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**Speech subject：** Robust Power Package Design with Simulation Driven Product Development

***Speech leader:*** Haibo Fan—Senior Principal Engineer, Nexperia Hong Kong

**Speech Description/Objective:**
Simulation Driven Product Design and Development for Robust Power Package

The design of power packages with both high efficiency and high-power density performance while maintaining the highest possible reliability is a challenge. However, there are a lot of reliability concerns, like delamination, die crack and solder crack etc. in power package, design optimization is needed to lower risk as possible. At same time, more strict requirement is addressed by customer to meet high requirements for application of automotive products. Therefore, a well understanding of factors causing these concerns can help drive design and process optimization for more robust package designs.

Numerical modeling can play as a virtual prototype to predict the concern during assembly processes and extensive reliability testing for design and process optimization in automotive electronic, portable power electronics and high-power module. A simulation-driven design for manufacturing approach delivers manufacturability insights directly for early risk assessment to minimize some risks, like delamination, die crack, package crack, solder fatigue etc. for design and process optimization, helping bring products to the market as early as faster.

In this talk, challenge in design and reliability from die level to board level will be discussed and several cases are demonstrated to show how designs are driven by simulation to achieve robust power package designs. Application of simulation AI-enabled simulation on semiconductor process and reliability will be discussed based on a methodology with a combination of machine learning and finite element analysis (FEA) as well.

**Introduction of Speaker:**
Dr. Haibo Fan, working as Senior Principal Engineer in Packaging R&D-Advanced Material Technology and Modeling, Nexperia Hong Kong. He got his PhD degree from Hong Kong University of Science and Technology (HKUST), then worked in HKUST, Philips LED lighting global R&D Center, NXP Hong Kong and Nexperia Hong Kong with 20+ year experience on simulation, and 15-year industry experience on design and reliability; He authored or co-authored more than 50 peer-reviewed technique publications, published 2 books and 3 book chapters.