ISSUE: June 2026

Wireless Power Chipset Enables NFC-Compatible Wearables

ROHM Semiconductor's wireless power supply IC chipset consisting of the ML7670 receiver and ML7671 transmitter is compatible with near field communication (NFC) technology, enabling development of compact wearables such as smart rings and smart bands as well as peripheral devices like smart pens. The receiver and transmitter chips are pictured in Fig. 1.

Following its successful commercialization of the 1-W ML7660/ML7661, ROHM has developed the ML7670/ML7671 chipset optimized for even smaller devices. For the new chipset, the maximum power transfer is specified at 250 mW, while enables peripheral components such as the switching MOSFETs required to supply power to the charging IC to be built in. The result is a solution optimized for both mounting area and power transfer efficiency in the power class demanded by compact wearable devices, especially smart rings.

Table 1 compares the ML7670 with the predecessor ML7660 and a competing standard product. Table 2 lists key specifications for the ML7670/ML7671 chipset.

The smart ring market has seen rapid growth in recent years, primarily in healthcare and fitness applications, says the vendor. However, for extremely small ring-shaped devices worn on the finger, wired charging is impractical, while conventional Qi wireless charging standard is difficult to implement due to constraints such as coil size. This has driven increased demand for a proximity-based power transfer method capable of reliably charging ultra-compact devices, according to ROHM Semiconductor.

In response, NFC-based charging, which operates in the high-frequency 13.56-MHz band that enables antenna miniaturization, is attracting increased attention, with adoption accelerating in next-generation wearables.

Compliance with NFC Forum (WLC 2.0) enables power transfer while maintaining compatibility with existing devices, positioning the chipset as a core element in the expanding NFC wireless power ecosystem, says ROHM.

The ML7670/ML7671 chipset is in mass production. Evaluation boards and reference designs are also offered to facilitate integration. For more information, contact the company.

Fig. 1. The ML7670 power receiver IC achieves a maximum power transfer efficiency of 45% in the 250-mW low output range—all in what's described as an industry-leading form factor of just 2.28 × 2.56 × 0.48 mm. According to the vendor, a key feature of the chipset is superior performance that surpasses the efficiency of comparable products in the same class by optimizing elements such as coil matching, rectifier circuitry, and reduced losses in switching devices. What's more, all firmware required for wireless power delivery is embedded directly within the IC, eliminating the need for a host MCU. This significantly reduces board space along with development workload in device design.

Table 1. The ML7670 versus existing power receiver ICs.

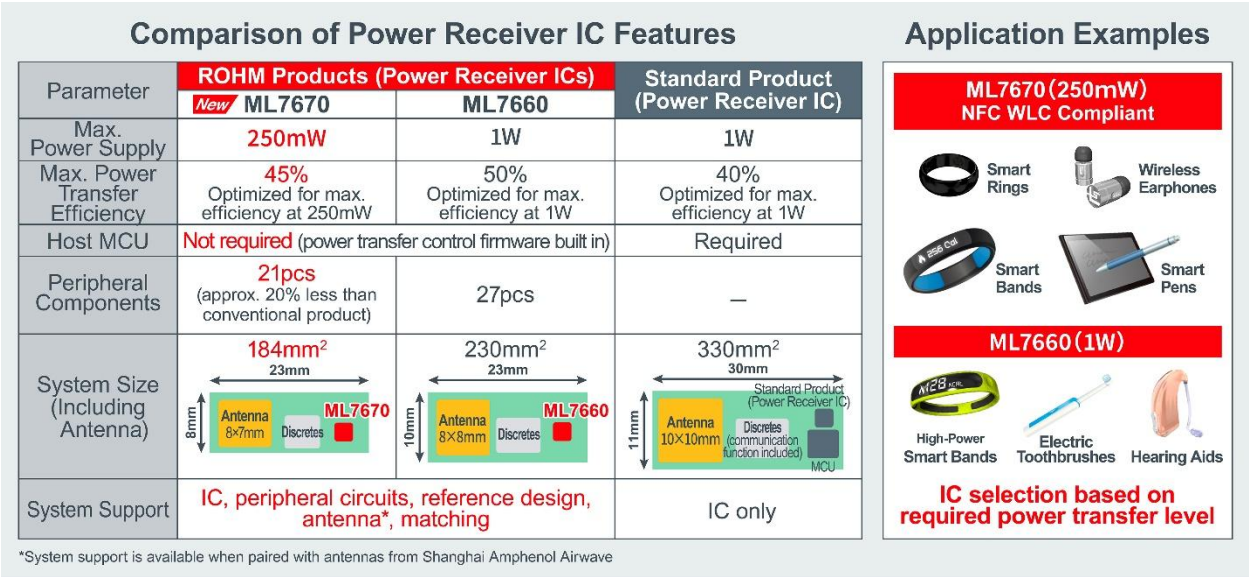

Table 2. Key chipset specifications.

Parameter	New ML7670	New ML7671
Function	NFC wireless power IC (receiver)	NFC wireless power IC (transmitter)
Specifications	• Supports 250mW power reception • Single-channel serial host interface (I²C target) • 10-bit ADC • NFC Forum WLC 2.0 compliant • NFC Forum Type F (FeliCa)	• Single-channel serial host interface (I²C target) • 10-bit ADC • NFC Forum Type F (FeliCa)
Power Supply [V]	Activated by voltage generated by the antenna's magnetic field	5.0
Operating Temperature [˚C]	−40 to +85	
Package [mm]	30pin WL-CSP (2.28 × 2.56 × 0.48)	40pin WQFN (6.0 × 6.0 × 0.8)