Innovative Practices on Test in Japan

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I. Introduction

The IP session highlights three innovative practices in Asia, which include low cost testing of analog front-end circuits, evaluation of complex analog filter and power reduction of power-on self-test for automotive MCU.

II. Analysis and Evaluation Method of Complex Analog Filter
(Koji Asami, Yoshiro Tamura and Haruo Kobayashi)

An RC polyphase filter is well-known as a complex analog filter and has asymmetric frequency characteristics with respect to DC. It is composed of resistors and capacitors, and has complex analog input/output ports. Since this type of filter can partially realize Hilbert transform, it can be used for generating orthogonal signals. In the field of wireless communications, it can also be used for suppressing interference signals by combining the Low-IF receiver topologies.

In this presentation, the transfer function of the RC polyphase filter is analyzed and its relationship to the Hilbert transform is discussed. Furthermore, we introduce a technique to evaluate the mismatch characteristics between the real path and the imaginary path in the RC polyphase filter. These studies could lead the complex analog processing to apply for the wideband wireless communications.

III. A DFT based approach to functional safety for automotive MCU
(Jun Matsushima and Yoichi Maeda)

As required by ISO 26262 standard, it is essential to equip the automotive MCUs (Micro-Control Unit) with the functional safety mechanisms. Power-On-Self-Test (POST) is a well-known functional safety mechanism that has been widely deployed in various safety-critical systems. For automotive MCU, the POST is required to meet many constraints in terms of the specified fault coverage, the limited test application time and the low power consumption. We have developed these automotive MCUs in a limited development period and have further supplied them to the market. This presentation explain about reducing power consumption at POST and realizing POST with minimal change of design flow.

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