

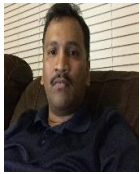
MWSCAS 2021 Tutorial Abstract (Aug 8th 2pm to 4pm EDT)

Analog, Mixed Signal and Power Integrated Circuits (ICs) for automotive applications

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Automotive ICs (Integrated Circuits) have seen more integration of high voltage power transistors in the last decade. This trend continues with several low ohmic power transistors getting integrated with R_{ds_on} ranging from $30m\Omega$ to 7Ω based on their application. As semiconductor suppliers increase their expertise in integration, the requirements for automotive ICs continue to increase. In this tutorial, State of the Art, large scale integration (aka System Basis Chips (SBC)) of power circuits like switching converters, Low Drop Out regulators, wave shaped transceivers, complex digital circuitry and low to medium voltage analog cores on a single substrate with advanced diagnostics are discussed. These diagnostics detect the nature of the loads and potential faults (open pins, short circuit to ground, battery etc..) at system level. In addition, the tutorial discusses about the Multiple Supply Voltages (MSV) circuits, level shifting schemes to handle the supply domain crossing, supply faults wave shaping techniques for reduced RF emissions, cross talk between independent circuits due to common supply and ground strategies and how they are mitigated. This is not only applicable for automotive but also industrial and other high voltage consumer ICs.

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Dr. -Ing. Sri Navaneeth Easwaran, Senior Member IEEE, received his Bachelor's (1998, Bharathidasan University), Master's (2006, University Twente) degrees in Electrical Engineering and Dr. -Ing. degree from University of Erlangen-Nuremberg in 2017. He worked at SPIC Electronics, STMicroelectronics, Philips Semiconductors between 1998 and 2006. From 2006 he is with Texas Instruments (TI) where he was the design lead of airbag squib driver ICs. and System Basis Chips. He is an IET Fellow (Feb 2021), TI Senior Member Technical Staff, has 20+ granted patents and 14 publications. He has offered tutorials on automotive ICs at IEEE Conferences. Since Dec 2020, he is offering iDLP (Industrial Distinguished Lecturer Program) CASS seminars on smart automotive circuits.



Dr. -Ing. Dr.-Ing. habil. Robert Weigel, Fellow IEEE and Fellow ITG, is Full Professor at the University of Erlangen-Nuremberg, Germany. He co-founded several companies some of which were later overtaken by Infineon, Intel and Apple, respectively. He has been engaged in microwave electronic circuits and systems and has published more than 1200 papers. He received the 2002 VDE ITG-Award, the 2007 IEEE Microwave Applications Award, the 2016 IEEE MTT-S Distinguished Educator Award, the 2018 Distinguished Service Award of the EuMA and the 2018 IEEE Rudolf Henning Distinguished Mentoring Award. He has been Distinguished Microwave Lecturer, MTT-S AdCom Member, and the 2014 MTT-S President.