



FCC RF Test Report

APPLICANT : Republic Wireless, Inc.
EQUIPMENT : Cellular Voice Device
BRAND NAME : Relay
MODEL NAME : RW2265
FCC ID : 2AMBHRW2265
STANDARD : FCC Part 15 Subpart C §15.225
CLASSIFICATION : (DXX) Low Power Communication Device Transmitter

The product was received on Jan. 12, 2018 and testing was completed on Mar. 27, 2018. We, Sporton International (Kunshan) 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 (Kunshan) Inc., the test report shall not be reproduced except in full.



Approved by: James Huang / Manager

Sporton International (Kunshan) Inc.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR811212D	Rev. 01	Initial issue of report	Apr. 27, 2018



SUMMARY OF THE TEST RESULT

Part	FCC Rule	Description of Test	Result	Remark
3.1	15.207	AC Power Line Conducted Emissions	Complies	Under limit 15.82 dB at 0.152MHz
3.2	15.215(c)	20dB Spectrum Bandwidth	Complies	-
	-	99% OBW Spectrum Bandwidth	Complies	-
3.3	15.225(e)	Frequency Stability	Complies	-
3.4	15.225(a)(b)(c)	Field Strength of Fundamental Emissions	Complies	Max level 63.51 dB μ V/m at 13.560 MHz
3.5	15.225(d) 15.209	Radiated Emissions	Complies	Under limit 4.01 dB at 40.670 MHz
3.6	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	± 2.3 dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	± 4.5 dB	Confidence levels of 95%



1. GENERAL INFORMATION

1.1 Applicant

Republic Wireless, Inc.

940 Main Campus Drive, Ste 300, Raleigh, NC 27606, United States

1.2 Manufacturer

Bluebank Communication Technology Co Ltd

No.16 Cuiping Road, Yubei District, Chongqing , P.R.China, 401120

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Cellular Voice Device
Brand Name	Relay
Model Name	RW2265
FCC ID	2AMBHRW2265
EUT supports Radios application	CDMA/EV-DO/WCDMA/HSPA/DC-HSDPA/HSPA+(16QAM uplink is not supported)/LTE/NFC WLAN 2.4GHz 802.11b/g/n HT20/ Bluetooth v3.0 + EDR / Bluetooth v4.0 LE / Bluetooth v4.1 LE
HW Version	B1
SW Version	msm8909_BLUEBANK-QC26A-000-01-15-01.20.2018_user debug
EUT Stage	Identical Prototype

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



1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	13.553 ~ 13.567MHz
Channel Number	1
20dBW	2.48KHz
99%OBW	2.10KHz
Antenna Type	FPC Antenna
Type of Modulation	ASK

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

1.5 Modification of EUT

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



1.6 Testing Location

Sporton International (Kunshan) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600155-0) and the FCC designation No is CN5013.

Test Site	Sporton International (Kunshan) Inc.			
Test Site Location	No.3-2 Ping-Xiang Rd, Kunshan Development Zone Kunshan City Jiangsu Province 215335 China TEL : +86-512-57900158 FAX : +86-512-57900958			
Test Site No.	Sporton Site No.			FCC Test Firm Registration No.
	TH01-KS	03CH02-KS	CO01-KS	630927

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

1.7 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



2. TEST CONFIGURATION OF EQUIPMENT UNDER TEST

2.1 Descriptions of Test Mode

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.

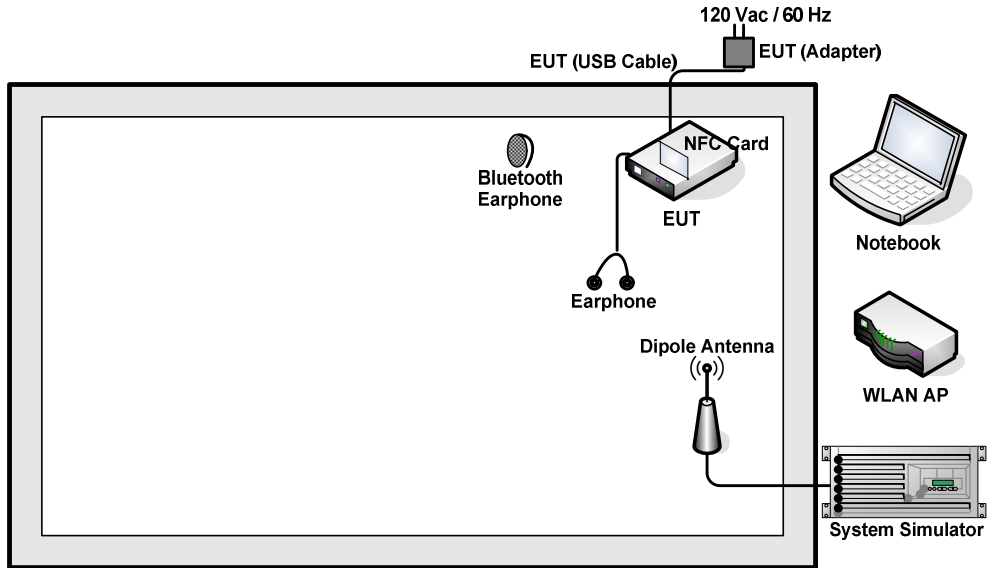
Test Items	
AC Power Line Conducted Emissions	Field Strength of Fundamental Emissions
20dB Spectrum Bandwidth	Frequency Stability
Radiated Emissions 9kHz~30MHz	Radiated Emissions 30MHz~1GHz

The EUT pre-scanned in four NFC type, A, B, F, V. The worst type (type F) was recorded in this report.

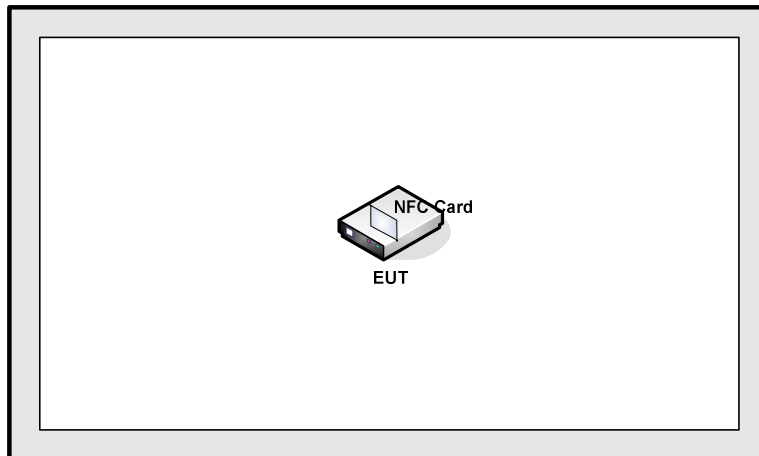
Pre-scanned tests, X, Y, Z in three orthogonal panels to determine the final configuration (Z plane as worst plane) from all possible combinations.

2.2 Connection Diagram of Test System

<AC Conducted Emissions>



< For Fundamental Emissions and Mask and Radiated Emissions Measurement >



2.3 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-855	KA2DIR855A2	N/A	Unshielded,1.8m
3.	Notebook	Lenovo	G480	PRC4	N/A	AC I/P: Unshielded, 1.8m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Lenovo	LBH308	N/A	N/A	N/A
5.	SD Card	Kingston	8GB	N/A	N/A	N/A
6.	NFC Card	PAX	N/A	N/A	N/A	N/A
7.	Earphone	Lenovo	SH100	N/A	N/A	N/A

2.4 EUT Operation Test Setup

The EUT was programmed to be in continuously transmitting mode.

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.

3. TEST RESULTS

3.1 AC Power Line Conducted Emissions Measurement

3.1.1 Limit of AC Conducted Emission

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 (dB μ V)	
	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.

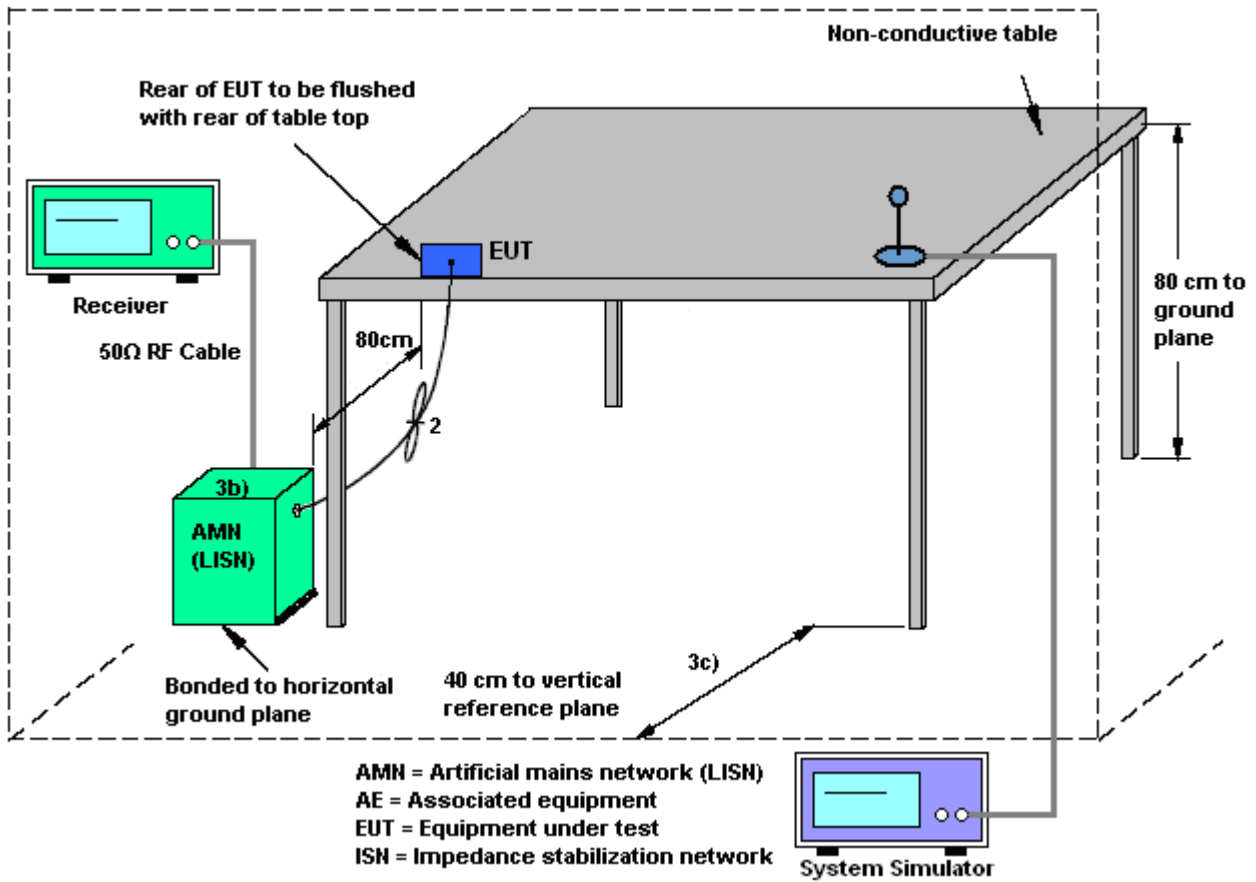
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 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.

3.1.4 Test setup



3.1.5 Test Result of AC Conducted Emission

Please refer to Appendix A.

3.2 20dB and 99% OBW Spectrum Bandwidth Measurement

3.2.1 Limit

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

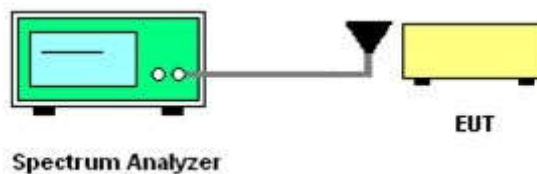
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 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.

3.2.4 Test Setup



3.2.5 Test Result of Conducted Test Items

Please refer to Appendix B.

3.3 Frequency Stability Measurement

3.3.1 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.

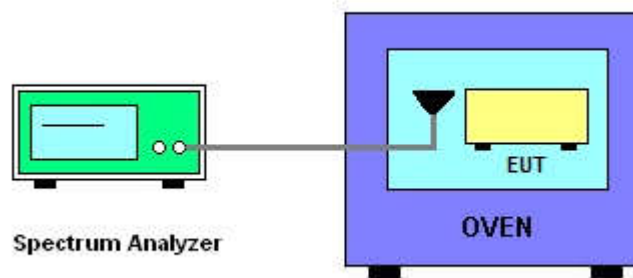
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 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 f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f) / f_c \times 10^6$ ppm and the limit is less than ± 100 ppm.
6. Extreme temperature rule is -20°C~50°C.

3.3.4 Test Setup



3.3.5 Test Result of Conducted Test Items

Please refer to Appendix B.

3.4 Field Strength of Fundamental Emissions and Mask Measurement

3.4.1 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

3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

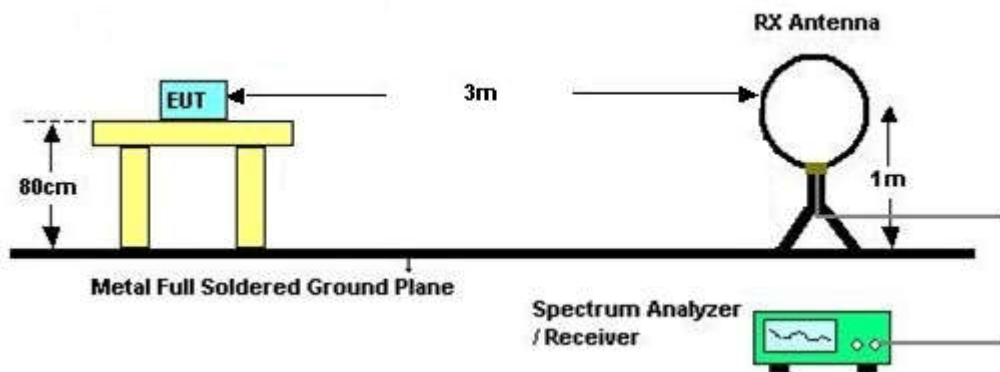
3.4.3 Test Procedures

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 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 (dB μ V/m) = 20 log Emission level (μ V/m).

3.4.4 Test Setup

For radiated emissions below 30MHz



3.4.5 Test Result of Field Strength of Fundamental Emissions and Mask

Please refer to Appendix C.

3.5 Radiated Emissions Measurement

3.5.1 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 ($\mu\text{V/m}$)	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

3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 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, 110-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

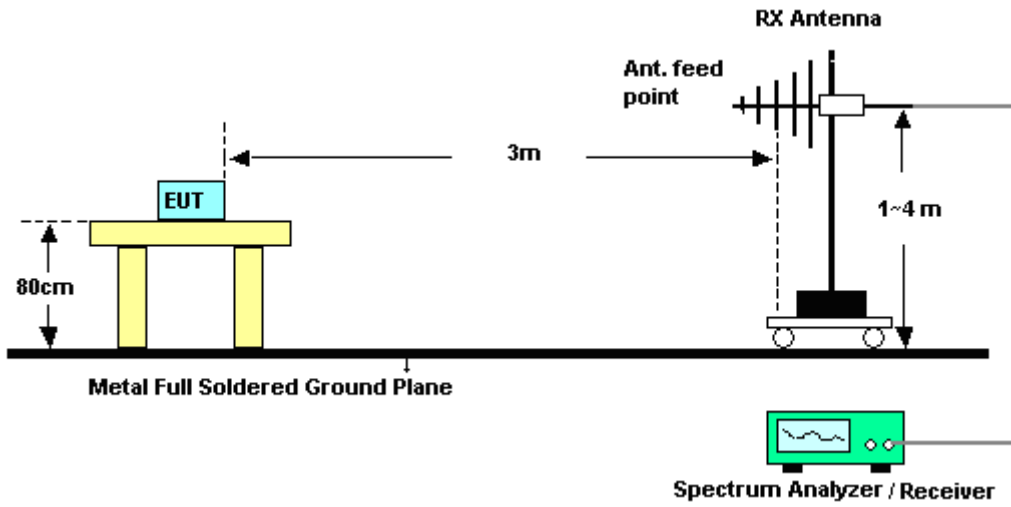


3.5.4 Test Procedures

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

3.5.5 Test Setup

For radiated emissions from 30MHz to 1GHz



3.5.6 Test Result of Radiated Emissions Measurement

Please refer to Appendix C.



3.6 Antenna Requirements

3.6.1 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 FCC rule.

3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.



4. LIST OF MEASURING EQUIPMENT

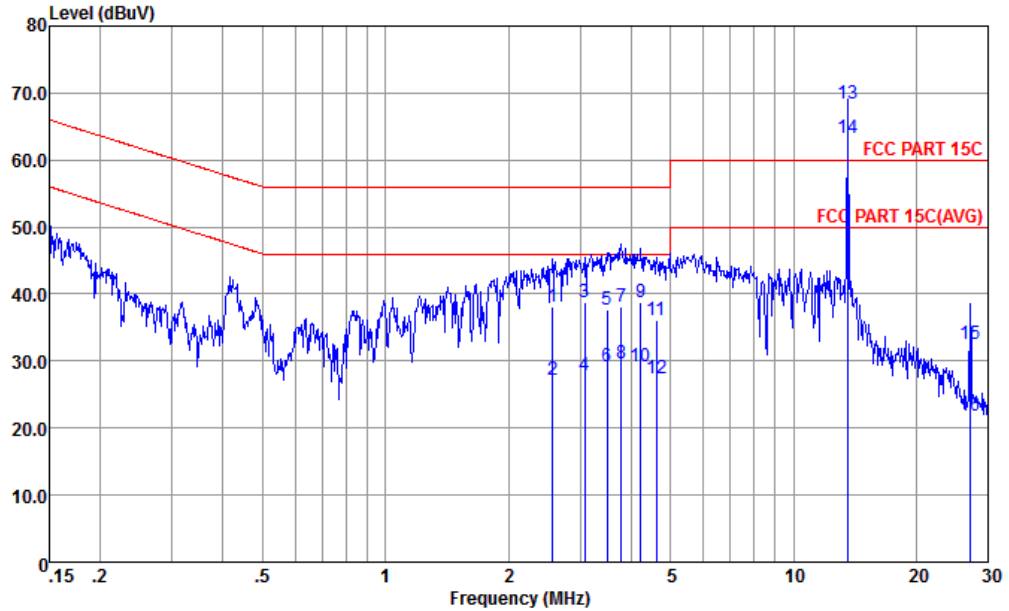
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Aug. 08, 2017	Mar. 03, 2018	Aug. 07, 2018	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Oct.12, 2017	Mar. 03, 2018	Oct. 11, 2018	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz;Max 30dBm	Aug. 08, 2017	Mar. 27, 2018	Aug. 07, 2018	Radiation (03CH02-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 22, 2017	Mar. 27, 2018	Oct. 21, 2018	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6112D	23188	30MHz~2GHz	Apr. 25, 2017	Mar. 27, 2018	Apr. 24, 2018	Radiation (03CH02-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Aug. 07, 2017	Mar. 27, 2018	Aug. 06, 2018	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Mar. 27, 2018	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Mar. 27, 2018	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Mar. 27, 2018	NCR	Radiation (03CH02-KS)
EMI Receiver	R&S	ESC17	100768	9kHz~7GHz;	Apr. 20, 2017	Mar. 20, 2018~Mar. 22, 2018	Apr. 19, 2018	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 13, 2017	Mar. 20, 2018~Mar. 22, 2018	Oct. 12, 2018	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 13, 2017	Mar. 20, 2018~Mar. 22, 2018	Oct. 12, 2018	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 12, 2017	Mar. 20, 2018~Mar. 22, 2018	Oct. 11, 2018	Conduction (CO01-KS)

NCR: No Calibration Required



Appendix A. Test Results of Conducted Emission Test

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



Site : CO01-KS
 Condition : FCC PART 15C LISN-L-171013-060103 LINE

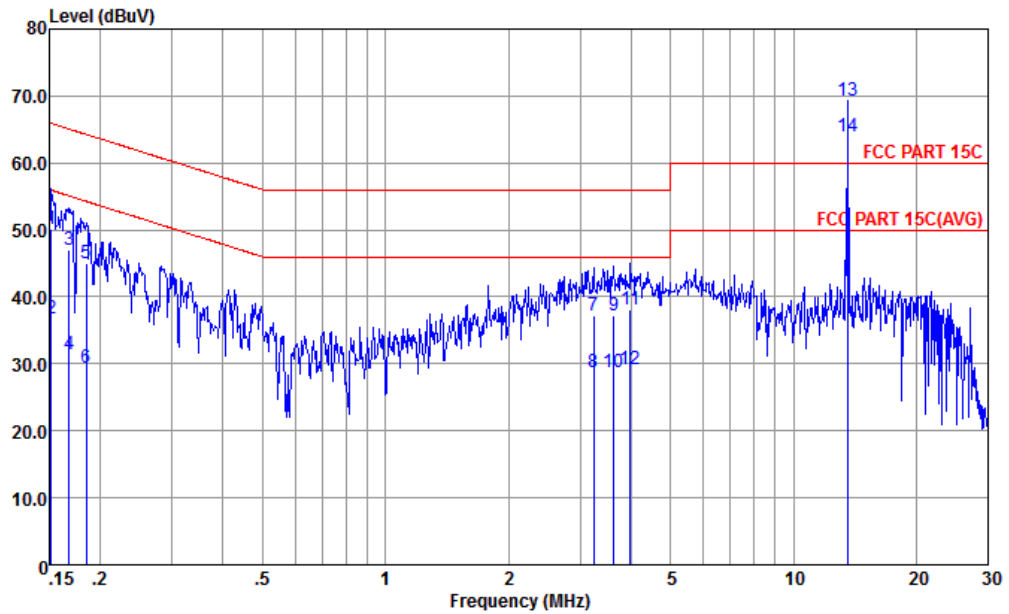
	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	2.567	38.10	-17.90	56.00	27.60	0.30	10.20	QP
2	2.567	27.10	-18.90	46.00	16.60	0.30	10.20	Average
3	3.074	38.81	-17.19	56.00	28.31	0.32	10.18	QP
4	3.074	27.81	-18.19	46.00	17.31	0.32	10.18	Average
5	3.491	37.71	-18.29	56.00	27.21	0.33	10.17	QP
6	3.491	29.11	-16.89	46.00	18.61	0.33	10.17	Average
7	3.779	38.11	-17.89	56.00	27.60	0.34	10.17	QP
8	3.779	29.71	-16.29	46.00	19.20	0.34	10.17	Average
9	4.224	38.73	-17.27	56.00	28.20	0.35	10.18	QP
10	4.224	29.13	-16.87	46.00	18.60	0.35	10.18	Average
11	4.622	36.17	-19.83	56.00	25.60	0.36	10.21	QP
12	4.622	27.37	-18.63	46.00	16.80	0.36	10.21	Average
13 *	13.560	68.48	8.48	60.00	57.81	0.28	10.39	QP
14 *	13.560	63.38	13.38	50.00	52.71	0.28	10.39	Average
15	27.127	32.59	-27.41	60.00	21.60	0.39	10.60	QP
16	27.127	21.89	-28.11	50.00	10.90	0.39	10.60	Average

(1) with antenna

Remark: 13.560MHz is the NFC RF fundamental signal.



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



Site : CO01-KS
 Condition : FCC PART 15C LISN-N-171013-060103 NEUTRAL

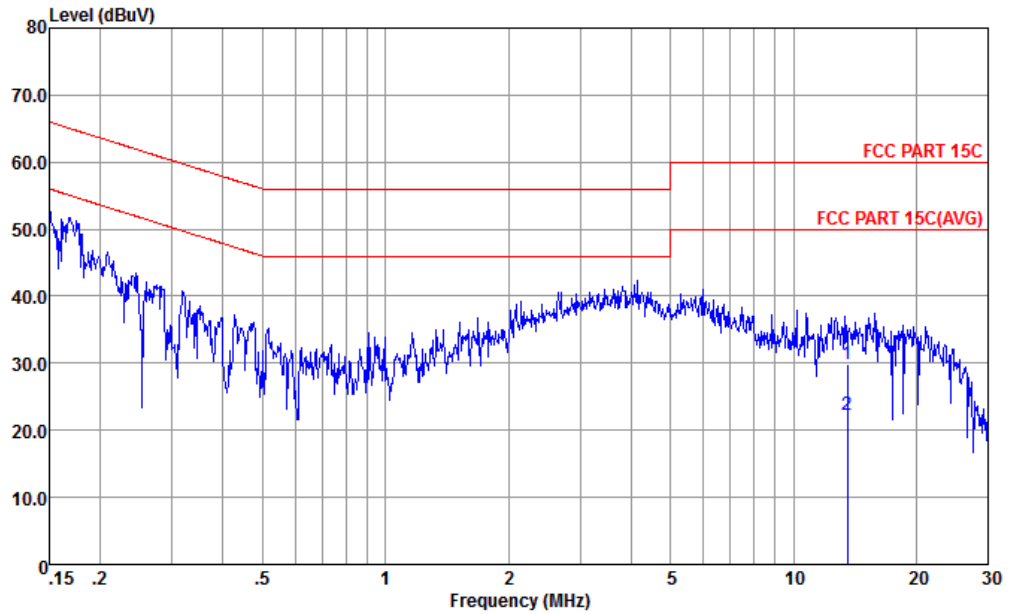
	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.152	50.09	-15.82	65.91	39.20	0.28	10.61	QP
2	0.152	36.79	-19.12	55.91	25.90	0.28	10.61	Average
3	0.168	47.03	-18.05	65.08	36.20	0.28	10.55	QP
4	0.168	31.43	-23.65	55.08	20.60	0.28	10.55	Average
5	0.184	44.98	-19.30	64.28	34.20	0.28	10.50	QP
6	0.184	29.38	-24.90	54.28	18.60	0.28	10.50	Average
7	3.241	37.11	-18.89	56.00	26.60	0.33	10.18	QP
8	3.241	28.71	-17.29	46.00	18.20	0.33	10.18	Average
9	3.623	37.31	-18.69	56.00	26.81	0.33	10.17	QP
10	3.623	28.81	-17.19	46.00	18.31	0.33	10.17	Average
11	3.985	38.00	-18.00	56.00	27.49	0.34	10.17	QP
12	3.985	29.10	-16.90	46.00	18.59	0.34	10.17	Average
13 *	13.560	69.23	9.23	60.00	58.61	0.23	10.39	QP
14 *	13.560	64.03	14.03	50.00	53.41	0.23	10.39	Average

(1) with antenna

Remark: 13.560MHz is the NFC RF fundamental signal.



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



Site : CO01-KS
 Condition : FCC PART 15C LISN-L-171013-060103 LINE

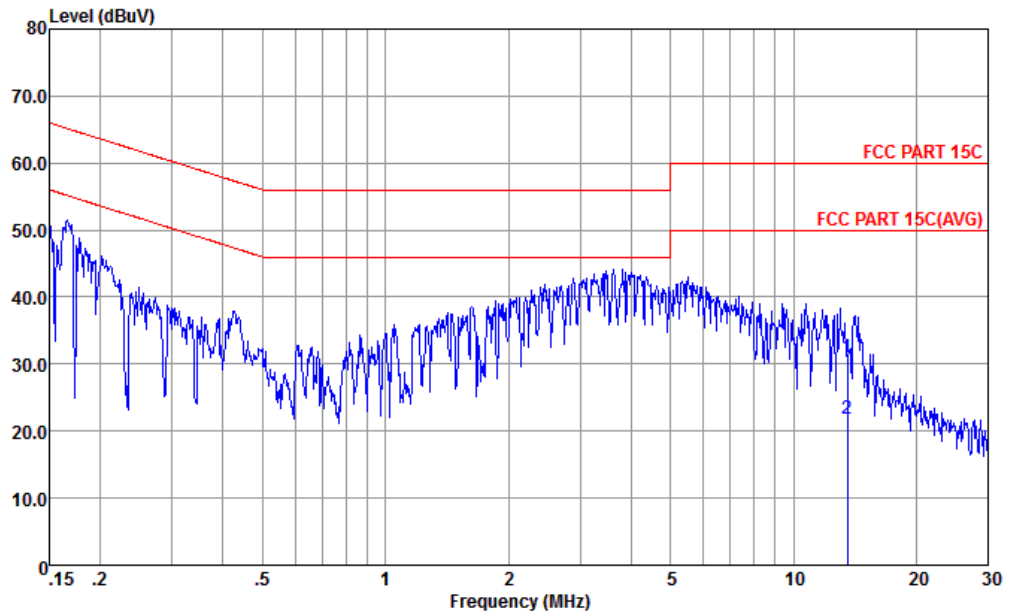
	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	13.560	29.88	-30.12	60.00	19.21	0.28	10.39	QP
2 *	13.560	22.18	-27.82	50.00	11.51	0.28	10.39	Average

(2) With dummy load

Remark: Only the fundamental NFC signal needs to be retested per C63.4.



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



Site : CO01-KS
 Condition : FCC PART 15C LISN-N-171013-060103 NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	13.560	30.93	-29.07	60.00	20.31	0.23	10.39	QP
2 *	13.560	21.83	-28.17	50.00	11.21	0.23	10.39	Average

(2) With dummy load

Remark: Only the fundamental NFC signal needs to be retested per C63.4.



Appendix B. Test Results of Conducted Test Items

B1. Test Result of 20dB Spectrum Bandwidth

Test mode	NFC Tx	Test Frequency (MHz)	13.56																																																								
<table border="1"> <thead> <tr> <th>Type</th> <th>Ref</th> <th>Trc</th> <th>X-value</th> <th>Y-value</th> <th>Function</th> <th>Function Result</th> </tr> </thead> <tbody> <tr> <td>M1</td> <td></td> <td>1</td> <td>13.559711 MHz</td> <td>-23.10 dBm</td> <td>ndB down</td> <td>2.475 kHz</td> </tr> <tr> <td>T1</td> <td></td> <td>1</td> <td>13.55048 MHz</td> <td>-42.94 dBm</td> <td>ndB</td> <td>20.00 dB</td> </tr> <tr> <td>T2</td> <td></td> <td>1</td> <td>13.560955 MHz</td> <td>-42.97 dBm</td> <td>Q factor</td> <td>5479.4</td> </tr> </tbody> </table>		Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1		1	13.559711 MHz	-23.10 dBm	ndB down	2.475 kHz	T1		1	13.55048 MHz	-42.94 dBm	ndB	20.00 dB	T2		1	13.560955 MHz	-42.97 dBm	Q factor	5479.4	<table border="1"> <thead> <tr> <th>Type</th> <th>Ref</th> <th>Trc</th> <th>X-value</th> <th>Y-value</th> <th>Function</th> <th>Function Result</th> </tr> </thead> <tbody> <tr> <td>M1</td> <td></td> <td>1</td> <td>13.559696 MHz</td> <td>-22.52 dBm</td> <td></td> <td></td> </tr> <tr> <td>T1</td> <td></td> <td>1</td> <td>13.5586541 MHz</td> <td>-36.26 dBm</td> <td>Occ Bw</td> <td>2.098408104 kHz</td> </tr> <tr> <td>T2</td> <td></td> <td>1</td> <td>13.5607525 MHz</td> <td>-36.37 dBm</td> <td></td> <td></td> </tr> </tbody> </table>		Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1		1	13.559696 MHz	-22.52 dBm			T1		1	13.5586541 MHz	-36.26 dBm	Occ Bw	2.098408104 kHz	T2		1	13.5607525 MHz	-36.37 dBm		
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20dB Bandwidth (kHz)	2.48	99% OccupiedBW(kHz)	2.10																																																								
Frequency range (MHz)	$f_L > 13.553$	13.558480	Test Result																																																								
	$f_H < 13.567$	13.560955	Complies																																																								



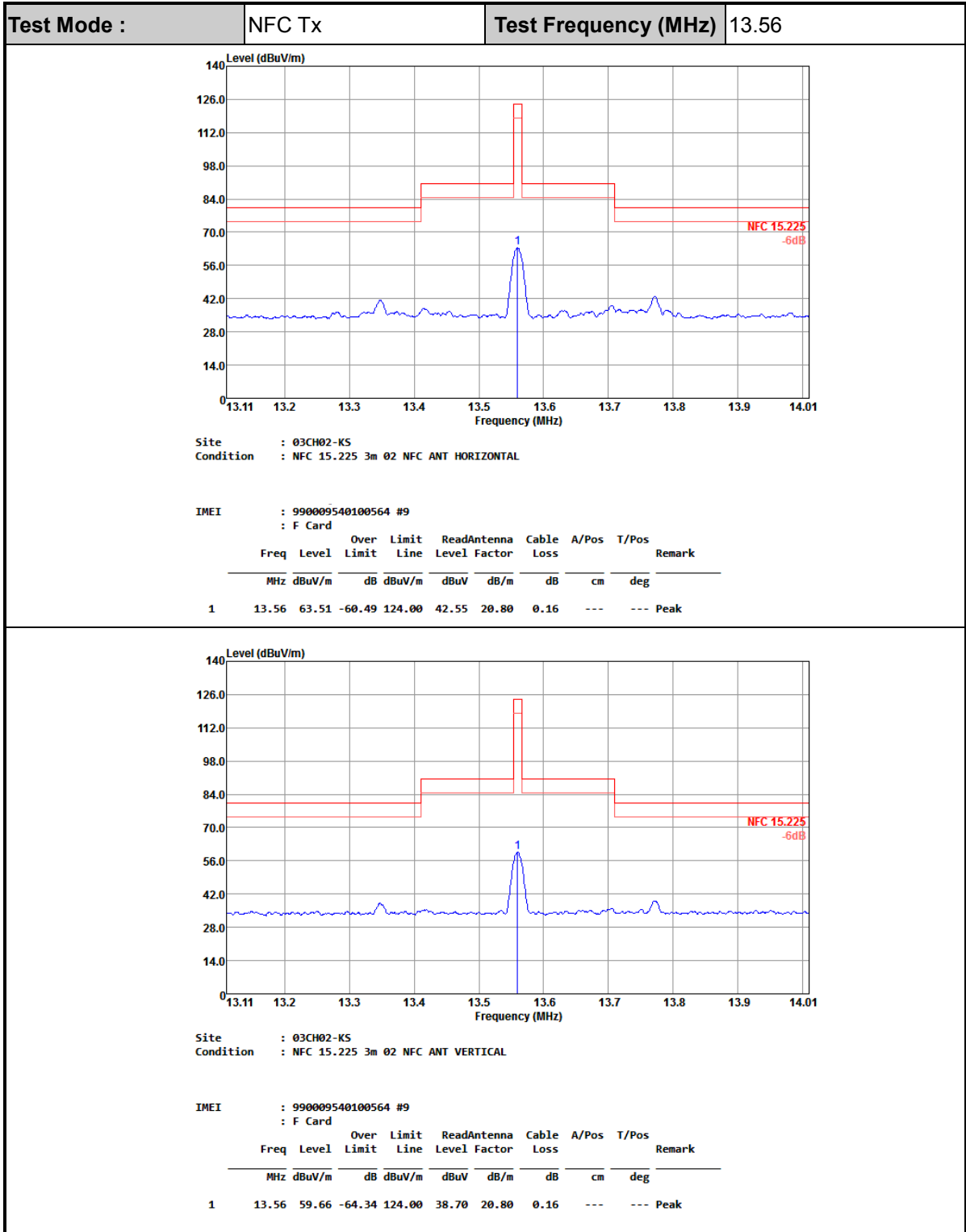
B2. Test Result of Frequency Stability

Voltage vs. Frequency Stability		Temperature vs. Frequency Stability	
Voltage (Vac)	Measurement Frequency (MHz)	Temperature (°C)	Measurement Frequency (MHz)
102	13.559711	-20	13.559697
120	13.559711	-10	13.559697
138	13.559711	0	13.559689
		10	13.559697
		20	13.559711
		30	13.559697
		40	13.559689
		50	13.559697
Max.Deviation (MHz)	-0.000290	Max.Deviation (MHz)	-0.000311
Max.Deviation (ppm)	-21.3496	Max.Deviation (ppm)	-22.9351
Limit	FS < ±100 ppm	Limit	FS < ±100 ppm
Test Result	PASS	Test Result	PASS



Appendix C. Test Results of Radiated Test Items

C1. Test Result of Field Strength of Fundamental Emissions





C2. Results of Radiated Spurious Emissions (9 kHz~30MHz)

Test Mode :	NFC Tx	Polarization :	Horizontal
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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)	Ant Pos (cm)	Table Pos (deg)	Remark
0.00999	49.88	-77.74	127.62	29.77	20.1	0.01	-	-	Average
0.01915	46.72	-75.24	121.96	26.61	20.1	0.01	-	-	Average
1.219	46.8	-19.07	65.87	25.97	20.81	0.02	-	-	QP
5.846	39.8	-29.74	69.54	19.23	20.5	0.07	-	-	QP
7.52	43	-26.54	69.54	22.56	20.35	0.09	-	-	QP
15.392	43.56	-25.98	69.54	22.3	21.08	0.18	-	-	QP

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)	Ant Pos (cm)	Table Pos (deg)	Remark
0.0114	51.75	-74.72	126.47	31.64	20.1	0.01	-	-	Average
0.01464	49.51	-74.78	124.29	29.4	20.1	0.01	-	-	Average
1.258	56.21	-9.39	65.6	35.44	20.75	0.02	-	-	QP
2.426	48.94	-20.6	69.54	28.76	20.14	0.04	-	-	QP
7.592	42.83	-26.71	69.54	22.4	20.34	0.09	-	-	QP
12.29	39.58	-29.96	69.54	18.89	20.55	0.14	-	-	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. Limit line = specific limits (dBμV) + distance extrapolation factor.



C3. Results of Radiated Spurious Emissions (30MHz~1GHz)

Test Mode :	NFC Tx	Polarization :	Horizontal
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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	21.83	-18.17	40	28.29	25	0.57	32.03	-	-	Peak
40.67	24.9	-15.1	40	37.69	18.62	0.64	32.05	100	0	Peak
67.83	19.31	-20.69	40	38.19	12.32	0.85	32.05	-	-	Peak
261.83	19.03	-26.97	46	29.05	19.64	1.79	31.45	-	-	Peak
552.83	24.81	-21.19	46	27.33	24.88	2.56	29.96	-	-	Peak
926.28	27.14	-18.86	46	24.54	26.76	3.15	27.31	-	-	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
40.67	35.99	-4.01	40	48.78	18.62	0.64	32.05	100	0	Peak
67.83	27.91	-12.09	40	46.79	12.32	0.85	32.05	-	-	Peak
94.99	21.46	-22.04	43.5	36.63	15.85	0.98	32	-	-	Peak
259.89	18.68	-27.32	46	28.57	19.8	1.78	31.47	-	-	Peak
800.18	28.17	-17.83	46	27.95	25.9	2.64	28.32	-	-	Peak
922.4	28.93	-17.07	46	26.39	26.74	3.14	27.34	-	-	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.