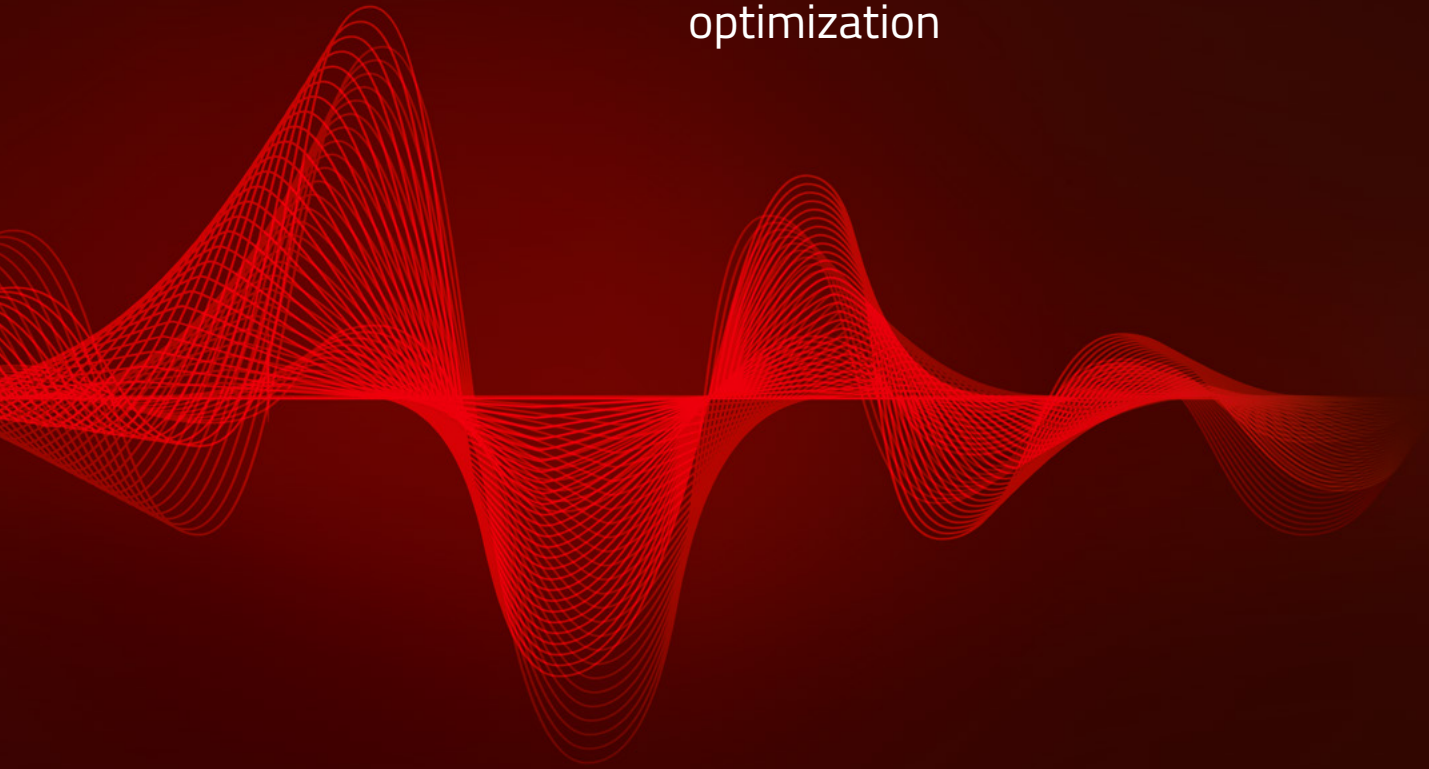
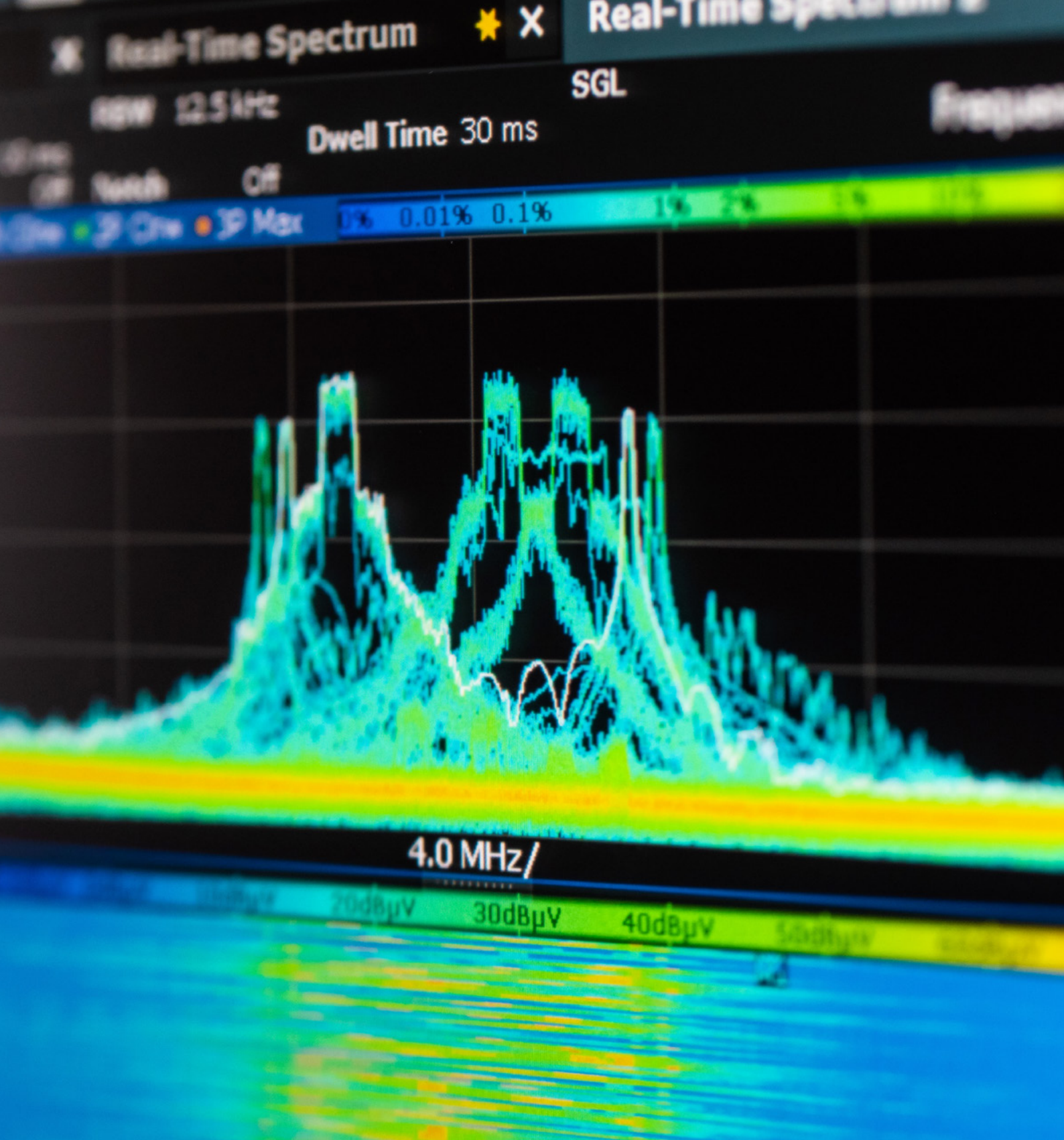


WÜRTH ELEKTRONIK EMC LABORATORIES

For precompliance testing,
troubleshooting and product
optimization



WÜRTH ELEKTRONIK MORE THAN YOU EXPECT



Please contact one of our specialists from the EMC laboratory at the following email address emc.lab@we-online.com or visit www.we-online.com/emclab if you want to perform measurements or tests.

CONTENT

General information	4
General information about the EMC laboratories	4
Product development process	4
Optimization of the radiated emission of a DUT	5
EMC Lab Waldenburg	6
Fully anechoic chamber	6
Radiated emission and immunity tests	6
Shielded room	8
Conducted emission and immunity tests	8
Immunity testing against transient disturbances	9
EMC Lab Munich	10
Fully anechoic chamber	10
Radiated Emission and Immunity tests	10
Shielded room	12
Conducted emission and immunity tests	12
Immunity testing against transient disturbances	13
Troubleshooting in the EMC Lab	14
More Than You Expect	15
Our service for you	15

GENERAL INFORMATION

General information about the EMC laboratories

As a specialist in the field of passive components with years of experience in training and supporting customers in the area of electromagnetic compatibility, Würth Elektronik eiSos GmbH & Co. KG also has well equipped EMC laboratories at our Waldenburg and Munich locations in Germany.

WE will support you in the troubleshooting, noise suppression, optimization and the selection of the relevant product standards along with the general questions about EMC.

WE offer EMC lab service to our customers to perform EMC measurements during development/precompliance testing.
Talk with us about EMC!

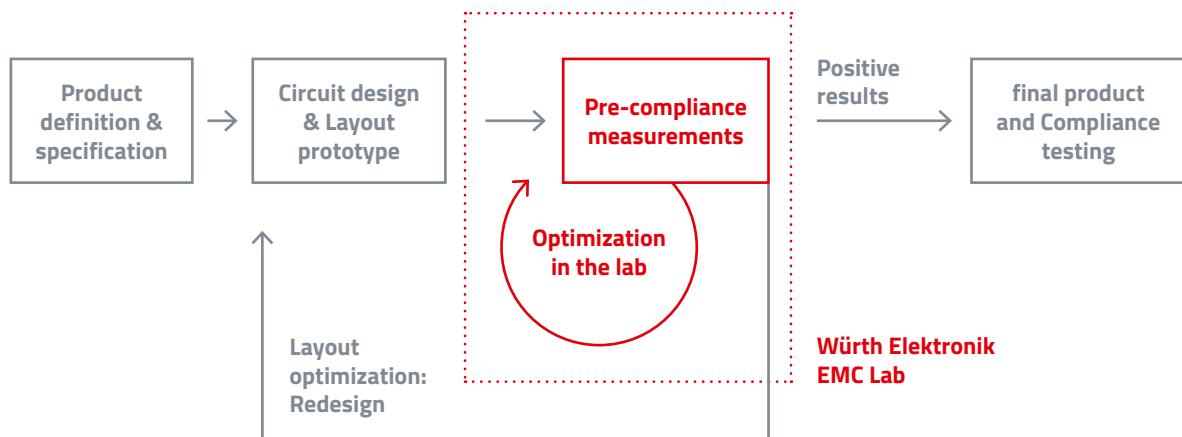
Product development process

It is the responsibility of the manufacturer to declare the conformity of a product with the relevant European directives and represent it to the consumer by the CE mark.

For example, a product within the scope of the EMC Directive 2014/30/EU should comply with the essential requirements defined in the directive. EMC behaviour of the product should be taken into account during the early stages of the product development.

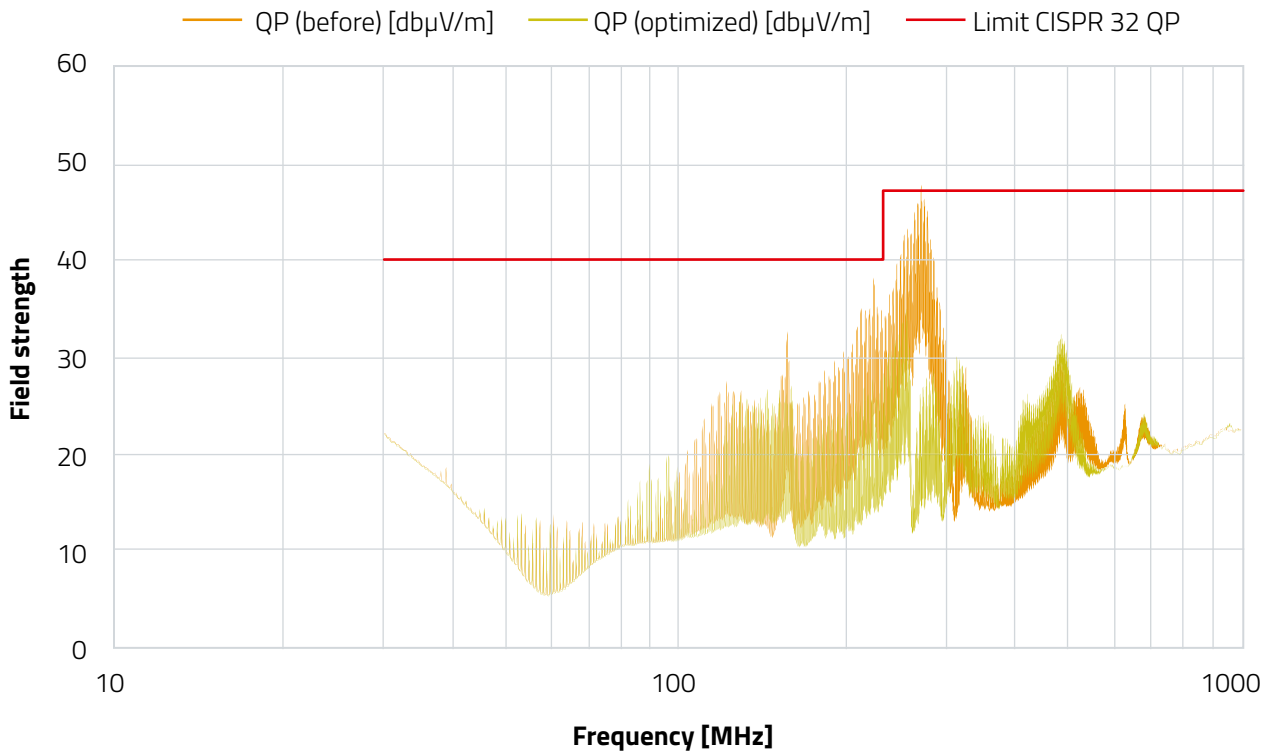
EMC tests during the development stage help identify EMC problems earlier which leads to the reduction of overall development costs.

Consequently, appropriate measures can be taken, and solutions can be implemented cost-effectively avoiding significant delays in the project plan. Product optimizations can be carried out directly in the EMC lab at the circuit and system level using our large portfolio of EMC components. WE also provide support with advice on circuit and layout redesign, component placement or change in concept of the device under test.



Optimization of the radiated emissions of a DUT

- **Orange Curve:** Emissions of the DUT before the optimization
- **Green Curve:** Emissions of the DUT after the optimization in the lab



Our EMC laboratories are located at the Waldenburg (Headquarters) and Munich (HighTech Innovation centre) sites. The EMC laboratories at both locations are equipped with modern measurement and testing equipment to perform EMC tests on devices for

industrial and residential environments. Taking into account the equipment and capacity utilization of the laboratories, we try to consider your preferred location for the measurements.

The following pages introduce our laboratories and provide an overview of the available EMC testing facilities and services (S. 6–S. 13)



EMC LAB WALDENBURG

FULLY ANECHOIC CHAMBER

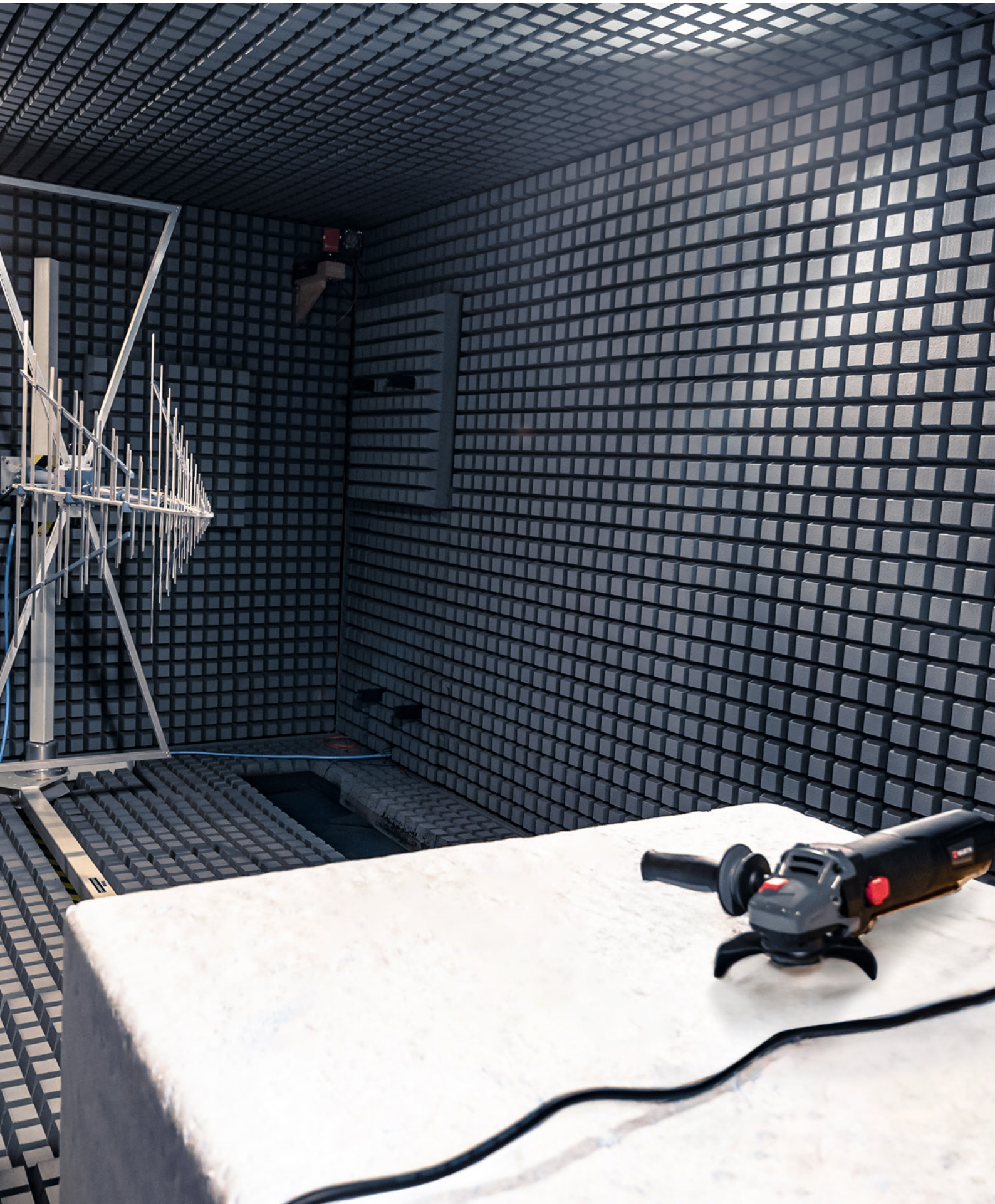
Radiated emission and immunity tests

Reduced distance between DUT and Antenna: 2 m

- **Radiated Emissions:**
 - 30 MHz to 6 GHz
 - Measuring receiver Rohde & Schwarz ESW (8 GHz) with FFT-Analysis and Real-Time Spectrum Analysis
 - Log periodic antenna 30 MHz to 6 GHz
- **Radiated Immunity:**
 - 80 MHz to 6 GHz
 - Radiated immunity according to IEC 61000-4-3 with Field strengths up to 20 V/m
- **Adapted Automotive Monopole measurement**
 - Radiated emissions measurement from 150 kHz to 30 MHz
 - Structure of the Anechoic chamber suitable for CISPR 25 testing
- **DUT specifications:**
 - Maximum weight 500 kg
 - Device must fit on a Euro pallet and should have maximum height of 1.5 m



*Pic. 1: Fully anechoic chamber
in the EMC Lab Waldenburg*



EMC LAB WALDENBURG

SHIELDED ROOM

Conducted emission and immunity tests

■ **Conducted emission:**

- 9 kHz to 30 MHz
- Conducted emissions as per CISPR 16-2-1
- Measuring receiver Rohde & Schwarz ESW (8 GHz) with FFT-Analysis and Real-Time Spectrum Analysis

■ **DUT specifications:**

- Maximum weight 500 kg
- Device must fit on a Euro pallet and should have maximum height of 1.5 m

■ **Conducted Immunity:**

- Immunity test as per IEC 61000-4-6; frequency range from 150 kHz to 300 MHz, Coupling via CDNs and EM clamp
- Immunity test as per IEC 61000-4-16 from 15 Hz to 150 kHz
- Immunity test as per IEC 61000-4-19 upon request

Pic. 2: Conducted emission



Immunity testing against transient disturbances

Burst- und Surge test:

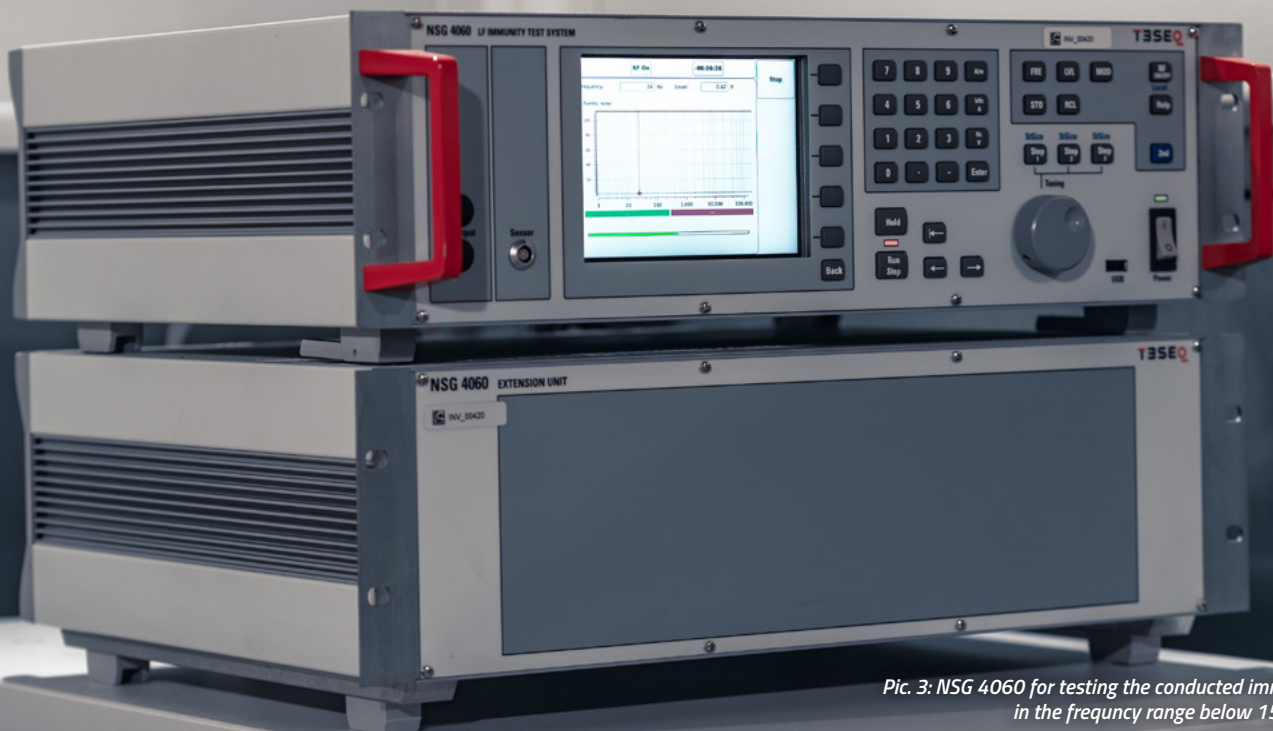
- Test generator emtest UCS 500N
- IEC 61000-4-4; Burst up to 5.5 kV
- IEC 61000-4-5; Surge up to 5k V
- Surge and Burst coupling on AC and DC ports
- Burst coupling via Capacitive Coupling Clamp
- Surge coupling via CDNs on signal lines

ESD test:

- IEC 61000-4-2
- ESD up to 30 kV
- R/C-Network: 150 pF / 330 Ω ; 150 pF / 2000 Ω

Testing low frequency disturbances:

- Voltage dips and Interruptions as per IEC 61000-4-11
- Power frequency magnetic field as per IEC 61000-4-8 up to 1000 A/m



Pic. 3: NSG 4060 for testing the conducted immunity in the frequency range below 150 kHz

EMC LAB MUNICH

FULLY ANECHOIC CHAMBER

Radiated Emission and Immunity tests

Fully Anechoic Chamber: 3 m

- **Radiated Emission:**
 - 30 MHz to 26 GHz
 - Measuring receiver Rohde & Schwarz ESW (26 GHz) with FFT-Analysis and Real-Time Spectrum Analysis
 - Antenna Rohde & Schwarz Ultralog HL562e 30 MHz to 6 GHz
 - Antenna Rohde & Schwarz Log-periodic HL050 850 MHz to 26.5 GHz
 - Turntable (0 – 360°), Continuous and Stepmode
- **Radiated Immunity:**
 - 80 MHz to 6 GHz
 - Radiated Immunity test according to IEC 61000-4-3 with Field strengths up to 20 V/m
 - 80 MHz – 2.7 GHz, 20V/m
 - 2.7 GHz – 6 GHz, 10V/m
- **DUT specifications:**
 - Maximum weight 500 kg
 - Device must fit on a Euro pallet and should have maximum height of 1.5 m



Pic. 4: Fully anechoic chamber Munich



EMC LAB MUNICH

SHIELDED ROOM

Conducted emission and immunity tests

- **Conducted emission:**
 - Conducted emissions as per CISPR 16-2-1
 - Frequency range 9 kHz to 30 MHz
- **DUT specifications:**
 - Maximum weight 500 kg
 - Device must fit on a Euro pallet and should have maximum height of 1.5 m
- **Conducted Immunity:**
 - Immunity test as per IEC 61000-4-6
 - Frequency range from 150 kHz to 250 MHz
 - Coupling via CDNs and EM clamp



Pic. 5: Shielded room Munich

Immunity testing against transient disturbances

Burst and Surge test:

- Test generator AMETEK NX5
- IEC 61000-4-4; Burst up to 5.5 kV
- IEC 61000-4-5; Surge up to 5 kV
- Surge and Burst coupling on AC and DC ports
- Burst coupling via Capacitive Coupling Clamp

ESD test:

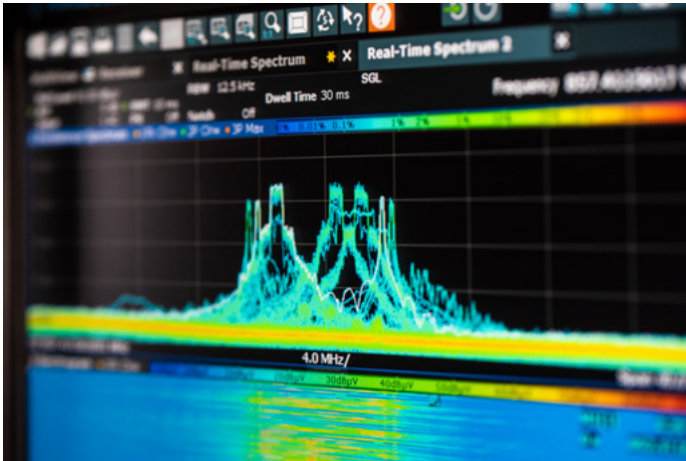
- ESD generator AMETEK NSG435
- IEC 61000-4-2
- ESD up to 16.5 kV
- R/C-Network: 150 pF / 330 Ω
- Air-discharge: 200 V to 16.5 kV
- Contact-discharge: 200 V to 9 kV



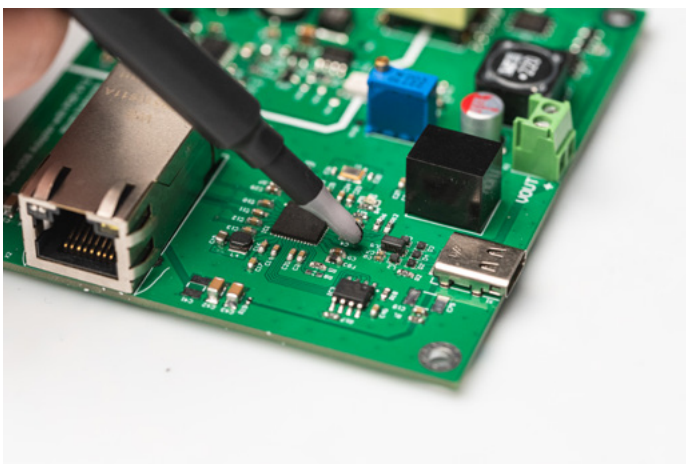
Pic. 6: Surge test of an angle grinder

TROUBLESHOOTING IN THE EMC LAB

We offer support in troubleshooting your assembly on site. The noise sources are identified quickly and effectively using the latest measurement technology and proven methodology.



Signal analysis using Real-Time Spectrum.



Noise source detection with **Near Field probes**.



Shielding optimization of an enclosure using adhesive **Copper tape**.

MORE THAN YOU EXPECT: OUR SERVICE FOR YOU

Global Support

- Global Key Account Management
- Local personal sales support
- Global technical support
- Free technical seminars and webinars

Design-In Support

- EMC test lab racks
- Reference designs of leading IC manufacturers
- #askLorandt for electronic design support

Delivery

- All products available ex stock
- Within 24 – 48 hours
- No MOQ
- Service degree: 98.5 %
- Samples free of charge

Service

- Design kits with lifelong free refill
- smartPCN

Tools

- Toolbox for developers and purchasers
- Free online design platform **REDEXPERT**
- Search engine for EMC labs
- WE Plus Service – Personalize your connectors
- Component libraries
- 3D PDFs

Reference Guides

- Trilogy of Wireless Power Transfer
- Trilogy of Connectors
- Trilogy of Magnetics
- Abc of Capacitors
- Abc of Power Modules
- The LTspice XVII Simulator



Reference designs with major IC manufacturers

- Analog Devices
- Microchip Technologies
- ROHM Semiconductor
- ON Semiconductor
- Texas Instruments
- Infineon Technologies
- STMicroelectronics



DIENECKARPRINZER 99 99 1 76 1723 500 00

WÜRTH ELEKTRONIK MORE THAN YOU EXPECT