DEKRA Testing and Certification, S.A.U.
Parque Tecnológico de Andalucía,
c/ Severo Ochoa nº 2 · 29590 Campanillas · Málaga · España
C.I.F. A29 507 456

FCC LISTED,
REGISTRATION NUMBER:
720267

ISED LISTED
REGISTRATION NUMBER
4621A-4

Nº 51/LE147

Test report No:

NIE: 58247RRF.001

Test report

USA FCC Part 15.225, 15.209
CANADA RSS-210, RSS-Gen

Identification of item tested	Bike docking point
Trademark	Ride On dock
Model and /or type reference	DOCK00003A
Other identification of the product	FCC ID: 2ARMN-DOCK00003A IC: Not provided data
Features	NFC & BLE
Applicant	RIDE ON CONSULTING, S.L. C/ Francisco Alcántara, 3. 28002. Madrid. SPAIN.
Test method requested, standard	USA FCC Part 15.225 (10–1–17 Edition): Operation within the band 13.110 -14.010. USA FCC Part 15.209 (10–1–17 Edition): Radiated emission limits, general requirements. CANADA RSS-210 Issue 9 (August 2016). CANADA RSS-Gen Issue 5 (April 2018). ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Approved by (name / position & signature)	A. Llamas RF Lab. Manager Firmado digitalmente por ALEJANDRO LLAMAS RODRIGUEZ Fecha: 2018.12.20 17:03:31 +01'00'
Date of issue	2018-12-20
Report template No	FDT08_21

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Competences and guarantees

DEKRA Testing and Certification is a testing laboratory accredited by the National Accreditation Body (ENAC - Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

DEKRA Testing and Certification is a laboratory with a measurement facility in compliance with the requirements of Section 2.948 of the FCC rules and has been added to the list of facilities whose measurements data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Registration Number: 720267.

DEKRA Testing and Certification is a laboratory with a measurement site in compliance with the requirements of RSS 212, Issue 1 (Provisional) and has been added to the list of filed sites of the Canadian Certification and Engineering Bureau. Reference File Number: ISED 4621A-4.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification at the time of performance of the test.

DEKRA Testing and Certification is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA Testing and Certification.

General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification and the Accreditation Bodies.

Uncertainty

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

Data provided by the client

The sample consists of a bike docking point.

DEKRA declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: the client.

Sample M/01 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
58247/003	Bike docking point	DOCK00003A	---	2018-10-16
58247/004	Bike docking point	DOCK00003A	---	2018-10-22

1. Sample M/01 has undergone the following test(s):

All conducted tests indicated in Appendix A.

Sample M/02 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
58247/003	Bike docking point	DOCK00003A	---	2018-10-16

1. Sample M/02 has undergone the following test(s):

All radiated tests indicated in Appendix A.

Test sample description

Ports…… :	Port name and description	Cable						
		Specified max length [m]	Attached during test	Shielded	Coupled to patient(3)			
			☐	☐	☐			
Supplementary information to the ports…… :								
Rated power supply .....:	Voltage and Frequency	Reference poles						
		L1	L2	L3	N	PE		
	☒ DC: 48 V							
Rated Power .....:								
Clock frequencies .....:	8Mhz							
Other parameters.....:								
Software version .....:	1.0							
Hardware version.....:	1.0							
Dimensions in cm (W x H x D)....:	28x18x23							

Mounting position.....:	☒	Other: On the raised floor.		
Modules/parts .....:	Module/parts of test item		Type	Manufacturer
	Card reader 1		RFID	
	Card reader 2		RFID	
	Bluetooth module		BLE	Ride-On Consulting, S.L.
Accessories (not part of the test item) .....:	Description		Type	Manufacturer
	Android Application		Software	Ride-On Consulting, S.L.
Documents as provided by the applicant.....:	Description		File name	Issue date
	Datasheet and manual		Dock_datasheet.pdf	4-10-2018

(3) Only for Medical Equipment

Identification of the client

RIDE ON CONSULTING, S.L.

C/ Francisco Alcántara, 3. 28002. Madrid. SPAIN.

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2018-10-17
Date (finish)	2018-10-18

Document history

Report number	Date	Description
58247RRF.001	2018-12-20	First release

Environmental conditions

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

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 1 Ω

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

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 1 Ω
Normal site attenuation (NSA)	< ±4 dB at 10 m distance between item under test and receiver antenna, (30 MHz to 1000 MHz)
Field homogeneity	More than 75% of illuminated surface is between 0 and 6 dB (26 MHz to 1000 MHz).

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 35 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 1 Ω

Remarks and comments

The tests have been performed by the technical personnel: Jaime Amador, Miguel Ángel Torres, Francisco José Alcaide, Carlos Alberto Contreras, Juan Carlos Fuentes.

Used instrumentation:

Conducted Measurements

		Last Cal. date	Cal. due date
1.	Chamber HERAEUS VMT 04/35	2018/06	2020/06
2.	Signal and Spectrum Analyser Rohde & Schwarz FSV40	2017/07	2019/07
3.	DC Power Supply Agilent Technologies N5770A	---	---
4.	Digital multimeter FLUKE 113	2017/05	2019/05

Radiated Measurements

		Last Cal. date	Cal. due date
1.	Semianechoic Absorber Lined Chamber ETS LINDGREN FACT 3 200 STP	N.A.	N.A.
2.	Active Loop Antenna Schwarzbeck FMZB 1519B	2018/01	2021/01
3.	EMI Test Receiver Rohde & Schwarz ESR7	2017/08	2019/08
4.	Antena Bilog 30MHz - 6GHz ETS LINDGREN 3142E	2018/07	2021/07
5.	RF Pre-amplifier, 38 dB, 30 MHz-6 GHz Bonn Elektronik BLNA 0360-01N	2018/07	2019/07

Testing verdicts

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

Summary

FCC PART 15 PARAGRAPH / RSS-247		
Requirement – Test case	**Verdict**	**Remark**
15.225 Subclause (a) / RSS-210 Clause B.6 (a). Field strength of emissions within the band 13.553 MHz -13.567 MHz	P	
15.225 Subclause (b) / RSS-210 Clause B.6 (b). Field strength of emissions within the band 13.410 - 13.553 MHz and 13.567 – 13.710 MHz	P	
15.225 Subclause (c) / RSS-210 Clause B.6 (c). Field strength of emissions within the band 13.110 - 13.410 MHz and 13.710 – 14.010 MHz	P	
15.225 Subclause (d) / RSS-210 Clause B.6 (d). Field strength of emissions outside of the band 13.110 MHz -14.010 MHz	P	
15.225 Subclause (e) / RSS-210 Clause B.6. Frequency tolerance of the carrier signal	P	
Supplementary information and remarks: None.		

Appendix A: Test results.

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TEST CONDITIONS

Power supply (V):

Vnominal = 48 Vdc

Vmin = 40.8 Vdc

Vmax = 55.2 Vdc

Type of power supply = DC voltage from external power supply

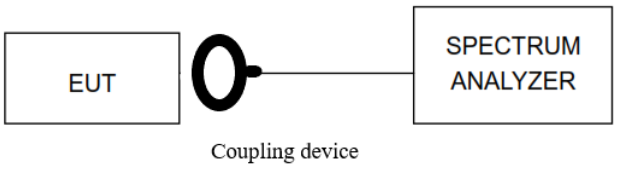
Type of antenna = Integrated antenna.

TEST FREQUENCIES:

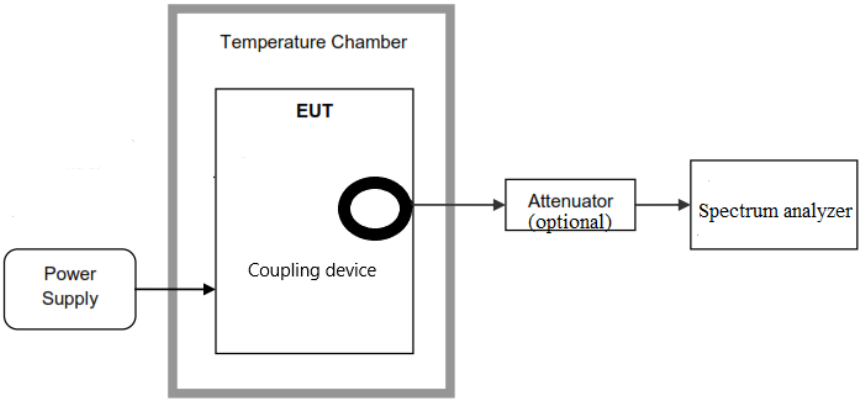
Nominal Operating frequency: 13.56 MHz

CONDUCTED MEASUREMENTS

The equipment under test was set up in a shielded room and it is directly connected to the spectrum analyzer through a coupling device.



For frequency stability test the EUT was placed inside a climatic chamber and connected to a spectrum analyzer using a low loss cable and a coupling device. An external DC power supply was connected to the EUT for voltage variation test.

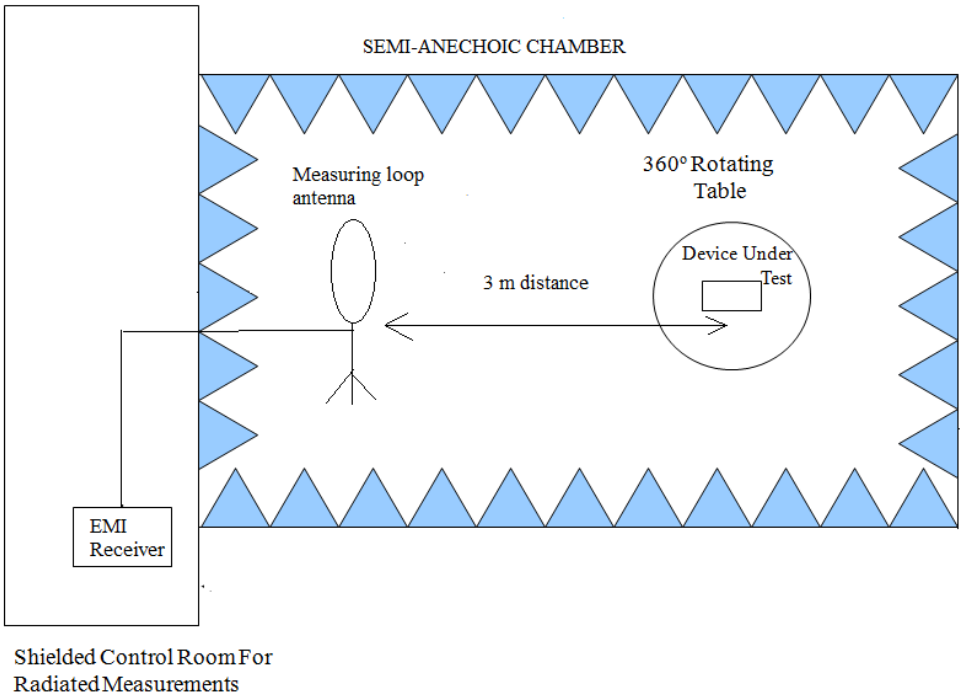


RADIATED MEASUREMENTS

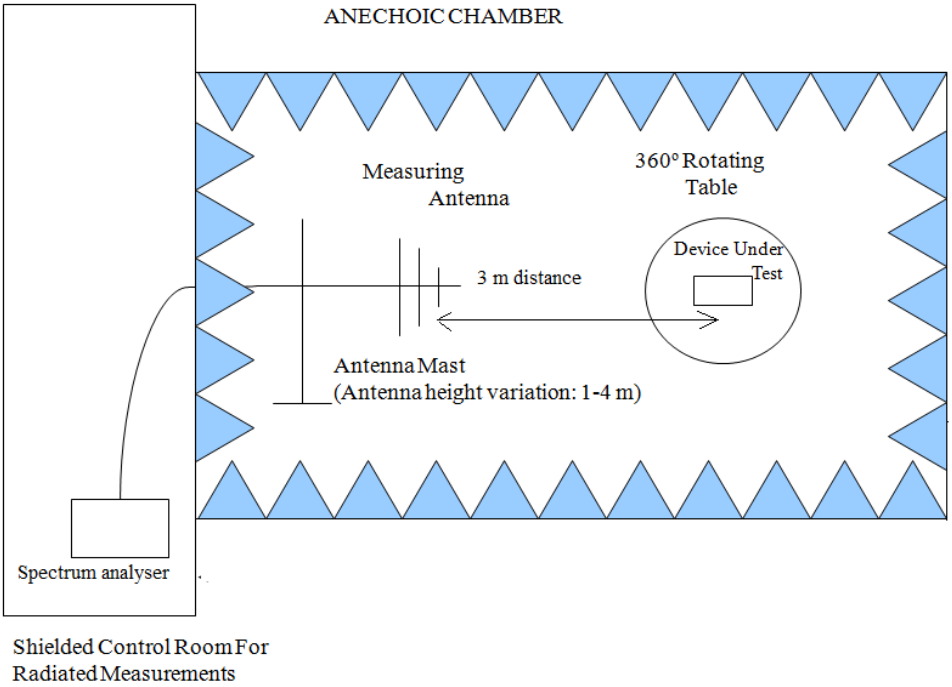
All radiated tests were performed in a semi-anechoic chamber. The measurement antenna (Loop antenna for the range between 9 kHz to 30 MHz and Bilog antenna for the range between 30 MHz to 200 MHz) is situated at a distance of 3 m.
For radiated emissions in the range 9 kHz to 30 MHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 40 dB per decade is used to normalize the measured data for determining compliance.
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 360º and in the range between 30 MHz and 200 MHz the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.
In the range between 9 kHz and 30 MHz the measurements were made in the three different orientation planes of the loop antenna to determine the maximum received field.
In the range between 30 MHz and 200 MHz the measurements were made in both horizontal and vertical planes of polarization.

The test was performed with the equipment transmitting first with only the 13.56 MHz radio and repeated with the 2.4 GHz BT LE radio transmitting simultaneously to check the impact of the co-location of the other radio interfaces. The results and plots below show the worst results obtained.

Radiated measurements setup 9 kHz to 30 MHz.



Radiated measurements setup 30 MHz to 200 MHz.



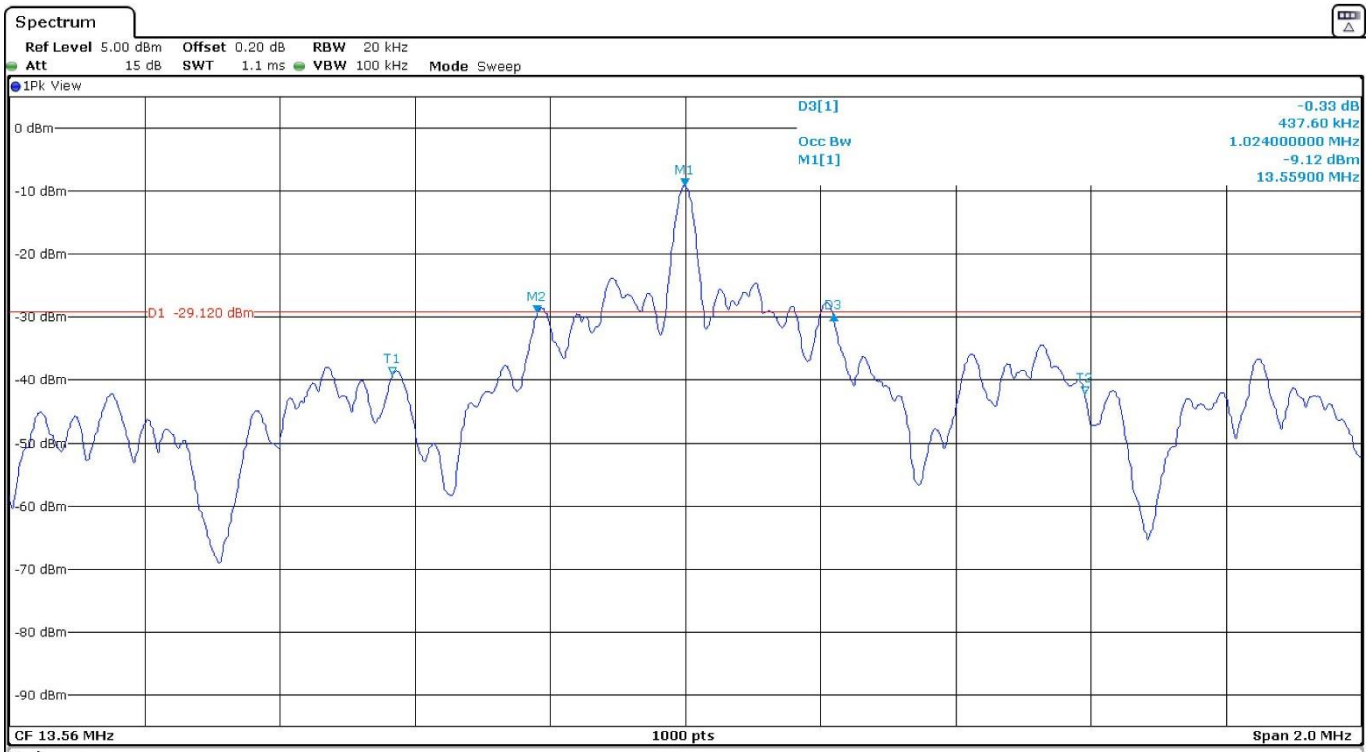
Occupied Bandwidth

RESULTS:

99 % Occupied Bandwidth and 20 dB bandwidth (see next plots).

NFC ISO 14443A

Operation mode	99% occupied bandwith (kHz)	20 dB bandwidth (kHz)
NFC	1024	437.6 kHz
Measurement uncertainty (kHz)	<±1.20	

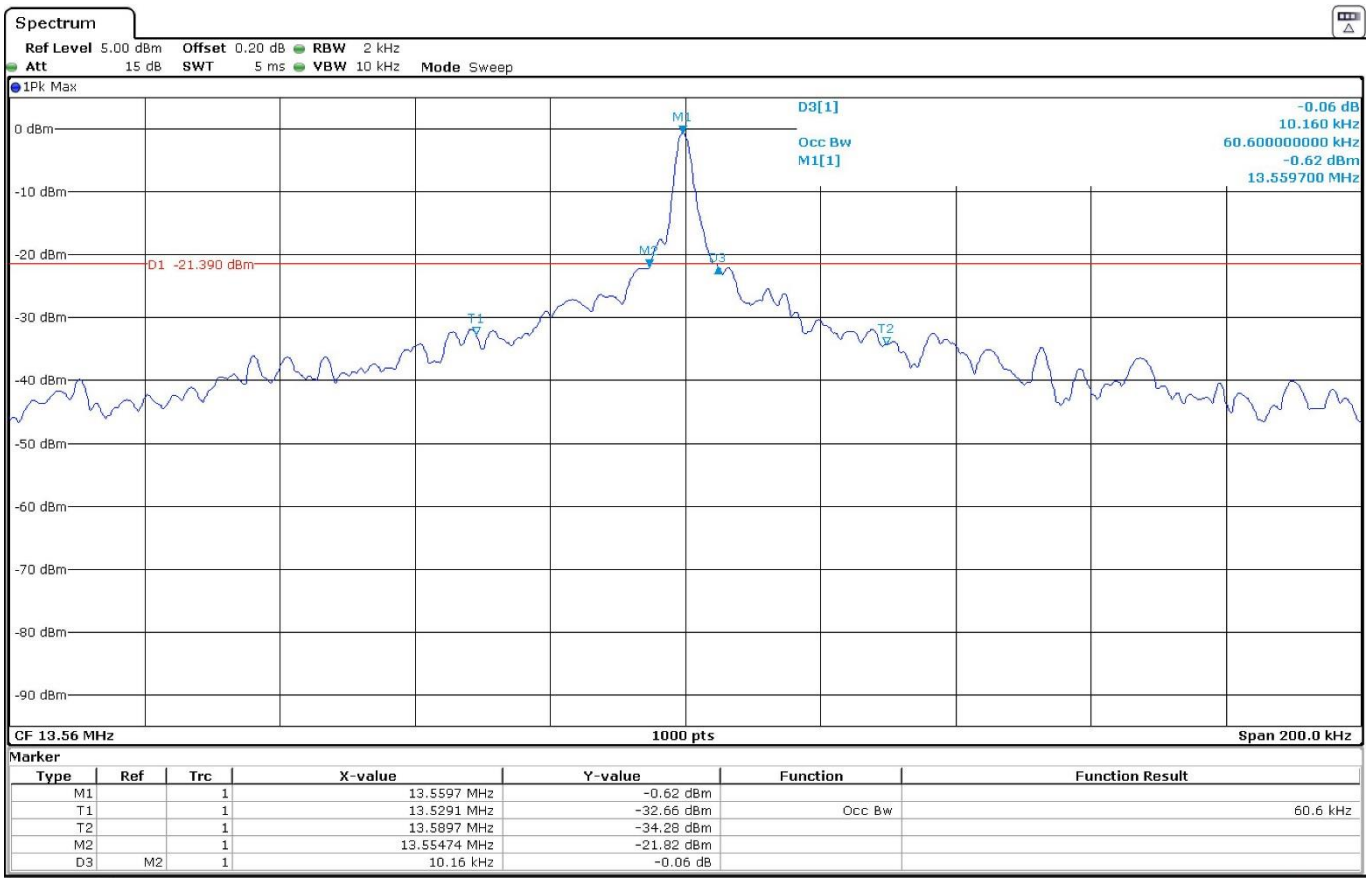


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	13.559 MHz	-9.12 dBm		
T1		1	13.127 MHz	-39.09 dBm	Occ Bw	1.024 MHz
T2		1	14.151 MHz	-42.23 dBm		
M2		1	13.341 MHz	-29.25 dBm		
D3	M2	1	437.6 kHz	-0.33 dB		

NFC ISO 15693

Operation mode	99% occupied bandwith (kHz)	20 dB bandwidth (kHz)
NFC	60.6	10.16
Measurement uncertainty (kHz)	<±1.20	



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	13.5597 MHz	-0.62 dBm		
T1		1	13.5291 MHz	-32.66 dBm	Occ Bw	60.6 kHz
T2		1	13.5897 MHz	-34.28 dBm		
M2		1	13.55474 MHz	-21.82 dBm		
D3	M2	1	10.16 kHz	-0.06 dB		

Section 15.225 Subclause (a) / RSS-210 Clause B.6 (a). Field strength of emissions within the band 13.553 MHz -13.567 MHz

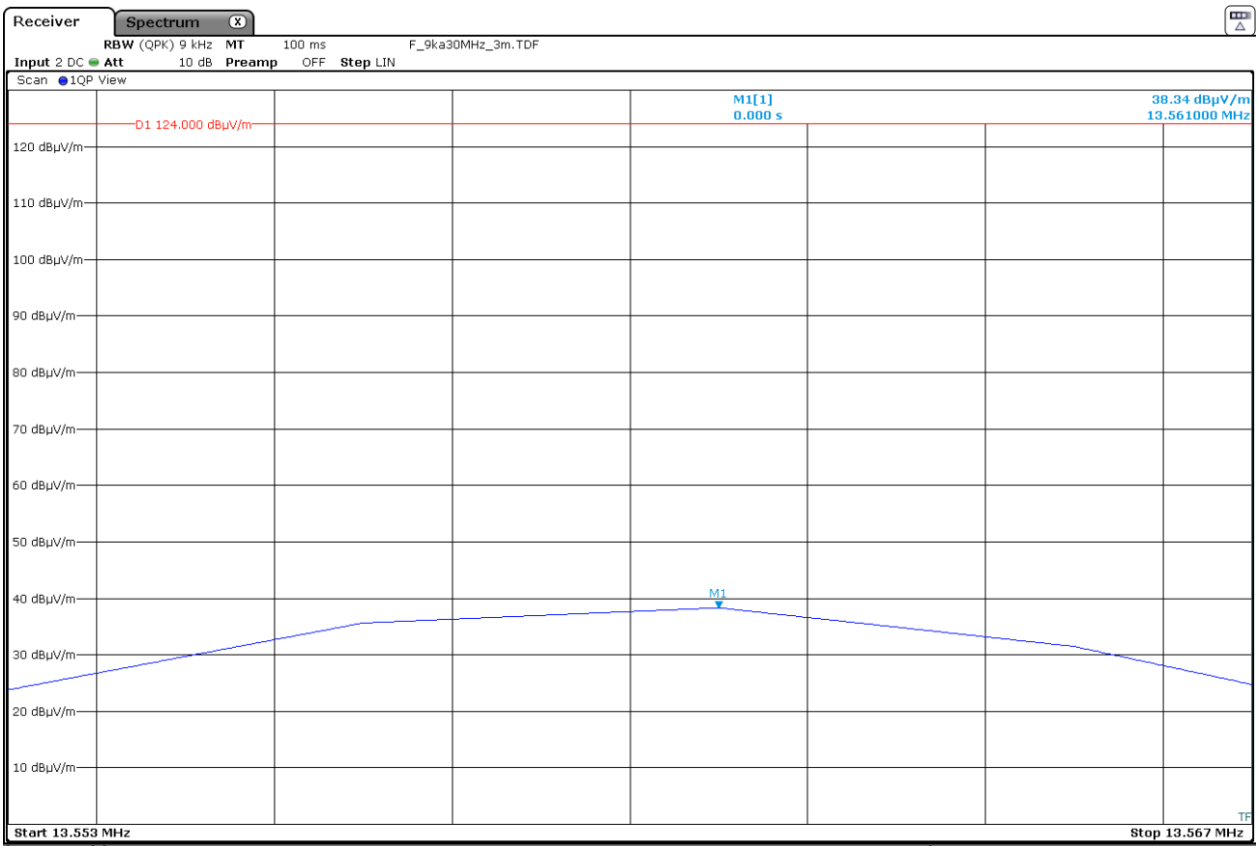
SPECIFICATION

The field strength of any emissions within the band 13.553 – 13.567 MHz shall not exceed 15,848 microvolts/meter (84 dBµV/m) at 30 meters.

RESULTS

Measurement distance: 3 meters.

NFC ISO 14443A

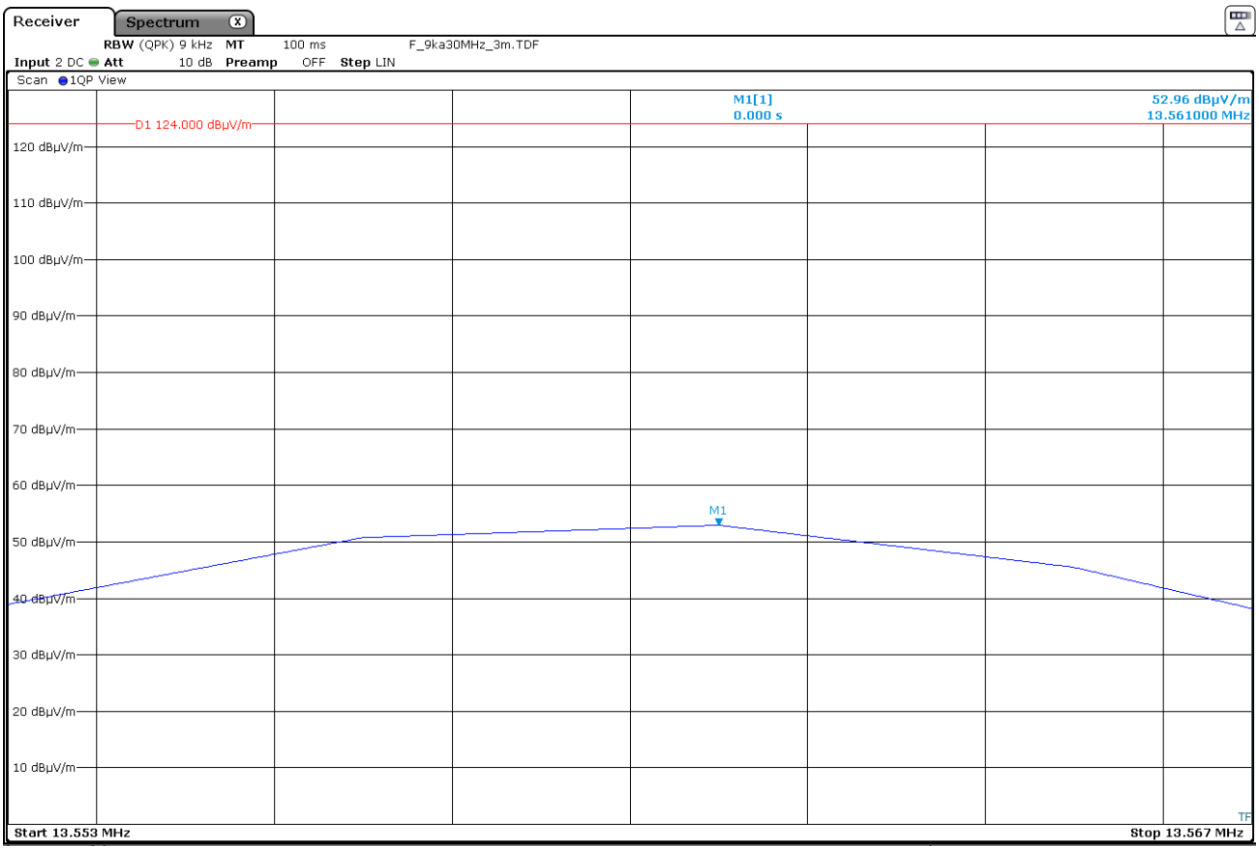


Note: The limit shown in the above plot is extrapolated to 3 meters

Frequency (MHz)	Maximum field strength (dBµV/m) measured at 3 m (quasi-peak detector)	Maximum field strength (dBµV/m) extrapolated to 30 m (40 dB/decade)
13.561	38.34	-1.66
Measurement uncertainty (dB)	<±3.61	

Verdict: PASS

NFC ISO 15693



Note: The limit shown in the above plot is extrapolated to 3 meters

Frequency (MHz)	Maximum field strength (dBµV/m) measured at 3 m (quasi-peak detector)	Maximum field strength (dBµV/m) extrapolated to 30 m (40 dB/decade)
13.561	52.96	12.96
Measurement uncertainty (dB)	<±3.61	

Verdict: PASS

Section 15.225 Subclause (b) / RSS-210 Clause B.6 (b). Field strength of emissions within the band 13.410 MHz -13.553 MHz and 13.567 MHz -13.710 MHz

SPECIFICATION

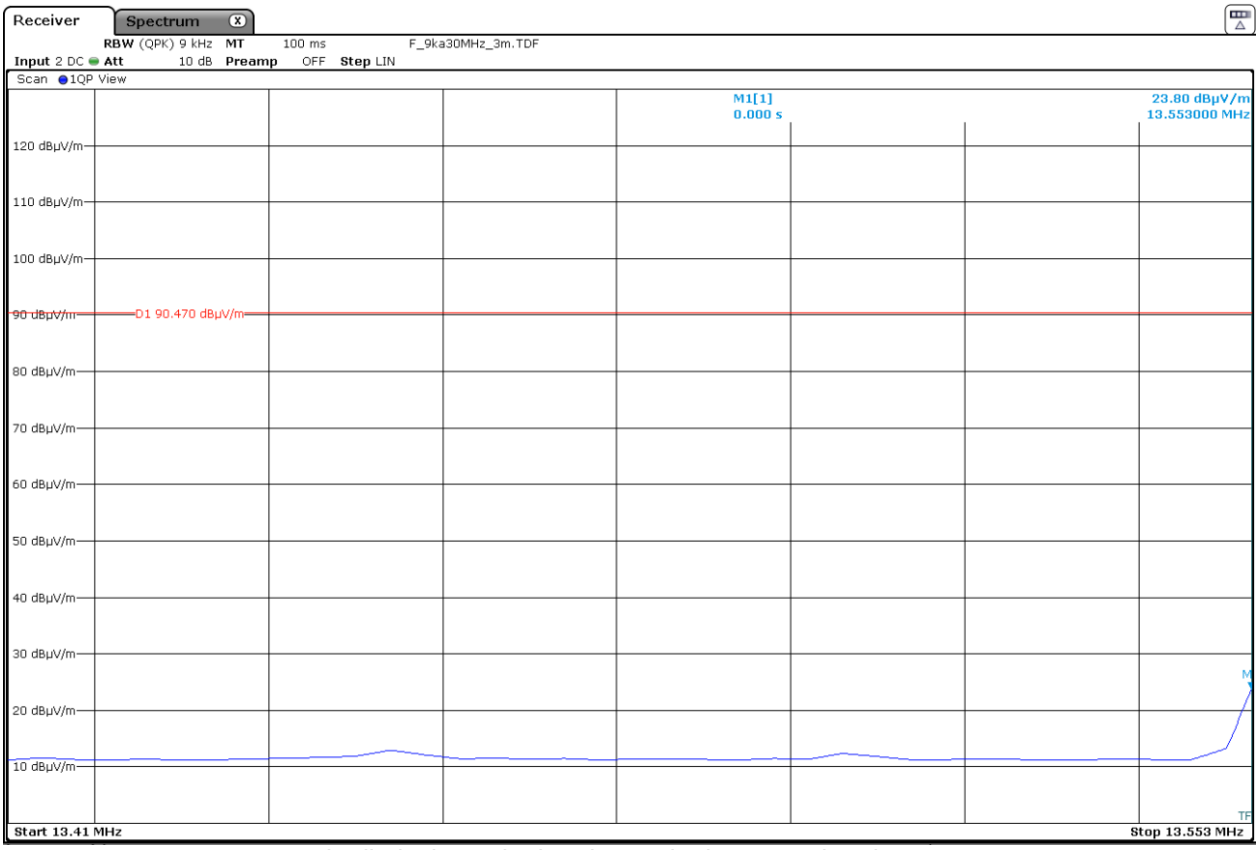
Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter (50.47 dBµV/m) at 30 meters.

RESULTS

Band 13.410-13.553 MHz

Measurement distance: 3 meters.

NFC ISO 14443A

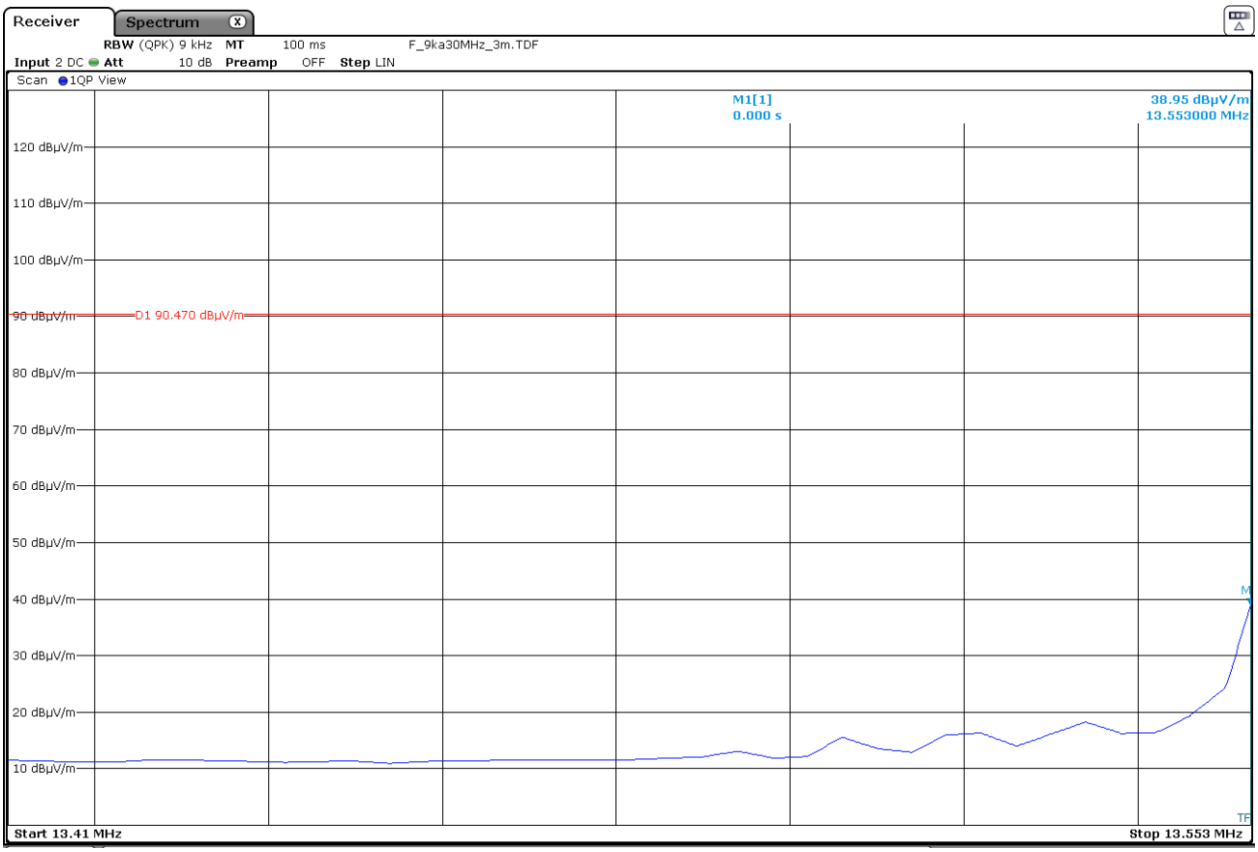


Note: The limit shown in the above plot is extrapolated to 3 meters

Frequency (MHz)	Maximum field strength (dBµV/m) measured at 3 m (quasi-peak detector)	Maximum field strength (dBµV/m) extrapolated to 30 m (40 dB/decade)
13.553	23.80	-16.20
Measurement uncertainty (dB)	<±3.61	

Verdict: PASS

NFC ISO 15693



Note: The limit shown in the above plot is extrapolated to 3 meters

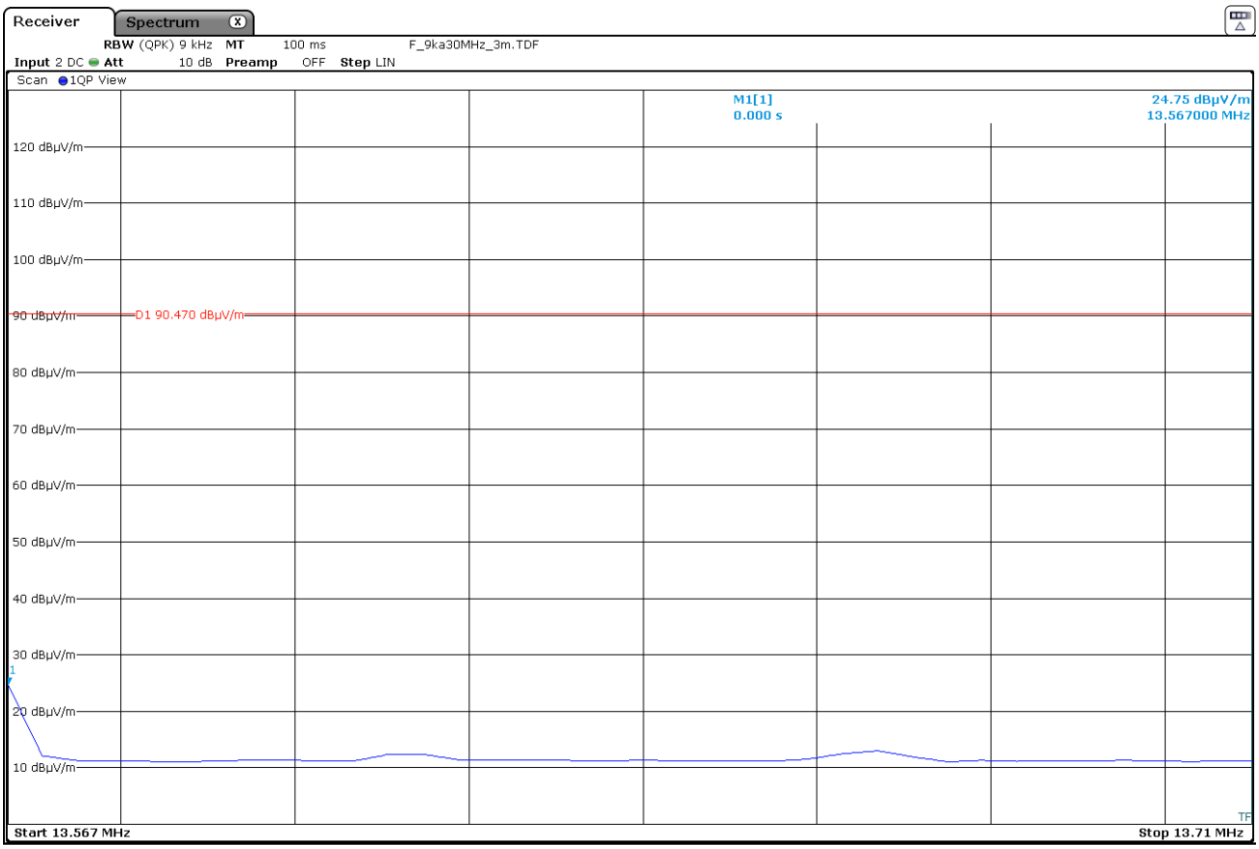
Frequency (MHz)	Maximum field strength (dBµV/m) measured at 3 m (quasi-peak detector)	Maximum field strength (dBµV/m) extrapolated to 30 m (40 dB/decade)
13.553	38.95	-1.05
Measurement uncertainty (dB)	<±3.61	

Verdict: PASS

Band 13.567-13.710 MHz

Measurement distance: 3 meters.

NFC ISO 14443A

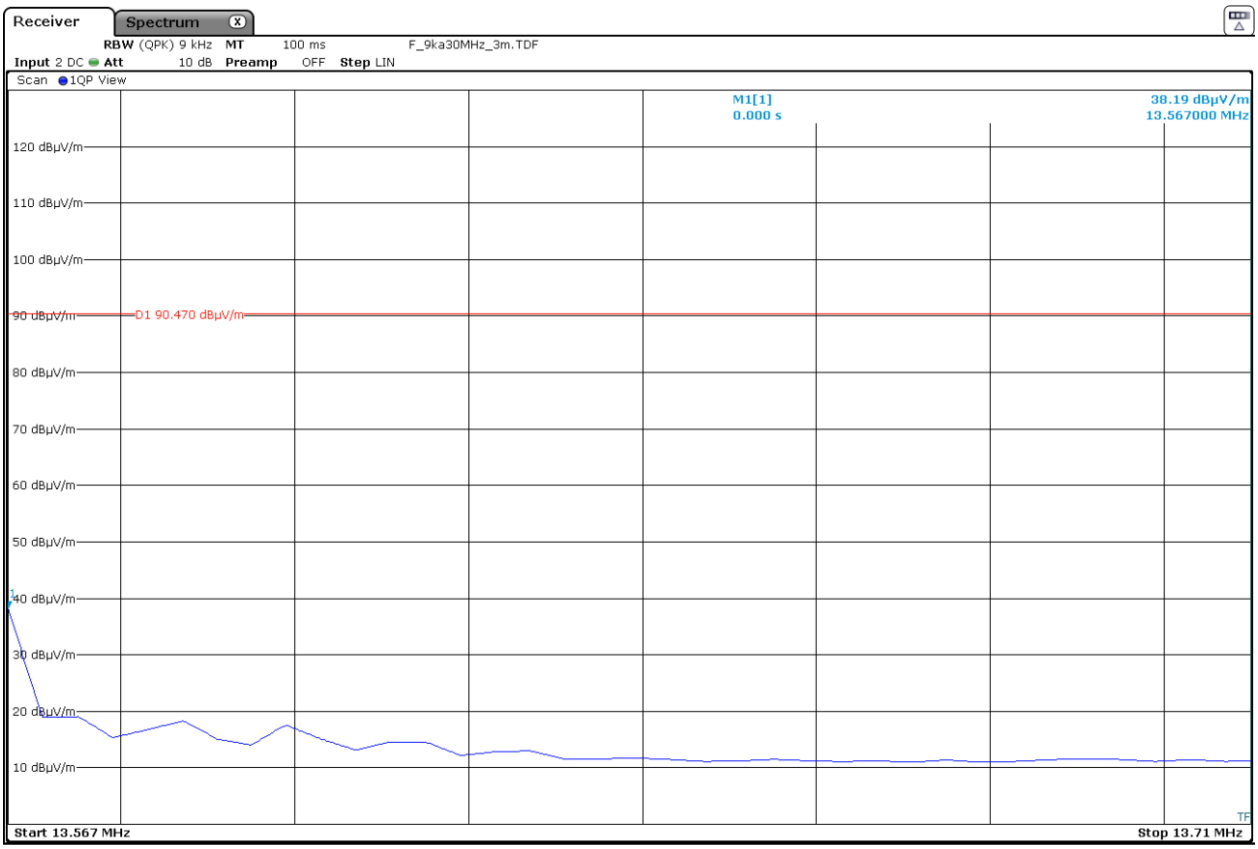


Note: The limit shown in the above plot is extrapolated to 3 meters

Frequency (MHz)	Maximum field strength (dBµV/m) measured at 3 m (quasi-peak detector)	Maximum field strength (dBµV/m) extrapolated to 30 m (40 dB/decade)
13.567	24.75	-15.25
Measurement uncertainty (dB)	<±3.61	

Verdict: PASS

NFC ISO 15693



Note: The limit shown in the above plot is extrapolated to 3 meters

Frequency (MHz)	Maximum field strength (dBµV/m) measured at 3 m (quasi-peak detector)	Maximum field strength (dBµV/m) extrapolated to 30 m (40 dB/decade)
13.567	38.19	-1.81
Measurement uncertainty (dB)	<±3.61	

Verdict: PASS

Section 15.225 Subclause (c) / RSS-210 Clause B.6 (c). Field strength of emissions within the band 13.110 MHz -13.410 MHz and 13.710 MHz -14.010 MHz

SPECIFICATION

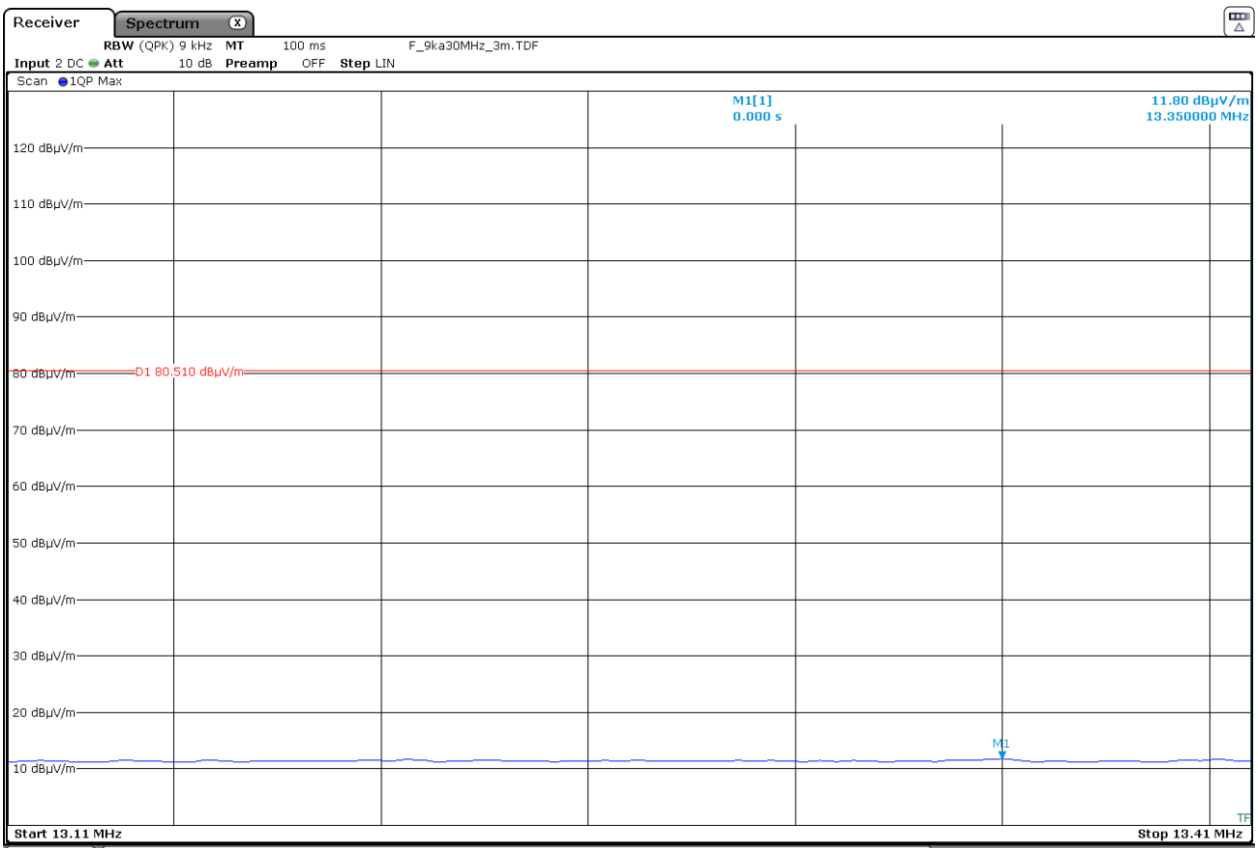
Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz, the field strength of any emissions shall not exceed 106 microvolts/meter (40.51 dBµV/m) at 30 meters.

RESULTS

Band 13.110-13.410 MHz

Measurement distance: 3 meters.

NFC ISO 14443A

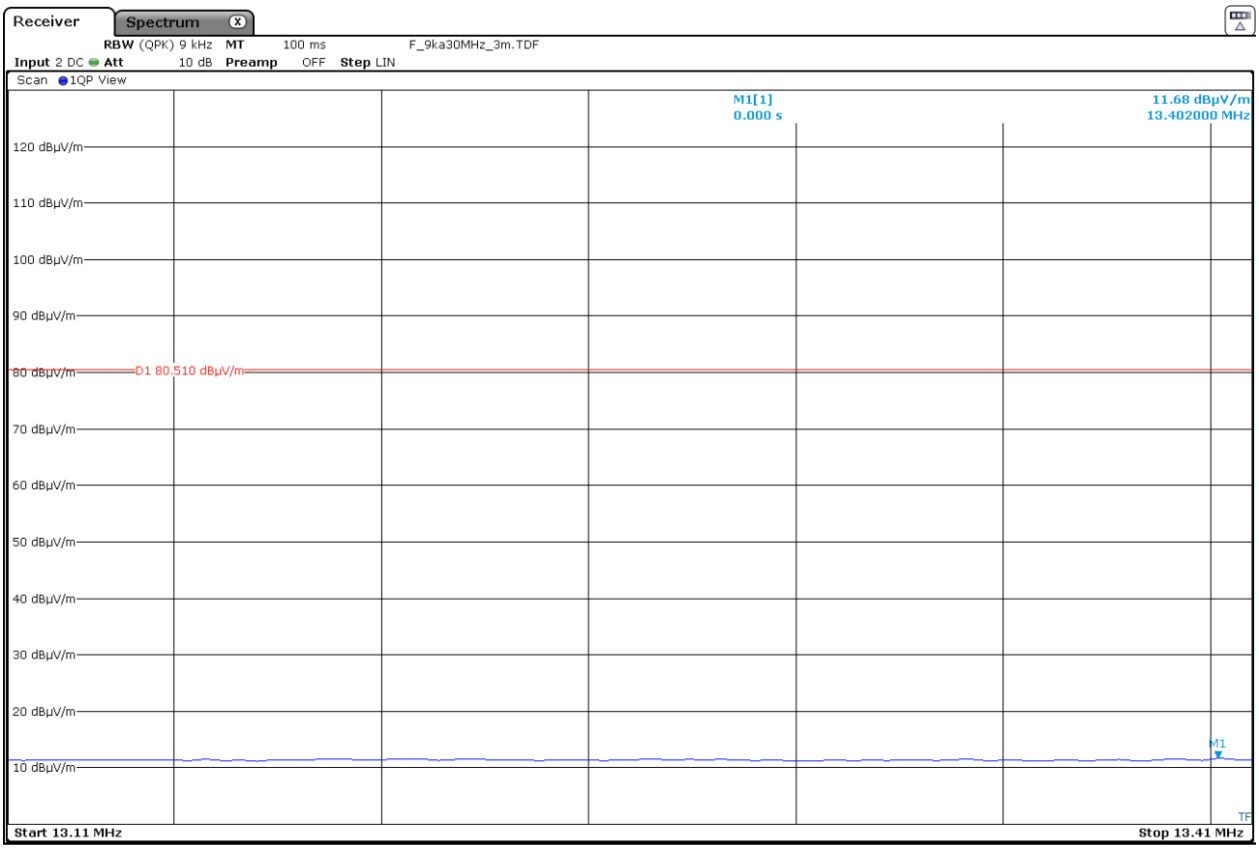


Note: The limit shown in the above plot is extrapolated to 3 meters

Frequency (MHz)	Maximum field strength (dBµV/m) measured at 3 m (quasi-peak detector)	Maximum field strength (dBµV/m) extrapolated to 30 m (40 dB/decade)
13.350	11.80	-28.2
Measurement uncertainty (dB)	<±3.61	

Verdict: PASS

NFC ISO 15693



Note: The limit shown in the above plot is extrapolated to 3 meters

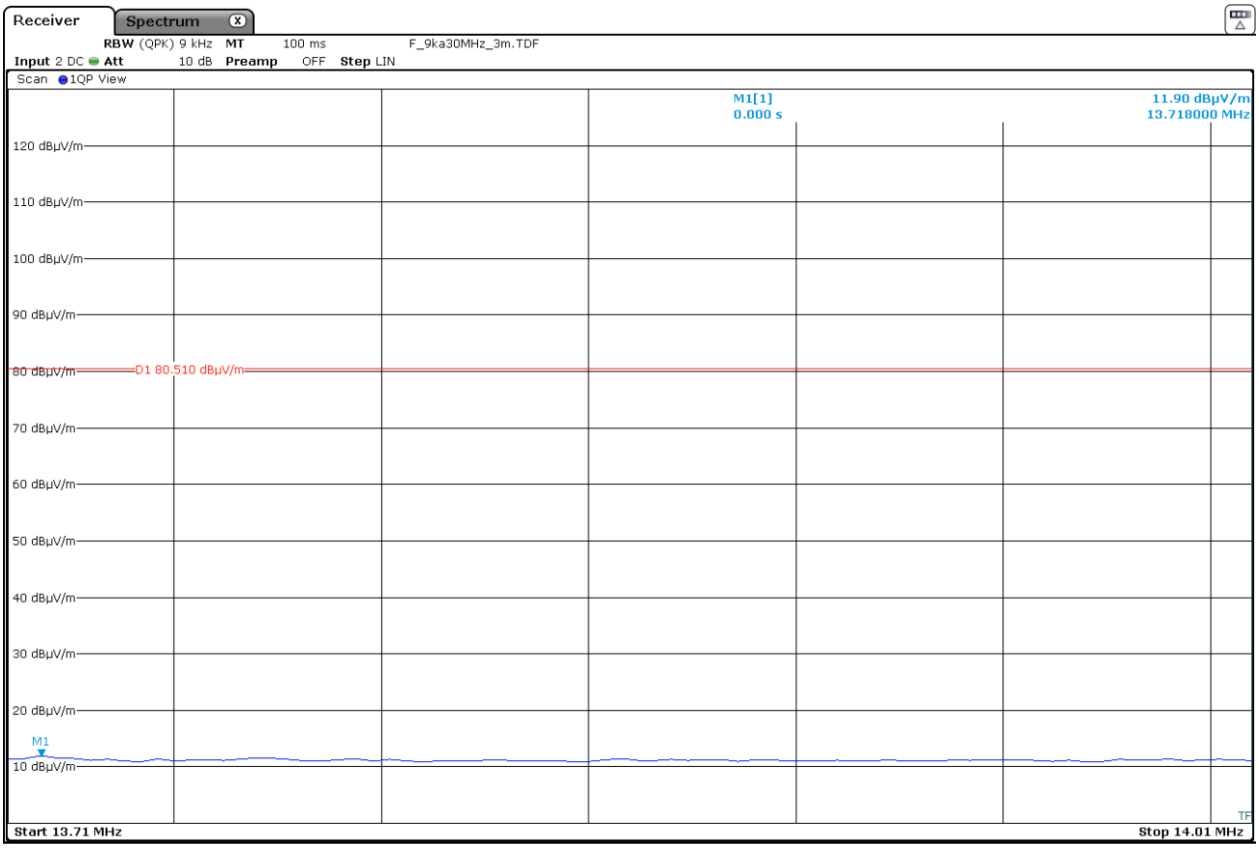
Frequency (MHz)	Maximum field strength (dBµV/m) measured at 3 m (quasi-peak detector)	Maximum field strength (dBµV/m) extrapolated to 30 m (40 dB/decade)
13.402	11.68	-28.32
Measurement uncertainty (dB)	<±3.61	

Verdict: PASS

Band 13.710-14.010 MHz

Measurement distance: 3 meters.

NFC ISO 14443A

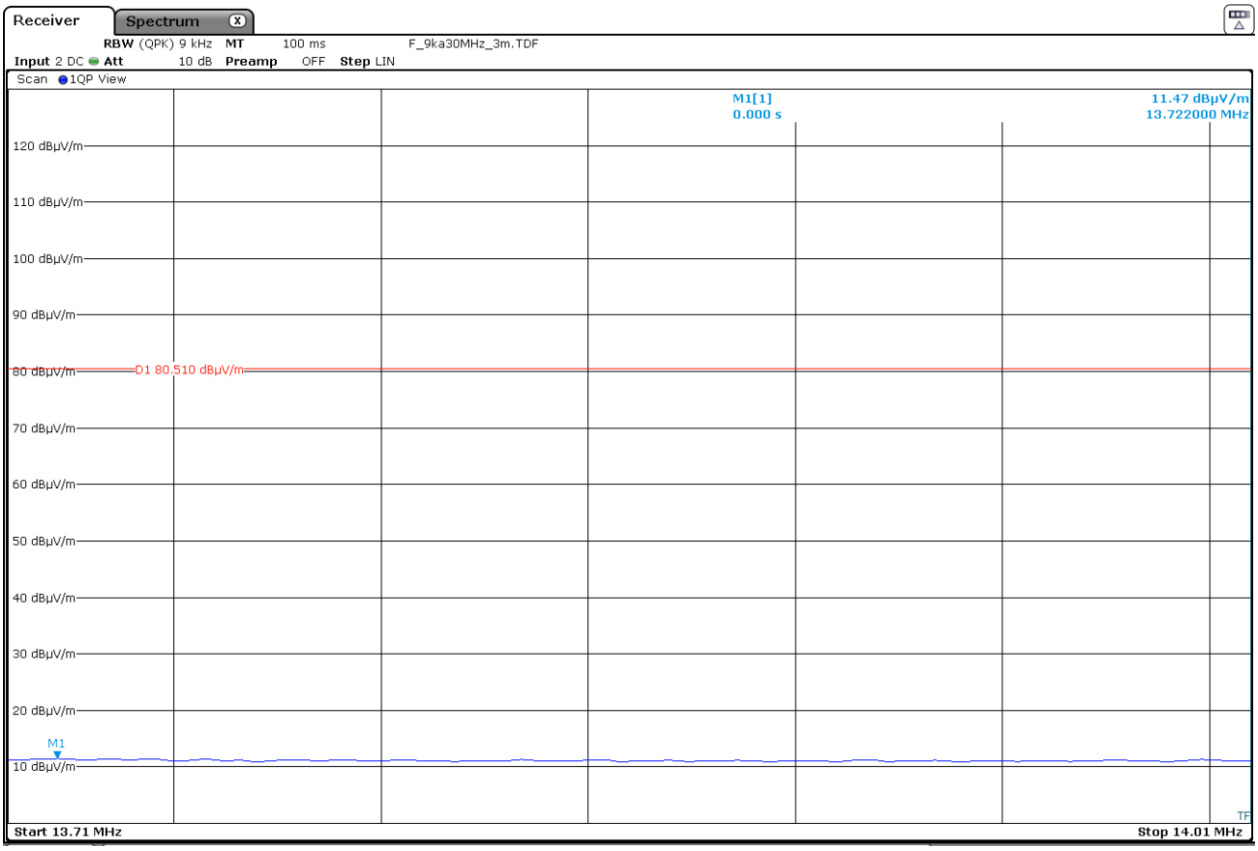


Note: The limit shown in the above plot is extrapolated to 3 meters

Frequency (MHz)	Maximum field strength (dBµV/m) measured at 3 m (quasi-peak detector)	Maximum field strength (dBµV/m) extrapolated to 30 m (40 dB/decade)
13.718	11.9	-28.1
Measurement uncertainty (dB)	±3.61	

Verdict: PASS

NFC ISO 15693



Note: The limit shown in the above plot is extrapolated to 3 meters

Frequency (MHz)	Maximum field strength (dBµV/m) measured at 3 m (quasi-peak detector)	Maximum field strength (dBµV/m) extrapolated to 30 m (40 dB/decade)
13.722	11.47	-28.53
Measurement uncertainty (dB)	±3.61	

Verdict: PASS

Section 15.225 Subclause (d) / RSS-210 Clause B.6 (d). Field strength of emissions outside of the band 13.110 MHz -14.010 MHz

SPECIFICATION

Field strength of any emissions appearing outside of the band 13.110 MHz - 14.010 MHz band shall not exceed the general radiated emission limits in 15.209/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
Above 960	500	54	3

RESULTS:

All tests were performed in a semi-anechoic chamber at a distance of 3 m.

The spectrum was inspected from 9 kHz to 200 MHz searching for spurious signals.

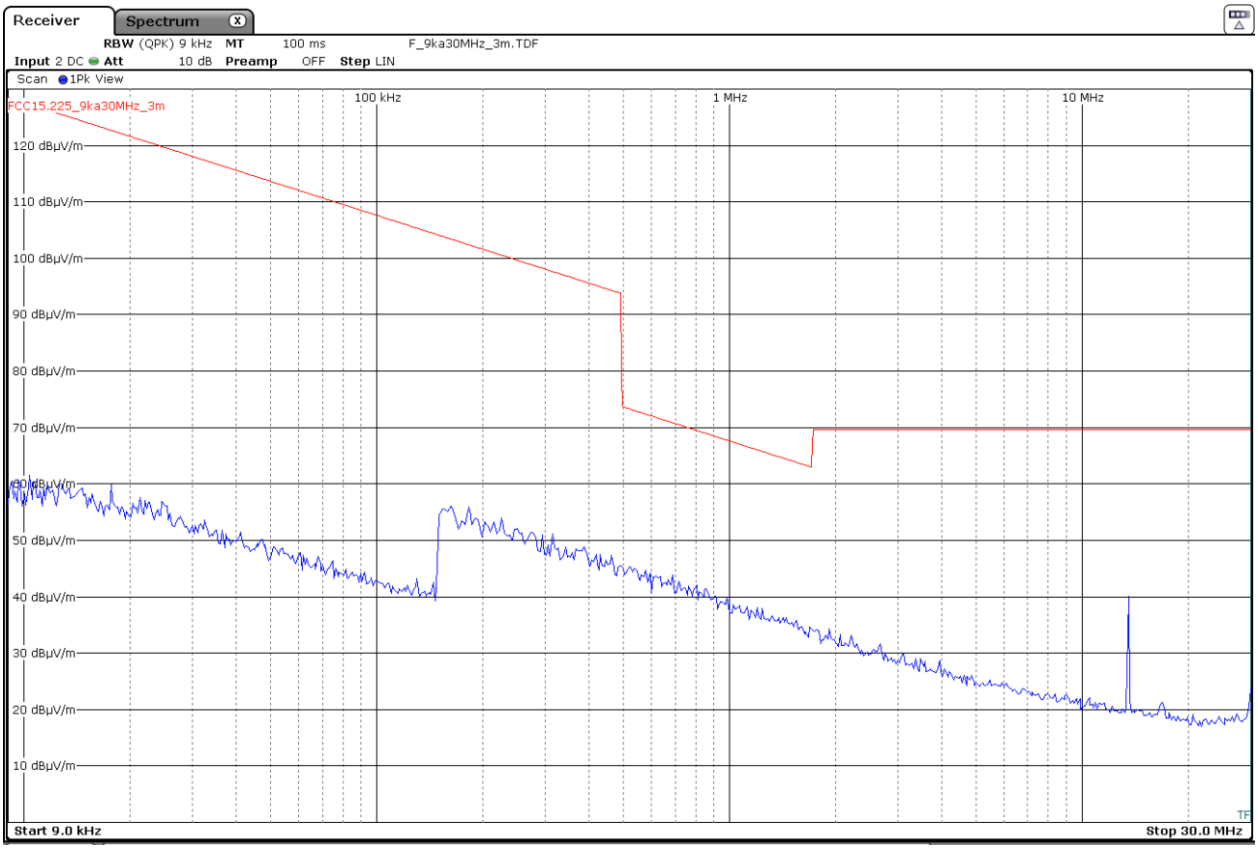
The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifier gain.

The tests were performed with the equipment transmitting first with only NFC ISO 14443A mode and then repeated with the NFC ISO 15693 and both NFC and BLE transmitting simultaneously to check the impact of the co-location of the other radio interfaces. The results and plots below show the worst results obtained.

NFC ISO 14443A

Frequency range 9 kHz-30 MHz.

No spurious signals were found at less than 20 dB below the limit.



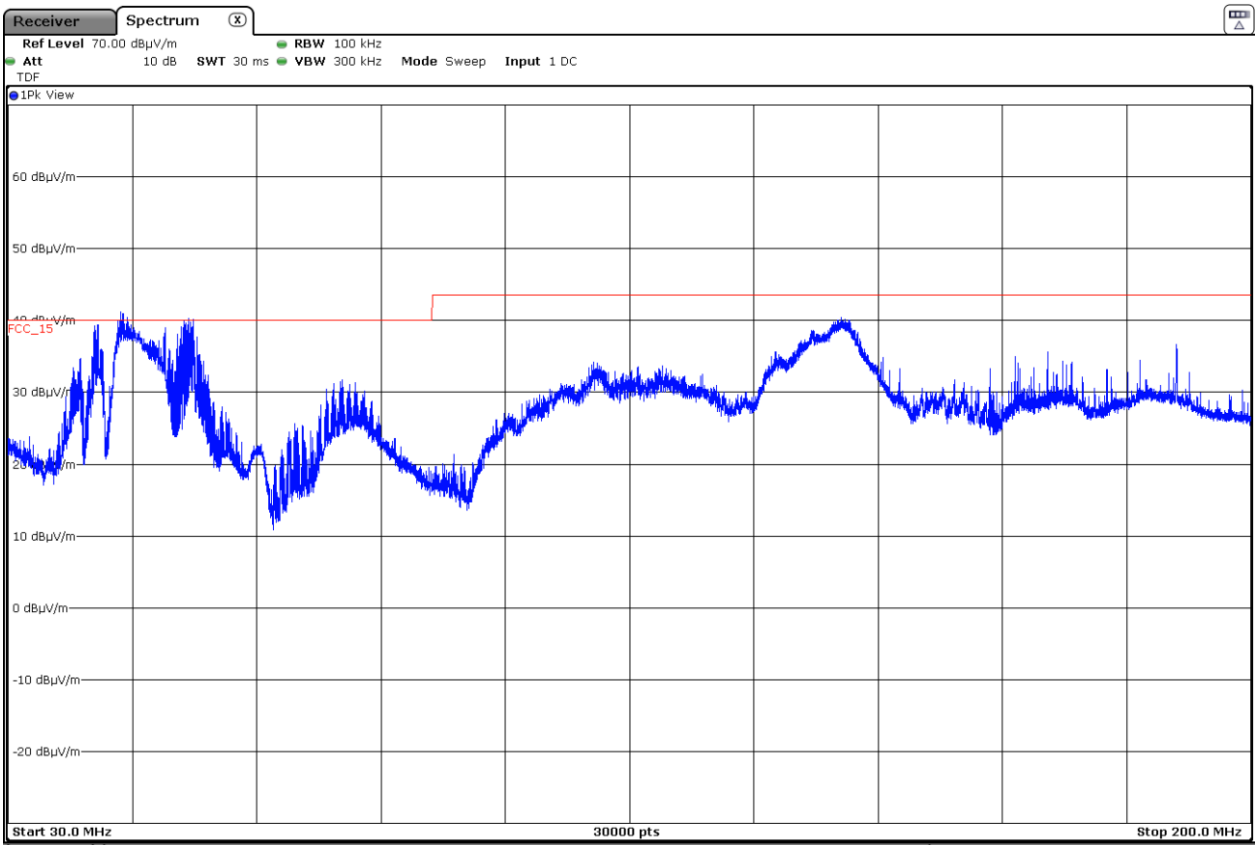
Note: The limits shown in the above plot are extrapolated to 3 meters. The highest peak corresponds to the carrier level.

Resolution bandwidth:
200 Hz for 9 kHz ≤ f ≤ 150 kHz
9 kHz for 150 kHz ≤ f ≤ 30 MHz

Frequency range 30 MHz-200 MHz

Spurious signal closest to the limit.

Spurious frequency (MHz)	Polarization	Detector	Emission Level (dBµV/m)	Measurement Uncertainty (dB)
45.4445	V	Quasi-peak	36.9	± 3.88
143.9708	V	Quasi-peak	37.4	± 3.88
182.3908	H	Quasi-peak	32.8	± 3.88
189.8652	H	Quasi-peak	38.4	± 3.88



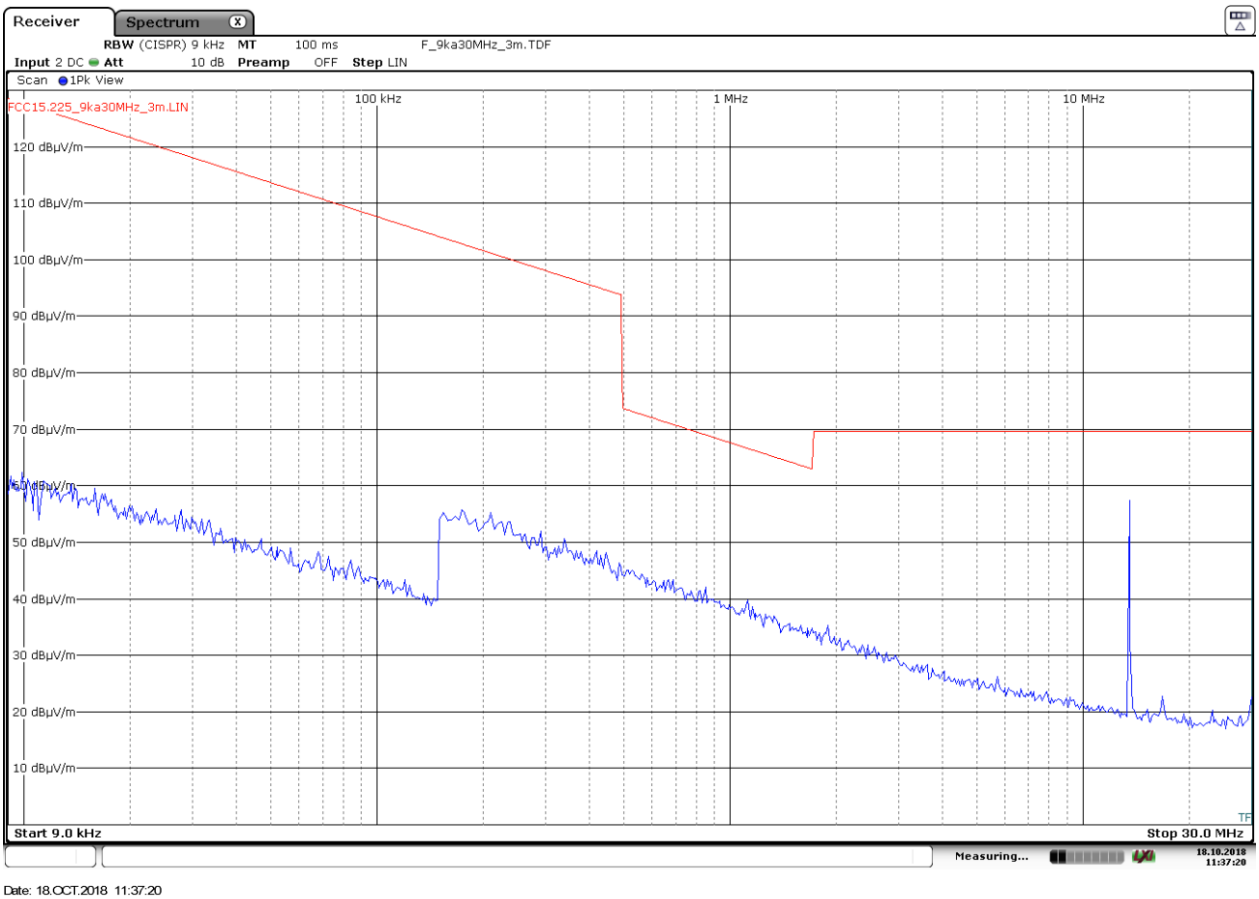
Note: The above plot shows the results of the scan using peak detector.

Verdict: PASS

NFC ISO 15693

Frequency range 9 kHz-30 MHz.

No spurious signals were found at less than 20 dB below the limit.



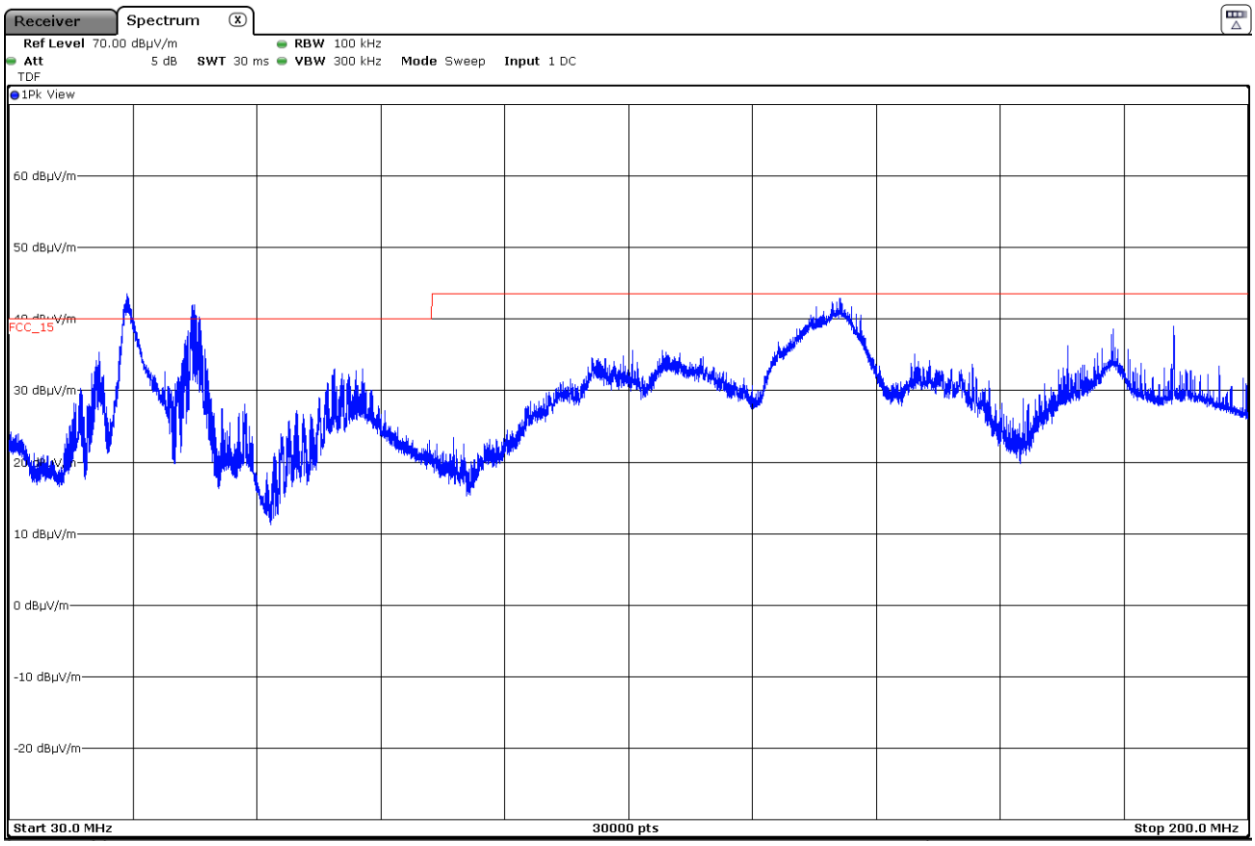
Note: The limits shown in the above plot are extrapolated to 3 meters. The highest peak corresponds to the carrier level.

Resolution bandwidth:
200 Hz for 9 kHz ≤ f ≤ 150 kHz
9 kHz for 150 kHz ≤ f ≤ 30 MHz

Frequency range 30 MHz-200 MHz

Spurious signal closest to the limit.

Spurious frequency (MHz)	Polarization	Emission Level (dBµV/m)	Detector	Measurement Uncertainty (dB)
46.1698	V	38.3	Quasi-peak	± 3.88
143.9478	V	38.7	Quasi-peak	± 3.88
154.2672	V	32.3	Quasi-peak	± 3.88
179.8125	H	32.6	Quasi-peak	± 3.88
189.8538	H	39.3	Quasi-peak	± 3.88
191.5708	H	32.6	Quasi-peak	± 3.88



Note: The above plot shows the results of the scan using peak detector.

Verdict: PASS

Section 15.225 Subclause (e) / RSS-210 Clause B.6. Frequency tolerance of the carrier signal

SPECIFICATION

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

RESULTS

Nominal operating frequency: 13.56 MHz.

NFC mode ISO 14443A

Frequency stability over temperature variations.

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (%)
+50	77.5	0.000572
+40	77.5	0.000572
+30	77.5	0.000572
+20	77.5	0.000572
+10	77.5	0.000572
0	77.5	0.000572
-10	77.5	0.000572
-20	77.5	0.000572

Frequency stability over voltage variations.

DC Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (%)
Vmax	55.2	127.5	0.000940
Vmin	40.8	127.5	0.000940

Verdict: PASS

NFC mode ISO 15693

Frequency stability over temperature variations.

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (%)
+50	27.5	0.000203
+40	27.5	0.000203
+30	27.5	0.000203
+20	27.5	0.000203
+10	27.5	0.000203
0	27.5	0.000203
-10	27.5	0.000203
-20	27.5	0.000203

Frequency stability over voltage variations.

DC Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (%)
Vmax	55.2	27.5	0.000203
Vmin	40.8	27.5	0.000203

Verdict: PASS