NEWS Release

SUMITOMO ELECTRIC
Ingenious Dynamics

August 7, 2014

Sumitomo Electric Has Developed the Industry's Smallest Wireless Charging Modules

Sumitomo Electric Industries, Ltd. has developed ultra-small, slim wireless charging module that enables us to charge electronics appliances, such as wearable devices, without using power cable. The Company will launch the sample products in August 2014.

The wireless charging module uses the electromagnetic inductive method, a wireless power transmission method that allows electricity to flow in the air from the transmitting side to the receiving side by generating magnetic flux on the receiving side.

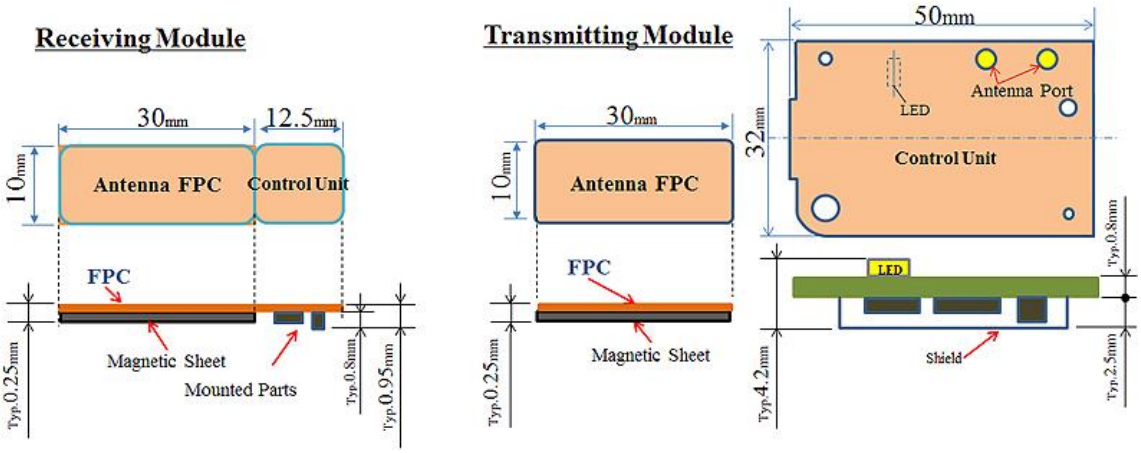
The wireless charging module consists of a transmitting module and a receiving module, each of which has a control unit and an antenna. The miniaturization of electronics appliances has been restricted with conventional antennas that are made of magnet wire coils and have poor flexibility. To overcome this challenge, we replaced magnet wire coils with flexible printed circuits (FPCs) by utilizing our original 3 dimensional wiring technology for the first time in the industry. This improved flexibility of the antennas and enabled size reduction. This product enhances the functionality of electronics appliances by offering cordless charging capability or water- and dust-proof properties.

This product is expected to be used in wearable devices for which water- and dust-proof properties are essential and health-care devices and industrial equipment for which cordless application is required. We will strive to enhance the transmission efficiency of the module and expand the line-up for its commercial production scheduled on October 2014. We will also work to develop the magnetic field resonance method*1.

【Features of this product】

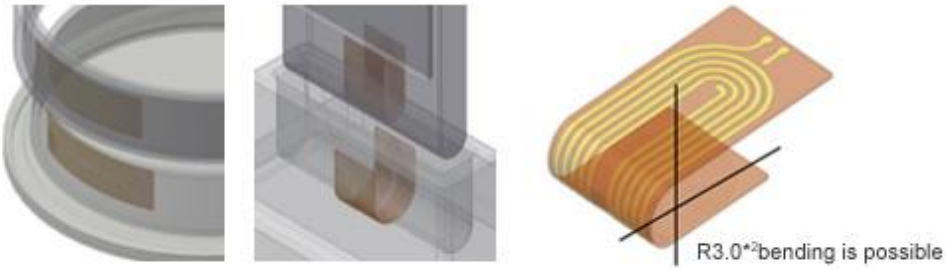
1. Reduction in size and thickness of antenna

By using FPCs instead of magnet wire coils, the receiving and transmitting antennas reduce their size by 84% to 10 mm×30 mm and thickness by 75% to 0.25 mm compared to the conventional antennas. Consequently, we have succeeded in developing the industry's smallest and thinnest wireless charging module. This product responds to the requirement for space saving by combining the conventional magnet wire coil and control unit of the receiving module.



2. **Flexible installation**

This module can be fitted into various outer cases due to the FPC's advantages of bendability. This product can also be mounted onto a U-shaped or flexing part, which has never been possible with the conventional modules.



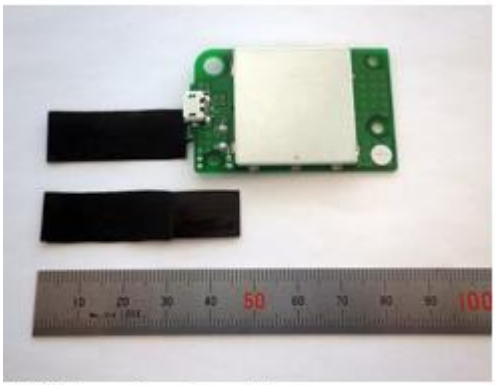
▲ Layout example of module on outer case which requires flexibility

3. **Charging control function**

In principle, the electromagnetic induction method may decrease the transmission efficiency and generate a minor degree of heat when transmitting and receiving antennas are displaced or foreign materials are present. As a countermeasure, this product has a power supply control function linked to a temperature monitor and stops transmitting electricity upon temperature rise.

4. **Available as a set of transmitting and receiving modules**

We meet customer needs by designing and producing transmission and reception modules. The miniaturization of devices requires sophisticated design considering the balance between transmission and reception modules. We offer a set of a transmitting module and receiving module that satisfy this requirement.



▲ Wireless charging module
(Upper: Transmission module, Lower: Receptic module)

▲ Antenna area which adopts our FPC

NEWS Release

SUMITOMO ELECTRIC
Ingenious Dynamics

【Reference Specification】

	Item		Specification
Transmission	Input Voltage		DC 5V
	Input Current		Max. 400 mA (Reference value based on the following dimension)
	Dimension	Antenna	30.0 (W) × 10 (H) × 0.25 (T) mm (Exclusive of extruded area)
		Control Unit	50 (W) × 32 (H) × 0.25 (T) mm (Exclusive of extruded area)
Reception	Input Voltage		DC 5V
	Input Current		Max. 170 mA (Reference value based on the following dimension)
	Dimension	Antenna	30 (W) × 10 (H) × 0.25 (T) mm (Exclusive of extruded area)
		Control Unit	12.5 (W) × 10 (H) × 0.25 (T) mm (Exclusive of extruded area)

*The above shows only an example of design.
Current capacity, antenna module size, and outer case design can be changed depending on customer requests.

*1 Magnetic field resonance method: Electricity is transmitted from the transmission side to the reception side based on the phenomenon where the vibration of magnetic field occurs due to the current flow on the transmission side and is transmitted to the resonance circuit on the receiving side that resonates with the same frequency. This method is attracting the attention as a way to send electricity over longer distances than the electromagnetic inductive method.

*2 R : Flexing radius (Unit: mm)
The above mentioned value (the flexing radius of R3.0) is only for reference and is not guaranteed.