

Wireless Power Chipset Shrinks Footprint And Lowers Cost

[Integrated Device Technology](#) has introduced a wireless power chipset offering improvements in both the transmitter and receiver design. The chipset includes the IDTP9030, which is described as the world's first true single-chip wireless power transmitter, and the IDTP9020, a complementary multi-mode receiver described as the industry's highest-output-power single-chip receiver solution (Fig 1.) According to IDT, the highly integrated, multi-mode transmitter reduces board footprint by 80% and solution bill-of-materials (BOM) cost by 50% compared to existing solutions (Fig.2 and Table 1.) Meanwhile, the receiver is said to deliver twice the power of commonly used solutions, cutting batter- charging time in half (Table 2.)

Designed to satisfy requirements of the Wireless Power Consortium's Qi standard, which ensures interoperability among Qi-compatible products, the chips also offer capabilities that go beyond the standard. For example, the Qi standard specifies delivery of 5 W of power transmission and the IDTP9020 receiver meets this requirement. However, when used in combination with the IDTP9030 transmitter, the IDTP9020 can also deliver 7.5 W in a proprietary operating mode. Other features that exceed Qi requirements include two-way communications between transmitter and receiver, and four layers of foreign object detection. In addition, in the transmitter, the input voltage range extends down to 10 V to accommodate automotive applications. When used in tandem, the IDTP9030 and IDTP9020 can achieve a total system efficiency of approximately 73%.

Both the IDTP9030 transmitter and the IDTP9020 receiver are capable of "multi-mode" operation, supporting both the Qi standard as well as proprietary formats for added features, improved safety, and increased power output capability. Built-in protocol detection enables dynamic switching between Qi and proprietary modes, creating seamless transitions. These devices can be used in a myriad of mobile applications for convenient and effortless battery charging.

"IDT is the first to offer a true single-chip wireless power transmitter IC solution to address a projected \$3.3B wireless power market," said Arman Naghavi, vice president and general manager of the Analog and Power Division at IDT. "IDT's new transmitter reduces application footprint from 1800 mm² to 360 mm² and consolidates the function of nine ICs into one, enabling our customers to develop more compact and cost-effective products. In addition, our proprietary multi-mode capability offers benefits beyond the limits of the Qi standard by enhancing foreign object detection for improved safety and increasing output power for faster charging time."

The IDTP9020 and IDTP9030 feature proprietary multi-layered foreign object detection (FOD), using sophisticated multi-parameter algorithms to assure a high level of safety while avoiding FOD false alarms. These features are coupled with overtemperature, overvoltage, and overcurrent protection. In addition, the receiver includes support for charging the battery via USB cable when a wireless charging station is not available, eliminating the need for external USB adaptor switches in mobile devices.

The IDTP9030 and IDTP9020 are currently sampling to qualified customers. They are available in 48-lead 6-mm x 6-mm VFQFN (IDTP9030) and 56-lead 7-mm x 7-mm TQFN (IDTP9020) packages. The IDTP9030 and IDTP9020 are priced, respectively, at \$4.70 and \$3.60 each in volumes of 10,000 units. For more information, see www.idt.com/go/wirelesspower.

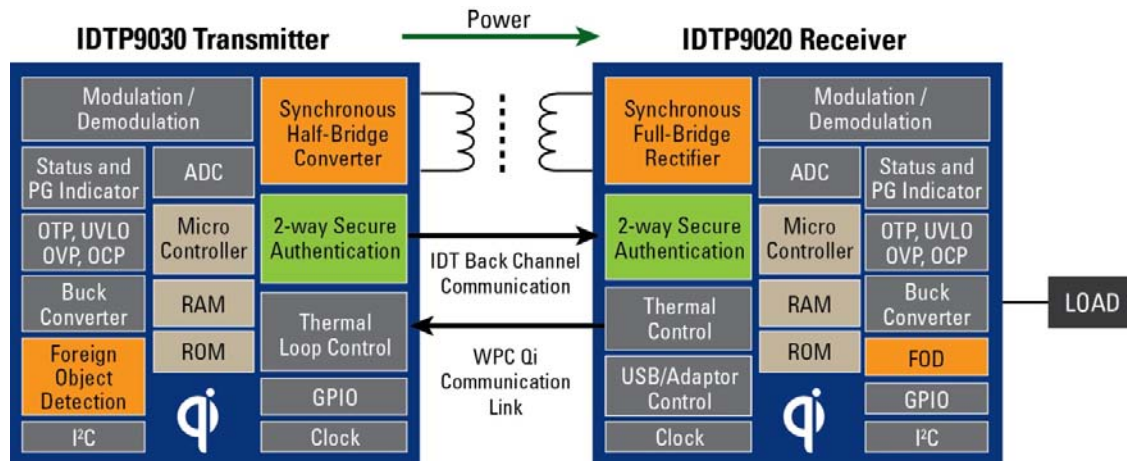


Fig. 1. Designed to meet the Wireless Power Consortium's Qi standard, IDT's wireless power chips enable greater integration on the transmitter side with a single-chip solution, and greater power output on the receiver side to enable faster battery charging.

Application Area

- Competitor: ~1800 mm²
- IDT: 360 mm²
 - ~80% reduction in area

No. of Components

- Competitor: 91 w/9 IC's
- IDT: 30 (1 IC)
 - 67% Reduction in Component Count
 - 8 fewer ICs than competitor

50% Savings in Solution BOM Cost!

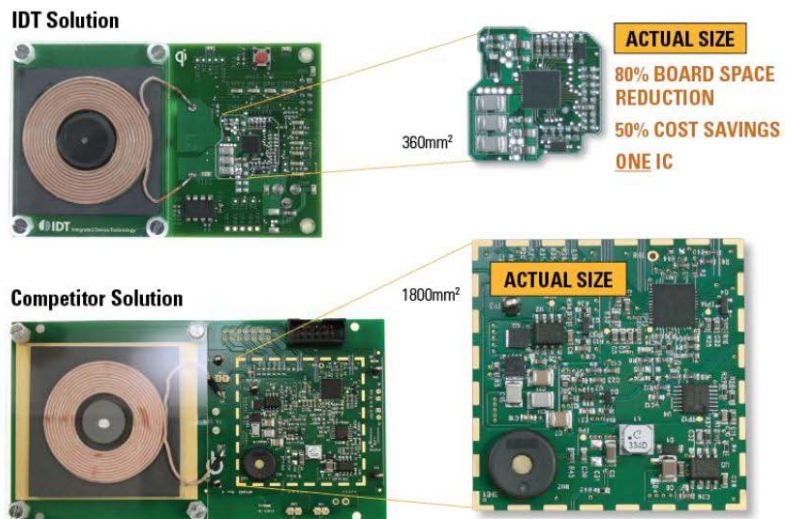


Fig. 2. When compared with competing Qi-compatible wireless power solutions, IDT's IDTP9030 transmitter reduces the required board area and component count, according to the vendor.

Table 1. A comparison (by the vendor) of the features of the IDTP9030 wireless power transmitter with those of the leading competitor.

Feature	IDTP9030	Leading Competitor (2 nd Gen)
Single Chip Tx	Yes	No
Power Transmission	Up to 7.5W*	Up to 5W
Embedded uC	Yes	Yes
Multilingual Operation	Yes	No
Multi-Layered FOD	Yes	Not as many levels
Back Channel Comm	Yes	No
2-way Authentication	Yes	No
External BOM	30	91
Total IC's Req'd	1	9
Board Space	360mm ²	1800mm ²

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Table 2. A comparison (by the vendor) of the features of the IDTP9020 wireless power receiver with those of the leading competitor.

Feature	IDTP9020	Leading Competitor (2 nd Gen)
Package	QFN/WLSCP	QFN/WLSCP
Single Chip Rx	Yes	Yes
Embedded uC	Yes	No
Power Capability	Up to 7.5W*	5W/3-4W
Multilingual Operation	Yes	No
Multi-Layered FOD	Yes	No
High Eff. Buck Converter	Yes	No
Back Channel Comm	Yes	No
2-way Authentication	Yes	No
Integr. Current Limiter	Yes	No
Integrated USB Switches	Yes	No

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