

One of the pleasures of attending CES each year is comparing it to the year before—taking in all the remarkable technological advances made over a short 12-month span. One area where this will be evident at this year's show is wireless power, which, over the course of the past year, has crossed the technology chasm.

Let us explain: In his book, *Crossing the Chasm*, Geoffrey Moore describes a gap, or “chasm,” between early adopters and mainstream market acceptance in the lifecycle of disruptive new technologies. Entering 2017, the drop-and-go convenience of wireless charging has effectively crossed the threshold into mainstream adoption. We can now view wireless power technology from *The Other Side of the Chasm* and consider next evolutions that spark further adoption and expansion to new markets.

IDT will demonstrate where wireless power is headed next month at CES, but let's take a look at how we got to where we are.

### The Journey to this Point

From modest beginnings in a single smartphone model, the path it has taken can perhaps best be illustrated with a few statistics:

- **>250 Million** wireless power ICs sold in 2015 and 2016. (source: I.H.S)
- Wireless charging is integrated into **more than 50** smartphones and smartwatches.
- Wireless charging is integrated into **greater than 50** automobile models as standard or optional equipment.
- **Over 200** wireless power transmitter pads are commercially available.

Statistics aside, wireless power's move to the other side of the chasm can be seen anecdotally by taking a look on store shelves and car dealership showrooms. The largest corporations and consumer brands on the planet have announced and deployed wireless charging: *Samsung, Sony, Apple, HP, Ikea, Starbucks, McDonalds, Marriott, Toyota, General Motors, and Mercedes-Benz.*

Several key factors lifted wireless charging technology across the chasm:

- IC costs have come down with scale allowing for broad adoption.
- SOC (system-on-chip) based chip architectures greatly streamlined the development process.
- Standards confusion finally clearing up: Wireless Power Consortium Qi has emerged as the dominant industry standard. *Qi* provides the best tradeoffs by far in terms of ecosystem maturity, performance, and solution cost. Other wireless power protocols must overcome technical and economic challenges which will keep charging-at-distance schemes outside the realm of practical application for the foreseeable future.

### The View Forward

The WPC 1.2 *Qi* specification was recently released and this allows for charging at much higher powers up to 15 Watts. This is comparable to, and sometimes even exceeds, wired charging power today in smartphones. (IDT plans to demonstrate its 15 Watt WPC 1.2 kits at CES.)

WPC 1.2 is viable because of advances in power transmission efficiency. *15 Watt systems in 2017 (87% efficiency) and in development for 2018 (89% efficiency) have the same or LESS waste heat than the original 5 Watt systems from 2011.*

Another performance improvement to expect is better and better “placement forgiveness.” Early wireless charging systems required attention to X and Y dimension alignment between the transmitter and receiver to effect a charge (+/-6 mm forgiveness). This has changed over the last 5 years to the point where the placement forgiveness (+/-11 mm XY) is truly in the realm of “drop-and-go” as we enter 2017. *Planned improvements for 2018 to XY and Z distance will soon allow for under desk mount!*

Transmitter infrastructure convergence is another important area of focus. Currently *Qi* charging pads work best charging 5W receivers and don't always charge lower power 2W devices such as smartwatches smoothly. As the infrastructure in hotels, coffee shops, automobiles, and other key places proliferates, the designs will converge so that one pad will be able to charge just about any device between 1 Watts and 15 Watts.

## The Other Side of the Chasm

From the other side of the chasm, we can now see the ideas of the pioneers like Faraday and Tesla realized. Adoption of wireless power continues to proliferate, strengthening the ecosystem of wireless installations and users. As user awareness increases, we enter the next phase of the “chasm” curve and see the emergence of new applications: like hermetically sealed medical equipment that is reliable with frequent sterilization - or electronic drones, seamlessly and automatically landing and re-charging on wireless pads.

**Come visit IDT at CES and join us on the “Other Side of the Chasm”**

**IDT Booth: Tech West, Sands Expo Halls, A-D #40736 – drop-ins welcome**

**IDT Meeting Rooms, Tech East, LVCC, South Hall 2 – MP25472. By appointment only**

### About the Authors

Chris Stephens is the General Manager of IDT’s Wireless Power Division; Prior to this he was a founder and General Manager of IDT’s fast growing RF division. Prior to joining IDT seven years ago, Chris had a 20-year career marketing integrated transceivers, pioneering Polar PA technology, and developing portable radios at Maxim, TriQuint, and Motorola respectively. Chris has been awarded a US Patent and holds a Bachelor of Science Degree in Electrical Engineering from Virginia Tech.



Laurence McGarry is Director of Marketing for IDT’s Wireless Power Division. He joined IDT in 2015, bringing with him over 25 years of experience working in the power management and semiconductor industries with previous experience at GEC Marconi, Astec/Emerson, and Analog Devices. Laurence has a BEng (Hons) in Electronics and Electrical Engineering from the University of Glasgow and executive MBA from Washington State University.



### About IDT

IDT is the worldwide leader in Wireless Power. By industry estimates, greater than 70% of all wireless charging ICs sold, to date, were manufactured by IDT. Learn more at the [IDT website](#) and come see us at CES (Sands Expo Halls, A-D #40736), where we will demonstrate new advances and applications in wireless power.