TESTED IN GERMANY

FCC 3

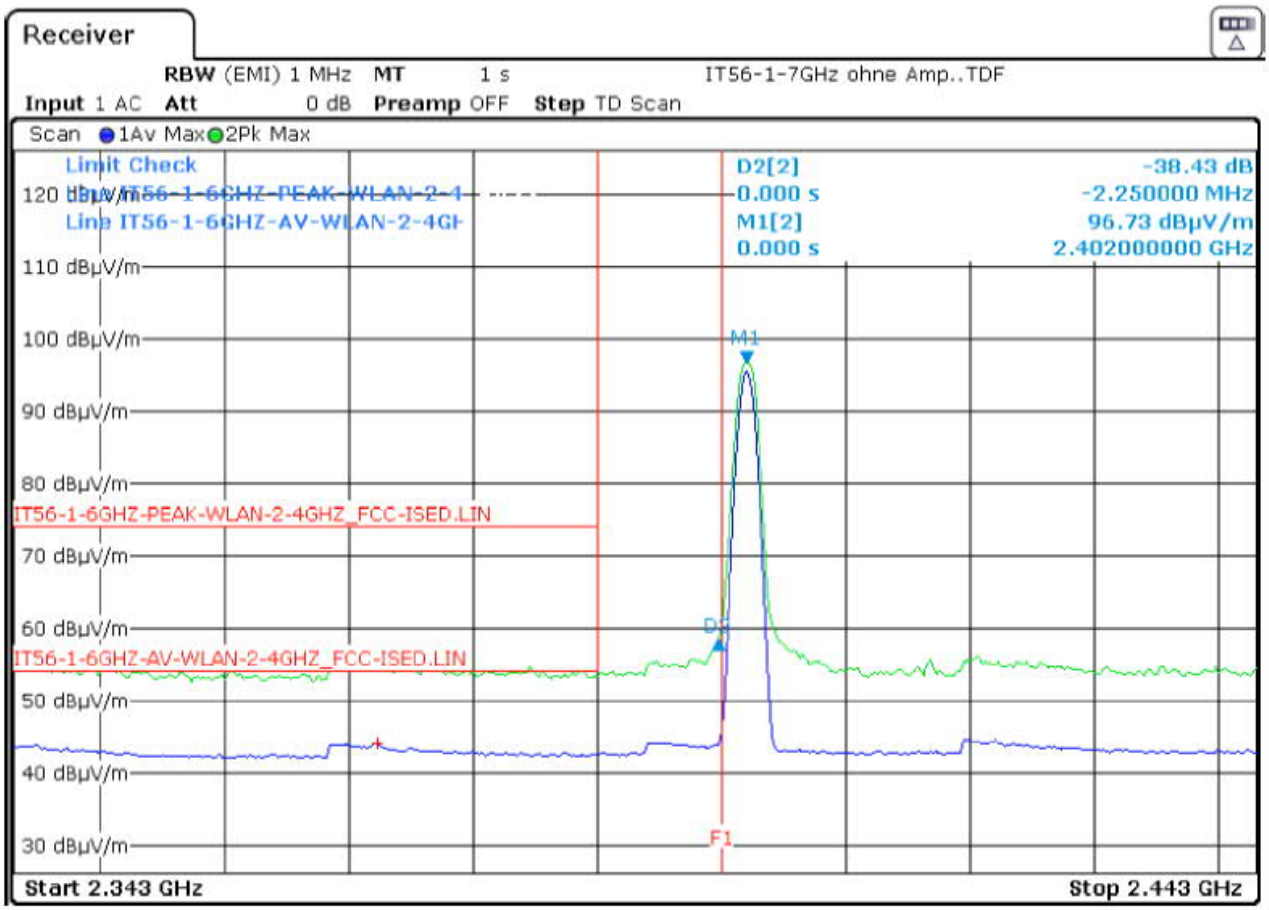
Band edge emission

acc. FCC Subpart C; § 15.247 / acc. RSS-247

STC

Ref.-No.: 22/09-0001

Operation mode: TX BLE CH.0 (2402MHz); Lowend



Position: Z Polarisation: V									
Detector Average					Detector Peak				
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
all emissions are 10dB below limit				pass	all emissions are 10dB below limit				pass

TESTED IN GERMANY

FCC 3

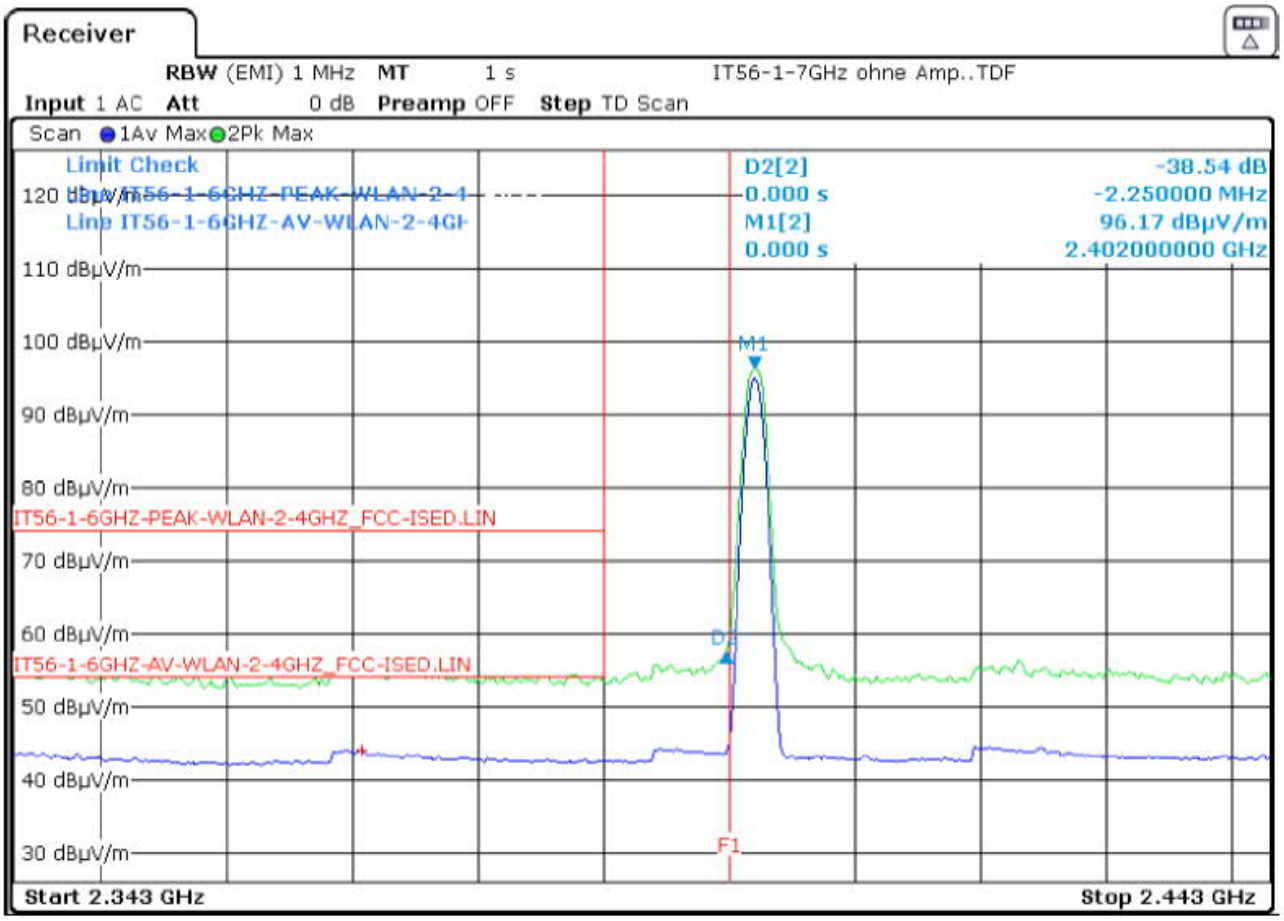
Band edge emission

acc. FCC Subpart C; § 15.247 / acc. RSS-247

STC

Ref.-No.: 22/09-0001

Operation mode: TX BLE CH.0 (2402MHz); Lowend



Position: Z Polarisation: H									
Detector Average					Detector Peak				
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
all emissions are 10dB below limit				pass	all emissions are 10dB below limit				pass

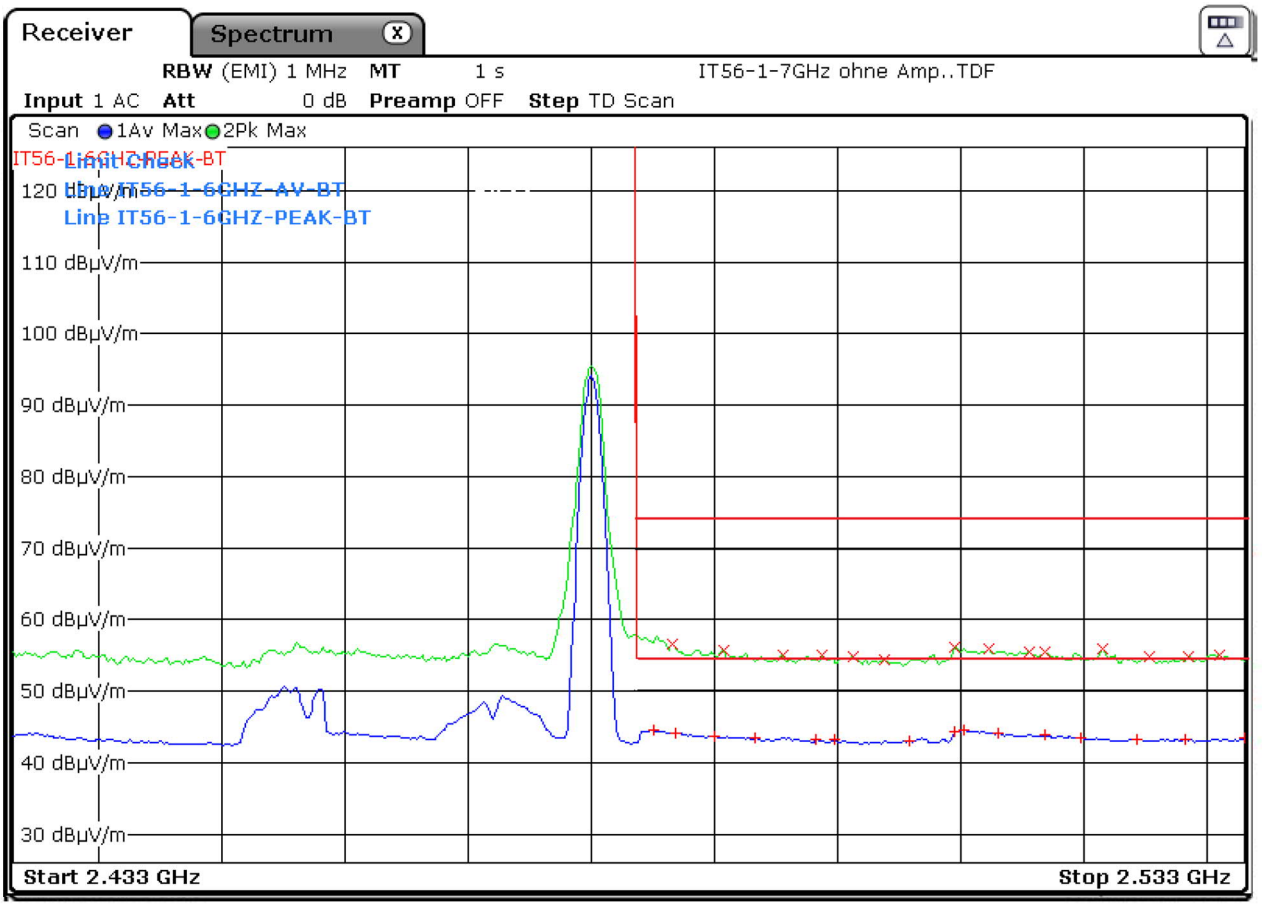
FCC 3

Band edge emission

acc. FCC Subpart C; § 15.247 / acc. RSS-247

Ref.-No.: 22/09-0001

Operation mode: TX BLE CH.39 (2480MHz); Highend



Position: Z Polarisation: V									
Detector Average					Detector Peak				
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
2,5103	44,57	-9,43	54,00	pass	2,4865	56,43	-17,57	74,00	pass
2,4850	44,45	-9,55	54,00	pass	2,5095	55,96	-18,04	74,00	pass
2,5095	44,19	-9,81	54,00	pass	2,5123	55,87	-18,13	74,00	pass
2,4868	44,08	-9,92	54,00	pass	2,5215	55,73	-18,27	74,00	pass
2,5130	44,08	-9,92	54,00	pass	2,4908	55,59	-18,41	74,00	pass
2,5168	43,74	-10,26	54,00	pass	2,5155	55,41	-18,59	74,00	pass

TESTED IN GERMANY

FCC 3

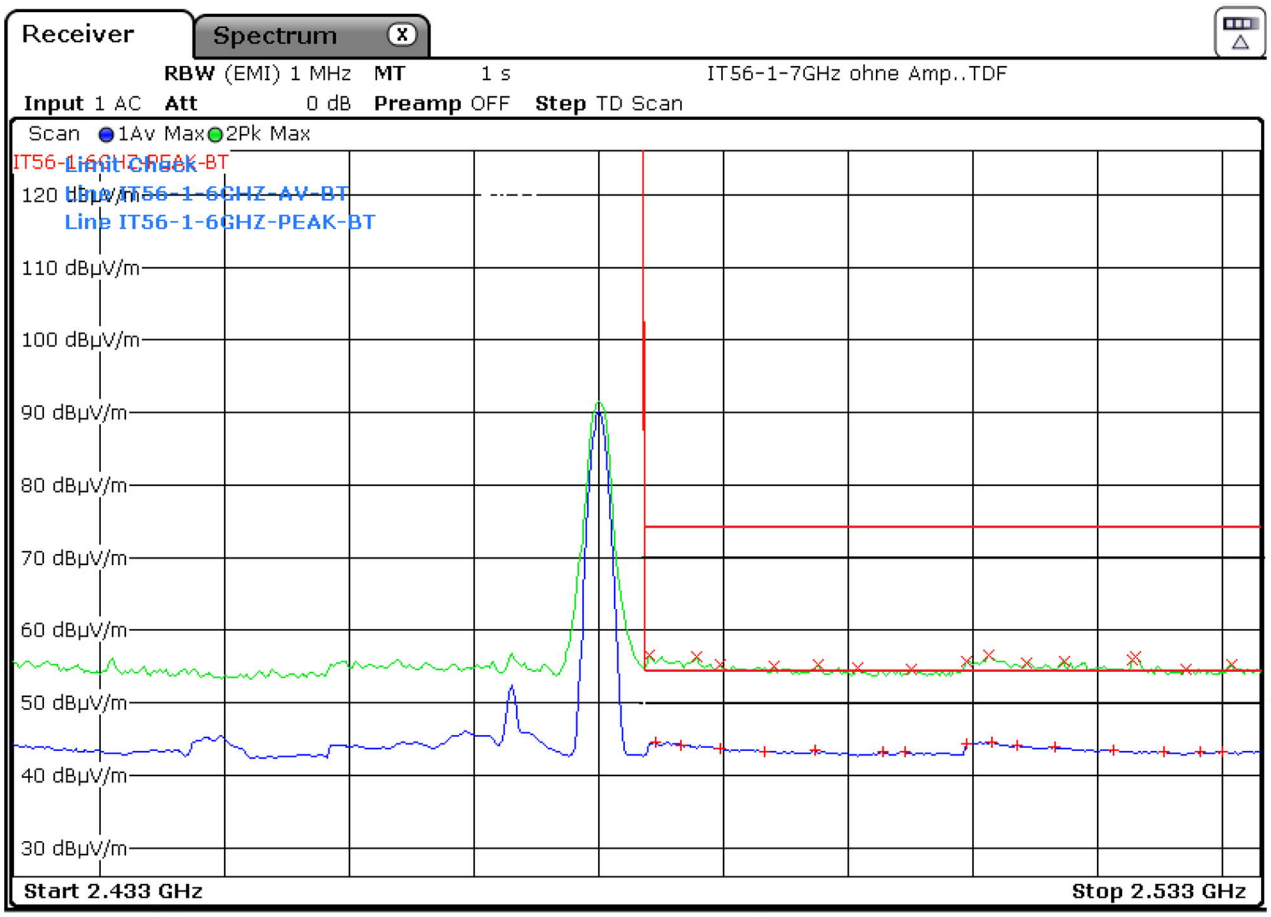
Band edge emission

acc. FCC Subpart C; § 15.247 / acc. RSS-247

STC

Ref.-No.: 22/09-0001

Operation mode: TX BLE CH.39 (2480MHz); Highend



Position: Z Polarisation: H									
Detector Average					Detector Peak				
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
2,4845	44,55	-9,45	54,00	pass	2,5113	56,47	-17,53	74,00	pass
2,5115	44,47	-9,53	54,00	pass	2,4840	56,38	-17,62	74,00	pass
2,5095	44,24	-9,76	54,00	pass	2,5230	56,25	-17,75	74,00	pass
2,4865	44,15	-9,85	54,00	pass	2,4878	56,14	-17,86	74,00	pass
2,5135	44,06	-9,94	54,00	pass	2,5228	55,72	-18,28	74,00	pass
2,5165	43,90	-10,10	54,00	pass	2,5173	55,53	-18,47	74,00	pass

8.5. 99% Power Bandwidth

Aplied standards
-RSS-Gen issue 5 Section 6.7

Test equipment and test set up
Test equipment used for conducted measurements as given in clause Test equipment of this report.
Test setup used for conducted measurements as given in clause Test setups of this report.

Description
The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.
The 99% power bandwidth function of the instrument was used for the measurement.

Measurement

No measurement was performed

Result
-/-

.

9. Test equipment

Test equipment used for radiated Measurements:

Kind of equipment	Manufacturer	Type	Ident no.	Serial no.	Calibrated on (y-m)	Calibration interval
Signal Spectrum Analyzer 2 Hz - 26.5 GHz	Rohde & Schwarz	FSW26 Instrument FW 5.00	11571	102047	2022-March	3 years
ESR 7 EMI Testreceiver 7 GHz	Rohde & Schwarz	ESR 7 Instrument FW 3.36	11676	101694	2021-April	3 years
Signal Spectrum Analyzer 7 GHz – 22 GHz	Hewlett Packard	8562B	10208	2750A00209	2021-April	3 years
Signal Spectrum Analyzer 26 – 40 GHz	Rohde & Schwarz	FSMS 26	10481/ 10482	839014/004	-/-	no
Antenna 1 GHz – 18 GHz	Electro Metric	RGA 50/60	10273	2753	2021-Jan.	3 years
Antenna (FCC) 30 MHz – 1 GHz	Chase	CBL6111	10022	1064	2022-Aug.	3 years
Antenna 9 kHZ – 30 MHz	Schwarzbeck	EMCO 6502	10546	2018	2021-Jan.	3 years
Antenna 15 GHz – 26.5 (40) GHz	Schwarzbeck	BBHA 9170	11580	BBHA91706	2019-Dec.	3 years
Preamplifier 18 GHz – 40 GHz	CERNEX	CBM18403523	11679	29711	2022-June	3 years
Shielded room/ Chamber	Frankonia	SAC3 "SEMI-ANECHOIC-CHAMBER"	11609	004/16	2022-March	3 years
Climatic exposure test cabinet	Heraeus	HC4020	10369			3 years
Multimeter	Fluke	79III	10938	71150461	2020-April	3 years
Broadband-Preamplifier 1 GHz - 18 GHz	Schwarzbeck	BBV9718	11231	9718-002	2021-Jan.	3 years
Cable 8 m	el-spec GmbH	FlexCore-SMA11-SMA11-8000-ARM	11625	-/-	2020-Oct.	3 years
Cable 1.5 m	Suhner	Sucoflex 100	11648	-/-	2020-Oct.	3 years
Band Reject Filter	Telemeter	BRF-2450-150-7-N (0441)	11243	-/-	2020-Oct.	3 years
High Pass Filter	Wainwright Instruments GmBH	WHKX10-902-1100-1500-80ST	11735	1	2020-Oct.	3 years

Test equipment used for Band Edge Measurements:

Kind of equipment	Manufacturer	Type	Ident no.	Serial no.	Calibrated on (y-m)	Calibration interval
ESR 7 EMI Testreceiver 7 GHz	Rohde & Schwarz	ESR 7 Instrument FW 3.36	11676	101694	2021-April	3 years
Antenna 1 GHz – 18 GHz	Electro Metric	RGA 50/60	10273	2753	2021-Jan.	3 years
Cable 8 m	el-spec GmbH	FlexCore-SMA11-SMA11-8000-ARM	11625	-/-	2020-Oct.	3 years
Shielded room/ Chamber	Frankonia	SAC3 "SEMI-ANECHOIC-CHAMBER"	11609	004/16	2022-March	3 years

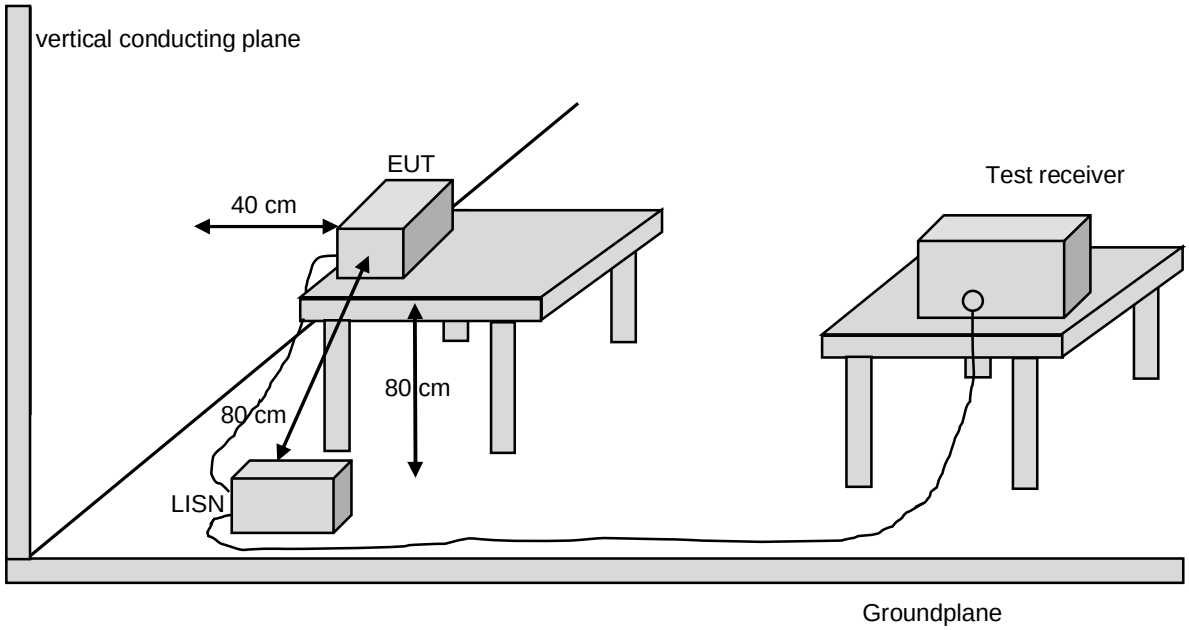
All measurements were made with measuring instruments, including any accessories that may affect test results, calibrated according to the requests of ISO/IEC 17025 according to which the test site is accredited from DAkkS. Measurement of conducted mains emissions was made with instruments conforming to American National Standard Specification, ANSI C63.4-2014.

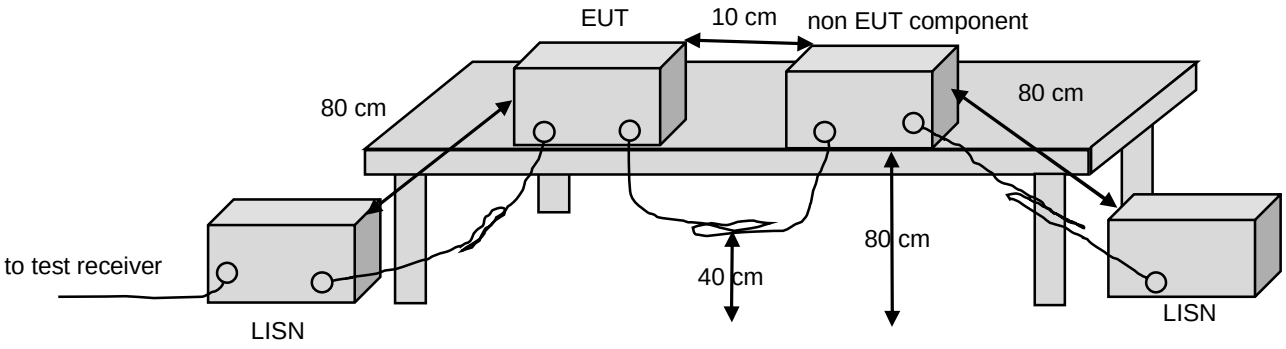
Test equipment to support EUT functions:

Kind of equipment	Manufacturer	Type	Ident no.
Laptop	Lenovo	G700	11568
Mobil telephone	Samsung	Galaxy A21	-/-

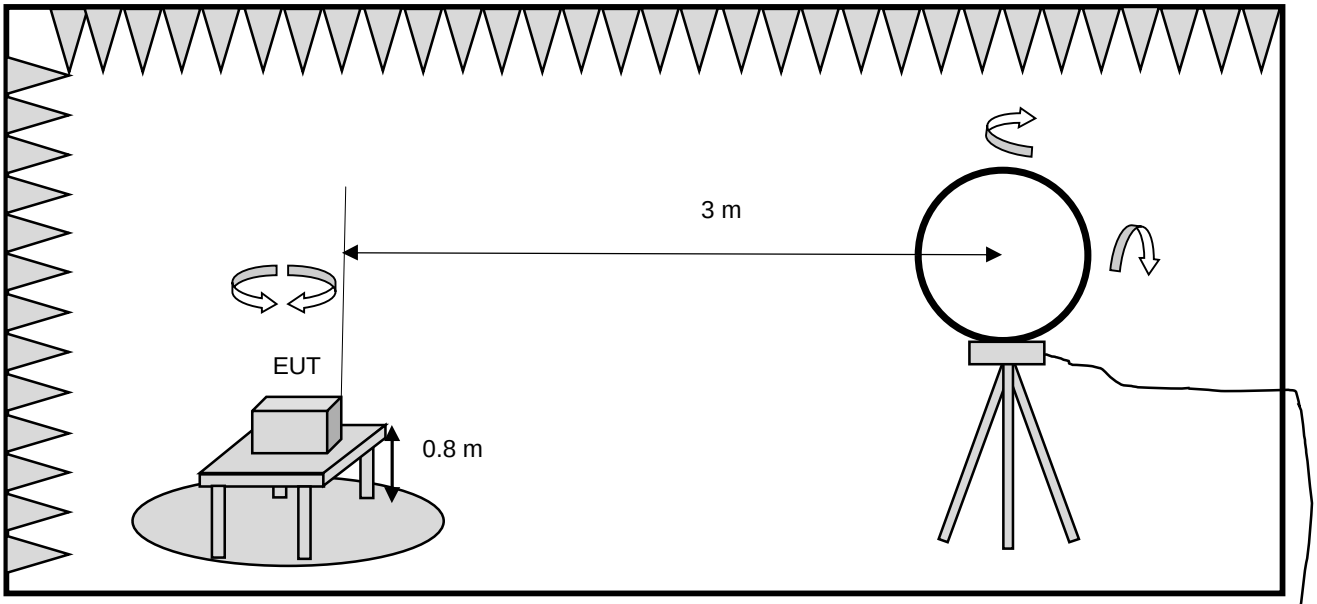
10. Test setups

Block diagram Conducted Mains emissions





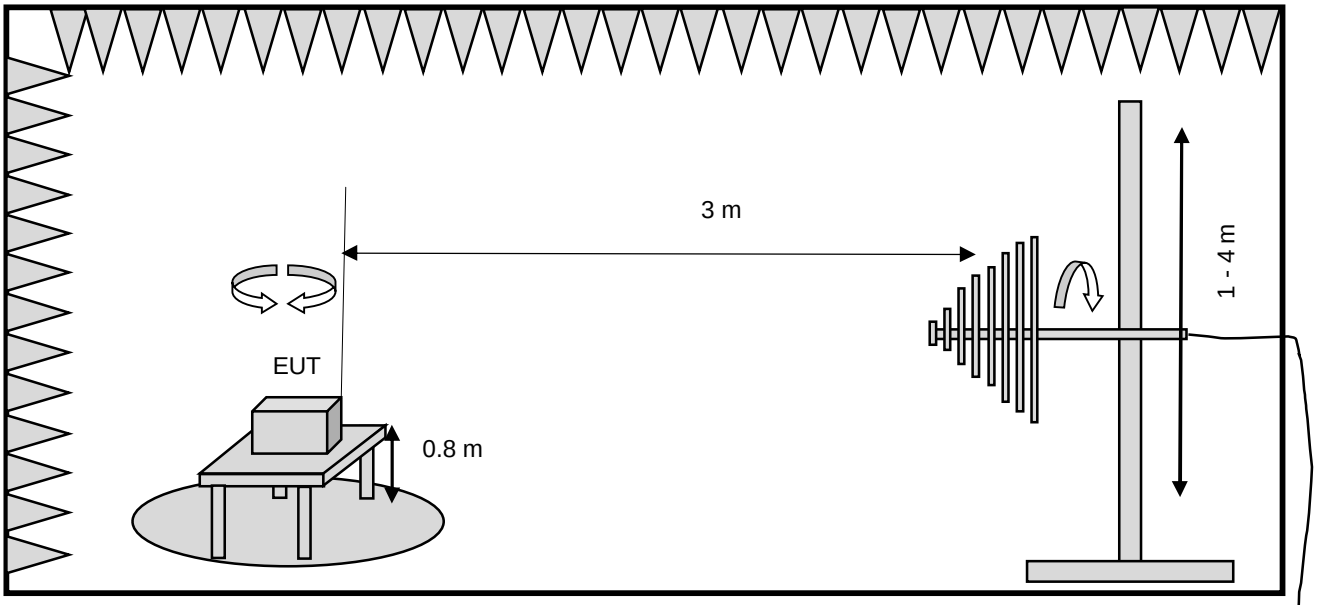
Block diagram Radiated emissions



Semi anechoic chamber with absorber and ferrite tiles

Test receiver

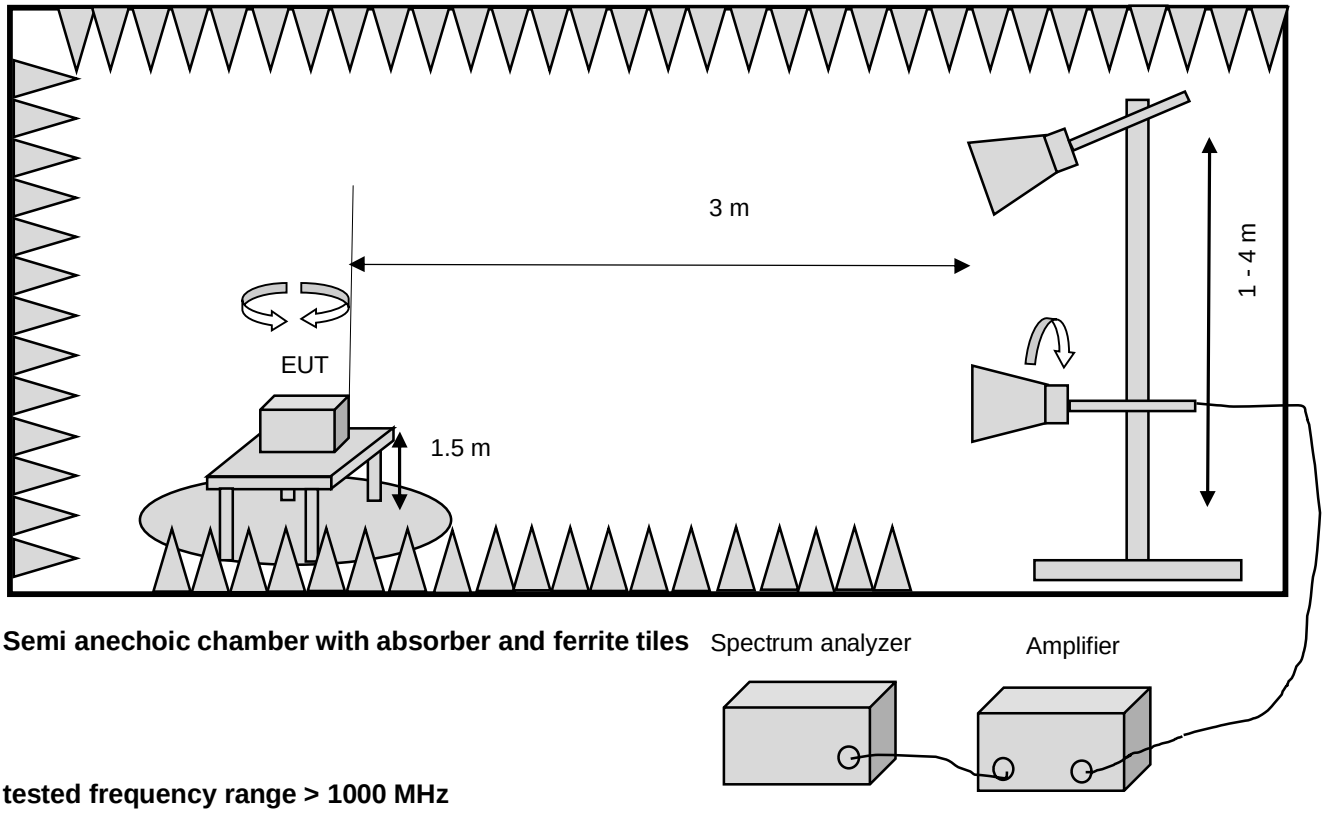
tested frequency range 9 kHz - 30 MHz



Semi anechoic chamber with absorber and ferrite tiles

Test receiver

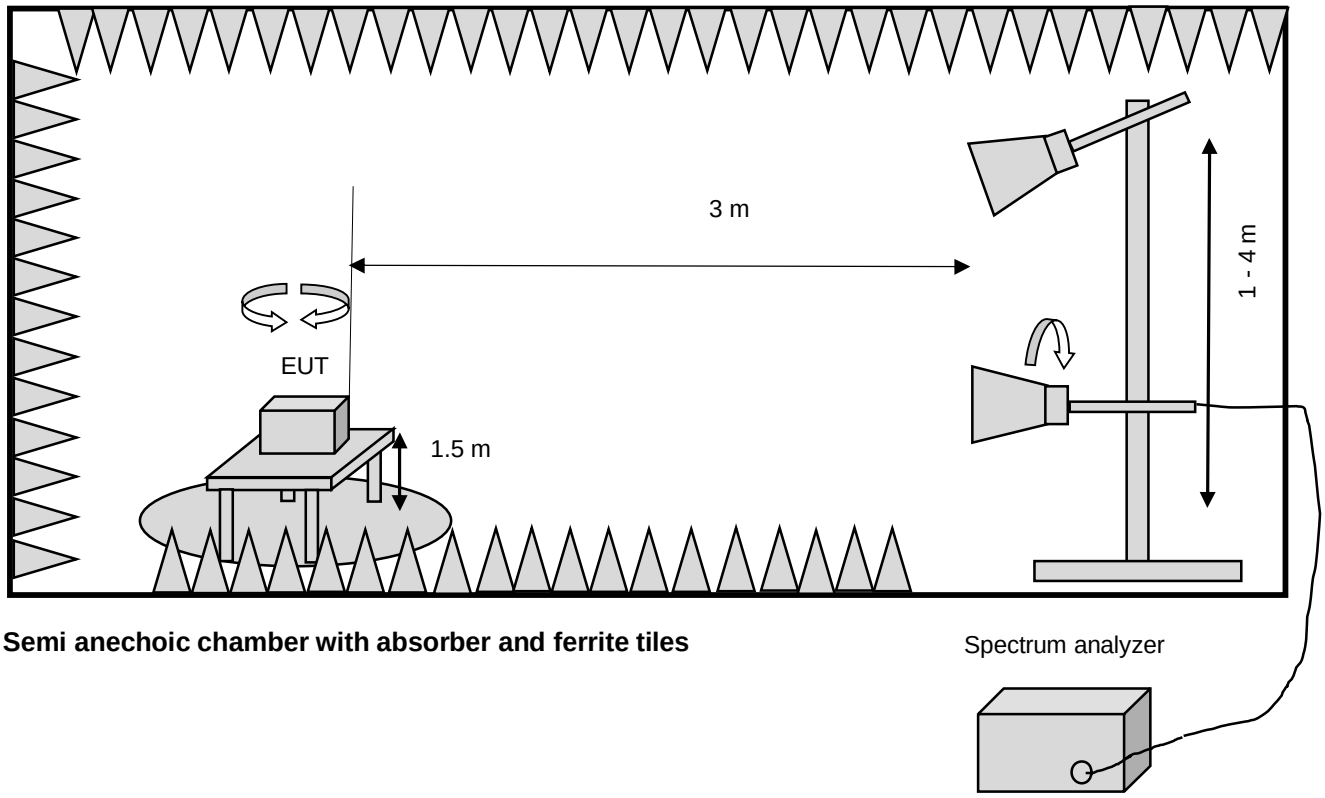
tested frequency range 30 MHz - 1000 MHz



Semi anechoic chamber with absorber and ferrite tiles

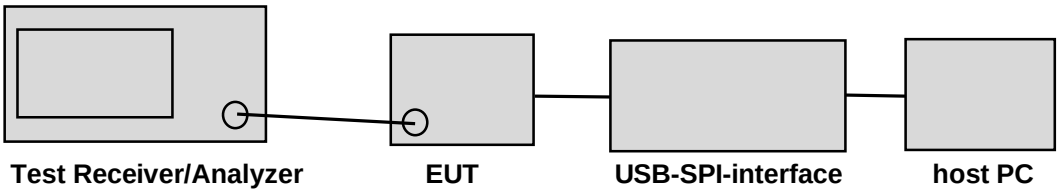
tested frequency range > 1000 MHz

Block diagram Band Edge emisions



Semi anechoic chamber with absorber and ferrite tiles

Block diagram for conducted measurements



11. Measurement uncertainty

Measurement uncertainty

nach CISPR 16-4-2 Edition 2.0 2011-06/according to *CISPR 16-4-2 Edition 2.0 2011-06*

Messgröße Measurement	**berechnete Messunsicherheit calculated uncertainty U_{lab}**	**Vorgegebene CISPR Messunsicherheit nach CISPR 16-4-2 Edition 2.0 2011-06, Tabelle 1 Specified CISPR uncertainty according CISPR 16-4-2 Edition 2.0 2011-06, table 1 U_{CISPR}**
Conducted disturbance at mains port using AMN 9 kHz – 150 kHz	3.6 dB	3.8 dB
Conducted disturbance at mains port using AMN 150 kHz – 30 MHz	3.2 dB	3.4 dB
Conducted disturbance at mains port using voltage probe 9 kHz to 30 MHz	2.1 dB	2.9 dB
Conducted disturbance at telecommunication port using AAN 150 kHz to 30 MHz	3.7 dB	5.0 dB
Conducted disturbance at telecommunication port using CVP 150 kHz to 30 MHz	3.2 dB	3.9 dB
Conducted disturbance at telecommunication port using CP 150 kHz to 30 MHz	2.4 dB	2.9 dB
Disturbance power 30 MHz to 300 MHz	4.1 dB	4.5 dB
Radiated disturbance (electric field strength in the SAC) 30 MHz to 1 000 MHz	4.7 dB	6.3 dB
Radiated disturbance (electric field strength at the OATS) 30 MHz to 1 000 MHz	4.5 dB	6.3 dB
Radiated disturbance (electric field strength in the SAC) 1 GHz to 6 GHz	4.1 dB	-/-
Radiated disturbance (electric field strength in the SAC) 6 GHz to 18 GHz	4.6 dB	-/-
Radiated disturbance (electric field strength in the SAC) 18 GHz to 26 GHz	4.6 dB	-/-

The horizontal and vertical site attenuation for the semi anechoic chamber is within the tolerance of +/-4dB according to CISPR16-1 series.

The uncertainty of the measurement equipment fulfils the requirements of CISPR 16-4-2 Edition 2.0 2011-06, table 1.

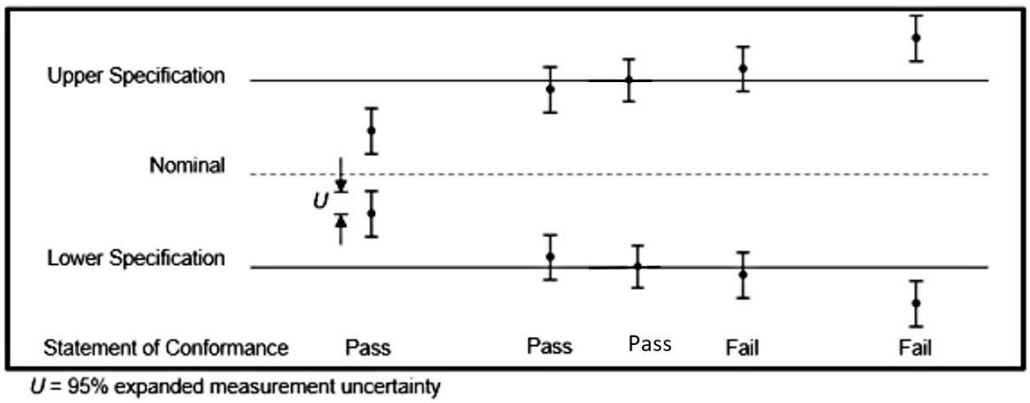
Zusätzliche Messunsicherheitsangaben/additional measurement uncertainty

Messgröße Measurement	berechnete Messunsicherheit calculated uncertainty	Messgröße Measurement	berechnete Messunsicherheit calculated uncertainty
Magnetische Feldstärke/ Magn. fieldstrength 9kHz - 30MHz	3.4 dB	Störspannung/ Interference voltage according CAR-Directive 2004/104/EC	1.2 dB
Störleistung an der Antennenbuchse/ Interference power at antenna socket	2.1 dB	Temperatur/Temperature	0.58 °C
Audio Pegel/ Audio level	1.9 dB	Feuchtigkeit/Humidity	0.58 % rel.
Schirmdämpfung/ Screening immunity	3.9 dB	Druck/ Pressure	3.1 %

The shown measurement uncertainty is based on a coverage factor of k = 2 (95 % level of confidence).

Applied Decision Rule:

☒ STC Germany Decision Rule applied for following tests: all



U = 95% expanded measurement uncertainty

Explanation:
The dot indicates the measured value and "U" indicates the measurement uncertainty. If the measured value is exactly on the limit value (specification), the result is assessed with "pass" - see the drawing above.

☐ Decision Rule prediscribed by

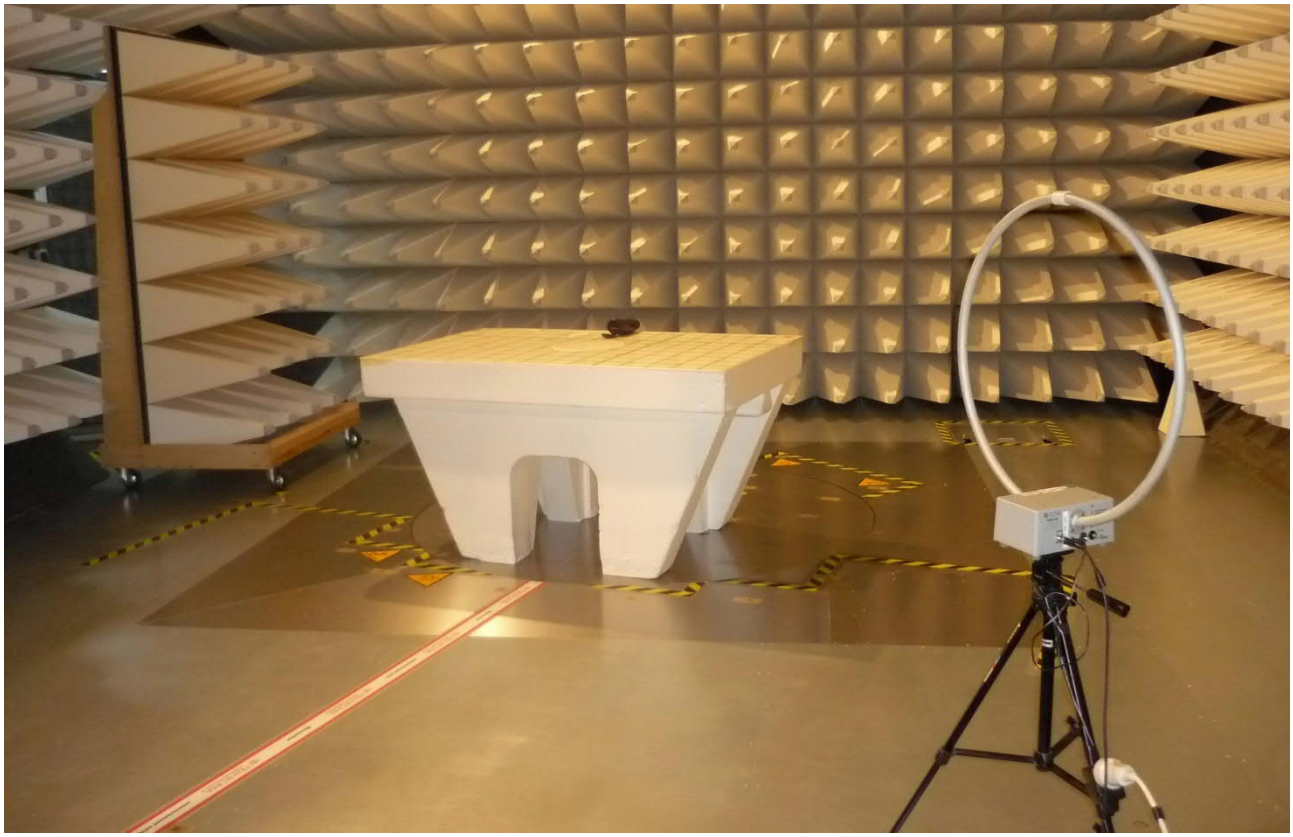
☐ Customer applied for following tests: -/-

☐ Regulations applied for following tests: -/-

☐ Normative Documents applied for following tests: -/-

12. Photos setup

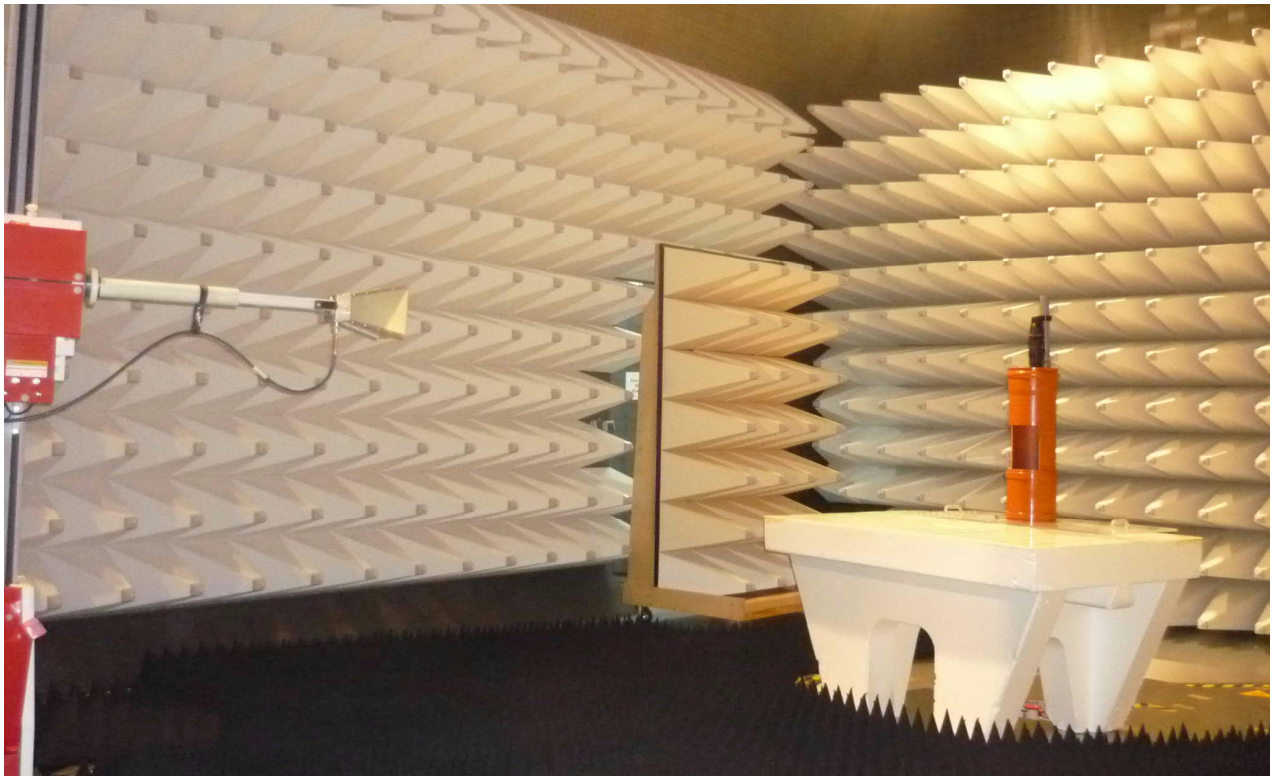
Interference Radiation:



tested frequency range 9 kHz – 30 MHz radiated

tested frequency range 30 MHz – 1000 MHz radiated

Interference Radiation and Output Power



tested frequency range > 1000 MHz radiated

13. Conclusions

From the measurement data obtained, the tested sample was considered to have **COMPLIED** with the requirements for the relevant §15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

From the measurement data obtained, the tested sample was considered to have **COMPLIED** with the requirements for the relevant RSS-247 issue 02 Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network.

Following specific modifications and/or special attributes are necessary to pass the above mentioned requirements:

none

05.12.2022	M. Wundrak, Laboratory Engineer	
Erstellt am/*prepared on*	**(Name/***name* / **Stellung/***position***)**	**(Unterschrift/***signature***)**

12.12.2022	K. Gisbert, Laboratory Supervisor	
Freigabe am/released *on*	**(Name/***name* / **Stellung/***position***)**	**(Unterschrift/***signature***)**

14. Photos of tested sample


ZEISS


ZEISS


ZEISS DTI 6


5272768
5272768


5272777


NVDEMO85


ZEISS
Rechargeable Li-ion Battery 2INR19/66
Model Name: ZB-DTI6
Voltage: 7.2V / Capacity: 3.2Ah / Energy: 23.04Wh
CAUTION
Replace with same type only.
Use of other battery may present a fire or explosion hazard.
Please refer to user manual or follow local ordinances and / or regulations for disposal.
Safety advice for Lithium Ion battery:
Risk of Fire and Burns. Do not open, crush, heat above 60°C/140°F, or incinerate.
Don't short circuit, don't dismantel, and don't immerse in any liquid.
May vent or rupture.
Respect charging instruction.
RECYCLE
1-800-822-8837
LISTED
UK CA
Li-ion


ZEISS
BATTERY CHARGER MODEL:
INPUT: 5V⎓3A or 9V⎓3A or
12V⎓2.5A or 15V⎓2A
OUTPUT: 8.4V / 3A
CAUTION: PLEASE USE THE ORIGINAL ADAPTER.
Carl Zeiss AG
MADE IN TAIWAN BY Jarpone Technology Inc.

End of test report