FCC TEST REPORT

For

EMV Android Validator

Model Number: FX925SF-ING-VWDC-PRE, 011P; FX925SF-ING-VPDC-PRE, 011P; FX925SF-ING-VWDC-PRE, 010P; FX925SF-ING-VPDC-PRE, 010P

FCC ID: 2AGQIFX925F

Report Number : WT218003686

Test Laboratory	:	Shenzhen Academy of Metrology and Quality Inspection
Site Location	:	NETC Building, No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China
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TEST REPORT DECLARATION

Applicant	:	FAMOCO SAS
Address	:	59 avenue Victor Hugo Paris, France
Manufacturer	:	FAMOCO SAS
Address	:	59 avenue Victor Hugo Paris, France
EUT Description	:	EMV Android Validator
Model No	:	FX925SF-ING-VWDC-PRE, 011P; FX925SF-ING-VPDC-PRE, 011P; FX925SF-ING-VWDC-PRE, 010P; FX925SF-ING-VPDC-PRE, 010P
Trade mark	:	Famoco
Serial Number	:	/
FCC ID	:	2AGQIFX925F

Test Standards:

FCC Part 15 Subpart C 15.225 (2020)

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Project Engineer:	周芳媛	Date:	Jan.14, 2022
	(Zhou Fangai 周芳媛)		
Checked by:	施昌达	Date:	Jan.14, 2022
	(Shi Changda 施昌达)		
Approved by:	林奕翔	Date:	Jan.14, 2022
	(Lin Yixiang 林奕翔)		

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1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	FCC Rules	Test Results
Occupied Bandwidth	2.1049	Pass
In-Band Emission	15.225(a)(b)(c)	Pass
Out-of-Band Emission	15.209 15.225(d)	Pass
Conducted emission test for AC power port	15.207	Pass
Frequency Stability Tolerance	15.225(e)	Pass
Antenna Requirement	15.203	Pass

Remark: “N/A” means “Not applicable.”

2. GENERAL INFORMATION

2.1. Report information

This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

The lab will not be liable for any loss or damage resulting for false, inaccurate, inappropriate or incomplete product information provided by the applicant/manufacturer.

2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at NETC Building, No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.

The Laboratory is Accredited Testing Laboratory of FCC with Designation number CN1165 and Site registration number 582918.

The Laboratory is registered to perform emission tests with Innovation, Science and Economic Development (ISED), and the registration number is 11177A.

The Laboratory is registered to perform emission tests with VCCI, and the registration number are C-20048, G20076, R-20077, R-20078 and T-20047.

The Laboratory is Accredited Testing Laboratory of American Association for Laboratory Accreditation (A2LA) and certificate number is 3292.01.

2.3. Measurement Uncertainty

Conducted Emission
9 kHz~150 kHz U=3.7dB k=2
150 kHz~30MHz U=3.3dB k=2

Radiated Emission
30MHz~1000MHz U=4.3dB k=2
1GHz~6GHz U=4.6 dB k=2
6GHz~40GHz U=5.1dB k=2

3. PRODUCT DESCRIPTION

NOTE: The extreme test conditions for temperature and antenna gain were declared by the manufacturer.

3.1. EUT Description

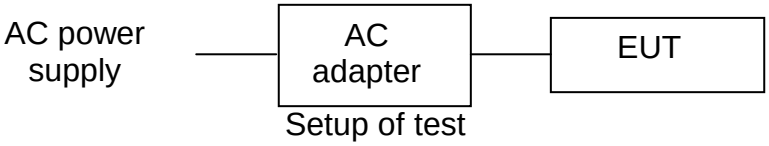
Description	:	EMV Android Validator
Manufacturer	:	FAMOCO SAS
Model Number	:	FX925SF-ING-VWDC-PRE, 011P; FX925SF-ING-VPDC-PRE, 011P; FX925SF-ING-VWDC-PRE, 010P; FX925SF-ING-VPDC-PRE, 010P
Operate Frequency	:	13.56MHz
Modulation	:	ASK
Antenna Designation	:	Integral antenna
Operating voltage	:	DC: 10.8V (Low)/12V (Nominal)/ 13.2V (Max)
Software Version	:	MOLY.LR12A.R2.MP.V44.1.P1
Hardware Version	:	FX925F-P

Remark: Remark: This is test report is for application of FCC ID: 2AGQIFX925F, which consists of reuse data of FCC ID: 2AGQIFX205. This report updates the standard FCC Part 15 15.209, 15.225 (2018) to FCC Part 15 Subpart C 15.225 (2020).See the APPENDIX I Product Equality Declaration for the differences between the new model(FX925SF-ING-VWDC-PRE, 011P; FX925SF-ING-VPDC-PRE, 011P; FX925SF-ING-VWDC-PRE, 010P; FX925SF-ING-VPDC-PRE, 010P) and the original model (FX925F PM, FX925F WM).
Considering above changes, in this test report, only the worst case of Conducted emission, Radiated Bandedge and Radiated spurious emission was re-tested, the other test data were reused the original test report No.: WT198005840.

3.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **2AGQIFX925F**, filing to comply with Section 15.209 and 15.225 of the FCC Part 15 Subpart C Rules.

3.3. Block Diagram of EUT Configuration



Setup of test

3.4. Operating Condition of EUT

The Radiated spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission (X plane).

3.5. Support Equipment List

Table 2 Support Equipment List

Name	Model No	S/N	Manufacturer
Adapter for EUT	LST-S72U12-A	---	ShenZhen GoldLister Power Source Co.,Ltd
Rechargeable Li-ion Polymer Battery for EUT	FX205 Series	---	Zhuhai Greaton Electronic Technology.Co., Ltd
DC Battery	---	---	---
Keyboard	SK-2015	---	HP
Mouse	MSU1465	---	HP

3.6. Test Conditions

Date of Re-test：Jan.14, 2022
Date of EUT Receive：Dec.10, 2021
Temperature: 20 ℃
Relative Humidity: 35-41%

Date of test：Oct.15, 2019 - Nov.07, 2019
Date of EUT Receive：Oct.15, 2019
Temperature: 21 ~ 25 ℃
Relative Humidity: 42-53%

3.7. Special Accessories

Not available for this EUT intended for grant.

3.8. Equipment Modifications

Not available for this EUT intended for grant.

4. TEST EQUIPMENT USED

Table 3 Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB9058/05	Test Receiver	R&S	ESCI 3	Sep.24,2021	1 Year
SB4357	AMN	R&S	ENN216	Aug.25,2021	1 Year
SB9549	Shielded Room	Albatross	SR	Sep.24,2021	1 Year
SB15044/01	Test Receiver	R&S	ESW8	Sep.14,2021	1 Year
SB12944	Broadband Antenna	R&S	VULB9163	Jan.08,2021	1 Year
SB3345	Loop Antenna	Schwarzbeck	FMZB1516-113	Feb.05,2021	1 Year
SB18844	Semi Anechoic Chamber	Albatross	9×6×6(m)	Mar.23,2021	1 Year
SB12829	Spectrum Analyzer	Rohde & Schwarz	FSL18	May.29, 2019	1 Year
SB9721/07	DC Source	Agilent	66319D	--	--
SB11818	Temperature & Humidity Test chamber	Espec	EH-010U	Mar.25, 2019	1 Year

5. 20DB BANDWIDTH MEASUREMENT

5.1. Test Standard

5.1.1. Test Standard

FCC part 2.1049

5.2. TEST PROCEDURE

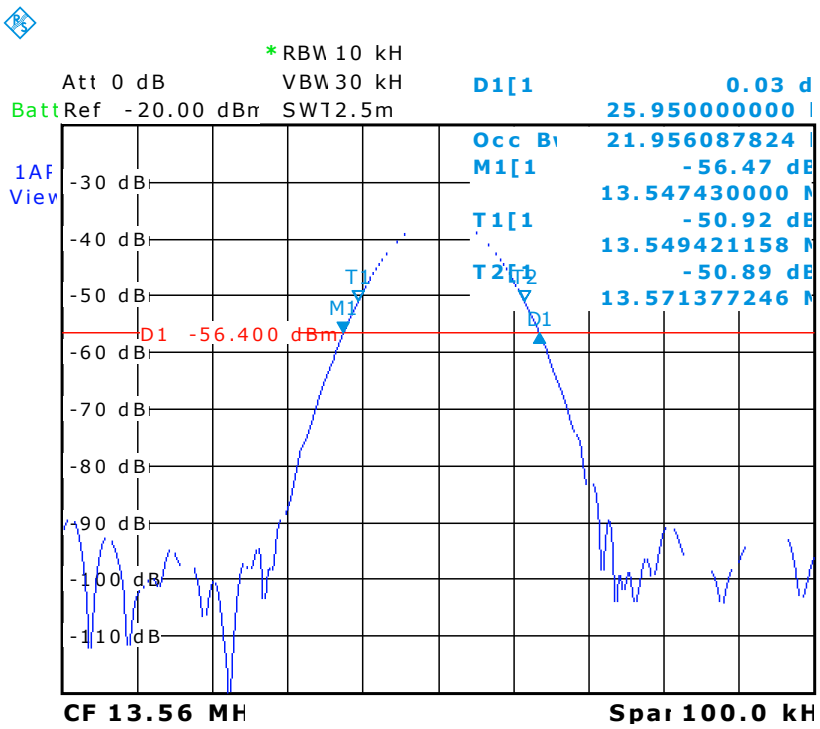
The 20dB bandwidth is measured with a spectrum analyzer connected via a receive antenna placed near the EUT while the EUT is operating in transmission mode

5.3. TEST SETUP

5.4. Test Data

Table 4 20dB Bandwidth Test Data

FREQUENCY (MHz)	20dB BANDWIDTH (kHz)	99% BANDWIDTH (kHz)
13.56	25.95	21.956


*RBW 10 kH
Att 0 dB
VBW 30 kH
D1[1
0.03 d
Batt
Ref -20.00 dBm
SWT 2.5m
25.950000000
Occ B
21.956087824
M1[1
-56.47 dB
13.547430000
T1[1
-50.92 dB
13.549421158
T2[1
-50.89 dB
13.571377246
1AP
View
-30 dB
-40 dB
-50 dB
-60 dB
-70 dB
-80 dB
-90 dB
-100 dB
-110 dB
D1 -56.400 dBm
M1
D1
CF 13.56 MH
Spar 100.0 kH

6. IN-BAND RADIATED SPURIOUS EMISSION MEASUREMENTS

6.1. Test Standard

6.1.1. Test Standard

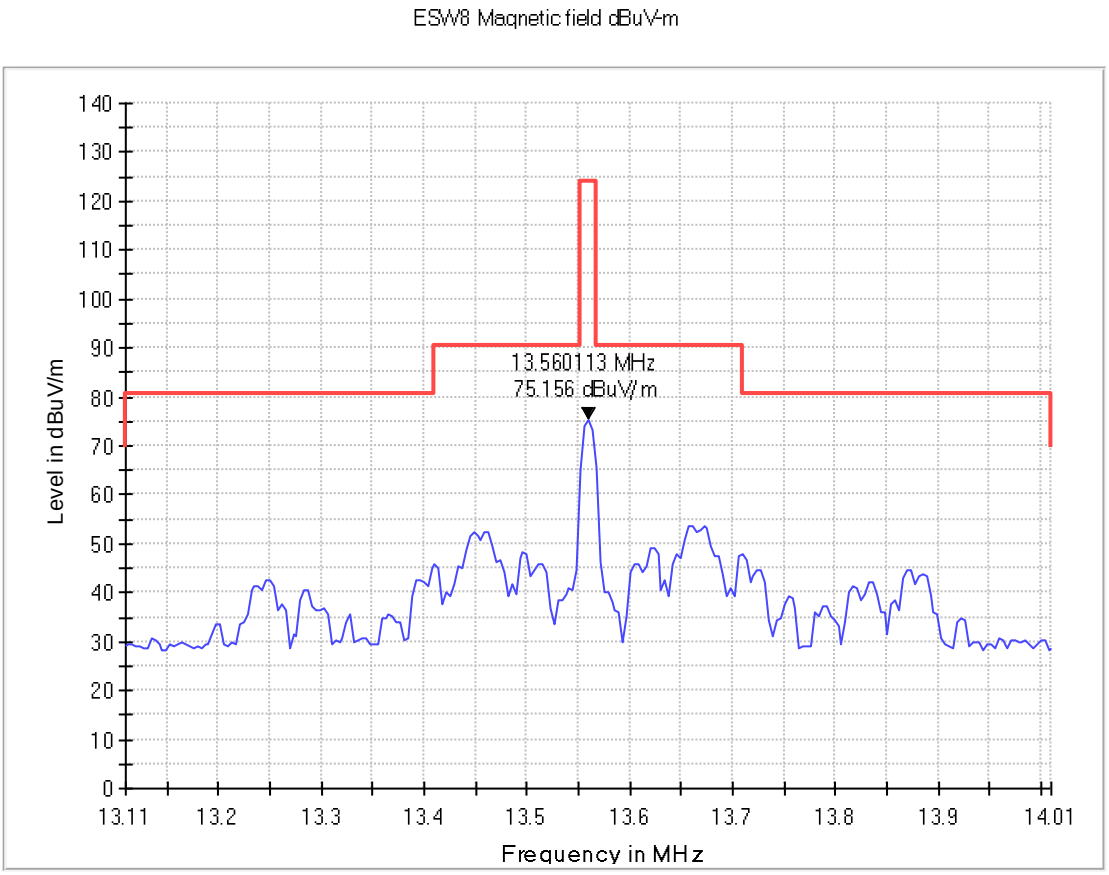
FCC part 15.225(a)(b)(c)

6.2. TEST PROCEDURE

Radiated emission testing was performed in the band 13.110 – 14.010 MHz.
1. All measurements were performed using a loop antenna. The antenna was positioned in three orthogonal positions (X front, Y side, Z top) and the position with the highest emission level was recorded.
2. The EUT was positioned in three orthogonal planes to determine the orientation resulting in the worst case emissions.
3. Measurements were performed at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2).
Extrapolation Factor = 20 log 10 (30/3) 2 = 40dB.
4. The spectrum was investigated from 9kHz up to 30MHz using the loop antenna. Only the emissions shown in the table above were found to be significant.
5. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector.

6.3. TEST DATA

Emission level(dBuV)=Read Value(dBuV/m) + Antenna Factor(dB)+ Cable Loss + pre amp(dB)
The emissions don't show in above result tables are more than 20dB below the limits



Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (deg)	Corr. (dB)	ANT Position (deg)
13.560	75.16	124	48.84	0	20	0

7. RADIATED SPURIOUS EMISSION MEASUREMENTS, OUT-OF-BAND

7.1. Test Standard and Limit

7.1.1. Test Standard

FCC part 15.205, 15.209 &15.225(d)

7.1.2. Test Limit

FCC Part 15.209

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Fieldstrength (microvolts/meter)	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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permItted under other sections of this part, e.g., §§ 15.231 and 15.241.

Formula for converting the filed strength from μV/m to dBμV/m is:

$dB\mu V/m = 20\log^{(\mu V/m)}$

7.2. TEST PROCEDURE

The EUT was tested from 9kHz up to the 1GHz excluding the band 13.110 – 14.010 MHz. All measurement sup to 960MHz were recorded with a spectrum analyzer employing a quasi-peak detector. All out-of-band emissions must not exceed the limits shown in Table 8-5 per Section 15.209. A loop antenna was used to investigate emissions below 30MHz

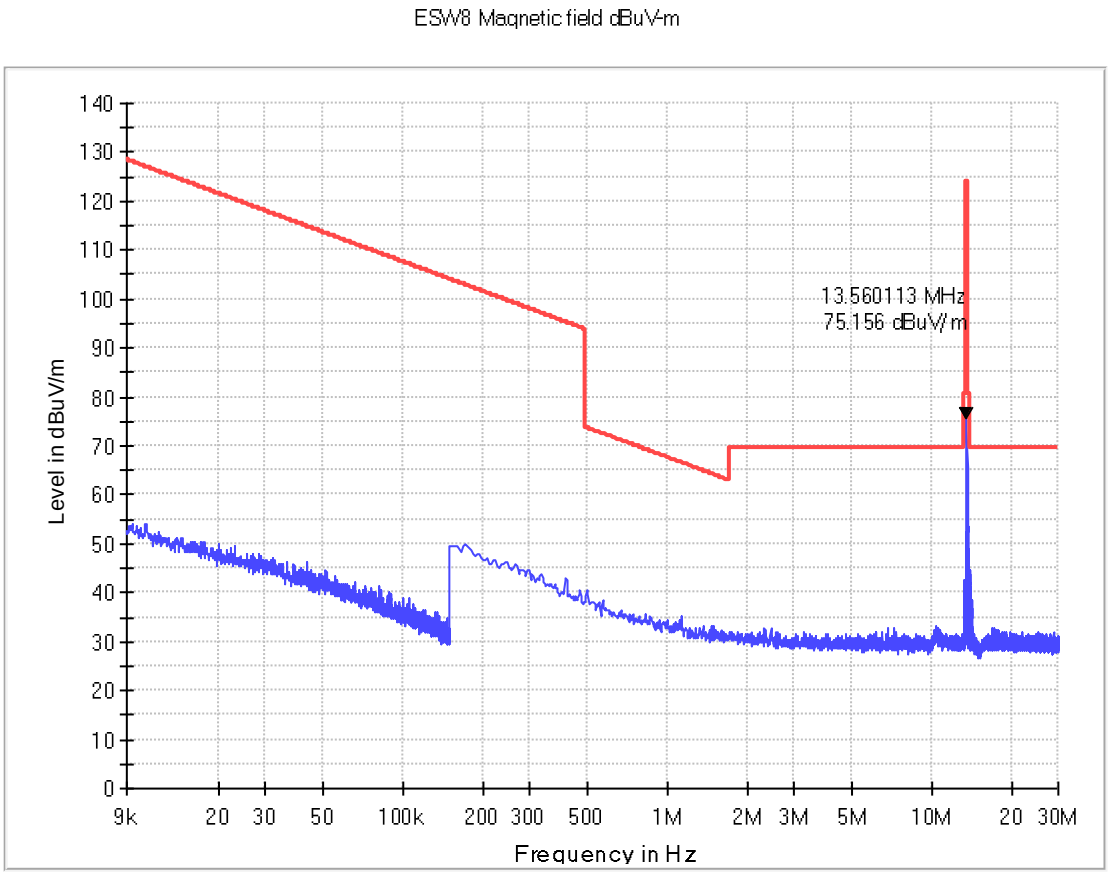
7.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

7.4. TEST DATA

The emissions don’t show in following result tables are more than 20dB below the limits.

9 kHz-30MHz



30MHz-1GHz

Table 5 Radiated Emission Test Data 30MHz-1GHz

Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (Horizontal /Vertical)	Limit (dBμV/m)	Margin (dB)	Note
33.395	0.7	12.3	16.3	29.3	Vertical	40	10.7	QP
40.670	0.7	13.6	11.9	26.2	Vertical	40	13.8	QP
237.459	1.8	11.2	20.2	33.2	Vertical	46	12.8	QP
479.959	2.6	15.6	13.3	31.5	Vertical	46	14.5	QP
804.060	3.6	20.1	8.7	32.4	Vertical	46	13.6	QP
960.473	3.9	21.1	20.3	45.3	Vertical	54	8.7	QP
191.990	1.6	10.6	16.5	28.7	Horizontal	43.5	14.8	QP
215.998	1.7	10.6	17.7	30.0	Horizontal	43.5	13.5	QP
240.005	1.9	12.1	27.5	41.5	Horizontal	46	4.5	QP
479.959	2.6	15.6	12.1	30.3	Horizontal	46	15.7	QP
720.398	3.4	18.8	8.8	31.0	Horizontal	46	15.0	QP
960.473	3.9	21.1	18.0	43.0	Horizontal	54	11.0	QP

Remark: Emission level (dBuV) =Read Value (dBuV/m) + Antenna Factor (dB) + Cable Loss +preamp (dB)

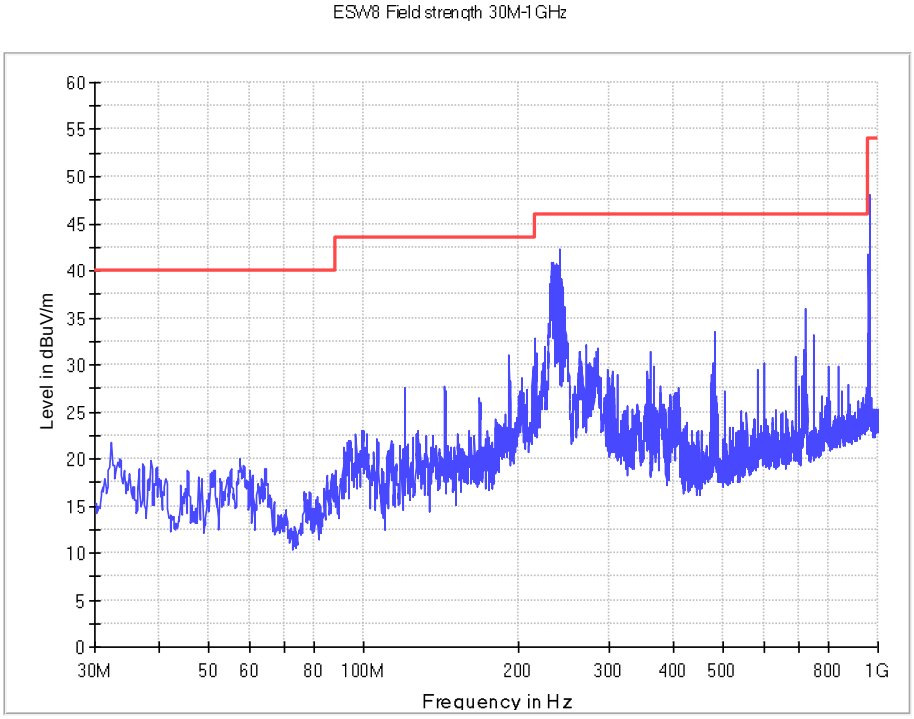
Frequency
(MHz)
Cable
Loss +preamp
(dB)
Antenna Factor
(dB)
Reading
(dBμV/m)
Level
(dBμV/m)
Polarity
(Horizontal
/Vertical)
Limit
(dBμV/m)
Margin
(dB)
Note

85.411
1.0
10.3
10.7
22.0
Vertical
40
18.0
QP

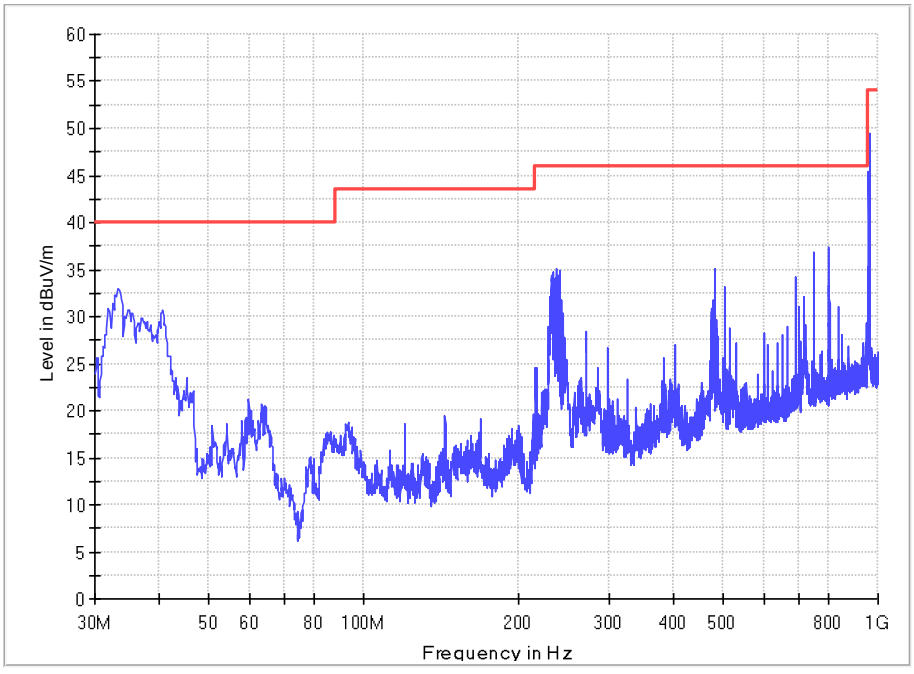
90.867
1.2
11.9
9.0

30MHz-1GHz

Horizontal



Vertical



8. CONDUCTED EMISSION TEST FOR AC POWER PORT MEASUREMENT

8.1. Test Standard and Limit

8.1.1. Test Standard

FCC Part 15.207

8.1.2. Test Limit

Table 6 Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dBμV)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

* Decreasing linearly with logarithm of the frequency
* The lower limit shall apply at the transition frequency.

8.2. Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver is used to test the emissions from both sides of AC line. According to the requirements in Section 7 and 13 of ANSI C63.4a-2017.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.
The bandwidth of EMI test receiver is set at 9 kHz.

8.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

8.4. Test Data

The emissions don’t show in below are too low against the limits. Refer to the test curves.

Table 7 Conducted Emission Test Data

	Frequency (MHz)	Correction Factor (dB)	Quasi-Peak			Average		
			Reading (dBμV)	Emission Level (dBμV)	Limit (dBμV)	Reading (dBμV)	Emission Level (dBμV)	Limit (dBμV)
Line	0.150	9.7	34.1	43.8	66	17.3	27.0	56
	0.235	9.7	25.1	34.8	62.3	17.9	27.6	52.3
	0.339	9.7	28.6	38.3	59.2	25.0	34.7	49.2
	0.685	9.8	10.3	20.1	56	4.2	14.0	46
	3.223	9.9	16.1	26.0	56	4.7	14.6	46
	16.166	9.9	18.6	28.5	60	13.8	23.7	50
Neutral	0.154	9.7	31.5	41.2	65.8	17.9	27.6	55.8
	0.244	9.7	26.6	36.3	62.0	22.8	32.5	52.0
	0.339	9.7	29.6	39.3	59.2	26.5	36.2	49.2
	2.553	9.9	13.8	23.7	56	0.1	10.0	46
	3.309	9.9	16.3	26.2	56	4.4	14.3	46
	16.255	9.9	20.0	29.9	60	14.6	24.5	50

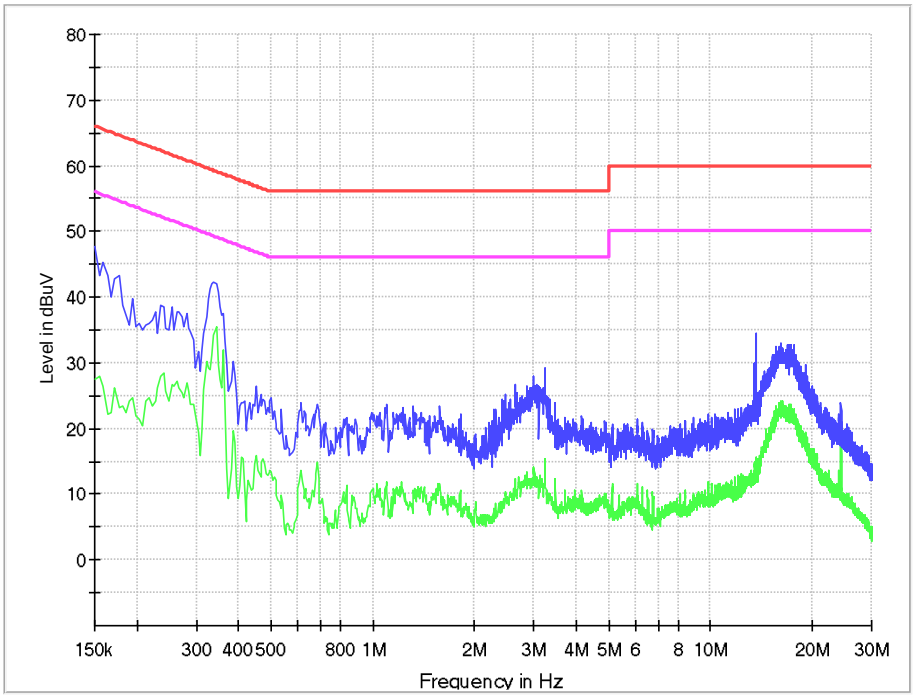
REMARKS: 1. Emission level (dBuV)=Read Value (dBuV) + Correction Factor(dB)

2. Correction Factor (dB) =LISN Factor (dB) + Cable Factor (dB)+Limiter Factor(dB)

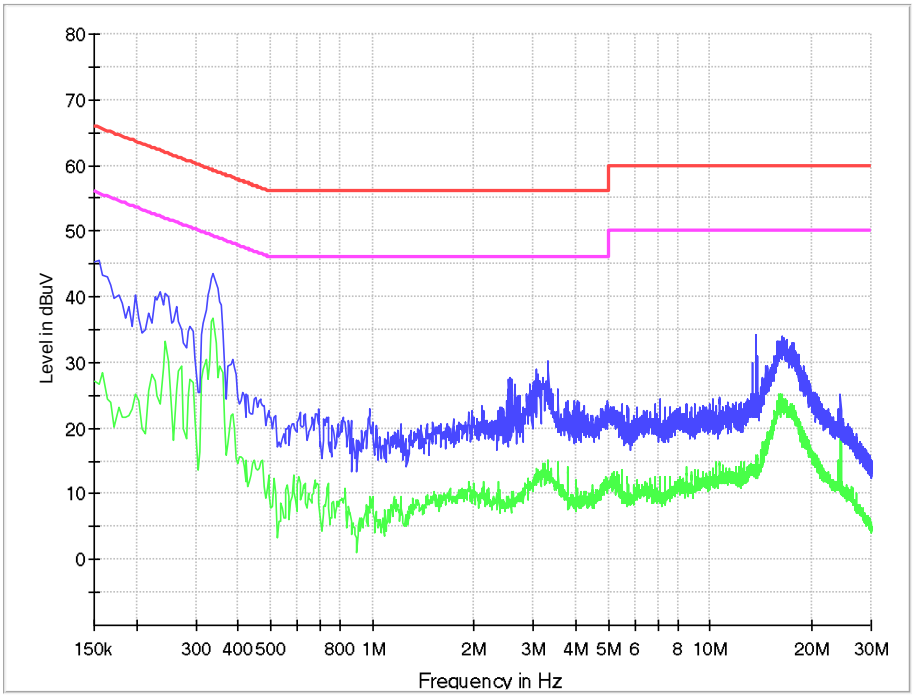
3. The other emission levels were very low against the limit.

4.13.56MHz is a fundamental frequency of the EUT

Line



Neutral



9. FREQUENCY STABILITY TOLERANCE

9.1. Test Standard

9.1.1. Test Standard

FCC part 15.225(e)
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 battery operated equipment, the equipment tests shall be performed using a new battery.

9.2. TEST PROCEDURE

ANSI C63.10-2013 Clause 6.8

9.3. TEST DATA

Table 8 Frequency Stability Tolerance Test Data

Nominal Frequency (MHz)	Voltage (%)	Voltage (Vdc)	Temperature (°C)	Measured Frequency Error(Hz)	Limit (Hz)	Verdict
13.56	100%	12	-20	52	1356	PASS
	100%	12	-10	-36	1356	PASS
	100%	12	0	-72	1356	PASS
	100%	12	+10	-15	1356	PASS
	100%	12	+20	63	1356	PASS
	100%	12	+30	108	1356	PASS
	100%	12	+40	-76	1356	PASS
	100%	12	+50	-12	1356	PASS
	High	13.8	+20	84	1356	PASS
	End. Point	10.8	+20	104	1356	PASS

10. ANTENNA REQUIREMENT

According to Section 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 EUT has a built in antenna which is integrated inside the enclosure, this is permanently attached antenna and meets the requirements of this section.

11. APPENDIX I PRODUCT EQUALITY DECLARATION

Product Equality Declaration

We: FAMOCO SAS, declare on our sole responsibility the differences between the hardware revision of **NFC Android Validator** products.

The new models of **NFC Android Validator** are:

- FX925SF-ING-VWDC-PRE,011P
- FX925SF-ING-VPDC-PRE,011P
- FX925SF-ING-VWDC-PRE,010P
- FX925SF-ING-VPDC-PRE,010P

All parts of hardware revision: FX925F-P.

NFC Android Validator models are made of two parts, a Front Casing, and a Back Casing. The composition of each model is described below.

Models	Front Casing Models	Back Casing Models
FX925SF-ING-VWDC-PRE,011P	FC-FX925SF-ING-PRE,0112	BC-VWDC-P366C,4
FX925SF-ING-VPDC-PRE,011P	FC-FX925SF-ING-PRE,0112	BC-VPDC-P366C,4
FX925SF-ING-VWDC-PRE,010P	FC-FX925SF-ING-PRE,0102	BC-VWDC-P366C,4
FX925SF-ING-VPDC-PRE,010P	FC-FX925SF-ING-PRE,0102	BC-VPDC-P366C,4

The original models of **NFC Android Validator** are:

- FX925F PM
- FX925F WM

All parts of hardware revision: FX925F,1

They are also made of two parts, a Front Casing and a Back Casing. The composition of each model is described below.

Models	Front Casing Models	Back Casing Models
FX925F WM	FC-FX925SF-ING-PRE,0112	BC-VWDC-P366C,2
FX925F PM	FC-FX925SF-ING-PRE,0112	BC-VPDC-P366C,2

Differences between **NFC Android Validator** hardware revisions FX925F,1 and FX925F-P are listed below.

To identify product pieces described below products exploded views are at the end of this document.

Table 1: List of differences between the two Front Casing versions of NFC Android Validators FC-FX925SF-ING-PRE,0112 *and* FC-FX925SF-ING-PRE,0102*:*

#	Differences	FC-FX925SF-ING-PRE,0112	FC-FX925SF-ING-PRE,0102
#1	Battery	• 1 Smartphone battery	• No smartphone battery

Table 2: List of differences between the two Back Casing versions of NFC Android Validators BC-VWDC-P447C,4 and BC-VPDC-P447C,4:

#	Differences	BC-VWDC-P366C,4	BC-VPDC-P366C,4
#1	Mechanical parts	• Wall mount	• Pole mount

Table 3:List of differences between the NFC Android Validator Back Casings Wall BC-VWDC-P366C,2 *and* BC-VWDC-P366C,4*:*

#	Differences	NFC Android Validator BC-VWDC-P366C,2	NFC Android Validator BC-VWDC-P366C,4
#1	PCBA POWER	• PCBA PWR V18 with ferrites on cables	• PCBA PWR V07

Table 4:List of differences between the NFC Android Validator Back Casing Pole BC-VPDC-P366C,4 *and* BC-VPDC-P366C,4*:*

#	Differences	NFC Android Validator BC-VPDC-P366C,2	NFC Android Validator BC-VPDC-P366C,4
#1	PCBA PWR	• PCBA PWR V18 with ferrites on cables	• PCBA PWR V07

Table 5:List of differences between the FX925SF-ING-VWDC-PRE,011P,FX925SF-ING-VWDC-PRE,010P FX925SF-ING-VPDC-PRE,011P,FX925SF-ING-VPDC-PRE,010P,and FX925F WM,FX925F PM

Models	Software version
FX925SF-ING-VWDC-PRE,011P,FX925SF-ING-VWDC-PRE,010P FX925SF-ING-VPDC-PRE,011P,FX925SF-ING-VPDC-PRE,010P	MOLY.LR12A.R2.MP.V44.1.P1
FX925F WM,FX925F PM	MOLY.LR12A.R2.MP.V44.1

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