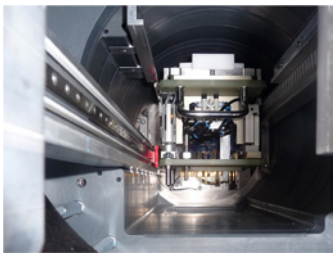
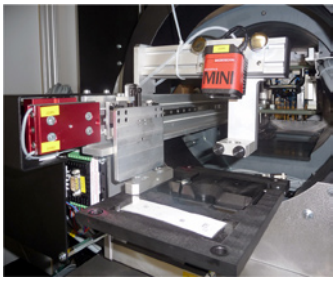
Automotive Radar ICT & FCT Test System

konrad technologies





Customer: Leading Automotive Supplier

Final Product: Blind Spot Radar Tx / Rx Board

Industry: Automotive

Description:

Development of an in-circuit test system with a subsequent functional test for a blind spot radar transmit and receive module within an RF chamber. This includes verification of the transmitting and reception characteristics in the 24GHz range. A system variant for the 76GHz - 81GHz frequency range for ACC module testing can be offered as well.

Customer Requirements:

- ICT
- Power input
- RF functional test
- Beam verification of the RF reception signal
- On-the-fly antenna switching while turning
- Short cycle time
- Good part labeling of the DUT
- Traceability

Implemented Solution:

For the in-circuit-test and a subsequent functional test for a blind spot radar receive module a 24 GHz RF chamber has been developed. Inside of this chamber is a transceiving antenna in 1400mm distance to the DUT mounted, adjusted at 0° angle to the DUT.

The ICT position or the FCT position can be selected. The ICT position has all contacting probes connected to the test points while the FCT position connects to the PCB only via shorter FCT contacting probes.

The chamber is lined with pyramid shaped foam absorbers. The measurement devices are located directly underneath the RF chamber in a separate 19" test rack. It has 33U on the front side and an additional 33U on the backside. The RF chamber and the test rack have been designed especially for this application. Maintenance of the measurement device is possible through steel and glass doors.

The RF signals are guided by coaxial conductors on waveguides. The coaxial conductors are designed for up to 28GHz. Reference measurements can be performed with an integrated power meter. The measuring adapter and receiving antenna are located on the inside of the RF chamber, opposite of the transmitting antenna. This arrangement allows the system to be self-tested. Part of the RF measuring and RF paths can be calibrated automatically.

A PLC has been installed for controlling of the sensors and actuating elements (servo drives, actuators, cylinders, etc.). Automatic analysis and storage of test results are performed good parts marking happens using an inkjet printer followed by sorting of these parts from the bad parts.

Software:

NI TestStand	Test sequencing Editor, Debugger
NI LabVIEW	Test step library
KT-OP	Operator Panel Debugging
KT-Project	Test step library ICT Functional test RF test steps
KT-STAT	Result file viewing and analysis Determination of process capability

Hardware:

Combined FCT/ICT Test System	
ICT Channels:	128 - 3000 x 4 Busses, non multiplexed
Tests:	R, L, C, Z, cont, short FCT RF Test up to 24GHz
Options:	Agilent E3646A Power Supply for powering DUT Agilent RF Signal Generator 250 kHz to 31,8 GHz Agilent U2002 A CW Power-Meter Head Scope
Adaptation:	Automatic adapter Carrier system
Interface:	Compact unit Tester integrated in mechanic RF chamber

Conclusion:

The test system operates in multi shift production.

In addition to the system functioning as an ICT and FCT test system within a production line, the possibility of testing the DUT using various transmitting antenna reception-angles allows the system to offer developers new flexibility and component-debug possibilities.

Konrad Technologies has developed this unique test system to deliver a whole new standard in delivering results during the development and optimization process of the product that could otherwise only be obtained by extensive laboratory simulations.

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