WCA presents:

Wireless Power Transfer: Now and the Future

A survey about current market applications using WPT

Thursday, March 25, 2021 – 4:00 PM - 5:30 PM (PT)
Location: Webinar (Zoom) - worldwide

Q&A Session:

Dinesh (WAWT):

Q: Technologies like Qi use power control and power delivery over the same medium. I thought there were power limits when using control and delivery on the same medium. Can you elaborate?

A: While the level of output power is dependent either on the Transmitter or Adapter capability, the level of power at which the devices gets charged or powered is mainly determined by the battery/heat/thermal management set up in the Receiver. Example – Even if the Output power of USB-C-PD adapter is say 45W, but the device such as mobile would only except max power 10W or 15W then that excess 45W power is meaningless. It is important to set these limits for safety of the device. On the other hand, each device has set receiving power levels based on the type of transmitter. If its OEM specified transmitter, then the device would charge at optimum level (15W), if not that it would charge just at 5W.

Q: Are there any wireless devices that are not being considered for wireless power?

A: Wireless power technology in its current form have limitation with regards to what and how much it could transfer, which considers efficiency levels, heathy and safety and EMC conditions, pairing compatibility, charging situation, regulatory approvals, device form-factor, or less costs effective, or also interferences with other communications protocols. This may restrict adoption of wireless power technology even if it is possible to do so. There are few examples I can provide here: Major Home Appliances/White-Goods like washing machines, air-conditioners, dryers, and other such devices. OR running heavy-duty machineries.

Q: Any idea of the breakdown of the growth - how much growth in the low frequency loose coupled e-mobility charging?

A: The growth depends on many factors. But for e-mobility device such as e-bikes or e-scooters or even EV cars, while adoption of wireless charging in EVs would depend on growth in the EV market, plus also how fast the Auto OEMs would like to incorporate wireless charging. The wireless charging technology and standard for EVs is already ready and published and could be adopted instantly. But one needs to consider the lead time also from concept approval to shipments which in case of automotive market is around 3-5 years. With regards of e-bikes/e-scooters, the discussion to get the standard developed ready to publish has just began and might take 1-2 years. But the growth could be faster once the standard is published. Saying so, in the meanwhile, we would witness few players adopting proprietary solution and get it incorporated in e-bikes/e-scooters. There is a good growth predicted in actual shipments of e-bikes and e-scooters which would also be seeing

in adoption of wireless charging in these devices as the benefits of wireless charging and use-case is clearly visible.

- Standard for solutions using either low-frequency as well as high-frequency are both under development stage. This could be a bottleneck is wider industry (OEMs) are waiting for the same to be published.

Q: What are the longest distances currently available?
A: Distance wireless charging is already available and operations from a near-field (few inches) to mid-field (few fees) to far-field (few meters/10-15 feet). There is also power transmitted even further – for instance wirelessly power drones from ground levels while they are flying in the sly many meters away, and at high power levels.

But if the question is for consumer/industrial and non-military applications type of devices, then there are limitations set by the regulatory body in terms of how much can one transmit, what are the energy efficiency limits one needs to achieve, and specification of the said device and circumstances of getting this charged wirelessly.

Currently market have witnessed wirelessly charging of say IIoT sensors up to 3-4 meters distance, but at very low power level, not to mention of concepts presented at various trade shows/industry events for even further distance and high power levels. But we cannot confirm those until we get to see them passing regulatory approvals and products viable enough to be commercialised.

Tom (WiTricity):

Q: Can you talk about how cars that are charged by plugged in can be upgraded to wireless charging?
A: There is no retrofit products right now, but may be in the future, there may be a retrofit vehicle assembly that can utilize the car's on-board charger. Wireless charging receivers are getting embedded by car makers on their new models.

Q: How do you address maximizing power commutation efficiency for each WPT type?
A: I don't fully understand the question. Each WPT type communicates between the ground assembly and the vehicle assembly and maximizes the power transfer efficiency by closed loop control between the two. I don't understand what you mean by commutation efficiency.

Aashish (TransferFi):

Q: How can the gateway comply with radiated emissions like FCC part 18? Or is there an exemption in the works?
A: We are within FCC part 18 with a safety distance. We are powering up very low powered devices. No exemptions here.

Q: Does the Tfi Sense support open standards? in other words any wireless sensor (for power and data) or specific sensors like Tfi sensors.
A: We are data protocal agnostic. Power is locked to the TFi WPN standard as it needs to be reliable and robust.

Q: Do the transfer-fi systems require line of sight?

A: No, the One Click calibration system finds alternative paths or gaps and choses the best reflection points.

Simon (Aira):

Q: Do aira's systems conform to a standard like air fuel alliance?
A: Yes, we are compliant with the Qi standard, latest release. We also charge other devices including proprietary receivers, but every Qi enabled device will charge.

Q: What sort of power levels is Aira capable of providing for phone charging?
A: currently we charge phones up to 15W including in-vehicle off a 12v input. This covers all phones including Apple iPhone12, Samsung and Google quick charging protocols. We also charge all the Asian phones (the latest from Xiaomi, Huawei, Oppo and Vivo) with quick charge capabilities. Note that the rate of phone charging is not limited by the input power from the transmitter, but by the battery chemistry of the devices and the thermal algorithms that are imposed to protect those batteries. While many phone companies are introducing quick chargers, the higher rate of charging only applies for a few minutes, until the thermal protection kicks in. So, it's a little bit of a marketing game. In benchmark tests (and we have a library of over 60 devices), most phones take a similar amount of time to reach 80% and 100% charge.