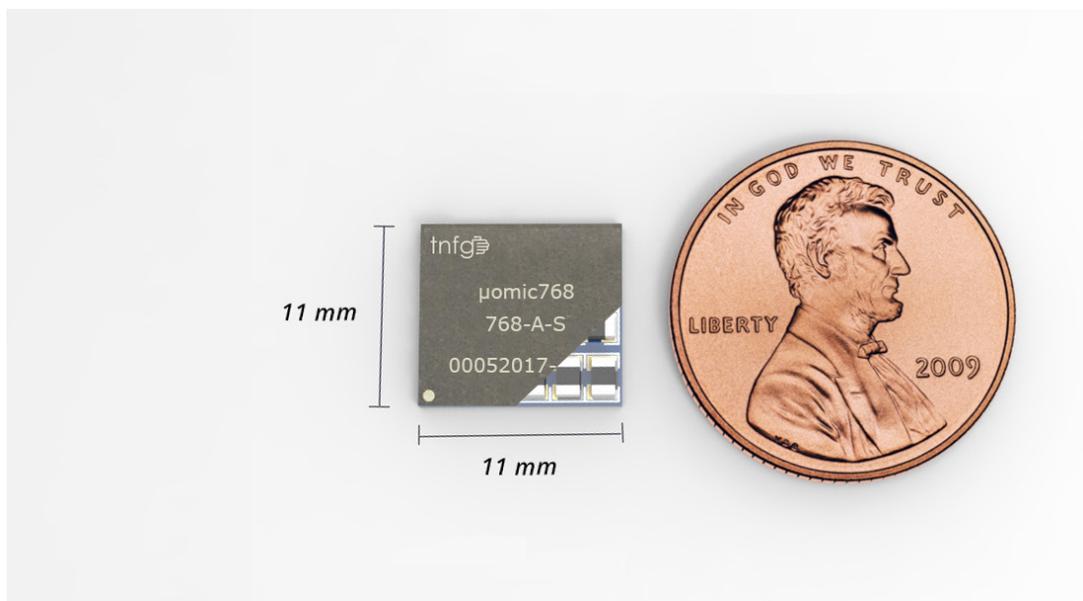# Tecnofingers (TNFG)

Speeding Up Electronic Product Development with Maxim Power Management and Sensor ICs

One of TNFG's newest solutions is its UOMIC power management IC, designed for multiple applications.

Headquartered in Valencia, Spain, Tecnofingers (TNFG) has developed a modular system called rhomb.io to help electronic designers quickly build, design, or test their products. "Using our revolutionary rhomb.io system, designers can meet their needs in the shortest time, while eliminating flaws or the need to design hardware and software from scratch before their final design is approved," notes Pedro Pelaez, the company's technical director.

One of the most important challenges for internet of things (IoT) applications is that the devices need to be semi-customized or customized completely, depending on the market. Time to market and development cost are other key considerations. TFNG's objective is to provide its customers with the easiest way to design devices by pre-assembling different ready-to-use elements in a system. All of the parts are designed to make life easier for IoT design teams. "For example, imagine if you design an SoC that will be in the same place for a long period, like years. You would have to upgrade the hardware and make sure it is still usable x years from now. Rhomb.io allows you to build something and get very quick results. This is a better way to design something from scratch more easily and faster than with a traditional method," said Pelaez.

Challenge

- Needed small ICs and great technical support

Solution

- **MAX30101** pulse oximeter and heart-rate sensor
- **MAX44005** RGB color, temperature, and infrared proximity sensor
- **MAX8814** 28V linear Li+ battery charger with smart autoboot assistant
- **Voltage regulators**
- **Optical bio analog front-end**

Benefits

- Small Maxim ICs met small form factor requirement
- Maxim's technical expertise supported the company through its product development
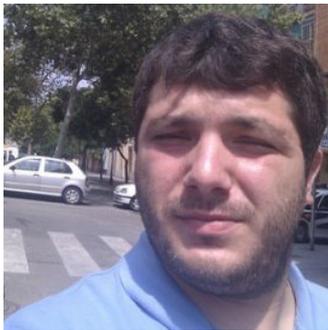
"Using our revolutionary rhomb.io system, designers can meet their needs in the shortest time, while eliminating flaws or the need to design hardware and software from scratch before their final design is approved."

- **Pedro Pelaez**, Technical Director, TNFG

rhomb.io provides a large selection of ready-to-use components such as motherboards, processor cores, and a variety of functional modules that designers can pick and choose for their end products. They can easily update existing products before they become obsolete by swapping in new rhomb.io pieces and also reuse rhomb.io pieces in new products. The rhomb.io system is open, so fabrication data, design guides, schematics, and software libraries are available and free for use. "Like Legos, you can select the modules easily. Once you've done the first product, you can reproduce it in volume. This is the only system in the world that allows this kind of modularity," said Pelaez.

Challenges

As TNFG evaluated ICs for its modular system, which is only 5mm to 10mm in thickness, its key criteria were small package size and good technical support. The company found its answer in an array of Maxim ICs.

Solution and Benefits

TNFG's modular system includes these Maxim components:

- **MAX30101** pulse oximeter and heart-rate sensor
- **MAX44005** RGB color, temperature, and infrared proximity sensor
- **MAX8814** 28V linear Li+ battery charger with smart autoboot assistant
- **Voltage regulators**
- **Optical bio analog front-end**

The variety of functions these ICs provide reflect the diversity of modules that rhomb.io offers. For example, the engineering team used the MAX30101 in a smartwatch it developed from the ground up for a customer. The team also plans to add

the sensor to its Rhomb.io Sensing MixOne Module, which provides a variety of sensing capabilities on a single board. The MAX44005 is also in the smartwatch as well as a GPS family of devices and one of the company's modules. The combination of the MAX30101 with the optical bio analog front-end supports high-performance fitness applications (including the smartwatch) with ultra-low power for long battery life. As for the voltage regulators, the company uses these parts in most of its projects for their efficiency, reliability, and durability.

TNFG recently launched its UOMIC complete power management IC (PMIC) that powers a core processor, external memory, and peripherals from a small single chip. Suited for multiple applications and developed with Maxim ICs, UOMIC contains buck converters, LDOs, real-time clock, backup battery charger, manual reset and shutdown inputs, reset output, input and output interrupts, and a UART serial interface to program individual regulator output voltages and on/off control.

"We have 150 kinds of modules, 50 kinds of mixed controller modules, and 50 kinds of processors," notes Pelaez. "Our customers have a wide range of solutions, so we give them a variety of options to build their products."

Not only did the Maxim parts provide the small form factor that the company needed, but the company was also pleased with the technical support provided by the Maxim team. When the company was just getting started, said Pelaez, the Maxim team believed in what they were building and supported them through their product development process.

"The only way to reach the best is to invest in R&D," said Pelaez. "We're continuously developing and selling our system, and we expect next year will be really great."

Learn more at www.maximintegrated.com

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