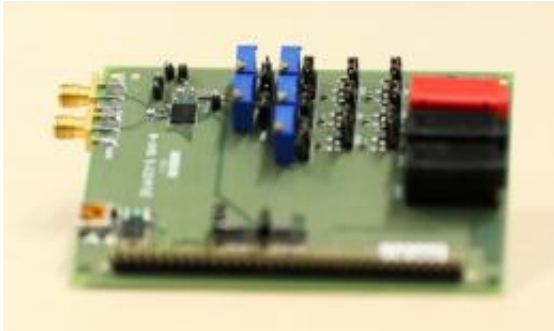


# New record low-power multi-standard transceiver for sensor networks

23 February 2012



Imec's ultra low power multistandard 2.4 GHz transmitter compliant with four wireless standards (Bluetooth Low Energy, Zigbee, IEEE802.15.4/4f/6).

Imec and Holst Centre announce a 2.3/2.4GHz transmitter for wireless sensor applications compliant with 4 wireless standards (IEEE802.15.6/4/4g and Bluetooth Low Energy). The transmitter has been fabricated in a 90nm CMOS process, and consumes only 5.4mW from a 1.2V supply (2.7nJ/bit) at 0dBm output. This is 3 to 5 times more power-efficient than the current state-of-the-art Bluetooth-LE solutions. These results have been obtained in collaboration with Panasonic, within imec and Holst Centre's program for ultralow-power wireless communication.

Applications for [wireless sensor](#) networks, personal healthcare, remote monitoring, smart building and logistics all require wireless low-power solutions. A common requirement is that they can operate for a reasonable long period on a small battery or harvester source. For such applications, standardization bodies have defined 2.4GHz wireless standards in the worldwide available ISM band, including IEEE802.15.6 (BAN) for body area networks, IEEE802.15.4 (Zigbee) and Bluetooth [Low Energy](#) (BLE). But all recent transmitters that comply to these standards use in the range of 20~50mW, which is still too high for use in autonomous and semi-autonomous sensor nodes.

[Imec](#)'s new transmitter saves at least 75% of power consumption by replacing several power-hungry analog blocks with digitally-assisted circuits. The result is a transceiver that is compliant with all 4 of the standards, but that runs on a mere 4.5mA from a 1.2V supply (2.7nJ/bit). The multi-standard transceiver is highly reconfigurable; it has been demonstrated to support the required modulations and data rates from 50k~2Mbps. With the SD<sup>2</sup>DPA for the generation of the time-variant signal envelope, it is also the first published ultralow-power 2.4GHz-ISM band IEEE802.15.6-compliant transceiver.

This innovative transceiver is presented at the 2012 IEEE International Solid-State Circuits Conference (ISSCC) in San Francisco (February 19-23).

Source: IMEC

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