



WIRELESS POWER

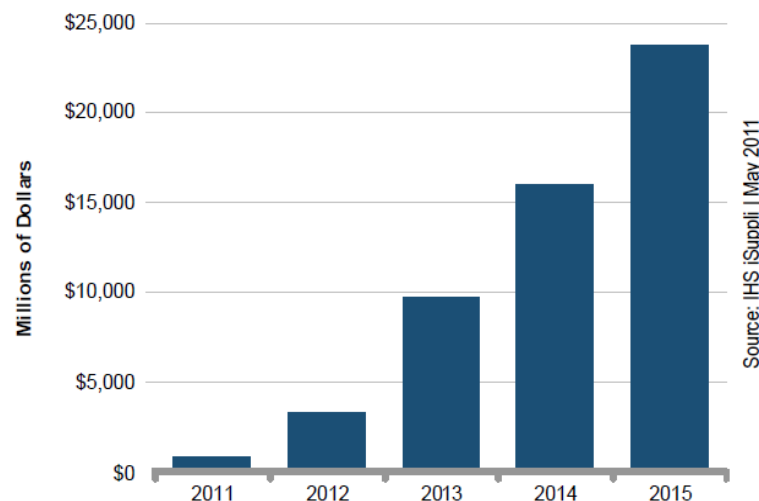
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- Charging Anywhere and Everywhere, without Cords and Wires for Laptops, Mobile Phones, Tablets, e-Readers, and Media Players
- Simply place device on charging mat or wireless power enabled surface
- Alternative to Carrying Collection of Device-Specific Chargers
- >800 Million wireless power transmitters and Receivers Forecast for 2015 (iSuppli)
- \$24B market size in 2015 (iSuppli)
- Samsung, Motorola, LG, HTC, Fujitsu, NEC and Sharp All Have Qi-Compatible Mobile Phones



Total Addressable Market of Wireless Charging in Revenue



- Standardization increases consumer confidence and demand
- Qi “气” (Chee: “Vital Energy” in Asian Philosophy - An Intangible Flow of Power无形的能量)
- Industry standard developed by Wireless Power Consortium (WPC)
- Rapid industry-wide adoption (100+ Members by Oct. 2011)



Wide Range of Mobile Devices

- Mobile Phone
- Tablet
- Camera
- MP3 Player
- MID (Mobile Intelligent Device)
- Battery charging, or other suitable loads



Wide Range of Locations

- Office
- Residential (bedroom, kitchen, family area, bathroom...)
- Hotels
- Coffee Shops
- Public Waiting Areas
- Educational (schools, universities, libraries....)
- Airports
- Aircraft Seats
- Medical
- Automotive
- Theaters
- Restaurants





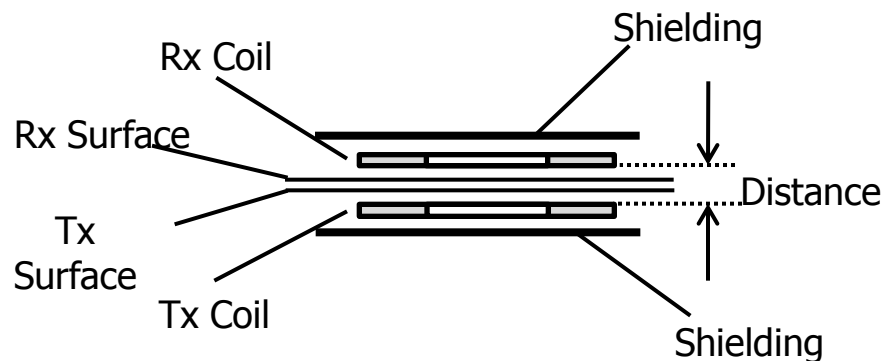
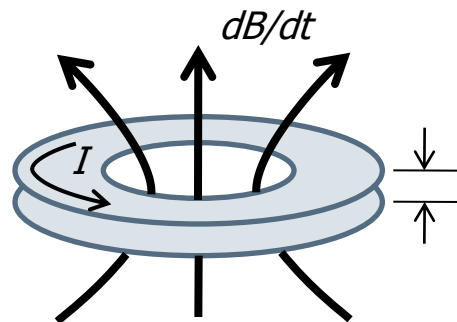


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- Power Transfer via Inductive Coupling at Short Distances (mm)
- Transmitter (Tx) and Receiver (Rx) Coils are Inductively Coupled Coils
 - AC current in Tx coil generates magnetic field, which induces a voltage in Rx coil. Rx voltage may be used to power a mobile device or charge a battery
- Magnetic Field Concentrated in Small Volume Between Tx/Rx
- User Exposed to Leakage Fields Only, which are Minimized by Shielding
- Improve Coupling between Coils by
 - ❖ Matching coil sizes
 - ❖ Flat interface surface to keep the distance small.
 - ❖ Shielding and aligning coils

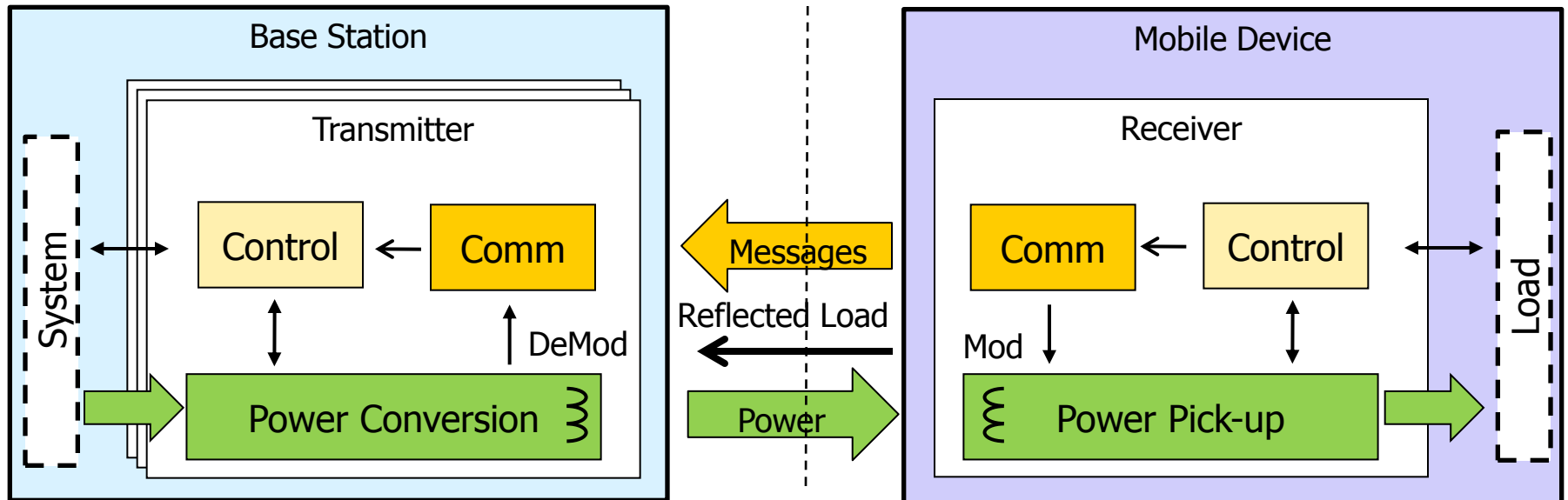


Transmitter (Tx)

- Drives Coil with AC current
- Receives Digital Messages
 - From the Receiver chip
 - Through AC load modulation
- Adjusts Power Output Level
 - At request of the Receiver
 - Maintains a stable system

Receiver (Rx)

- Recovers AC current from Coil
- Sends Messages to Transmitter
 - Identification, Up/Down Power
 - By modulating Load impedance
- Controls Received Power
 - Matching mobile device needs
 - To maintain an efficient system



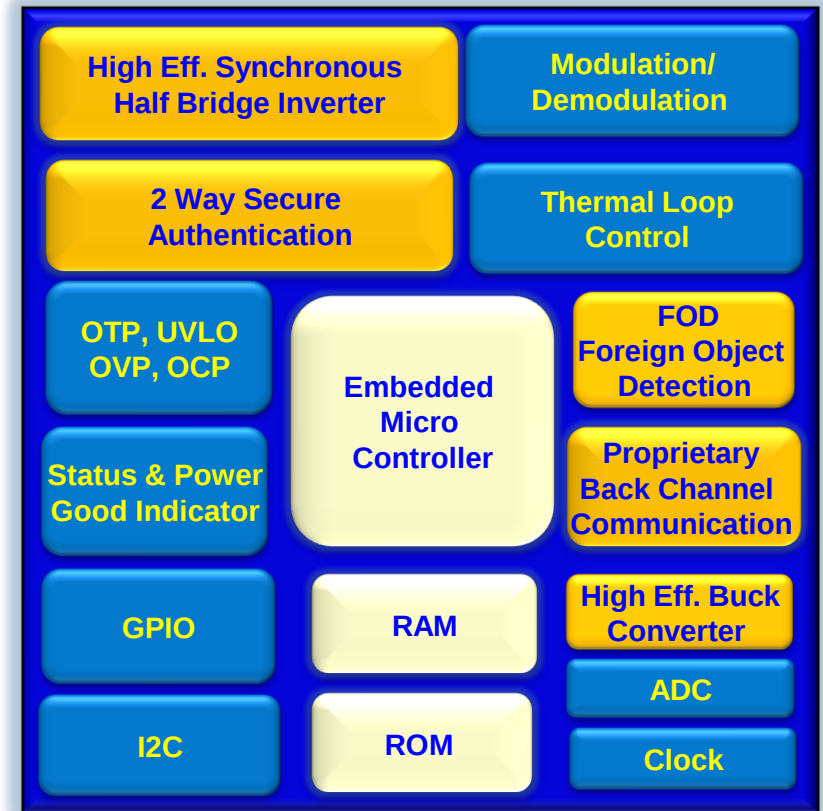


WIRELESS POWER

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- Industry's First Single Chip Solution for Wireless Power Consortium (WPC) compliant power transmitters
- Up to 7.5W Power in Proprietary Mode
- 10V to 20V Operating Input Voltage
- Programmable option for added security and encryption up to 64 bit
- Advanced Foreign Object Detection (FOD) for safety
- Proprietary Base to Mobile Communication for 2-Way Secure Authentication
- Highest Total System Efficiency (~73%) when used with IDTP9020 Power Receiver IC
- Over Temperature/Voltage/Current Protection
- Packages:
 - 6x6-48 VFQFN



Dual Mode IDTP9030

	WPC Mode	IDT Proprietary Customizable Mode
Input Range	18 V – 20 V	10 V – 20 V
Control Algorithm	PID	Proprietary
Authentication	OFF	ON
FODs	1, 2	1, 2, 3, 4
Secure Link	OFF	ON, during initial verification



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

****Proprietary Mode***

Application Area

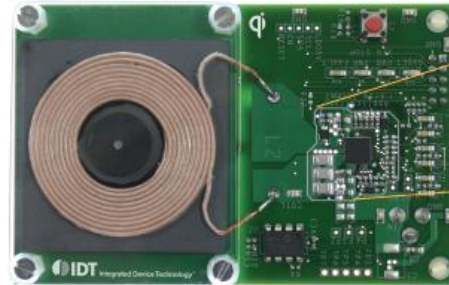
- Competitor: $\sim 1800 \text{ mm}^2$
- IDT: 360 mm^2
 - $\sim 80\%$ reduction in area

No. of Components

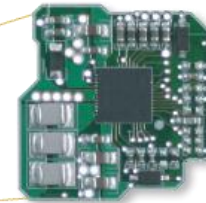
- Competitor: 91 w/9 IC's
- IDT: 30 (1 IC)
 - 67% Reduction in Component Count
 - 8 fewer ICs than competitor

**50% Savings in
Solution BOM Cost!**

IDT Solution



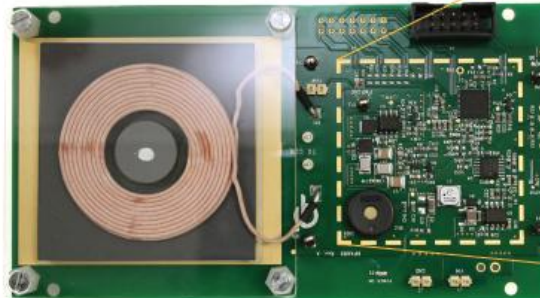
360mm²



ACTUAL SIZE

**80% BOARD SPACE
REDUCTION**
50% COST SAVINGS
ONE IC

Competitor Solution



1800mm²



ACTUAL SIZE

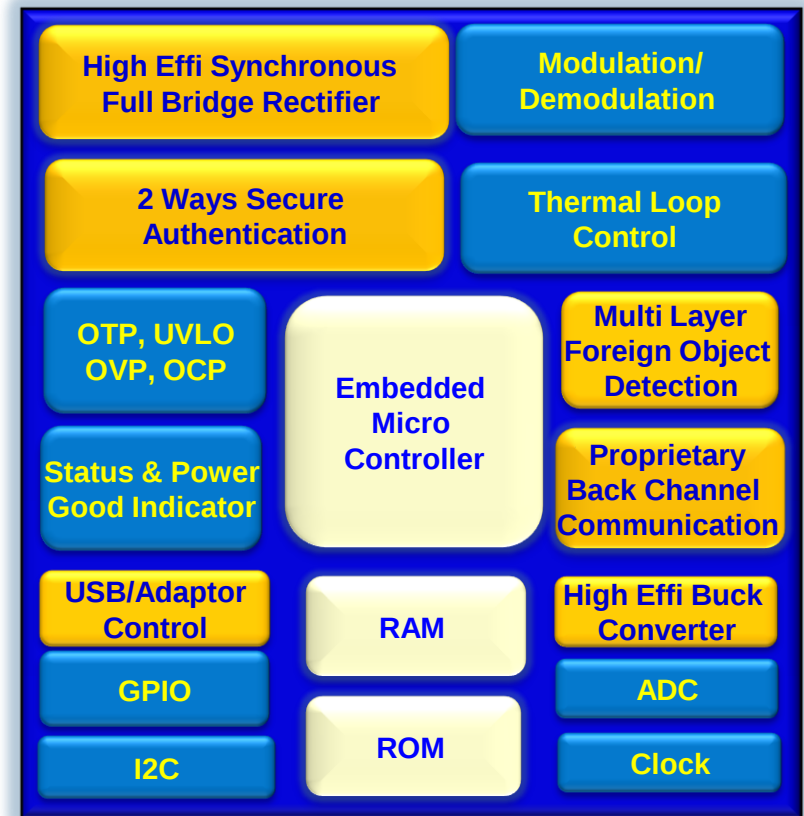
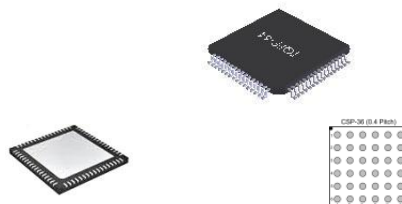


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- Fully integrated single chip solution for Wireless Power Consortium (WPC) receiver with 5V regulated output up to 7.5W
- Integrated high efficiency synchronous buck converter
- Highest total system efficiency ($\sim 73\%$) when used with IDTP9030 power transmitter IC
- Integrated USB adaptor switches
- Embedded micro controller
- Security authentication (Optional)
- Advanced Foreign Object Detection (FOD)
- Programmable option for added security and encryption up to 64 bit
- Supports proprietary back channel Communication
- Over Temperature/Voltage/Current Protection
- Packages:
 - 7x7-56 TQFN
 - WLCSP Option





Feature	IDTP9020	Leading Competitor (2 nd Gen)
Single Chip Rx	Yes	Yes
Embedded uC	Yes	No
Power Capability	Up to 7.5W*	5W
Multilingual Operation	Yes	No
Multi-Layered (4 levels) 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

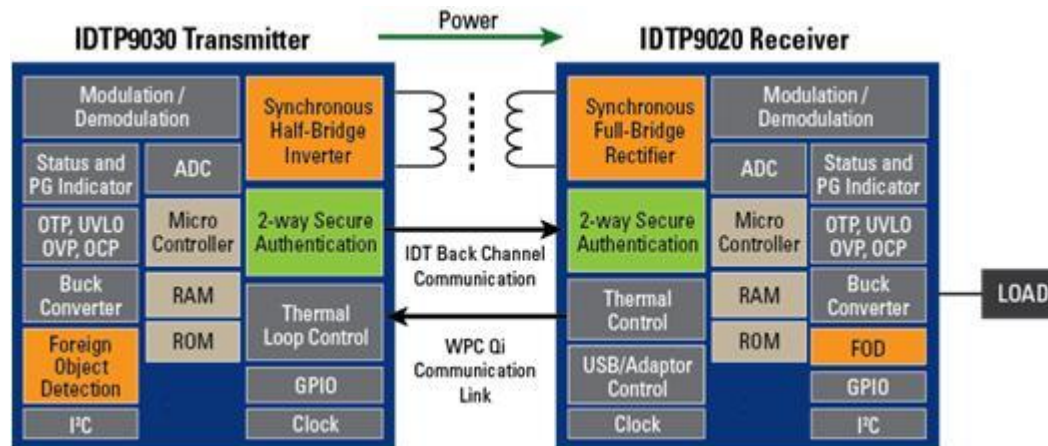
****Proprietary Mode***

Industry's First True Single Chip Tx (IDTP9030)

- Up to 7.5W power delivery (Proprietary Mode)
- One IC vs. leading competitor's nine ICs
- 80% reduction in board size
 - 67% reduction in component cost
- 50% solution BOM cost savings
- Multilingual capability
- >90% DC/AC efficiency

High-Power, Multilingual Single Chip Rx (IDTP9020)

- Up to 7.5W power delivery (Proprietary Mode)
- Multilingual capability
- Industry-leading efficiency (>90% AC/DC, >90% DC/DC)
- Integrated USB switches



IDTP9020/IDTP9030 Synergy

- 50% more power (7.5W) for faster recharging time
- Four levels of Foreign Object Detection (FOD) for maximum safety
- Back channel/Two-way communication
- Secure authentication options





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