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Kunden-Referenz-Nr.: <i>Client reference no.:</i>	4500445712	Auftragsdatum: <i>Order date:</i>	2025-09-04	
Auftraggeber: <i>Client:</i>	Richard Wolf GmbH, Pforzheimer Str. 32, 75438 Knittlingen, Deutschland			
Prüfgegenstand: <i>Test item:</i>	CONTROL DEVICE FOR TISSUE REMOVAL			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	2209001			
Auftrags-Inhalt: <i>Order content:</i>	Prüfung der Funkparameter nach FCC & ISCED <i>Test of radio parameters acc. to FCC & ISCED</i>			
Prüfgrundlage: <i>Test specification:</i>	Vollprüfung / Complete test FCC CFR 47 Part 15 Subpart C- §15.225 ISCED RSS-210, 2024 Issue 11			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2025-09-16	For reasons of confidentiality, no photos of the EUT are included in this report. For EUT and test setup photos please see the Photo Documentation to this report Number.		
Prüfmuster-Nr.: <i>Test sample no.:</i>	A004105594-001 to 002			
Prüfzeitraum: <i>Testing period:</i>	2025-10-16 - 2026-02-26			
Ort der Prüfung: <i>Place of testing:</i>	Nürnberg Nuremberg			
Prüflaboratorium: <i>Testing laboratory:</i>	Wireless Labor Wireless Test Lab			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	 07.08.2026 Signiert von: Matthias Kraeutlein		genehmigt von: <i>authorized by:</i>	 8/7/2026 Signed by: Shrinivas Naikar
Datum: <i>Date:</i>			Ausstellungsdatum: <i>Issue date:</i>	
Stellung / Position:	Sachverständige(r)/Expert		Stellung / Position:	Sachverständige(r)/Expert
Sonstiges / <i>Other:</i>				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* Legende: P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet * Legend: P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested				
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Anmerkungen Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. <i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system.</i> <i>Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i>
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4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2023, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. <i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2023, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i>
5	Wenn auf dem Bericht kein Akkreditierungshinweis aufgebracht ist, wurde der Bericht nicht im akkreditierten Bereich erstellt und ist folglich auch nicht vom EA MLA abgedeckt. Unabhängig davon wurde der Bericht auf Basis der allgemeinen Regeln der ISO/IEC 17000er Reihe erstellt. Mit "#" gekennzeichnete Prüfungen sind nicht Bestandteil der Akkreditierung D-PL-14169-03-00. <i>If there is no accreditation notice on the report, the report has not been produced in the accredited area and is consequently not covered by the EA MLA. Regardless of this, the report has been prepared based on the general rules of the ISO/IEC 17000 series. Tests marked with "#" are not covered by the accreditation D-PL-14169-03-00.</i>

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Produktbeschreibung
Product description

1	Test item	CONTROL DEVICE FOR TISSUE REMOVAL	
2	Typ-No.	2209001	
3	Identical Types and Application Part.	Type No	Name
		2209101	CONTROL DEVICE FOR TISSUE REMOVAL
		42209002	TISSUE REMOVAL DEVICE FOR URO
		42209102	TISSUE REMOVAL DEVICE FOR URO
4	Test sample obtaining	☒ Sampling by customer ☐ Sampling by TÜV Rheinland Group ☐ others:	
5	Serial-No.	1101132087	
6	Supported radio technologies evaluated in this report	RFID 13.56 MHz	
7	Supported radio technologies not evaluated in this report	-	
8	Description of EUT	Recognition, devaluation and parameter transmission of sterile application parts	
9	Max RF output power (declared)	100mA*3,3V*0,5=165mW max. (0,5 Leistungsanpassung) Powersupply 3,3V 100mA typ. 35dB von 60dB ist Standardsetting des CLRC66301HN	
10	Operating Frequency (declared)	13.56 MHz	
11	Channel Bandwidth (declared)	Not provided	
12	Number of Channels	1	
13	Modulation	100% ASK	
14	Rated Voltage / Frequency	100VAC to 240VAC (50Hz to 60Hz)	
15	Radio Module Name	CLRC66301HN	
16	FCC-ID (Radio module)	2BS3I-2209101	
17	IC (Radio module)	35058-2209001	
18	Radio Module / Antenna Type	☐ Radio module with antenna on module PCB ☒ Radio module with dedicated antenna ☐ Radio module with user accessible antenna connector	
19	Antenna Name	RFID PCB 64352620	
20	Antenna Type	☒ Integral antenna (designed as a fixed part of the EUT) ☐ Dedicated antenna (removable, obligation to be used) ☐ Permanent antenna connector	
21	Antenna number of chains	1	
22	Antenna Gain Choose an item	Not Provided	
23	Software / Firmware	Not Provided	
24	Hardware	Not Provided	
25	Provided Samples	A004105594-001 to 002	
26	Conducted measurements sample	N/A(cond. sample)	
27	Radiated measurements sample	A004105594-001 (rad. Sample) A004105594-002 RFID TAG	
28	Companion Device used for radio connection with the EUT	EUT in Test Mode. Therefore, no Companion Device was used.	
29	Auxiliary equipment used to set up the EUT	N/A	
30	Data Cable	N/A	
31	I/O Ports	N/A	
32	Temperature Range	+10°C -+35°C	
33	Environment	Indoor	

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FCC §15.203 ISED RSS-Gen sec. 6.8	Antenna Requirement		P ☒ F ☐ N/A ☐ N/T ☐
FCC §15.215 (c)	20dB Bandwidth		P ☒ F ☐
ISED RSS-Gen sec. 6.7	Occupied bandwidth (99%)	only to be measured but no limits apply.	N/A ☐ N/T ☐
FCC §15.225 (a-c) ISED RSS-210 Annex B.6 (a) i-iii	Fundamental Field Strength within the band 13.110-14.010 MHz		P ☒ F ☐ N/A ☐ N/T ☐
FCC §15.225 (d) ISED RSS-210 Annex B.6 (a) iv	Radiated Spurious Emission outside of the 13.110-14.010 MHz band		P ☒ F ☐ N/A ☐ N/T ☐
FCC §15.225 (e) ISED RSS-210 Annex B.6 (b)	Frequency Stability		P ☒ F ☐ N/A ☐ N/T ☐
FCC §15.207 ISED RSS-Gen sec. 8.8	AC Power Conducted Emissions	-	P ☒ F ☐ N/A ☐ N/T ☐

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1 Registration

The measurement facilities for conducted and radiated disturbance measurements of the TÜV Rheinland LGA Products have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules. Measurement data will be accepted in conjunction with applications for Certification under Parts 15 and 18 of the Commission's Rules.

FCC Registration Number: 939976

Bundesnetzagentur Registration Number: BNetzA-CAB-17/21-16

The measurement facilities are also recognized by Innovation, Science and Economic Development (ISED) Canada to test to Canadian radio equipment requirements.

Company Number: 11235A

CAB Identifier: DE0018

2 EUT Classification

2.1 Wireless technologies and frequencies supported by the EUT.

The named technologies are only those falling in the specification of the applied standard.

Technology	Frequency Range (TX)	TX Function	Supported by the EUT	Evaluated in this report
RFID	13.11 – 14.01 MHz (fc=13.56 MH)	SISO	☒	☒

SISO: Single Input Single Output

2.2 Standard specific classification of the EUT

2.2.1 Applied standards

FCC CFR 47 Part 15 Subpart C - §15.225

ISED RSS-210 Issue 11:06/2024

2.2.2 Test Methods and Guidance Documents

ANSI C63.10:2020 incl. Corrigendum 1:2023

KDB 558074 D01 v05r02:04/2019 DTS Measurement Guidance

KDB 174176 D01 v01r01:6/2015 Line Conducted FAQ

KDB 353028 D01 v01r01:04/2022 Antennas Part 15 Transmitters

ISED RSS-Gen I5:2018 incl. Amendment 2:2021 General Requirements for Compliance of Radio Apparatus

ANSI C63.10a:2024 incl. Errata to C63.10a:2024, applied for ISED, only.

Unless otherwise specified, in this documentation ANSI C63.10 refers to ANSI C63.10:2020 incl.

Corrigendum 1:2023 for FCC and ANSI C63.10a:2024 incl. Errata C63.10a:2024 for ISED. Any differences are stated where applicable.

2.2.3 Type of equipment

Tabletop Equipment

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3 Test conditions and configurations

3.1 Normal environmental test conditions

Environmental condition	Parameter	Range during test
Temperature	[°C]	21-24
Relative humidity	[%]	20-60
Supply voltage	[V]	120

3.2 Equipment modifications

No modifications were found to be necessary to perform the tests or to achieve compliance.

3.3 Antenna assemblies

No antenna connector is prepared so tests were done in radiated mode.

3.4 Test Modes

The EUT was rotated in all orientations (elevation).

FCC-ID: 2BS3I-2209101,
IC: 35058-2209001.

Following configurations were used for the test cases:

Test case	Worst case Configuration
Mode description	Mode configuration
All Modes	No auxiliary equipment was connected to the EUT.
Mode 1: TX-Mode	The RFID function starts immediately after the EUT is turned on and Tag applied
Mode 2: RX-Mode	The RFID function off if Tag not applied
Mode 3: N/A	
Mode 4: N/A	

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3.5 Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to ETSI TR 100 028-1/-2 and ETSI TS 103 051 (radiated measurements) and is documented in the quality system acc. to ISO/IEC 17025:2017.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation.

The stated values are the expanded uncertainty values, the measured value lies within the assigned range of values with a probability of 95% ($k = 1.96$).

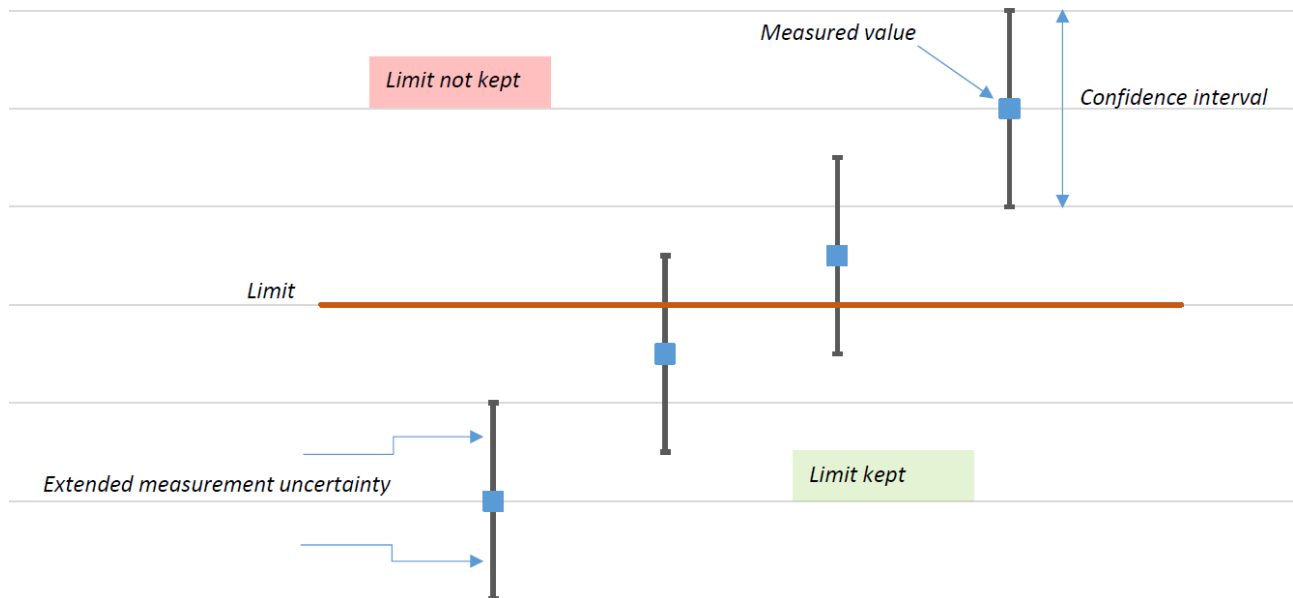
The manufacturer has the sole responsibility of continued compliance of the device.

Test	Value	Unit	Range
Frequency Error	2.7 *10 ⁻⁸	Hz	-
Frequency Stability under low voltage conditions			
Time	1.1*10 ⁻⁹	s	-
Conducted Carrier Power	1.0	dB	9k-1GHz
Conducted Spurious Emissions (RX/TX)	1.7	dB	1GHz-6GHz
	2.8	dB	6GHz-40GHz
Occupied Bandwidth (OBW)	0.1	%	-
TX Power Spectral Density	4.2	mW	9kHz - 6GHz
	1.6	dB	9kHz - 6GHz
Dwell Time	4.6 *10 ⁻⁷	Hz	-
Frequency Separation			-
Measurement of conducted emissions at the power supply connection to LISN	2.3	dB	9kHz – 150kHz
	2.2	dB	150kHz – 30MHz
Measurement of the field strength at distance 3m	1.6	dB	9k-150kHz
	4.5	dB	30-1000MHz
	5	dB	1-6GHz
	5.3	dB	6-40GHz
Temperature	0.8	K	-
Humidity	4	%	-
Voltage (AC/DC)	1.0	%	-

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Example:

Measured value	Limit	Extended measurement uncertainty ($k=1.96$)	Confidence interval (95%)
19 dBm @ 2.48GHz	20 dBm	1.7 dB	17.3 dBm – 20.7 dBm

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4 Test results in detail

4.1 Antenna Requirement

4.1.1 Requirements / Limits

FCC Part 15, Subpart C, §15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

ISED RSS-Gen sec. 6.8:

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna.

4.1.2 Test Results

The antenna connector is within the transmitter enclosure. Disassembly is not normally required. This is sufficient to demonstrate compliance with the antenna requirement in FCC Part 15, Subpart C, §15.203 (acc. KDB 353028 D01) and ISED RSS-Gen sec. 6.8.

4.1.1 Final test result (Antenna Requirement)

Final test result

Pass

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4.2 20 dB bandwidth and occupied bandwidth 99%

4.2.1 Requirements / Limits

FCC Part 15, Subpart C, §15.215

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.2.2 Test Method

The 20 dB bandwidth was measured according to ANSI C63.10 clause 6.9.2

The Occupied bandwidth (99%) was measured according to ISED RSS-Gen sec 6.7

For ISED measurements, a minimum RBW of 100 Hz (9 kHz–30 MHz), 1 kHz (30 MHz–1 GHz), and 10 kHz (above 1 GHz) was used in accordance with ANSI C63.10a, Clause 6.9.1

4.2.3 Test Setup (20 dB bandwidth and occupied bandwidth 99%)

4.2.3.1 Radiated measurements

EUT		A004105594-001 (rad. Sample) A004105594-002 RFID TAG
Chamber details		☐ 3m Fully Anechoic Chamber (FAC) ☒ 10m Semi Anechoic Chamber (SAC)
Measurement positioning		Distance: ☒ 3m ☐ 10m EUT height: ☐ 1.5m ☒ 0.8m Antenna height: ☒ 1m ☐ 1m to 4m – height scan
Companion device		EUT in Test Mode. Therefore, no Companion Device was used.
Operation mode		☒ 1: TX-Mode ☐ 2: RX-Mode ☐ 3: N/A ☐ 4: N/A
Spectrum Analyzer	Centre Frequency	13.56 MHz (nominal EUT channel centre frequency)
	Resolution Bandwidth	100 Hz (1% to 5% of the OBW)
	Video Bandwidth	2 kHz (three times RBW)
	Span	1 MHz (shall be between two times and five times the OBW)
	Sweep time	380µs
Detector		Peak with max-hold
Further parameters		-
Test engineer		Matthias Kräutlein

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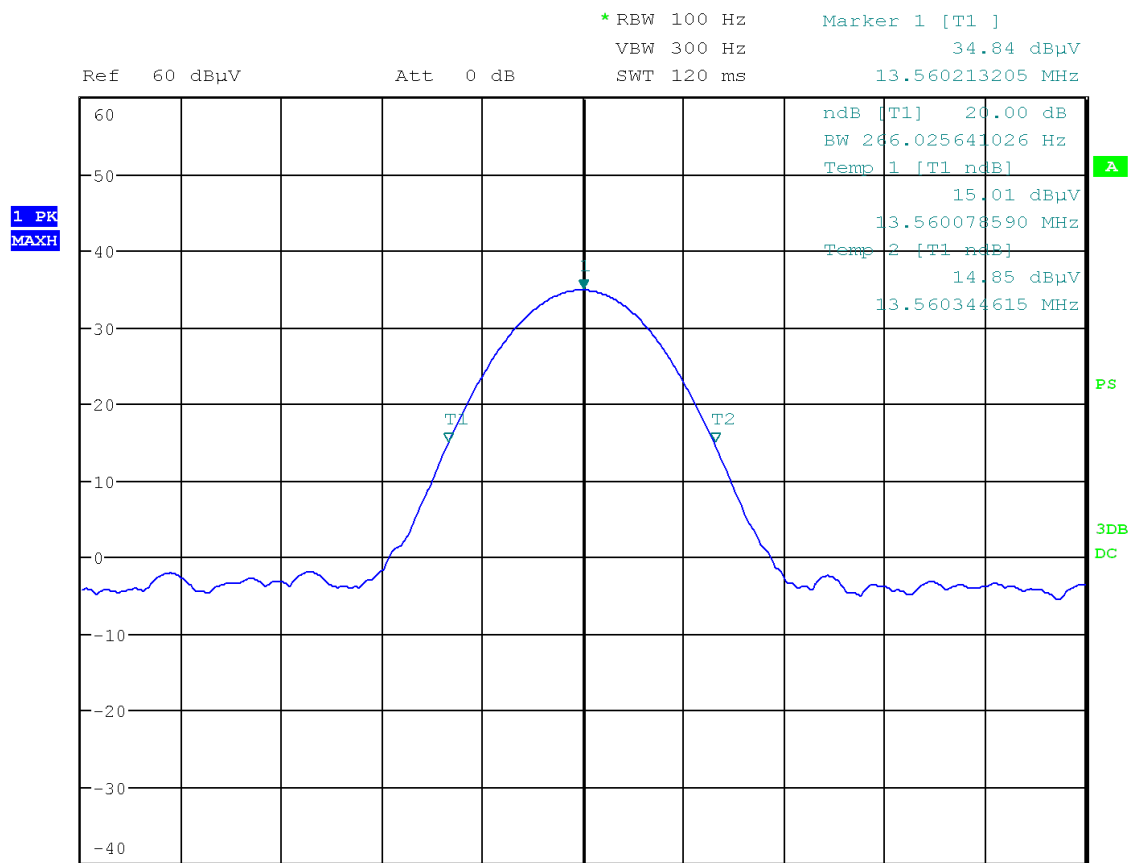
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4.2.4 Test Results (20 dB bandwidth and occupied bandwidth 99%)

4.2.4.1 20 dB Bandwidth

Frequency [MHz]	20 dB Bandwidth [kHz]	Lower Edge		Upper Edge		Test Result
		[MHz]	Limit [MHz]	[MHz]	Limit [MHz]	
13.56	266.0256	13.56008	13.11	13.56045	14.01	pass



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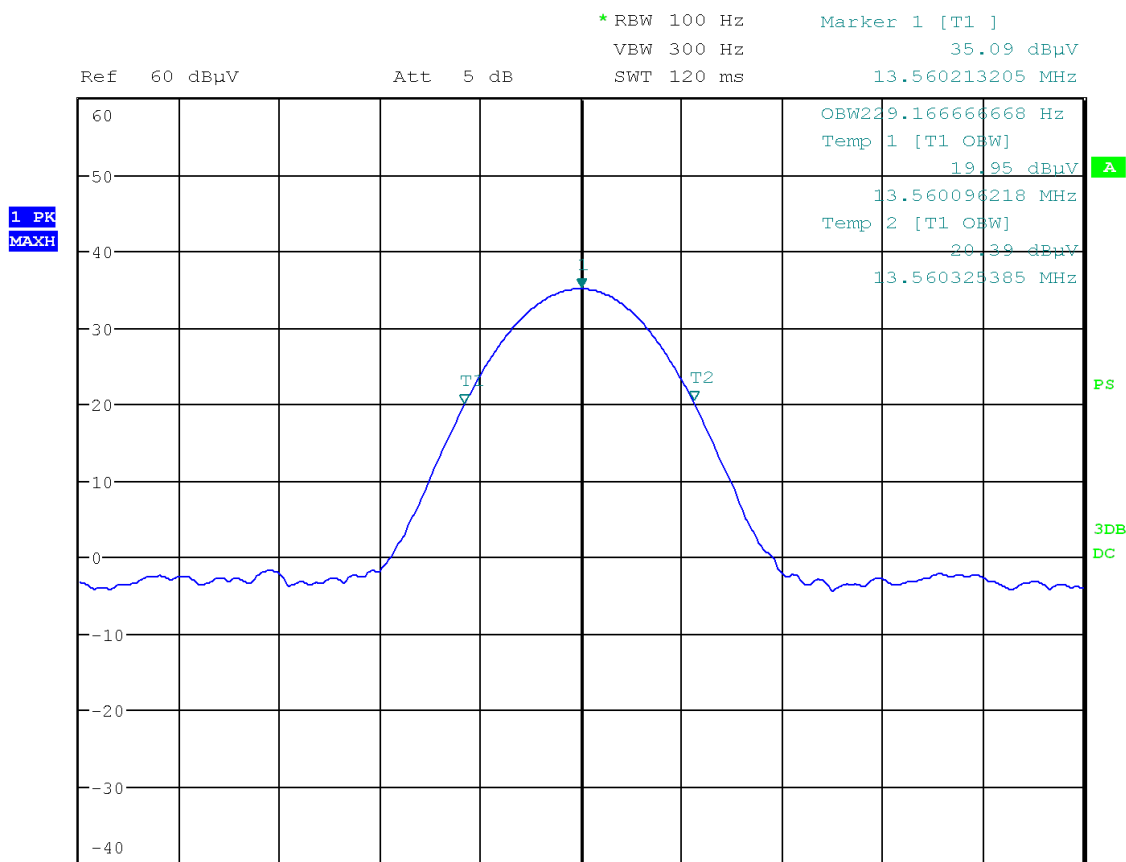
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4.2.4.2 Occupied bandwidth 99%

Frequency [MHz]	Bandwidth 99% [Hz]
13.56	229.16667

No Limits apply to the occupied bandwidth 99%



4.2.5 Final test result (20 dB bandwidth and occupied bandwidth 99%)

Final test result	Pass
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4.3 Radiated Emissions

4.3.1 Requirements / Limits

4.3.1.1 Fundamental Field Strength within the band 13.110-14.010 MHz

FCC Part 15, Subpart C, §15.225 (a-c); ISSED RSS-210 Annex B6 (a) i-iii

The field strength of any emission shall not exceed the following limits

Frequency [MHz]	Measurement distance [m]	Limit [$\mu\text{V/m}$]	Limit [dB $\mu\text{V/m}$]	Limits @ 3m [dB $\mu\text{V/m}$]
13.11-13.41	30	106	40.51	80.5@3m
13.41-13.553	30	334	50.47	90.5@3m
13.553 – 13.567	30	15848	84	124.0@3m
13.567-13.71	30	334	50.47	90.5@3m
13.71-14.01	30	106	40.51	80.5@3m

The limit values are corrected to the measurement distance with an inverse linear distance extrapolation factor (40 dB/decade) according to FCC 15.31 (f)(2); [RSS-Gen sec. 6.5].

4.3.1.2 Radiated Spurious Emissions outside of the 13.110-14.010 MHz band

FCC Part 15, Subpart C, §15.225 (d); ISSED RSS-210 Annex B6 (a) iv

The field strength of any emission appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209; ISSED RSS-Gen sec. 8.9

FCC Part 15, Subpart C, §15.209; ISSED RSS-Gen sec. 8.9; Radiated Emission Limits

Frequency [MHz]	Measurement distance [m]	Limit [$\mu\text{A/m}$]	Limit [$\mu\text{V/m}$]	Limit [dB $\mu\text{V/m}$]	Limit @3m [dB $\mu\text{V/m}$]	Detector
0.009 – 0.09	300	6.37/F	2400/F	48.5 ... 28.5	128.5 ... 108.5	AVG(Pk)
0.09 – 0.11	300	6.37/F	2400/F	28.5 ... 26.8	108.5 ... 106.8	QP
0.11 – 0.49	300	6.37/F	2400/F	26.8 ... 13.8	106.8 ... 93.8	AVG(Pk)
0.49 – 1.705	30	63.7/F	24000/F	33.8 ... 23.0	73.8 ... 63.0	QP
1.705 – 30	30	0.08	30	29.5	69.5	QP
30 – 88	3	-	100	40.0	40.0	QP
88 – 216	3	-	150	43.5	43.5	QP
216 – 960	3	-	200	46.0	46.0	QP
960 - 1000	3	-	500	54.0	54.0	QP
1000 - 40000	3	-	500	54.0	54.0	AVG(Pk)

F: Frequency in kHz

Used conversion factor [$\mu\text{A/m}$]->[$\mu\text{V/m}$]: Limit [$\mu\text{V/m}$] = Limit[$\mu\text{A/m}$] * 376.7Ohm

Used conversion factor [$\mu\text{V/m}$]->[dB $\mu\text{V/m}$]: Limit [dB $\mu\text{V/m}$] = 20 log (Limit [$\mu\text{V/m}$] / 1[$\mu\text{V/m}$])

FCC Part 15, Subpart C, §15.31 (f)(2); ISSED RSS-Gen sec. 6.5:

At frequencies below 30MHz, the limit values are corrected with an inverse linear distance extrapolation factor (40dB/decade).

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90kHz, 110–490kHz and above 1000MHz. Radiated emission limits in these three bands are based on measurements employing a linear average detector.

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FCC Part 15, Subpart C, §15.35(b); ISSED RSS-Gen sec. 8.1:

..., there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit...

FCC Part 15, Subpart A, §15.33 (a)(1); ANSI C63.10 clause 5.5; ISSED RSS-Gen sec. 6.13.2:

For an intentional radiator operating below 10 GHz, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

4.3.2 Test Method

A test program that controls instrumentation and data logging was used to automate the preliminary RF emission test procedure. Preliminary emission testing was performed inside the anechoic chamber. The measurement equipment was located outside of the chamber. A video camera was placed inside the chamber to view the EUT. The different measurement setups for each frequency range are shown below.

For the final testing, the placement of EUT and cables were the same as for preliminary testing. The six highest emissions relative to the limit were measured unless such emissions were more than 20 dB below the limit. If less than six emissions are within 20 dB of the limit, then the noise level of the receiver is measured at frequencies where emissions are expected. Multiples of all oscillator and microprocessor frequencies were also checked. For the measurements in the frequency range 30 MHz to 1 GHz for each measured frequency the peak emission was maximized by manipulating the receiving antenna from 1 to 4 meters above the ground plane and placing it at the position that produced the maximum signal strength reading. The turntable was then rotated through 360° while observing the peak signal and placing the EUT at the position that produced maximum radiation.

For the measurements in the frequency ranges (90-110kHz, 490 kHz-1 GHz) quasi-peak detector was used, while average and peak detectors were used in other ranges.

Final testing was performed on an NSA compliant test site.

The final average electric field value (E_{final}) is calculated using the following equation:

The field strength is calculated by adding the antenna factor and cable loss. The basic equation with a sample calculation is as follows:

$$E = U + AF + CA$$

Where

E : Field strength

U : Receiver reading

AF : Antenna factor

CA : Cable loss

For example:

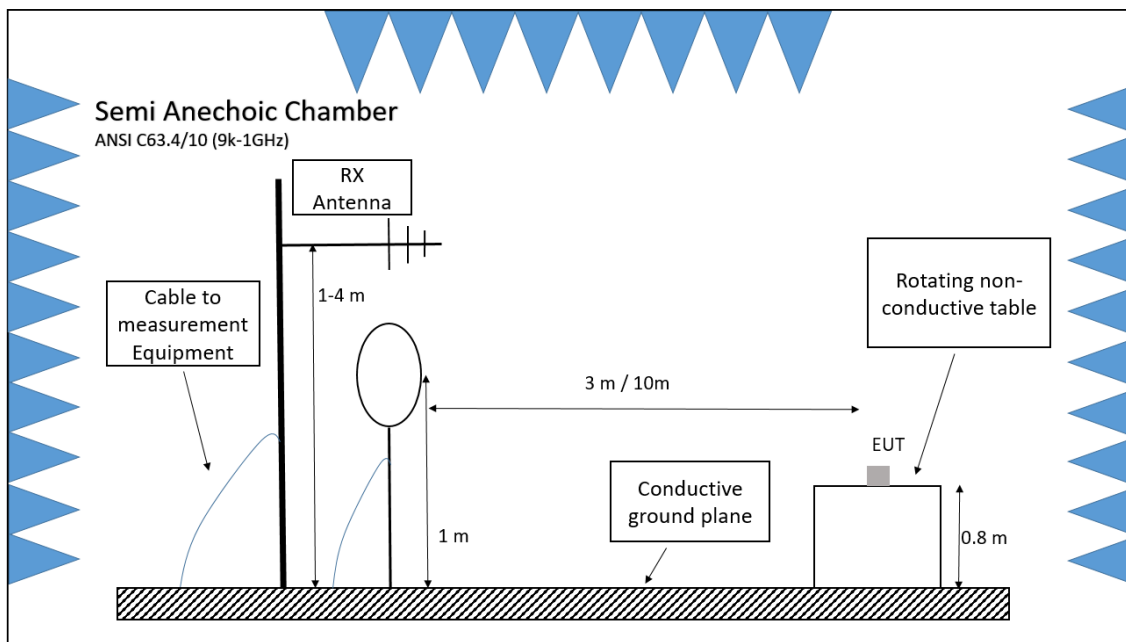
Receiver reading U (dBμV)	Correction antenna factor AF + cable loss CA (dB)	Field strength E (dBμV/m)
15.9	15.8	31.7

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4.3.2.1 EUT positioning



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4.3.2.1.1 Measurement Setup 9kHz - 30MHz

Test Site	SAC (Semi Anechoic Chamber)
Receiving Antenna	Loop antenna (HFH 2)
Receiving Antenna Height	1m (lowest height of Loop antenna)
Receiving Antenna Polarization	Parallel, perpendicular to the EUT and ground parallel (EUT with Loop antenna that can be in horizontal position) According to ANSI C63.10 clause 6.4.6
EUT Table	1.0m x 1.5m non-conductive table 80cm above the floor
EUT Turn Table Step Size	22.5° during exploratory tests Linear during maximizations for final measurements
Receiver Configurations	Average and peak detectors (9-90kHz and 110-490kHz) Quasi Peak detector (90-110kHz and 490kHz-30MHz)
	RBW: 200Hz (9 - 150kHz) and 9 kHz (150kHz – 30MHz)
	Step Size: 50Hz (9-150kHz) and 2.25kHz (150k-30MHz)
	Sweep Time: 30ms (FFT) during exploratory tests Sweep Time: 1s for final measurements

4.3.2.1.2 Measurement Setup 30MHz - 1GHz

Test Site	Semi-anechoic chamber
Receiving Antenna	Hybrid Antenna VULB 9168
Receiving Antenna height	Varied (1m to 4m, step size 1m) during exploratory tests Linear during maximizations for final measurements
Receiving Antenna Polarization	Horizontal and Vertical
EUT Table	1.0m x 1.5m non-conductive table 80cm above the floor
EUT Turn Table Step Size	45° during exploratory tests Linear during maximizations for final measurements
Receiver Configurations	Average and peak detector
	RBW :120 kHz
	Step Size: 30kHz (30-1000MHz)
	Sweep Time: 20ms (FFT) during exploratory tests Sweep Time: 1s for final measurements

4.3.3 Test Setup

EUT	A004105594-001 (rad. Sample) A004105594-002 RFID TAG
Companion device	EUT in Test Mode. Therefore, no Companion Device was used.
Operation mode	☒ 1: TX-Mode ☐ 2: RX-Mode ☐ 3: N/A ☐ 4: N/A
Further parameters	-
Test engineer	Matthias Kräutlein

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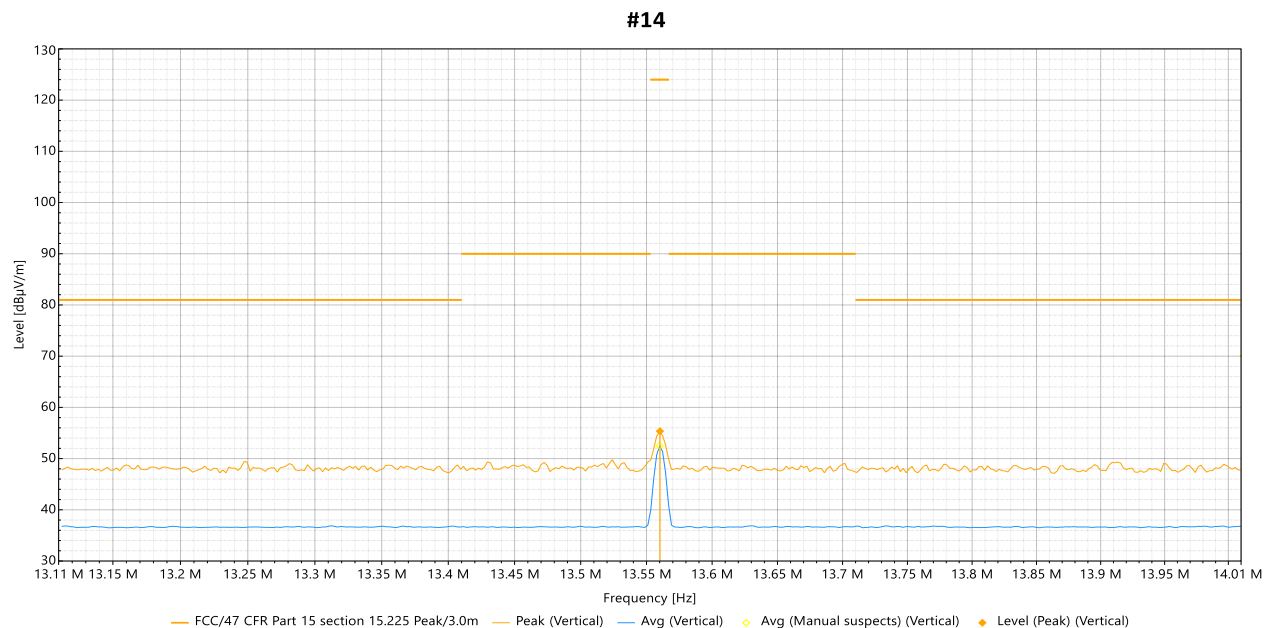
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4.3.4 Test results

4.3.4.1 Fundamental Field Strength within the band 13.110-14.010 MHz

4.3.4.1.1 Perpendicular Polarization



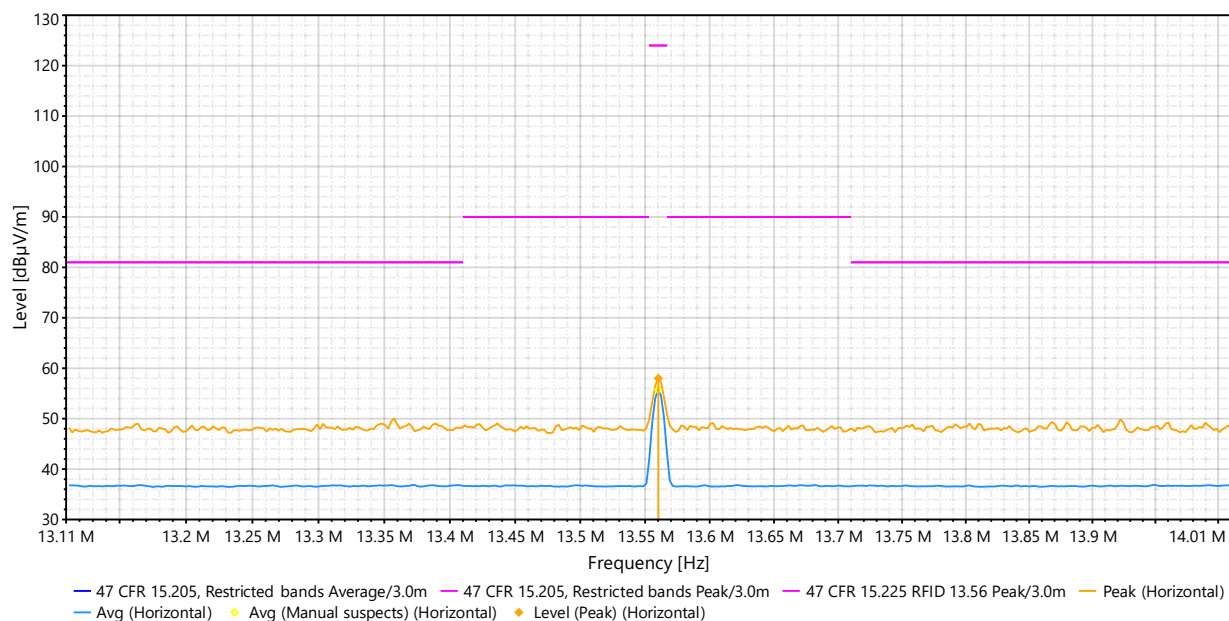
Frequency (Hz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pos	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)
13.56 M	55.4	124.0	-68.6	V	9.7	1.50	19.7	9 k	1.0

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4.3.4.1.2 Parallel Polarization



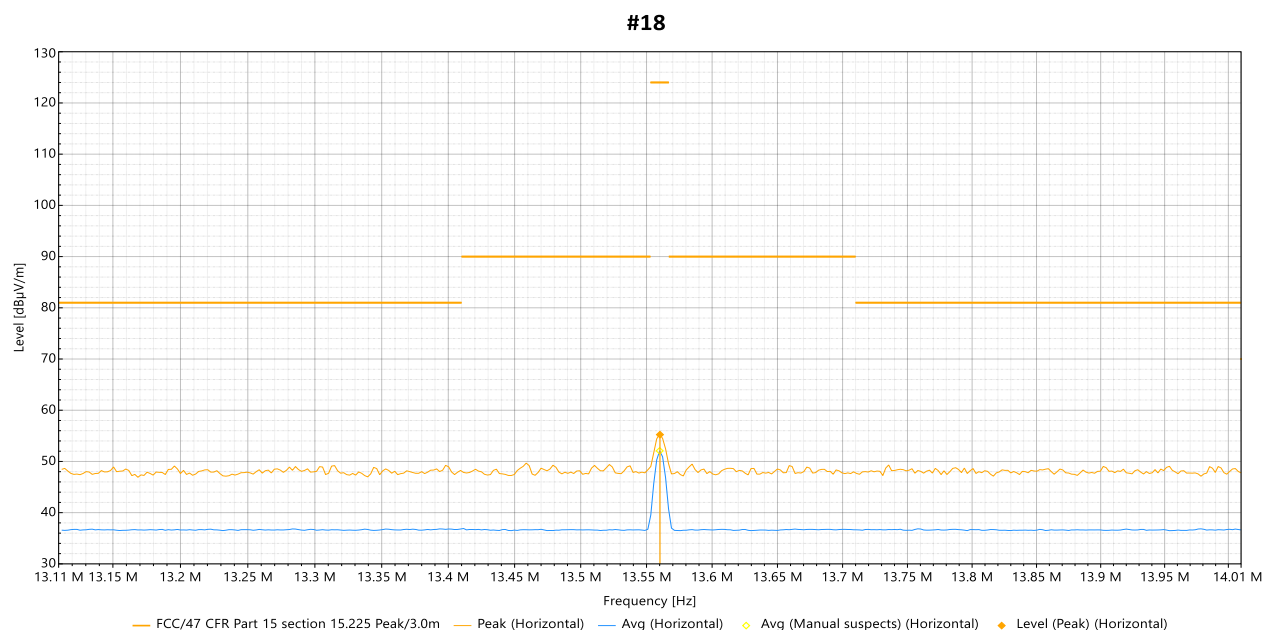
Frequency (Hz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pos	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)
13.56 M	58.0	124.0	-66.0	H	296.1	1.50	19.7	9 k	1.0

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4.3.4.1.3 Ground-Parallel Polarization



Frequency (Hz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pos	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)
13.56 M	55.2	124.0	-68.8	H	327.6	1.50	19.7	9 k	1.0

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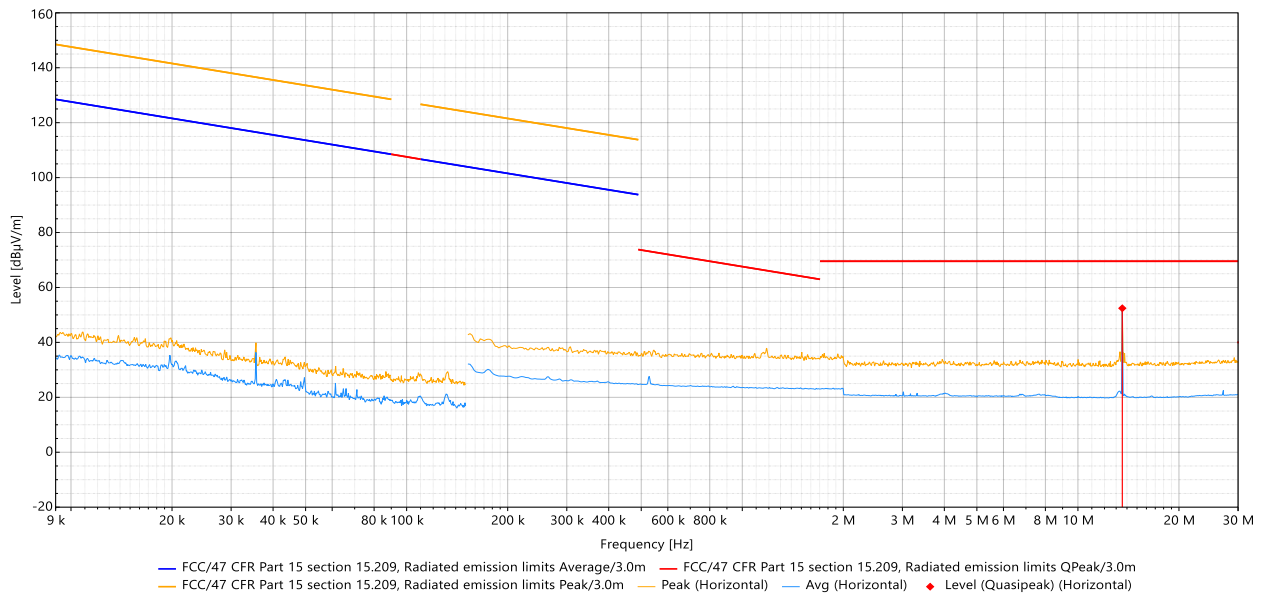
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4.3.4.2 Radiated Emissions 9 kHz to 30 MHz with tag

4.3.4.2.1 Perpendicular Polarization

#15



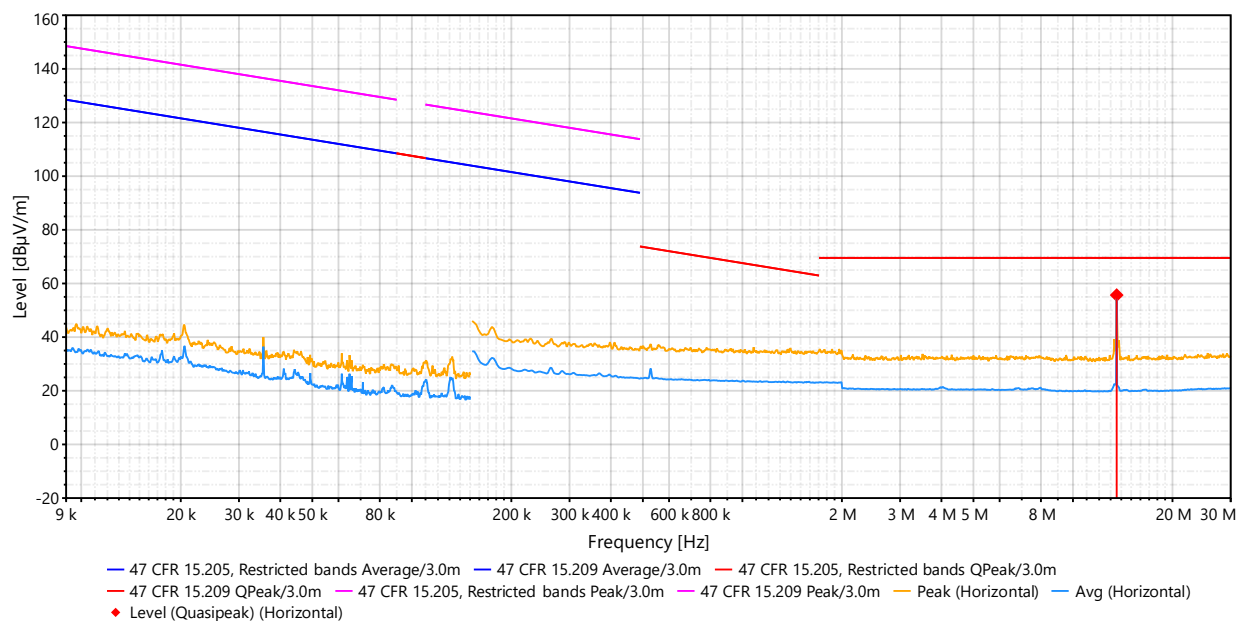
Frequency (Hz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)
13.56 M	52.4	69.5	-17.1	7.3	1.50	19.7	9 k	1.0

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4.3.4.2.2 Parallel Polarization



Frequency (Hz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)
13.56 M	55.7	69.5	-13.9	287.3	1.50	19.7	9 k	1.0

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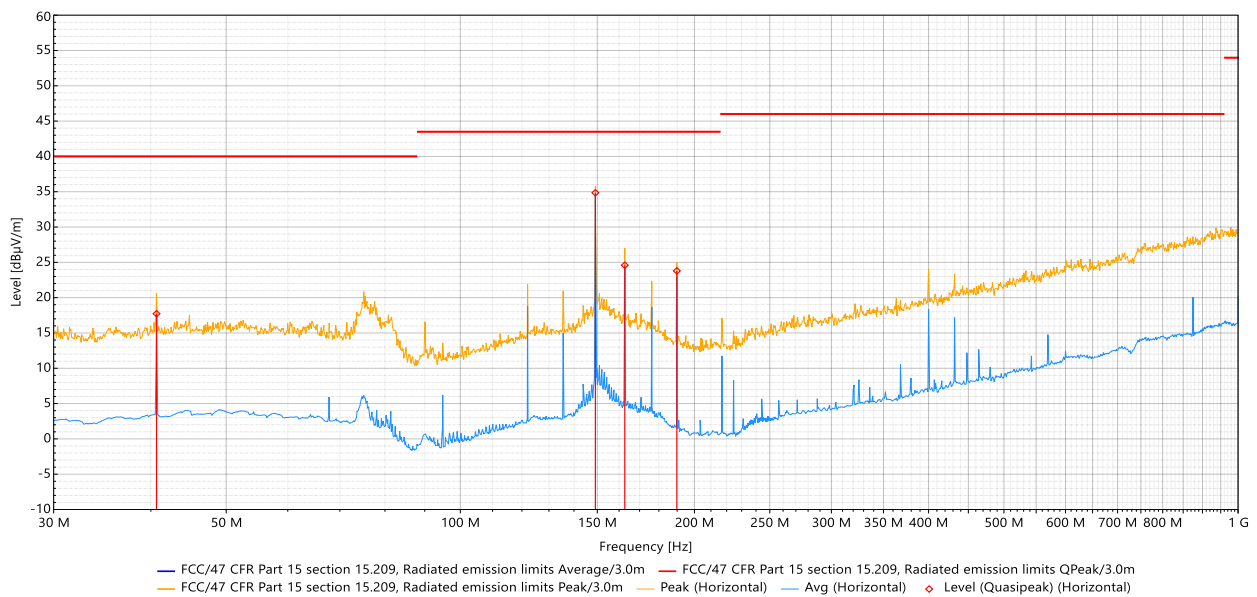
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4.3.4.3 Radiated Spurious Emissions 30 MHz to 1 GHz with tag

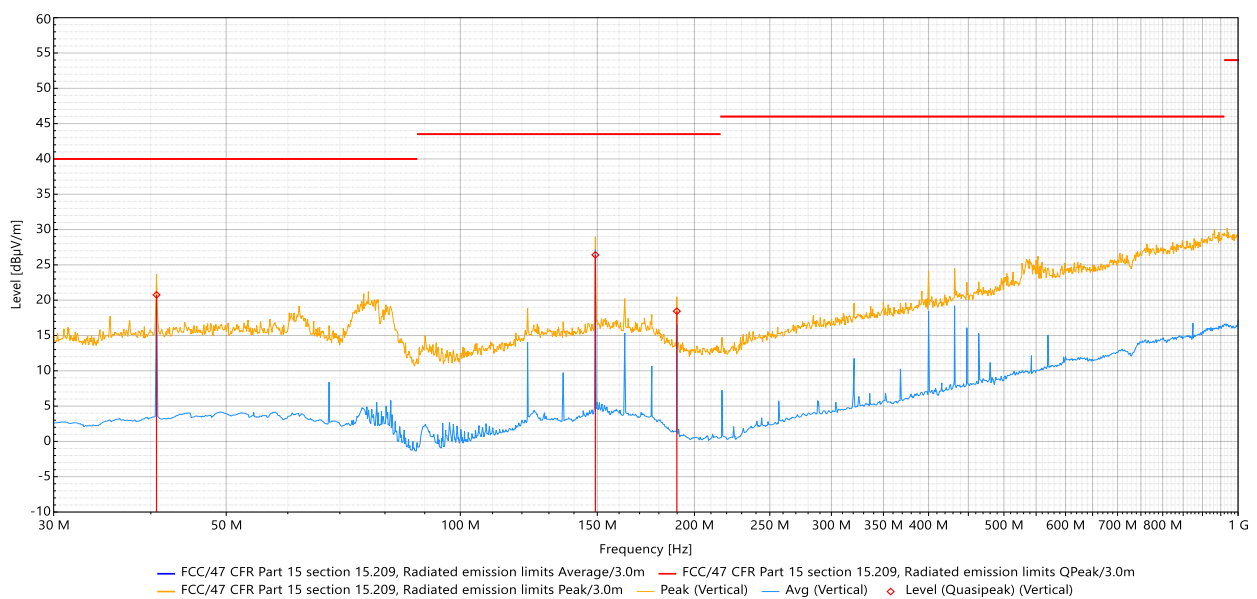
4.3.4.3.1 Horizontal Polarization

#10



4.3.4.3.2 Vertical Polarization

#10



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4.3.4.3.3 Measurement Values

Frequency (Hz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pos	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)
40.68 M	17.7	40.0	-22.3	H	279.1	4.00	-11.0	120 k	1
40.681 M	20.7	40.0	-19.3	V	14.8	1.51	-11.0	120 k	1
149.162 M	34.9	43.5	-8.6	H	72.2	1.99	-10.5	120 k	1
149.162 M	26.4	43.5	-17.1	V	18.6	2.48	-10.5	120 k	1
162.722 M	24.6	43.5	-18.9	H	59.1	1.95	-10.3	120 k	1
189.842 M	18.4	43.5	-25.1	V	29.7	1.00	-13.0	120 k	1
189.842 M	23.8	43.5	-19.7	H	98.9	1.68	-13.0	120 k	1

4.3.5 Final test result

(Fundamental Field Strength within the band 13.110-14.010 MHz)
(Radiated Spurious Emissions outside of the 13.110-14.010 MHz band)

Final test result	Pass
-------------------	------

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Test documentation

4.4 Frequency Stability

4.4.1 Requirements / Limits

FCC Part 15, Subpart C, §15.225 (e)

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage (for battery operated equipment, the tests shall be performed using a new battery), and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

ANSI C63.10 sec. 5.13

Where the device is intended to be powered from an external power adapter, the voltage variations shall be applied to the input of the adapter provided with the device at the time of sale. If the device is not marketed or sold with a specific adapter, then a typical power adapter shall be used.

For devices with wide range of rated supply voltage, test at 15% below the lowest and 15% above the highest declared nominal rated supply voltage.

For devices obtaining power from an input/output (I/O) port (USB, firewire, etc.), a test jig is necessary to apply voltage variation to the device from a support power supply, while maintaining the functionalities of the device.

ISED RSS-210 Annex B.6 (b); ISED RSS-Gen sec. 6.11

Frequency stability is a measure of frequency drift due to temperature and supply voltage variations, with reference to the frequency measured at an appropriate reference temperature and the rated supply voltage. The reference temperature for radio transmitters is $+20^{\circ}\text{C}$.

A hand-held device that is only capable of operating using internal batteries shall be tested at the battery's nominal voltage, and again at the battery's operating end-point voltage, which shall be specified by the equipment manufacturer.

4.4.2 Test Method

According to ANSI C63.10 sec.6.8

The EUT is not prepared with a dummy load so an antenna is connected to the spectrum analyser with a coaxial cable and is placed near the EUT in the middle of an environmental temperature chamber to couple the EUT output to the spectrum analyser.

Frequency stability with respect to ambient temperature

Nominal supply voltage was used. The environmental temperature chamber was first set to 50°C . After the temperature was stabilized the EUT was turned on and the frequency was measured four times, at start up, after 2 minutes, after 5 minutes, and after 10 minutes. Then the temperature was reduced by 10°C and the measurements were repeated in the same way until the minimum temperature is reached (-20°C).

Frequency stability when varying supply voltage

The frequency was measured four times, at start up, after 2 minutes, after 5 minutes, and after 10 minutes with the Supply voltages of 85% of the minimum supply voltage and 115% of the maximum supply voltage being used.

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1.1.1 Test Setup

EUT	A004105594-001 (rad. Sample)
Environmental Cond.	Normal and Extreme
Chamber details	Shielded room
Companion device	EUT in Test Mode. Therefore, no Companion Device was used.
Operation mode	☒ 1: TX-Mode ☐ 2: RX-Mode ☐ 3: N/A ☐ 4: N/A
Further parameters	-
Test engineer	Matthias Kräutlein

1.1.2 Test results

Temperature	Startup		2 Minutes		5 Minutes		10 Minutes		Result
	Frequency [MHz]	Drift [%]	Frequency [MHz]	Drift [%]	Frequency [MHz]	Drift [%]	Frequency [MHz]	Drift [%]	
50	-	-	-	-	-	-	-	-	Declared max temperature Range 35°C EUT Does not start
40	13.560217	0.001601	13.560217	0.001601	13.560210	0.001547	13.560217	0.001600	Pass
30	13.560239	0.001761	13.560239	0.001761	13.560232	0.001707	13.560232	0.001707	Pass
20	13.560268	0.001974	13.560260	0.001921	13.560260	0.001921	13.560260	0.001921	Pass
10	13.560289	0.002134	13.560289	0.002134	13.560289	0.002134	13.560289	0.002134	Pass
0	13.560297	0.002188	13.560297	0.002188	13.560297	0.002188	13.560297	0.002188	Pass
-10	13.560282	0.002081	13.560282	0.002081	13.560282	0.002081	13.560282	0.002081	Pass
-20	13.560239	0.001761	13.560246	0.001814	13.560246	0.001814	13.560246	0.001814	Pass

Voltage	Startup		2 Minutes		5 Minutes		10 Minutes		Result
	Frequency [MHz]	Drift [%]	Frequency [MHz]	Drift [%]	Frequency [MHz]	Drift [%]	Frequency [MHz]	Drift [%]	
85	13.5603	0.00187	13.5602	0.00181	13.5602	0.00181	13.5602	0.00181	Pass
276	13.5603	0.00187	13.5602	0.00181	13.5602	0.00181	13.5602	0.00181	Pass

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4.5 AC Power Conducted Emission

4.5.1 Requirements / Limits

AC power-line conducted emission measurements shall be made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz, to determine the line-to-ground radio-noise voltage that is conducted from all of the EUT current-carrying power input terminals that are directly (or indirectly via separate transformers or power supplies) connected to a public power network.

FCC Part 15, Subpart C, §15.207 (a); ISED RSS-Gen sec. 8.8

... for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN).

Conducted Emission Limits

Frequency [MHz]	Conducted Limit [dB μ V]	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

*Decreases with logarithm of the frequency

FCC Part 15, Subpart C, §15.207 (c)

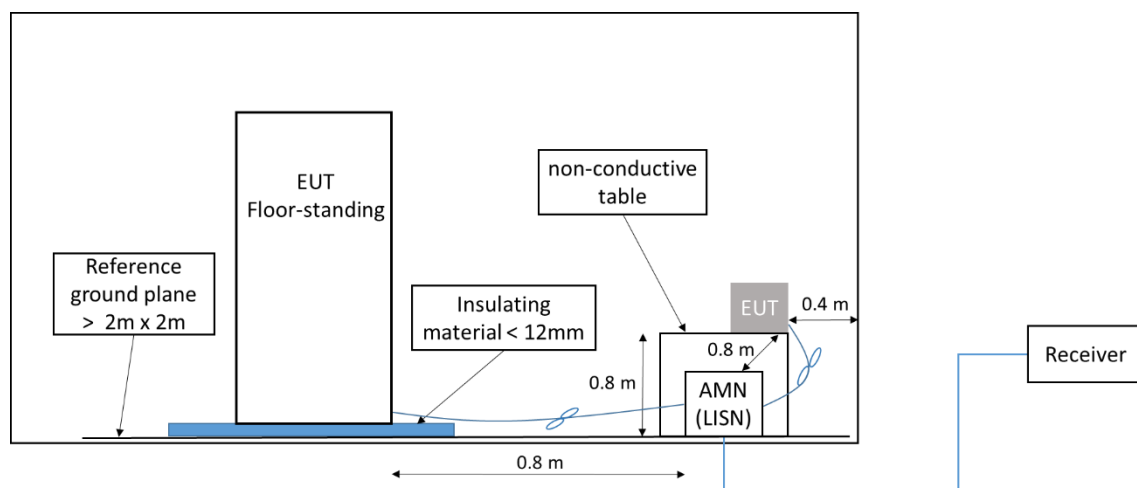
... Devices that include, or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

KDB174176 D01 Line Conducted FAQ v01r01; ISED RSS-Gen sec. 8.8

For a device operating at or below 30 MHz, the FCC will accept measurements performed with a suitable dummy load in lieu of the antenna within the transmitter's fundamental emission band.

4.5.2 Test Method

The test setup was made according to ANSI C63.10 clauses 6.2.2 & 6.2.3 as shown in the photograph



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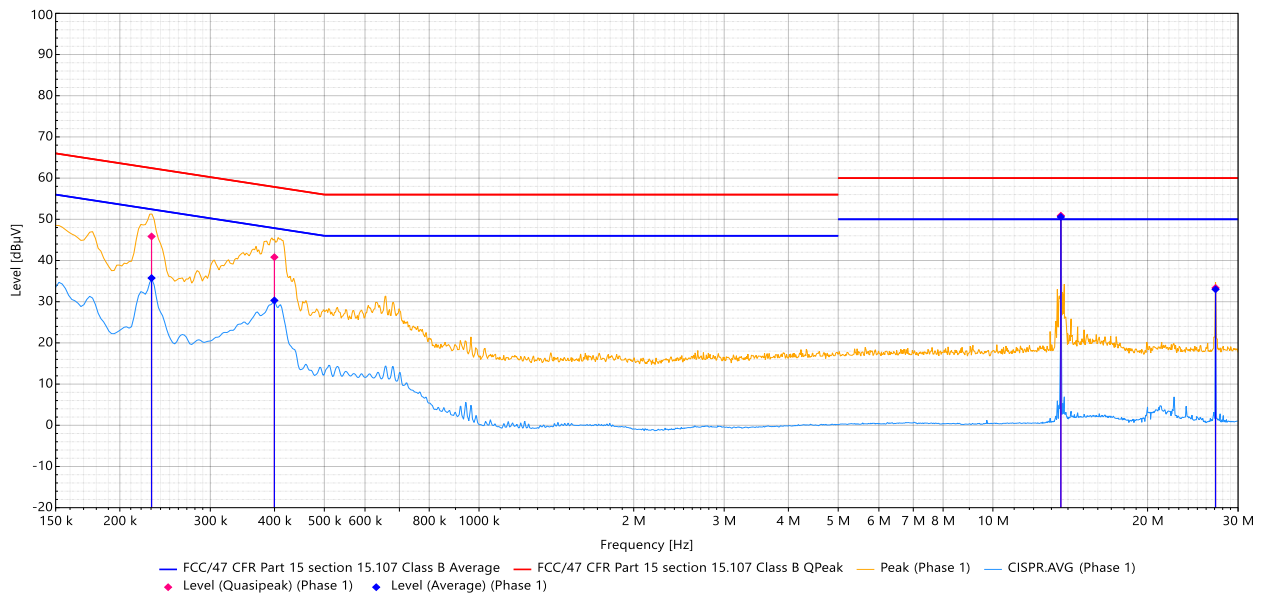
4.5.3 Test Setup (AC Power Conducted Emission)

EUT	A004105594-001 (rad. Sample) A004105594-002 RFID TAG
Companion device	EUT in Test Mode. Therefore, no Companion Device was used.
Operation mode	☒ 1: TX-Mode ☐ 2: RX-Mode ☐ 3: N/A ☐ 4: N/A
Further parameters	-
Test engineer	Matthias Kräutlein

4.5.4 Test results (AC Power Conducted Emission)

Line: Phase 1 / RFID ON

#6



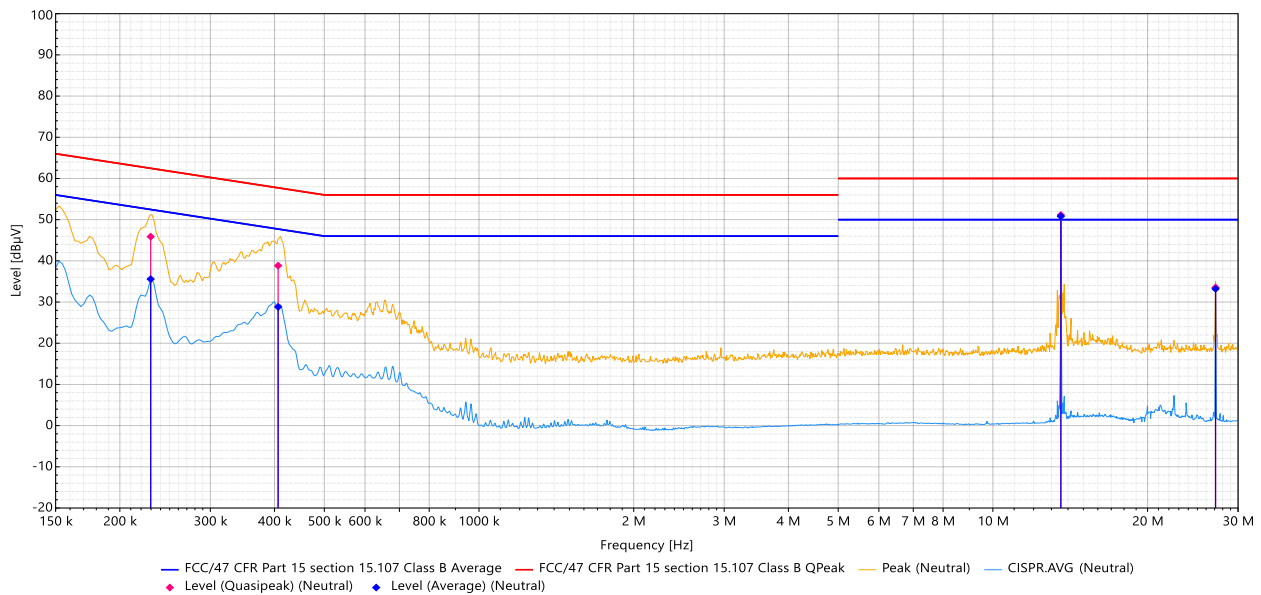
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Line: Neutral / RFID ON

#6



QuasiPeak

Frequency (Hz)	Level (dBµV)	Limit (dBµV)	Margin (dB)	Pos	Correction (dB)	RBW (Hz)	M. time (s)	Comments
229.65 k	45.9	62.5	-16.6	Neutral	10.0	9 k	1.0	Pass
230.55 k	45.8	62.4	-16.6	Phase 1	10.0	9 k	1.0	Pass
399.75 k	40.8	57.9	-17.0	Phase 1	10.0	9 k	1.0	Pass
406.5 k	38.8	57.7	-18.9	Neutral	10.0	9 k	1.0	Pass
13.56 M	51.1	60.0	-8.9	Neutral	10.4	9 k	1.0	Pass
13.561 M	50.9	60.0	-9.1	Phase 1	10.2	9 k	1.0	Pass
27.121 M	33.3	60.0	-26.7	Phase 1	10.1	9 k	1.0	Pass
27.121 M	33.5	60.0	-26.5	Neutral	10.3	9 k	1.0	Pass

Average

Frequency (Hz)	Level (dBµV)	Limit (dBµV)	Margin (dB)	Pos	Correction (dB)	RBW (Hz)	M. time (s)	Comments
229.65 k	35.6	52.5	-16.9	Neutral	10.0	9 k	1.0	Pass
230.55 k	35.7	52.4	-16.7	Phase 1	10.0	9 k	1.0	Pass
399.75 k	30.3	47.9	-17.5	Phase 1	10.0	9 k	1.0	Pass
406.5 k	28.8	47.7	-18.9	Neutral	10.0	9 k	1.0	Pass
13.56 M	50.8	50.0	0.8	Neutral	10.4	9 k	1.0	TX
13.561 M	50.6	50.0	0.6	Phase 1	10.2	9 k	1.0	TX
27.121 M	33.0	50.0	-17.0	Phase 1	10.1	9 k	1.0	Pass
27.121 M	33.2	50.0	-16.8	Neutral	10.3	9 k	1.0	Pass

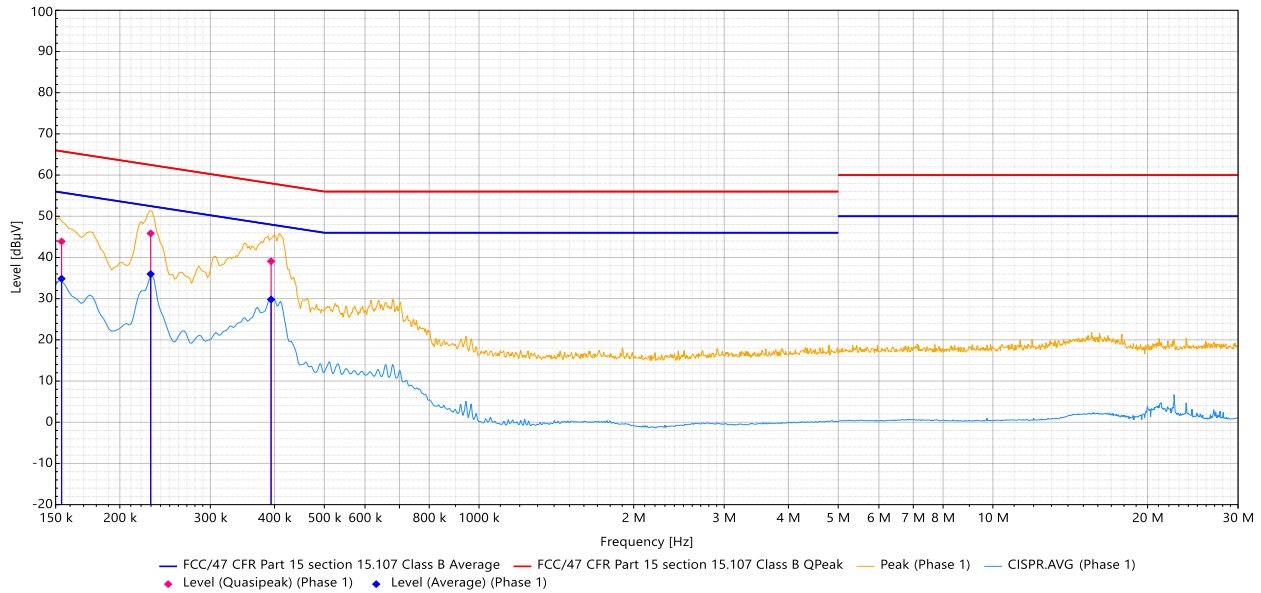
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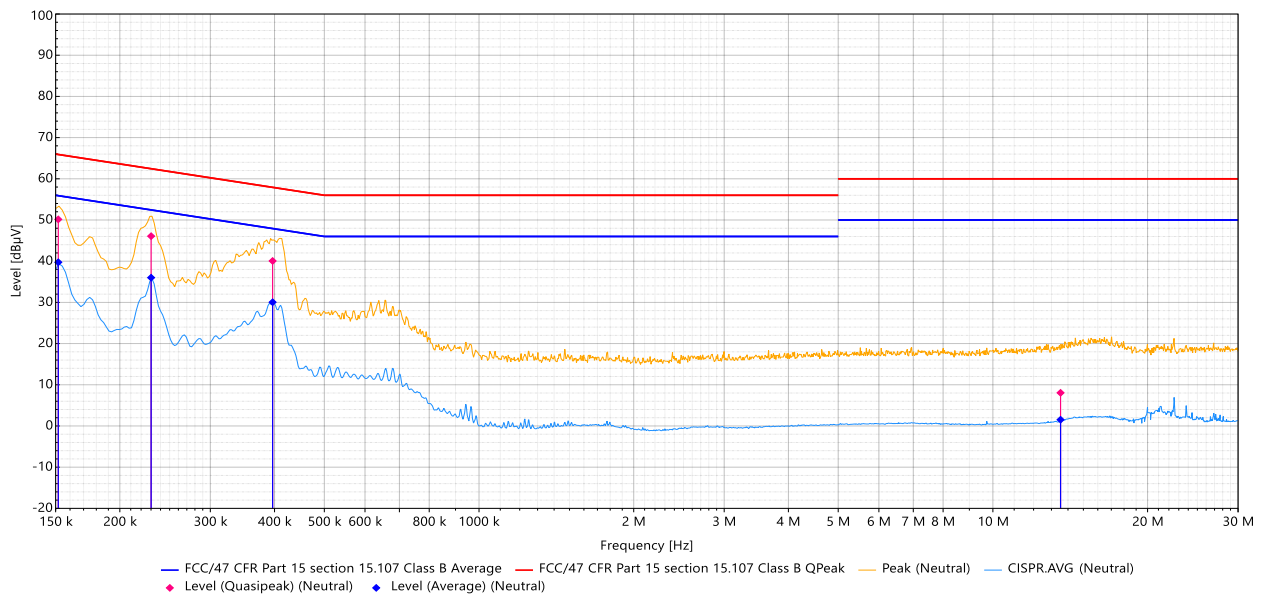
Line: Phase 1 / RFID OFF

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Line: Neutral / RFID OFF

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QuasiPeak

Frequency (Hz)	Level (dBμV)	Limit (dBμV)	Margin (dB)	Pos	Correction (dB)	RBW (Hz)	M. time (s)	Comments
151.8 k	50.1	65.9	-15.7	Neutral	10.0	9 k	1.0	Pass
154.05 k	43.9	65.8	-21.9	Phase 1	10.0	9 k	1.0	Pass
229.65 k	45.8	62.5	-16.6	Phase 1	10.0	9 k	1.0	Pass
230.1 k	46.1	62.4	-16.3	Neutral	10.0	9 k	1.0	Pass
393.9 k	39.1	58.0	-18.9	Phase 1	10.0	9 k	1.0	Pass
396.6 k	40.1	57.9	-17.8	Neutral	10.0	9 k	1.0	Pass
13.542 M	8.0	60.0	-52.0	Neutral	10.4	9 k	1.0	Pass

Average

Frequency (Hz)	Level (dBμV)	Limit (dBμV)	Margin (dB)	Pos	Correction (dB)	RBW (Hz)	M. time (s)	Comments
151.8 k	39.7	55.9	-16.1	Neutral	10.0	9 k	1.0	Pass
154.05 k	34.8	55.8	-20.9	Phase 1	10.0	9 k	1.0	Pass
229.65 k	36.0	52.5	-16.5	Phase 1	10.0	9 k	1.0	Pass
230.1 k	36.0	52.4	-16.4	Neutral	10.0	9 k	1.0	Pass
393.9 k	29.8	48.0	-18.2	Phase 1	10.0	9 k	1.0	Pass
396.6 k	30.0	47.9	-17.9	Neutral	10.0	9 k	1.0	Pass
13.542 M	1.5	50.0	-48.5	Neutral	10.4	9 k	1.0	Pass

4.5.5 Final test result (AC Power Conducted Emission)

Final test result	Pass
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5 Test Setup Photo

For reasons of confidentiality, no photos of the EUT are included in this report.
For EUT and test setup photos please see the Photo Documentation to this report Number.

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Liste der verwendeten Prüfmittel
List of used test equipment

6 Equipment List

6.1 Hardware

Prüfmittel Test equipment		Prüfmittel-Nr. / ID-Nr. Equipment No. / ID-No.	Nächste Kalibrierung Next calibration
Humidity / Barometer / Temperature. Data Recorder	ALBHORN	9074532	30.09.2026
Semi Anechoic Chamber 30MHz to 1000MHz	Siemens	9049495	03.09.2027
Receiver ESU 8	Rohde & Schwarz	2728844	19.08.2027
Receiver ESU 26	Rohde & Schwarz	2728898	25.03.2026
Antenna HFH 2 (Loop) 9kHz-30MHz	Rohde & Schwarz	2728893	05.08.2027
Antenna VULB 9168 30MHz-1GHz	Schwarzbeck	2728787	18.11.2028
Spectrum Analyzer: FSV-30	Rohde & Schwarz	9000268	10.09.2027
Temperature & Humidity Chamber: PL-3-KPH	Espec	2731999	11.02.2028

6.2 Software

Test Software	Developer	Version
BAT-EMC	NEXIO	2024.0.17.103

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Änderungsverzeichnis
Change history

7 Change history

Revision Number	List of revisions
002	Type number and antenna name corrected.
001	Initial Release
Note: Latest revision report will replace all previous reports.	

Ende des Prüfberichts
End of Test Report