



Countermeasure of Security

The security countermeasure of software against information data penetrating through Digital Network has mostly been the so-called *Information Security Countermeasure* and *Cyber-terrorism Countermeasure* for telecom infrastructure network spreading all over the world.

However, engineers of communication devices and semiconductor manufacturers are about to recognize that originally a countermeasure from both hardware and software is necessary.

Security countermeasure that we propose is a new concept of *Electromagnetic Wave Noise Countermeasure* to this hardware.

It is effective to all digital electronic devices, and perfect as *Electromagnetic Noise Countermeasure* when used for electronic circuits of interface devices in wireless and wired communication equipments, which will continuously accelerate.

Harmonics (noise) generated by semiconductor leaked into power supply line of electric circuits board and Common Mode Noise (electromagnetic wave) that enter through the power source units supplying power to the electric circuits board are two important noises. Harmonics generated by semiconductor is the combination of these two noises. They are the weakest point of digital communication equipments that are accelerating more and more, and at the same time the development of their technical countermeasure is delayed.

Our technology is also effective as “the information security countermeasure of electromagnetic emission and immunity” wherein information is not leaked from electromagnetic emission.



< **Technical Proposal** >

A favorable environment wherein digital semiconductor circuit works at high speed does not leak the harmonics produced by semiconductor within the IC package to outside. At the same time, it is important that semiconductor inside the IC package is not disturbed by harmonics (electromagnetic wave) of the surrounding.

Construction of such electronic circuit in power supply circuit is to perform **Power Decoupling**.

At least five times the clock frequency that semiconductor works is necessary for frequency bandwidth of this Power Decoupling (there are different kinds of circuits such as Power decoupling, Power source decoupling, Power line decoupling and Bias line decoupling) in order to have high-speed semiconductor switching device to work smoothly with stability.

To materialize 3 GHz CPU, at least Power Decoupling to 15 GHz bandwidth is required. However, is Power Decoupling to 15 GHz band materialized in power circuits?

We have materialized **Power Decoupling Device** to 12 GHz bandwidth, in a size that can be put into the semiconductor package with subsidy from The Ministry of Public Management, Home Affairs, Post and Telecommunications of Japan. Also, we have developed **Coil Structure Device** with two components that can decouple beyond 20GHz. With your cooperation, we would like to realize the development of this decoupling device of 20GHz frequency band in CPU package to construct a new high-speed semiconductor package.