

How Low-power Wi-Fi Wireless MCUs Are at the Forefront of IoT Innovation



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Today's world is crowded with lots of connectivity technologies, resulting in new types of smart products coming to market daily. With this sort of rapid growth, you need to overcome a few challenges in order to create, produce and market differentiated Internet of Things (IoT) products, including:

- Security.
- Power consumption.
- Limited development resources.
- Evolution of connectivity standards.

In this blog post, I will discuss how new low-power wireless microcontroller (MCU) devices with enhanced security features can help address these challenges.

Why Does Security Matter?

As demonstrated by the major [distributed denial of service \(DDoS\) attack late last year](#) and the recent [accidental bricking of smart locks](#), connected products are subject to a range of security attacks from different vectors, including even routine over-the-air (OTA) firmware updates.

To protect the end user's assets, TI's SimpleLink™ Wi-Fi® CC3220 wireless MCU integrates a host of multilayered software and hardware-based security features, giving you powerful tools to help protect your products from local packet sniffing, man-in-the-middle server emulation, hostile takeovers via OTA updates, remote file manipulation, data and software theft, intellectual property (IP) cloning, and more. Read the blog post, "[Strengthening Wi-Fi security at the hardware level](#)" and watch the "[SimpleLink Wi-Fi integrated security features](#)" video to learn more about our security features.

Low Power Consumption Breeds Innovation

Consumers cringe when they hear that annoying chirp signaling a dying battery in a smoke detector. In a factory, changing a sensor battery in a hard-to-reach place can be outright dangerous. With the installation of more and more wireless IoT devices in buildings or factories, longer battery life is a must, in reducing overall system energy consumption.

With advancements in power saving techniques, it's now possible to use Wi-Fi technology to connect a range of battery-powered devices. Depending on the application, an IoT device using the low-power features can operate as long as five years on two AA batteries by leveraging hibernate sleep mode, which consumes 4.5µA.

Alternatively, an application such as a surveillance camera that requires a continuous wireless connection could operate on a 5,000mAh capacity battery for up to two years by leveraging the CC3220 devices' low-power deep-sleep mode, which consumes 135µA. [Figure 1](#) provides examples of common low-power profiles of SimpleLink Wi-Fi devices.

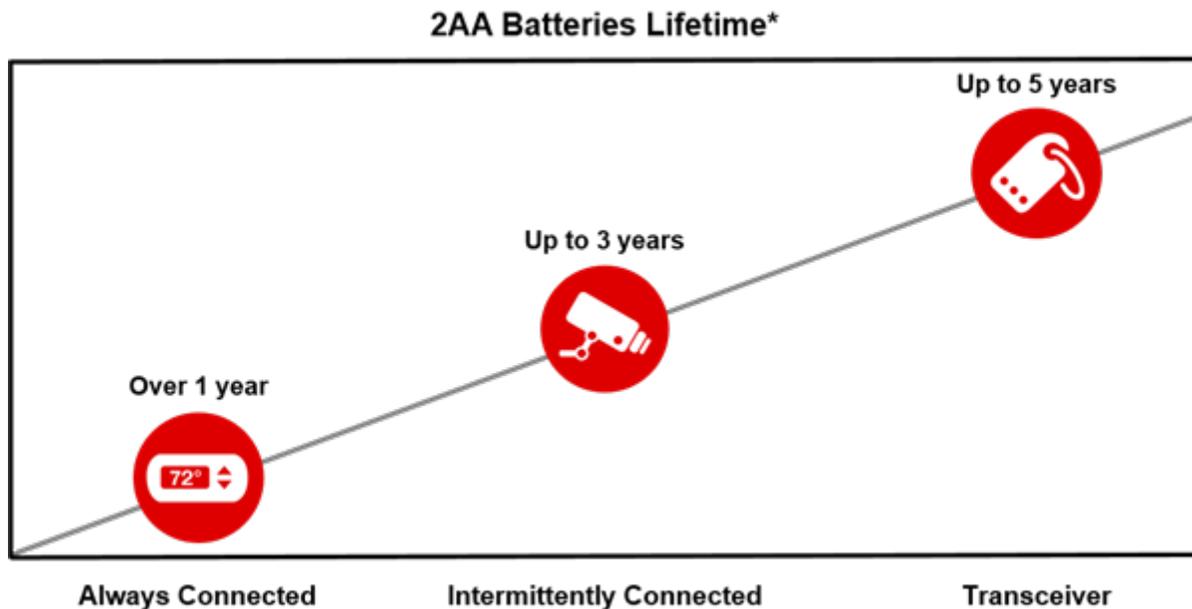


Figure 1. SimpleLink Wi-Fi Common Low-power Profiles

The power consumption of an IoT node is greatly affected by the behavior of the access point (AP) to which it connects. The CC3220 wireless MCU includes TI's proprietary network learning algorithm to ensure consistent low-power numbers with various APs (more than 200 APs) worldwide. Products using the CC3220 device are deployable anywhere and perform well with most APs, while keeping a low power profile.

The Complete Ecosystem to Get to Market

Connected device developers are being pressured on all sides to get to market quickly with limited internal manpower. By using SimpleLink Wi-Fi solutions, you have help from drop-in modules, an IoT cloud ecosystem, extensive interoperability testing, transferrable Wi-Fi certifications and many development tools.

For example, you could use a quad flat no-lead (QFN) device or choose one of the SimpleLink Wi-Fi modules (as pictured in [Figure 2](#)), and avoid the six months that TI engineers spent designing and testing the printed circuit board (PCB). Modules that include an integrated antenna enable you to accelerate your design from development to production. Modules without an integrated antenna give you flexibility in the placement of the antenna on the PCB and in the product's enclosure. The modules have government regulatory certifications such as FCC, SRRG, TELEC, CE/RED and IC. You can build products anywhere and sell them practically anywhere.

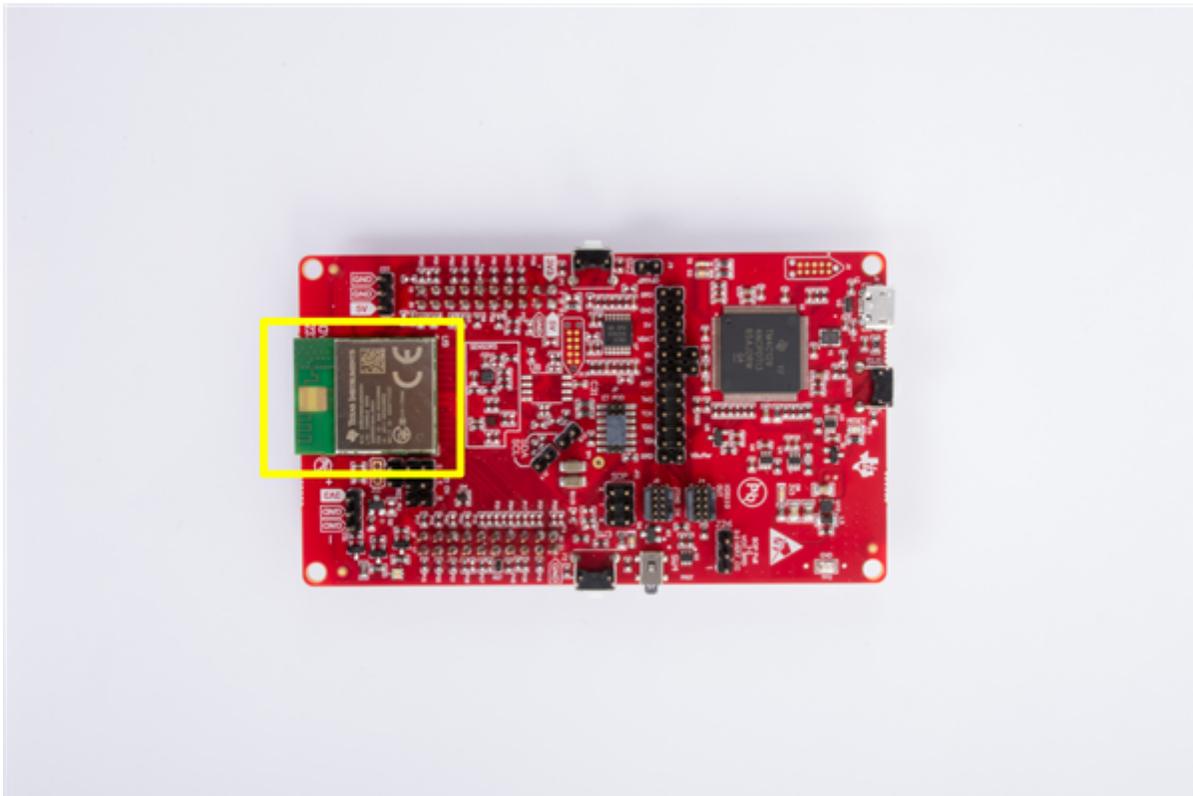


Figure 2. Wi-Fi Module on the LaunchPad™ Kit for Easy Development

The [TI IoT cloud ecosystem](#) also gives you easy access to a wide range of cloud service provider plug-ins, including [Apple's HomeKit](#), [Amazon Web Services](#), [IBM Watson](#) and [Microsoft Azure](#).

Achieving Wi-Fi Alliance certification can usually take months for a development team. By using [Wi-Fi CERTIFIED CC3220/CC3120](#) devices, you can easily [transfer TI's Wi-Fi certification](#) to your final product. Additionally, TI performs interoperability testing with more than 200 of the most popular Wi-Fi APs and routers. So you can concentrate on differentiating features that will provide a competitive advantage when your product gets to market, with the assurance of a robust and Wi-Fi CERTIFIED solution.

No Device Is an Island; Planning for Scalable Designs

Bringing a product to market is one thing, but having a strategy for being a long-term player in the IoT, cloud computing and connectivity marketplace is quite another. Developers need to adapt as application requirements evolve. The [SimpleLink MCU platform ecosystem](#) ([Figure 3](#)) enables and supports such a strategy. [SimpleLink MCU devices](#) share the same software development environment and unified tool chain, while supporting a range of connectivity standards including Wi-Fi, Sub-1 GHz and [Bluetooth®](#) low energy. Therefore, you can reuse the knowledge and code you learn on one device to expand or update your IoT product offerings when application requirements change.

SimpleLink™ MCU Platform

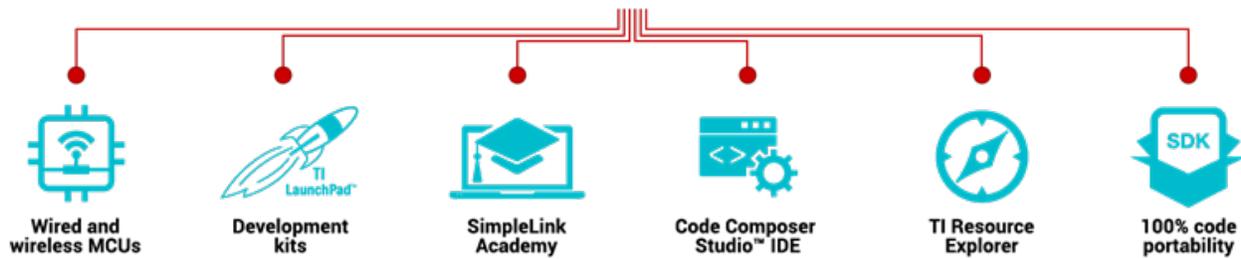


Figure 3. You Have Access to a Range of Tools and Resources with the SimpleLink MCU Platform

The innovations packed into the SimpleLink Wi-Fi CC3220 wireless MCU can help you address these IoT challenges, so you can focus on creating a differentiated, secure product.

Get started today and accelerate your development to production with the SimpleLink MCU platform.

Additional Resources

- To learn more about low-power consumption:
 - Download the application note, “[SimpleLink CC3120, CC3220 Wi-Fi Internet-on-a chip Networking Subsystem Power Management.](#)”
 - Watch the “[SimpleLink Wi-Fi CC32XX Power Management Framework](#)” video.
 - To learn more about security:
 - Read “[Understanding security features for SimpleLink Wi-Fi CC3x20 MCUs.](#)”
 - Order your Wi-Fi module:
 - www.ti.com/product/cc3220mod
 - www.ti.com/product/cc3220moda
 - www.ti.com/product/cc3120mod

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