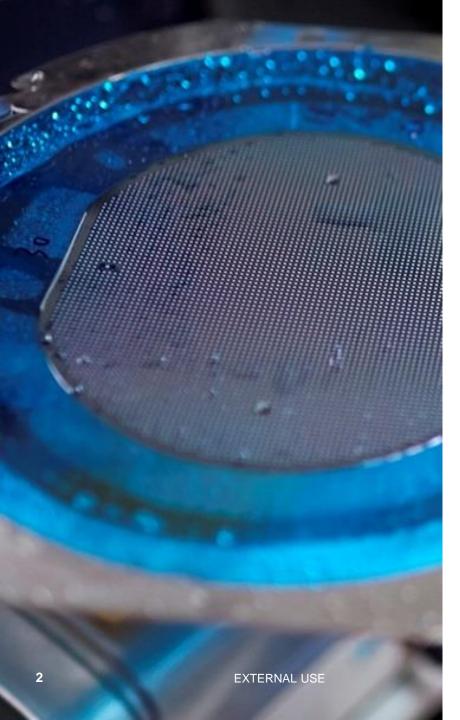
MATLAB for Verifying the Hardware Implementation of Automotive Radar Signal Processing

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SECURE CONNECTIONS FOR A SMARTER WORLD



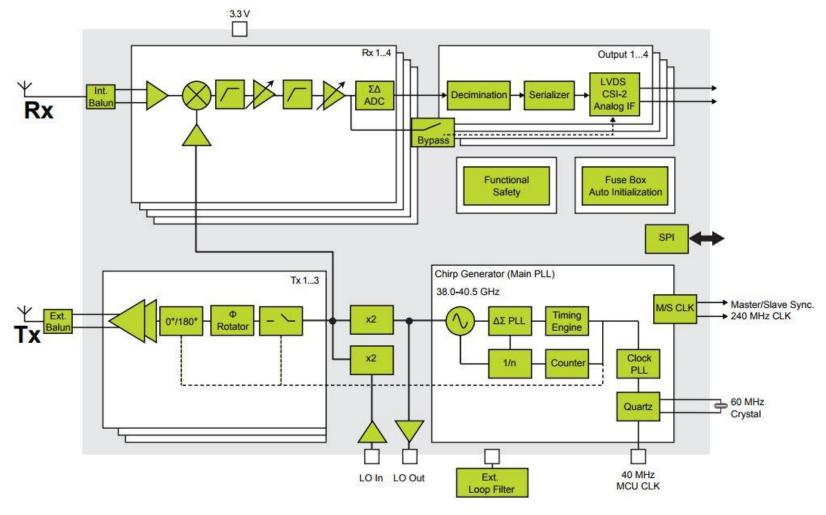
Agenda

- Automotive RADAR Architecture
- Verification Challenges
- Problem Statement
- Conventional Approach
- DPI-C Approach
- Tools Used
 - Benefits

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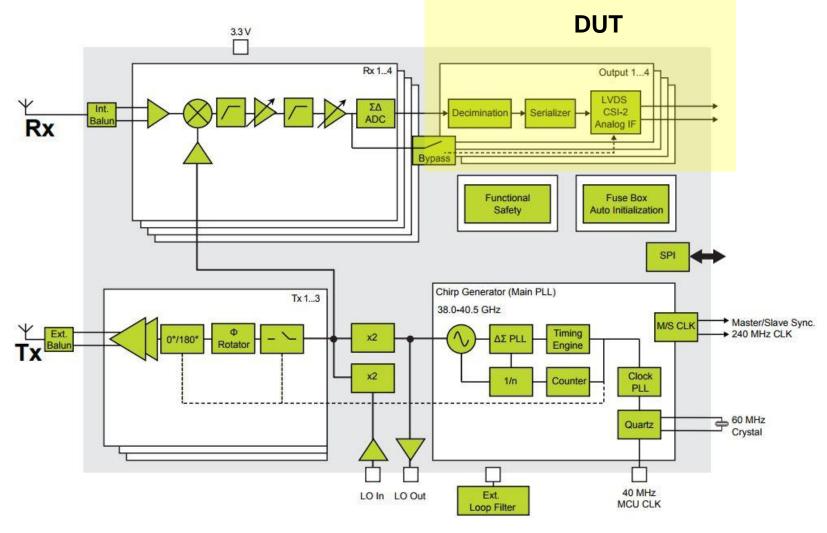


Automotive RADAR Architecture





Automotive RADAR Architecture





Verification Challenges

Mixed Signal Design

- DSP centric
- Functional and performance parameters

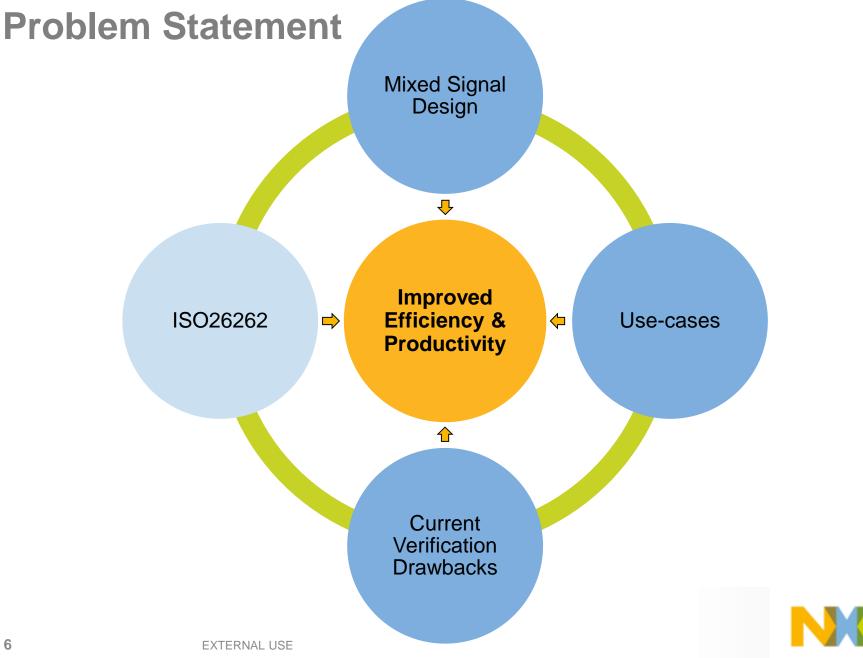
Conventional Verification Flow

- Based on Constrained Randomization
- Highly inefficient
- · Involves its own verification cycle

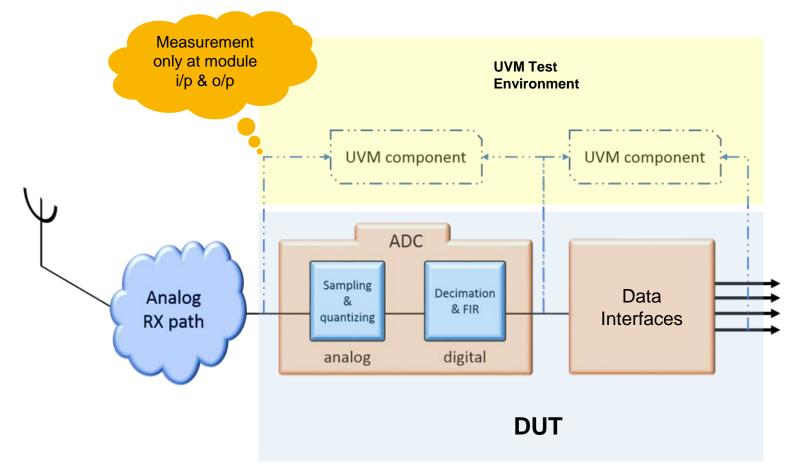
Test-bench implementation

- Need for golden reference DUT models
- · High effort in terms of manpower and time



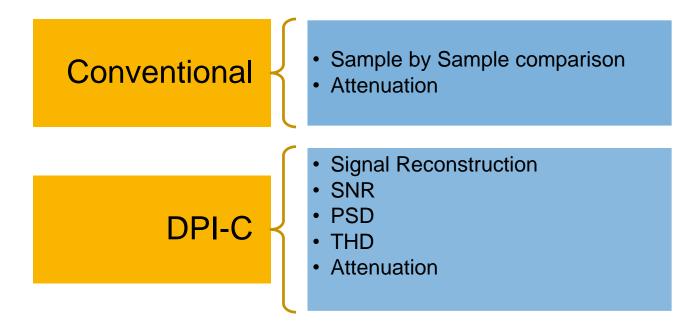


Conventional Approach





Verification Metrics





DPI-C Approach

Functions written in MATLAB to measure functional & performance parameters

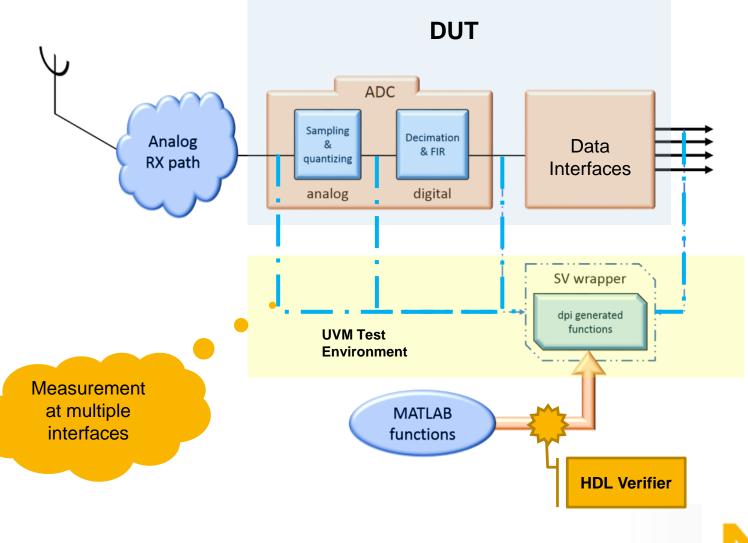
Using MATLAB Coder, shared object library is generated

UVM Components replaced with dpi generated "shared object"

Scoreboard compares the measurement with spec Functions report all functional & performance parameters to scoreboard UVM Scoreboard collects sample data and passes it to DPI-C functions generated in MATLAB

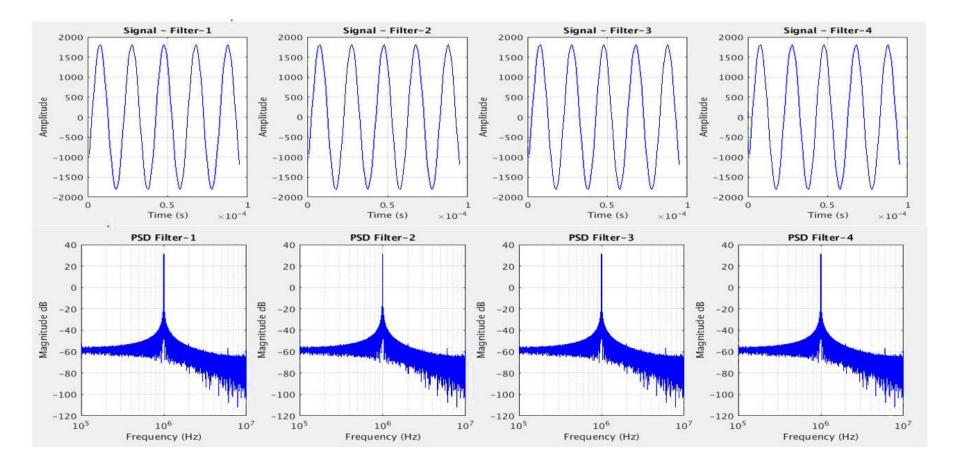


DPI-C Approach (contd..)



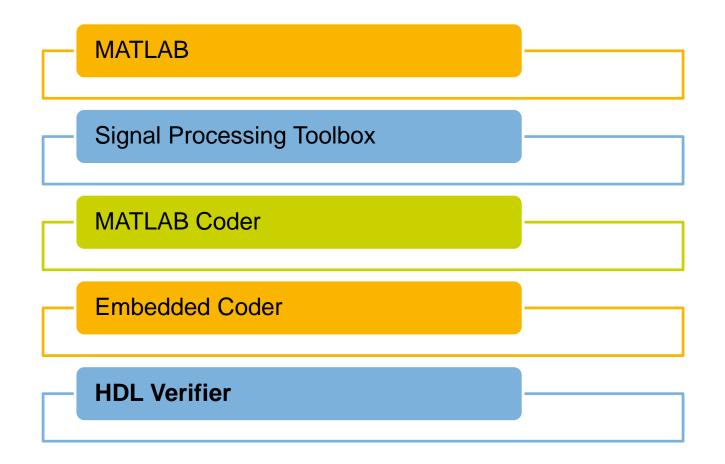


DPI-C Approach (contd..)





Tools Used





Benefits

Reduced verification Effort

Performed verification at higher level of abstraction \rightarrow more inline with customer

Enables signal analysis during regression runs

Allows metrics measurements at multiple interfaces

Eliminated human prone errors in modelling by transferring effort to machine

Testcases reused for post-silicon validation

Allows for functional & performance parameter measurements at multiple interfaces





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