# 1 XDS

1.1 产品名称

Xpeedic Design System

1.2 应用背景

The forthcoming rollout of 5G, AI technologies and continued mass adoption of IoT is rapidly gaining boarder acceptance from market. However, the new RF bands (sub-6 GHz and mm-waves) and advanced SiP packaging pose big challenges for the industry. Also, multiple filter technologies IPD/SAW/BAW are needed for RF FE due to the varying performance and frequency requirements when higher frequencies coupled with the increasing design integration and complexity of 5G. The traditional EDA design approach is insufficient for modern design. Xpeedic Design System (XDS) is a dedicated EDA platform for RF system design and filter-centric RF front-end design, its unique schematic-layout and IC-PKG-System co-simulation flow help designer maximize design efficiency by reducing system design iteration.

1.3 产品概述

XDS is the leading EDA platform across all design phases including schematic to layout as well as IC-PKG-System and Circuit-

EM co-simulation for RFFE filters and RF system to optimize performance, cost and time-to-market; Accelerated 3D planar EM solver based on the Method of Moment (MoM Solver) delivers the best performance in both speed and accuracy. It captures all the conductor and dielectric effects which are crucial for RF and microwave design; As a dedicated EDA platform for filter design, synthesis and optimization, XDS built-in COM Engine and filter PDK modeling capabilities enable a powerful and easy-to-use interface to simulate IPD filters and acoustic filters including SAW, TC-SAW and BAW filters; XDS supports versatile parametric, optimization, tuning, DOE and yield analysis algorithms to quick explore parameter influence on the performance of RF module and system; XDS Smith Chart allows easy calculation of the transformation of a complex load impedance through lumped resister, inductors, capacitors and transformers, and provides easy to use interface for impedance matching.
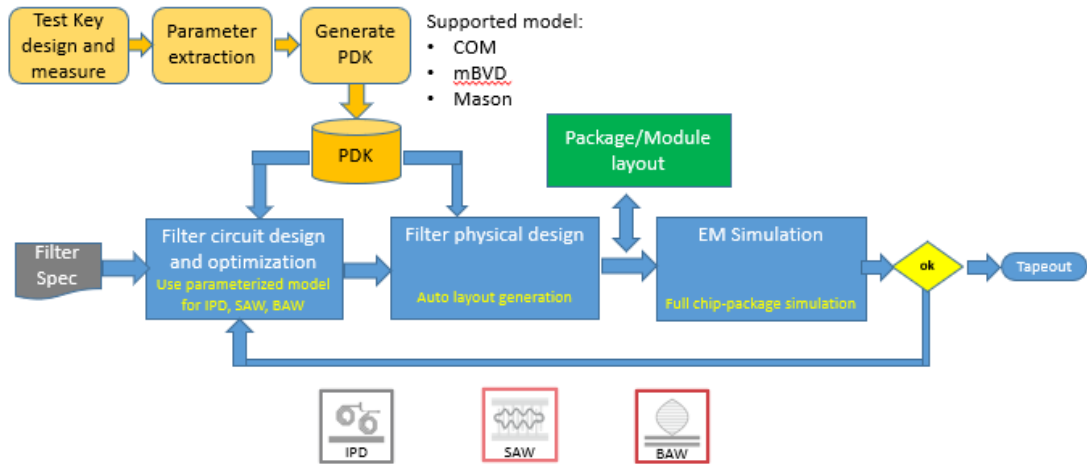
1.4 产品特色

- Provides multidimensional co-simulation flow across from schematic to layout for RF system design, including IC-PKG-System level, Circuit-EM level and schematic-layout level co-design.

- Dedicated flow for BAW/SAW filter-centric RF front-end designs, built-in multiple filter topologies, mBVD model, mason model and COM model.

- Accelerated 3D planar EM solver based on the Method of Moment (MoM Solver) and 2D FEM RLGC Solver delivers the best performance in both speed and accuracy from DC to THz. Linear Network Analyzer and COM Engine are indispensable for filter design.

- Built-in multiple advanced parametric, optimization, tuning, DOE and yield analysis algorithms to enable designers to optimize and tuning RF and microwave system design.

- Provides powerful S-parameter post-processing capabilities and easy to use Smith Chart toolkit for impedance matching.

1.5 主要功能

Xpeedic Design System (XDS) is a dedicated platform for RFIC, RF module, RF filters and RF system simulation, parametric sweep, Tuning, DOE and Yield analysis across all phases from schematic to layout.

Multidimensional Co-design Flow

Support import most mainstream layout formats, including *.brd, *.mcm, *.sip, ODB++, GDS and DXF, and allows arbitrary cutting to refine simulation area. EM simulation results can be back-annotated to schematic with IC/PKG attached and co-simulate.
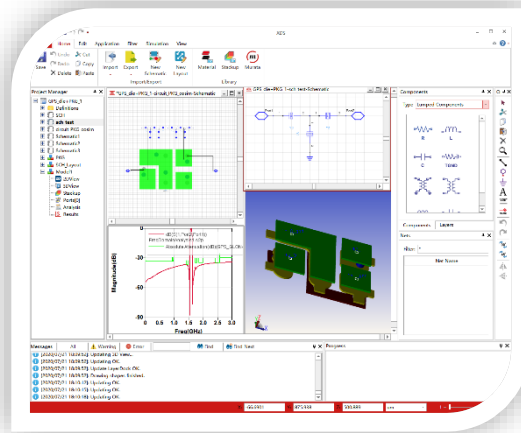
XDS

Dedicated 5G Filters Design Platform

XDS is a dedicated 5G filters platform for filter design, synthesis and optimization, XDS built-in COM Engine and filter PDK modeling capabilities enable a powerful and easy-to-use interface to simulate IPD filters and acoustic filters including SAW, TC-SAW an BAW filters. XDS built-in multiple filter topologies, mBVD model, mason model and COM model.
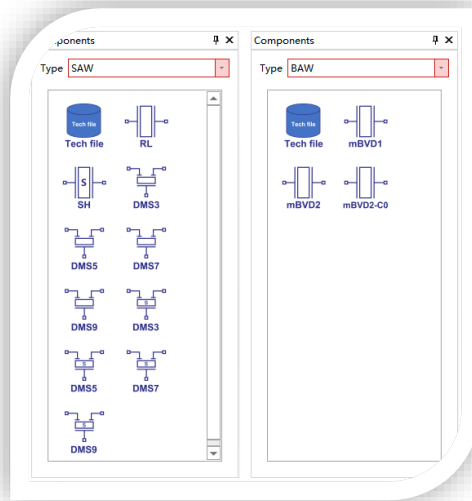
SAW/BAW Components

Versatile Parametric Templates

Support several kinds of built-in templates to easy create PCells, including octagon/square inductor, capacitor, and interleave transformer.
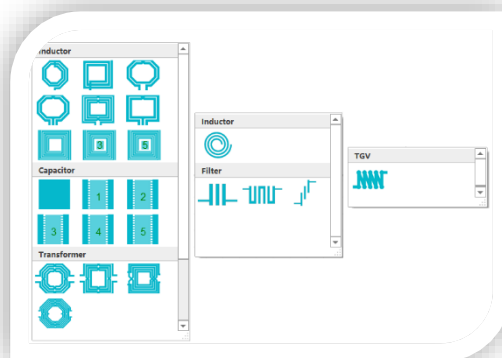

IPD Templates

Multiple Solver Integrated

XDS deploys an accelerated 3D planar EM solver based on the Method of Moment (MoM Solver) and 2D FEM RLGC Solver delivers the best performance in both speed and accuracy from DC to THz. Linear Network Analyzer and COM Engine are indispensable for filter design. In addition to the fast computation technology used in solver, XDS also supports parallel processing technology to reduce simulation time. Both of distributed processing and multi-core processing are available, which can further increase the simulation efficiency by maximizing computing resource usage.

Advanced Tuning and Analysis Capabilities

XDS Built-in multiple advanced parametric, optimization, tuning, DOE and yield analysis algorithms to enable designers to optimize and tuning RF and microwave system design.

- Parametric: parametric sweep allows any design parameters to be parameterized to explore those variables effeteness to RF system.
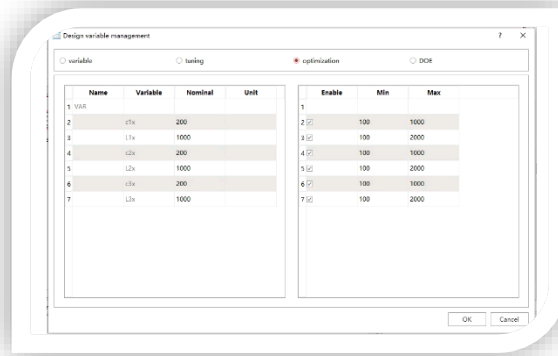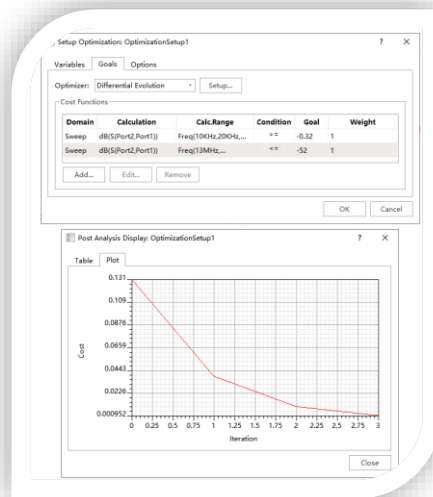
Parametric

- Tuning: XDS have real-time tuning capability by drag "Tune Bar".
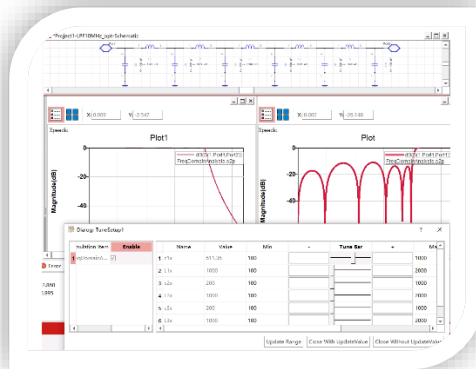
Tuning

- Optimization: support Radom Search, Differential Evolution, Gradient and Quasi-Newton algorithms to meet most RF system optimization design requirements.

Optimization

- DOE: XDS DOE enable designers to determine simultaneously the individual and interactive effects that could affect the system performance, then optimize final system design.
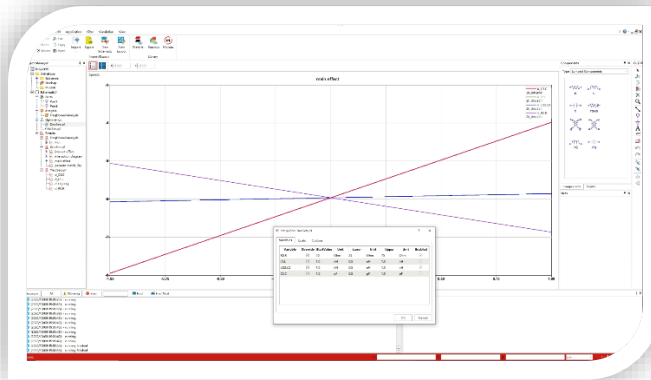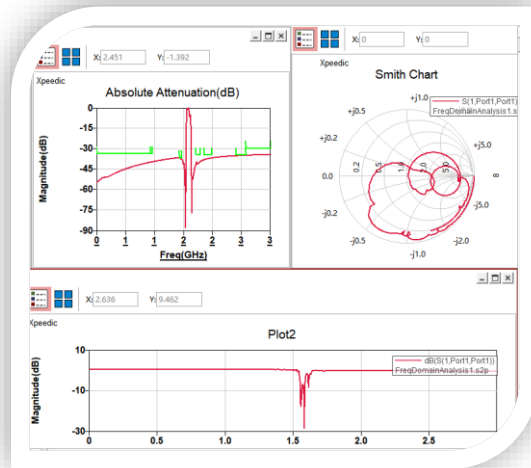

DOE

- Yield: Monte Carlo based yield analysis algorithm embedded in XDS is useful to evaluate the percentage of acceptance and unacceptance by randomly varying network parameter values according to statistical distribution.
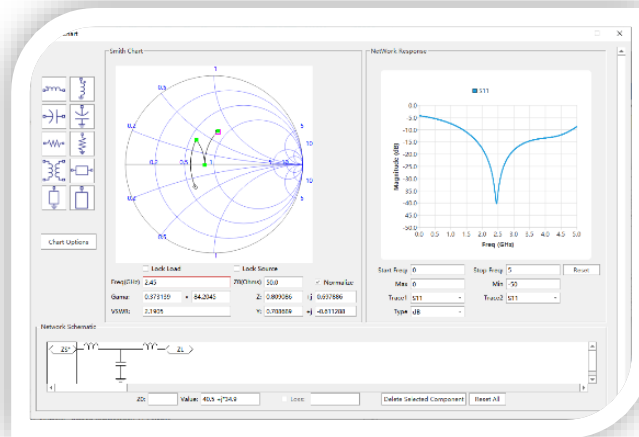

Yield

Powerful Post-processing Capabilities

XDS Smith Chart allows easy calculation of the transformation of a complex load impedance through lumped resister, inductors, capacitors and transformers, and provides easy to use interface for impedance matching. SnpExpert is integrated in XDS to provide powerful S-parameter post-process capability.

结果显示

Smith chart