

ISED CABid: ES1909

Test Report No:
NIE: 67776RRF.016

Partial Test Report

USA FCC Part 15.209, 15.225, 15.247, 15.249

CANADA RSS-Gen, RSS-210, RSS-247

(*) Identification of item tested	Destination Operation Panel
(*) Trademark	KONE
(*) Model and /or type reference	KSP 1028 -L
Other identification of the product	HW version: Ver A SW version: OS 1.2.00_20210219 FCC ID: FCC ID UXS-SMR-3X3 / Radar FCC ID: 2ALQBOFACCL / RFID, BT/BTLE IC: 6902A-SMR3X3 / Radar IC: 4228A-OFACCL / RFID, BT/BTLE Kone part number (KM51566502V000-KM51566509V000) Kone Reference Number: 51836023D10
(*) Features	Radar, RFID High Frequency, BT/BLE
Applicant	KONE CORPORATION Keilasatama 3 - 02150 ESPOO - FINLAND
Test method requested, standard	USA FCC Part 15.209 (10-1-20) Edition: Radiated emission limits; general requirements. USA FCC Part 15.225 (10-1-20 Edition): Operation within the band 13.110 -14.010 MHz. USA FCC Part 15.247 (10-1-20) Edition: Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz. USA FCC Part 15.249 (10-1-20) Edition: Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz. CANADA RSS-Gen Issue 5 (March 2019). CANADA RSS-210 Issue 10 (December 2019). CANADA RSS-247 Issue 2 (February 2017). -Transmitter out of band radiated emissions with simultaneous transmissions. Guidance for Performing Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid Systems Devices Operating Under Section 15.247 of the FCC Rules. 558074 D01 Meas Guidance v05r02 dated April 2, 2019. ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Approved by (name / position & signature)	Rafael López Martín EMC Consumer & RF Lab. Manager
Date of issue	2021-10-06
Report template No	FDT08_23 (*) "Data provided by the client"

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Competences and guarantees

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DEKRA Testing and Certification S.A.U. is an FCC-recognized accredited testing laboratory with the appropriate scope of accreditation that covers the performed tests in this report.

DEKRA Testing and Certification S.A.U. is an ISED-recognized accredited testing laboratory, CABid: ES1909, with the appropriate scope of accreditation that covers the performed tests in this report.

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Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Testing and Certification internal document PODT000.

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
2. The sample of the model KSP 1028 -L is a Destination Operation Panel for lift applications located at landing.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of result.

Usage of samples

Samples undergoing test have been selected by: The client.

- Sample S/01 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
67776/007	Destination Operation Panel	KSP 1028-L	A00AZ2110600001	2021/03/08

Auxiliary elements used with the Sample S/01:

Control N°	Description	Model	Serial N°	Date of reception
67776/001	Samples Table	--	--	2021/03/08
67776/002	Switch	WS-C3560CX-12PC-S	FOC2206Y43S	2021/03/08
67776/003	Feeding Cable	--	--	2021/03/08
67776/018	DVT Card	--	--	2021/03/08

Sample S/01 has undergone the test(s): The Radiated tests of the Co-Location mode RFID 13.56 MHz + Radar 24.175 GHz for the ranges 9 kHz to 30 MHz, 30 MHz to 1 GHz and 1 - 40 GHz indicated in the Appendix A. The element under test contained a chipset LEGIC RFID ANTENNA (KSP 10XX-L).

- Sample S/02 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
67776/051	Destination Operation Panel	KSP 1028-L	A00AZ2106000002	2021/04/27

Auxiliary elements used with the Sample S/02:

Control N°	Description	Model	Serial N°	Date of reception
67776/001	Samples Table	--	--	2021/03/08
67776/002	Switch	WS-C3560CX-12PC-S	FOC2206Y43S	2021/03/08
67776/003	Feeding Cable	--	--	2021/03/08
67776/032	DVT Card	--	--	2021/03/08

Sample S/02 has undergone the test(s): The Radiated tests of the Co-Location mode RFID 13.56 MHz + Radar 24.175 GHz for the range 40 - 110 GHz indicated in the Appendix A. The element under test contained a chipset LEGIC RFID ANTENNA (KSP 10XX-L).

- Sample S/03 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
67776/007	Destination Operation Panel	KSP 1028-L	A00AZ2110600001	2021/03/08

Auxiliary elements used with the Sample S/03:

Control N°	Description	Model	Serial N°	Date of reception
67776/001	Samples Table	--	--	2021/03/08
67776/002	Switch	WS-C3560CX-12PC-S	FOC2206Y43S	2021/03/08
67776/003	Feeding Cable	--	--	2021/03/08

Sample S/03 has undergone the test(s): The Radiated tests of the Co-Location mode BLE + Radar 24.175 GHz for the ranges 30 MHz to 1 GHz and 1 - 40 GHz indicated in the Appendix A. The element under test contained a chipset LEGIC RFID ANTENNA (KSP 10XX-L).

- Sample S/04 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
67776/051	Destination Operation Panel	KSP 1028-L	A00AZ2110600002	2021/04/27

Auxiliary elements used with the Sample S/04:

Control N°	Description	Model	Serial N°	Date of reception
67776/001	Samples Table	--	--	2021/03/08
67776/002	Switch	WS-C3560CX-12PC-S	FOC2206Y43S	2021/03/08
67776/003	Feeding Cable	--	--	2021/03/08

Sample S/04 has undergone the test(s): The Radiated tests of the Co-Location mode BLE + Radar 24.175 GHz for the range 40 - 110 GHz indicated in the Appendix A. The element under test contained a chipset LEGIC RFID ANTENNA (KSP 10XX-L).

Access module information:

- Legic RFID antenna: KM51566509V000
- Access board: KM51598313G01
- Legic BT / RFID component: Legic SM-63x0

Access module (-L) FCC ID: 2ALQBOFACCL

Access module (-L) IC: 4228A-OFACCL

Test sample description

Ports..... :	Port name and description	Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾
	RJ-45/PoE, Ethernet port	30m	☒	☒	☐
	PE		☒	☐	☐
	X2, AUX: RS485		☐	☐	☐
	X3, AUX: Relay input		☐	☐	☐
	XU1, AUX, USB 1		☐	☐	☐
	XU2, AUX, USB 2		☐	☐	☐
Supplementary information to the ports..... :	PE connected				
Rated power supply	Voltage and Frequency				
	☒ DC: 48V; PoE+(802.3at)				
Rated Power	14W				
Clock frequencies.....	See attachment. KSP 10xx DOP internal Frequencies				
Other parameters	-				
Software version	OS 1.2.00_20210219				
Hardware version	Ver A				
Dimensions in cm (W x H x D)	-				
Mounting position	☐	Table top equipment			
	☒	Wall/Ceiling mounted equipment			
	☐	Floor standing equipment			
	☐	Hand-held equipment			
	☐	Other:			
Modules/parts..... :	Module/parts of test item		Type	Manufacturer	
	Radar		SMR-333	InnoSenT	
	FCC ID UXS-SMR-3X3 / Radar, IC: 6902A-SMR3X3 / Radar, FCC ID: 2ALQBOFACCL / IC: 4228A-OFACCL / KSP Access module			KONE Corporation	
	-				
Accessories (not part of the test item)	Description		Type	Manufacturer	
	DOP WALL MOUNT KM51566508V000			Kone	
	POE+ power switch CISCO 3560CX-8			Cisco	
	Ethernet cables			Harting	
	-				
Documents as provided by the applicant..... :	Description		File name	Issue date	
	KSP 1028 KSP 1068 DOP Technical description V11		--	2020-11-30	
	Setup configuration for OMNIKEY 5127CK MINI_setu		--	2020-08-07	
	KSP 1068 DOP internal Frequencies		--	2021-01-04	

⁽³⁾ Only for Medical Equipment

Identification of the client

KONE CORPORATION

Myllykatu 3 - 05800, HYVINKÄÄ - FINLAND

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2021-03-25
Date (finish)	2021-05-14

Document history

Report number	Date	Description
67776RRF.016	2021-10-06	First release.

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %

Remarks and comments

The tests have been performed by the technical personnel: Alfonso Gutiérrez, Cristina Calle, Pablo Redondo, Miguel Manuel López and Ignacio Cabra.

Used instrumentation:

Radiated Measurements:

		Last Calibration	Due Calibration
1.	Semianechoic Absorber Lined Chamber ETS LINDGREN FACT 3 200 STP	N/A	N/A
2.	Shielded Room ETS LINDGREN S101	N/A	N/A
3.	Active Loop Antenna HEWLETT PACKARD 11966A	2020/07	2022/07
4.	EMI Test Receiver 7 GHz ROHDE AND SCHWARZ ESR7	2020/12	2022/12
5.	Digital Multimeter FLUKE 175	2020/11	2021/11
6.	Biconical/Log Antenna 30 MHz - 6 GHz ETS LINDGREN 3142E	2020/04	2023/04
7.	Preamplifier G>40dB 10MHz-6GHz, BONN ELEKTRONIK, BLNA 0160-01N	2021/03	2022/03
8.	Horn Antenna 1-18 GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9120 D	2020/08	2023/08
9.	Horn Antenna 18-40 GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9170	2020/05	2023/05
10.	RF Preamplifier G>30dB, 1-18GHz BONN ELEKTRONIK BLMA 0118-3A	2020/10	2021/10
11.	Signal and Spectrum Analyzer 10 Hz - 40 GHz ROHDE AND SCHWARZ FSV40	2019/10	2021/10
12.	Low Noise Amplifier G>30dB, 18 - 40 GHz BONN ELEKTRONIK BLMA 1840-3G	2019/11	2021/11
13.	RF Preamplifier 40 dB, 10 MHz - 6 GHz BONN ELEKTRONIK BLNA 0160-01N	2021/03	2022/03
14.	Horn Antenna 1-18 GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9120 D	2019/11	2022/11
15.	RF Preamplifier, 40 dB ,1-18 GHz BONN ELEKTRONIK BLMA 0118-1M	2020/05	2021/05
16.	Spectrum Analyzer ROHDE AND SCHWARZ FSW50	2020/07	2022/07
17.	Horn Antenna 40-60 GHz MI-WAVE 261U/383	N/A	N/A
18.	Horn Antenna 60-90 GHz MI-WAVE 261E/387	N/A	N/A
19.	Horn Antenna 90-140 GHz MI-WAVE 261F/387	N/A	N/A
20.	Harmonic Mixer 40-60 GHz RADIOMETER FS-Z60	2019/12	2021/12
21.	Harmonic Mixer 60-90 GHz RADIOMETER FS-Z90	2019/12	2021/12
22.	Harmonix Mixer 90-140 GHz RADIOMETER FS-Z140	2019/12	2021/12

Testing verdicts

Not applicable:	N/A
Pass:	P
Fail:	F
Not measured:	N/M

Summary

FCC Part 15 PARAGRAPH / RSS-Gen, RSS-210, RSS-247		
Requirement – Test case	Verdict	Remark
FCC 15.31(h), FCC 15.209 (a), 15.225 (d), 15.247 (d), 15.249 (d) / RSS-Gen 8.9, RSS-210 B.6 (d), RSS-247 5.5: - Transmitter out of band radiated emissions with simultaneous transmissions.	P	(1)
<u>Supplementary information and remarks:</u> (1) Only Co-Location radiated spurious emissions test requested.		

Appendix A: Test results.

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TEST CONDITIONS12

FCC 15.209 (a), 15.225 (d), 15.247 (d), 15.249 (d) / RSS-Gen 8.9, RSS-210 B.6 (d), RSS-247 5.5

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TEST CONDITIONS

(*): Data provided by the Applicant.

POWER SUPPLY (*):

Vnominal: 48 Vdc
Type of Power Supply: PoE+(802.3at).

ANTENNA (*):

Type of NFC 13.56 MHz Antenna:	Dedicated fixed.
Maximum Declared Gain for NFC 13.56 MHz Antenna:	+2 dBi
Type of Bluetooth Low Energy Antenna:	PCB.
Maximum Declared Gain for Bluetooth Low Energy Antenna:	+2 dBi
Type of Radar 24.175 GHz Antenna:	Integrated Patch.
Maximum Declared Gain for Radar 24.175 GHz Antenna:	+7 dBi

RADIOS AND CHANNELS TESTED (*):

The EUT was tested in the following operating mode:

- Continuous transmission with a modulated carrier at maximum power in all required channels selecting the supported data rates/modulations types.

During transmitter test the EUT was being controlled by the SW tool to operate in a continuous transmit mode on the test channel as required and in each of the different modulation modes.

Selected Transmission Mode for each Radio:

The following configurations were selected based on preliminary testing that identified those corresponding to the worst cases:

* NFC 13.56 MHz: Transmitter radiated spurious emissions tests were performed with the EUT transmitting in Single Channel.

* Bluetooth Low Energy: Transmitter radiated spurious emissions tests were performed with the EUT transmitting in Bluetooth Low Energy / Single Channel.

* Radar 24.175 GHz: Transmitter radiated spurious emissions tests were performed with the EUT transmitting in Single Channel.

TESTED SIMULTANEOUS TRANSMISSION MODES:

* **Co-Location mode NFC 13.56 MHz, Radar 24.175 GHz**, with the EUT configured to simultaneously transmit two signals at maximum output power:

NFC 13.56 MHz / Single Channel, Radar 24.175 GHz / Single Channel.

* **Co-Location mode Bluetooth Low Energy, Radar 24.175 GHz**, with the EUT configured to simultaneously transmit two signals at maximum output power:

Bluetooth Low Energy / Single Channel, Radar 24.175 GHz / Single Channel.

RADIATED MEASUREMENTS:

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at a distance of 3 m.

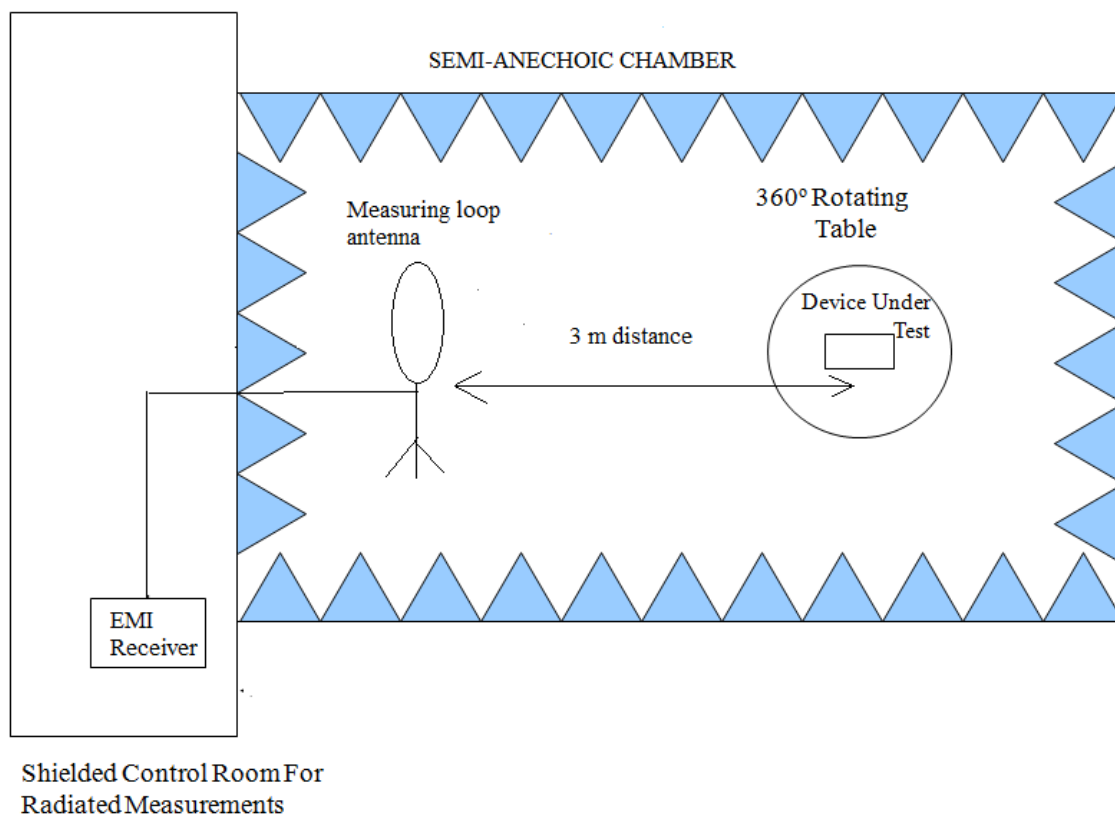
The EUT was placed at a height of 80 cm above the reference ground plane in the center of the chamber turntable to perform the measurements below 1GHz and the EUT was placed at a height of 1.5 meters above the test chamber floor in the center of the chamber turntable to perform the measurements above 1GHz.

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

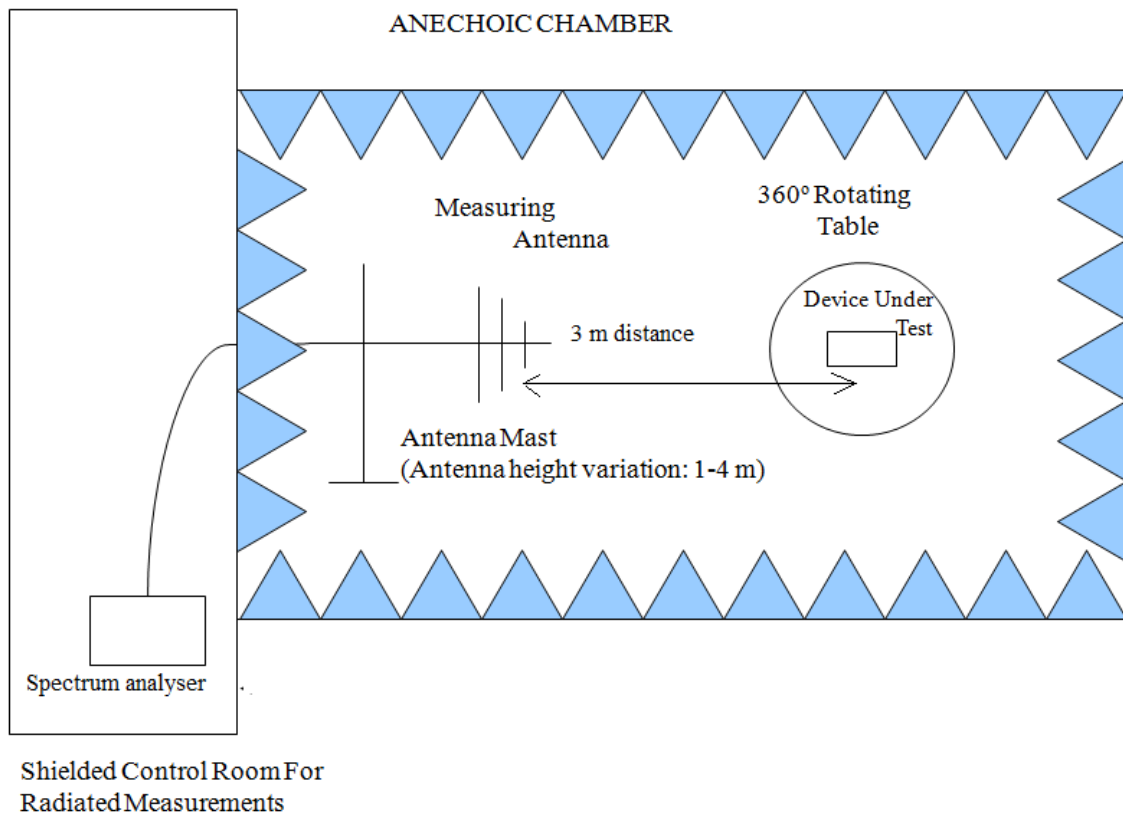
Measurements were made in both horizontal and vertical planes of polarization.

The final measured value, for the given emission, in the tables below incorporates the calibrated antenna factor, preamplifier gain (if used) and cable losses.

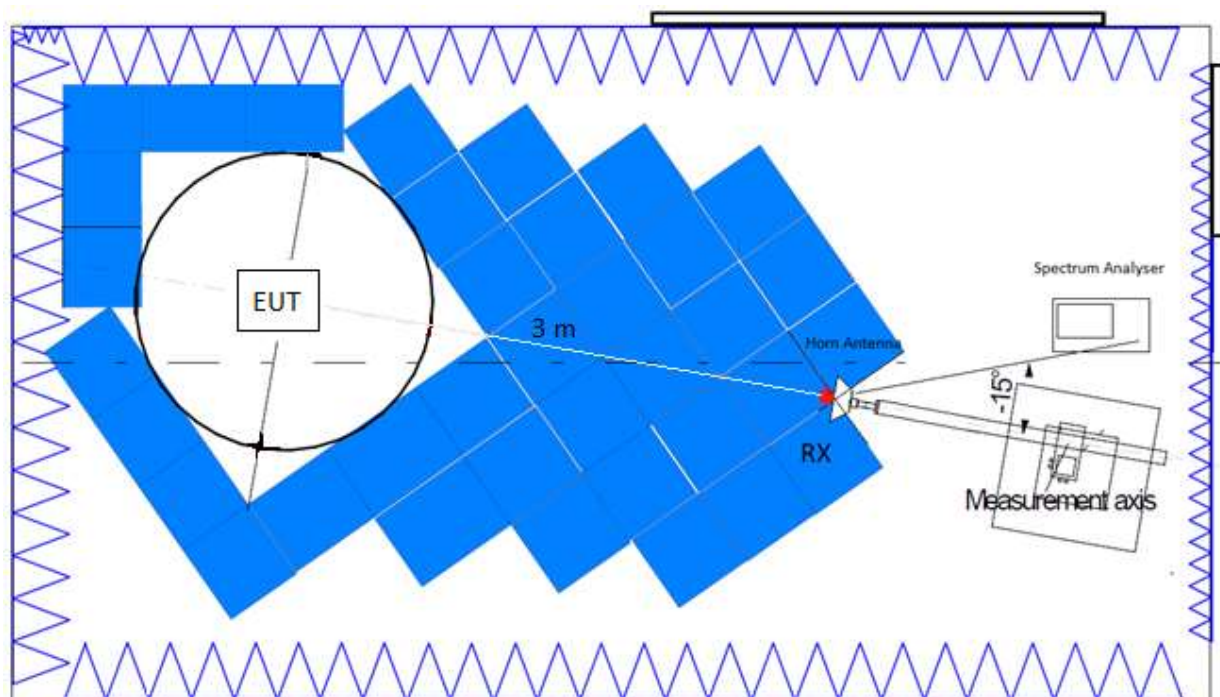
Radiated measurements setup $9 \text{ kHz} < f < 30 \text{ MHz}$:



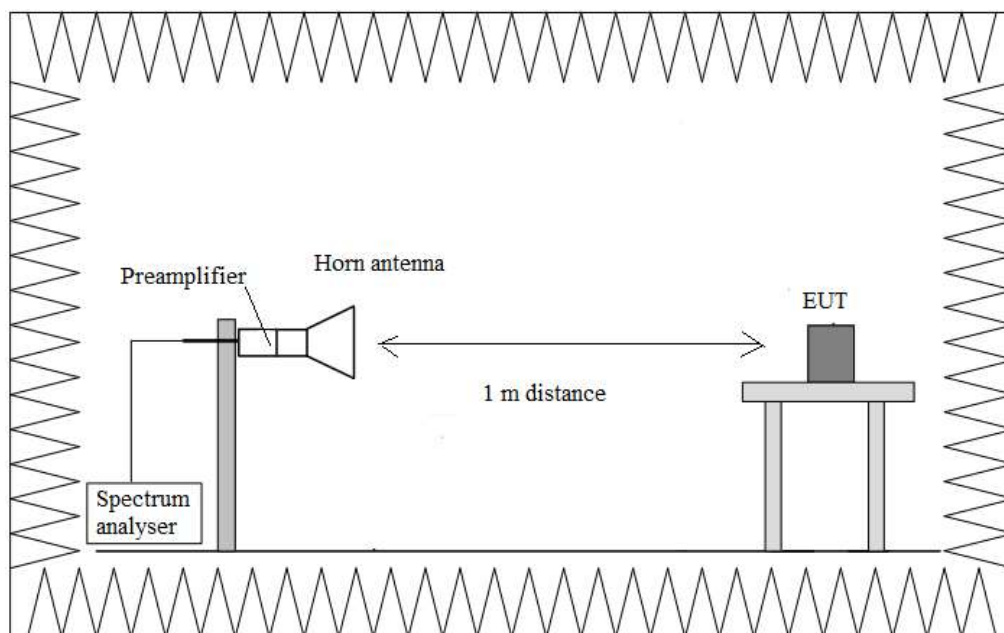
Radiated measurements setup $30 \text{ MHz} < f < 1 \text{ GHz}$:



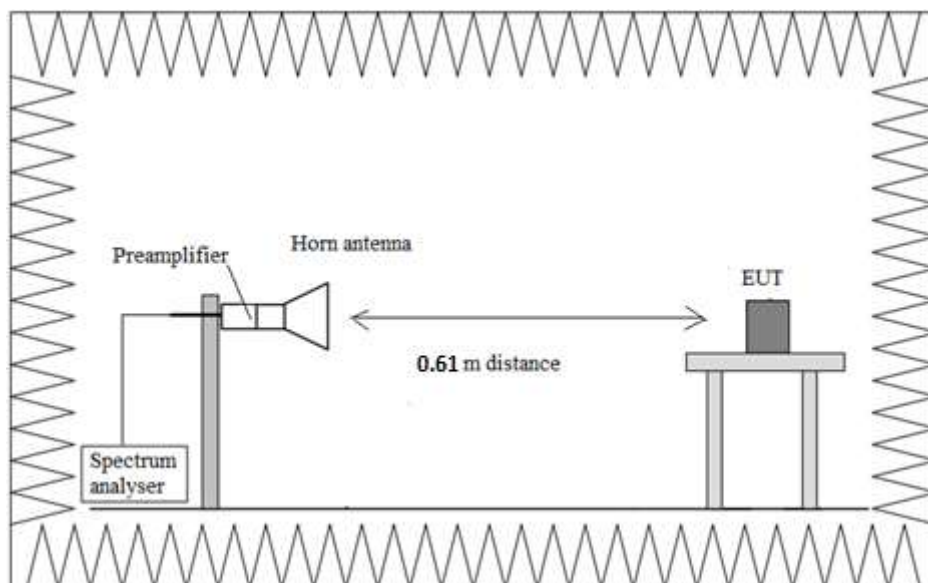
Radiated measurements setup $f > 1 \text{ GHz}$ up to 17 GHz:



Radiated measurements setup $f > 17$ GHz:



Radiated measurements setup $f > 90$ GHz up to 110 GHz:



FCC 15.209 (a), 15.225 (d), 15.247 (d), 15.249 (d) / RSS-Gen 8.9, RSS-210 B.6 (d), RSS-247 5.5 Transmitter out of band radiated emissions with simultaneous transmissions

SPECIFICATION:

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c) / RSS-Gen):

Frequency Range (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705 - 30.0	30	29.54	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 40000	500	54	3

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

For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

RSS-247. Attenuation below the general field strength limits specified in RSS-Gen is not required.

RESULTS:

The situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

All tests were performed in a semi-anechoic chamber at a distance of 3 m for the frequency range 30 MHz-1000 MHz and at distance of 1m for the frequency range 1 GHz-90 GHz and at distance of 0.61m for the frequency range 90 GHz-110 GHz.

The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

Test performed on the following worst cases in all relevant tests channels.

- **Co-Location mode NFC 13.56 MHz, Radar 24.175 GHz.**

NFC 13.56 MHz:	Single Channel (13.558 MHz).
Radar 24.175 GHz:	Single Channel (24.18788 GHz).

Frequency range 9 kHz - 30 MHz:

The spurious emissions below 1 GHz do not depend on either the operating channel or the modulation mode.

No spurious frequencies at less than 20 dB below the limit.

Measurement Uncertainty (dB) $\leq \pm 2.99$

Frequency range 30 MHz - 1 GHz:

The spurious emissions below 1 GHz do not depend on either the operating channel or the modulation mode.

Spurious frequencies detected closest to the limit:

Spurious frequency (MHz)	Emission Level (dB μ V/m)	Polarization	Detector	Measurement Uncertainty (dB)
50.645	32.7	V	Quasi-Peak	$\leq \pm 4.99$
125.004	26.1	V	Quasi-Peak	$\leq \pm 4.99$
375.013	34	V	Quasi-Peak	$\leq \pm 4.99$
479.999	33.3	V	Quasi-Peak	$\leq \pm 4.99$
716.841	29.7	V	Quasi-Peak	$\leq \pm 4.99$
921.608	29.5	H	Quasi-Peak	$\leq \pm 4.99$

Measurement Uncertainty (dB) $\leq \pm 4.99$

Frequency range 1 - 40 GHz:

Spurious frequencies detected closest to the limit:

Spurious frequency (GHz)	Emission Level (dB μ V/m)	Polarization	Detector	Measurement Uncertainty (dB)
1.583967	44.62	V	Peak	$\leq \pm 4.98$

Measurement Uncertainty (dB): 1 GHz to 17 GHz $\leq \pm 4.98$
17 GHz to 26.5 GHz $\leq \pm 5.08$
26.5 GHz to 40 GHz $\leq \pm 5.33$

Frequency range 40 - 110 GHz:

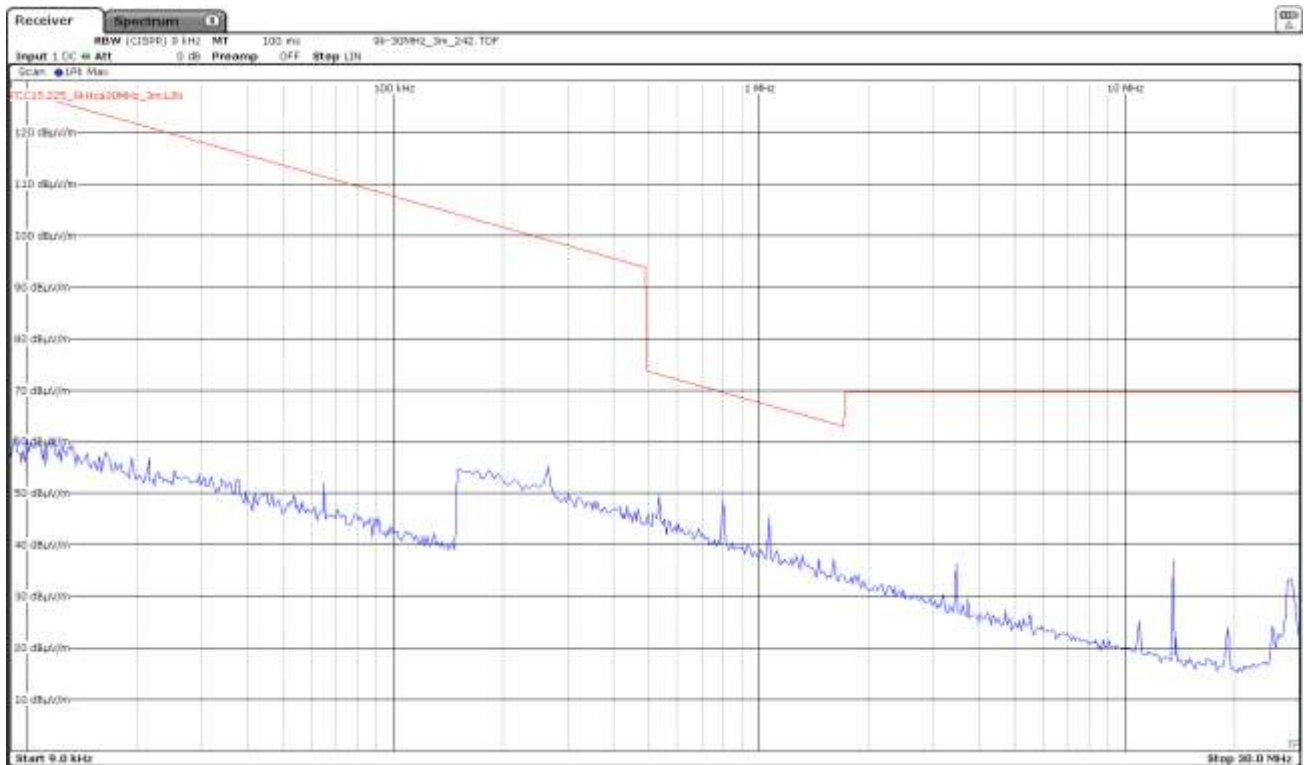
Spurious frequencies detected closest to the limit:

Spurious frequency (GHz)	Emission Level (dB μ V/m)	Polarization	Detector	Measurement Uncertainty (dB)
48.37633	57.73	V	Peak	$\leq \pm 5.14$
	53.54		Average	$\leq \pm 5.14$
72.5484	55.65	V	Peak	$\leq \pm 5.14$
	49.8		Average	$\leq \pm 5.14$

Measurement Uncertainty (dB): 40 GHz to 110 GHz $\leq \pm 5.14$

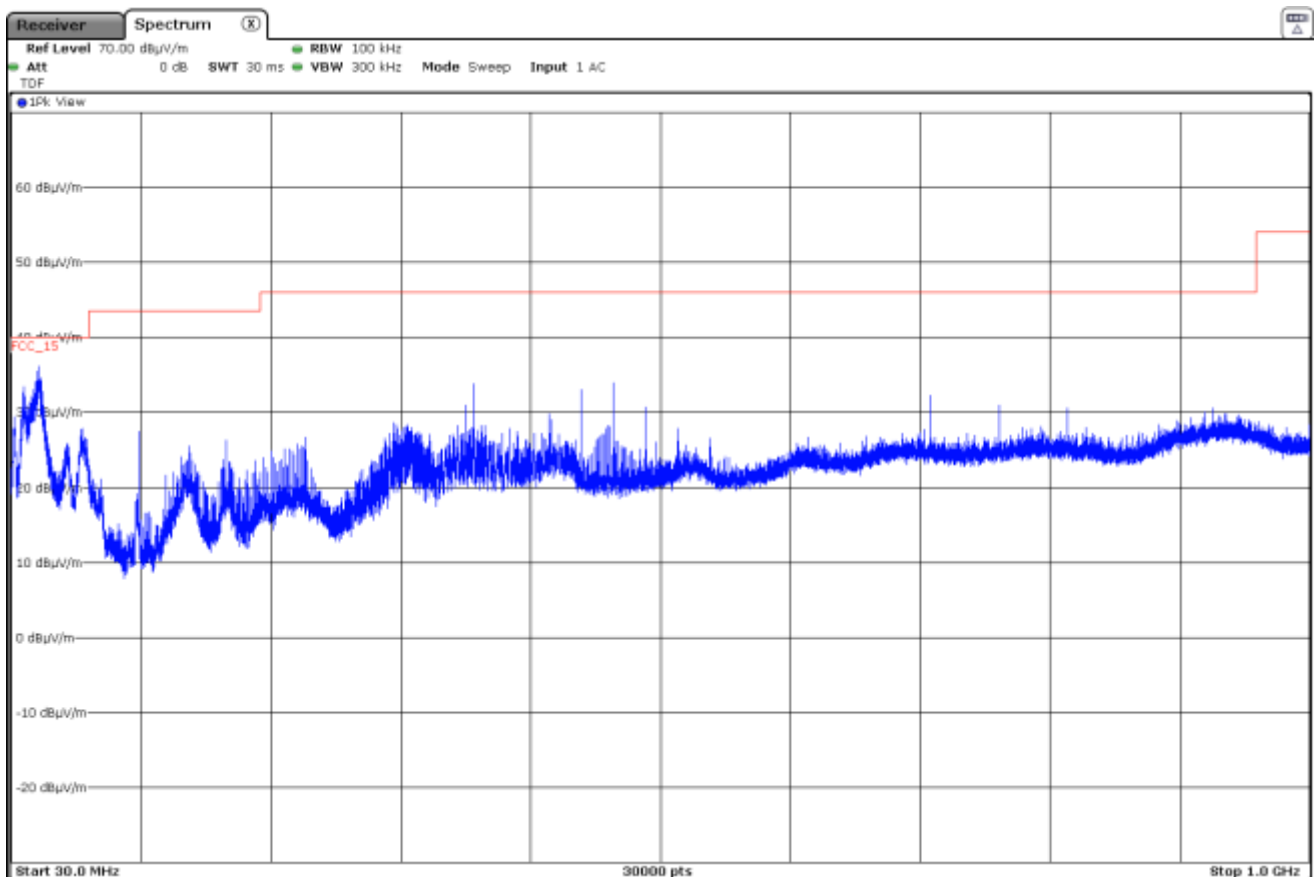
Verdict: PASS

FREQUENCY RANGE 9 kHz - 30 MHz (worst case):

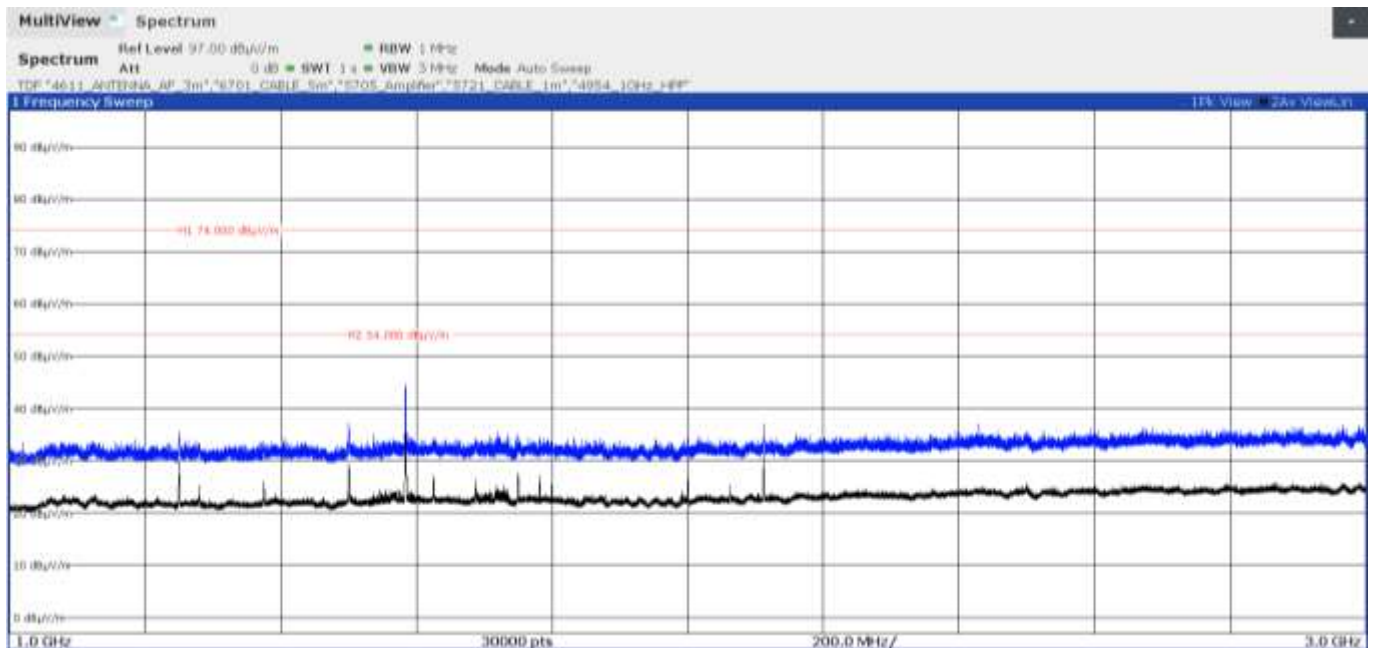


The highest peak in the middle is the NFC 13.56 MHz carrier frequency.

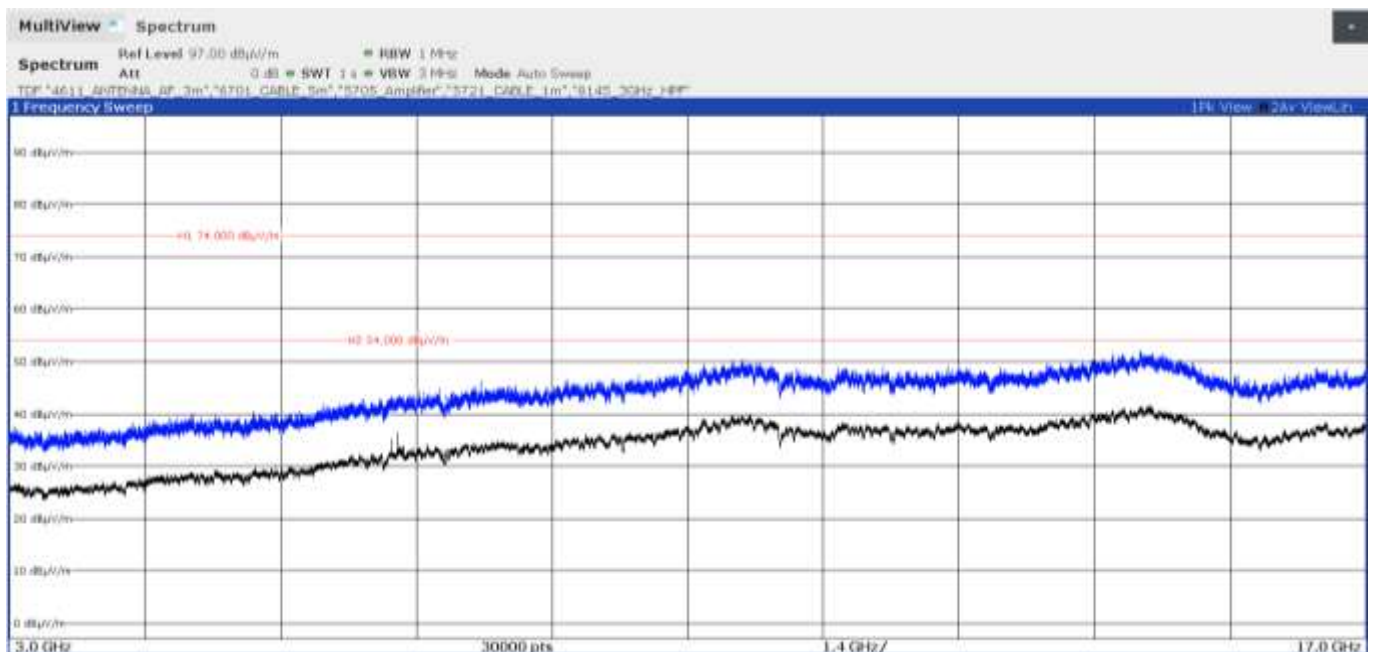
FREQUENCY RANGE 30 MHz - 1 GHz (worst case):



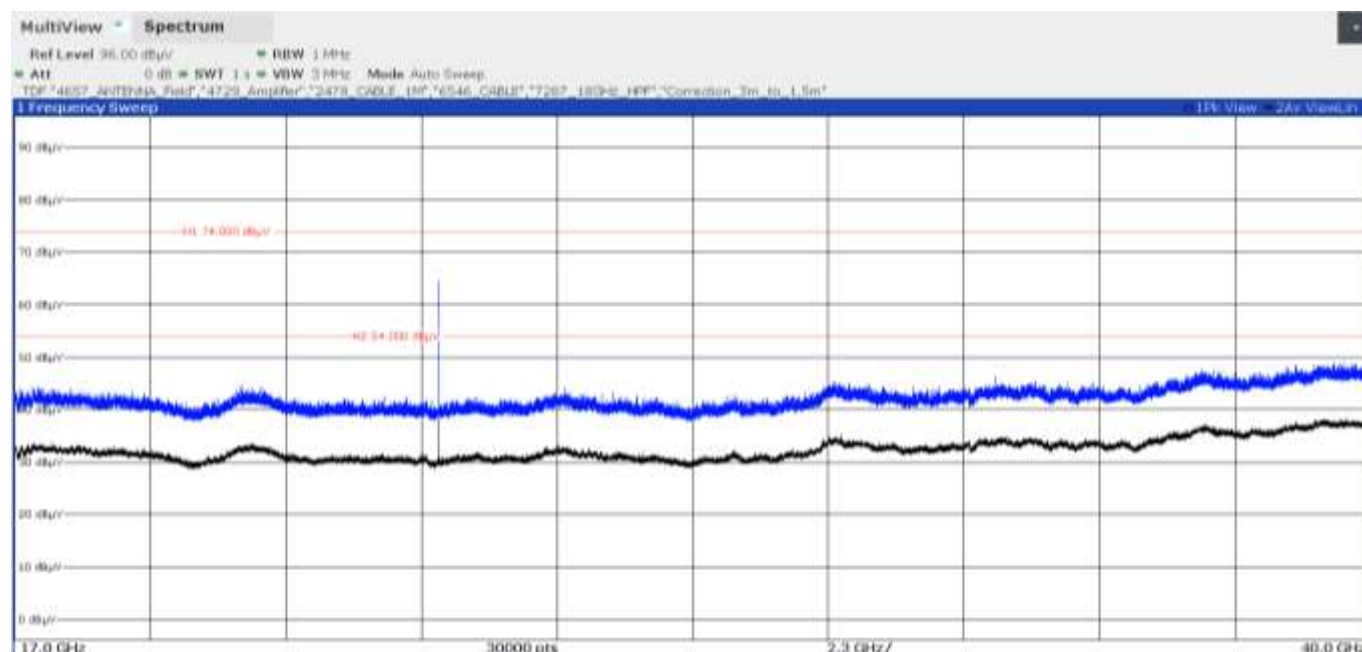
FREQUENCY RANGE 1 - 3 GHz (worst case):



FREQUENCY RANGE 3 - 17 GHz (worst case):



FREQUENCY RANGE 17 - 40 GHz (worst case):



The highest peak is the Radar 24.175 GHz carrier frequency.

- Co-Location mode Bluetooth Low Energy, Radar 24.175 GHz.**

Bluetooth Low Energy: Single Channel (2402 MHz).
Radar 24.175 GHz: Single Channel (24.18788 GHz).

Frequency range 30 MHz - 1 GHz:

The spurious emissions below 1 GHz do not depend on either the operating channel or the modulation mode.

Spurious frequencies detected closest to the limit:

Spurious frequency (MHz)	Emission Level (dBμV/m)	Polarization	Detector	Measurement Uncertainty (dB)
38.132	26.4	V	Quasi-Peak	<± 4.99
50.677	32.3	V	Quasi-Peak	<± 4.99
125.012	26.3	V	Quasi-Peak	<± 4.99
375.013	33.8	V	Quasi-Peak	<± 4.99
479.999	33.4	V	Quasi-Peak	<± 4.99
716.841	29.8	V	Quasi-Peak	<± 4.99
921.64	28.5	H	Quasi-Peak	<± 4.99

Measurement Uncertainty (dB) <± 4.99

Frequency range 1 - 40 GHz:

Spurious frequencies detected closest to the limit:

Spurious frequency (GHz)	Emission Level (dBμV/m)	Polarization	Detector	Measurement Uncertainty (dB)
4.8039	40.77	V	Peak	<± 4.98
7.2049	51.57	V	Peak	<± 4.98

Measurement Uncertainty (dB): 1 GHz to 17 GHz <± 4.98
17 GHz to 26.5 GHz <± 5.08
26.5 GHz to 40 GHz <± 5.33

Frequency range 40 - 110 GHz:

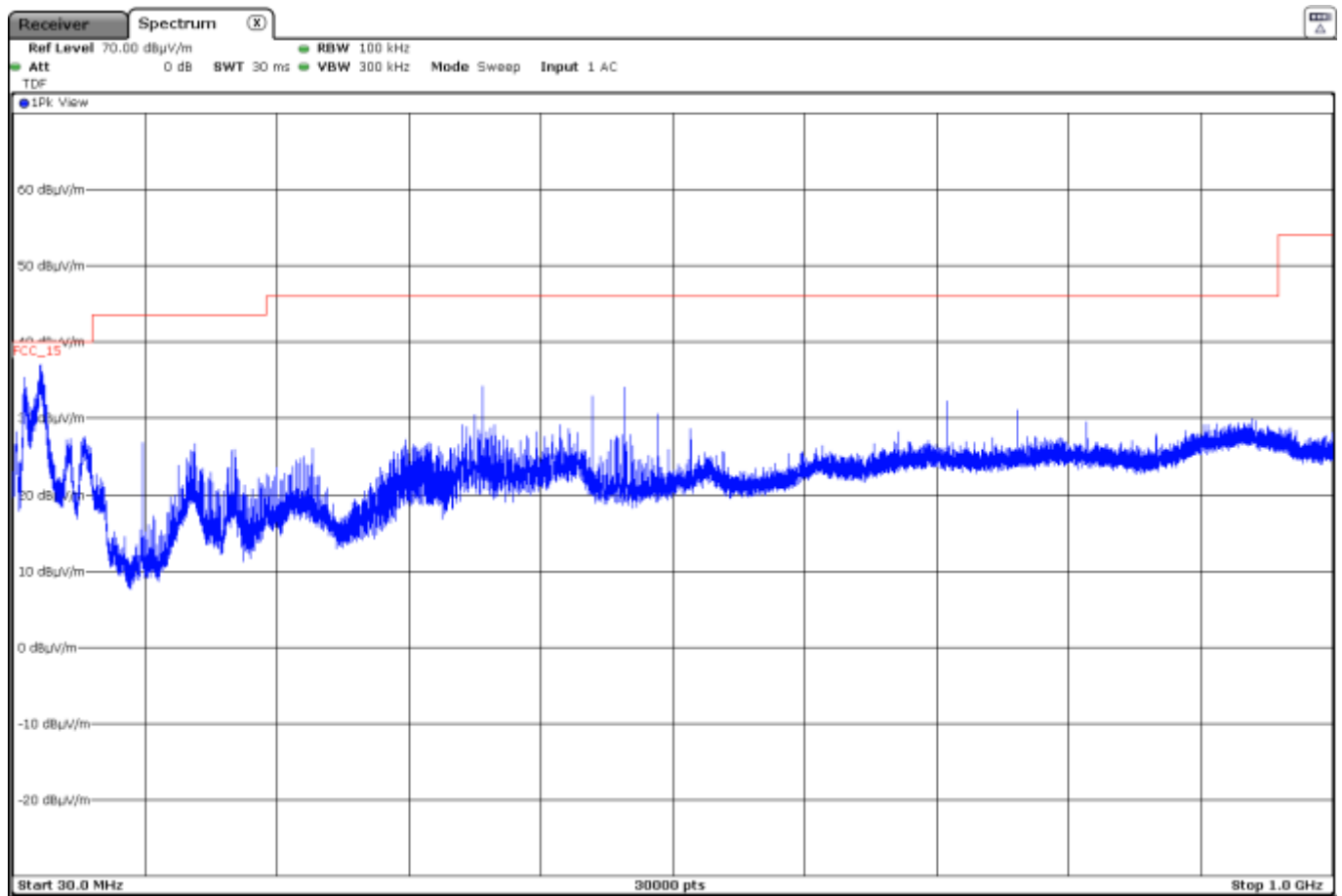
Spurious frequencies detected closest to the limit:

Spurious frequency (GHz)	Emission Level (dBμV/m)	Polarization	Detector	Measurement Uncertainty (dB)
48.373	56.87	V	Peak	<± 5.33
	53.22		Peak	<± 5.33
72.5475	56.27	V	Peak	<± 5.33
	50.5		Peak	<± 5.33

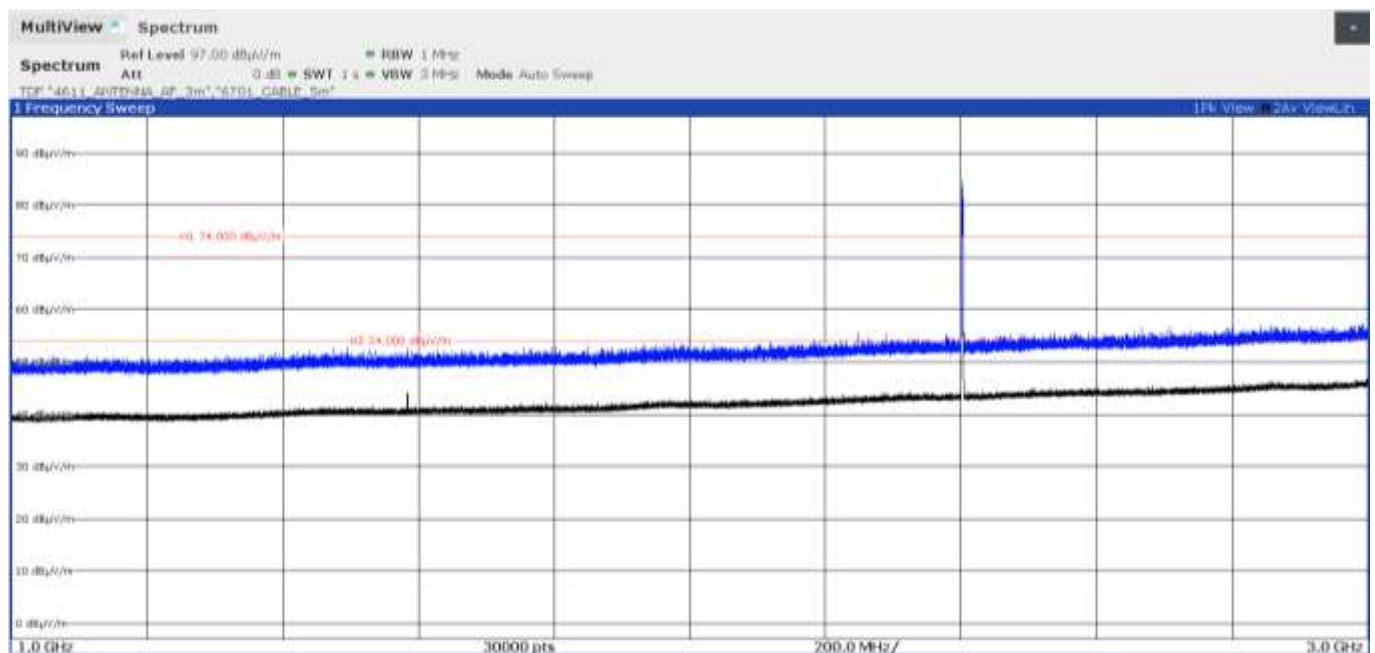
Measurement Uncertainty (dB): 40 GHz to 110 GHz <± 5.33

Verdict: PASS

FREQUENCY RANGE 30 MHz - 1 GHz (worst case):

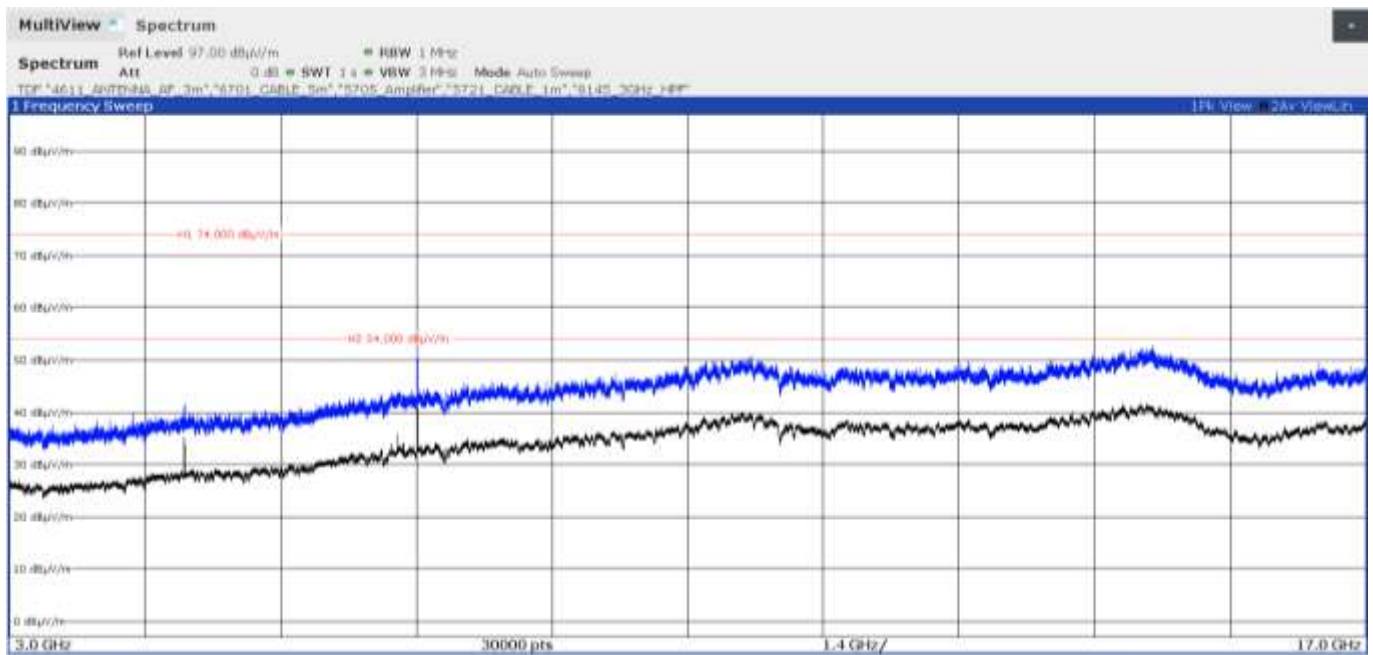


FREQUENCY RANGE 1 - 3 GHz (worst case):

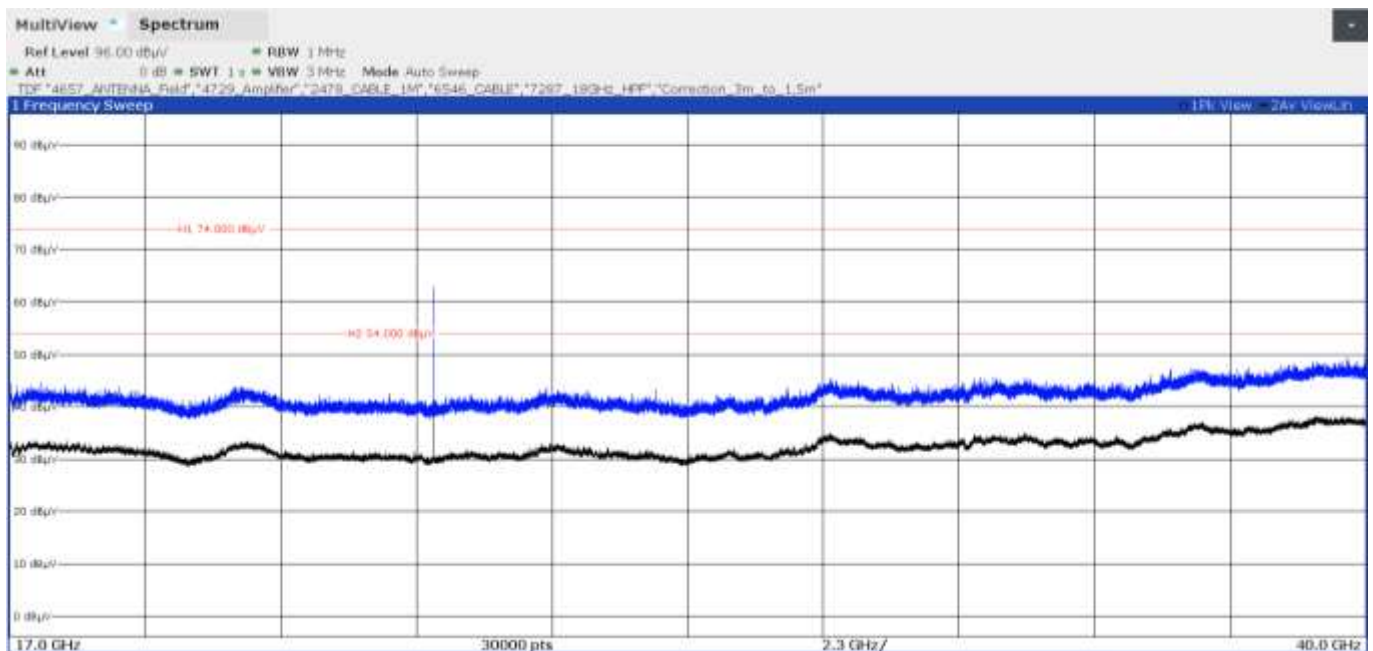


The highest peak is the Bluetooth Low Energy carrier frequency.

FREQUENCY RANGE 3 - 17 GHz (worst case):



FREQUENCY RANGE 17 - 40 GHz (worst case):



The highest peak is the Radar 24.175 GHz carrier frequency.