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IC-package Modeling for EMC Analysis and High-Speed Applications

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In the context of digital ICs development and electrical performance verification, the increase of operating frequencies increases the weight of very small design details: this is why package modeling is gaining more and more importance. For the purpose of EMC analysis, conducted and radiated emissions should be distinguished since they require different flows in terms of package representation. Conducted EME flow relies on circuit level package models, obtained with quasi-static or full-wave extraction techniques, each one having its own challenges. Radiated EME requires a 3D system-level representation, leading to the issue of package and PCB merging in a common environment. Furthermore, the reconstruction of the full measurement framework according to international standards is important to allow simulation and measurements correlation. For all EME analyses, a key task is to have accurate, standardized and compact models of IC activity as noise sources. Finally, a critical point not only for EMC but for all electrical performance analyses is the analytical definition of simplified target parameters to allow fast and early verification. In the described scenario, the collaboration among product developers, CAD vendors and academy is fundamental for industrial activities success.