

World first 79 GHz radar transmitter in 28nm CMOS

18 February 2014, by Hanne Degans



Imec's continuous wave radar transmitter operates in the 79 GHz band. Implemented in 28nm CMOS, with a supply voltage of 0.9V, it only consumes 121mW and is fully compliant with the spectral mask imposed by ETSI. Phase modulation guarantees high resilience against interference and enables code-domain multiple-input, multiple-output (MIMO) radar.

These results were presented at last week's ISSCC2014 (San Francisco): A 79GHz phase-modulated 4GHz-BW CW Radar TX in 28nm CMOS. Giannini et al.

Imec, in collaboration with Vrije Universiteit Brussel, Brussels, Belgium, presents the world's first 79 GHz radar transmitter implemented in plain digital 28nm CMOS. With an output power above 10dBm, the transmitter front-end paves the way towards full radar-on-chip solutions for automotive and smart environment applications.

Mm-wave [radar](#) systems, featuring a range resolution finer than 10cm and an [angular resolution](#) finer than 10 degrees, will be used in next-generation driver assistance systems to improve safety in blurry conditions (dust, fog, and darkness) where image-based [driver assistance systems](#) fail. However, the high bandwidth and carrier frequency needed to achieve such high resolution, wide field of view and high angular resolution, translate into large, expensive and power hungry mm-wave antenna arrays. A low power compact radar technology will be key to enable the application of mm-wave sensors in next generation automotive and smart environment applications.

Imec welcomes industrial and academic partners for joint R&D. After developing receiver functionality (by end 2014), [imec](#) aims at building a complete multi-antenna lab prototype by the end of 2015. Afterwards, integration of ADCs and digital logic will lead to a full SoC.

Provided by IMEC

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