

# World first 79 GHz radar transmitter in 28nm CMOS

February 18 2014, by Hanne Degans

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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'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 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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