



Transforming Wireless Solution Energy Efficiency and Flexibility

Industry Problem Statement

The most critical issue holding back the market development and growth of battery-based IoT solutions is the significant amount of power required by today's "old-technology" analog-centric radio architectures. Battery-based IoT products don't last long enough between recharging or battery changes to be acceptable - even to early-adopter consumers. The underlying issue: Basic radio signal processing architectures used by wireless communication products today are based on a 25-year old RF technique known as IQ radio data representation. The IQ (which stands for in-phase and quadrature – the way that the RF waveform data is represented inside the radio) radio architecture is used in all popular Wi-Fi, Bluetooth, Zigbee, Z-Wave and radios in the market today. Today's wireless signal processing architectures were developed long before the need for battery-based wireless devices were even contemplated. Traditional semiconductor radio technology is power hungry and not well suited for battery-based wireless applications. The absence of a low power radio technology is negatively impacting the growth and potential of battery-based wireless IoT products.

Company Focus

InnoPhase is a fabless wireless semiconductor platform company specializing in extreme low power wireless IoT solutions. The company has created PolaRFusion™, an innovative digitally-intensive radio architecture that dramatically reduces the amount of power required to transmit, process, and receive wireless information using industry standard wireless protocols. The PolaRFusion architecture moves much of the radio signal processing from power-hungry analog circuits found in today's wireless solutions into highly efficient digital logic. Battery-based "edge-of-the network" IoT products will now be able go weeks or months longer between battery changes. InnoPhase technology enables an entirely new category of high volume, battery-powered consumer, commercial, medical and industrial applications that are simply not possible using today's wireless semiconductor technology.

Date Incorporated

Late 2012

Company Founders

Dr. Dahong Qian (CEO), Dr. Yang Xu (CTO)

Locations

The company is headquartered in San Diego, California with an additional development center in Kista, Sweden.

Employees

55+ (Q1-2019)

Corporate Funding

InnoPhase is funded by a variety of sources including private investments and tier-one venture capital firms.

Market Focus

InnoPhase is targeting the development of cost-effective wireless semiconductor platforms for high volume, battery-based consumer, commercial, medical, and industrial wireless IoT products running Wi-Fi, Bluetooth, Zigbee™ and emerging wireless IoT standards.

Technology InnoPhase Solution

InnoPhase has created the PolaRFusion wireless platform architecture that has moved significant portions of a semiconductor radio's large and power-hungry analog RF processing into efficient digital logic. The InnoPhase solution the industry's first extreme low power Smart Digital Radio platform. The PolaRFusion architecture includes all major radio processing functionality including the advanced digital polar transceiver, an innovative flexLNA™ design, and a fully digital high efficiency power amplifier. This high level of component integration keeps total IoT product solution costs to a bare minimum.

Key Differentiators

- **Extreme low power for long battery life** – Wireless semiconductor platforms based on the Company's digital PolaRFusion radio architecture set a new industry benchmark for low power and maximum battery life in energy critical IoT wireless applications
- **High level of solution flexibility for today's and tomorrow's IoT platforms** – The PolaRFusion radio architecture can be applied to a wide range of industry standard wireless protocols including Wi-Fi, Bluetooth, Zigbee, NB-IoT, LTE, and a host of other popular and emerging wireless standards.
- **Complete wireless solution integration to minimize product cost** – The efficient InnoPhase digital intensive design enables the integration of almost the entire wireless solution that is found in a traditional module level product including the digital based radio, an MCU for lightweight applications, memory, I/O and RF support circuitry.
- **Technology with a long life** -- The move from an analog-intensive IQ architecture to a digital based PolaRFusion RF design means that wireless solutions can finally get onto Moore's Law Curve. Traditional analog intensive IQ radios have "hit a wall" with limited low power gains and cost reductions even possible. The digital PolaRFusion architecture enables semiconductor radios move to even lower levels of power consumption and smaller, less expensive die sizes as more advanced semiconductor process nodes are used in the design.

Typical Product Applications

InnoPhase wireless semiconductor products address the market for battery driven smart audio speakers, remote security cameras, sensor modules, portable patient monitoring devices, wearables and other energy critical edge-of-network wireless IoT applications. These applications require an extreme low power direct-to-cloud connection using existing popular and emerging wireless standards.

Product Availability

InnoPhase wireless platform semiconductor products are in the late stages of commercialization. Product sampling is now taking place with key volume customers. Commercial availability of the Company's extreme low power wireless platform will take place in early 2019.