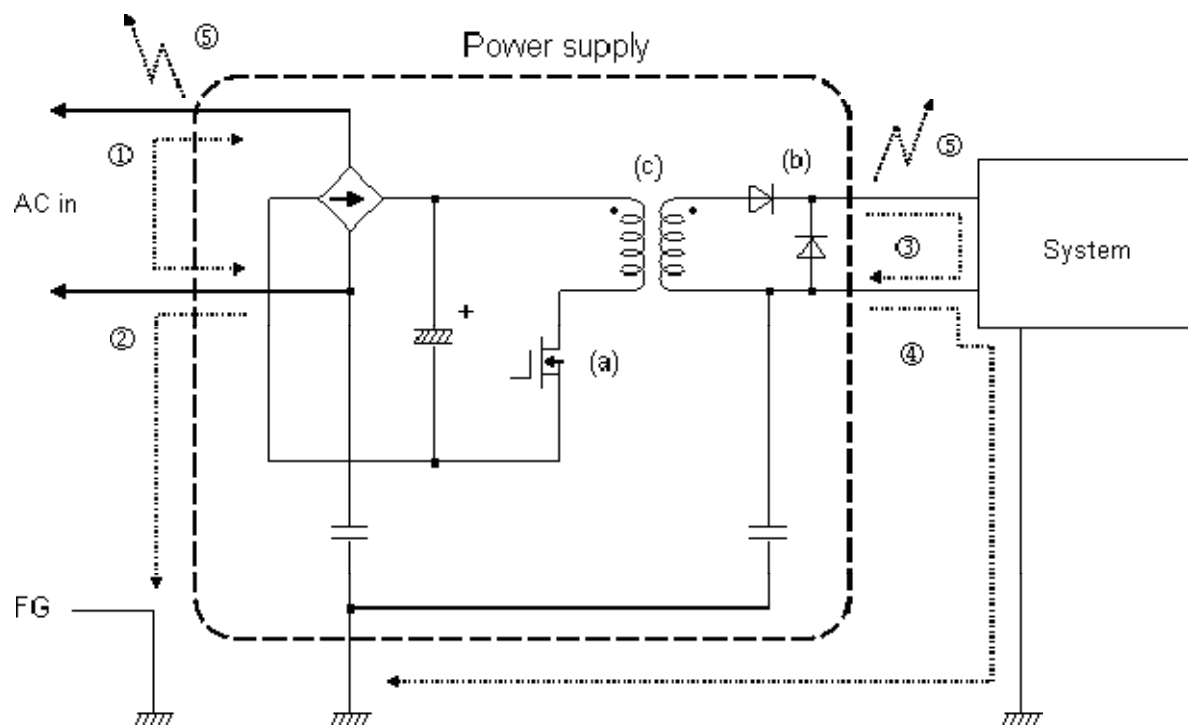


Fig.1.1 The conduction pathways of noise

2. Countermeasures for noise occurring from the power supply

2.1 Countermeasures for conducted noise

1) Countermeasures for line conduction

A noise filter is built in the power supply in order that a noise occurring from the inside of power supply doesn't return to input side. Please keep the output line and the input line separate when doing wiring, so as to avoid spoiling the effect of noise filter. In addition, to keep the input line away from the effect of radiated noise, please place the input line away from power supply.

Furthermore, to reduce the noise radiated from power supply and to avoid receiving an effect of noise due to long input line, please assemble external noise filter at the AC terminal of the unit case.

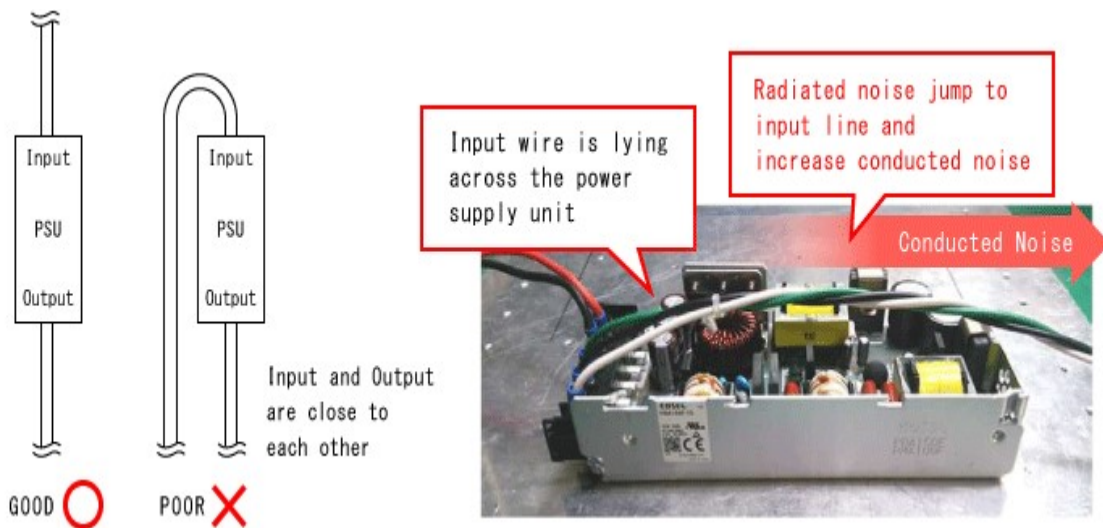


Fig.2.1 The conduction pathway of noise

2) Countermeasures for output noise

It is important to wire a power supply with thick and short wires. Differential-mode noise and common-mode noise can be reduced by setting a capacitor or a filter on the output line.

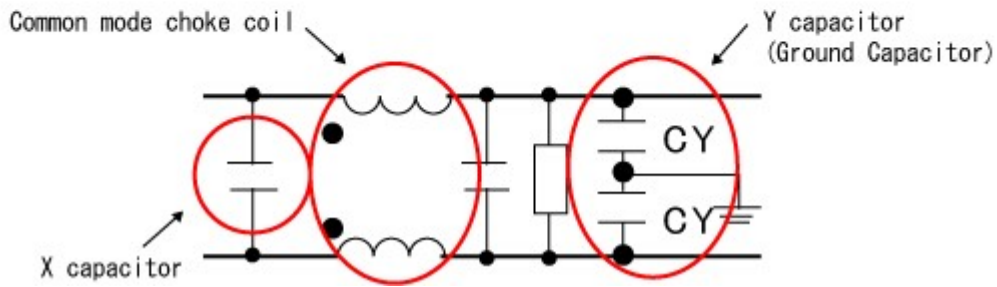
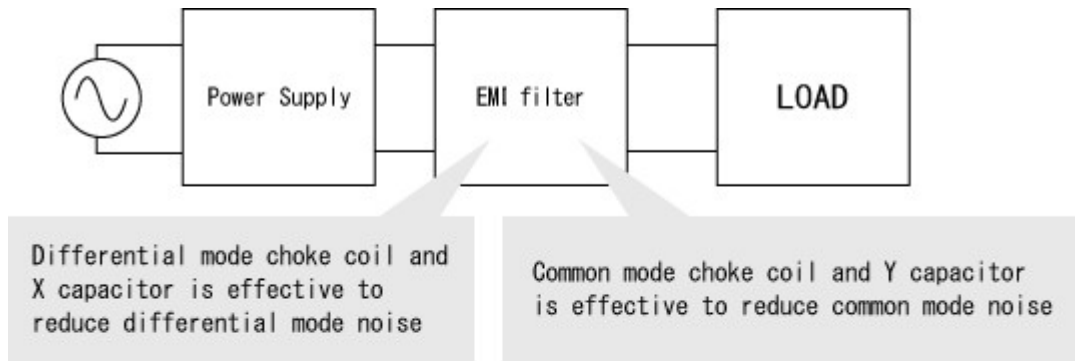


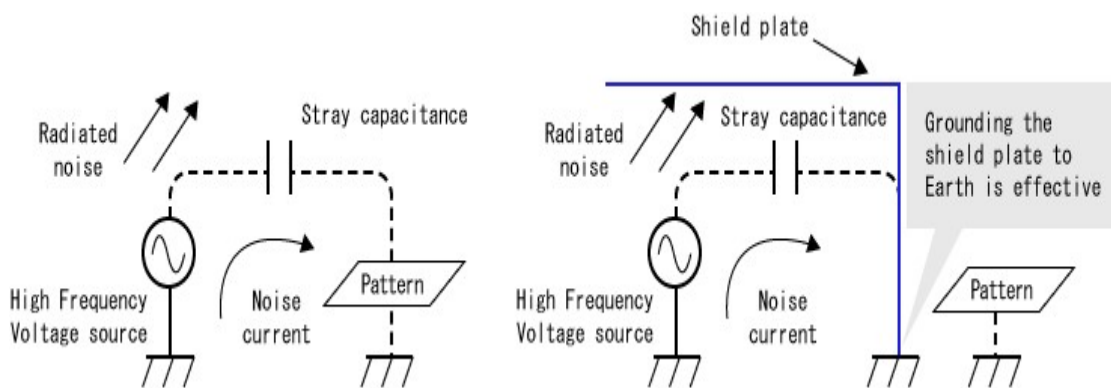
Fig.2.2 Countermeasure for output noise

2.2 Countermeasures for radiated noise (Radiated emission)

A Noise becomes radio waves and radiates to midair, by cables such as the input line, the output line and the signal line extending toward the outside of unit which have antenna effect.

For the above reason, please firstly take countermeasures to avoid conducting a noise to input/output line. If it is not enough, please use some components such as noise filter or data line filter.

It is also effective to use a metal board or a metal film to shut the noise up in the power supply if the unit case is not metal.





Radiated noise from power supply contains high frequency noise and shield effect is depending on installation and environmental condition.

Ideally, power supply and chassis of application shall be connected to same chassis. In case that power supply and chassis are separated, please do grounding the chassis of application via metal plate.

It makes low impedance between power supply and application, and becomes less affected from noise source.