What OEMs Need To Know About Wireless Power Safety Standards

Ori Mor | Founder & VP R&D at Wi-Charge

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There's no question safety plays second fiddle to innovation. Accelerated innovation and first-to-market products generate immense buzz and "wow" the consumer, but every product should be designed with safety in mind. Unfortunately, this is not always the case. A safety-first approach is a defensible approach and something everyone can do -- from inventors to the world's largest consumer goods manufacturers.

Safety standards need to remain a critical component in the evaluation of innovative new technologies. Regulatory bodies have an important role to play, but the most stringent regulators of safety should be the original equipment manufacturers (OEMs) and innovators themselves, as they know the product and the use case the best and share the burden and repercussions of a catastrophic failure in safety or quality.

One of the emerging technology categories that stands to benefit the most from a more transparent and in-depth evaluation of safety is the wireless power industry.

Wireless Power's Road To Verifiable Safety

Long-range wireless power will soon serve numerous types of devices around us. As the name suggests, wireless power delivers energy without wires to devices, such as smartphones, smart home products, digital signage and sensors from across the room. Consumers will notice a reduced dependency on batteries and finally be able to unshackle devices from restrictive power cords.

But sending energy across the room should raise very serious safety questions that nobody should take lightly. For OEMs looking at integrating wireless power technology into their products, there are two simple questions that require answers when it comes to safety:

1. What are the applicable safety standards?

2. Does the technology being considered meet these standards?

Safety Standards

There are currently three major types of long-range wireless power technologies: radio frequency (RF), infrared light (IR) and ultrasound. No matter what technology is being considered, it needs to comply with its governing standards body.

For example, any RF wireless power solution emits RF radiation, which can be harmful to living things if not properly controlled. As such, it is subject to stringent standards. In the United States, there are bodies that set safety standards for products that emit RF:

- The Federal Communications Commission (FCC)

- The Occupational Safety and Health Administration (OSHA)

- Underwriters Laboratory (UL)

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Other long-range wireless power methodologies, those using infrared light and sound waves to transfer energy, face a similar set of stringent standards from different agencies. Infrared devices, for instance, are examined by the FDA -- even if they are not used as medical devices -- because the FDA is responsible for the part of the spectrum that includes infrared light.

For the wireless power vendor, it's essential to comply with the relevant standards and file all the required paperwork before the product is commercially available.

Due Diligence Required

OEMs that are looking to integrate wireless power technologies should verify safety compliance before integrating them into their products. I recommend following a very simple common sense safety query:

- Ask to see the technology's compliance certificate. If a government agency approved the product, there is public record of this approval.

- Verify that the test conditions represent the future scenario the OEM is targeting.

- Understand the limitations of the different regulatory agencies. When it comes to measuring the safety limits of transmitted power, agencies focus on ensuring that the new device will not exceed safety limits and will not interfere with other devices that share similar wavelengths. Agencies don't focus on whether the device actually does what the vendor claims it does.

- Check if there are limitations associated with the approval. For example, if approved as safe only if the user maintains a certain distance from the device or is wearing a certain type of protective gear, that is a red flag and not realistic for public spaces or ordinary home use.

For instance, don't assume that a certificate approving a 10 milliwatt device will be relevant for a 1,000 milliwatt device, even if both use the same Wi-Fi frequency. Microwave ovens and Wi-Fi routers use

approximately the same 2.4 GHz frequency, yet one needs to be in a closed metal box while the other is safe to put anywhere in our homes.

It's critical that OEMs evaluate all performance and self-made safety claims for any long-range wireless power providers. It's the OEM's responsibility is to verify that, under the relevant conditions -- mainly received power over the desired distance for the use case -- the wireless power transmitter does not violate the applicable safety requirements.

As always, be mindful of marketing claims. In an effort to educate the masses, it's not uncommon to see an oversimplification the technology such as, "Our technology works just like Wi-Fi, which is broadly used in public spaces and can be trusted as such." From a technical perspective, however, the devil is in the details. Wireless power delivery and data transmission require completely different power levels and can't truly be compared. While ultra-low power bouncing everywhere is deemed safe for Wi-Fi communication, the energy needed to transmit power using the same principles -- about 1,000 times more than Wi-Fi -- is not, per the FCC.

Safety First, And Always

Many technologists jump at the chance to innovate rapidly, but sometimes it's important to take a step back to ensure safety is still coming first -- for the sake of users and their surroundings. Governments and regulatory bodies can sometimes appear to slow down the innovation process; however, they play a very important role in making sure that technology is not only functional but safe.

Wireless power offers exciting disruptive opportunities for the future of connected devices, but it's paramount that wireless power vendors do their best to ensure their technology is certified and ready for safe public use and adoption. Likewise, OEMs that truly understand and diligently verify applicable wireless power standards through technical examination and common sense before integrating with technologies will ensure the market innovates safely.

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