

Prüfbericht-Nr.: <i>Test report no.:</i>	DE26WTW7 001	Auftrags-Nr.: <i>Order no.:</i>	1207530 80	Seite 1 von 69 Page 1 of 69
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	Riham Karim	Auftragsdatum: <i>Order date:</i>	2026-01-07	
Auftraggeber: <i>Client:</i>	Axis Communications AB, Gränden 1, 223 69 LUND, Schweden			
Prüfgegenstand: <i>Test item:</i>	Surveillance Radar			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	AXIS D2124-VE Radar			
Auftrags-Inhalt: <i>Order content:</i>	Prüfung der Funkparameter nach FCC & ISED <i>Test of radio parameters acc. to FCC & ISED</i>			
Prüfgrundlage: <i>Test specification:</i>	Vollprüfung / Complete test FCC CFR 47 Part 15 Subpart C- §15.249 ISED RSS-210:06/2024 Issue 11			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2026-02-18	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>	A004211591-001 to 014			
Prüfzeitraum: <i>Testing period:</i>	2026-02-23 - 2026-03-19			
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>	26.03.2026 	genehmigt von: <i>authorized by:</i>	30.03.2026 	
Datum: <i>Date:</i>	Signiert von: Primoz Erzen	Ausstellungsdatum: <i>Issue date:</i>	Signiert von: Matthias Kraeutlein	
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. 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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3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. <i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i> <i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i>
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	Surveillance Radar
2	Typ-No.	AXIS D2124-VE Radar
3	Test sample obtaining	☒ Sampling by customer ☐ Sampling by TÜV Rheinland Group ☐ others:
4	Provided Samples	A004211591-001 to 014
5	Conducted measurements sample	A004211591-001 (rad. Sample with Test fixture)
6	Radiated measurements sample	A004211591-001 (rad. sample)
7	Serial-No.	E82725000002
8	Supported radio technologies evaluated in this report	Radar 24GHz
9	Supported radio technologies not evaluated in this report	-
10	Description of EUT	This product will classify different targets with a 24 GHz radar and alert if there are any intruders.
11	Max RF field strength (measured)	113.55dBµV/m (Peak); 87.03dBµV/m (Average)
12	Rated Voltage / Frequency	PoE: 52-57 V DC, 98.3W max (radar), 100-240 V, 50-60 Hz, 3A (Filter)
13	FCC-ID	PNB-AXISD2124-VE
14	IC-ID	3919A-D2124VE
15	Antenna Gain (declared)	11.6 dBi
16	Radio Module / Antenna Type	☒ Radio module with antenna on module PCB ☐ Radio module with dedicated antenna ☐ Radio module with user accessible antenna connector
17	Antenna Type	☒ Integral antenna (designed as a fixed part of the EUT) ☐ Dedicated antenna (removable, obligation to be used) ☐ Permanent antenna connector
18	Antenna number of chains	EUT contains 4 Radar Modules Each Radar Module uses 2 TX-Antennas and 8 RX Antennas
19	Software / Firmware	12
20	Hardware	R1
21	Companion Device used for radio connection with the EUT	EUT in Test Mode. Therefore, no Companion Device was used.
22	Auxiliary equipment used to set up the EUT	PC with PUTTY and Test Software provided by customer
23	Accessory Devices used together with the EUT	POE-Adapter provided by customer
24	Temperature Range	-40°C to + 60°C
25	Environment	Outdoor

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Absatz Clause	Anforderungen - Prüfungen / Requirements - Tests	Bemerkungen/ Remarks	Ergebnis Result
FCC §15.203 ISED RSS-Gen sec. 6.8	Antenna Requirement	-	P ☒ F ☐ N/A ☐ N/T ☐
FCC §15.215 (c)	20Bandwidth	-	P ☒ F ☐ N/A ☐ N/T ☐
ISED RSS-Gen sec. 6.7	Occupied bandwidth 99%	only to be measured but no limits apply.	N/A ☐ N/T ☐
FCC §15.249 (a) ISED RSS-210 sec. B.10 a	Field strength of fundamental emissions	-	P ☒ F ☐ N/A ☐ N/T ☐
FCC §15.249 (a-b) ISED RSS-210 sec. B.10 a-b	Field strength of unwanted and harmonic emissions	-	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
SRD 24GHz	24.0 GHz – 24.25GHz	MIMO	☒	☒

SISO: Single Input Single Output; MIMO; Multiple Input Multiple Output

2.2 Additional specifications for Applications with FMCW-Modulation

Peak Power Measurements on FMCW-Signals are to be corrected for the FMCW desensitization factor.

Average and RMS Power Measurements (with a sweep time that it is very slow relative to the EUT cycle time) are not desensitized. Therefore, no FMCW desensitization factor is to be used.

The calculated desensitization factor is only valid for the fundamental emission.

Mode	Chirp Bandwidth [MHz]	Chirp duration [µs]	Inter chirp duration [µs]	Chirp slope [MHz/µs]	Frame time		Desensitization factor [dB]		
					active [ms]	total [ms]	RBW 5 MHz	RBW 1 MHz	RBW 30 kHz
Area Default	195	46.84	21.84	4.16	50	150	0.0	3.2	33.1
Area-Coexistence	195	46.84	21.84	4.16	25	150	0.0	3.2	33.1
Low Doppler	195	46.84	18.24	4.16	66.67	133.34	0.0	3.2	33.1

The Desensitization factor is calculated with the formula:

$$\text{DesensitizationFactor[dB]} = 5 \cdot \log(1 + 0.1947 \cdot (\text{ChirpSlope[MHz/µs]} / \text{RBW[MHz]})^2)$$

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2.3 Standard specific classification of the EUT

2.3.1 Test Methods and Guidance Documents

ANSI C63.10:06/2013 Procedures for Compliance Testing of Unlicensed Wireless Devices
ANSI C63.10-2020 + Corrigendum 1-2023 + Amendment 1-2024
KDB 558074:04/19 D01 DTS Measurement Guidance v05r02
KDB 662911 D01:10/2011 Multiple Transmitter Output v02r01
ISED RSS-Gen:04/2018 Issue 5 Amendment 2 (Feb 2021)

2.3.2 Type of equipment

Ceiling Mounted Equipment

3 Test conditions and configurations

3.1 Normal environmental test conditions

Environmental condition	Parameter	Range during test
Temperature	°C	21 to 24
Relative humidity	%	20 to 60
Supply voltage	V DC	53.5

3.2 Extreme environmental test conditions

Environmental condition	Parameter	Range
Temperature	°C	-40 to +60
Supply voltage	Volts DC	50 to 57

3.3 Equipment modifications

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

3.4 Antenna assemblies

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

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3.5 Test Modes

3.5.1 Test Modes Setup

Mode description	Mode configuration
All Modes	The auxiliary equipment was connected to the EUT during the tests. The Ethernet Cable was grounded and filtered at the point of feed-trough. The device was setup with SSH-connection via putty. The following commands for setting the mode were being used:
Mode 1: Low Doppler_TxBackoff	radarconf set ChirpConfig area_lowdoppler
Mode 2: Low Doppler_no TxBackoff	radarconf set ChirpConfig area_lowdoppler radarconf set TxBackoff 0 radarconf set TxBackoffGain 0
Mode 3: N/A	
Mode 4: N/A	

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3.6 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	$2.7 \cdot 10^{-8}$	Hz	-
Frequency Stability under low voltage conditions			
Time	$1.1 \cdot 10^{-9}$	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	$4.6 \cdot 10^{-7}$	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	%	-

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 is soldered to a printed circuit board. 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 20dB / 99% Bandwidth

4.2.1 Requirements / Limits

FCC Part 15, Subpart C, §15.215 (c):

Intentional radiators operating under the alternative provisions to the general emission limits must be designed to ensure that the 20 dB bandwidth of the emission is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage.

If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

ISED RSS-Gen sec. 6.7

The occupied bandwidth (99%) shall be reported for all equipment, but no limits apply.

The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

4.2.2 Test Method

The 20 dB bandwidth was measured according to ANSI C63.10 clause 6.9.2 and ISED RSS-Gen sec. 6.7

The 99% bandwidth was measured according to ISED RSS-Gen sec. 6.7.

For EUTs with permanent or temporary antenna connector conducted method was used to measure the 20dB and 99% bandwidth at normal conditions and (if needed) the 20dB bandwidth at extreme conditions. The EUT was connected to the spectrum analyzer via a coax cable with a known loss.

For EUTs with integral antenna only, radiated method was used to measure the 20dB and 99% bandwidth under normal conditions and (if needed) conducted method with a test fixture was used to measure the 20dB bandwidth under extreme conditions.

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4.2.3 Test Setup (20dB / 99% Bandwidth)

4.2.3.1 Conducted measurements

EUT		A004211591-001 (rad. Sample with Test fixture)
Chamber details		Shielded room
Companion device		EUT in Test Mode. Therefore, no Companion Device was used.
Operation mode		☒ 1: Low Doppler_TxBackoff ☒ 2: Low Doppler_no TxBackoff ☐ 3: N/A ☐ 4: N/A
Spectrum Analyzer	Centre Frequency	24150MHz
	Resolution Bandwidth	2MHz (1% to 5% of the OBW)
	Video Bandwidth	8MHz (>three times RBW)
	Span	300MHz
	Sweep time	1000 ms
Detector		Peak with max-hold
Further parameters		-
Test engineer		Primoz Erzen

4.2.3.2 Radiated measurements

EUT		A004211591-001 (rad. sample)
Chamber details		☒ 3m Fully Anechoic Chamber (FAC) ☐ 10m Semi Anechoic Chamber (SAC)
Measurement positioning		Distance: EUT height: Antenna height: ☒ 3m ☒ 1.5m ☒ 1.5m ☐ 10m ☐ 0.8m ☐ 1m to 4m – height scan
Receiving Antenna		Horn Antenna 3116C-PA (18-40GHz)
Receiving Antenna Polarization		Horizontal and Vertical
EUT Positioner		40cm x 60cm non-conductive positioner Only on worst case positions of radiated field strength measurement
EUT Turn Table		Only on worst case positions of radiated field strength measurement
Companion device		EUT in Test Mode. Therefore, no Companion Device was used.
Operation mode		☒ 1: Low Doppler_TxBackoff ☒ 2: Low Doppler_no TxBackoff ☐ 3: N/A ☐ 4: N/A
Spectrum Analyzer	Centre Frequency	24150MHz
	Resolution Bandwidth	2MHz (1% to 5% of the OBW)
	Video Bandwidth	8MHz (>three times RBW)
	Span	300MHz
	Sweep time	1000 ms
Detector		Peak with max-hold
Further parameters		-
Test engineer		Primoz Erzen

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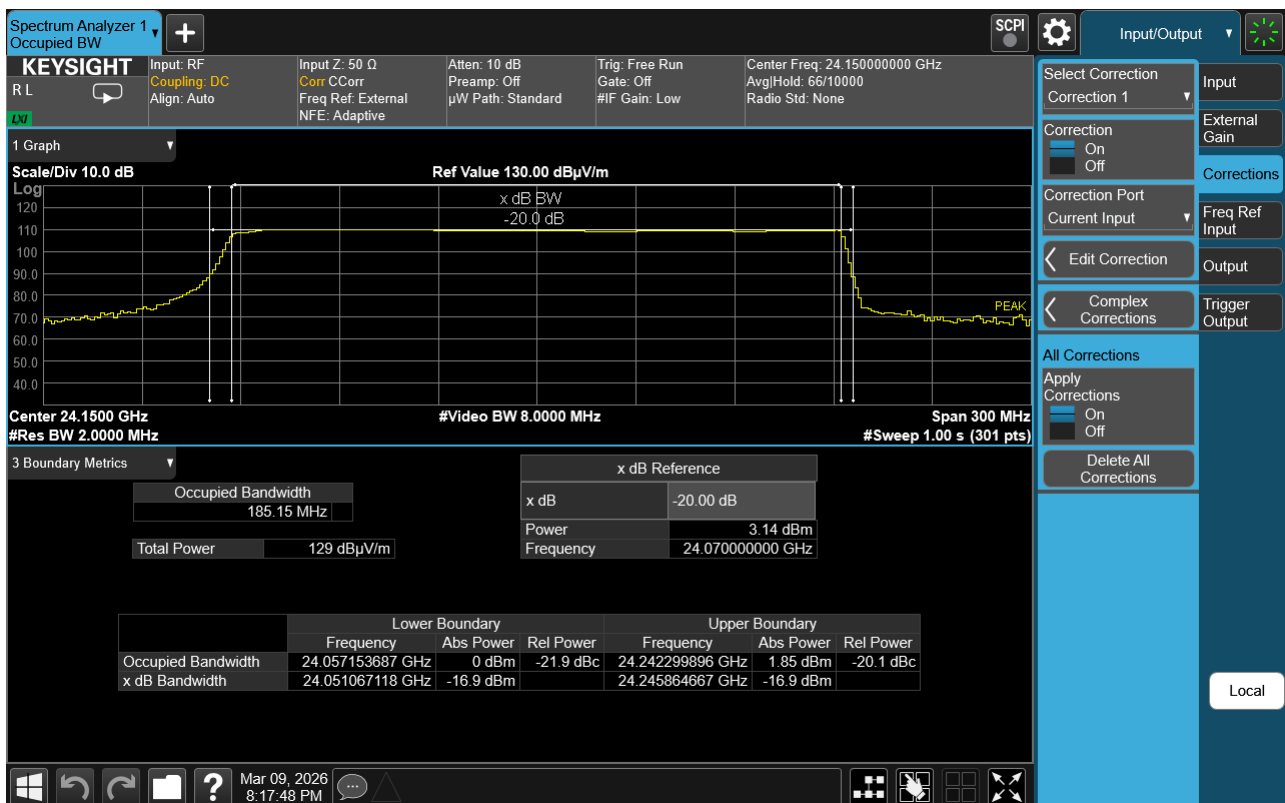
4.2.4 Test Results (20dB / 99% Bandwidth)

4.2.4.1 Radiated measurements, normal test conditions

For the radiated measurements the worst case positioning from the fundamental field strength measurements was used.

4.2.4.1.1 Mode 1: Low Doppler_TxBackoff

4.2.4.1.1.1 worst case position (Average); Azimuth 186deg; Elevation 91deg; Horizontal polarization



99 % Bandwidth

Test Conditions	f _{L_99%} [MHz]	f _{H_99%} [MHz]	Limit		Result
			f _L [MHz]	f _H [MHz]	
normal	24057.2	24242.3	24000	24250	P

20 dB Bandwidth

Test Conditions	f _{L_20dB} [MHz]	f _{H_20dB} [MHz]	Limit		Result
			f _L [MHz]	f _H [MHz]	
normal	24051.1	24245.9	24000	24250	P

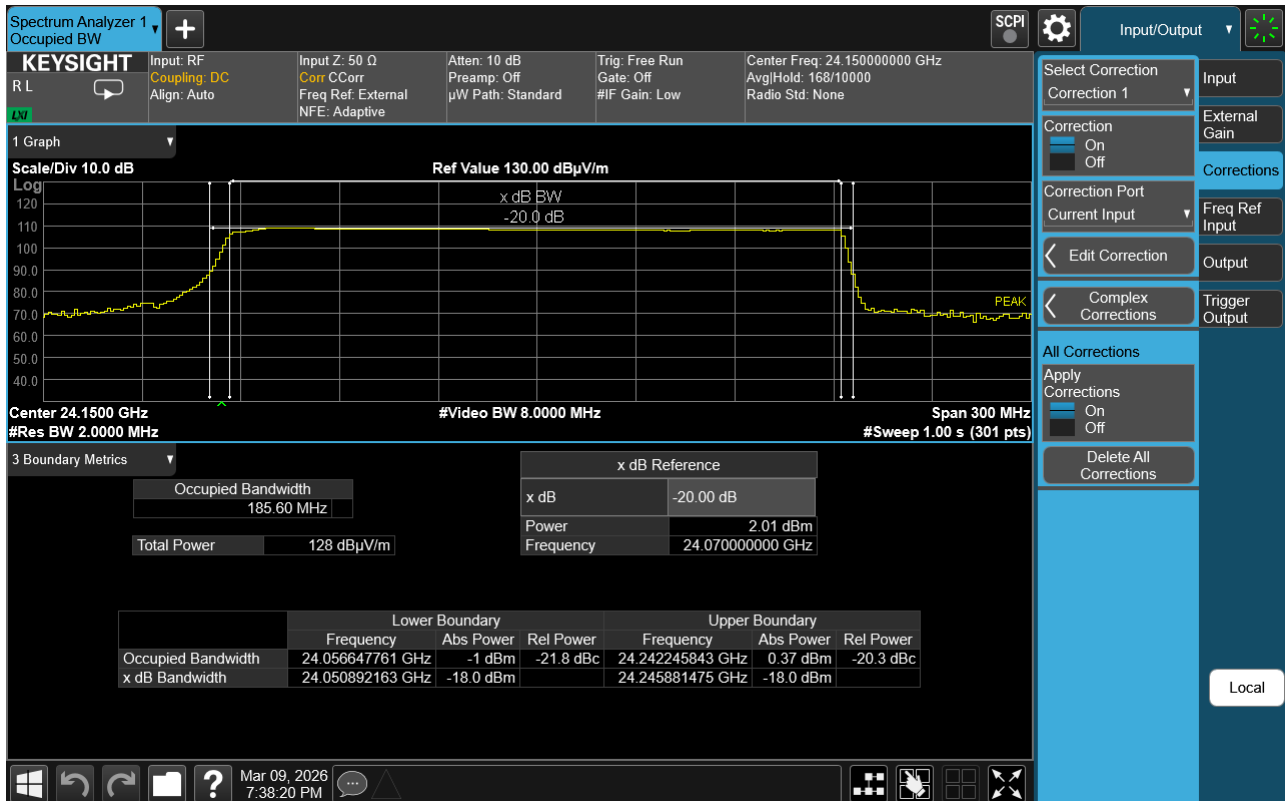
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4.2.4.1.1.2 worst case position (Peak); Azimuth 272deg; Elevation 1deg; Vertical polarization



99 % Bandwidth

Test Conditions	f _L 99% [MHz]	f _H 99% [MHz]	Limit		Result
			f _L [MHz]	f _H [MHz]	
normal	240566.6	24242.2	24000	24250	P

20 dB Bandwidth

Test Conditions	f _L 20dB [MHz]	f _H 20dB [MHz]	Limit		Result
			f _L [MHz]	f _H [MHz]	
normal	24050.9	24245.9	24000	24250	P

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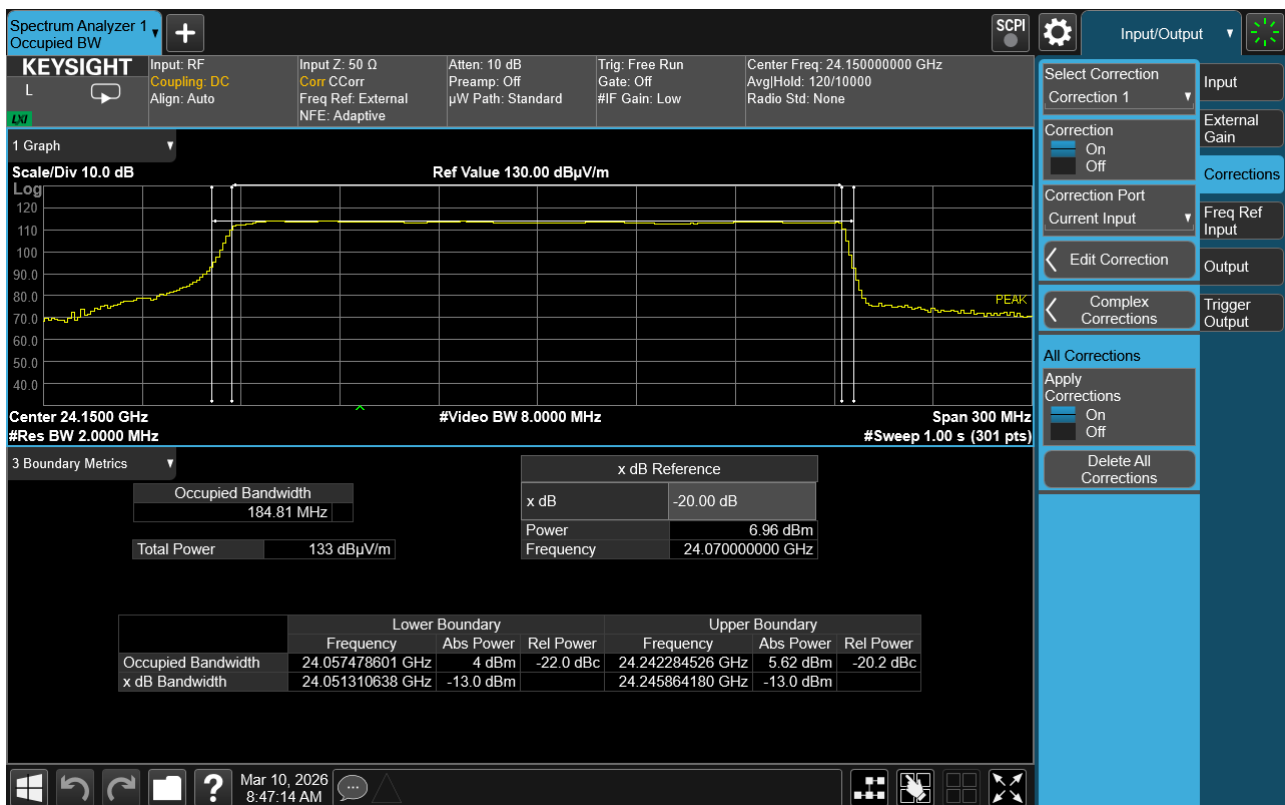
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4.2.4.1.2 Mode 2: Low Doppler_no TxBackoff

4.2.4.1.2.1 worst case position (Average); Azimuth 185deg; Elevation 89deg; Horizontal polarization



99 % Bandwidth

Test Conditions	f _L 99% [MHz]	f _H 99% [MHz]	Limit		Result
			f _L [MHz]	f _H [MHz]	
normal	24057.5	24242.3	24000	24250	P

20 dB Bandwidth

Test Conditions	f _L 20dB [MHz]	f _H 20dB [MHz]	Limit		Result
			f _L [MHz]	f _H [MHz]	
normal	24051.3	24245.9	24000	24250	P

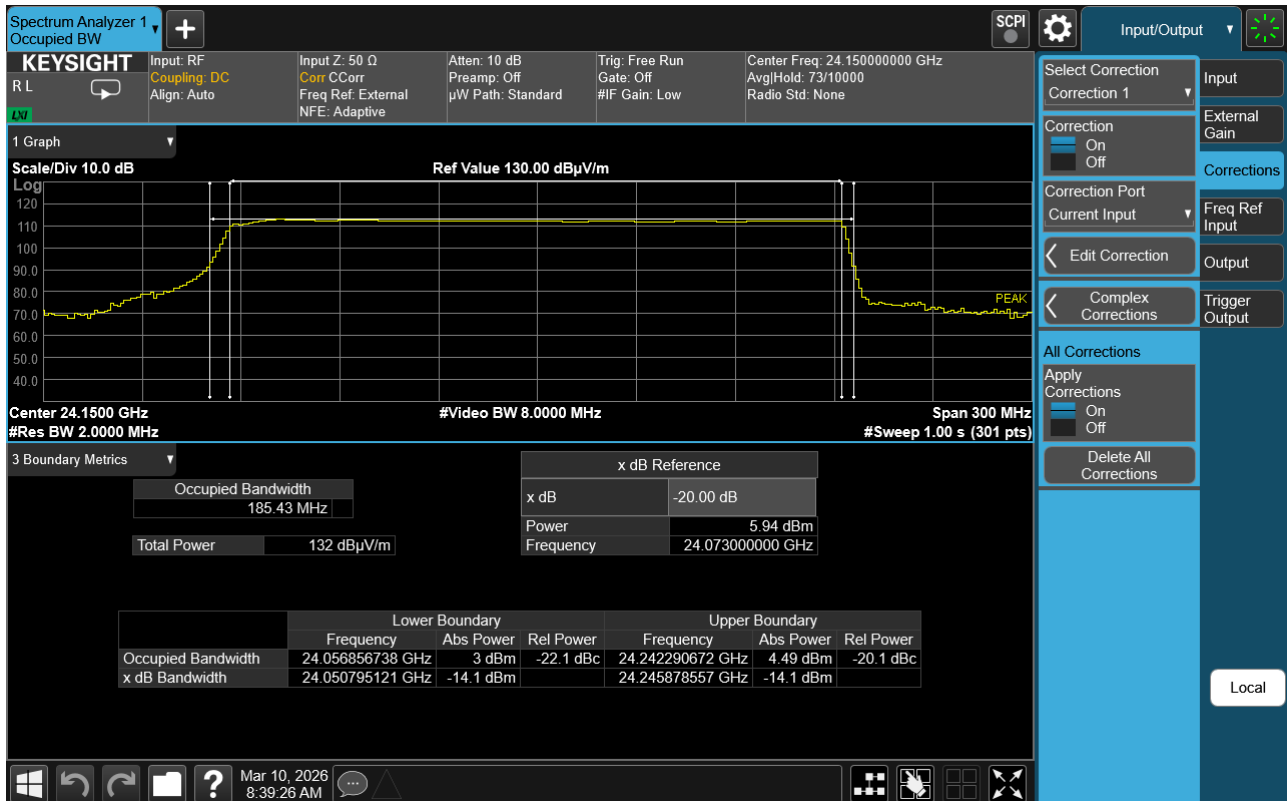
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4.2.4.1.2.2 worst case position (Peak); Azimuth -2deg; Elevation 88deg; Horizontal polarization



99 % Bandwidth

Test Conditions	f _{L_99%} [MHz]	f _{H_99%} [MHz]	Limit		Result
			f _L [MHz]	f _H [MHz]	
normal	24056.9	24242.3	24000	24250	P

20 dB Bandwidth

Test Conditions	f _{L_20dB} [MHz]	f _{H_20dB} [MHz]	Limit		Result
			f _L [MHz]	f _H [MHz]	
normal	24050.8	24245.9	24000	24250	P

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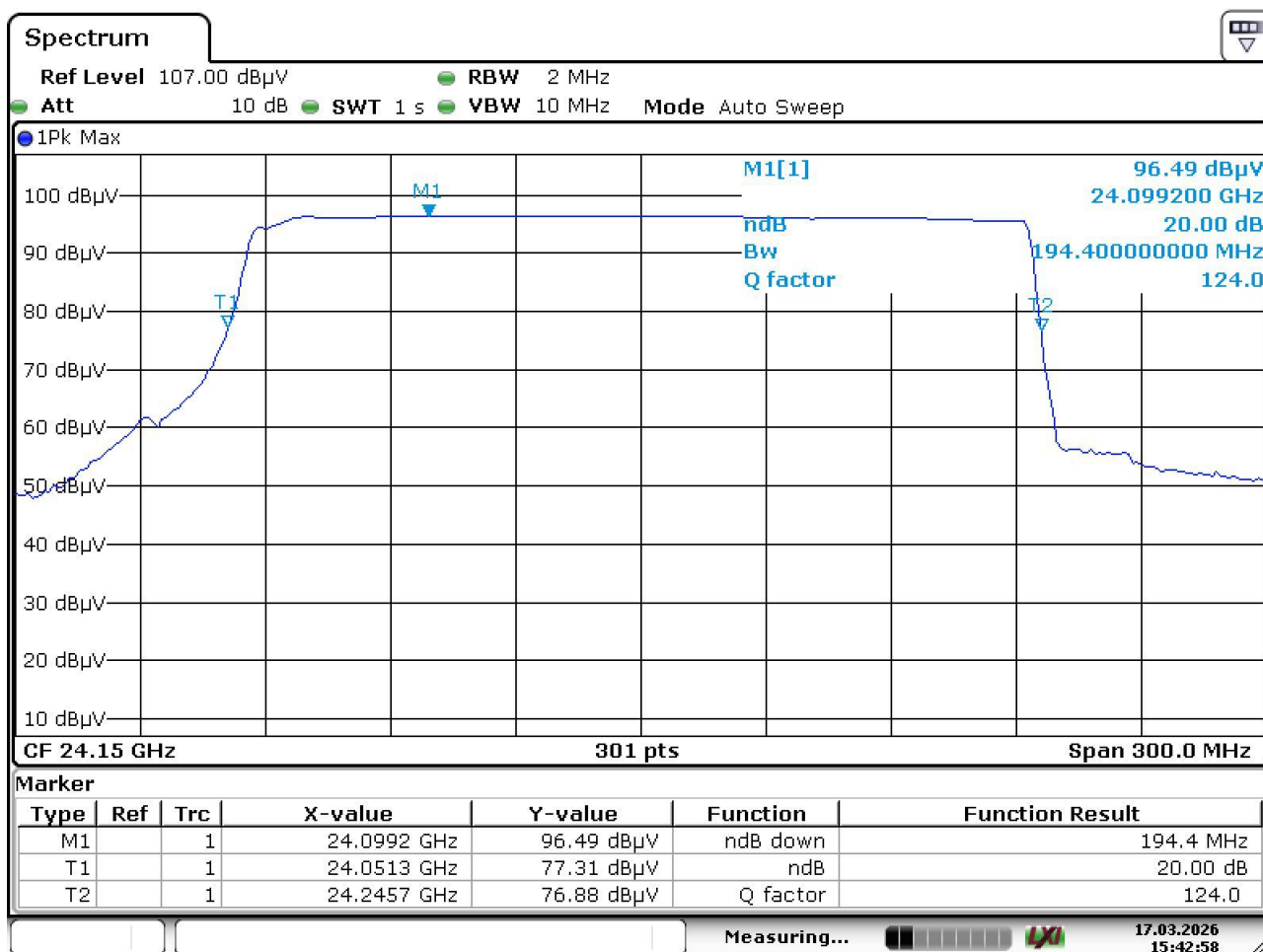
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4.2.4.2 Conducted measurements at normal and extreme conditions

No frequency stability is specified in the regulations, and the fundamental emission is not kept within at least the central 80% of the permitted band, therefore the 20dB bandwidth of the emission was additionally measured over the expected variations in temperature and supply voltage in Mode 2: Low Doppler_no TxBackoff

4.2.4.2.1 Normal test conditions



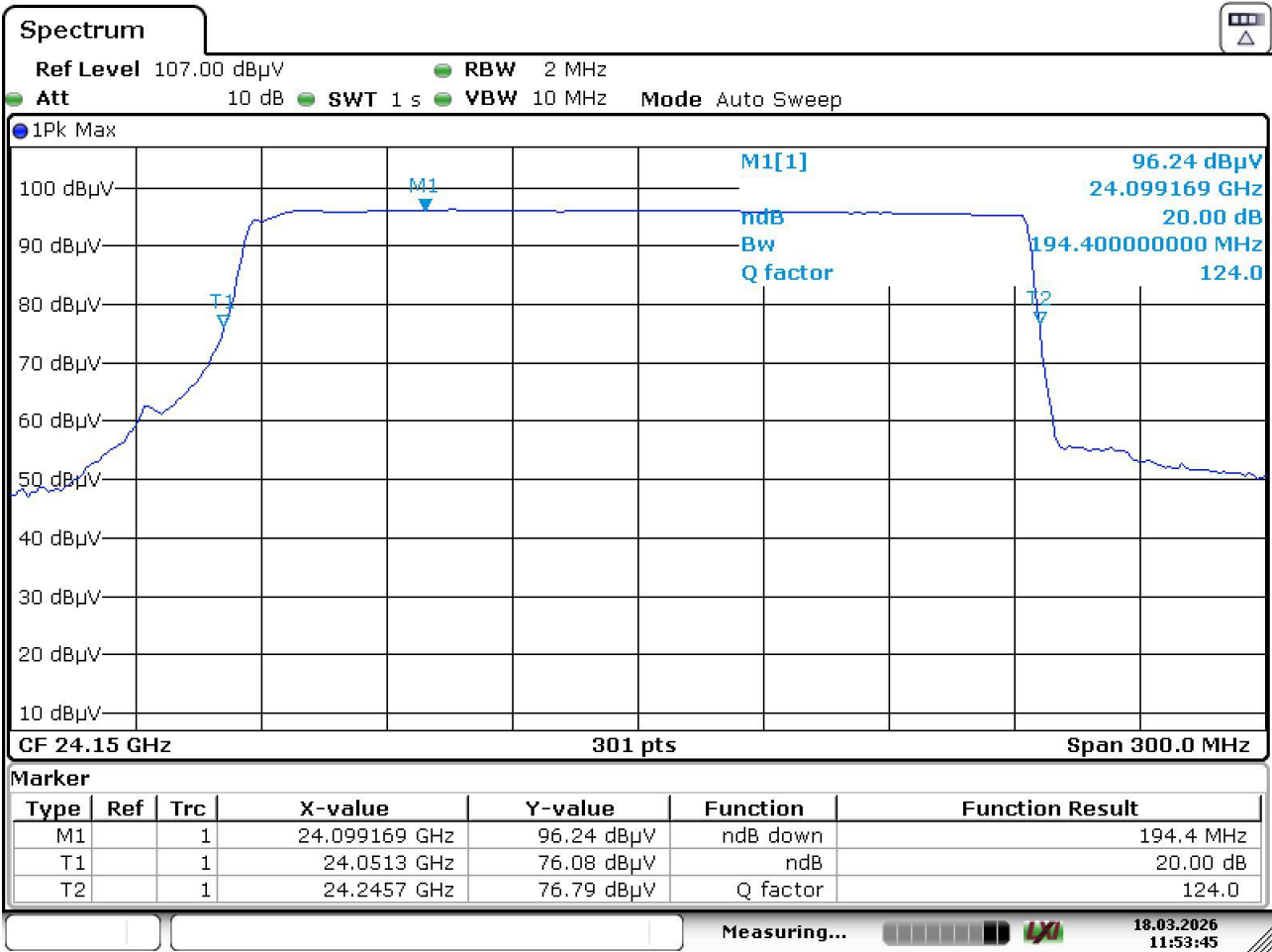
Date: 17.MAR.2026 15:42:59

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4.2.4.2.2 Extreme test conditions +60°C, 57V



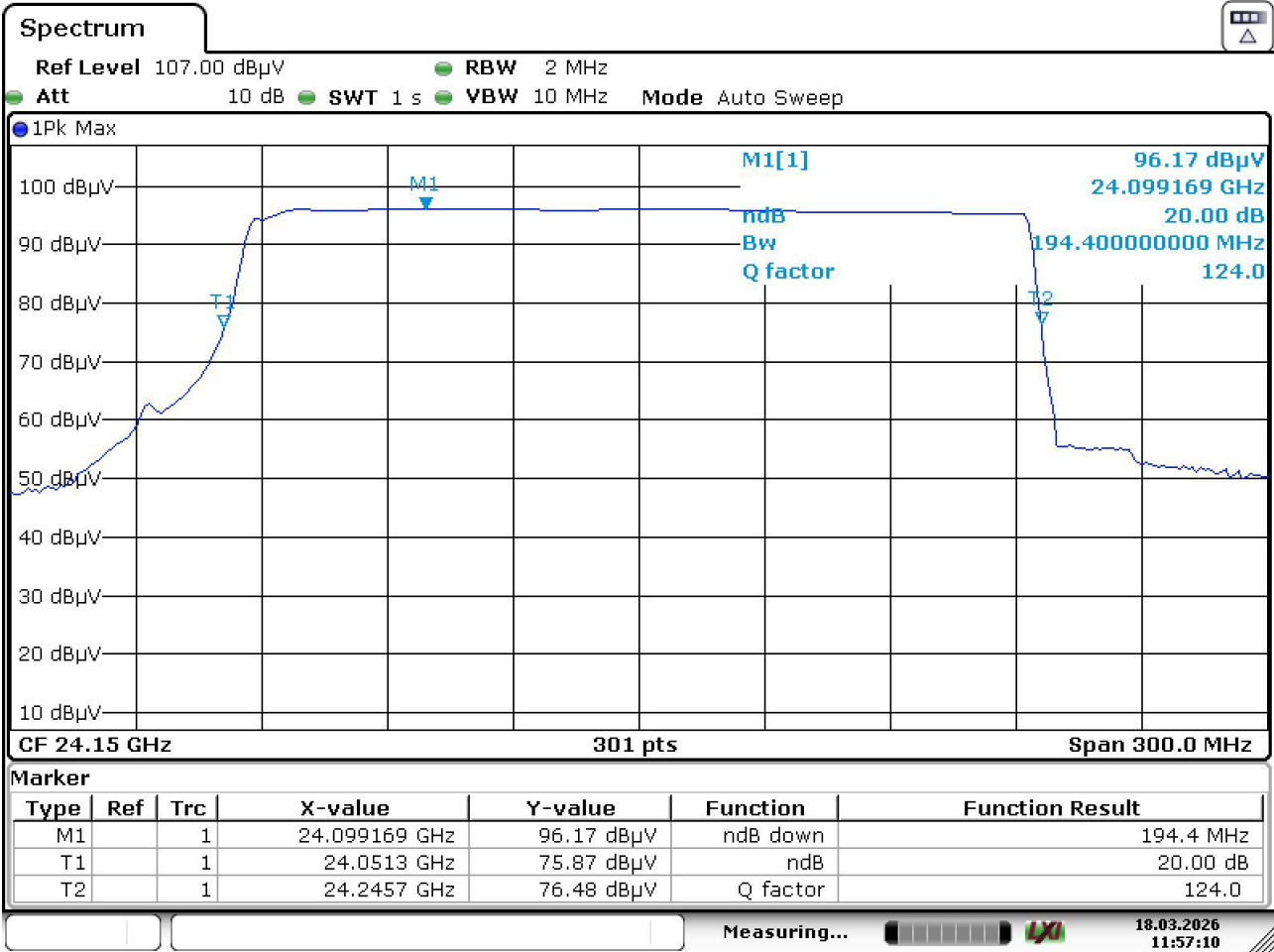
Date: 18.MAR.2026 11:53:45

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4.2.4.2.3 Extreme test conditions +60°C, 50V



Date: 18.MAR.2026 11:57:10

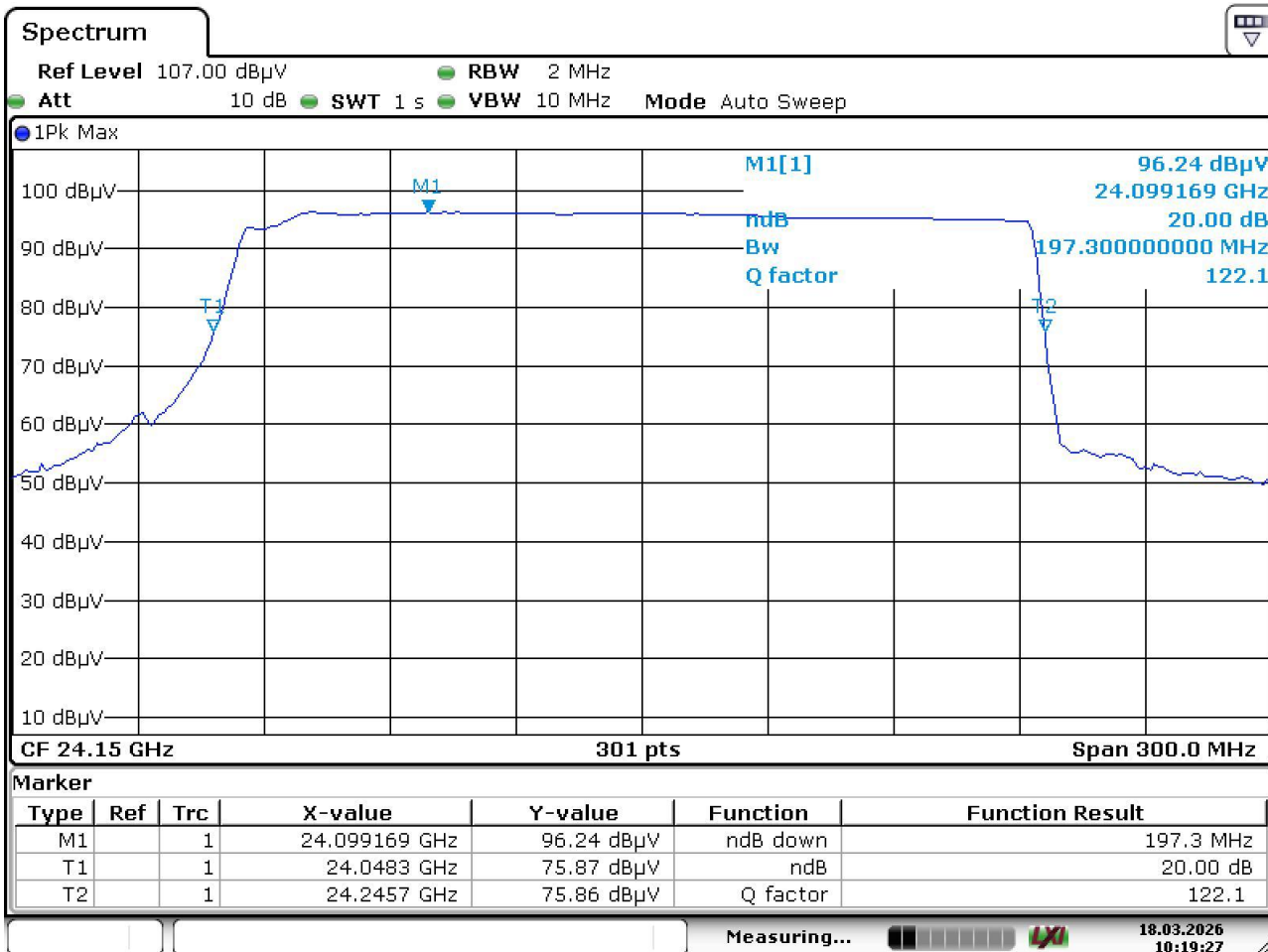
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4.2.4.2.4 Extreme test conditions -40°C, 57V



Date: 18.MAR.2026 10:19:27

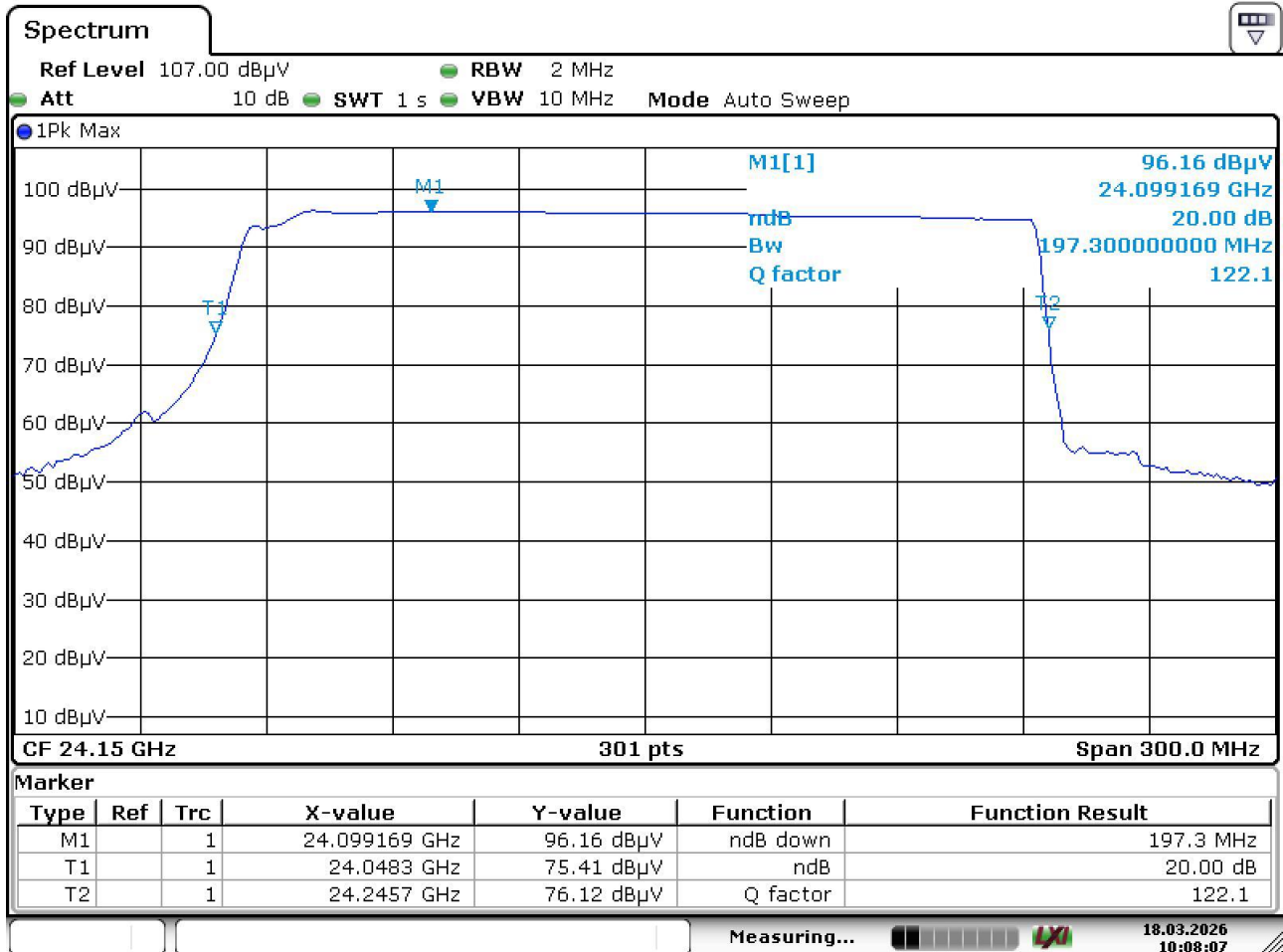
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4.2.4.2.5 Extreme test conditions -40°C, 50V



Date: 18.MAR.2026 10:08:06

4.2.4.2.6 Summary

Test Conditions T [°C] / U [V]	f _L [MHz]	f _H [MHz]	Limit f _L [MHz]	Limit f _H [MHz]	Result
Normal	24051.3	24245.7	24000	24250	P
+60 / 57	24051.3	24245.7	24000	24250	P
+60 / 50	24051.3	24245.7	24000	24250	P
-40 / 57	24048.3	24245.7	24000	24250	P
-40 / 50	24048.3	24245.7	24000	24250	P

4.2.5 Final test result (20dB / 99% Bandwidth)

Final test result	Pass
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4.3 Field strength of fundamental emissions

4.3.1 Requirements / Limits (no Fixed point-to point System)

FCC §15.249 (a) and ISSED RSS-210 sec. B.10 a

The field strength of fundamental emissions measured at the distance of 3 m shall not exceed the following limits.

	Fundamental frequency [MHz]	Limit [mV/m]	Limit [dBµV/m]
☐	902-928	50	94
☐	2400-2483.5	50	94
☐	5725-5875	50	94
☒	24000-24250	250	108

Used conversion factor [mV/m]->[dBµV/m]: $\text{Limit}_{\text{dB}\mu\text{V/m}} = 20 \log (\text{Limit}_{\text{mV/m}} * 1000) \text{ dB}\mu\text{V/m}$

For example, if the $\text{limit}_{\text{mV/m}}$ is given with 1mV/m, then the $\text{limit}_{\text{dB}\mu\text{V/m}}$ is calculated to:

$\text{Limit}_{\text{dB}\mu\text{V/m}} = 20 * \log((1 * 1000)) \text{ dB}\mu\text{V/m} = 60 \text{ dB}\mu\text{V/m}$.

ISSED RSS-210 sec. 7:

Unless otherwise specified, the measurements shall be performed in accordance with ANSI C63.10.

FCC Part 15, Subpart C, §15.35(a); ANSI C63.10:

On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified.

FCC Part 15, Subpart C, §15.35(b); ANSI C63.10:

Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz.

FCC Part 15, Subpart C, §15.35(b); ANSI C63.10:

..., 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 C, §15.35(c); ISSED RSS-Gen sec. 8.2:

Unless otherwise specified, when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value

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4.3.2 Test Method (Field strength of fundamental emissions)

4.3.2.1 Radiated measurements

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.

For the final testing, the placement of EUT and cables were the same as for preliminary testing. The highest emission relative to the limit was measured.

Final testing was performed on an SVSWR compliant test site.

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

$$E_{\text{final}} = \text{RawRec} + \text{Corr}$$

While

$$\text{Corr} = \text{AF} + \text{SigPathAtt} + \text{PreampAtt}$$

Were

E_{final} : final average electric field value

RawRec: Receiver reading

AF: Antenna factor

SigPathAtt: Signalpath losses

PreampAtt: Preamplifier losses

For example, if a Receiver reading of 1 dB μ V was measured and the Antenna factor is 2 dB/m, the Signalpath losses are 3dB and the Preamplifier losses are -10dB, then the Correction is calculated to:

Corr = (2+3-10) dB= -5dB and the Final electric field strength E_{Final} is calculated to:

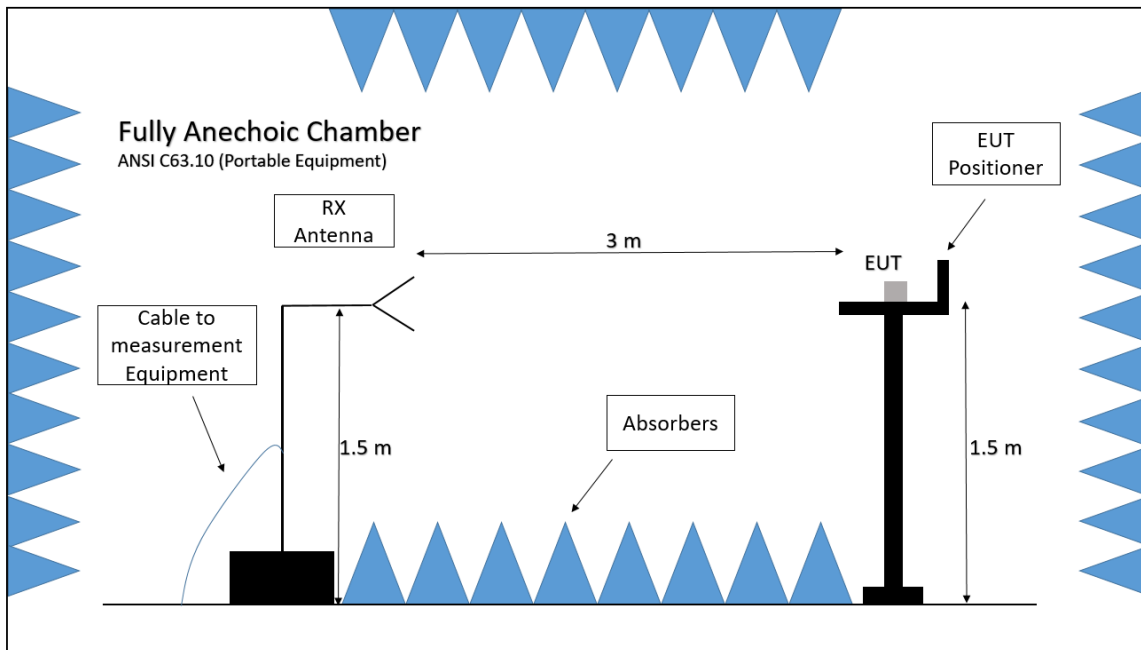
$$E_{\text{Final}} = (1 - 5) \text{ dB}\mu\text{V/m} = -4 \text{ dB}\mu\text{V/m}$$

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4.3.2.1.1 EUT positioning



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4.3.3 Test setup (Field strength of fundamental emissions)

4.3.3.1 Radiated measurements

EUT		A004211591-001 (rad. sample)
Chamber details		☒ 3m Fully Anechoic Chamber (FAC) ☐ 10m Semi Anechoic Chamber (SAC) ☐ Shielded room
Measurement positioning		Distance: EUT height: Antenna height: ☒ 3m ☒ 1.5m ☒ 1.5m ☐ 10m ☐ 0.8m ☐ 1m to 4m – height scan
Receiving Antenna		Horn Antenna 3116C-PA (18-40GHz)
Receiving Antenna Polarization		Horizontal and Vertical
EUT Positioner		40cm x 60cm non-conductive positioner Step size elevation angle 30°
EUT Turn Table		Continuous turning
Companion device		EUT in Test Mode. Therefore, no Companion Device was used.
Operation mode		☒ 1: Low Doppler_TxBackoff ☒ 2: Low Doppler_no TxBackoff ☐ 3: N/A ☐ 4: N/A
Spectrum Analyzer	Resolution Bandwidth	5MHz during exploratory tests 5MHz for final measurements For average field strength measurement on worst case position, the Resolution Bandwidth was reduced to 1MHz
	Video Bandwidth	8MHz during exploratory tests 8MHz for final measurements For average field strength measurement on worst case position, the Video Bandwidth was reduced to 3MHz
	Measurement Time	0.1s during exploratory tests 20s for final measurements For average field strength measurement on worst case position, the measurement time was set to 80.1s (100ms per Sweep Point)
	Span	500MHz during exploratory tests Zero Span for final measurements For average field strength measurement on worst case position, the span was set to 400MHz
	Detector	Peak and RMS during exploratory tests Peak and RMS for final measurements
Further parameters		-
Test engineer		Primoz Erzen

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4.3.4 Test results (Field strength of fundamental emissions)

4.3.4.1 Radiated measurements

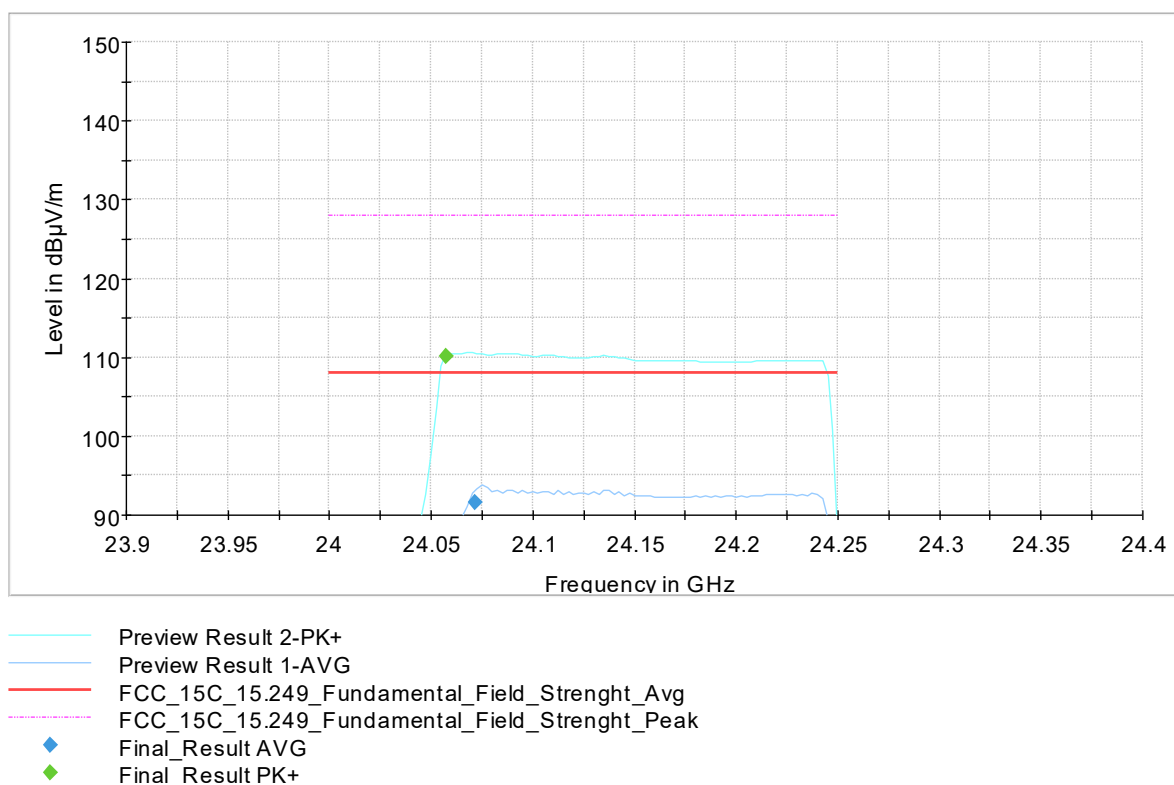
As the FMCW-desensitization factor for the used RBW of 5MHz is 0.00dB (see 2.2), no additional correction factor needs to be applied to the peak field strength measurements.

The average field strength was not measured according to the standard and only used to determine the worst-case position.

The average field strength was therefore remeasured on the worst-case position with a RBW of 1MHz and a sweep time of 0.1s per Sweep Point. Max hold was used to get the highest average field strength.

4.3.4.1.1 Mode 1: Low Doppler_TxBackoff

4.3.4.1.1.1 Peak field strength measurement and worst-case position evaluation for average field strength measurement



Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Result
24057.500000	110.06		128.00	17.94	V	272.0	1.0	22.9	Pass
24071.500000		91.57	108.00	---	H	186.0	91.0	22.8	---

The average field strength level from this measurement is informative only, as the Sweep Time for final measurement is not according to the standard.

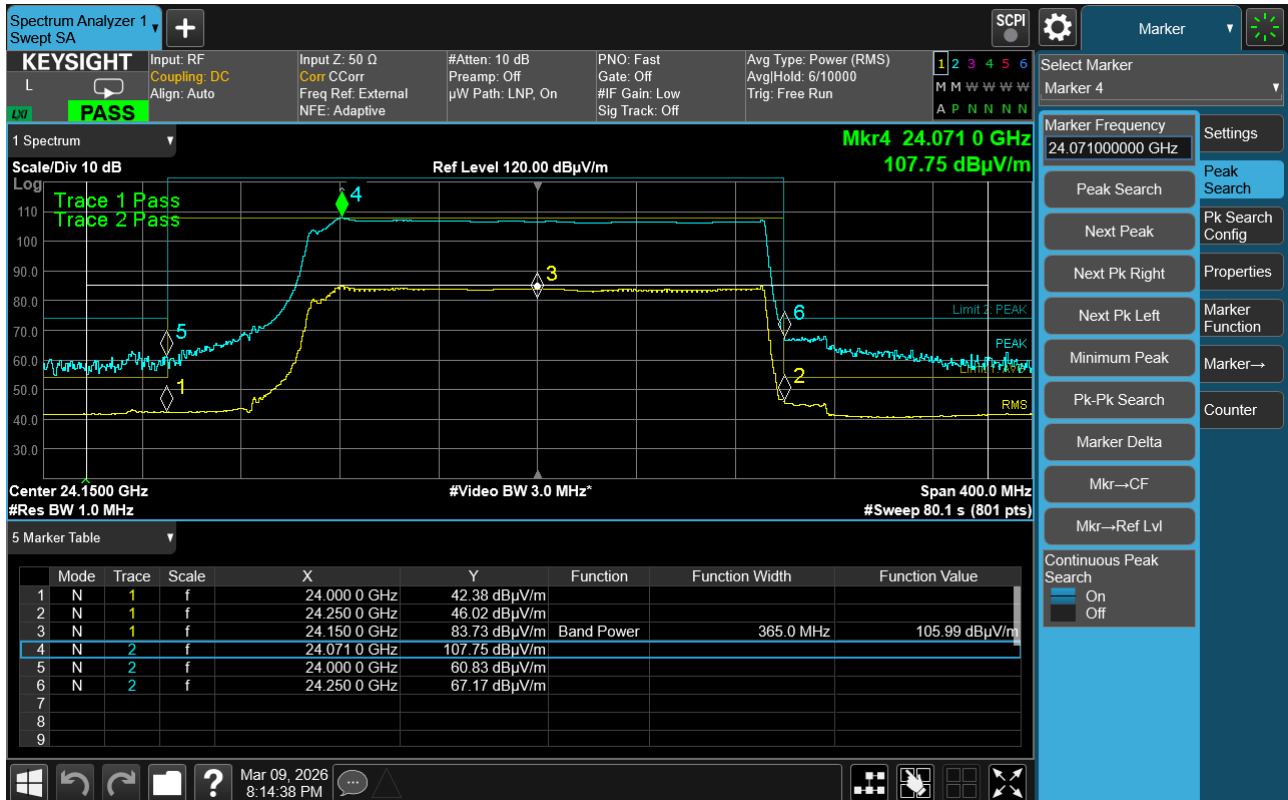
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4.3.4.1.1.2 Average field strength measurement on worst case position (Average) Azimuth 186deg; Elevation 91deg; Horizontal polarization



Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (s)	Pol	Azimuth (deg)	Elevation (deg)	Result
24150	83.73	108	24.27	80.1	H	186	91	Pass

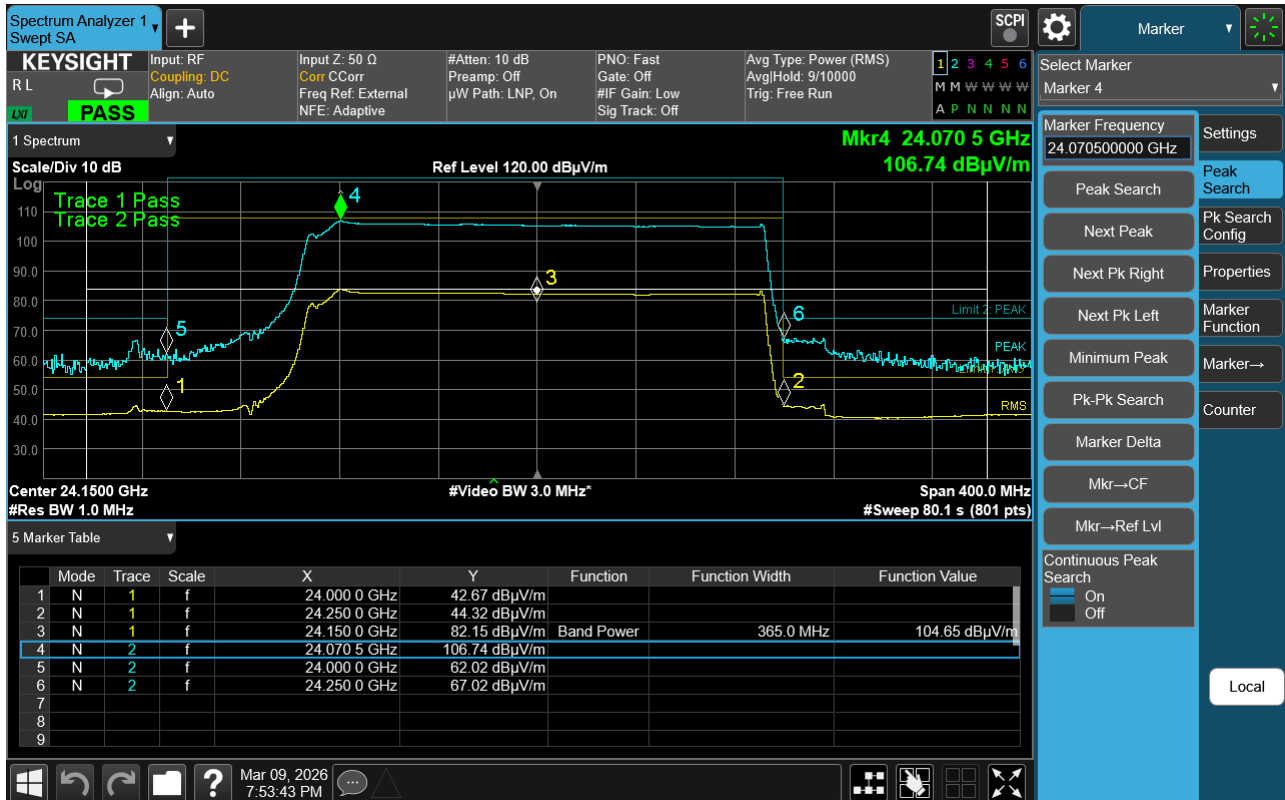
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4.3.4.1.1.3 Average field strength measurement on worst case position (Peak) Azimuth 272deg; Elevation 1deg; Vertical polarization



Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (s)	Pol	Azimuth (deg)	Elevation (deg)	Result
24150	82.15	108	25.85	80.1	V	272	1	Pass

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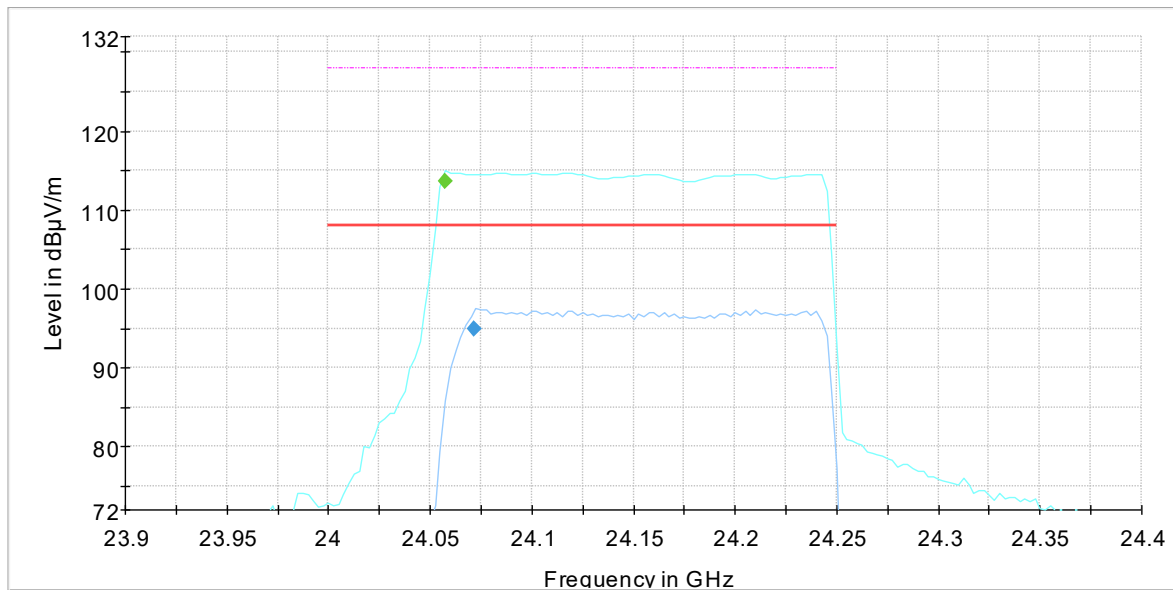
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4.3.4.1.2 Mode 2: Low Doppler_no TxBackoff

4.3.4.1.2.1 Peak field strength measurement and worst-case position evaluation for average field strength measurement



Preview Result 2-PK+
 Preview Result 1-AVG
 FCC_15C_15.249_Fundamental_Field_Strenght_Avg
 FCC_15C_15.249_Fundamental_Field_Strenght_Peak
 Final_Result AVG
 Final_Result PK+

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Result
24057.500000	113.55		128.00	14.45	H	-2.0	88.0	22.9	Pass
24071.500000		94.94	108.00	---	H	185.0	89.0	22.8	---

The average field strength level from this measurement is informative only, as the Sweep Time for final measurement is not according to the standard.

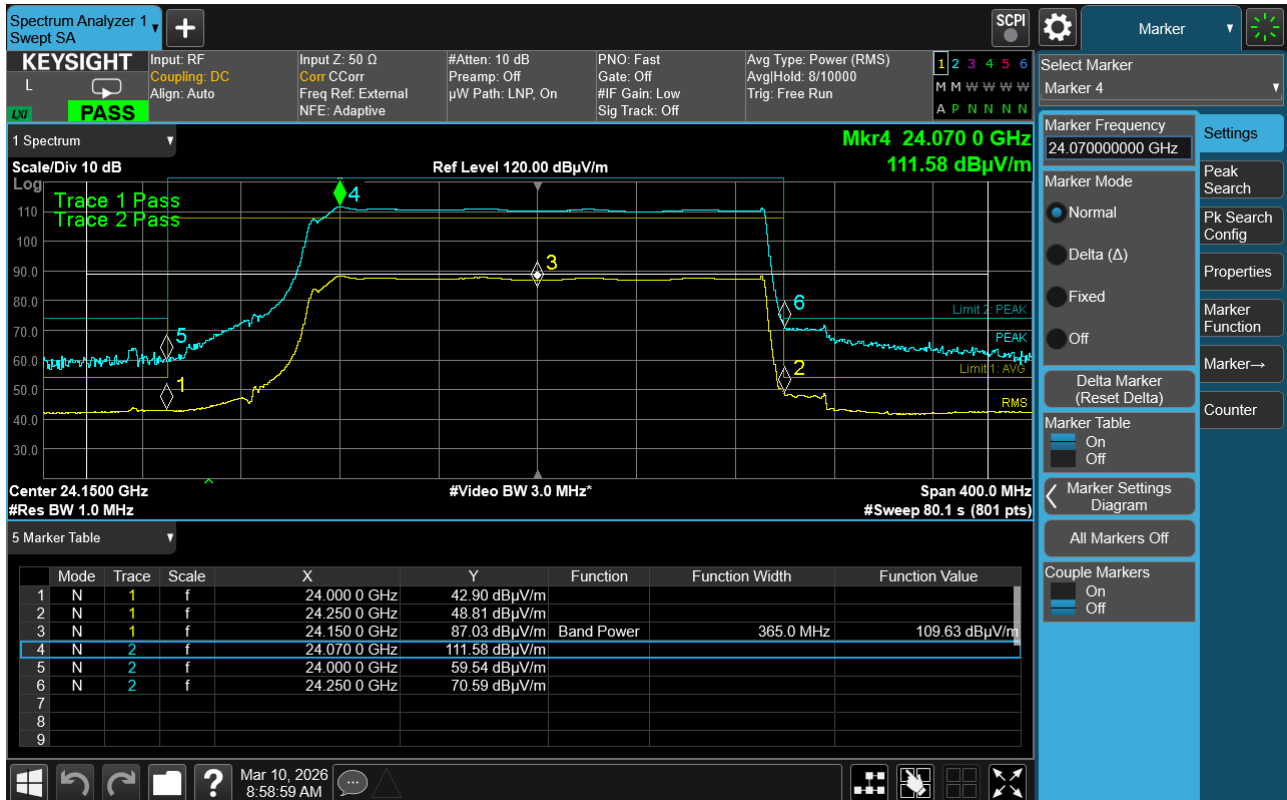
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4.3.4.1.2.2 Average field strength measurement on worst case position (Average) Azimuth 185deg; Elevation 89deg; Horizontal polarization



Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (s)	Pol	Azimuth (deg)	Elevation (deg)	Result
24150	87.03	108	20.97	80.1	H	185	89	Pass

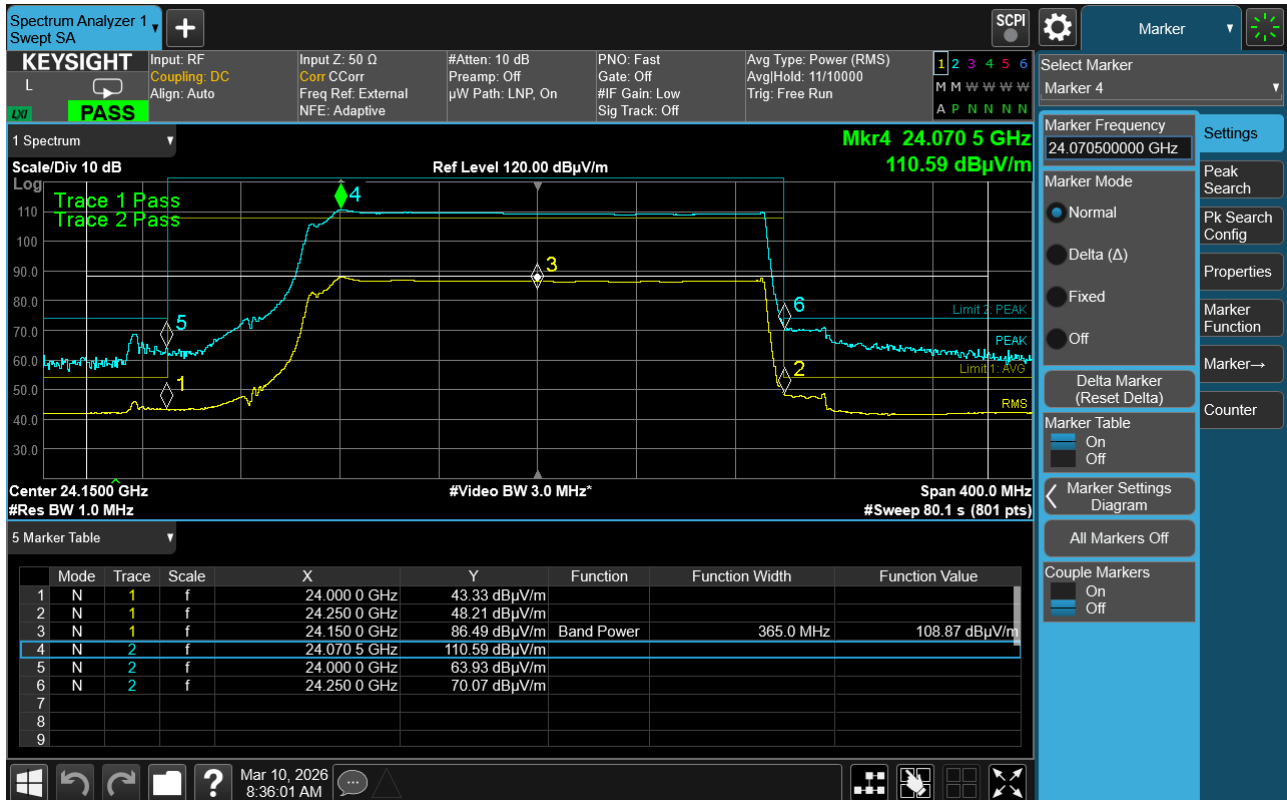
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4.3.4.1.2.3 Average field strength measurement on worst case position (Peak) Azimuth -2deg; Elevation 88deg; Horizontal polarization



Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (s)	Pol	Azimuth (deg)	Elevation (deg)	Result
24150	86.49	108	21.51	80.1	H	-2	88	Pass

4.3.5 Final test result (Field strength of fundamental emissions)

Measured maximum field strength: 113.55dBμV/m (Peak); 87.03dBμV/m (Average)

Final test result	Pass
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4.4 Field strength of unwanted and harmonic emissions

4.4.1 Requirements / Limits

FCC §15.249 (a) and ISSED RSS-210 sec. B.10 a

The field strength of harmonic emissions measured at the distance of 3 m shall not exceed the following limits.

	Fundamental frequency [MHz]	Harmonic limit [$\mu\text{V/m}$]	Harmonic Limit [$\text{dB}\mu\text{V/m}$]
☐	902-928	500	54
☐	2400-2483.5	500	54
☐	5725-5875	500	54
☒	24000-24250	2500	68

Used conversion factor [mV/m]->[$\text{dB}\mu\text{V/m}$]: $\text{Limit}_{\text{dB}\mu\text{V/m}} = 20 \log (\text{Limit}_{\text{mV/m}} * 1000) \text{ dB}\mu\text{V/m}$

For example, if the $\text{limit}_{\text{mV/m}}$ is given with 1 mV/m , then the $\text{limit}_{\text{dB}\mu\text{V/m}}$ is calculated to:

$\text{Limit}_{\text{dB}\mu\text{V/m}} = 20 * \log((1 * 1000)) \text{ dB}\mu\text{V/m} = 60 \text{ dB}\mu\text{V/m}$.

ISSED RSS-210 sec. 7:

Unless otherwise specified, the measurements shall be performed in accordance with ANSI C63.10.

FCC §15.249 (c) and ISSED RSS-210 sec. B.10 b:

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits whichever is the lesser attenuation.

FCC Part 15, Subpart C, §15.35(a); ANSI C63.10:

On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified.

FCC Part 15, Subpart C, §15.35(b); ANSI C63.10:

Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz.

FCC Part 15, Subpart C, §15.35(b); ANSI C63.10:

..., 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 C, §15.35(c); ISSED RSS-Gen sec. 8.2:

Unless otherwise specified, when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value

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FCC Part 15, Subpart C, §15.209; ISED RSS-Gen sec. 8.9
General 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
Above 1000	3		500	54.0	54.0	AVG(Pk)

F: Frequency in kHz

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

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

For example, if the $\text{Limit}_{\mu\text{A/m}}$ is given with 5 $\mu\text{A/m}$, then the $\text{limit}_{\mu\text{V/m}}$ is calculated to:

$\text{Limit}_{\mu\text{V/m}} = 5 * 376.7 \mu\text{V/m} = 1883.5 \mu\text{V/m}$ and the $\text{Limit}_{\text{dB}\mu\text{V/m}}$ is calculated to:

$\text{Limit}_{\text{dB}\mu\text{V/m}} = 20 * \log(1883.5) \text{ dB}\mu\text{V/m} = 65.5 \text{ dB}\mu\text{V/m}$.

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.

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

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

FCC Part 15, Subpart A, §15.33 (a)(1-2); ANSI C63.10 clause 5.5; ISED 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.

If the intentional radiator operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

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4.4.2 Radiated measurements with general limit (Unwanted emissions)

4.4.2.1 Test Method

Radiated unwanted Emissions were tested against the general limits specified in § 15.209(a) ISED RSS-Gen sec. 8.9. Emissions that fall inside the frequency band in which the intentional radiator is operating were excluded.

Emissions that exceed the general limits were additionally tested for the further requirements of §15.249 (d); ISED RSS-210 sec. B.10

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 measurement above 1 GHz the turntable and positioner step sizes were set to a range of 22° and the antenna height is fixed.

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 SVSWR compliant test site.

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

$$E_{\text{final}} = \text{RawRec} + \text{Corr}$$

While

$$\text{Corr} = \text{AF} + \text{SigPathAtt} + \text{PreampAtt}$$

Were

E_{final} : final average electric field value

RawRec: Receiver reading

AF: Antenna factor

SigPathAtt: Signalpath losses

PreampAtt: Preamplifier losses

For example, if a Receiver reading of 1dB μ V was measured and the Antenna factor is 2 dB/m, the Signalpath losses are 3dB and the Preamplifier losses are -10dB, then the Correction is calculated to:

Corr = (2+3-10) dB= -5dB and the Final electric field strength E_{Final} is calculated to:

$$E_{\text{Final}} = (1 - 5) \text{ dB}\mu\text{V/m} = -4 \text{ dB}\mu\text{V/m}$$

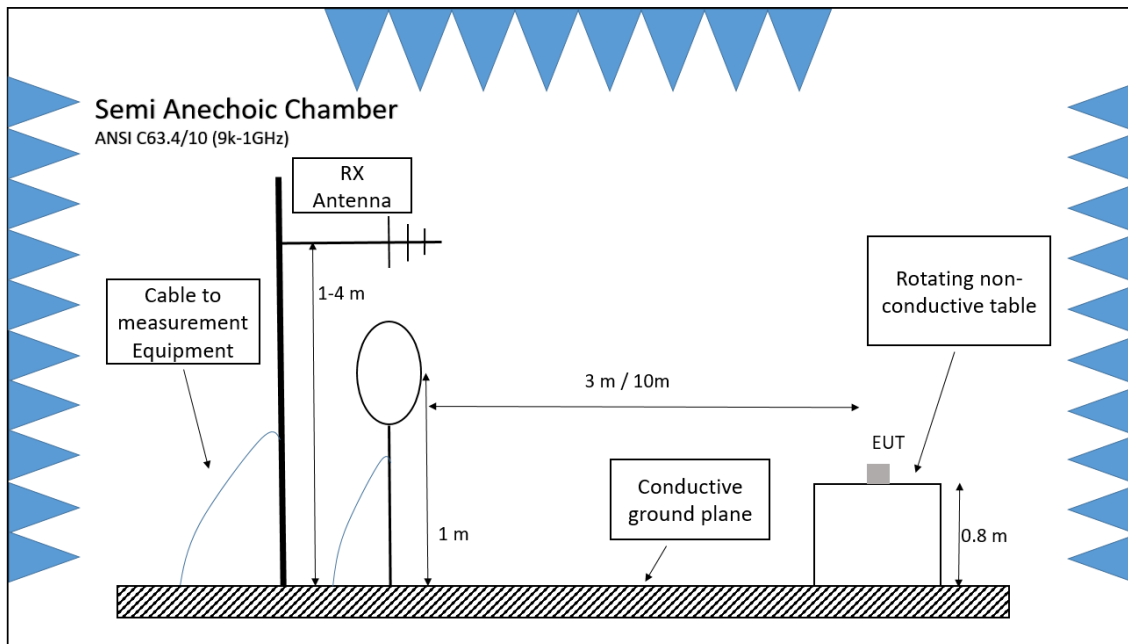
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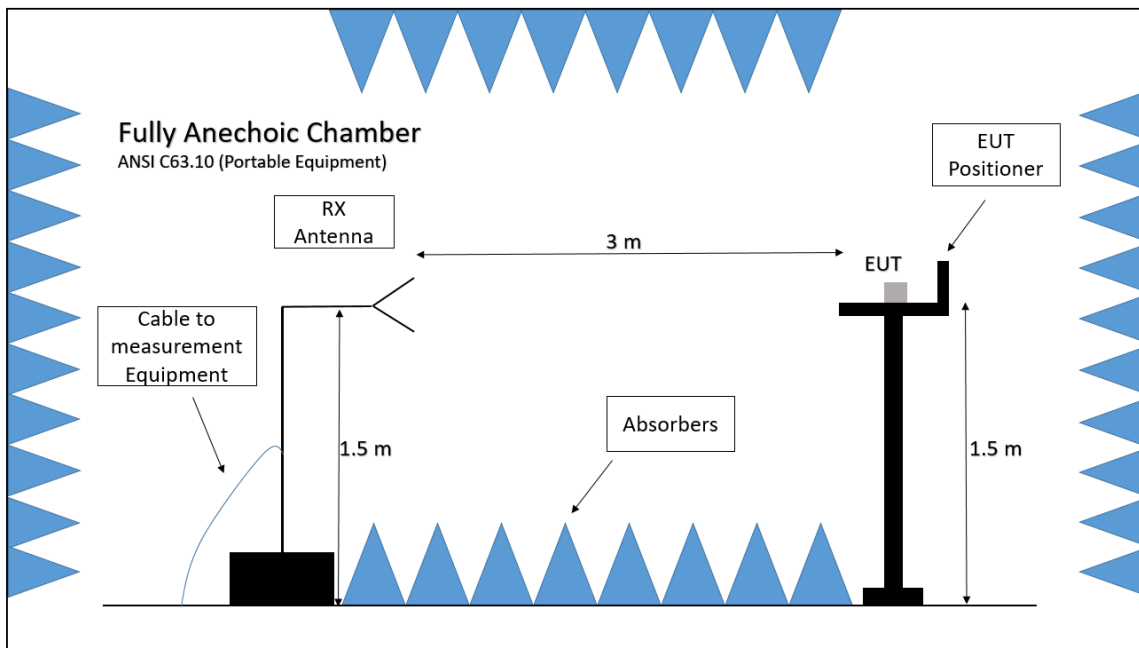
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4.4.2.2 EUT positioning (Radiated measurements with general limit; Unwanted emissions)

4.4.2.2.1 EUT positioning below 1GHz



4.4.2.2.2 EUT positioning above 1GHz



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4.4.2.3 Measurement Setup (Radiated measurements with general limit; Unwanted emissions)

4.4.2.3.1 Measurement Setup 9kHz - 30MHz

Test Site	SAC (Semi Anechoic Chamber)
Receiving Antenna	Loop antenna (HFH 2)
Receiving Antenna Height	1m
Receiving Antenna Polarization	Parallel and perpendicular to the EUT (EUT without Loop antenna) 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: 100ms (FFT) during exploratory tests Sweep Time: 1s for final measurements

4.4.2.3.2 Measurement Setup 30MHz - 1GHz

Test Site	SAC (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

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4.4.2.3.3 Measurement Setup 1GHz- 18GHz

Test Site	FAC (Fully-anechoic chamber)
Receiving Antenna	Horn Antenna HF907 (1-18GHz)
Receiving Antenna Height	1.5m
Receiving Antenna Polarization	Horizontal – Vertical
EUT Positioner	40cm x 60cm non-conductive positioner 1.5m above the floor Step size elevation angle 30°
EUT Turn Table Step Size	Continuous turning
Spectrum Analyzer	Average and peak detectors
	RBW: 1 MHz
	Sweep Time: 1s during exploratory tests Sweep Time: 1s for final measurements

4.4.2.3.4 Measurement Setup 18GHz- 40GHz

Test Site	FAC (Fully-anechoic chamber)
Receiving Antenna	Horn Antenna 3116C-PA (18-40GHz)
Receiving Antenna Height	1.5m
Receiving Antenna Polarization	Horizontal – Vertical
EUT Positioner	40cm x 60cm non-conductive positioner 1.5m above the floor Step size elevation angle 30°
EUT Turn Table Step Size	Continuous turning
Spectrum Analyzer	Average and peak detectors
	RBW: 1 MHz
	Sweep Time: 1s during exploratory tests Sweep Time: 1s for final measurements

4.4.2.3.5 Measurement Setup 40GHz- 60GHz

Test Site	FAC (Fully-anechoic chamber)
Receiving Antenna	Horn Antenna M19RH (40-60GHz)
Receiving Antenna Height	1.5m
Receiving Antenna distance	0.6m
Receiving Antenna Polarization	Vertical
EUT Positioner	40cm x 60cm non-conductive positioner 1.5m above the floor Step size elevation angle 22.5°
EUT Turn Table Step Size	Continuous turning
Spectrum Analyzer	Average and peak detectors
	RBW: 1 MHz
	Sweep Time: 1s during exploratory tests with Max Hold

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4.4.2.3.6 Measurement Setup 60GHz- 90GHz

Test Site	FAC (Fully-anechoic chamber)
Receiving Antenna	SAX322 Extension Module with external Horn Antenna M12RH 60-90GHz
Receiving Antenna Height	1.5m
Receiving Antenna distance	0.1m
Receiving Antenna Polarization	Vertical
EUT Positioner	Manuel exploratory over whole sphere of EUT
EUT Turn Table Step Size	Manuel exploratory over whole sphere of EUT
Spectrum Analyzer	Average and peak detectors
	RBW: 1 MHz
	Sweep Time: 1s during exploratory tests with Max Hold

4.4.2.3.7 Measurement Setup 90GHz- 110GHz

Test Site	FAC (Fully-anechoic chamber)
Receiving Antenna	SAX321 Extension Module with external Horn Antenna M08RH 90-120GHz
Receiving Antenna Height	1.5m
Receiving Antenna distance	0.1m
Receiving Antenna Polarization	Vertical
EUT Positioner	Manuel exploratory over whole sphere of EUT
EUT Turn Table Step Size	Manuel exploratory over whole sphere of EUT
Spectrum Analyzer	Average and peak detectors
	RBW: 1 MHz
	Sweep Time: 1s during exploratory tests with Max Hold

4.4.2.4 Test Setup (Radiated measurements with general limit; Unwanted emissions)

EUT	A004211591-001 (rad. sample)
Companion device	EUT in Test Mode. Therefore, no Companion Device was used.
Operation mode	☒ 1: Low Doppler_TxBackoff ☒ 2: Low Doppler_no TxBackoff ☐ 3: N/A ☐ 4: N/A
Further parameters	-
Test engineer	Primož Erzen

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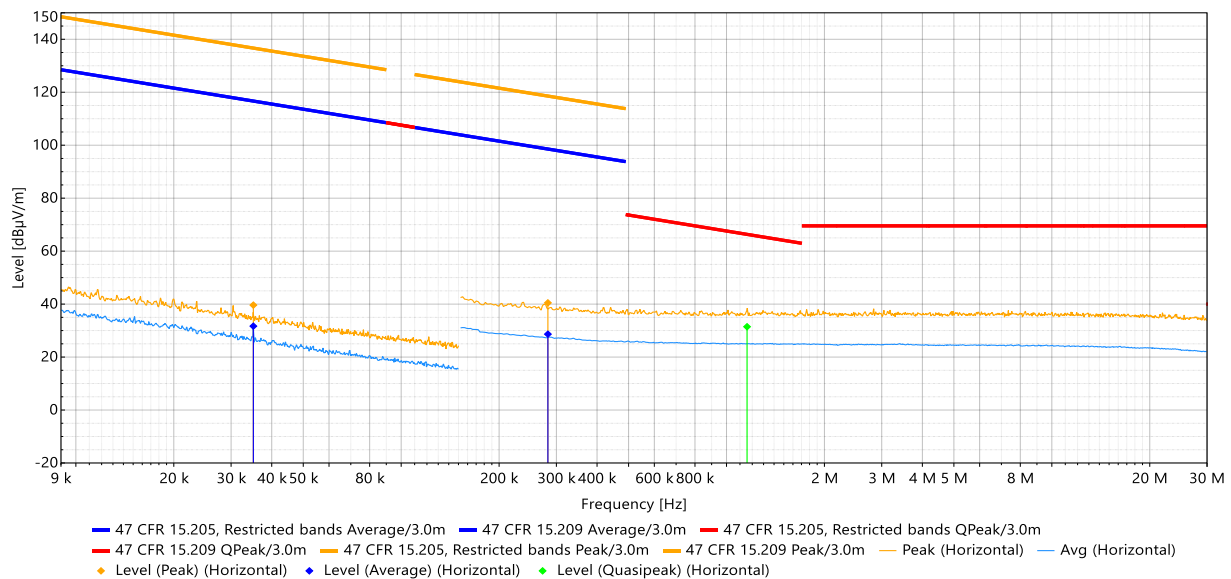
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4.4.2.5 Test results (Radiated measurements with general limit; Unwanted emissions)

4.4.2.5.1 9 kHz to 30 MHz; Mode 1: Low Doppler_TxBackoff

4.4.2.5.1.1 Perpendicular Polarization



Peak

Frequency (Hz)	SR #	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pos	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)	Comment
35.122 k	1	39.6	136.7	-97.1	H	58.7	1.50	20.4	200	1.0	Pass
282.49 k	2	40.5	118.5	-78.1	H	40.4	1.50	20.2	9 k	1.0	Pass

Average

Frequency (Hz)	SR #	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pos	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)	Comment
35.122 k	1	31.7	116.7	-85.0	H	58.7	1.50	20.4	200	1.0	Pass
282.49 k	2	28.7	98.5	-69.9	H	40.4	1.50	20.2	9 k	1.0	Pass

QuasiPeak

Frequency (Hz)	SR #	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pos	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)	Comment
1.157 M	2	31.5	66.3	-34.9	H	15.8	1.50	20.0	9 k	1.0	Pass

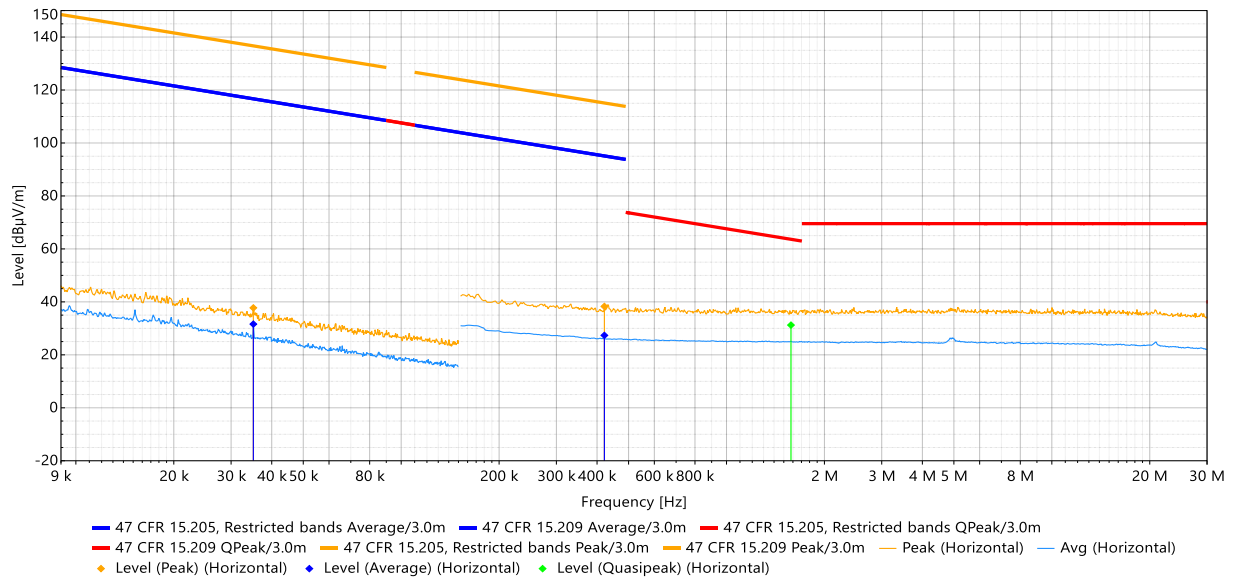
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4.4.2.5.1.2 Parallel Polarization



Peak

Frequency (Hz)	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pos	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)	Comment
35.121 k	1	37.7	136.7	-98.9	H	219.3	1.50	20.4	200	1.0	Pass
421.314 k	2	38.3	115.1	-76.8	H	92.4	1.50	20.1	9 k	1.0	Pass

Average

Frequency (Hz)	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pos	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)	Comment
35.121 k	1	31.6	116.7	-85.1	H	219.3	1.50	20.4	200	1.0	Pass
421.314 k	2	27.3	95.1	-67.7	H	92.4	1.50	20.1	9 k	1.0	Pass

QuasiPeak

Frequency (Hz)	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pos	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)	Comment
1.578 M	2	31.2	63.6	-32.4	H	111.0	1.50	20.0	9 k	1.0	Pass

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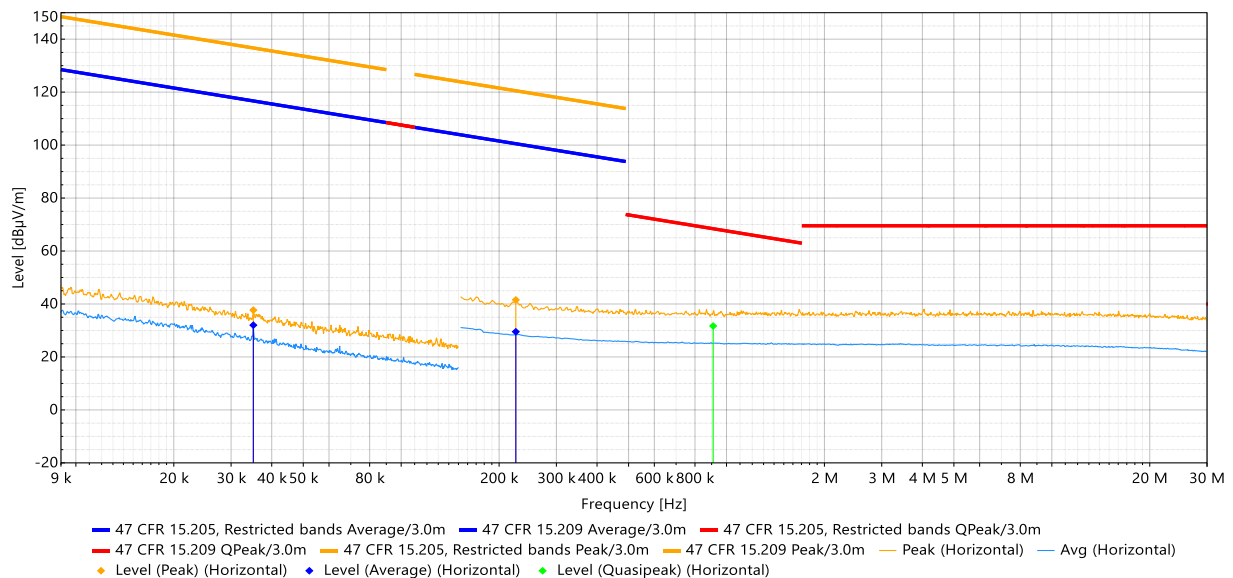
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4.4.2.5.2 9 kHz to 30 MHz; Mode 2: Low Doppler_no TxBackoff

4.4.2.5.2.1 Perpendicular Polarization



Peak

Frequency (Hz)	SR #	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pos	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)	Comment
35.119 k	1	37.7	136.7	-99.0	H	209.8	1.50	20.4	200	1.0	Pass
225.115 k	2	41.5	120.5	-79.0	H	258.0	1.50	20.2	9 k	1.0	Pass

Average

Frequency (Hz)	SR #	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pos	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)	Comment
35.119 k	1	32.0	116.7	-84.7	H	209.8	1.50	20.4	200	1.0	Pass
225.115 k	2	29.5	100.5	-71.0	H	258.0	1.50	20.2	9 k	1.0	Pass

QuasiPeak

Frequency (Hz)	SR #	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pos	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)	Comment
909.785 k	2	31.7	68.4	-36.7	H	139.7	1.50	20.1	9 k	1.0	Pass

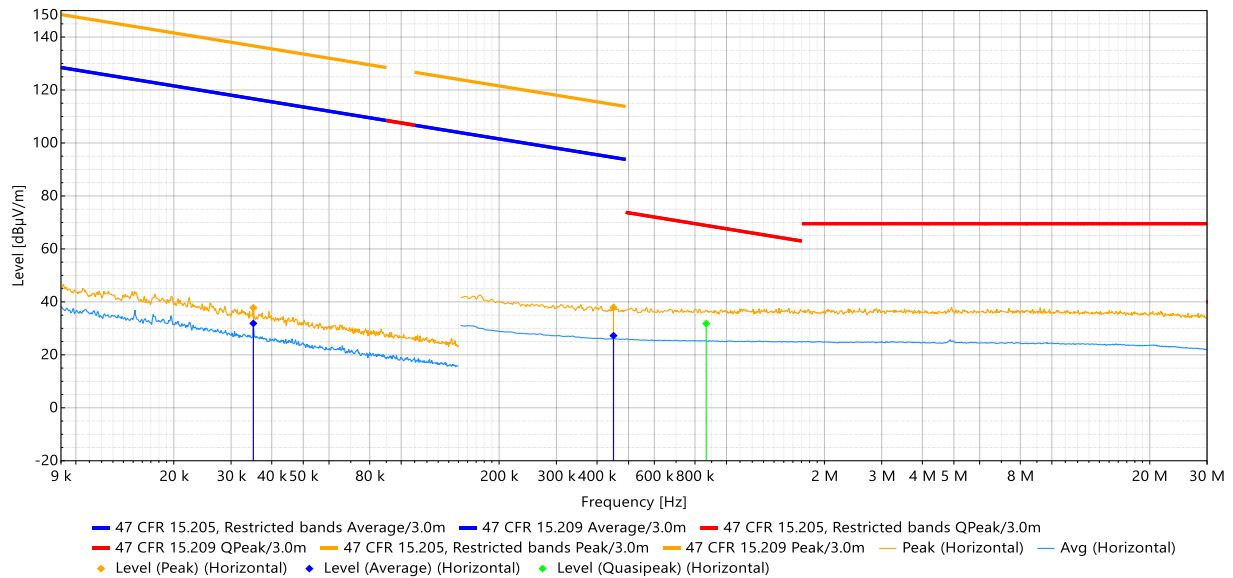
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4.4.2.5.2.2 Parallel Polarization



Peak

Frequency (Hz)	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pos	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)	Comment
35.124 k	1	37.8	136.7	-98.9	H	31.5	1.50	20.4	200	1.0	Pass
449.404 k	2	37.9	114.5	-76.7	H	261.4	1.50	20.1	9 k	1.0	Pass

Average

Frequency (Hz)	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pos	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)	Comment
35.124 k	1	31.9	116.7	-84.8	H	31.5	1.50	20.4	200	1.0	Pass
449.404 k	2	27.2	94.5	-67.3	H	261.4	1.50	20.1	9 k	1.0	Pass

QuasiPeak

Frequency (Hz)	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pos	Azimuth (°)	Height (m)	Correction (dB)	RBW (Hz)	M. time (s)	Comment
866.394 k	2	31.8	68.9	-37.1	H	224.7	1.50	20.1	9 k	1.0	Pass

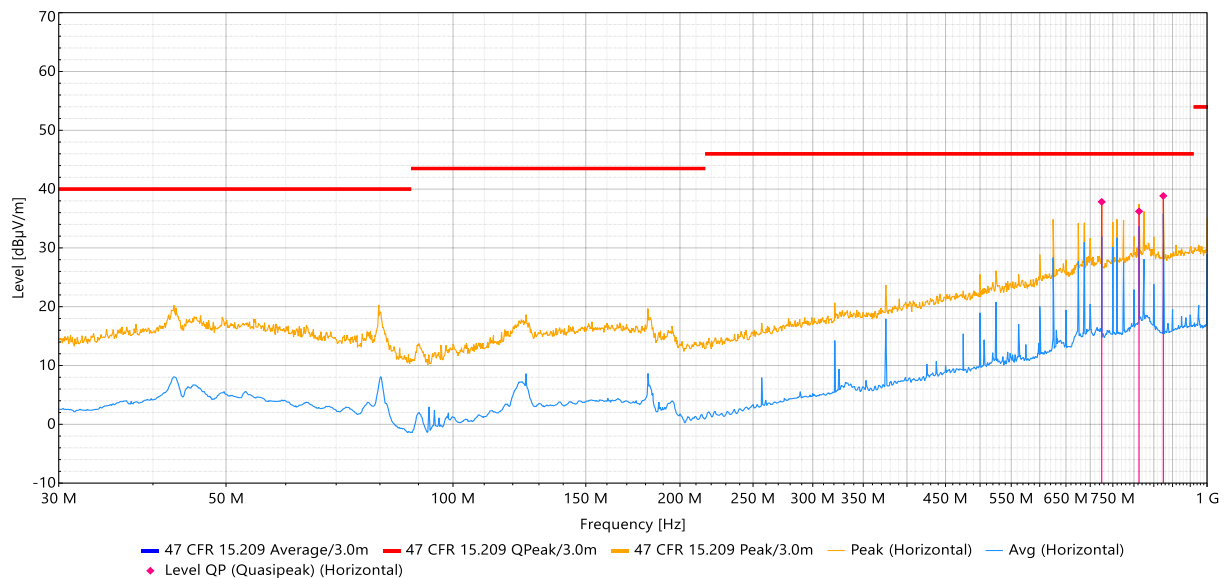
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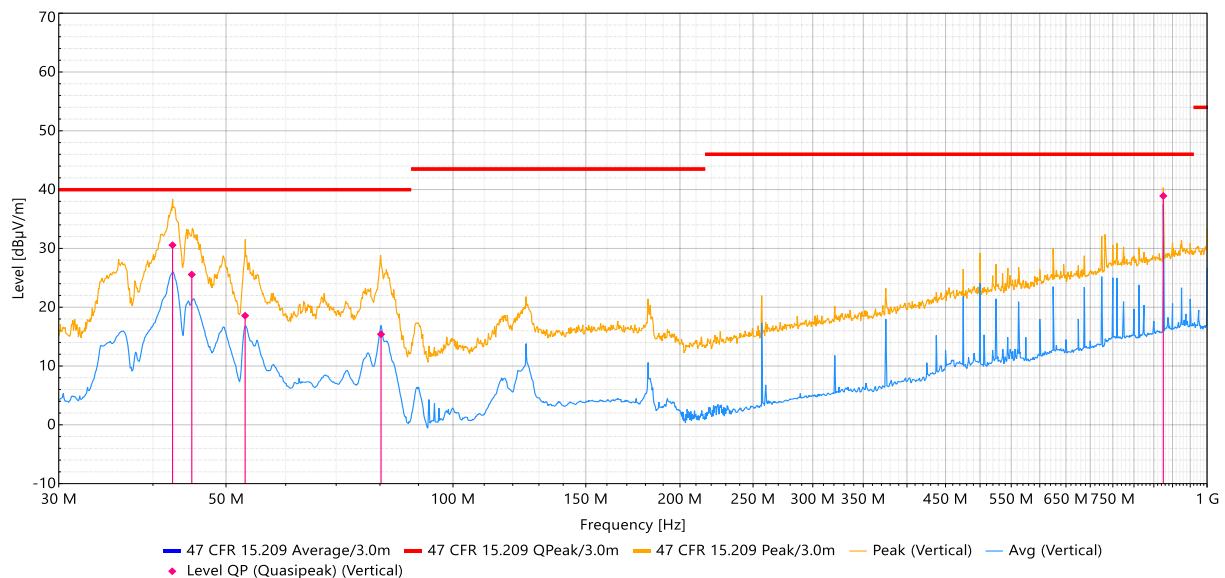
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4.4.2.5.3 30 MHz to 1 GHz; Mode 1: Low Doppler_TxBackoff

4.4.2.5.3.1 Horizontal Polarization



4.4.2.5.3.2 Vertical Polarization



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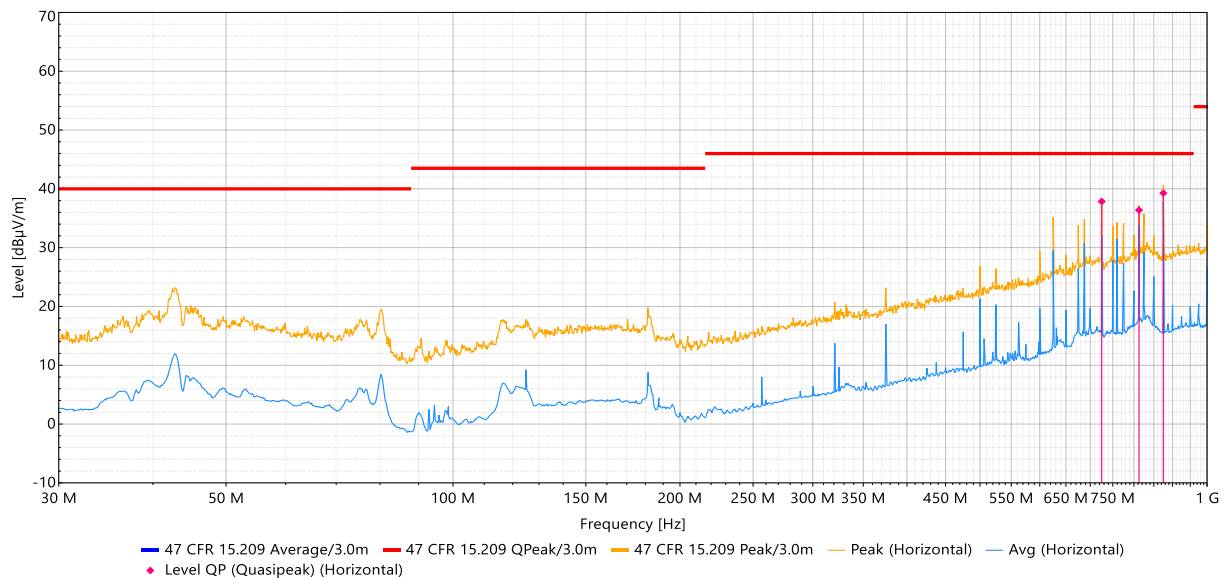
4.4.2.5.3 Results

QuasiPeak

Frequency (Hz)	SR #	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Polarization	Angle(°)	Height (m)	Correction (dB)
42.47 M	1	30.6	40.0	-9.4	V	235.5	1.23	-10.8
45.038 M	1	25.6	40.0	-14.4	V	346.9	1.12	-10.5
53.005 M	1	18.6	40.0	-21.4	V	341.2	1.17	-10.4
80.275 M	1	15.4	40.0	-24.6	V	181.4	1.27	-14.4
725 M	2	37.8	46.0	-8.2	H	74.0	1.02	-1.7
812.508 M	2	36.2	46.0	-9.8	H	8.2	1.01	0.0
875.007 M	1	38.9	46.0	-7.1	V	360.0	1.06	0.8
875.008 M	2	38.8	46.0	-7.2	H	25.0	1.46	0.8
42.47 M	1	30.6	40.0	-9.4	V	235.5	1.23	-10.8
45.038 M	1	25.6	40.0	-14.4	V	346.9	1.12	-10.5

4.4.2.5.4 30 MHz to 1 GHz; Mode 2: Low Doppler_no TxBackoff

4.4.2.5.4.1 Horizontal Polarization



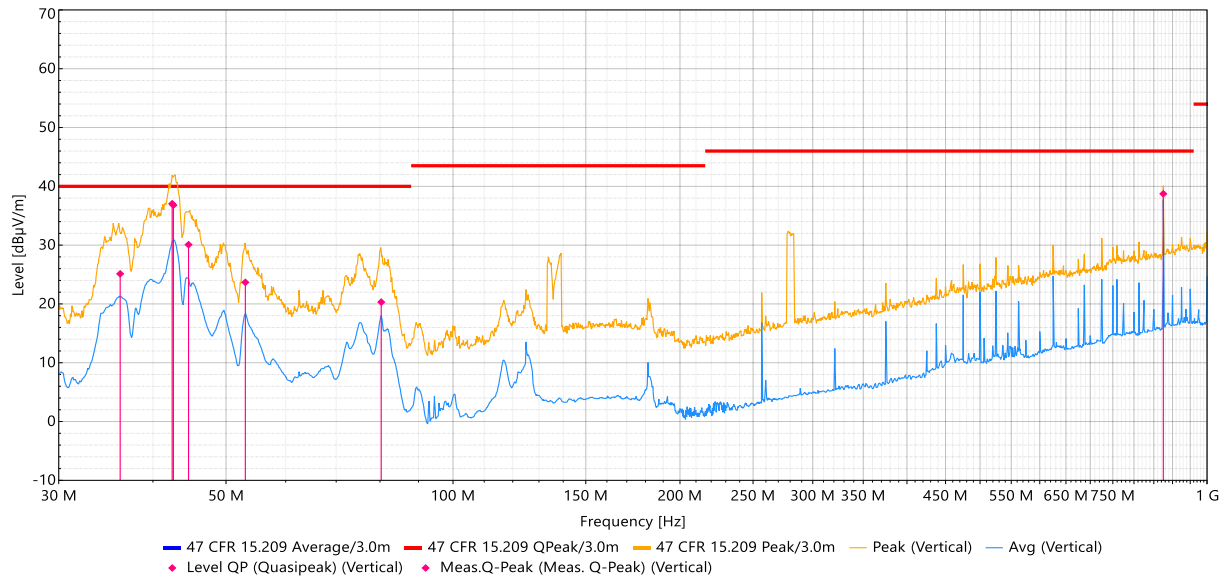
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4.4.2.5.4.2 Vertical Polarization



4.4.2.5.4.3 Results

QuasiPeak

Frequency (Hz)	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Polarization	Angle(°)	Height (m)	Correction (dB)
36.191 M	1	25.1	40.0	-14.9	V	34.8	1.66	-12.0
44.597 M	1	30.1	40.0	-9.9	V	101.0	1.00	-10.6
53.042 M	1	23.7	40.0	-16.3	V	180.9	1.00	-10.4
80.319 M	1	20.3	40.0	-19.7	V	33.1	1.07	-14.5
725 M	2	37.9	46.0	-8.1	H	75.3	1.06	-1.7
812.507 M	2	36.4	46.0	-9.6	H	18.8	1.02	0.0
875.008 M	2	39.3	46.0	-6.7	H	29.0	1.40	0.8
875.008 M	1	38.7	46.0	-7.3	V	3.0	1.02	0.8
42.42 M	1	37.0	40.0	-3.0	V	264.9	1.00	-10.8
42.578 M	1	36.8	40.0	-3.2	V	208.6	1.00	-10.8

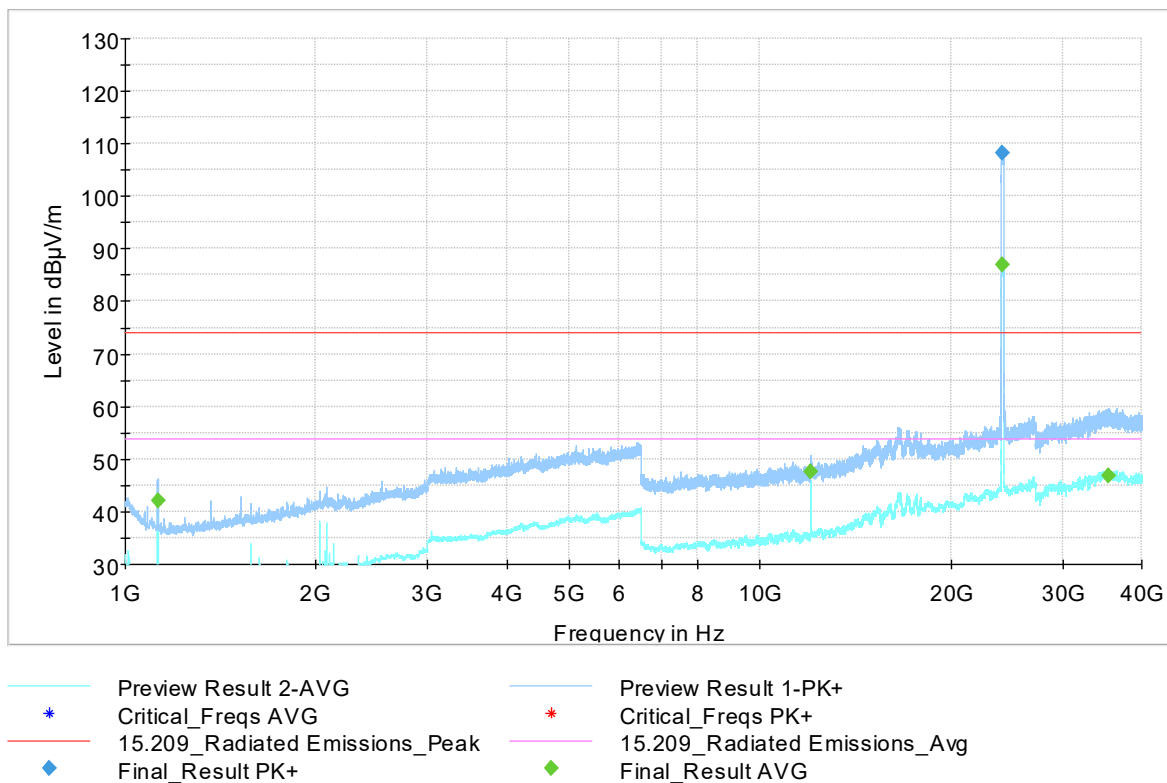
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4.4.2.5.5 1 to 40GHz; Mode 1: Low Doppler_TxBackoff



Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Band width (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
1125.06493	---	42.11	54.00	11.89	1000.0	1000.0	150.0	H	264.0	9.0	-7.1
12028.5649	---	47.51	54.00	6.49	1000.0	1000.0	150.0	V	302.0	53.0	-0.2
24070.5166	Tx-wanted emission				1000.0	1000.0	150.0	H	186.0	90.0	22.8
24070.7333					1000.0	1000.0	150.0	H	186.0	87.0	22.8
35503.2833	---	46.79	54.00	7.21	1000.0	1000.0	150.0	V	33.0	56.0	33.2

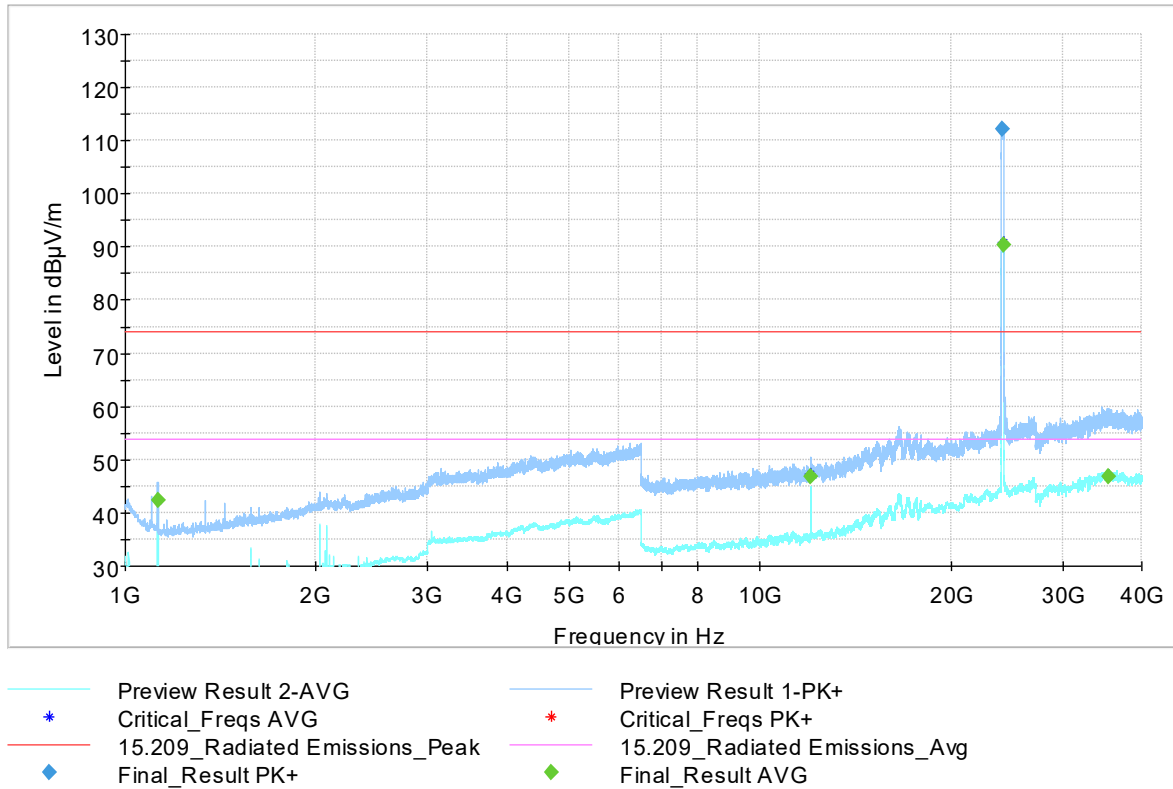
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4.4.2.5.6 1 to 40GHz; Mode 2: Low Doppler_no TxBackoff



Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Band width (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)
1125.06493	---	42.28	54.00	11.72	1000.0	1000.0	150.0	H	268.0	7.0	-7.1
12028.5000	---	46.79	54.00	7.21	1000.0	1000.0	150.0	V	267.0	47.0	-0.2
24070.6000	Tx-wanted emission				1000.0	1000.0	150.0	V	175.0	-1.0	22.8
24240.6333					1000.0	1000.0	150.0	H	185.0	89.0	22.9
35510.3409	---	46.77	54.00	7.23	1000.0	1000.0	150.0	V	38.0	60.0	33.2

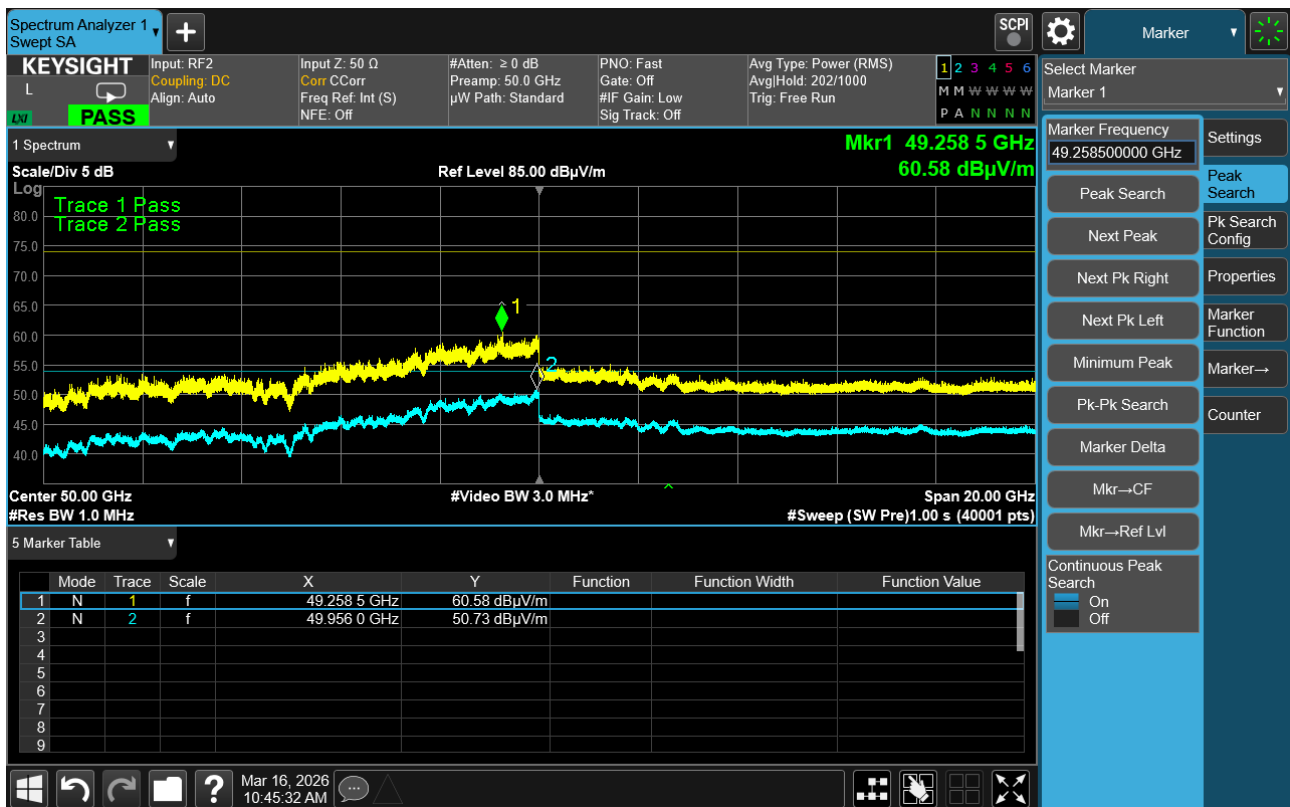
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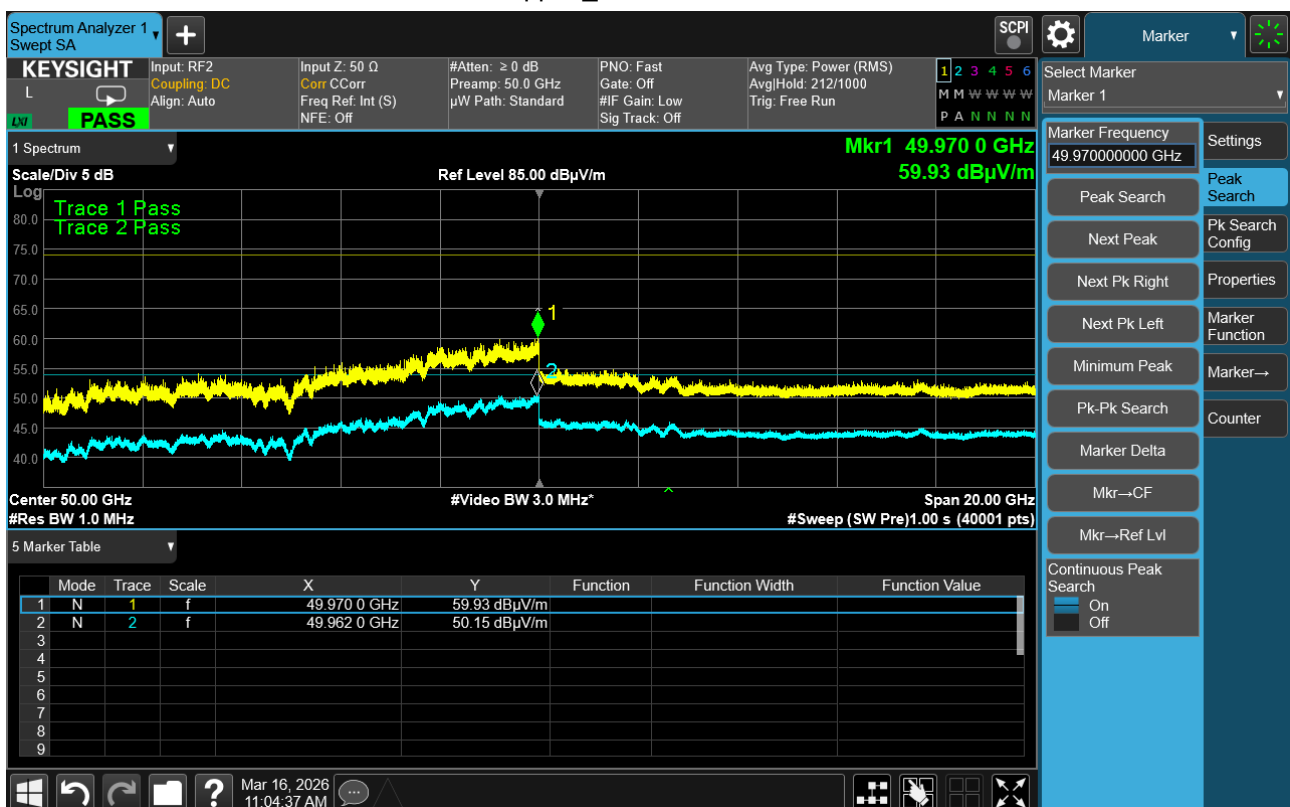
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4.4.2.5.7 40 to 60GHz; Mode 1: Low Doppler_TxBackoff



4.4.2.5.8 40 to 60GHz; Mode 2: Low Doppler_no TxBackoff



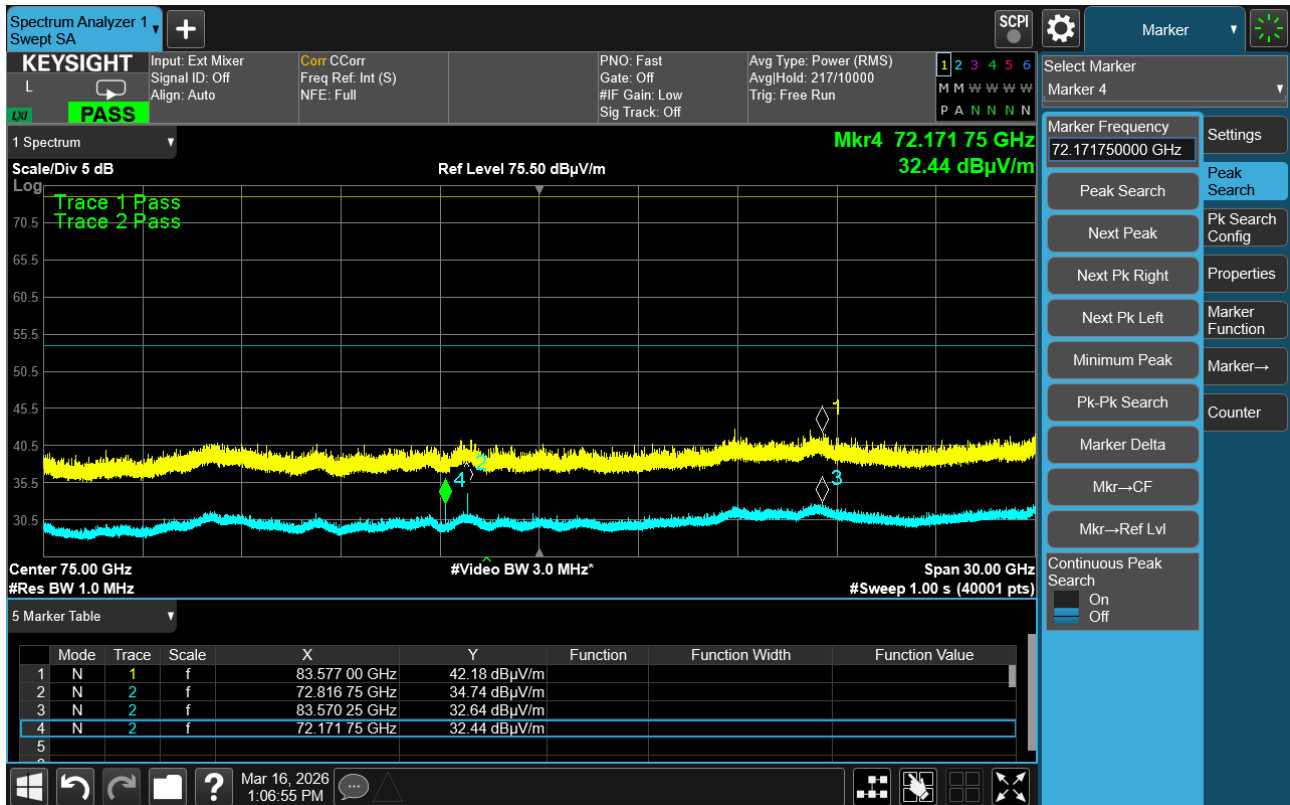
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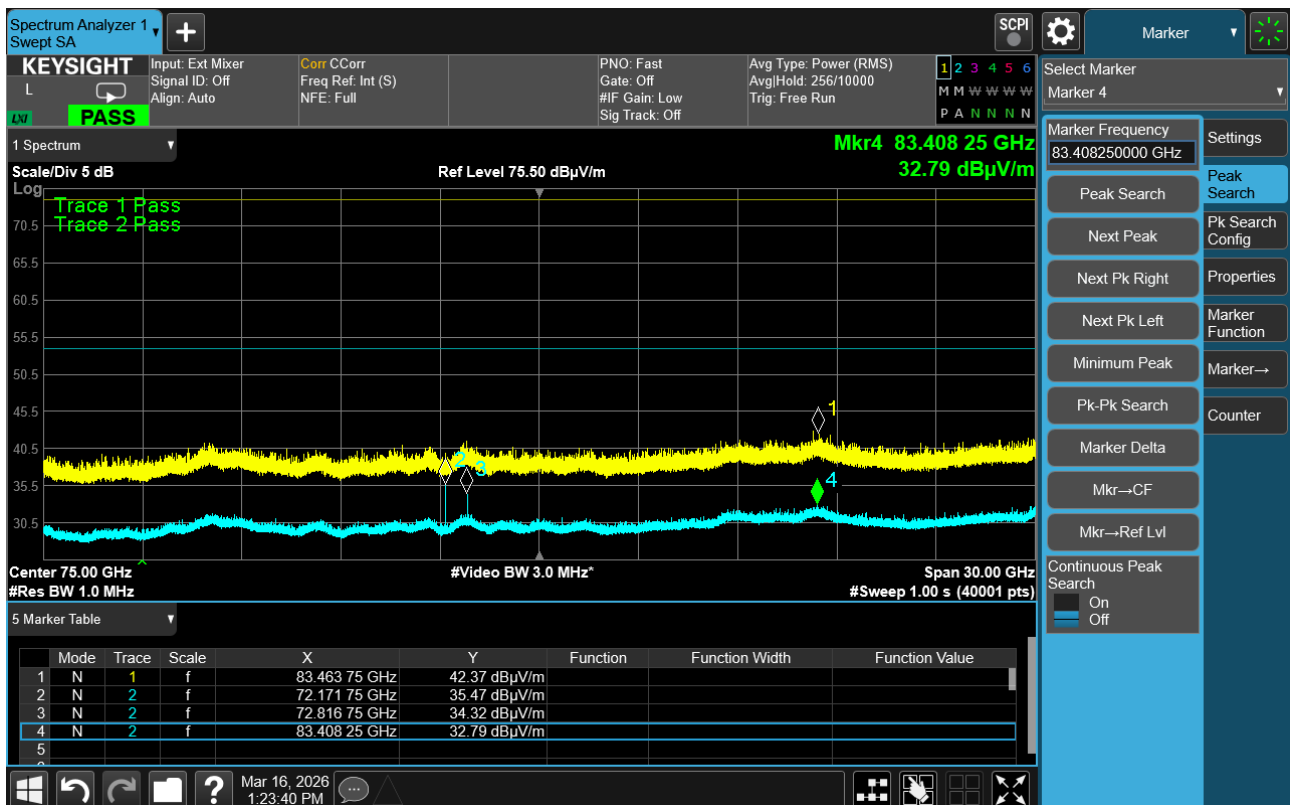
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4.4.2.5.9 60 to 90GHz; Mode 1: Low Doppler_TxBackoff



4.4.2.5.10 60 to 90GHz; Mode 2: Low Doppler_no TxBackoff



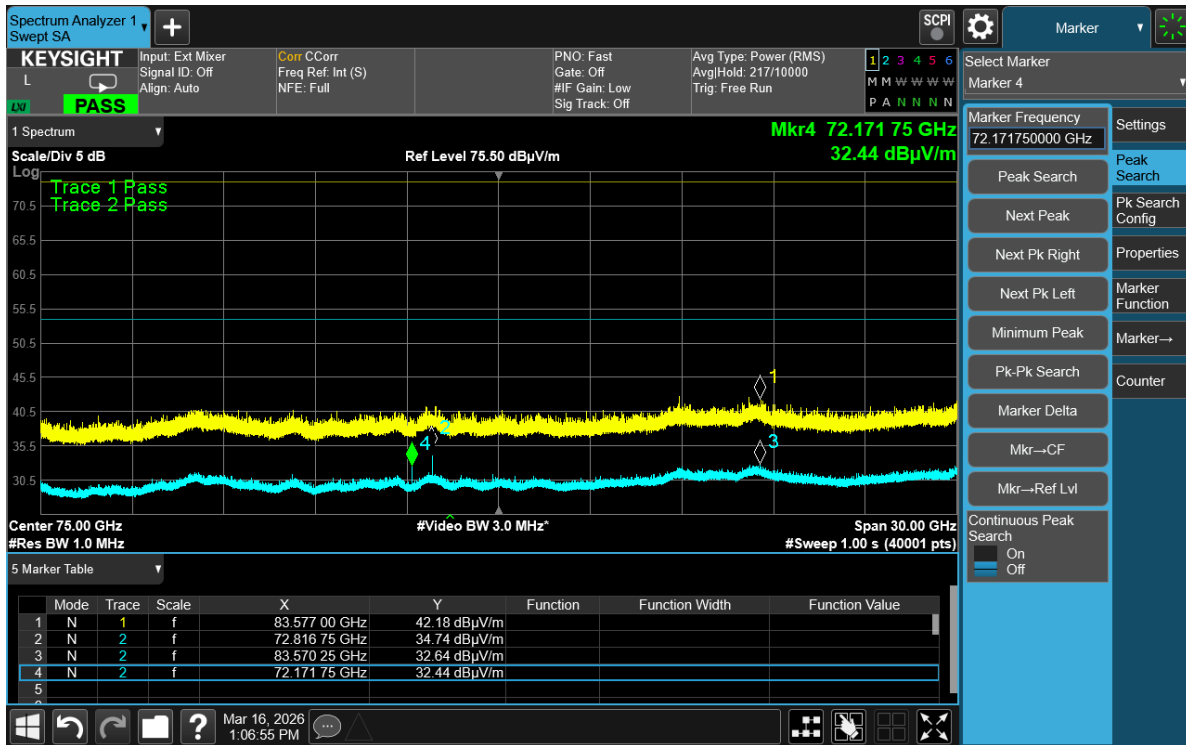
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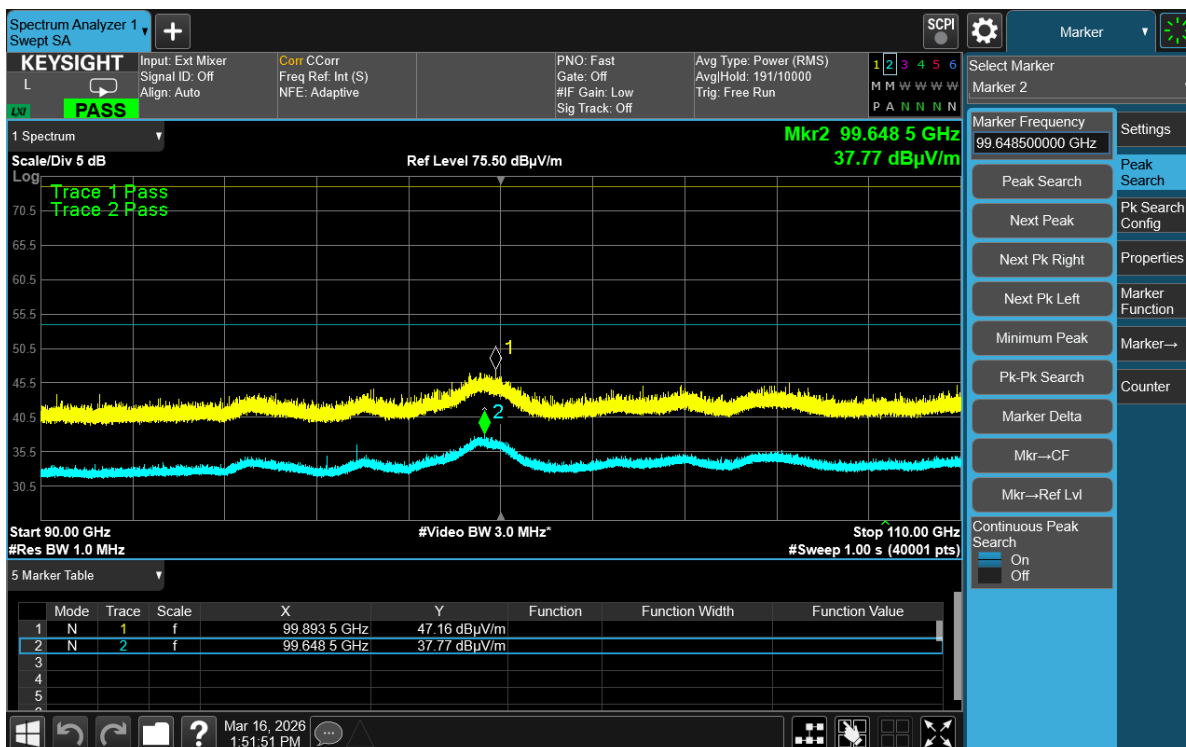
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4.4.2.5.11 90 to 110GHz; Mode 1: Low Doppler_TxBackoff



4.4.2.5.12 90 to 110GHz; Mode 2: Low Doppler_no TxBackoff



4.4.2.5.13 Final test result (Radiated measurements with general limit; Unwanted emissions)

Final test result

Pass

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4.4.3 Band Edge Measurement (Unwanted emissions)

4.4.3.1 Test Method

Unwanted emissions close to the operating band were additionally tested here.

4.4.3.2 Test Setup

EUT		A004211591-001 (rad. sample)
Chamber details		☒ 3m Fully Anechoic Chamber (FAC) ☐ 10m Semi Anechoic Chamber (SAC)
Measurement positioning		Distance: EUT height: Antenna height: ☒ 3m ☒ 1.5m ☒ 1.5m ☐ 10m ☐ 0.8m ☐ 1m to 4m – height scan
Receiving Antenna		Horn Antenna 3116C-PA (18-40GHz)
Receiving Antenna Polarization		Horizontal and Vertical
EUT Positioner		40cm x 60cm non-conductive positioner Only on worst case positions of radiated field strength measurement
EUT Turn Table		Only on worst case positions of radiated field strength measurement
Companion device		EUT in Test Mode. Therefore, no Companion Device was used.
Operation mode		☒ 1: Low Doppler_TxBackoff ☒ 2: Low Doppler_no TxBackoff ☐ 3: N/A ☐ 4: N/A
Spectrum Analyzer	Centre Frequency	24150MHz (Mode Area_lowdoppler); 24110MHz (Mode Road)
	Resolution Bandwidth	1MHz
	Video Bandwidth	3MHz
	Span	400MHz
	Sweep Points	801 (2*Span /RBW)
	Sweep time	80.1s (0.1s * Sweep Points → meas Time per sweep points 0.1s)
Further parameters		Average detector (average in 0.1s in each sweep point) and Max hold of these average points have been used, to get the maximum Value of the Average in 0.1s for each sweep point.
Test engineer		Primoz Erzen

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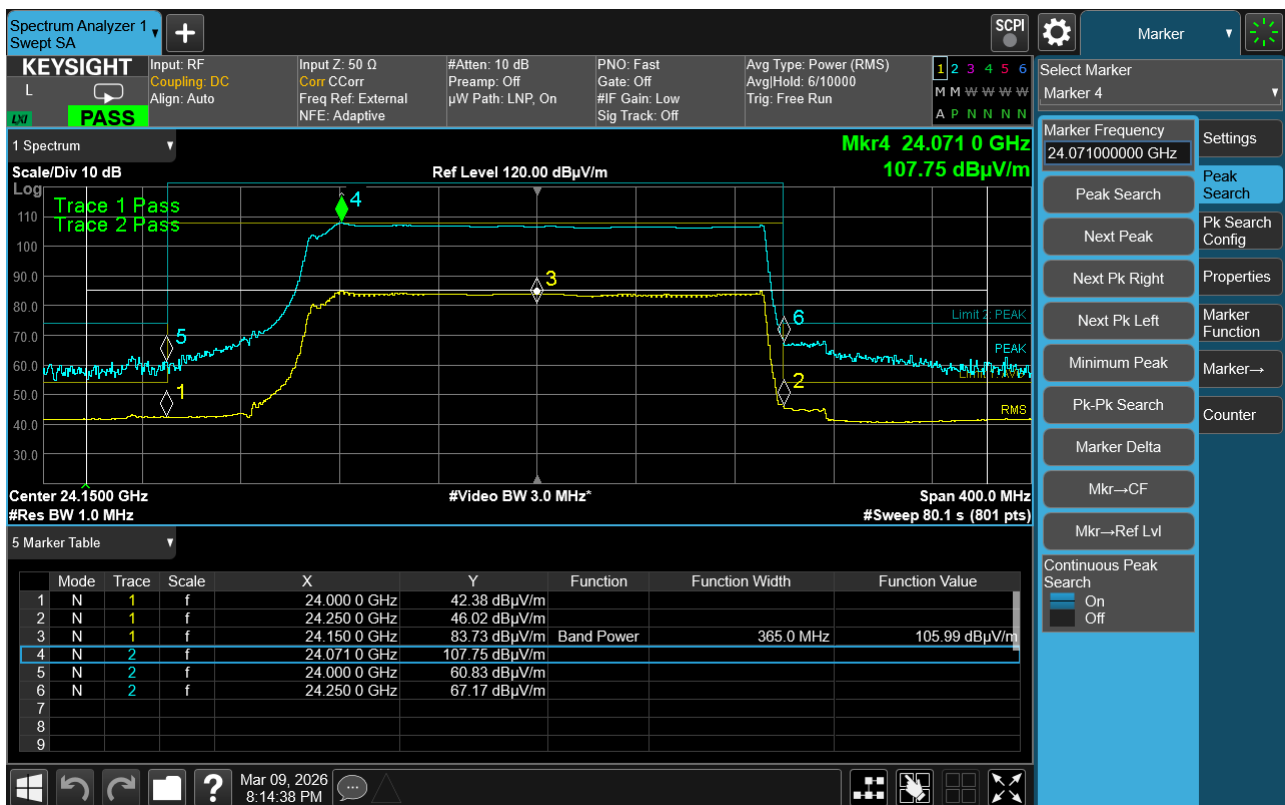
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4.4.3.3 Test results (Unwanted emissions; Band Edge Measurement)

Emissions near to the FMCW-Wanted Signal had been remeasured in Zero-span and qualified as FMCW-Modulated or not. FMCW-Modulated Signal are assumed to have the same slope rate as the Wanted Signal. Therefore, the peak Emissions for these have been additionally corrected for the FMCW-Desensitisation factor.

4.4.3.3.1 Mode 1: Low Doppler_TxBackoff on worst case position (Average) Azimuth 186deg; Elevation 91deg; Horizontal polarization



Peak Emissions

Frequency (MHz)	Peak Raw (dBμV/m)	FMCW desensitisation [dB]	Peak Final (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
24250.0	67.17	3.2	70.37	74.00	3.63	P

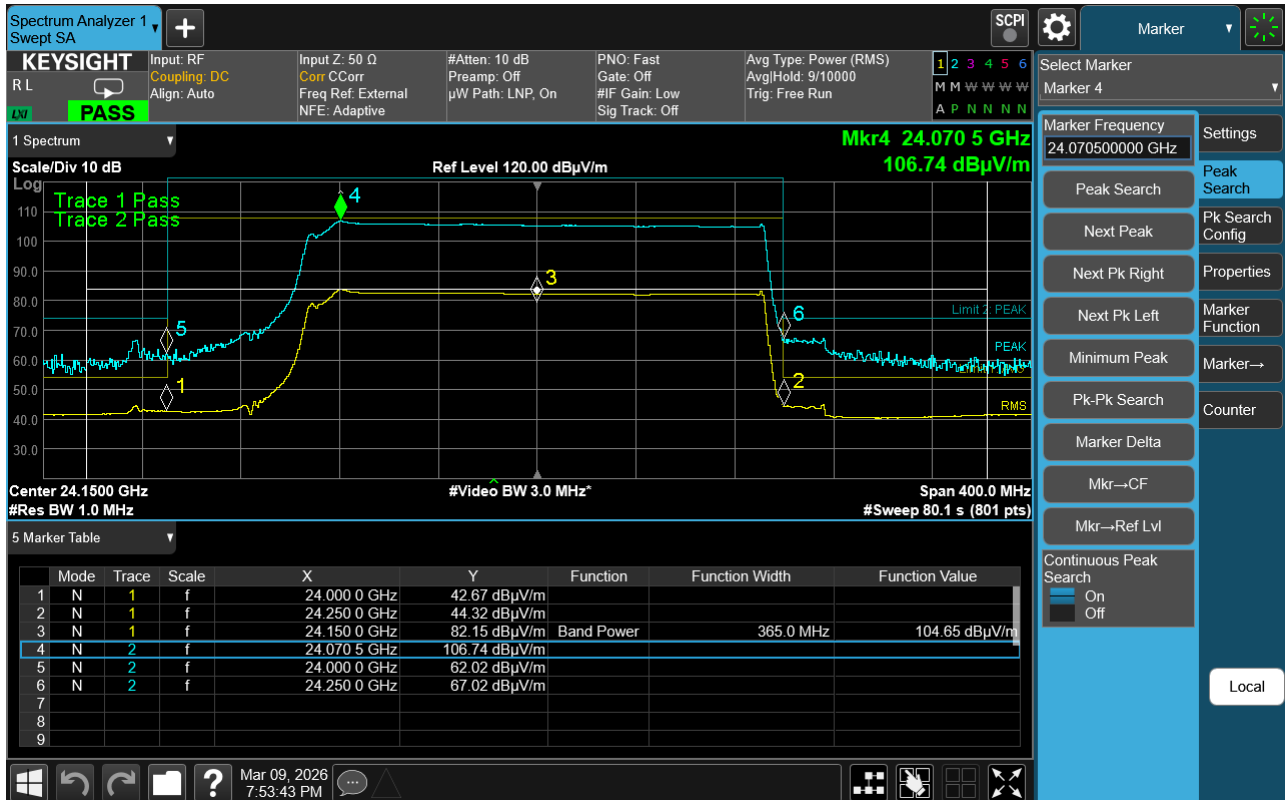
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4.4.3.3.2 Mode 1: Low Doppler_TxBackoff on worst case position (Peak) Azimuth 272deg; Elevation 1deg; Vertical polarization



Peak Emissions

Frequency (MHz)	Peak Raw (dBμV/m)	FMCW desensitisation [dB]	Peak Final (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
24250.0	67.02	3.2	70.22	74.00	3.78	P

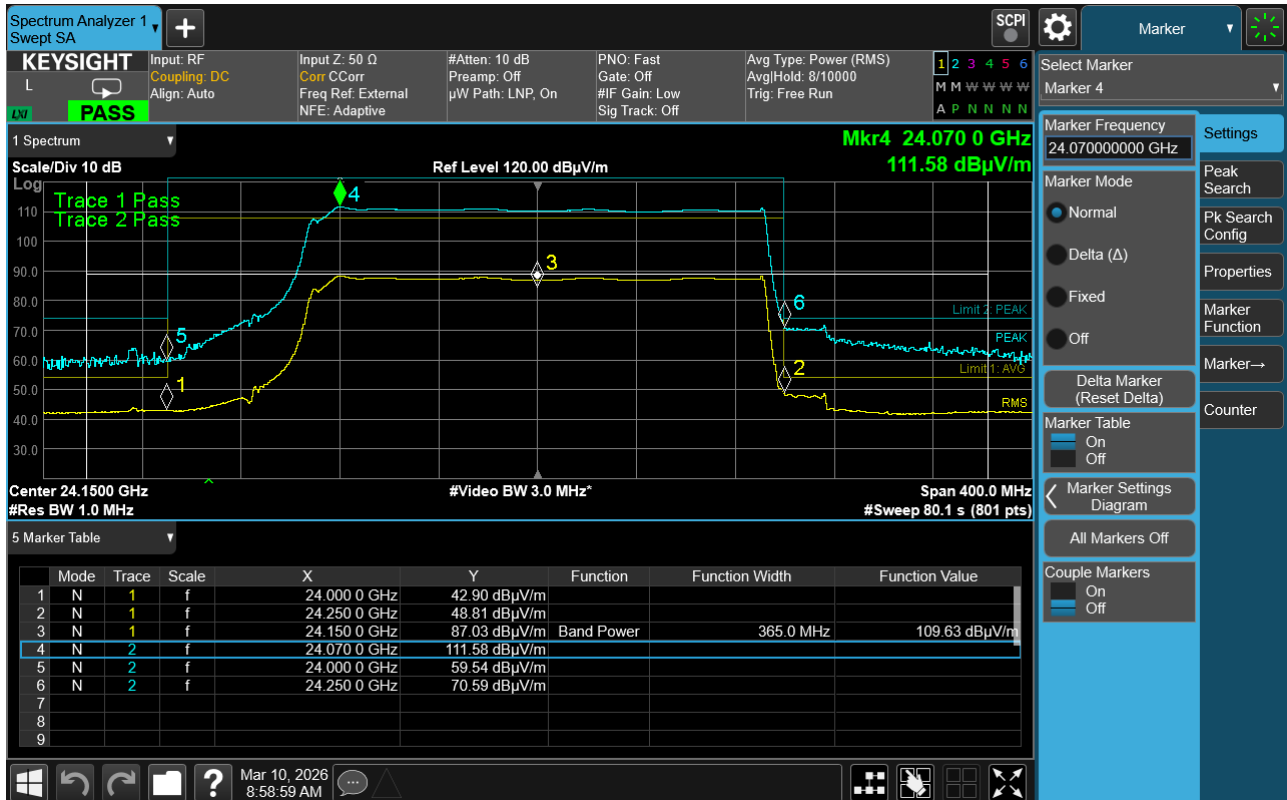
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4.4.3.3.3 Mode 2: Low Doppler_no TxBackoff on worst case position (Average) Azimuth 185deg; Elevation 89deg; Horizontal polarization



Peak Emissions

Frequency (MHz)	Peak Raw (dBμV/m)	FMCW desensitisation [dB]	Peak Final (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
24250.0	70.59	3.2	73.79	74.00	0.21	P

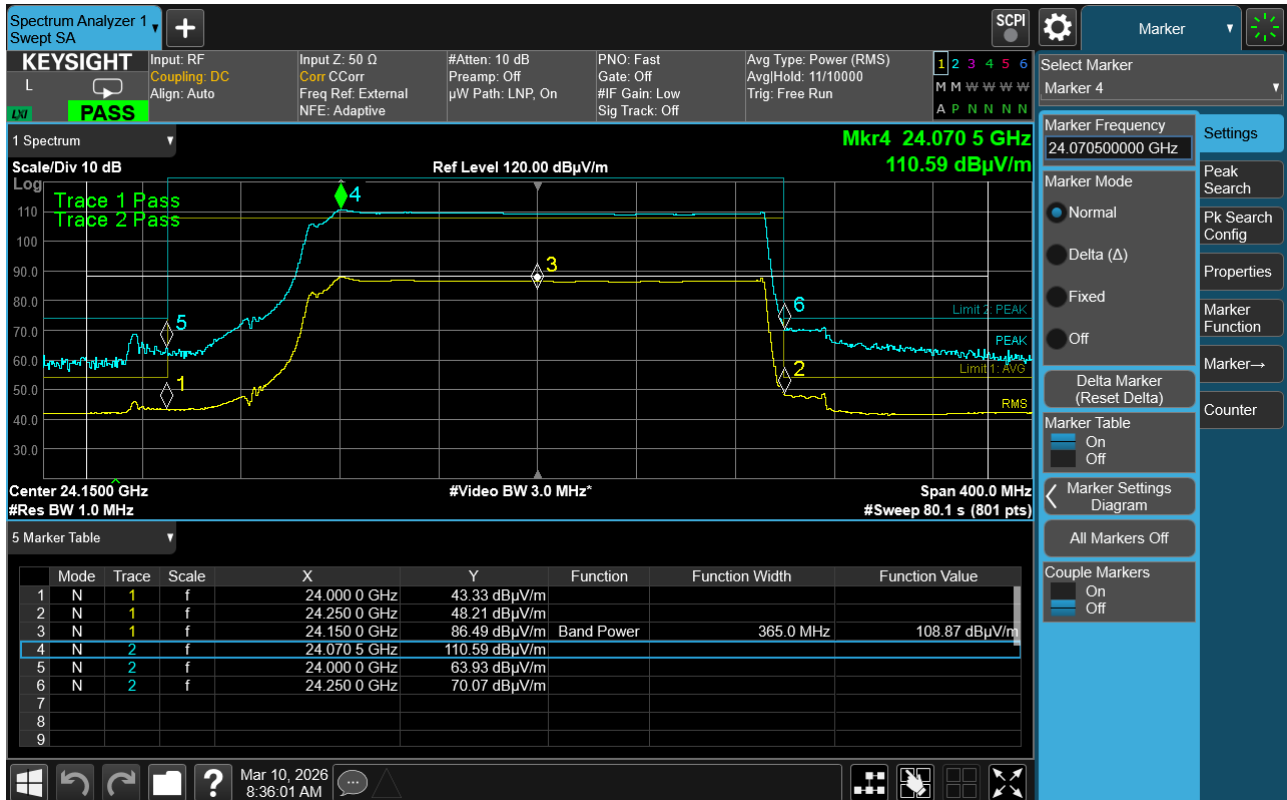
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4.4.3.3.4 Mode 2: Low Doppler_no TxBackoff on worst case position (Peak) Azimuth -2deg; Elevation 88deg; Horizontal polarization



Peak Emissions

Frequency (MHz)	Peak Raw (dBμV/m)	FMCW desensitisation [dB]	Peak Final (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
24250.0	70.07	3.2	73.27	74.00	0.73	P

4.4.3.3.5 Final test result (Unwanted emissions; Band Edge Measurement)

Final test result	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)

... 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).

FCC Part 15, Subpart C, §15.207, 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)

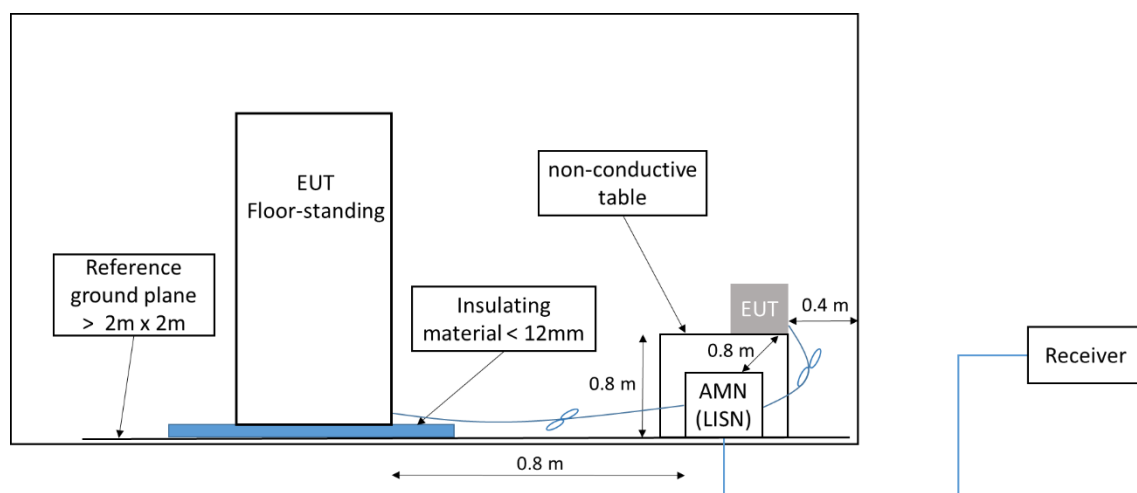
... Devices that include, or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested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

KDB174176 D01 Line Conducted FAQ v01r01:

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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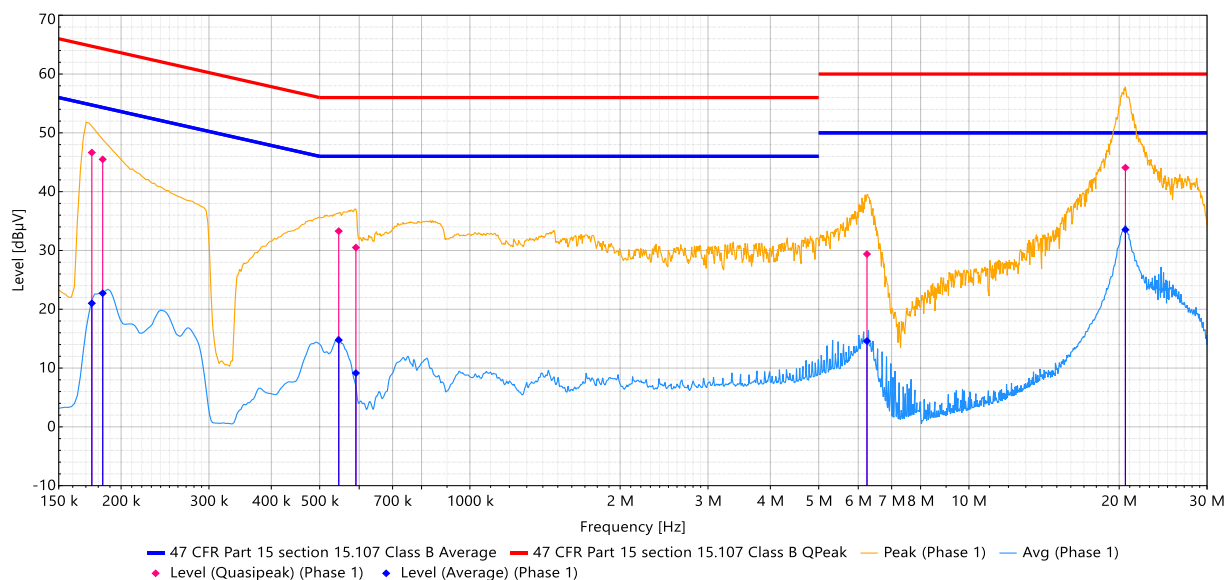
4.5.3 Test Setup (AC Power Conducted Emission)

EUT	A004211591-001 (rad. Sample with Test fixture) A004211591-001 (rad. sample)
Companion device	EUT in Test Mode. Therefore, no Companion Device was used.
Operation mode	☒ 1: Low Doppler_TxBackoff ☒ 2: Low Doppler_no TxBackoff ☐ 3: N/A ☐ 4: N/A
Further parameters	-
Test engineer	Primoz Erzen

4.5.4 Test results (AC Power Conducted Emission)

4.5.4.1.1 Mode 1: Low Doppler_TxBackoff; 120VAC-60Hz

4.5.4.1.2 Line: Phase 1

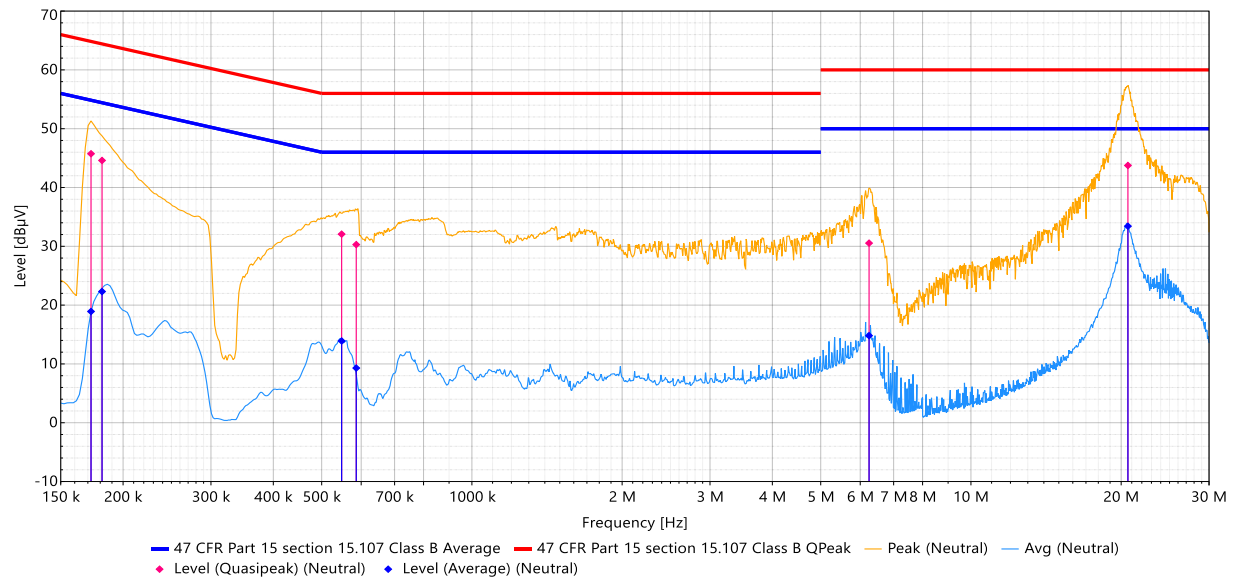


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Prüfdokumentation Test documentation

4.5.4.1.3 Line: Neutral



4.5.4.1.4 Summary

Frequency [Hz]	Q-Peak [dBμV]	Limit [dBμV]	Margin [dB]	Line	Meas time [s]	Correction [dB]	Result
172.5 k	45.7	64.8	-19.1	Neutral	1.0	10.0	Pass
174.75 k	46.6	64.7	-18.1	Phase 1	1.0	10.0	Pass
181.5 k	44.6	64.4	-19.8	Neutral	1.0	10.0	Pass
183.75 k	45.5	64.3	-18.8	Phase 1	1.0	10.0	Pass
546 k	33.3	56.0	-22.7	Phase 1	1.0	10.0	Pass
548.25 k	32.1	56.0	-23.9	Neutral	1.0	10.0	Pass
586.5 k	30.3	56.0	-25.7	Neutral	1.0	10.0	Pass
591 k	30.5	56.0	-25.5	Phase 1	1.0	10.0	Pass
6.248 M	29.4	60.0	-30.6	Phase 1	1.0	10.1	Pass
6.25 M	30.5	60.0	-29.5	Neutral	1.0	10.2	Pass
20.587 M	44.1	60.0	-15.9	Phase 1	1.0	10.6	Pass
20.634 M	43.7	60.0	-16.3	Neutral	1.0	10.5	Pass

Frequency [Hz]	Average [dBμV]	Limit [dBμV]	Margin [dB]	Line	Meas time [s]	Correction [dB]	Result
172.5 k	18.9	54.8	-35.9	Neutral	1.0	10.0	Pass
174.75 k	21.0	54.7	-33.7	Phase 1	1.0	10.0	Pass
181.5 k	22.3	54.4	-32.1	Neutral	1.0	10.0	Pass
183.75 k	22.7	54.3	-31.6	Phase 1	1.0	10.0	Pass
546 k	14.8	46.0	-31.2	Phase 1	1.0	10.0	Pass
548.25 k	13.9	46.0	-32.1	Neutral	1.0	10.0	Pass
586.5 k	9.3	46.0	-36.7	Neutral	1.0	10.0	Pass
591 k	9.1	46.0	-36.9	Phase 1	1.0	10.0	Pass
6.248 M	14.6	50.0	-35.4	Phase 1	1.0	10.1	Pass
6.25 M	14.8	50.0	-35.2	Neutral	1.0	10.2	Pass
20.587 M	33.5	50.0	-16.5	Phase 1	1.0	10.6	Pass
20.634 M	33.4	50.0	-16.6	Neutral	1.0	10.5	Pass

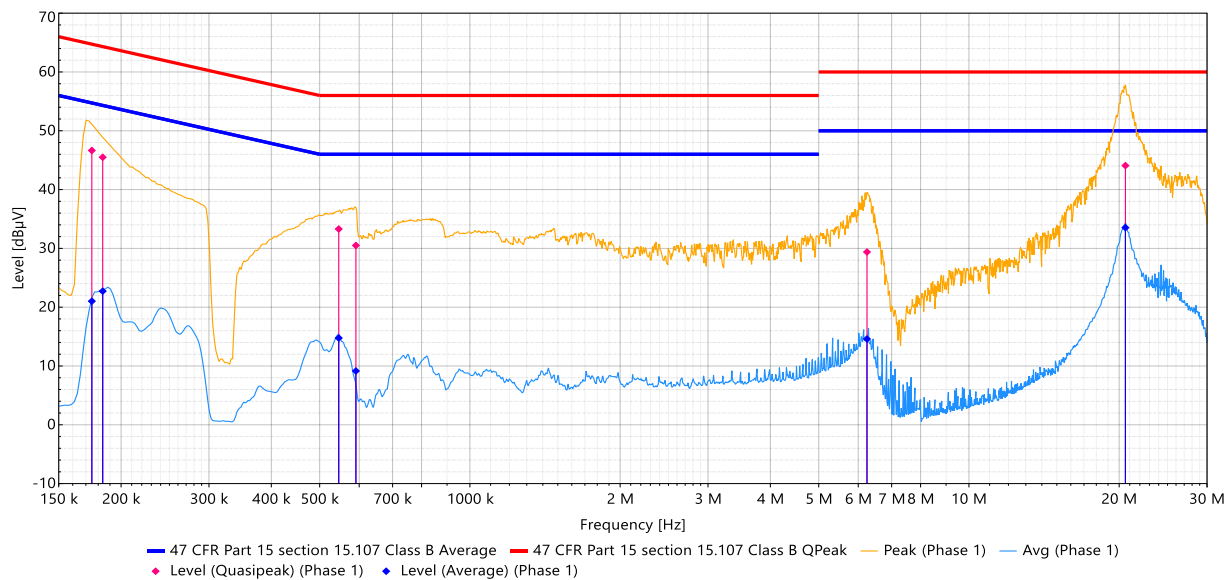
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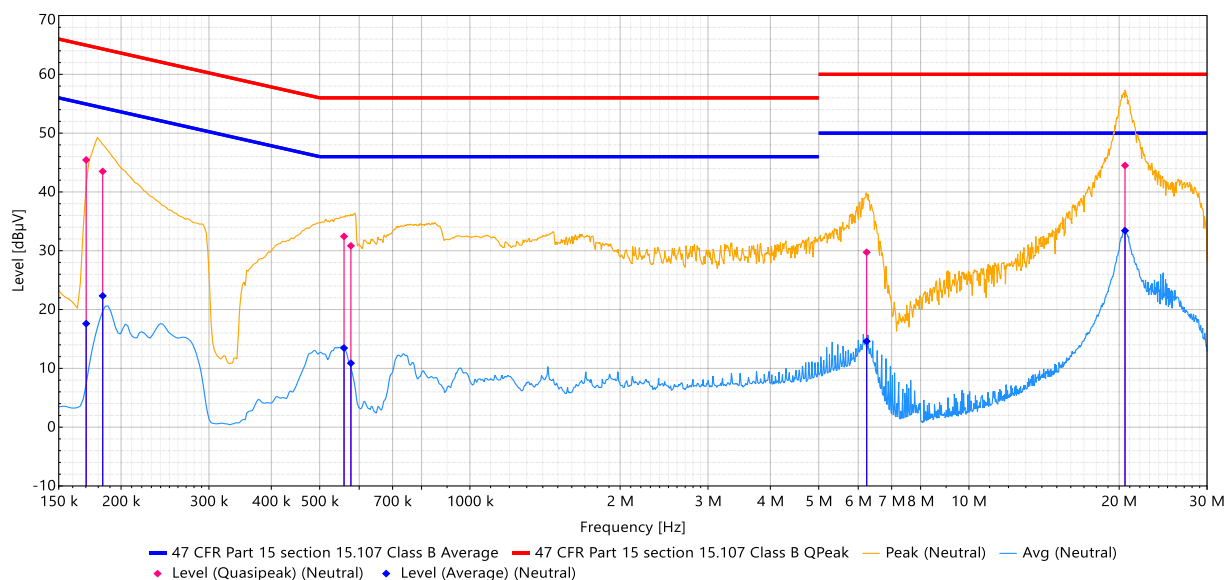
Prüfdokumentation Test documentation

4.5.4.1.5 Mode 2: Low Doppler_no TxBackoff; 120VAC-60Hz

4.5.4.1.6 Line: Phase 1



4.5.4.1.7 Line: Neutral



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4.5.4.1.8 Summary

Frequency [Hz]	Q-Peak [dBµV]	Limit [dBµV]	Margin [dB]	Line	Meas time [s]	Correction [dB]	Result
170.25 k	45.4	64.9	-19.5	Neutral	1.0	10.0	Pass
172.5 k	46.5	64.8	-18.4	Phase 1	1.0	10.0	Pass
179.25 k	45.2	64.5	-19.3	Phase 1	1.0	10.0	Pass
183.75 k	43.5	64.3	-20.8	Neutral	1.0	10.0	Pass
559.5 k	32.8	56.0	-23.2	Phase 1	1.0	10.0	Pass
559.5 k	32.4	56.0	-23.6	Neutral	1.0	10.0	Pass
577.5 k	30.8	56.0	-25.2	Neutral	1.0	10.0	Pass
586.5 k	30.7	56.0	-25.3	Phase 1	1.0	10.0	Pass
6.146 M	28.9	60.0	-31.1	Phase 1	1.0	10.1	Pass
6.239 M	29.7	60.0	-30.3	Neutral	1.0	10.2	Pass
20.531 M	45.2	60.0	-14.8	Phase 1	1.0	10.6	Pass
20.549 M	44.5	60.0	-15.5	Neutral	1.0	10.5	Pass

Frequency [Hz]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	Meas time [s]	Correction [dB]	Result
170.25 k	17.6	54.9	-37.3	Neutral	1.0	10.0	Pass
172.5 k	19.5	54.8	-35.3	Phase 1	1.0	10.0	Pass
179.25 k	21.8	54.5	-32.7	Phase 1	1.0	10.0	Pass
183.75 k	22.3	54.3	-32.0	Neutral	1.0	10.0	Pass
559.5 k	13.8	46.0	-32.2	Phase 1	1.0	10.0	Pass
559.5 k	13.5	46.0	-32.5	Neutral	1.0	10.0	Pass
577.5 k	10.9	46.0	-35.1	Neutral	1.0	10.0	Pass
586.5 k	9.0	46.0	-37.0	Phase 1	1.0	10.0	Pass
6.146 M	14.5	50.0	-35.5	Phase 1	1.0	10.1	Pass
6.239 M	14.6	50.0	-35.4	Neutral	1.0	10.2	Pass
20.531 M	33.5	50.0	-16.5	Phase 1	1.0	10.6	Pass
20.549 M	33.4	50.0	-16.6	Neutral	1.0	10.5	Pass

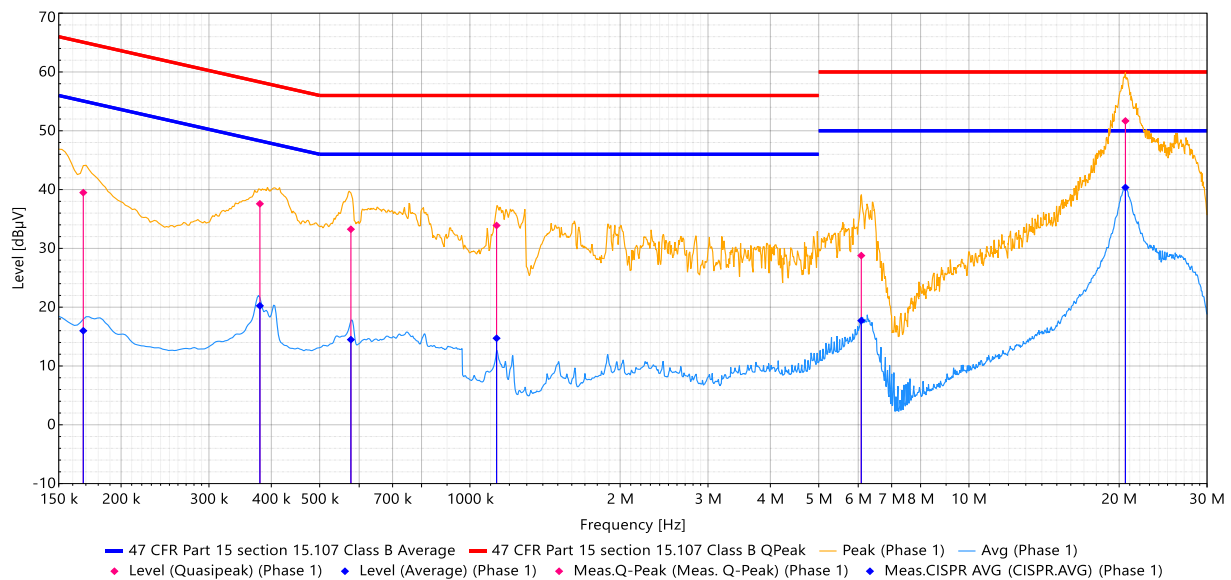
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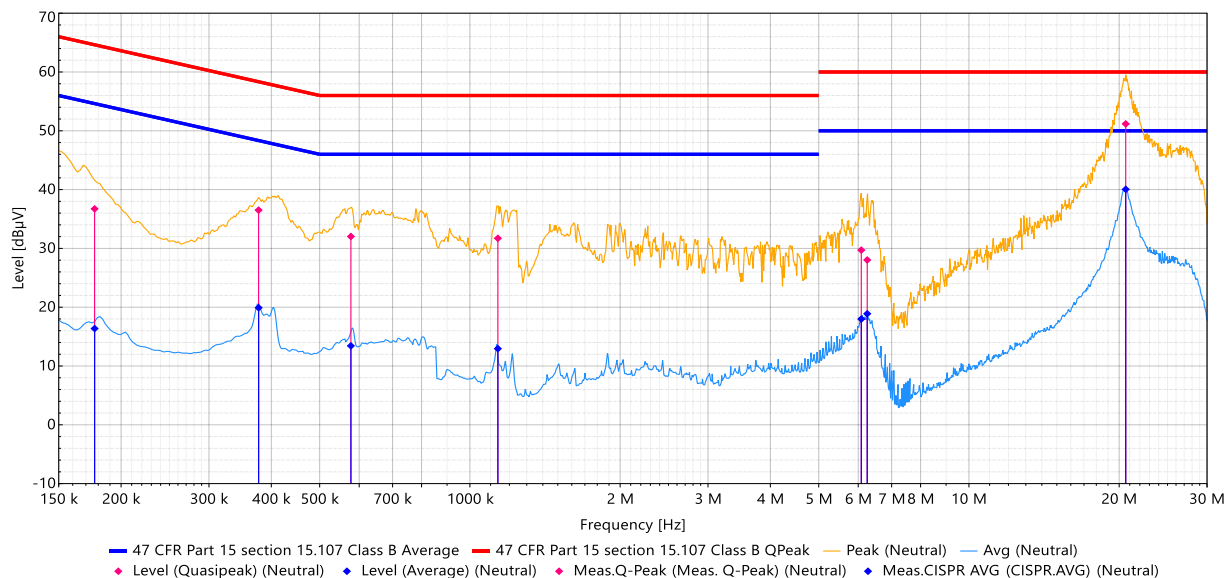
Prüfdokumentation Test documentation

4.5.4.1.9 Mode 1: Low Doppler_TxBackoff; 240VAC-60Hz

4.5.4.1.10 Line: Phase 1



4.5.4.1.11 Line: Neutral



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4.5.4.1.12 Summary

Frequency [Hz]	Q-Peak [dBμV]	Limit [dBμV]	Margin [dB]	Line	Meas time [s]	Correction [dB]	Result
168 k	39.5	65.1	-25.6	Phase 1	1.0	10.0	Pass
177 k	36.7	64.6	-27.9	Neutral	1.0	10.0	Pass
377.25 k	36.5	58.3	-21.8	Neutral	1.0	10.0	Pass
379.5 k	37.6	58.3	-20.7	Phase 1	1.0	10.0	Pass
577.5 k	32.0	56.0	-24.0	Neutral	1.0	10.0	Pass
577.5 k	33.3	56.0	-22.7	Phase 1	1.0	10.0	Pass
1.131 M	33.9	56.0	-22.1	Phase 1	1.0	10.0	Pass
1.138 M	31.7	56.0	-24.3	Neutral	1.0	10.0	Pass
6.086 M	29.7	60.0	-30.3	Neutral	1.0	10.2	Pass
6.086 M	28.8	60.0	-31.2	Phase 1	1.0	10.1	Pass
6.254 M	28.0	60.0	-32.0	Neutral	1.0	10.2	Pass
20.587 M	51.7	60.0	-8.3	Phase 1	1.0	10.6	Pass
20.616 M	51.2	60.0	-8.8	Neutral	1.0	10.5	Pass

Frequency [Hz]	Average [dBμV]	Limit [dBμV]	Margin [dB]	Line	Meas time [s]	Correction [dB]	Result
168 k	16.0	55.1	-39.1	Phase 1	1.0	10.0	Pass
177 k	16.4	54.6	-38.3	Neutral	1.0	10.0	Pass
377.25 k	19.9	48.3	-28.4	Neutral	1.0	10.0	Pass
379.5 k	20.2	48.3	-28.1	Phase 1	1.0	10.0	Pass
577.5 k	13.4	46.0	-32.6	Neutral	1.0	10.0	Pass
577.5 k	14.5	46.0	-31.5	Phase 1	1.0	10.0	Pass
1.131 M	14.7	46.0	-31.3	Phase 1	1.0	10.0	Pass
1.138 M	12.9	46.0	-33.1	Neutral	1.0	10.0	Pass
6.086 M	18.0	50.0	-32.0	Neutral	1.0	10.2	Pass
6.086 M	17.7	50.0	-32.3	Phase 1	1.0	10.1	Pass
6.254 M	18.9	50.0	-31.1	Neutral	1.0	10.2	Pass
20.587 M	40.4	50.0	-9.6	Phase 1	1.0	10.6	Pass
20.616 M	40.0	50.0	-10.0	Neutral	1.0	10.5	Pass

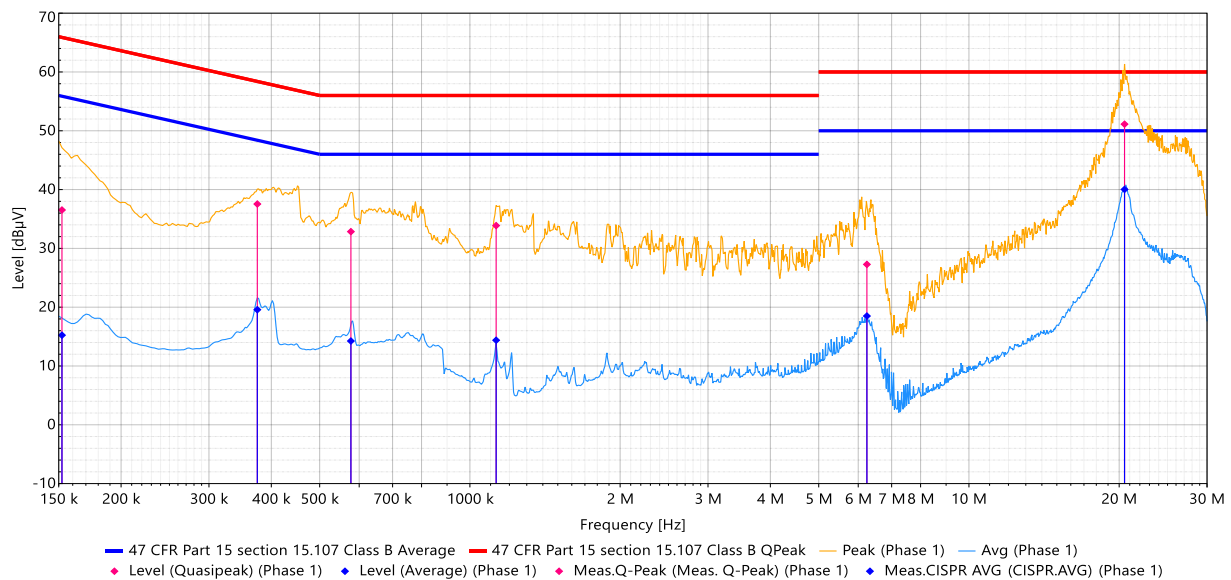
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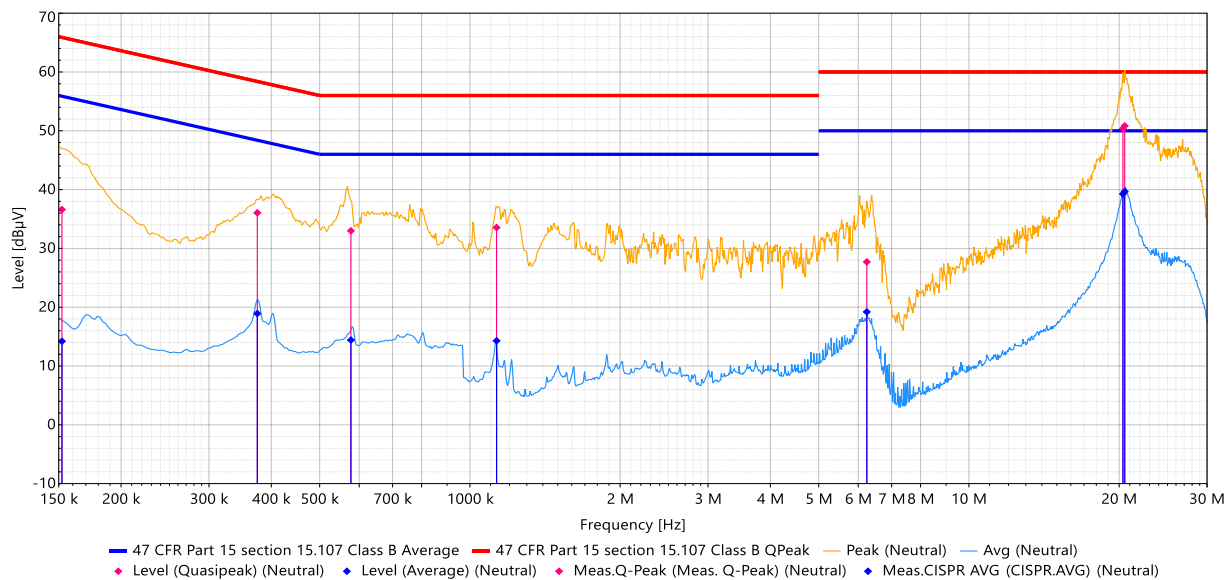
Prüfdokumentation Test documentation

4.5.4.1.13 Mode 2: Low Doppler_no TxBackoff; 240VAC-60Hz

4.5.4.1.14 Line: Phase 1



4.5.4.1.15 Line: Neutral



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4.5.4.1.16 Summary

Frequency [Hz]	Q-Peak [dBµV]	Limit [dBµV]	Margin [dB]	Line	Meas time [s]	Correction [dB]	Result
152.25 k	36.6	65.9	-29.3	Neutral	1.0	10.0	Pass
152.25 k	36.5	65.9	-29.3	Phase 1	1.0	10.0	Pass
375 k	37.5	58.4	-20.8	Phase 1	1.0	10.0	Pass
375 k	36.1	58.4	-22.3	Neutral	1.0	10.0	Pass
577.5 k	32.8	56.0	-23.2	Phase 1	1.0	10.0	Pass
577.5 k	33.0	56.0	-23.0	Neutral	1.0	10.0	Pass
1.129 M	33.9	56.0	-22.1	Phase 1	1.0	10.0	Pass
1.131 M	33.5	56.0	-22.5	Neutral	1.0	10.0	Pass
6.243 M	27.7	60.0	-32.3	Neutral	1.0	10.2	Pass
6.245 M	27.3	60.0	-32.7	Phase 1	1.0	10.1	Pass
20.351 M	50.4	60.0	-9.6	Neutral	1.0	10.5	Pass
20.504 M	51.1	60.0	-8.9	Phase 1	1.0	10.6	Pass
20.519 M	50.8	60.0	-9.2	Neutral	1.0	10.5	Pass

Frequency [Hz]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	Meas time [s]	Correction [dB]	Result
152.25 k	14.2	55.9	-41.7	Neutral	1.0	10.0	Pass
152.25 k	15.2	55.9	-40.6	Phase 1	1.0	10.0	Pass
375 k	19.6	48.4	-28.8	Phase 1	1.0	10.0	Pass
375 k	18.9	48.4	-29.5	Neutral	1.0	10.0	Pass
577.5 k	14.2	46.0	-31.8	Phase 1	1.0	10.0	Pass
577.5 k	14.4	46.0	-31.6	Neutral	1.0	10.0	Pass
1.129 M	14.4	46.0	-31.6	Phase 1	1.0	10.0	Pass
1.131 M	14.3	46.0	-31.7	Neutral	1.0	10.0	Pass
6.243 M	19.2	50.0	-30.8	Neutral	1.0	10.2	Pass
6.245 M	18.5	50.0	-31.5	Phase 1	1.0	10.1	Pass
20.351 M	39.3	50.0	-10.7	Neutral	1.0	10.5	Pass
20.504 M	40.0	50.0	-10.0	Phase 1	1.0	10.6	Pass
20.519 M	39.7	50.0	-10.3	Neutral	1.0	10.5	Pass

4.5.5 Final test result (AC Power Conducted Emission)

Final test result	Pass
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Fotodokumentation
Photo documentation

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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Zusatzdokumentation
Additional documentation

6 Application form

The following information was provided by the customer and form the basis for the execution of the tests and the assessment of conformity. The given information can affect the results of both.

No application form was provided.

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Liste der verwendeten Prüfmittel
List of used test equipment

7 Equipment List

7.1 Hardware

Prüfmittel Test equipment			Prüfmittel-Nr. / ID- Nr. Equipment-No. / ID- No.	Letzte Kalibrierung Last calibration	Nächste Kalibrierung Next calibration
TS8997	Spectrum Analyzer FSV30	Rohde & Schwarz	9000268	10.09.2025	10.09.2027
	Antenna BBHA 9170 15-40GHz	Schwarzbeck	2723744	30.05.2023	30.05.2026
	Temperature & Humidity Chamber: PL-3-KPH	Espec	2731999	11.02.2025	11.02.2028
Fully Anechoic Room		Albatross Projects GmbH	2959749	13.02.2025	* 19.04.2026
Spectrum Analyzer FSU26		Rohde & Schwarz	2844118	20.08.2025	20.08.2027
Spectrum Analyzer UXA N9041B		Keysight	2971644	24.06.2024	24.06.2026
RSE-Filtersystem		Rohde & Schwarz	9002802	23.02.2026	* 23.02.2027
Antenna HF907 1-18GHz		Rohde & Schwarz	2856263	10.09.2024	10.09.2027
Horn Antenna 3116C-PA 18-40GHz		ETS LINDGREN	2900393	30.01.2026	30.01.2029
Horn Antenna M19RH 40-60GHz with adapter		Rohde & Schwarz	9001953	07.04.2025	07.04.2026
SAX322 Extension Module with external Horn Antenna M12RH 60-90GHz		VDI Virginia Diodes, Inc.	9000431	21.07.2025	* 21.07.2026
SAX321 Extension Module with external Horn Antenna M08RH 90-120GHz		VDI Virginia Diodes, Inc.	9000430	21.07.2025	* 21.07.2027
Receiver ESU 26		Rohde & Schwarz	2723865	22.10.2025	22.10.2026
Antenna FMZB 1513-60 B 9kHz-30MHz		Schwarzbeck	9058239	09.10.2023	09.10.2026
Antenna VULB 9168 30MHz – 1GHz		Schwarzbeck	2728136	05.10.2023	05.10.2026
LISN		Rohde & Schwarz	2731908	16.07.2024	16.07.2027
Limitor		Rohde & Schwarz	9017596	05.09.2024	05.09.2026
ESU8		Rohde & Schwarz	2728844	19.08.2025	19.08.2027

*Equipment only verified and not calibrated

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7.2 Software

Test Software	Developer	Version
EMC32	Rohde & Schwarz	10.60.20
BAT-EMC	NEXIO	2022.0.19.0

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Änderungsverzeichnis
Change history

8 Change history

Revision Number	List of revisions
001	Initial Release
Note: Latest revision report will replace all previous reports.	

Ende des Prüfberichts
End of Test Report