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He has chosen the term “fabless” to describe the company’s business as it designs ICs without using the customary fabrication plant.

To create a solid foundation for the business, he and his team have developed core IC technologies that are based on what he calls “mixed-signal” design, which integrates the strength of analogue and digital technologies into a single IC.

Realising that it is not possible to compete with the world’s giant semiconductor companies, with their huge resources and budgets for complicated chip development, Manop has decided to design chips that will be used mainly in what have become known as smart devices – devices with a self-contained computer.

RFID, or radio frequency identification, is also a technology that he has chosen for his design, mainly because the technology enables a device to not only communicate but is also capable of identifying itself using radio frequencies.

“Since we cannot compete with giant global companies, we have to think of something else. It must be something that is different, with outstanding features and better performance, and impor-

tantly, at an even better price,” he said.

To demonstrate the company’s capability in design, Manop and his team last year developed a new microchip of only 0.30 square millimetres that uses the same technology. The development at that time challenged one of the world’s largest semiconductor companies since its aim was to design and produce what was then considered the tiniest chip in the world.

It won the position of being the world’s smallest chip, and held that spot for quite a while. The development enabled the company to produce a “super low-cost” microchip. It was designed as a 256-bit electrically erasable programmable read-only memory, with a user-modifiable read-only memory that could be erased and reprogrammed repeatedly through the application of higher-than-normal electrical voltages.

Moving further to develop chips of higher grades, Manop has been toiling to create a self-powered wireless temperature sensor using RFID technology.

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oped are all self-powered,” he said.

The company has combined an embedded temperature sensor unit with passive RFID circuitry in a single-chip for commercial use. The emerging technology, dubbed sensor RFIDs, is expected to supersede the traditional sensor-wired equipment, making it possible to measure environmental parameters more freely and wirelessly without physical or visual contact.

“We’re moving towards pressure, humidity or chemical-sensing tools. RFID suits us fine as it can be fixed anywhere. It will usher in a new age in measurement,” he said.

Having started the development in the middle of last year, the company said the temperature sensor RFID could be used with various applications, especially in areas where an appropriate temperature level is essential.

The sensor RFID is 950 x 1.5 microns in size and packed with sensors designed to measure industrial-grade temperatures, from minus 40 degrees to 120 degrees Celsius, with a maximum resolution of eight bits.

He said warehouses, cold-storage facilities and product distributors could have miniature RFID tags attached to styrofoam packaging on a tray hold-

ing food, or in a freezer chamber, to monitor the surrounding environment.

The company is trying to transfer the design to a temperature sensor that can be implanted for animal healthcare applications with minimal structural modification.

“The chip was out there in the market but came without any memory. This will be for a niche, premium market,” said Manop. He said RFID chips are marketed globally at US\$5 (Bt195) a unit, each calling for an external power supply.

Chances are Silicon Craft will market its sensor RFID chip at \$2 per piece. The company expects the chip will be emulated for future low-power smart sensors.

Toward the goal of being both a regional and global leader in the field, Manop said he has still much to accomplish in the near future. Part of his plan is to develop the next-generation temperature sensor chip that would perform calibration algorithms on its own.

“Such a development would be somewhat different from what exists in the market. We are a research firm and our team comprises Thai intellectuals. Through our creativity we believe that we can find a position in the world market,” he said. ■