

# 5G Technology Still Faces Heat, Signal Issues, Expert Says

## Laird's Strader: Wireless Standards Needed

■ By KEVIN COSTELLOE

While there is plenty of hype around the upcoming deployment and application of 5G mobile phones, an expert at a technical conference earlier this month in Anaheim cautioned there are some issues still to be worked out by engineers.

Two key problems that design engineers will need to solve are electromagnetic signal interference (EMI) and the heat issues that affect both the handsets and the transmitter base station cells.

"Many of the final talks of the show yesterday talked about the need of co-engineering or co-design between the EMI, thermal and structural engineers," said **Jason Strader**, director of technology product development at **Laird Technologies Inc.**, a manufacturer of advanced electronics and wireless products.

5G is short for the fifth generation of cellular wireless technology now on its way in the U.S. It's designed to provide high-bandwidth connectivity that can be up to 100 times faster than the 4G LTE connections people rely on today.

The 5G technology operates at higher frequencies and requires putting more high-powered electronics in ever-smaller spaces, producing the overlapping challenges related to electromagnetic interference and heat.

Local companies involved in the deployment of 5G infrastructure include Newport Beach's **Mobilitie**, which is working with numerous wireless providers to roll-out small cell base stations, and the Irvine office of **Crown Castle**, which is handling the Houston-based giant's rollout of small cells on the West Coast.

### Heat Check

"In the past we would provide just the thermal solution, just the EMI solution," Strader told the Business Journal after the **Interpack** conference.

"They're overlapping enough that we now try to provide multi-functional or hybrid solutions."

"There are problems with some of the thermal solutions that cause the EMI issues and vice versa," Strader said, adding that the units need to be cooled "passively" to avoid using even more energy.

"There are 5G cellphones out on the market today that you can purchase, and there are a few test places in the world that actually you can go use your 5G phone such as Las Vegas," Strader said. "Your phone will get extremely hot if it's using 5G and may actually throttle itself after about 30 seconds."

The transmitting devices in test areas "have fans in these little small cells and the neighborhood gets kind of angry about it because makes a lot of noise," he said.

"People that are streaming videos, surfing content and downloading files" will notice a lot of the increased 5G speed, said Strader.



5G's noisy fans irritating neighbors

"Once it's rolled out the problems should be minimal. But it's during the rollout phase is where you may have spotty 5G total signal if they haven't figured out the spacing exactly for the small cells and if they haven't figured out what all can interfere with the signal."

His Laird colleague, staff scientist **Paul Dixon**, in a white paper published in April said: "If design engineers don't address these issues effectively, they risk producing unreliable hardware and even running afoul of FCC regulations.

"5G hype is everywhere you look," Dixon wrote. "From electronics manufacturers to the military to consumers, it seems like everyone is itching to capitalize on the ability to transmit more data, more precisely and faster than ever before."

Dixon also predicted that technologies such as virtual reality gaming will thrive on 5G, which he said "will likely also play a key role in the high-volume data exchange that will be part of autonomous driving advancements.

"More immediately, 5G will facilitate the advent of fixed wireless access, which untethers homes and businesses from fiber optic lines, delivering hyper-fast internet speeds through wireless beams," he wrote.

### Next Up

Reflecting the speed of tech changes, **University of California-Irvine** scientists said they've already developed silicon chips that are at least four times faster than the speed of the upcoming 5G and pushes technology into "the 6G standard."

Commercialization of the super-fast wireless transceiver could be a year or two down the road, project leader and UCI Professor **Payam Heydari** told the Business Journal in July. ■