



icyTRX-LE-22 Bluetooth® Low Energy 6.2 PHY IP with Channel Sounding

High RF performance at the lowest cost

The icyTRX-LE-22 RF transceiver PHY IP delivers an optimal trade-off between power consumption and Bluetooth Low Energy (LE) RF performance – excellent sensitivity and strong interference rejection – while minimizing the overall cost for IoT applications.

Occupying just 0.57 mm² in a 22 nm technology (7 metal layers), the analog RF portion of the IP integrates on-chip passives and Built-In-Self-Test (BIST) structures to drive down silicon area, wafer cost, bill of materials, and production-test expenses.

Thanks to its built-in LDOs, programmable modem, and its interface compatible with leading Bluetooth baseband controllers (Hardware and software-based), the icyTRX-LE IP is optimized for seamless ASIC and SoC integration.

Key features

- Compliant with Bluetooth Low Energy 6.2 Core Version and integrating all existing features, including Channel Sounding, LE 2Mbps, Long Range (Coded 125 and 500 kbps), Direction Finding (AoA, AoD), LE Audio.
- Flexible modem compatible with 802.15.4-2015 and other modulation schemes (various pulse shape, data rate, and modulation index)
- Programmable packet handler, supporting a multitude of packet structures, including Link Layer functionalities thanks to hardware accelerators (CCM-AES, CRC, etc.)

Key specifications

- 22 nm CMOS, 7 metal layers
- Automotive Grade 1 temperature range: -40°C to +125°C
- Ultra low power consumption:
 - 0.87 V supply voltage (LDO input)
 - 3.9 mW in RX LE1M mode (including modem)
 - 6.8 mW in TX mode with 0 dBm output power
- Best-in-class sensitivity: -99 dBm for 1 Mbps (-101 dBm in boost mode)
- Configurable output power: -20 dBm to +8 dBm
- 48 MHz ultra low consumption crystal oscillator
- Designed for ultra-compact WCSP and QFN packaging

Typical applications

- Healthcare monitoring
- Access control system (digital keys)
- Electronic shelf label
- Beacons
- Indoor positioning
- Asset and personal item tracking
- Wireless sensor networks
- Alarms and security systems
- Home automation
- Wireless mouse and keyboard
- LE Audio hearing aids, earbuds, wireless headsets and speakers

