FCC RF Test Report

APPLICANT	:	**Sony Mobile Communications Inc.**
EQUIPMENT	:	**Smart phone**
BRAND NAME	:	**Sony**
FCC ID	:	**PY7-PM0952**
STANDARD	:	**FCC Part 15 Subpart C §15.225**
CLASSIFICATION	:	**(DXX) Low Power Communication Device Transmitter**

The testing was completed on Apr. 19, 2016. We, SPORTON INTERNATIONAL INC., 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 report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory 1190

SPORTON INTERNATIONAL INC.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR620405D	Rev. 01	Initial issue of report	Apr. 30, 2016
FR620405D	Rev. 02	Updating EUT information in section 1.3.	May 10, 2016

SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	**FCC Rule**	**Description of Test**	**Result**	**Under Limit**
3.1	15.207	AC Power Line Conducted Emissions	Complies	3.40 dB at 13.558 MHz
3.2	15.225(a)(b)(c)	Field Strength of Fundamental Emissions	Complies	66.85 dB at 13.560 MHz
3.3	2.1049	20dB Spectrum Bandwidth	Complies	-
	-	99% OBW Spectrum Bandwidth		
3.4	15.225(d) 15.209	Radiated Emissions	Complies	7.72 dB at 30.000 MHz
3.5	15.225(e)	Frequency Stability	Complies	-
3.6	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.26dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±4.8dB	Confidence levels of 95%

1. GENERAL INFORMATION

1.1 Applicant

Sony Mobile Communications Inc.

4-12-3 Higashi-Shinagawa, Shinagawa-ku,Tokyo, 140-0002, Japan

1.2 Manufacturer

Sony Mobile Communications Inc.

4-12-3 Higashi-Shinagawa, Shinagawa-ku,Tokyo, 140-0002, Japan

1.3 Product Details

Items	Description
Channel Number	1
20dBW	2.66kHz
99%OBW	2.24kHz

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

EUT Information List				
IMEI	HW Version	SW Version	S/N	Performed Test Item
004402455814016	A	36.0.A.1.28	WUJ01M8BA5	RF Conducted Measurement Radiated Emission
004402455814008			WUJ01M8BA4	AC Conducted Emission

Accessory List	
AC Adapter	Model No. : UCH20
	Type No. : AC-0060-US
	S/N : 1315W52500072 (for Radiated Spurious Emission) 1315W52500025 (for Conducted Emission)
Earphone	Model No. : MH410c
	Type No. : AG-1100
	S/N : 1435204403A9122 (for Radiated Spurious Emission) 14321E5F00817B2 (for Conducted Emission)
USB Cable	Model No. : UCB16
	Type No. : AI-0142
	S/N : 1602A901000542E (for Radiated Spurious Emission) 1602A90A000378C (for Conducted Emission)

Note:

1. Above EUT list and accessory list used are electrically identical per declared by manufacturer.
2. Above the accessories list are used to exercise the EUT during test.
3. For other wireless features of this EUT, test report will be issued separately.

1.4 Modification of EUT

No modifications are made to the EUT during all test items.

1.5 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978		
Test Site No.	Sporton Site No.		
	TH03-HY	CO05-HY	03CH07-HY
Test Engineer	Tommy Lee	Derreck Chen	James Chiu
Temperature	21~24°C	21~22°C	21~23°C
Relative Humidity	51~55%	52~53%	55~58%

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

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 30-2, Dingfu Tsuen, Linkou District, New Taipei City, Taiwan 244, R.O.C. TEL: +886-2-2603-5367 / +886-2-2601-1640 FAX: +886-2-2601-1695
Test Site No.	Sporton Site No.
	OS03-LK
Test Engineer	Eric Jeng
Temperature	26~27℃
Relative Humidity	44~46%

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

1.6 Applicable Standards

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

- FCC Part 15 Subpart C §15.225
- ANSI C63.10-2013

1.7 Test Modes

Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

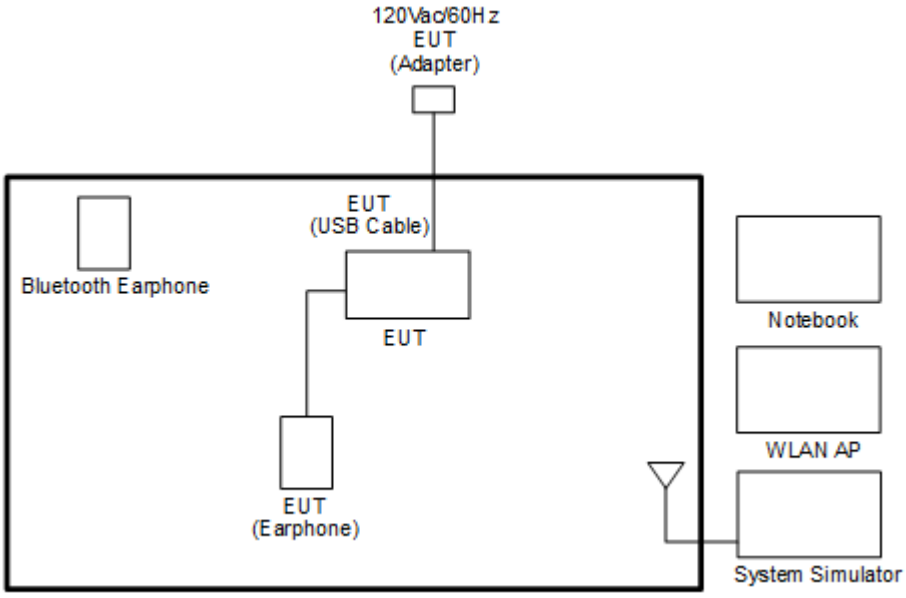
Test Items	
AC Power Line Conducted Emissions	Field Strength of Fundamental Emissions
20dB Spectrum Bandwidth	Frequency Stability
Radiated Emissions 9kHz~30MHz	Radiated Emissions 30MHz~1GHz

Note:

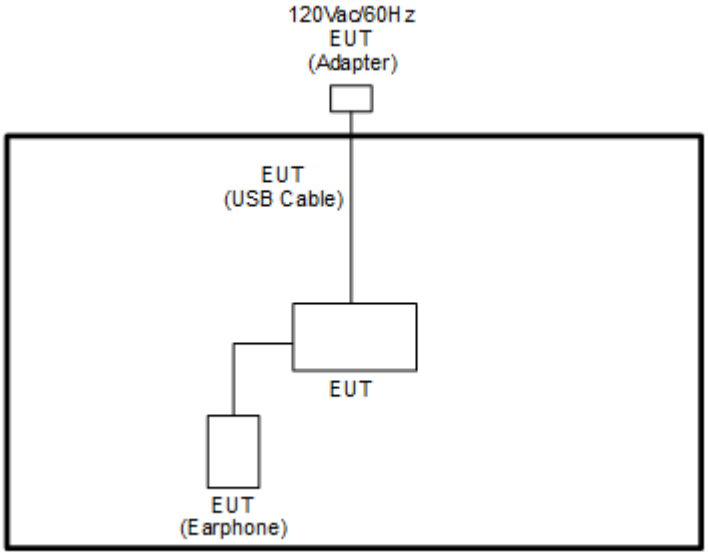
1. The EUT was programmed to be in continuously transmitting mode.
2. The ancillary equipment, NFC card, is used to make the EUT (NFC) continuously transmit at 13.56MHz and is placed around 3 cm gap to the EUT.

1.8 Test Configurations

<AC Conducted Emissions>



<For Fundamental Emissions and Mask and Radiated Emissions Measurement>



1.9 Table for Supporting Units

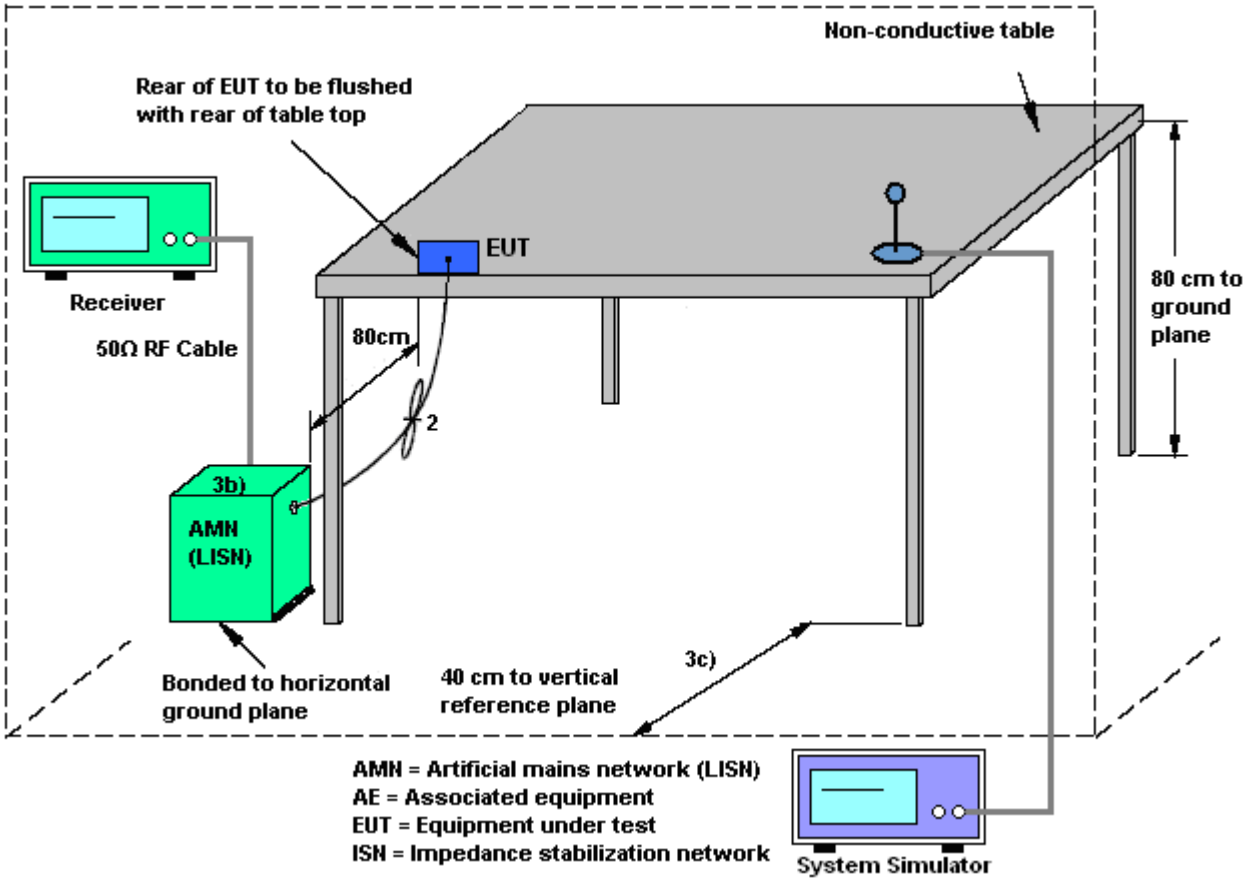
Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
3.	Bluetooth Earphone	Sony	SBH20	PY7-RD0010	Unshielded, 0.75m	N/A
4.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	NFC Card	Metro Taipei	Easy Card	N/A	N/A	N/A
6.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2. CONDUCTED EMISSION TEST

2.1 Measuring Instruments

See list of measuring instruments of this test report.

2.2 Test setup



2.3 Test Result of Conducted Emission Test

Please refer to Appendix A.

2.4 AC Power Line Conducted Emissions Measurement

2.4.1 Limit

For equipment 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.

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

2.4.2 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

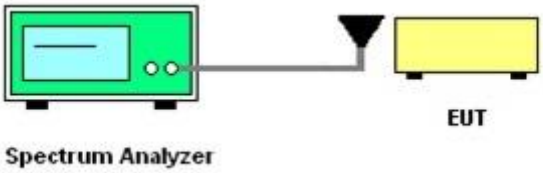
3. CONDUCTED TEST ITEMS

3.1 Measuring Instruments

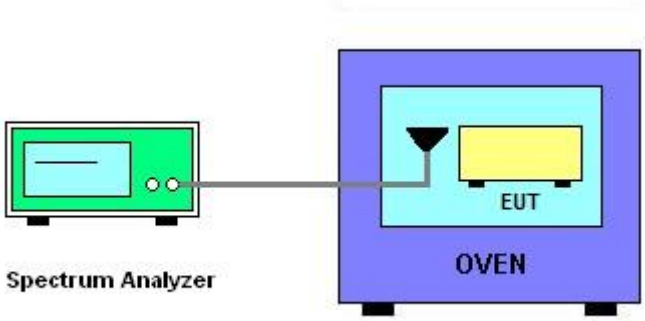
See list of measuring instruments of this test report.

3.2 Test Setup

3.2.1 20dB and 99% OBW Spectrum Bandwidth



3.2.2 Frequency Stability



3.3 Test Result of Conducted Test Items

Please refer to Appendix B.

3.4 20dB and 99% OBW Spectrum Bandwidth Measurement

3.4.1 Limit

Intentional radiators must be designed to ensure that the 20dB and 99% emission bandwidth in the specific band 13.553~13.567MHz.

3.4.2 Test Procedures

1. The spectrum analyzer connected via a receive antenna placed near the EUT in peak Max hold mode.
2. The resolution bandwidth of 1 kHz and the video bandwidth of 3 kHz were used.
3. Measured the spectrum width with power higher than 20dB below carrier.
4. Measured the 99% OBW.

3.5 Frequency Stability Measurement

3.5.1 Limit

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% (100ppm) 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.

3.5.2 Test Procedures

1. The spectrum analyzer connected via a receive antenna placed near the EUT.
2. EUT have transmitted signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire emissions bandwidth.
4. Set RBW = 1 kHz, VBW = 3 kHz with peak detector and maxhold settings.
5. The fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 10^6 ppm and the limit is less than ±100ppm.
6. Extreme temperature rule is -20°C~50°C.

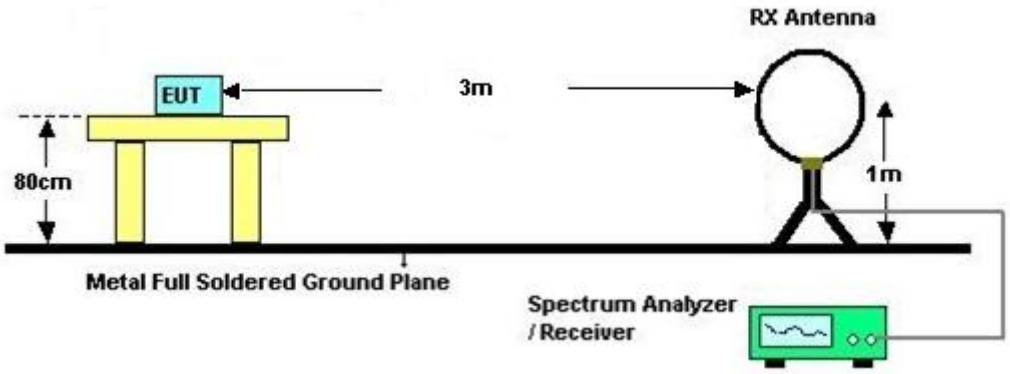
4. RADIATED TEST ITEMS

4.1 Measuring Instruments

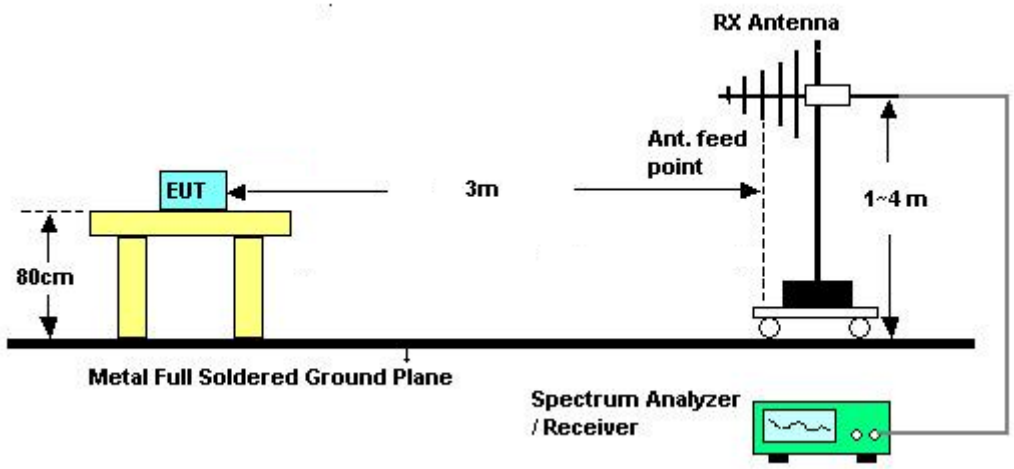
See list of measuring instruments of this test report.

4.2 Test Setup

4.2.1 For radiated emissions below 30MHz



4.2.2 For radiated emissions above 30MHz



4.3 Test Result of Radiated Test Items

Please refer to Appendix C.

4.4 Field Strength of Fundamental Emissions and Mask Measurement

4.4.1 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

4.4.2 Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the loop receiving antenna mounted antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the receiving antenna was 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 9kHz.

Note: Emission level (dBμV/m) = 20 log Emission level (μV/m).

4.5 Radiated Emissions Measurement

4.5.1 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

4.5.2 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, 110-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

4.5.3 Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT was 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 was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was 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 was scan (from 1 M to 4 M) and then the turntable was 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 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. Antenna Requirements

4.5.4 Limit

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.

4.5.5 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

5. LIST OF MEASURING EQUIPMENT

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
RF Cable	JYEBAO	K30K30-5003-0.5M40	N/A	0.1MHz~40GHz	Mar. 23, 2015	Feb. 18, 2016 ~ Feb. 19, 2016	Mar. 22, 2016	Conducted (TH03-HY)
RF Cable	JYEBAO	K30K30-5003-0.5M40	N/A	0.1MHz~40GHz	Mar. 22, 2016	Apr. 19, 2016	Mar. 21, 2017	Conducted (TH03-HY)
Hygrometer	Testo	608-H1	34893241	N/A	May 04, 2015	Feb. 18, 2016~ Apr. 19, 2016	May 03, 2016	Conducted (TH03-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101329	9kHz~30GHz	Jun. 24, 2015	Feb. 18, 2016~ Apr. 19, 2016	Jun. 23, 2016	Conducted (TH03-HY)
Temperature Chamber	ESPEC	SU-641	92013721	-30℃ ~70℃	Nov. 20, 2015	Feb. 18, 2016~ Apr. 19, 2016	Nov. 19, 2016	Conducted (TH03-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Feb. 23, 2016	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Aug. 26, 2015	Feb. 23, 2016	Aug. 25, 2016	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Apr. 20, 2015	Feb. 23, 2016	Apr. 19, 2016	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 02, 2015	Feb. 23, 2016	Dec. 01, 2016	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 06, 2016	Feb. 23, 2016	Jan. 05, 2017	Conduction (CO05-HY)

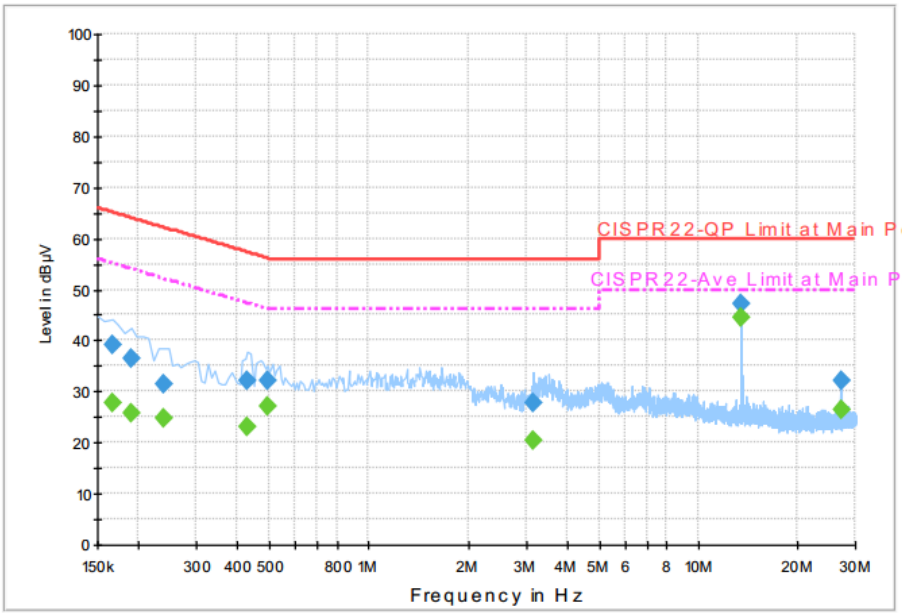
Note: Test equipment calibration is traceable to the procedure of ISO17025.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Bilog Antenna	TESEQ	CBL 6111D	35419	30MHz~1GHz	Jan. 13, 2016	Feb. 22, 2016	Jan. 12, 2017	Radiation (03CH07-HY)
Hygrometer	Testo	608-H1	34897197	N/A	May 04, 2015	Feb. 22, 2016	May 03, 2016	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Sep. 02, 2015	Feb. 22, 2016	Sep. 01, 2016	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz-1000MHz	Mar. 12, 2015	Feb. 22, 2016	Mar. 11, 2016	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Mar. 03, 2015	Feb. 22, 2016	Mar. 02, 2016	Radiation (03CH07-HY)
Controller	ChainTek	Chaintek 3000	N/A	Control Turn table	N/A	Feb. 22, 2016	N/A	Radiation (03CH07-HY)
Controller	Max-Full	MF7802	MF780208368	Control Ant Mast	N/A	Feb. 22, 2016	N/A	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Feb. 22, 2016	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 degree	N/A	Feb. 22, 2016	N/A	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY84209521	9kHz~1GHz	Dec. 03, 2015	Feb. 22, 2016	Dec. 02, 2016	Radiation (03CH07-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Aug. 26, 2015	Feb. 22, 2016	Aug. 25, 2016	Radiation (03CH07-HY)
Test Software	N/A	E3	6.2009-8-24 (sporton)	N/A	N/A	Feb. 22, 2016	N/A	Radiation (03CH07-HY)
Filter	Wainwright	WHK20 /1000C7/40SS	SN2	20M High Pass	Oct. 01, 2015	Feb. 22, 2016	Sep. 30, 2016	Radiation (03CH07-HY)

Note: Test equipment calibration is traceable to the procedure of ISO17025.

Appendix A. Test Results of Conducted Emission Test

Test Mode :	NFC Tx	Test Voltage :	120Vac / 60Hz
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + NFC Tx + Earphone		



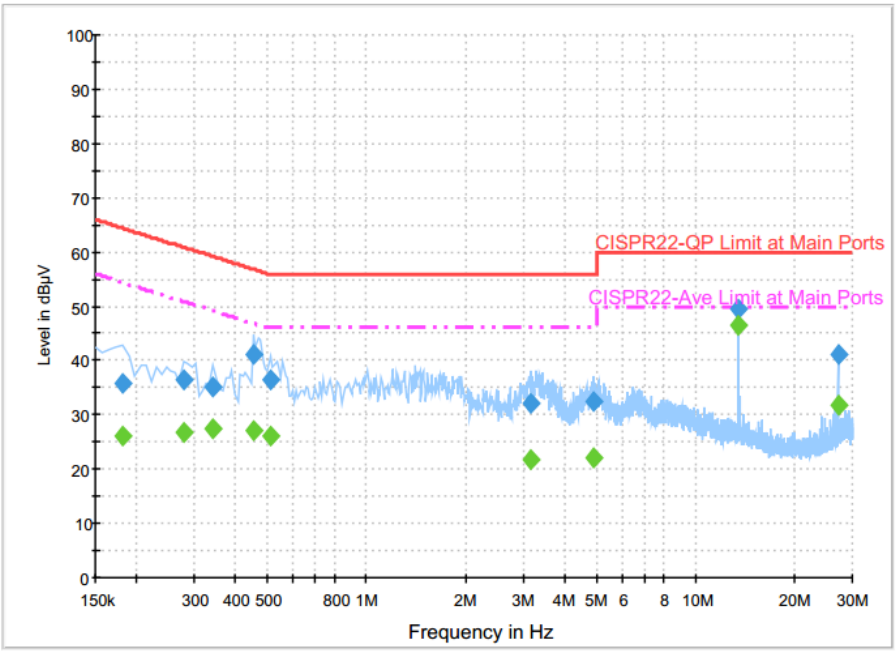
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	39.0	Off	L1	19.6	26.2	65.2
0.190000	36.4	Off	L1	19.6	27.6	64.0
0.238000	31.5	Off	L1	19.6	30.7	62.2
0.430000	32.0	Off	L1	19.6	25.3	57.3
0.494000	32.2	Off	L1	19.6	23.9	56.1
3.166000	27.7	Off	L1	19.6	28.3	56.0
13.558000	47.1	Off	L1	19.8	12.9	60.0
27.118000	32.0	Off	L1	19.9	28.0	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	27.6	Off	L1	19.6	27.6	55.2
0.190000	25.9	Off	L1	19.6	28.1	54.0
0.238000	24.7	Off	L1	19.6	27.5	52.2
0.430000	23.2	Off	L1	19.6	24.1	47.3
0.494000	27.1	Off	L1	19.6	19.0	46.1
3.166000	20.4	Off	L1	19.6	25.6	46.0
13.558000	44.5	Off	L1	19.8	5.5	50.0
27.118000	26.3	Off	L1	19.9	23.7	50.0

Test Mode :	NFC Tx	Test Voltage :	120Vac / 60Hz
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + NFC Tx + Earphone		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	36.0	Off	N	19.6	28.4	64.4
0.278000	36.4	Off	N	19.6	24.5	60.9
0.342000	35.1	Off	N	19.6	24.1	59.2
0.454000	41.2	Off	N	19.6	15.6	56.8
0.510000	36.5	Off	N	19.6	19.5	56.0
3.166000	32.1	Off	N	19.6	23.9	56.0
4.918000	32.5	Off	N	19.7	23.5	56.0
13.558000	49.5	Off	N	19.8	10.5	60.0
27.118000	41.1	Off	N	20.1	18.9	60.0

Final Result : Average

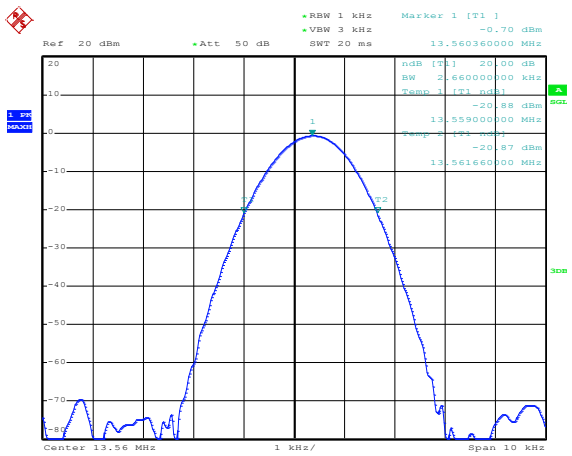
Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	26.2	Off	N	19.6	28.2	54.4
0.278000	26.6	Off	N	19.6	24.3	50.9
0.342000	27.4	Off	N	19.6	21.8	49.2
0.454000	27.0	Off	N	19.6	19.8	46.8
0.510000	26.2	Off	N	19.6	19.8	46.0
3.166000	21.8	Off	N	19.6	24.2	46.0
4.918000	21.9	Off	N	19.7	24.1	46.0
13.558000	46.6	Off	N	19.8	3.4	50.0
27.118000	31.9	Off	N	20.1	18.1	50.0

Remark: 13.558MHz is the NFC RF fundamental signal.

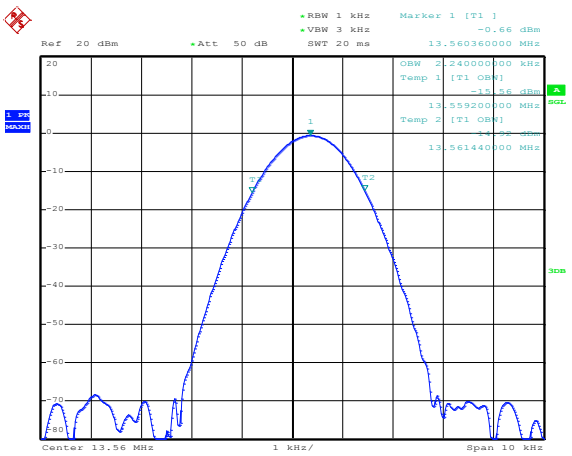
Appendix B. Test Results of Conducted Test Items

B.1 Test Result of 20dB Spectrum Bandwidth

Test mode	NFC Tx	Test Frequency (MHz)	13.56



Date: 18.FEB.2016 16:25:56



Date: 18.FEB.2016 16:34:58

20dB Bandwidth (kHz)	2.660	99% Occupied BW(kHz)	2.240
Frequency range (MHz)	**f_L > 13.553**	13.55900	**Test Result**
	f_H < 13.567	13.56166	**Complies**

B.2 Test Result of Frequency Stability

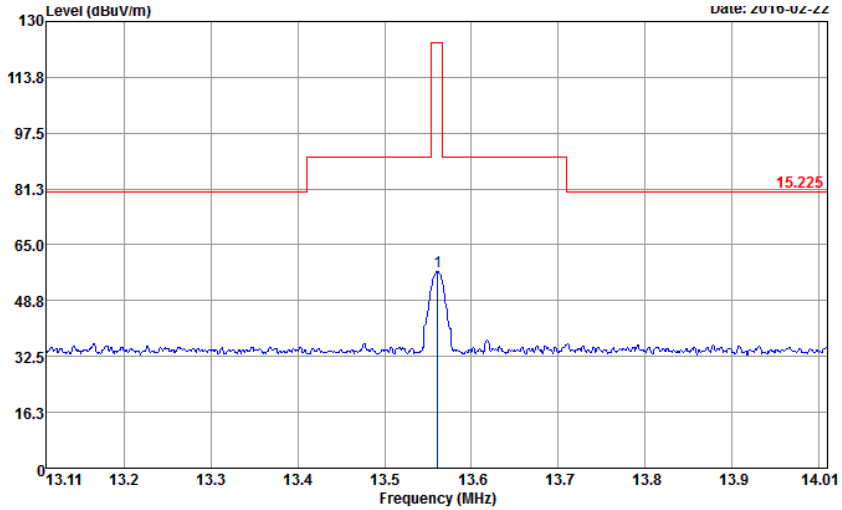
Voltage vs. Frequency Stability		Temperature vs. Frequency Stability		
Voltage (Vac)	Measurement Frequency (MHz)	Temperature (℃)	Time	Measurement Frequency (MHz)
120	13.560330	**-20**	**0**	13.560360
102	13.560320		**2**	13.560320
138	13.560330		**5**	13.560340
			10	13.560360
		-10	**0**	13.560360
			2	13.560350
			5	13.560360
			10	13.560360
		0	**0**	13.560360
			2	13.560360
			5	13.560360
			10	13.560360
		10	**0**	13.560360
			2	13.560360
			5	13.560360
			10	13.560360
		20	**0**	13.560340
			2	13.560350
			5	13.560340
			10	13.560330
		30	**0**	13.560330
			2	13.560310
			5	13.560320
			10	13.560310
		40	**0**	13.560310
			2	13.560300
			5	13.560290
			10	13.560290

Voltage vs. Frequency Stability		Temperature vs. Frequency Stability		
Voltage (Vac)	Measurement Frequency (MHz)	Temperature (℃)	Time	Measurement Frequency (MHz)
		50	0	13.560280
			2	13.560280
			5	13.560290
			10	13.560280
Max.Deviation (MHz)	0.000330	Max.Deviation (MHz)		0.000360
Max.Deviation (ppm)	24.3363	Max.Deviation (ppm)		26.5487
Limit	FS < ±100 ppm	Limit		FS < ±100 ppm
Test Result	PASS	Test Result		PASS

Appendix C. Test Results of Radiated Test Items

C.1 Test Result of Field Strength of Fundamental Emissions

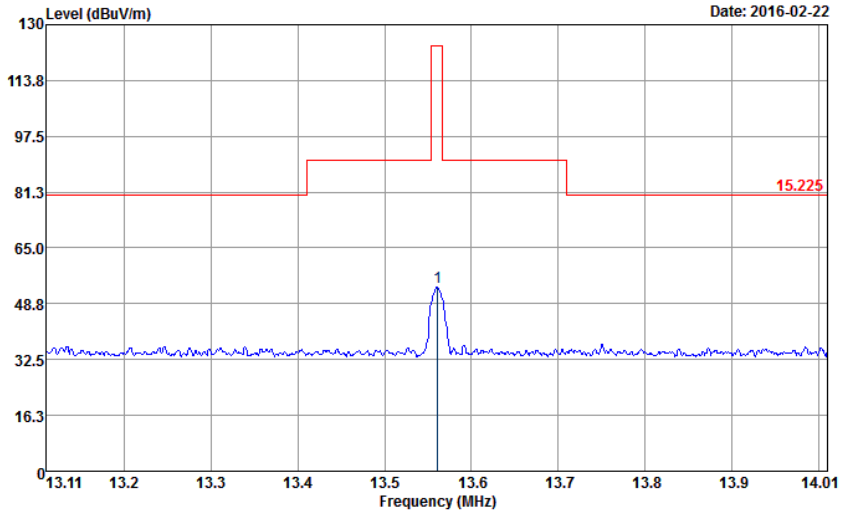
Test Mode :	NFC Tx	Test Frequency (MHz)	13.56



Site : 03CH07-HY
Condition : 15.225 3m LOOP_ANT(H) HORIZONTAL

: Z_With accessory
: Type F

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1	13.56	57.15	-66.85	124.00	36.42	20.05	0.68	100	121	QP



Site : 03CH07-HY
Condition : 15.225 3m LOOP_ANT(V) VERTICAL

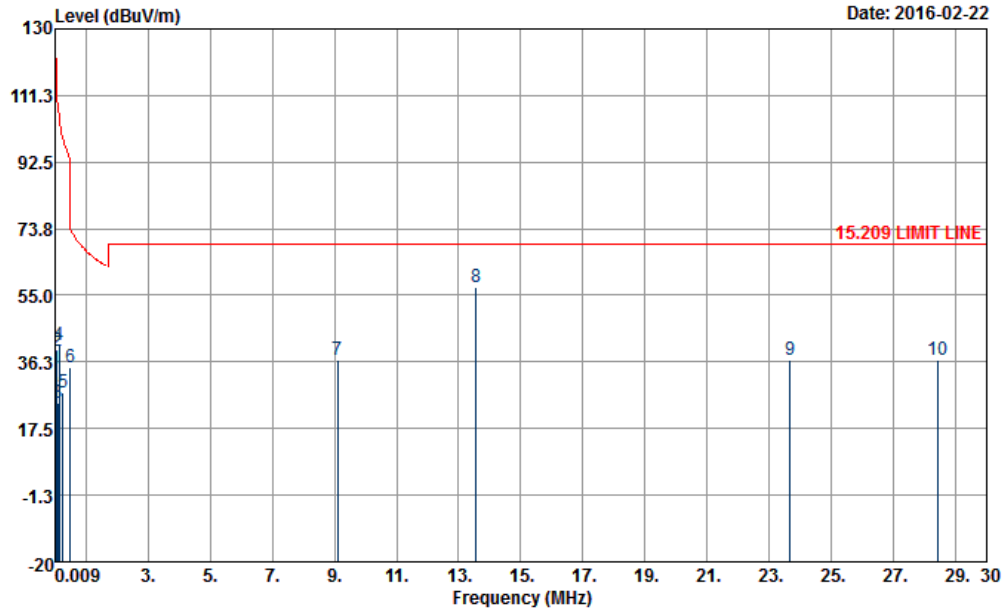
: Z_With accessory
: Type F

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1	13.56	53.43	-70.57	124.00	32.70	20.05	0.68	100	66	QP

Note: All NFC's spurious emissions are below 20dB of limits.

C.2 Results of Radiated Emissions (9 kHz~30MHz)

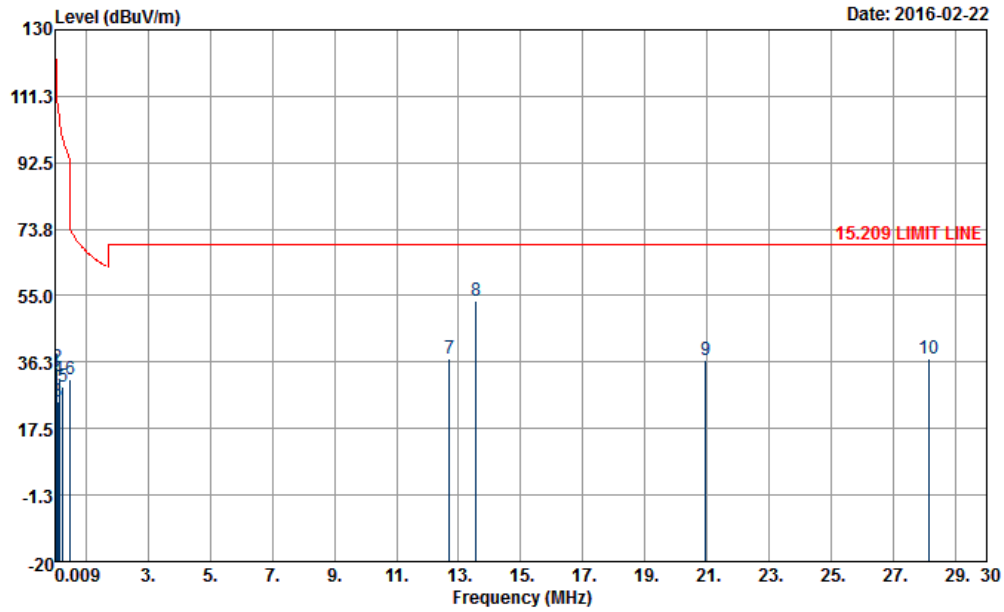
Test Mode :	NFC Tx	Polarization :	Horizontal



Site : 03CH07-HY
Condition : 15.209 LIMIT LINE 3m LOOP_ANT(H) HORIZONTAL

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
0.01532	34.49	-89.41	123.9	13.56	20.25	0.68	-	-	Average
0.06471	39.46	-71.92	111.38	18.74	20.04	0.68	-	-	Average
0.0967	24.56	-83.34	107.9	3.89	19.99	0.68	-	-	QP
0.1294	40.95	-64.42	105.37	20.3	19.97	0.68	-	-	Average
0.26084	27.6	-71.68	99.28	7	19.92	0.68	-	-	Average
0.49751	34.88	-38.79	73.67	14.3	19.9	0.68	-	-	QP
9.112	36.75	-32.75	69.5	16.08	19.99	0.68	-	-	QP
13.56	57.15	-12.35	69.5	36.42	20.05	0.68	-	-	QP
23.677	36.93	-32.57	69.5	15.29	20.57	1.07	100	0	QP
28.44	36.69	-32.81	69.5	15.06	20.56	1.07	-	-	QP

Test Mode :	NFC Tx	Polarization :	Vertical



Site : 03CH07-HY
Condition : 15.209 LIMIT LINE 3m LOOP_ANT(V) VERTICAL

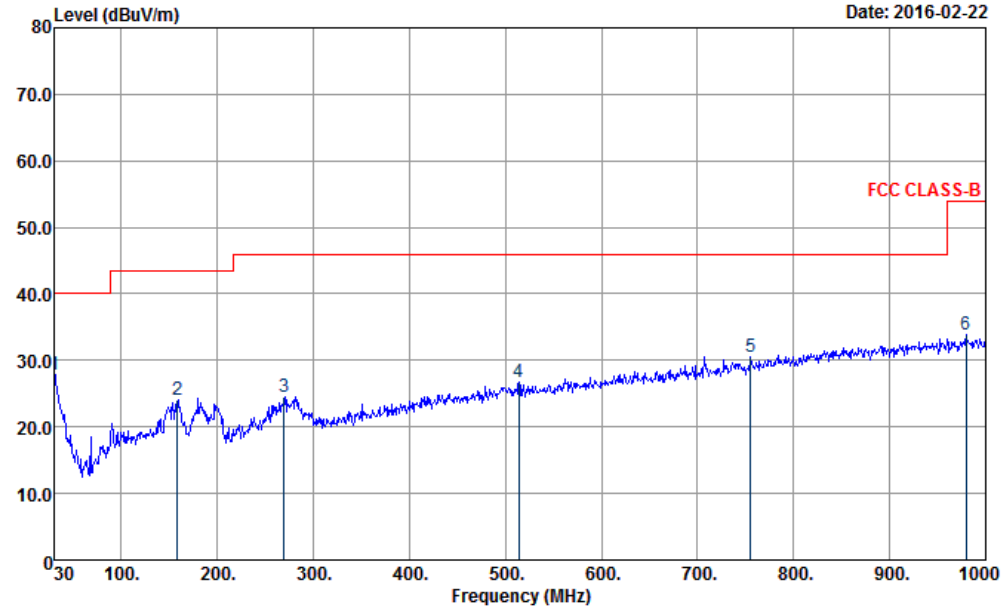
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
0.01328	33.33	-91.81	125.14	12.4	20.25	0.68	-	-	Average
0.06471	34.61	-76.77	111.38	13.89	20.04	0.68	-	-	Average
0.09236	25.13	-83.16	108.29	4.46	19.99	0.68	-	-	QP
0.1294	31.29	-74.08	105.37	10.64	19.97	0.68	-	-	Average
0.26288	29.43	-69.78	99.21	8.83	19.92	0.68	-	-	Average
0.49751	31.53	-42.14	73.67	10.95	19.9	0.68	-	-	QP
12.704	37.44	-32.06	69.5	16.7	20.06	0.68	100	0	QP
13.56	53.43	-16.07	69.5	32.7	20.05	0.68	-	-	QP
20.95	36.99	-32.51	69.5	15.42	20.5	1.07	-	-	QP
28.135	37.17	-32.33	69.5	15.51	20.59	1.07	-	-	QP

Note:

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

C.3 Results of Radiated Emissions (30MHz~1GHz)

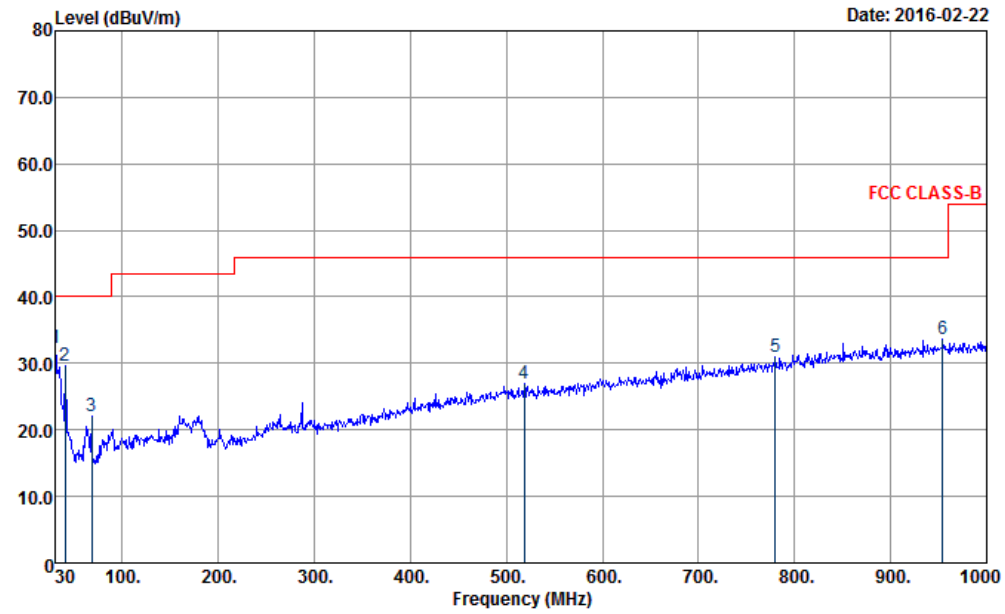
Test Mode :	NFC Tx	Polarization :	Horizontal



Site : 03CH07-HY
Condition : FCC CLASS-B 3m LF-ANT-35419(6) HORIZONTAL

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
30.27	27.85	-12.15	40	32.28	26	1.07	31.5	100	0	Peak
158.25	24.1	-19.4	43.5	36.37	17.14	1.78	31.19	-	-	Peak
269.76	24.46	-21.54	46	33.74	19.4	2.32	31	-	-	Peak
514.2	26.65	-19.35	46	29.86	24.31	3.14	30.66	-	-	Peak
755	30.6	-15.4	46	29.92	27.25	3.82	30.39	-	-	Peak
979.7	33.91	-20.09	54	29.86	30.26	4.07	30.28	-	-	Peak

Test Mode :	NFC Tx	Polarization :	Vertical



Site : 03CH07-HY
Condition : FCC CLASS-B 3m LF-ANT-35419(6) VERTICAL

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	32.28	-7.72	40	36.71	26	1.07	31.5	100	0	Peak
40.53	29.7	-10.3	40	39.99	19.84	1.07	31.2	-	-	Peak
67.8	22.08	-17.92	40	39.5	12.56	1.28	31.26	-	-	Peak
518.4	27	-19	46	30.18	24.35	3.14	30.67	-	-	Peak
779.5	31.02	-14.98	46	30.04	27.5	3.82	30.34	-	-	Peak
954.5	33.7	-12.3	46	29.8	30.21	4.07	30.38	-	-	Peak

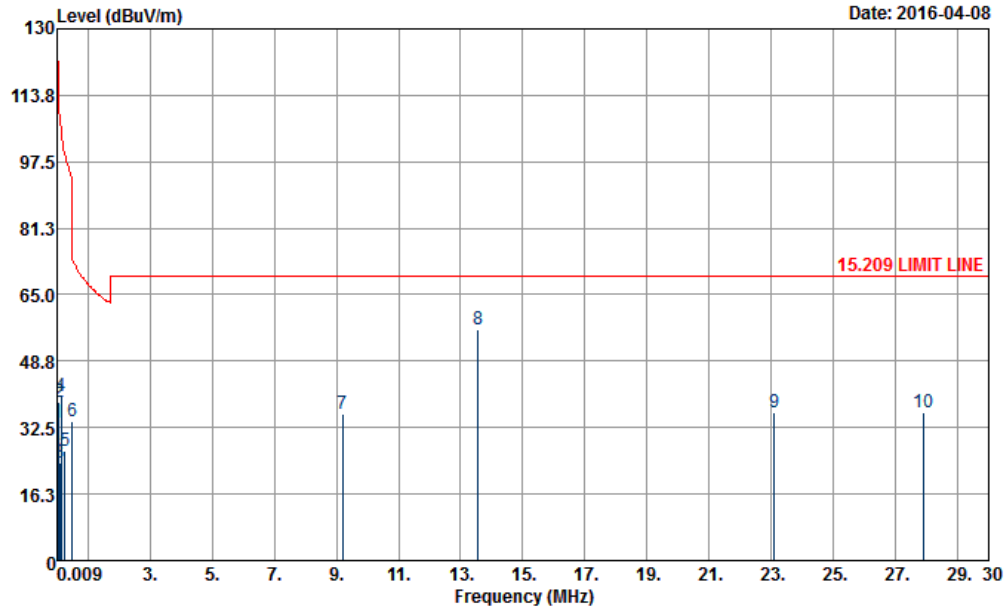
Note:

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.

Appendix D. Verification of Radiated Spurious Emissions at open-area test site

D.1 Results of Radiated Emissions (9 kHz~30MHz)

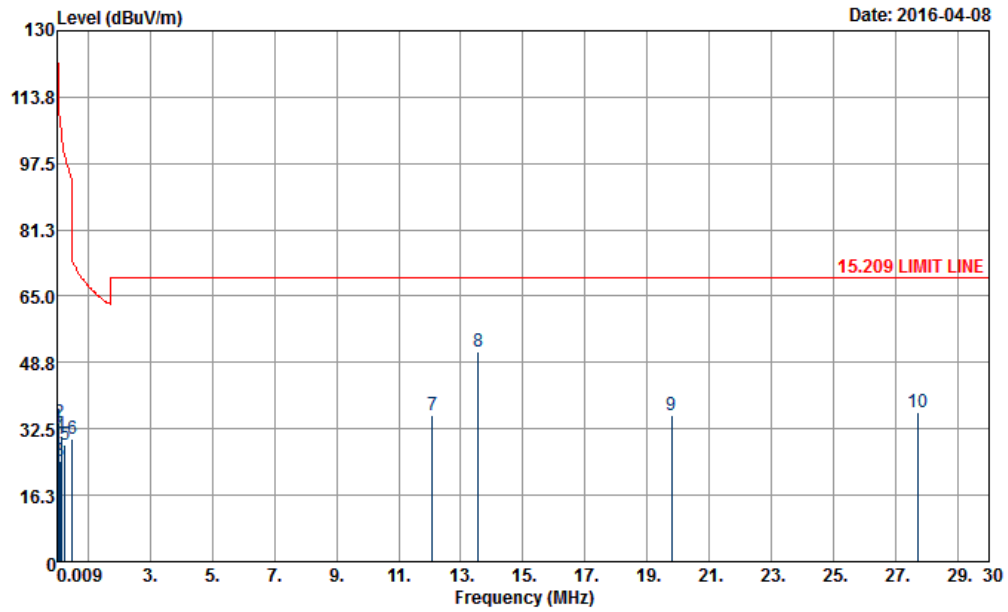
Test Mode :	NFC Tx	Polarization :	Horizontal



Site : OS03-LK
Condition : 15.209 LIMIT LINE 3m LOOP_ANT(H) HORIZONTAL

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
0.01563	33.8	-89.93	123.73	12.87	20.25	0.68	-	-	Average
0.06794	38.9	-72.06	110.96	18.18	20.04	0.68	-	-	Average
0.09896	23.9	-83.8	107.7	3.23	19.99	0.68	-	-	QP
0.13097	40.1	-65.16	105.26	19.45	19.97	0.68	-	-	Average
0.2694	26.8	-72.2	99	6.2	19.92	0.68	-	-	Average
0.5082	33.9	-39.58	73.48	13.32	19.9	0.68	-	-	QP
9.195	35.9	-33.6	69.5	15.23	19.99	0.68	-	-	QP
13.56	56.34	-13.16	69.5	35.61	20.05	0.68	-	-	QP
23.105	36.2	-33.3	69.5	14.57	20.56	1.07	-	-	QP
27.911	36.3	-33.2	69.5	14.62	20.61	1.07	100	274	QP

Test Mode :	NFC Tx	Polarization :	Vertical



Site : OS03-LK
Condition : 15.209 LIMIT LINE 3m LOOP ANT(V) VERTICAL

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
0.0121	32.9	-93.05	125.95	11.97	20.25	0.68	-	-	Average
0.06103	34.1	-77.79	111.89	13.38	20.04	0.68	-	-	Average
0.095	24.8	-83.25	108.05	4.13	19.99	0.68	-	-	QP
0.13407	30.8	-74.26	105.06	10.15	19.97	0.68	-	-	Average
0.2694	28.7	-70.3	99	8.1	19.92	0.68	-	-	Average
0.5082	30.1	-43.38	73.48	9.52	19.9	0.68	-	-	QP
12.09	35.98	-33.52	69.5	15.24	20.06	0.68	-	-	QP
13.56	51.27	-18.23	69.5	30.54	20.05	0.68	-	-	QP
19.791	35.9	-33.6	69.5	14.82	20.4	0.68	-	-	QP
27.7	36.58	-32.92	69.5	14.89	20.62	1.07	100	299	QP

Note:

1. 13.56 MHz are fundamental signal which can be ignored.
2. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
3. Distance extrapolation factor = 40 log (specific distance / test distance) (dB);
4. Limit line = specific limits (dBµV) + distance extrapolation factor.
5. The test distance between the receiving antenna and the EUT is 3meter.

D.2 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Test Receiver	R&S	ESCS 30	836858/024	9 kHz ~ 2.75 GHz	Jul. 17, 2015	Apr. 08, 2016	Jul. 16, 2016	Radiation (OS03-LK)
Loop Antenna	R&S	HFH2-Z2	25236	9 kHz ~ 30MHz	Sep. 02, 2015	Apr. 08, 2016	Sep. 01, 2016	Radiation (OS03-LK)
Turn Table	EMCO	2080	9711-2021	0 ~ 360 degree	N/A	Apr. 08, 2016	N/A	Radiation (OS03-LK)
Hygrometer	TECPEL	DTM-20	150606350	N/A	Jul. 30, 2015	Apr. 08, 2016	Jul. 29, 2016	Radiation (OS03-LK)
RF Cable	HUBER+SUHNER	SUCOFLEX 104	MY84209521	9kHz~1GHz	Dec. 03, 2015	Apr. 08, 2016	Dec. 02, 2016	Radiation (OS03-LK)
Controller	EMCO	2090	N/A	Control Turn table	N/A	Apr. 08, 2016	N/A	Radiation (OS03-LK)
Test software	N/A	E3	6.2009-8-24 (sporton)	N/A	N/A	Apr. 08, 2016	N/A	Radiation (OS03-LK)