

Toshiba announces new cutting-edge CMOS silicon on insulator process

New process will enhance the noise figure of RF switches and low noise amplifiers for 5G and Wi-Fi applications

Düsseldorf, Germany, 27th February 2020 – Toshiba Electronics Europe GmbH has improved the characteristics of their silicon on insulator (SOI) process technology for RF switch /LNA ICs. The process, known as TaRFSOI™ (Toshiba RF SOI) is SOI-CMOS (silicon on insulator complementary metal oxide semiconductor), is an original front-end process technology that Toshiba developed for RF switch ICs.

As the performance of mobile devices including smartphones is constantly improving, their wireless frequencies are becoming higher. There are general concerns that receiving sensitivity deteriorates at higher frequencies in the same manner as signal loss increases between an antenna and a receiving circuit. Therefore, there are increasing needs for the enhancement of the characteristics of LNAs in order to improve the received signal quality by compensating for signal loss.

The latest generation process (TaRF11) makes it possible to significantly improve the characteristics of low noise amplifiers (LNAs). This new process offers additional enhancement to RF characteristics when compared with TaRF10 – the current generation SOI-CMOS process. A key parameter for these devices is their noise figure (NF) that compares the signal-to-noise ratio at the input and output.

TaRF11-based MOSFETs, intended for use in LNAs, achieved a minimum noise figure (NF) of 0.48 dB @ 8 GHz, an improvement of 0.3 dB compared to similar devices developed with TaRF10. In common with TaRF10, the TaRF11 process allows the LNA, RF switch and control circuit to be fabricated on a single chip.

Innovative RF switch ICs are developed using Toshiba's TaRFSOI process in conjunction with the group production facilities (Japan Semiconductor Corporation), allowing new products to be brought to market swiftly.

As end-use technology evolves, Toshiba will continue to develop their process to meet the market needs, including the move from 5 GHz to 7 GHz planned in the smartphone arena. In addition, Toshiba plans to develop devices for 7 GHz to 10 GHz ultra-wide band (UWB) using the TaRFSOI process.

About Toshiba Electronics Europe

[Toshiba Electronics Europe GmbH](#) (TEE) is the European electronic components business of [Toshiba Electronic Devices and Storage Corporation](#) (Toshiba). TEE offers European consumers and businesses a wide variety of innovative hard disk drive (HDD) products plus semiconductor solutions for automotive, industrial, IoT, motion control, telecoms, networking, consumer and white goods applications. The company's broad portfolio encompasses integrated wireless ICs, power semiconductors, microcontrollers, optical semiconductors, ASSPs and discrete devices ranging from diodes to logic ICs.

TEE has headquarters in Düsseldorf, Germany, with branch offices in France, Italy, Spain, Sweden and the United Kingdom providing design, manufacturing, marketing and sales. Company president is Mr. Tomoaki Kumagai

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