



# FCC RADIO TEST REPORT

**FCC ID** : B32V400M2  
**Equipment** : Point of Sale Terminal  
**Brand Name** : Verifone  
**Model Name** : V400m-2  
**Applicant** : Verifone, Inc.  
1400 West Stanford Ranch Road Suite  
150 Rocklin CA 95765 USA  
**Manufacturer** : Verifone, Inc.  
**Standard** : FCC Part 15 Subpart C §15.225

The product was received on Aug. 10, 2023 and testing was performed from Sep. 08, 2023 to Sep. 08, 2023. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this partial report apply exclusively to the tested model / sample. Without written approval from Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Louis Wu

**Sporton International Inc. EMC & Wireless Communications Laboratory**  
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)



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### History of this test report

Report No.	Version	Description	Issue Date
FR372517D	01	Initial issue of report	Sep. 20, 2023



## Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.225(a)(b)(c)	Field Strength of Fundamental Emissions	Pass	Max level 42.57 dB $\mu$ V/m at 13.56 MHz
3.2	15.225(d) 15.209	Radiated Spurious Emissions	Pass	9.01 dB under the limit at 30.00MHz
3.3	15.203	Antenna Requirements	Pass	-

**Conformity Assessment Condition:**

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty".

**Disclaimer:**

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

**Reviewed by: Yun Huang**

**Report Producer: Lucy Wu**



# 1. General Description

## 1.1 Product Feature of Equipment Under Test

Product Feature
<p><b>General Specs</b> GSM/WCDMA/LTE, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac and NFC.</p> <p><b>Antenna Type</b> WWAN: Fixed Internal Antenna WLAN: PCB Antenna Bluetooth: PCB Antenna NFC: Loop Antenna</p>

**Remark:** The EUT's information above is declared by manufacturer. Please refer to Disclaimer in report summary.

## 1.2 Modification of EUT

No modifications made to the EUT during the testing.

## 1.3 Testing Location

<b>Test Site</b>	Sporton International Inc. EMC & Wireless Communications Laboratory
<b>Test Site Location</b>	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
<b>Test Site No.</b>	<b>Sporton Site No.</b> 03CH07-HY
<b>Test Engineer</b>	Jesse Wang
<b>Temperature</b>	23.3~25.5°C
<b>Relative Humidity</b>	53.5~58.1%

**Note:** The test site complies with ANSI C63.4 2014 requirement.

FCC designation No.: TW1190



## **1.4 Applicable Standards**

According to the specifications declared by the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart C §15.225
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01
- ♦ ANSI C63.10-2013

**Remark:**

1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
2. The TAF code is not including all the FCC KDB listed without accreditation.
3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



## 2. Test Configuration of Equipment Under Test

### 2.1 Descriptions of Test Mode

Investigation has been done on all the possible configurations.

The following table is a list of the test modes shown in this test report.

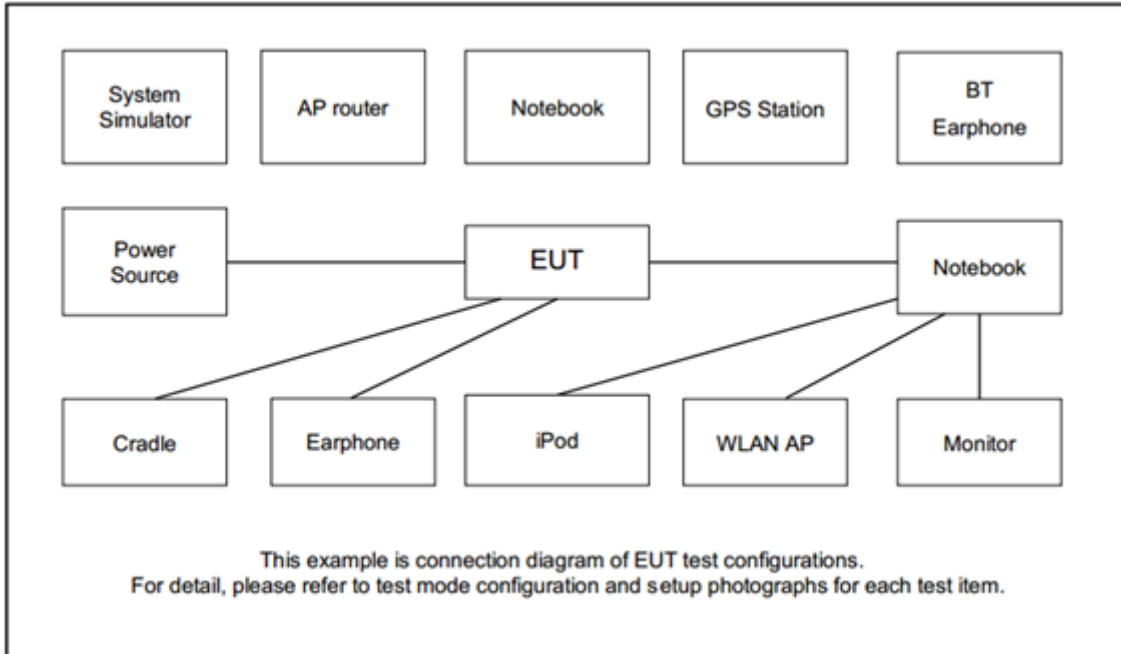
Test Items
Field Strength of Fundamental Emissions
Radiated Emissions 9kHz~30MHz
Radiated Emissions 30MHz~1GHz

The EUT pre-scanned in reader mode with NFC tag (two NFC type A, B) and without reading tag. Based on the highest field strength of fundamental and spurious emissions, the worst case type (type A) was recorded in this report.

The measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and only the worst case emissions were reported in this report.

**Remark:** For Radiated Test Cases, the tests were performed with AC Adapter.

## 2.2 Connection Diagram of Test System



## 2.3 Table for Supporting Units

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	NFC Card	N/A	N/A	N/A	N/A	N/A

## 2.4 EUT Operation Test Setup

The EUT is programmed to be in continuously transmitting mode.

The ancillary equipment, NFC card, is used to make the EUT (NFC) continuously transmitting signal (Power Level: Default) at 13.56MHz and is placed around 0 cm gap to the EUT.





### 3. Test Results

#### 3.1 Field Strength of Fundamental Emissions and Mask Measurement

##### 3.1.1 Limit

Rules and specifications	FCC CFR 47 Part 15 section 15.225			
Description	Compliance with the spectrum mask is tested with RBW set to 9kHz.			
Freq. of Emission (MHz)	Field Strength (μV/m) at 30m	Field Strength (dBμV/m) at 30m	Field Strength (dBμV/m) at 10m	Field Strength (dBμV/m) at 3m
1.705~13.110	30	29.5	48.58	69.5
13.110~13.410	106	40.5	59.58	80.5
13.410~13.553	334	50.5	69.58	90.5
13.553~13.567	15848	84.0	103.08	124.0
13.567~13.710	334	50.5	69.58	90.5
13.710~14.010	106	40.5	59.58	80.5
14.010~30.000	30	29.5	48.58	69.5

**Remark:**

1. The field strength test result is in 3m test distance, follow test rules the test data use distance extrapolation factor and reported in this report at 30m test result.
2. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)

##### 3.1.2 Measuring Instruments

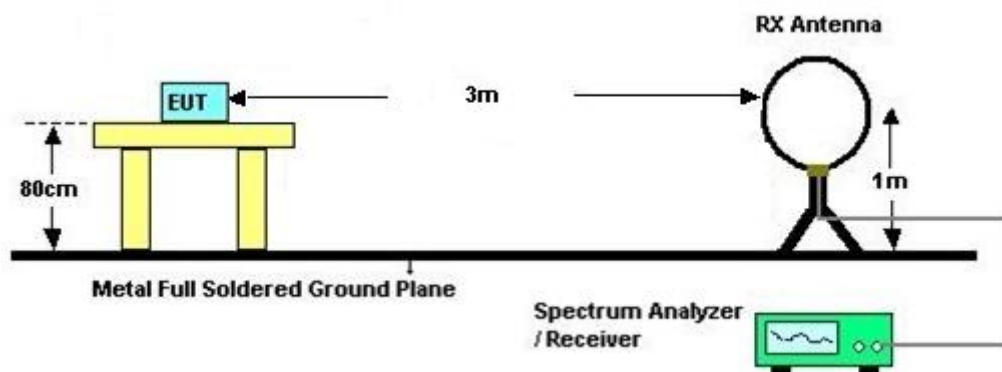
Please refer to the measuring equipment list in this test report.

### 3.1.3 Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT is placed on the top of the turntable 0.8 meter above ground. The phase center of the loop receiving antenna mounted antenna tower is placed 3 meters far away from the turntable.
  2. Power on the EUT and all the supporting units. The turntable is rotated by 360 degrees to determine the position of the highest radiation.
  3. The height of the receiving antenna is fixed at one meter above ground to find the maximum emissions field strength.
  4. For Fundamental emissions, use the receiver to measure QP reading.
  5. When the radiated emissions limits are expressed in terms of the average value of the emissions, 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.
  6. Compliance with the spectrum mask is tested with RBW set to 9 kHz.
- Note: Emission level (dB $\mu$ V/m) = 20 log Emission level ( $\mu$ V/m).

### 3.1.4 Test Setup

For radiated test below 30MHz



### 3.1.5 Test Result of Field Strength of Fundamental Emissions and Mask

Please refer to Appendix A.



### 3.2 Radiated Emissions Measurement

#### 3.2.1 Limit

The field strength of any emissions which appear outside of 13.110 ~14.010MHz band shall not exceed the general radiated emissions limits.

Frequencies (MHz)	Field Strength (μV/m)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

#### 3.2.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

#### 3.2.3 Measuring Instrument Setting

The following table is the setting of receiver:

Receiver Parameter	Setting
Attenuation	Auto
Frequency Range: 9kHz~150kHz	RBW 200Hz for QP
Frequency Range: 150kHz~30MHz	RBW 9kHz for QP
Frequency Range: 30MHz~1000MHz	RBW 120kHz for Peak

**Note:** The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz and 110-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

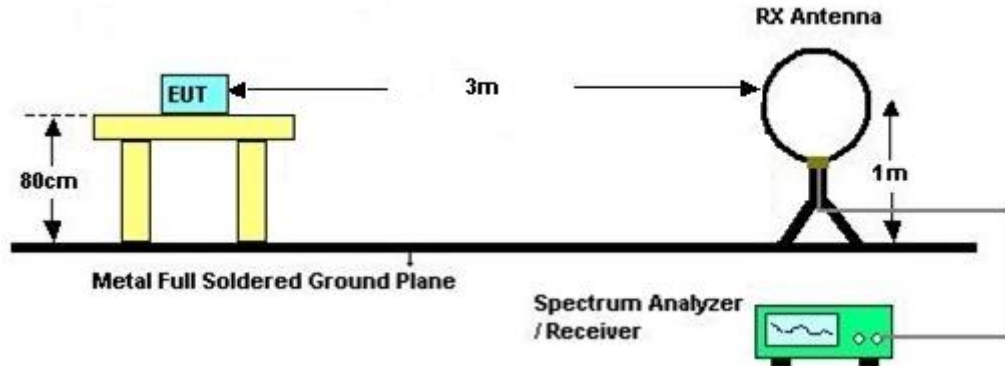


### 3.2.4 Test Procedures

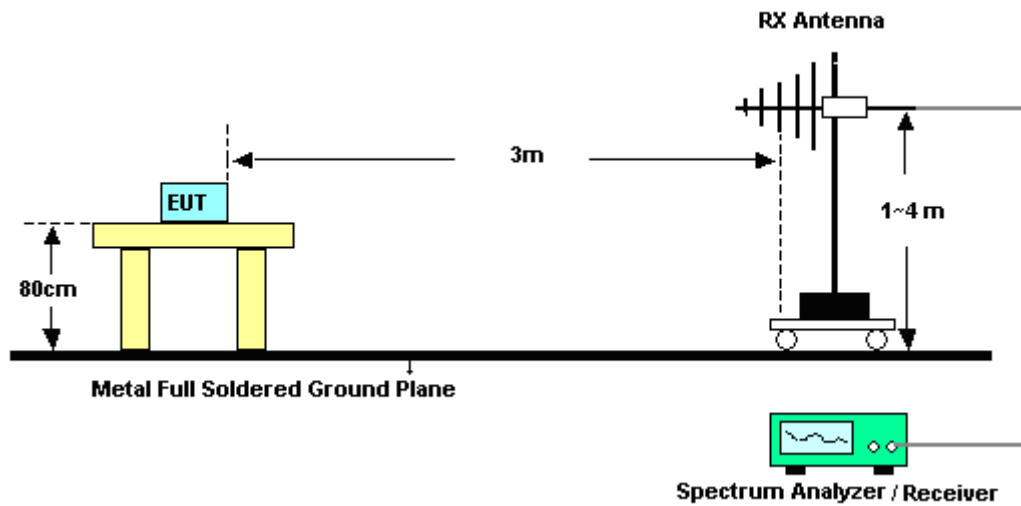
1. Configure the EUT according to ANSI C63.10. The EUT is placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower is placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable is rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna is varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower is scanned (from 1 M to 4 M) and then the turntable is rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. When the radiated emissions limits are expressed in terms of the average value of the emissions, 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.
7. In case the emission is lower than 30 MHz, loop antenna has to be used for measurement and the recorded data shall be QP measured by receiver.
8. Radiated testing below 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin against QP limit line, the position is marked as “-“.

### 3.2.5 Test Setup

For radiated test below 30MHz



For radiated test above 30MHz



### 3.2.6 Test Result of Radiated Emissions Measurement

Please refer to Appendix A.

**Remark:** There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.



### **3.3 Antenna Requirements**

#### **3.3.1 Standard Applicable**

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. 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 the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

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 rule.

#### **3.3.2 Antenna Anti-Replacement Construction**

An embedded-in antenna design is used.



## 4. List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	Rohde & Schwarz	ESU26	100472	20Hz~26.5GHz	Feb. 13, 2023	Sep. 08, 2023	Feb. 12, 2024	Radiation (03CH07-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	35419 & 03	30MHz~1GHz	Apr. 23, 2023	Sep. 08, 2023	Apr. 22, 2024	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Feb. 28, 2023	Sep. 08, 2023	Feb. 27, 2024	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	Oct. 03, 2022	Sep. 08, 2023	Oct. 02, 2023	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY15682/4	30MHz to 18GHz	Feb. 22, 2023	Sep. 08, 2023	Feb. 21, 2024	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971/4	9kHz to 18GHz	Feb. 22, 2023	Sep. 08, 2023	Feb. 21, 2024	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4	9kHz to 18GHz	Feb. 22, 2023	Sep. 08, 2023	Feb. 21, 2024	Radiation (03CH07-HY)
Controller	EMEC	EM1000	N/A	Control Ant Mast	N/A	Sep. 08, 2023	N/A	Radiation (03CH07-HY)
Controller	MF	MF-7802	N/A	Control Turn table	N/A	Sep. 08, 2023	N/A	Radiation (03CH07-HY)
Antenna Mast	EMEC	AM-BS-4500E	N/A	Boresight mast 1M~4M	N/A	Sep. 08, 2023	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Sep. 08, 2023	N/A	Radiation (03CH07-HY)
Software	Audix	E3	N/A	N/A	N/A	Sep. 08, 2023	N/A	Radiation (03CH07-HY)
USB Data Logger	TECPEL	TR-32	HE17XB2495	N/A	Mar. 14, 2023	Sep. 08, 2023	Mar. 13, 2024	Radiation (03CH07-HY)



## 5. Measurement Uncertainty

### Uncertainty of Radiated Emission Measurement (9 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	3.8 dB
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### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

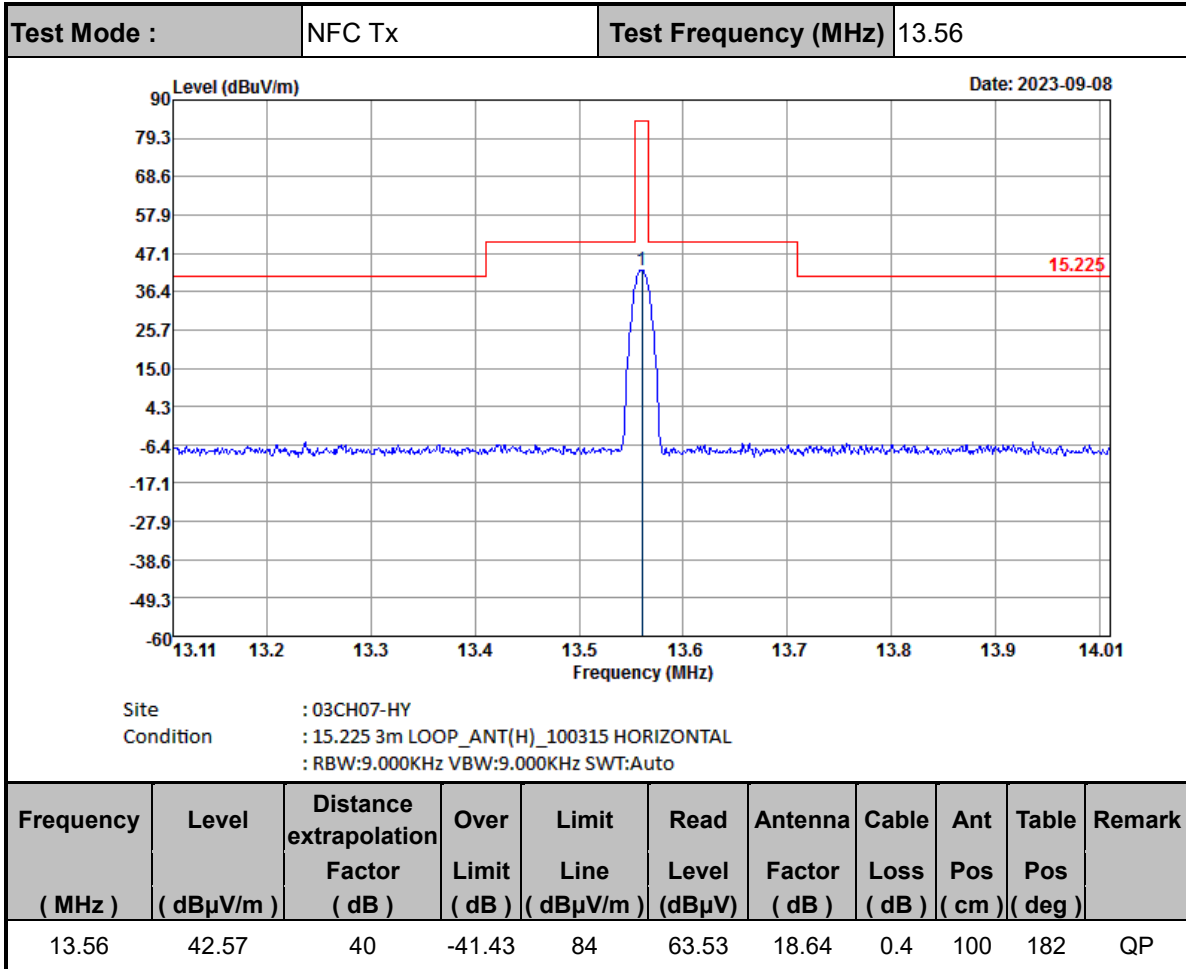
Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	6.3 dB
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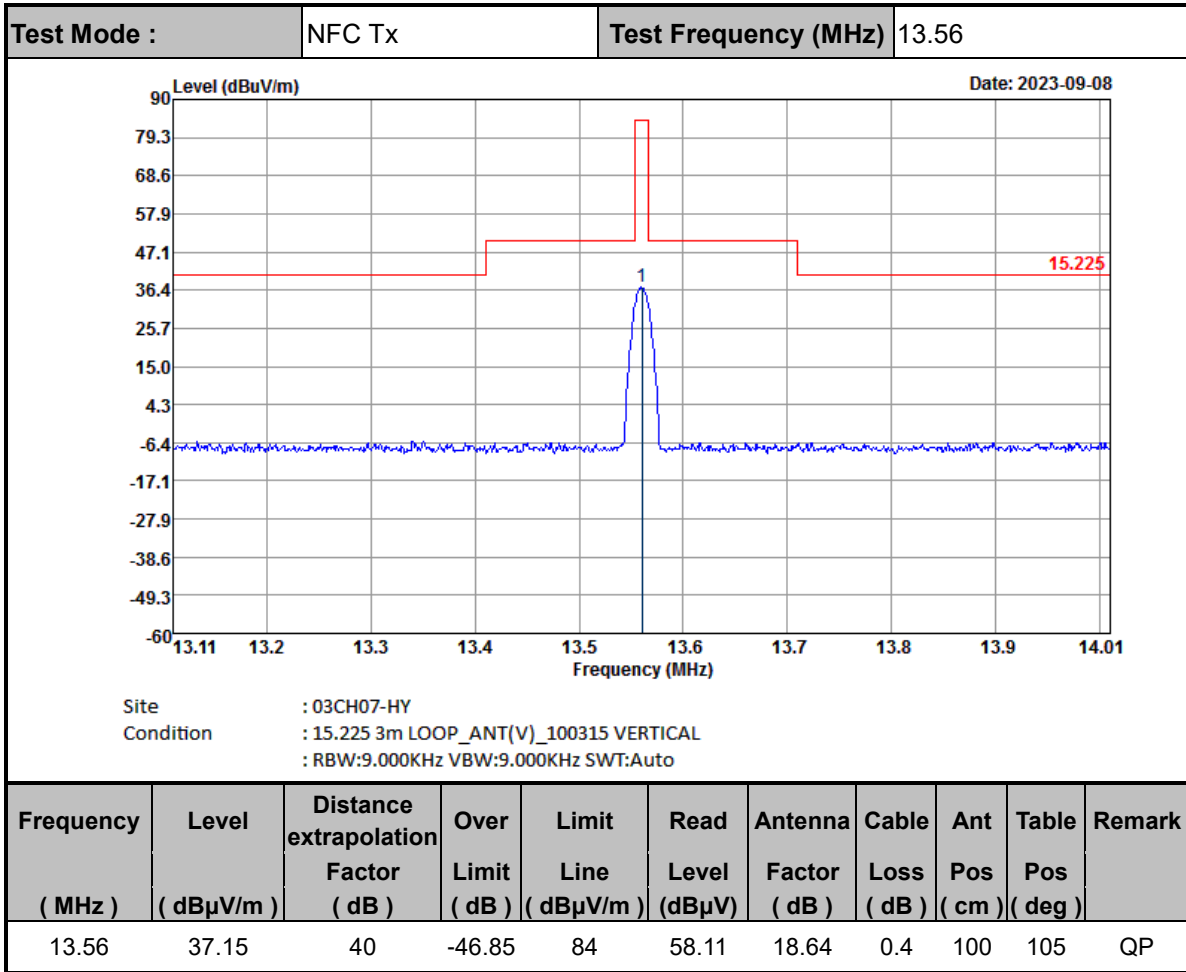




## Appendix A. Test Results of Radiated Test Items

### A1. Test Result of Field Strength of Fundamental Emissions



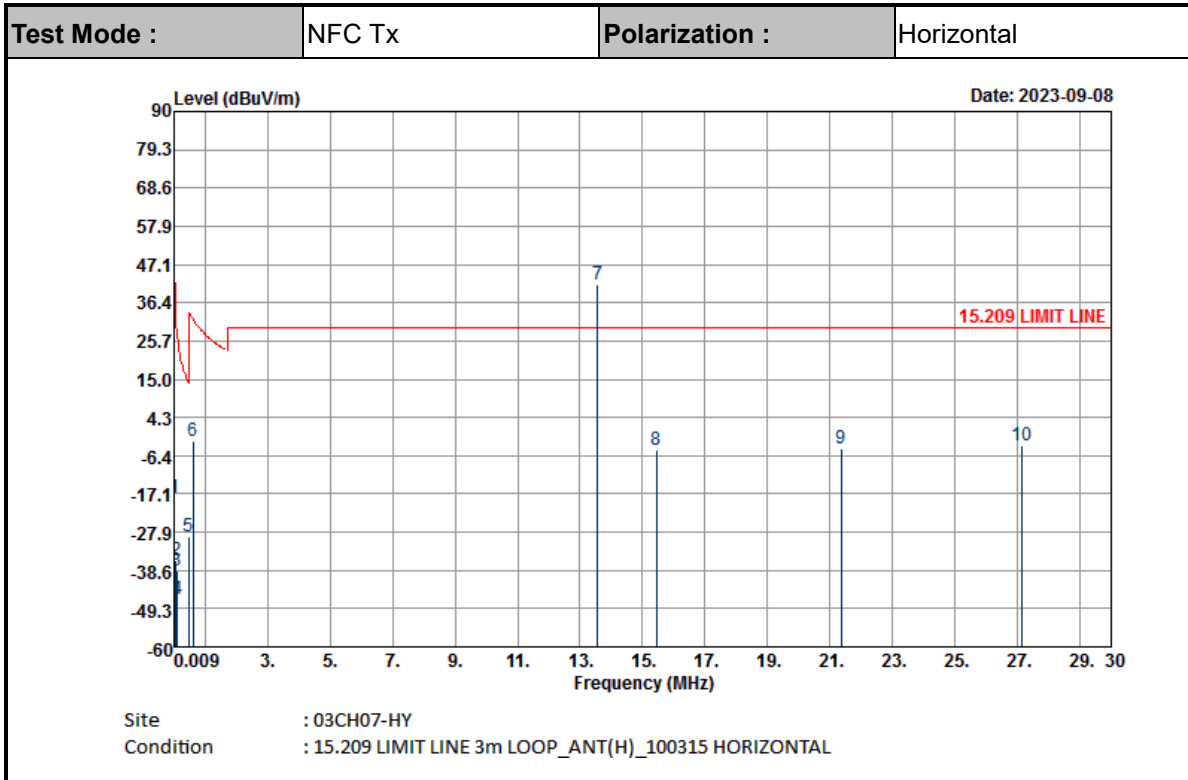


**Note :**

1. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
2. Level = Antenna Factor + Cable Loss + Read Level - Distance extrapolation factor.



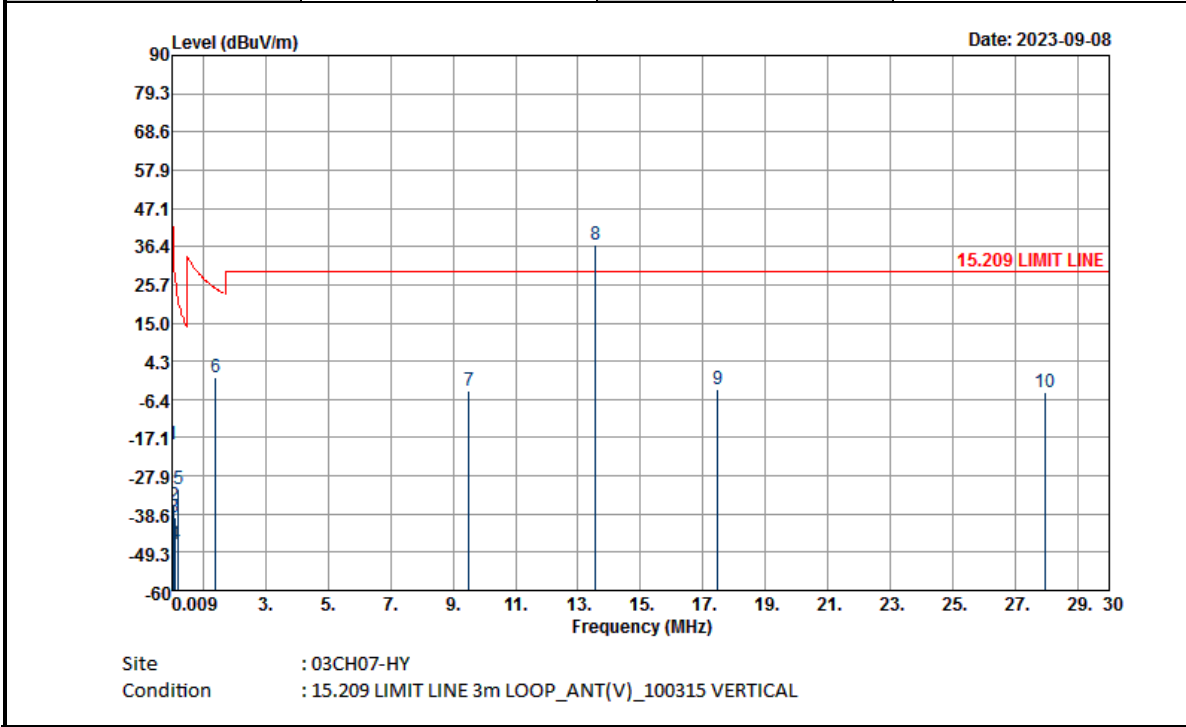
**A2. Results of Radiated Spurious Emissions (9 kHz~30MHz)**



Frequency ( MHz )	Level ( dBμV/m )	Distance extrapolation Factor ( dB )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level (dBμV)	Antenna Factor ( dB )	Cable Loss ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
0.0192	-18.38	80	-60.32	41.94	42.6	19	0.02	-	-	Average
0.06738	-35.78	80	-66.81	31.03	25.51	18.68	0.03	-	-	Average
0.09952	-38.78	80	-66.43	27.65	22.57	18.61	0.04	-	-	QP
0.11248	-46.75	80	-73.33	26.58	14.61	18.6	0.04	-	-	Average
0.47504	-29.23	80	-43.3	14.07	32.24	18.49	0.04	-	-	Average
0.61767	-2.36	40	-34.15	31.79	19.11	18.48	0.05	-	-	QP
13.56	41.69	40	12.19	29.5	62.65	18.64	0.4	-	-	QP
15.448	-4.99	40	-34.49	29.5	15.84	18.73	0.44	-	-	QP
21.346	-4.51	40	-34.01	29.5	15.65	19.31	0.53	-	-	QP
27.12	-3.78	40	-33.28	29.5	15.67	19.78	0.77	-	-	QP



Test Mode :	NFC Tx	Polarization :	Vertical
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Frequency ( MHz )	Level ( dBμV/m )	Distance extrapolation Factor ( dB )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level (dBμV)	Antenna Factor ( dB )	Cable Loss ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
0.0192	-18.91	80	-60.85	41.94	42.07	19	0.02	-	-	Average
0.06828	-36.05	80	-66.97	30.92	25.24	18.68	0.03	-	-	Average
0.09974	-39.41	80	-67.04	27.63	21.94	18.61	0.04	-	-	QP
0.11464	-46.94	80	-73.36	26.42	14.42	18.6	0.04	-	-	Average
0.2214	-31.69	80	-52.39	20.7	29.72	18.53	0.06	-	-	Average
1.399	-0.36	40	-25.05	24.69	21.05	18.47	0.12	-	-	QP
9.52	-4.03	40	-33.53	29.5	17.11	18.53	0.33	-	-	QP
13.56	36.9	40	7.4	29.5	57.86	18.64	0.4	-	-	QP
17.467	-3.42	40	-32.92	29.5	17.24	18.87	0.47	-	-	QP
27.95	-4.36	40	-33.86	29.5	15.04	19.76	0.84	-	-	QP

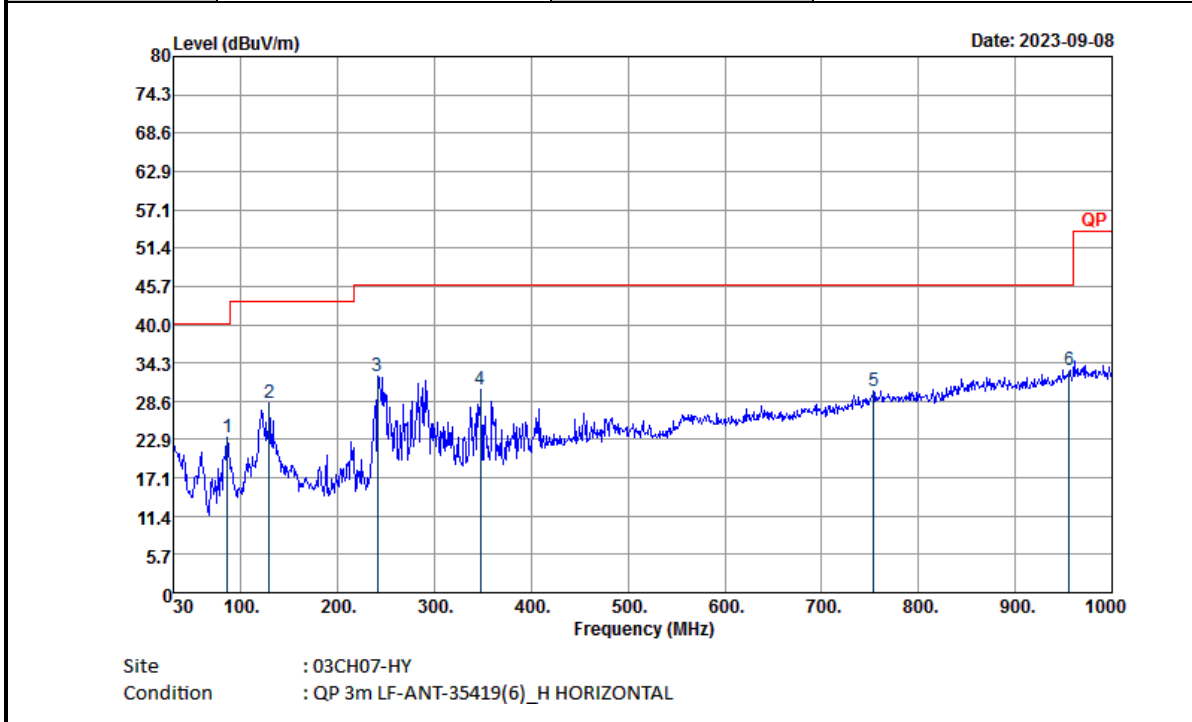
**Note :**

1. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
2. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
3. Level = Antenna Factor + Cable Loss + Read Level - Distance extrapolation factor.
4. 13.56 MHz is fundamental signal which can be ignored



**A3. Results of Radiated Spurious Emissions (30MHz~1GHz)**

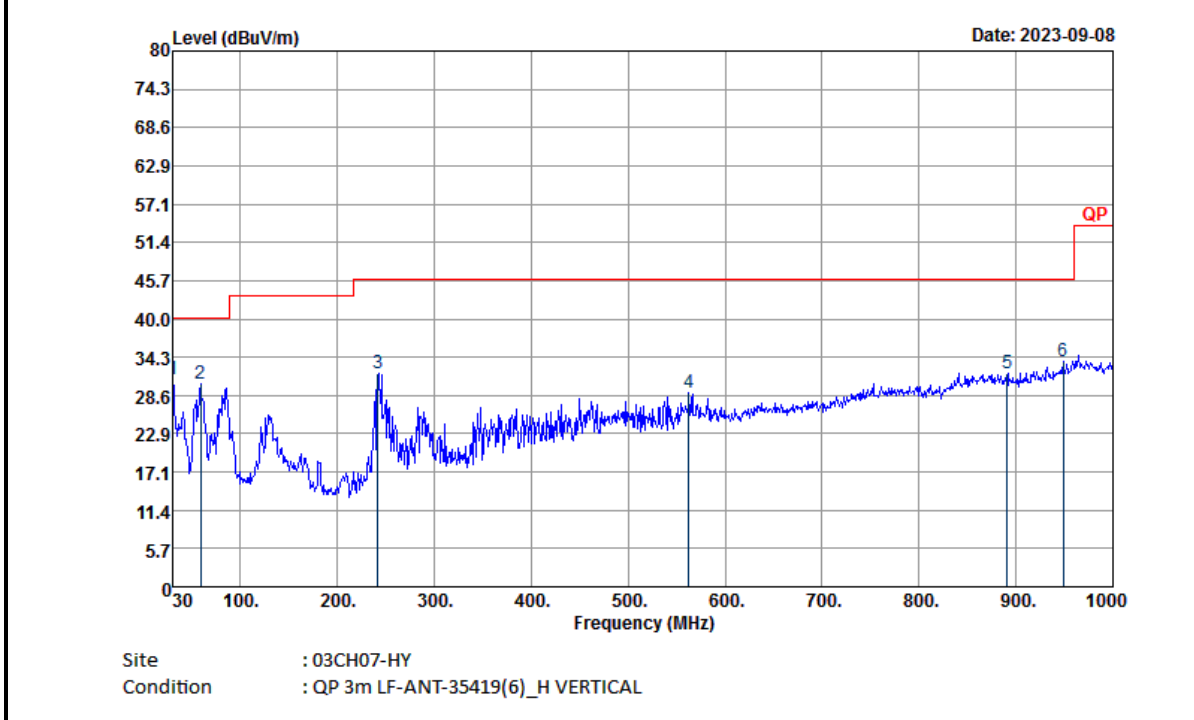
<b>Test Mode :</b>	NFC Tx	<b>Polarization :</b>	Horizontal
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Frequency ( MHz )	Level ( dB $\mu$ V/m )	Over Limit ( dB )	Limit Line ( dB $\mu$ V/m )	Read Level ( dB $\mu$ V )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
85.62	23.09	-16.91	40	37.56	14.07	1.51	30.05	-	-	Peak
128.82	28.24	-15.26	43.5	38.7	17.63	1.88	29.97	-	-	Peak
241.14	32.33	-13.67	46	42.43	17.34	2.49	29.93	-	-	Peak
347.6	30.23	-15.77	46	36.89	20.19	3.01	29.86	-	-	Peak
753.6	30.12	-15.88	46	27.46	27.83	4.57	29.74	-	-	Peak
955.9	33.23	-12.77	46	26.45	30.42	5.16	28.8	-	-	Peak



Test Mode :	NFC Tx	Polarization :	Vertical
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Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
30	30.99	-9.01	40	35.95	24.11	1.01	30.08	-	-	Peak
58.62	30.26	-9.74	40	47.14	11.71	1.35	29.94	-	-	Peak
241.68	31.93	-14.07	46	41.96	17.4	2.5	29.93	-	-	Peak
562.5	28.89	-17.11	46	29.15	25.86	3.89	30.01	-	-	Peak
890.8	31.91	-14.09	46	27.23	28.75	5	29.07	-	-	Peak
948.9	33.75	-12.25	46	27.24	30.2	5.14	28.83	-	-	Peak

**Note:**

1. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
2. Emission level (dBμV/m) = 20 log Emission level (μV/m).
3. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor= Level.
4. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.