



The SYN461x is an ultra-low-power (ULP) Wi-Fi® 6E (2.4/5/6 GHz), Bluetooth® 6.0 and Bluetooth Low Energy (BLE), and IEEE 802.15.4 (Zigbee®/ Thread™) system on chip (SoC). Designed for the embedded Edge AI Internet of Things (IoT), the SYN461x is optimized for power, system integration, size, and rapid time to market while delivering superior rate-over-range performance and seamless interoperability. The versatile Matter-compliant SoC offers the latest Bluetooth features, such as Channel Sounding and LE Audio—including Auracast™—and features an integrated RF front end with PA, LNA, and RF switches in a low-pin-count WLPGA package that helps reduce board costs by up to 25%. An integrated processor offloads the host application processor to minimize system power consumption. The SYN461x targets consumer and industrial applications in devices such as wearables, smart watches, audio speakers and headsets, home appliances, security cameras, asset trackers, and factory automation.



Benefits

- Reduced system area, cost, and complexity with integrated PAs, LNAs and T/R switches.
- Package options optimized for high density or low-cost PCBs.
- Supports IEEE 802.11ax (Wi-Fi 6E), Bluetooth Classic, BLE, and IEEE 802.15.4.
- Efficient system power through design enhancements and host CPU offloading.

Applications

- Wearables: smart watches and AR/VR glasses
- Home appliances
- Printers
- IP cameras
- Audio speakers and headsets



SUPPORTS WI-FI, BLUETOOTH, AND 802.15.4



LOW SYSTEM COST THROUGH EXTENSIVE BOM INTEGRATION



POWER OPTIMIZED TO EXTEND BATTERY LIFE



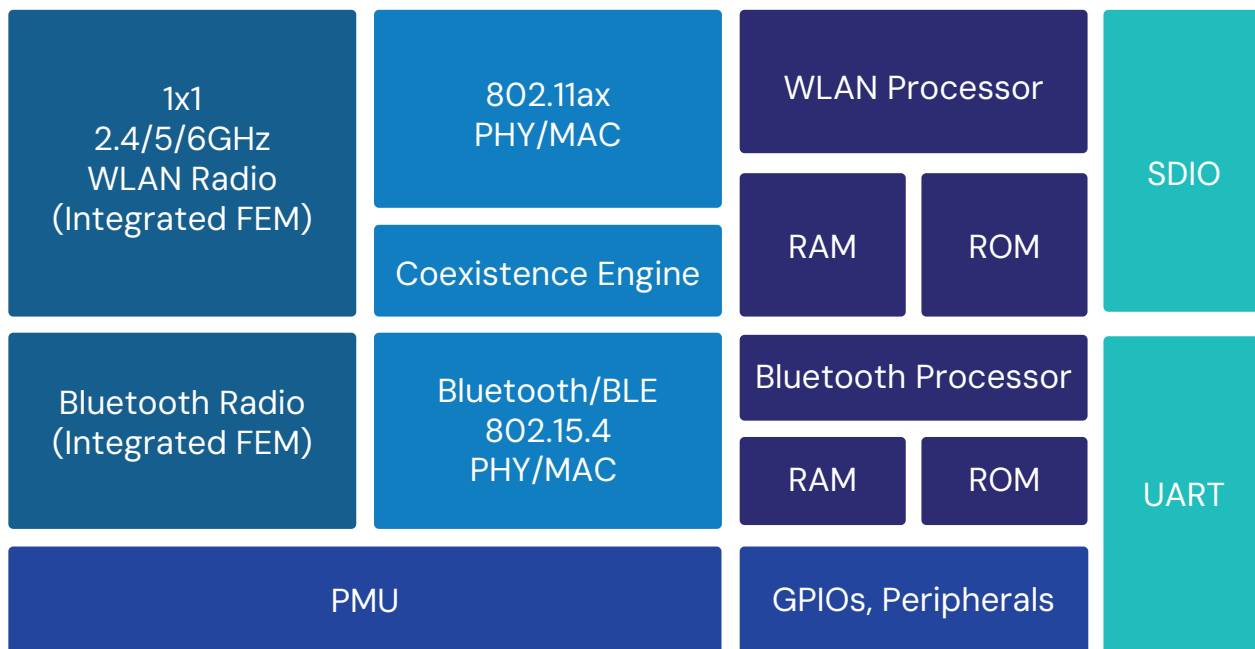
SUPERIOR RF RANGE AND INTEROPERABILITY

Features

- Single-chip solution with support for IEEE 802.11 a/b/g/n/ac/ax (Wi-Fi 6E), Bluetooth Classic, BLE, and IEEE 802.15.4 for Thread/Zigbee.
- Up to Tri-band 1x1 Wi-Fi 6E support across 2.4GHz, 5GHz, and 6GHz.
- Minimized system cost with fully integrated rBOM, including PA, LNA, RF switches, PMU, and LPC package for low-cost PCBs.
- Optimized for best-in-class power consumption, enabling extended battery operation.
- Bluetooth Channel Sounding for precise distance measurement.
- High Bluetooth Tx power for superior range.
- Robust security including Secure Boot.
- SDIO 3.0 interface for Wi-Fi and UART for Bluetooth/802.15.4 connectivity.
- External coexistence interface for seamless operation with LTE and GNSS technologies.

Synaptics SYN461x

Triple Combo with Wi-Fi, Bluetooth/BLE, and IEEE 802.15.4 for best in ULP performance and cost



System Block Diagram



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