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EDITORIAL

Special Issue on the German RoCC Project

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In the last decades, many efforts have been undertaken to improve traffic security, both with passive as well as with active measures, e.g. safety belts, airbag, antilock breaking systems, electronic stability control, etc. In 1999, the first automotive radar has been introduced into high-class cars of Mercedes-Benz, at that time as a comfort system only. Today, radars are involved increasingly also in security systems for crash mitigation, blind angle detection, rear traffic crossing alert, or lane change assistant. While the "long-range" forward-looking radar sensors operate in the 76–77 GHz frequency band, close-range systems are found in the 24 GHz ISM or in the wideband 21.65–26.65 GHz frequency range. The latter one with its large bandwidth allows an excellent range resolution, but its legal allocation to this application is limited to the year 2018. As replacement, the frequency range from 77 to 81 GHz has been allocated in Europe.

On the one hand, this new band with its high frequency and large bandwidth poses a number of challenges with respect to functionality and fabrication cost compared to the lower 24 GHz frequency range, therefore, the German Federal Ministry of Education and Research (BMBF) funded two research projects to develop necessary technologies and novel concepts for affordable sensors in the new frequency band, the first was called KOKON (automotive high frequency technology at 77/79 GHz) and ran from 2004 to 2007. In 2008, the second project called RoCC (radar on a chip for cars) was started, finished in 2011/2012. This special issue is intended to inform the microwave community about major results of the RoCC project, resulting in improved SiGe circuits, novel packaging approaches, broadband planar antennas, and sensor demonstrators already close to future products.

A short overview of the RoCC is given by the project coordinator, Dr. Rudolph Lachner from Infineon, Munich, followed by a number of papers on different topics out of the project.

Wolfgang Menzel received the Dipl.-Ing. degree in Electrical Engineering from the Technical University of Aachen, Germany, in 1974, and the Dr.-Ing. degree from the University of Duisburg, Germany, in 1977. From 1979 to 1989, he was with the Millimeter-Wave Department, AEG, Ulm, Germany [now the European Aerospace, Defense, and Space Systems (EADS)], which he finally headed from 1985 to 1989. During that time, his areas of interest included planar integrated circuits (mainly on the basis of fin-line techniques), planar antennas, and systems in the millimeter-wave frequency range. In 1989, he became a Full Professor with the Institute of Microwave Techniques, University of Ulm, Germany. His current areas of interest are multilayer planar circuits, waveguide filters and components, antennas, millimeter-wave and microwave interconnects and packaging, and millimeter-wave application and system aspects. Dr. Menzel is a Fellow of the IEEE.

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