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Press Release

Toshiba introduces SOI process for low-noise RF Amplifiers

New process will deliver low noise figures for smartphone applications

Düsseldorf, Germany, 22 February 2018 – Toshiba Electronics Europe today announced the development of TaRF10, a next generation TarfSOI™ (Toshiba advanced RF silicon-on-insulator[1]) CMOS process optimized for low-noise amplifiers (LNAs) in smartphone applications.

In recent years, the increasing speed of mobile data communication has expanded the use of RF switches and filters in the analog front end of mobile devices. The resulting increase in signal loss between the antenna and receiver circuits has degraded receiver sensitivity, and focused attention on LNAs with a low Noise Figure (NF) as a means to compensate for signal loss and improve the integrity of the received signal.

Toshiba has used its new TaRF10 process to develop a prototype LNA with an outstanding noise figure of 0.72dB and a gain of 16.9dB at a frequency of 1.8GHz. Supplied from a 1.8V source, the prototype consumes just 50µA in bypass mode and offers a NF of 0.72dB.

Mobile devices use multiple RF switches and LNAs in the receiver circuit, requiring reduced circuit size to reduce required board area. Current LNAs typically use silicon-germanium-carbon (SiGe:C) bipolar transistors, making it difficult to integrate LNAs and RF switches fabricated with different processes on the same chip.

The new TaRF10 process can integrate LNAs, control circuits and RF switches on a single chip, as it is highly compatible with RF switches based on the TaRF8 and TaRF9 processes – both of which have outstanding RF characteristics. TaRF9 realizes lower insertion loss and signal distortion than TaRF8. Toshiba now plans to bring to market LNAs with integrated RF switches.

Toshiba has developed RF ICs utilizing its subsidiary, Japan Semiconductor Corporation to implement the latest SOI-CMOS technology. By directly managing all aspects from RF process technology development to design and manufacturing, Toshiba has secured a rapid product launch.

To meet next-generation market requirements for 5G smartphones, the company will continue to further improve the characteristics of the TarfSOI™ process and develop RF ICs with cutting-edge technology.

Notes:
[1] TarfSOI™ (Toshiba advanced RF SOI): Toshiba's unique SOI-CMOS (silicon-on-insulator-complementary metal oxide semiconductor) front-end process

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About Toshiba Electronics Europe
Toshiba Electronics Europe (TEE) is the European electronic components business of Toshiba Electronic Devices and Storage Corporation. TEE offers a broad IC and discrete product line including high-end memory, microcontrollers, ASICs and ASSPs for automotive, multimedia, industrial, telecoms and networking applications. The company also has a wide range of power semiconductor solutions as well as storage products including HDDs, SSDs, SD Cards and USB sticks.

TEE was formed in 1973 in Neuss, Germany, providing design, manufacturing, marketing and sales and now has headquarters in Düsseldorf, Germany, with branch offices in France, Italy, Spain, Sweden and the United Kingdom. TEE employs approximately 300 people in Europe. Company president is Mr Akira Morinaga.
For more company information visit TEE's web site at www.toshiba.semicon-storage.com.

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February 2018 **Ref. 7124/A**