868 MHz RF Test System with Drawer Adapter

konrad technologies

System Overview:

The RF test system described here allows the testing of products in the 868 MHz frequency range, for example radio systems for heat cost allocators, water or heat meters. The system is designed as a semiautomatic manual work station and allows with its tandem configuration the parallel handling and functional test of two by two UUTs. In order to assure the stability of the measurement results, the test system has two identical RF-chambers.

Main Features:

- Layout: manual working station; handling and testing is done in parallel
- Very short cycle time, depending on product
- Parallel testing of two products
- Drawers equipped with fixture kits
- Simple adjustment of all parameters and limits
- Logging of all test results
- Integrated self test of the entire system down to the contact pin, without intervention from the operator

Implemented Solution:

One of the main features are the integrated RF-chambers, which are laid out for up to 6GHz and have a noise reduction of approximately 40 dB (at 868 MHz). This allows a repetitive accuracy of ± 1 dB for RF-measurements of transmit power and transmit frequency. Further RF measurements include THD Measurement, Modulation Bandwidth Detection (GMSK-modulation) and Occupied Bandwidth (OBW) Measurement.

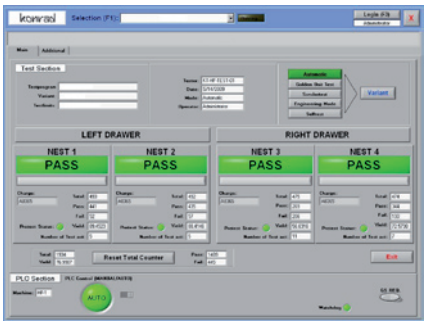
Through two parallel drawers with integrated fixture kits, the test system can be mounted alternatively with two DUTs, while other two products are being tested. As soon as the drawer is closed, the automatic RF-tight closing of the RF-chamber and electrical contacting of the DUTs takes place.

Through the system's design with fixture kits it can easily be adjusted to various products.

The integrated measurement system is composed of one PXI-chassis with various LF and RF instruments and switches, as well as one spectrum analyzer. Besides the RF measurements, several LF measurements can be done depending on the product. Typical measurements include current measurements during the DUTs' transmission, receiving and calibration mode.

Software:

NI TestStand:	Sequence control Editor, Debugger
NI LabVIEW:	Test step libraries
KT-OP:	Operator interface Debugging
KT-Project:	Test stepp libary Functional test
KT-STAT:	Presentation and analyze of the result files Determination of the process capability



Hardware:

RF chambers:	Measurement range DC-6GHz, noise reduction by 40 dB (at 868 MHz)
Interface:	RF: SMA connector
	LF: DSub-25
Adaptation:	Two drawers with manual fixture kit adapters via Pylon interface
Measurement system:	PXI-based
	NI PXI-6221 Multifunction DAQ board
	NI PXI-5650 1.3GHz RF signal generator
	Agilent E4404B 6,7GHz Spectrum Analyzer
Maschinensteuerung:	EPIS SPS
	Festo pneumatic system
	Faulhaber drive system

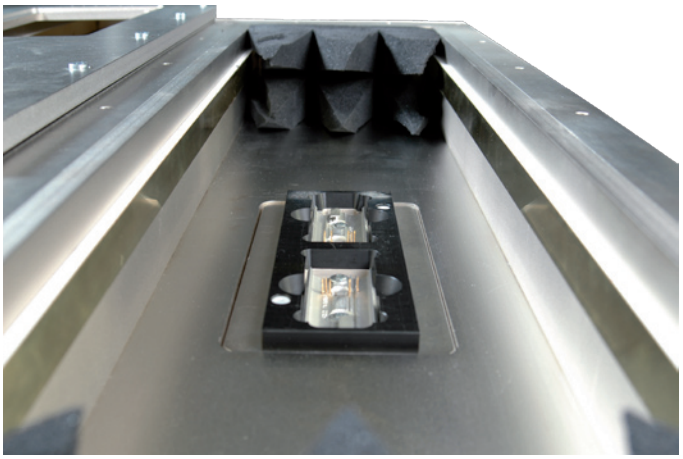
Conclusion:

The semiautomatic RF test system provides an efficient and long-time available solution for the client.

Due to its design based on worldwide available standard components, a very high availability can be guaranteed.

The customer's productivity can be increased significantly through the system's tandem structure and parallel layout for 2x2 products, combined with a very short cycle time of only a few seconds.

Future product generation with a possibly higher frequency range of up to 6 GHz can be tested on the test system with minimal effort, thus guaranteeing the security of the customer's investment.



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