Introduction of Countermeasure of Noise

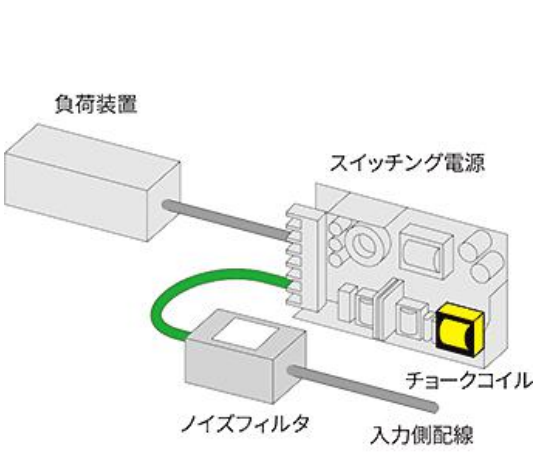
Q：We use noise filter to reduce conducted noise, but why is the result not so good as our expectation?

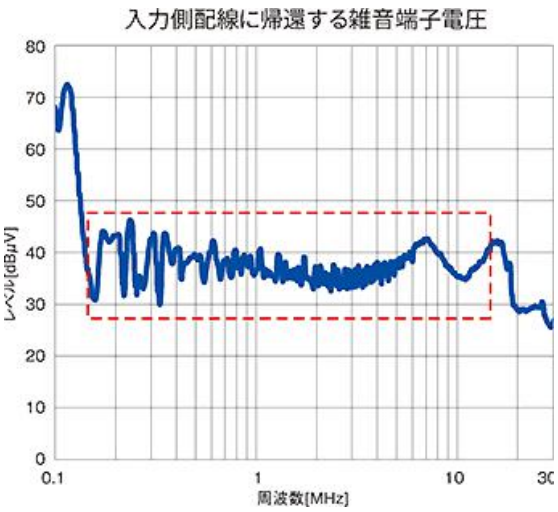
A：It is considered that the noise from source is interfering with wiring. So effective method is moving wiring far from noise source, or shielding wiring from noise.

Reason:

Noise interference from power supply where generates noise

The magnetic flux which is generated from the choke coil in power supply interferes with the wiring of input for noise filter nearby. That’s the reason why noise can’t be reduced than expected.



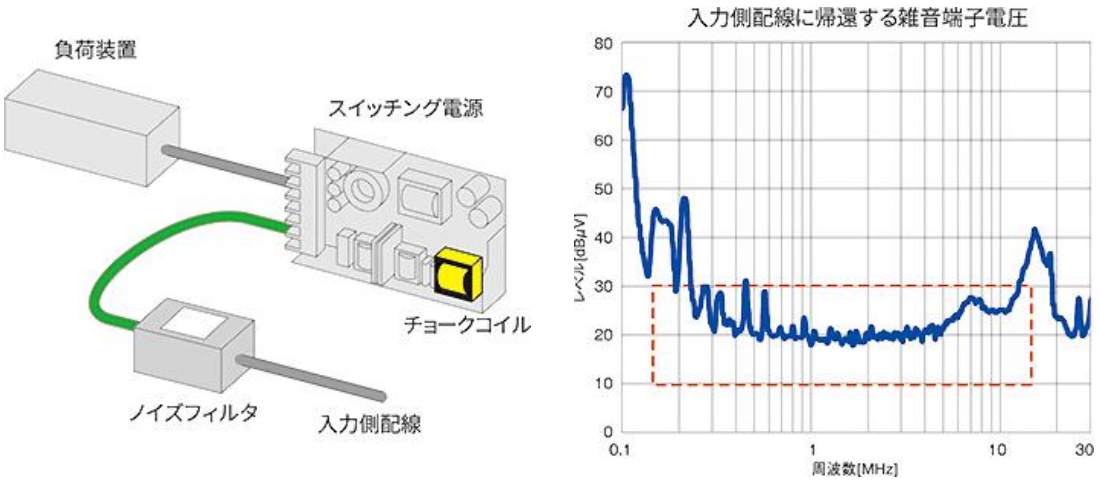


Countermeasure

Countermeasure 1

Moving Wiring far from noise source

To improve the effect of noise filter, you can move wiring of input for noise filter far from power supply.



対策事例-1

Key point

Many parts in your equipment such as power supply and motor driver can be noise source

It is important to move wiring far from noise source

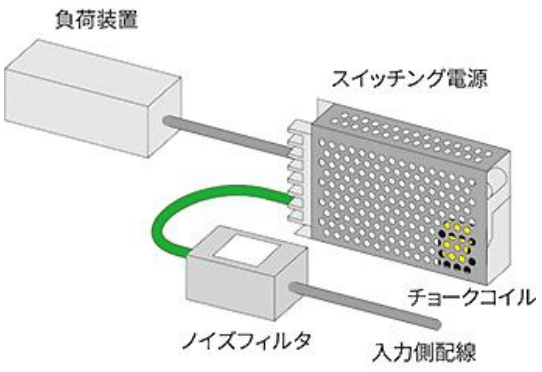
Countermeasure 2

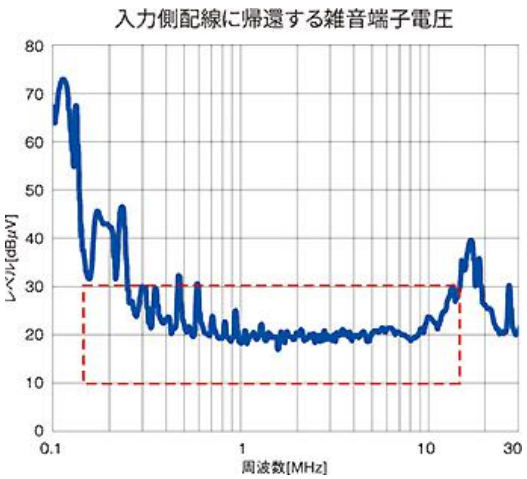
Shielding Wiring from Noise (Isolation)

It may not be possible to move wiring far from noise source due to limited space. In that case, shielding wiring is commonly adopted. There are two methods to shield wiring. One is to isolate the noise source and the other one is to isolate wiring. We will introduce the former one for the power supply with case in this article.

Attention

There are many kinds of power supply and some of them don't have case. And concerning the ones with case, output derating is required.





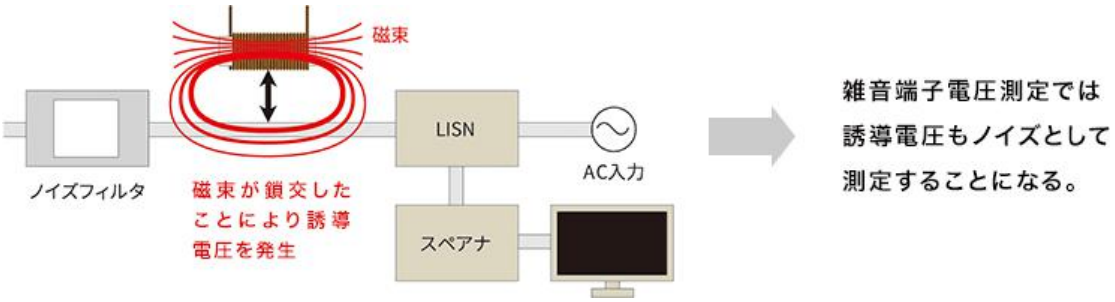
Key point

① When using this method, shield of wire and chassis shall be connected to safety ground. And isolation potential must be stable

② Please consider the trade-off (such as obstruction of air convection due to chassis and cost) before you make a decision

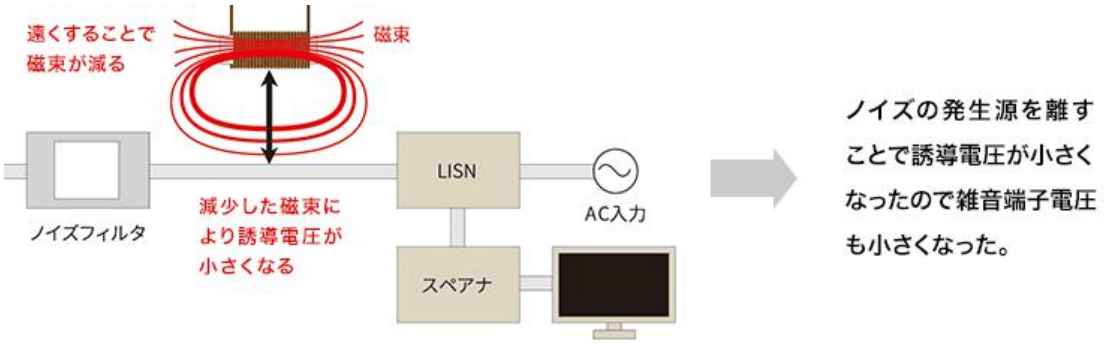
Explanation

Point 1 Magnetic flux from choke coil interferes wiring



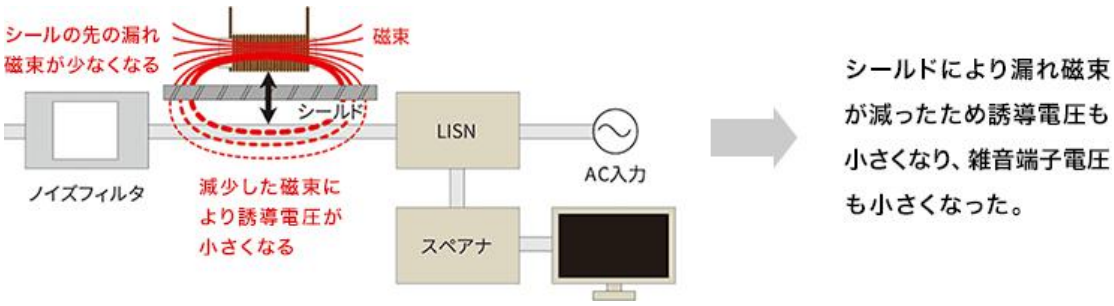
This example is telling that magnetic flux from choke coil interferes wiring. Induced voltage will be generated when magnetic flux is interlaced, and it will also result in extra noise. That's the reason why noise can't be reduced to your expectation.

Point 2 To avoid interference from the magnetic flux generated from choke coil, you are supposed to move wiring and noise filter far from it



The first countermeasure is moving wiring far from power supply to avoid interference from magnetic flux. And therefore induced voltage and extra conducted noise will be reduced.

Point 3 To reduce negative effects of magnetic flux from power supply, you can utilize case to achieve isolation



The second countermeasure is using case for isolation to reduce negative effects of magnetic flux from power supply.

Since there is less magnetic flux, induced voltage and extra conducted noise will be reduced.