TECH OFFER

Empower Your IoT Devices with Wireless Charging

KEY INFORMATION

TECHNOLOGY CATEGORY:
Infocomm - Wireless Technology
Infocomm - Internet of Things
Green Building - Indoor Environment Quality
Electronics - Power Management

TECHNOLOGY READINESS LEVEL (TRL): TRL5
COUNTRY: SINGAPORE
ID NUMBER: TO175137

OVERVIEW

In recent years, with the increasing use of the Internet of Things (IoT), the number of information devices, including sensors, has risen significantly. This surge has led to challenges in battery replacement, charging, and power wiring for these devices. To address these issues, there is a growing demand for wireless power transfer technology.

Traditional wireless power transfer technologies, such as smartphone charging systems, have primarily focused on supplying power over short distances. This limitation makes them unsuitable for devices installed over wide areas, such as IoT devices. In response, the development of long-distance wireless power transfer technology using microwaves has emerged. However, the amount of power that can be transmitted is constrained due to concerns about the effects of microwaves on human health and other communication devices.

The developed microwave power transmission technology can efficiently transmit power using low-power microwaves within regulated limits. This advancement allows the use of devices like sensors as power sources even in environments where people and communication devices are present.

The technology owner is seeking collaboration with IoT solution providers, platform providers, system integrators, and sensor manufacturers.

TECHNOLOGY FEATURES & SPECIFICATIONS

The technology consists of a transmitter and multiple receivers. One transmitter can provide power to several receivers over a certain distance. Additional transmitters can be added if the total power demand of the receivers exceeds the limit. It is designed to solve power supply problems for IoT devices by efficiently and stably converting Radio Frequency to DC power.

- **Small and High-Efficiency Reception:** Advanced antenna design technology combines compact size with high efficiency, enabling the device to receive even weak microwaves despite its small size.
- **Long-Distance Transfer:** Innovative circuit design technology converts low-power microwaves within regulated limits into stable, efficient DC power, allowing the power supply to multiple receiving devices within a range of up to 10 meters.
- **High-Speed Distributed Control:** Further technological advancements facilitate the distributed cooperative control of multiple low-power transmitters. This enables the rapid formation of power concentration spots and the ability to follow human movement seamlessly.

POTENTIAL APPLICATIONS

This technology can serve as a power source for IoT sensors where battery replacement and wiring are challenging. Applications include:

- **Manufacturing Sites:** Sensors attached to the moving parts of production equipment and robots.
- **Infrastructure Inspection:** Sensors for inspecting infrastructure facilities that are difficult for humans to access.
- **Nursing Care Monitoring:** Wearable sensors for monitoring the elderly.
- **Office Environments:** Numerous sensors collecting environmental information in office settings.

UNIQUE VALUE PROPOSITION

With existing wired IoT sensor deployments, a sizable amount of budget and deployment time is required for installation, cabling, or regular replacement of batteries. This wireless charging technology enables wireless-power sensor deployments, reducing the complexity of wiring infrastructure, deployment time, and associated cabling and labor costs.

- **Compact Design for Versatile Installation:** The small size of the receiving devices allows for installation in confined spaces, offering greater flexibility in system design and integration.
- **Efficient Power Distribution:** Simultaneous power transmission to multiple receiving devices over a broad area minimizes the need for extensive wiring and frequent battery replacements.
- **Advanced Power Management:** Technological advancements in distributed cooperative control enable targeted power delivery to specific devices, making it ideal for applications that require higher power.