



FCC RF Test Report

APPLICANT : BlackBerry Ltd.
EQUIPMENT : GSM Quad-band/HSPA-UMTS Penta-band/ LTE
Deca-band mobile phone
BRAND NAME : BlackBerry
MODEL NAME : BBA100-1
MARKETING NAME : DTEK60
FCC ID : L6ABBA1001
STANDARD : FCC Part 15 Subpart C §15.225
CLASSIFICATION : (DXX) Low Power Communication Device Transmitter

The product was received on Jul. 20, 2016 and testing was completed on Aug. 17, 2016. 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.

Prepared by: James Huang / Manager

Approved by: Jones Tsai / Manager

SPORTON INTERNATIONAL (KUNSHAN) INC.

No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China





TABLE OF CONTENTS

SUMMARY OF THE TEST RESULT	4
1. GENERAL INFORMATION.....	5
1.1 Applicant.....	5
1.2 Manufacturer	5
1.3 Product Feature of Equipment Under Test.....	5
1.4 Product Specification of Equipment Under Test.....	6
1.5 Specification of Accessory.....	6
1.6 Modification of EUT	6
1.7 Testing Location	7
1.8 Applicable Standards.....	7
1.9 Test Modes.....	8
1.10 Test Configurations	9
1.11 Table for Supporting Units.....	10
2. CONDUCTED EMISSION TEST.....	11
2.1 Measuring Instruments	11
2.2 Test setup.....	11
2.3 Test Result of Conducted Emission Test.....	11
2.4 AC Power Line Conducted Emissions Measurement	12
3. CONDUCTED TEST ITEMS	13
3.1 Measuring Instruments	13
3.2 Test Setup	13
3.3 Test Result of Conducted Test Items	13
3.4 20dB and 99% OBW Spectrum Bandwidth Measurement.....	14
3.5 Frequency Stability Measurement	14
4. RADIATED TEST ITEMS.....	15
4.1 Measuring Instruments	15
4.2 Test Setup	15
4.3 Test Result of Radiated Test Items	15
4.4 Field Strength of Fundamental Emissions and Mask Measurement.....	16
4.5 Radiated Emissions Measurement	17
5. LIST OF MEASURING EQUIPMENT	19

APPENDIX A. TEST RESULTS OF CONDUCTED EMISSION TEST

APPENDIX B. TEST RESULTS OF CONDUCTED TEST ITEMS

- B1. Test Result of 20dB Spectrum Bandwidth
- B2. Test Result of Frequency Stability

APPENDIX C. TEST RESULTS OF RADIATED TEST ITEMS

- C1. Test Result of Field Strength of Fundamental Emissions
- C2. Results of Radiated Emissions (9 kHz~30MHz)
- C3. Results of Radiated Emissions (30MHz~1GHz)

APPENDIX D. SETUP PHOTOGRAPHS



REVISION HISTORY



SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C / IC RSS-210 issue 8					
Part	FCC Rule	IC Rule	Description of Test	Result	Under Limit
2.4	15.207	RSS-GEN 8.8	AC Power Line Conducted Emissions	Complies	5.66 dB at 18.135MHz
3.4	2.1049	-	20dB Spectrum Bandwidth	Complies	-
3.4	-	RSS-GEN 6.6	99% OBW Spectrum Bandwidth	Complies	-
3.5	15.225(e)	A2.6	Frequency Stability	Complies	-
4.4	15.225(a)(b)(c)	A2.6	Field Strength of Fundamental Emissions	Complies	69.48 dB at 13.560 MHz
4.5	15.225(d) 15.209	A2.6	Radiated Emissions	Complies	10.81 dB at 30.000 MHz
-	15.203	-	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±5.7dB	Confidence levels of 95%



1. GENERAL INFORMATION

1.1 Applicant

BlackBerry Ltd.

2200 University Ave E., Waterloo, ON, CAN. N2K0A7

1.2 Manufacturer

TCL Communication Ltd

5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	GSM Quad-band/HSPA-UMTS Penta-band/ LTE Deca-band mobile phone
Brand Name	BlackBerry
Model Name	BBA100-1
Marketing Name	DTEK60
FCC ID	L6ABBA1001
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/DC-HSDPA/ HSPA+(16QAM uplink is not supported)/LTE/NFC/ WLAN 2.4GHz 802.11b/g/n HT20/ WLAN 5GHz 802.11a/n HT20/HT40/ WLAN 5GHz 802.11ac VHT20/VHT40/VHT80/ Bluetooth v3.0+EDR/ Bluetooth v4.0 LE/ Bluetooth v4.2 LE
IMEI Code	Conducted: 004402243144338 Conduction: 004402243144346 Radiation: 004402243143991
HW Version	PIO
SW Version	AAF884
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	2.48 KHz
99%OBW	2.10 KHz
Antenna Type	Loop 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 Specification of Accessory

Specification of Accessory				
AC Adapter 1	Brand Name	N/A	Model Name	QC10US
	Power Rating	I/P: 100-240Vac, 500mA, O/P: 5Vdc, 2000mA/9Vdc, 1670mA		
	Manufacturer	BYD	S/N	CBA0060AGHC1
AC Adapter 2	Brand Name	N/A	Model Name	QC10EU
	Power Rating	I/P: 100-240Vac, 500mA, O/P: 5Vdc, 2000mA/9Vdc, 1670mA		
	Manufacturer	BYD	S/N	CBA0060AAHC1
AC Adapter 3	Brand Name	N/A	Model Name	QC10UK
	Power Rating	I/P: 100-240Vac, 500mA, O/P: 5Vdc, 2000mA/9Vdc, 1670mA		
	Manufacturer	BYD	S/N	CBA0060ABHC1
AC Adapter 4	Brand Name	N/A	Model Name	QC10AU
	Power Rating	I/P: 100-240Vac, 500mA, O/P: 5Vdc, 2000mA/9Vdc, 1670mA		
	Manufacturer	BYD	S/N	CBA0060ACHC1
Battery 1	Brand Name	N/A	Model Name	TLp030F2
	Power Rating	3.84Vdc, 3000mAh		
	Manufacturer	SCUD	S/N	CAC3000027C2
Battery 2	Brand Name	N/A	Model Name	TLp030F1
	Power Rating	3.84Vdc, 3000mAh		
	Manufacturer	BYD	S/N	CAC3000026C1
USB Cable	Brand Name	N/A	Model Name	CDA0000078CF
Earphone	Brand Name	N/A	Model Name	CCB0045A16C3
	Signal Line Type	1.00m shielded without core		
	Signal Line Type	1.24m non-shielded without core		

1.6 Modification of EUT

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



1.7 Testing Location

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.	
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958	
Test Site No.	Sporton Site No.	
	TH01-KS	CO01-KS
Test Engineer	Ivan Chen	
Temperature	24~25°C	
Relative Humidity	54~55%	
Test Site	SPORTON INTERNATIONAL INC.	

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No. 52, Hwa Ya 1 st 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.	FCC/IC Registration No.
	03CH07-HY	TW1022/4086B
Test Engineer	Derreck Chen	
Temperature	27~28°C	
Relative Humidity	42~43%	

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

1.8 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
- ♦ IC RSS-210 Issue 8
- ♦ IC RSS-Gen Issue 4



1.9 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.

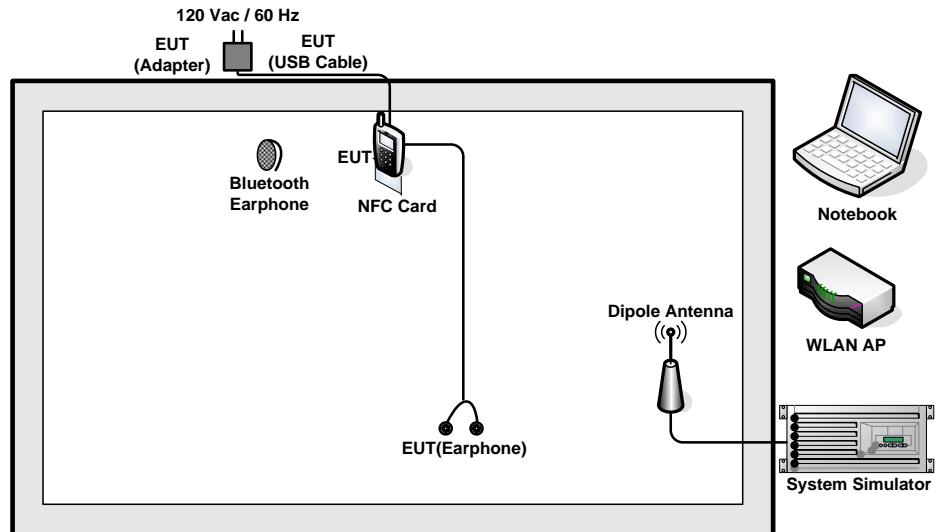
Test Items	
AC Power Line Conducted Emissions	Field Strength of Fundamental Emissions
20dB Spectrum Bandwidth	Frequency Stability
Radiated Emissions 9kHz~30MHz	Radiated Emissions 30MHz~1GHz

Note:

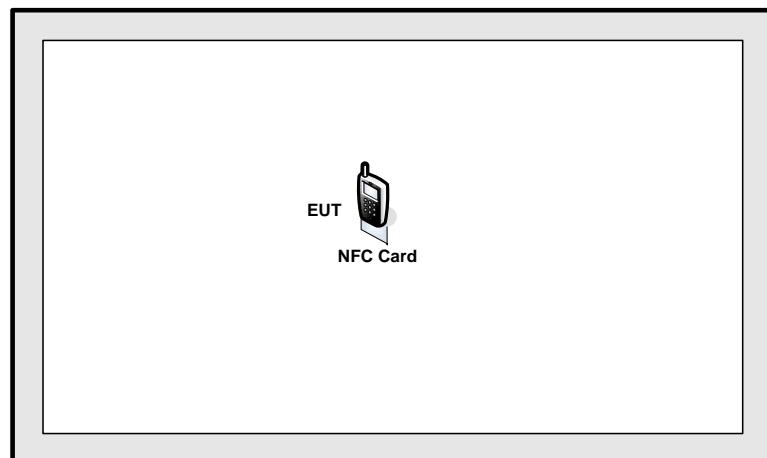
1. The EUT was programmed to be in continuously transmitting mode.
2. The ancillary equipment, NFC card, is used to make the EUT (NFC) continuously transmit at 13.56MHz and is placed around 3 cm gap to the EUT.
3. The EUT pre-scanned in four NFC type, A, B, F, V. The worst type (type F) was recorded in this report.

1.10 Test Configurations

<AC Conducted Emissions>



< For Fundamental Emissions and Mask and Radiated Emissions Measurement >





1.11 Table for Supporting Units

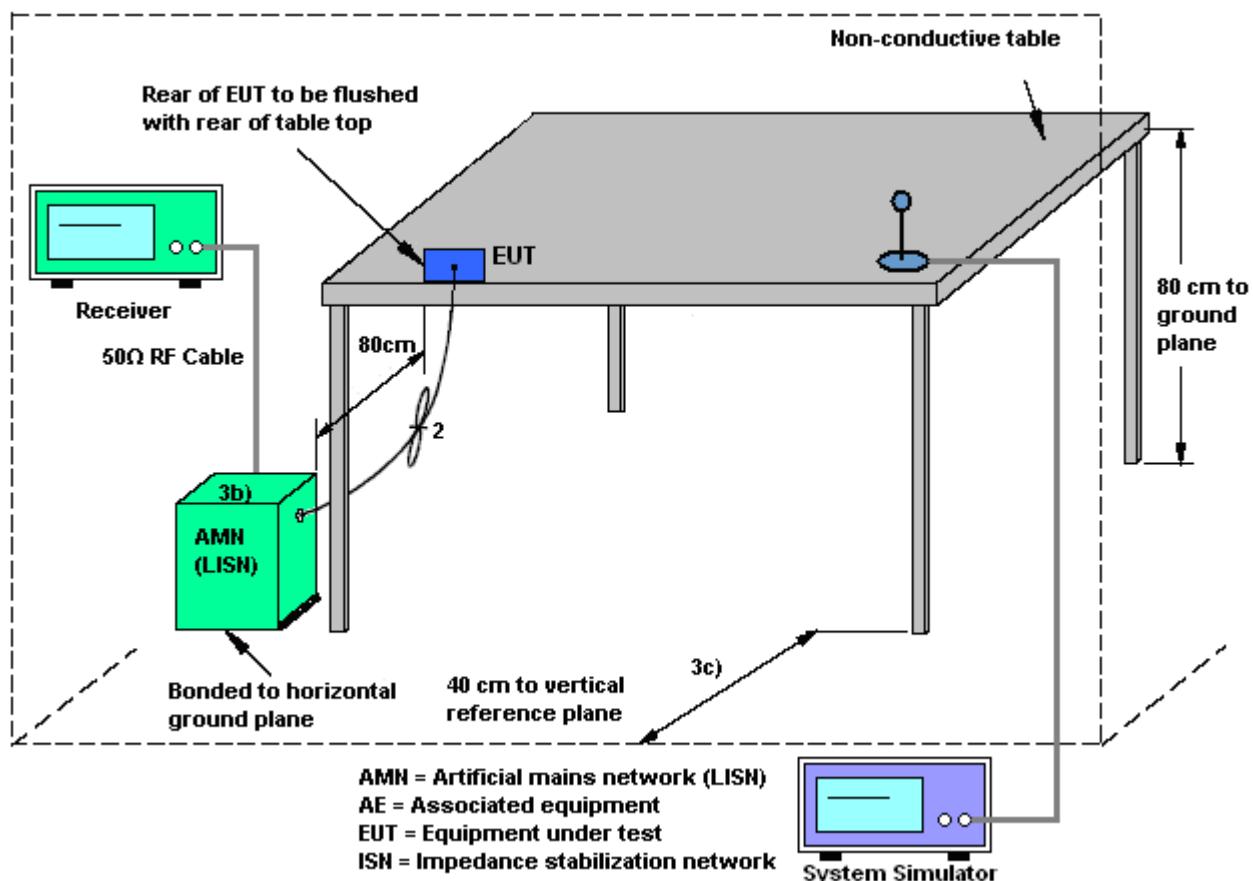
Support Unit	Manufacturer	Model	FCC ID
System Simulator	Anritus	MT8820C	N/A
WLAN AP	LINKSYS	WRT600N	Q87-WRT600NV11
Notebook	Lenovo	G480	N/A
Bluetooth Earphone	Nokia	BH-106	QTLBH-106
NFC Card	N/A	N/A	N/A

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 (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.

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.

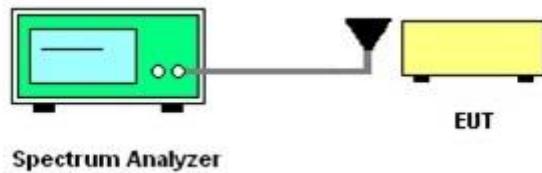
3. CONDUCTED TEST ITEMS

3.1 Measuring Instruments

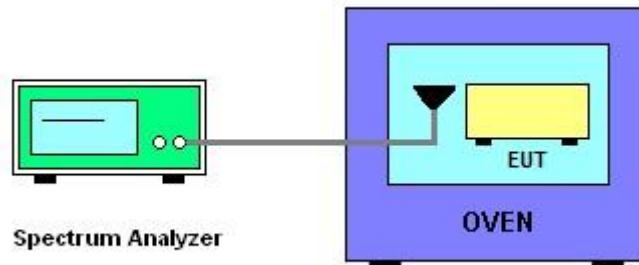
See list of measuring instruments of this test report.

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 $(fc-f)/fc \times 10^6$ ppm and the limit is less than +/-100ppm.
6. Extreme temperature rule is -20°C~50°C.

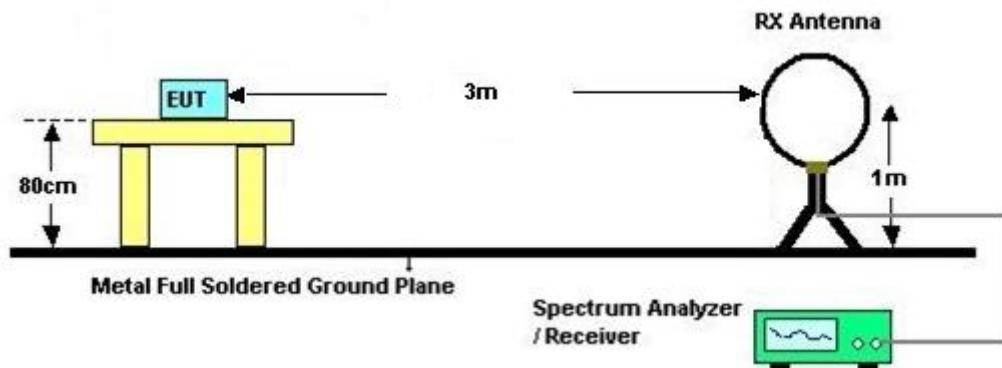
4. RADIATED TEST ITEMS

4.1 Measuring Instruments

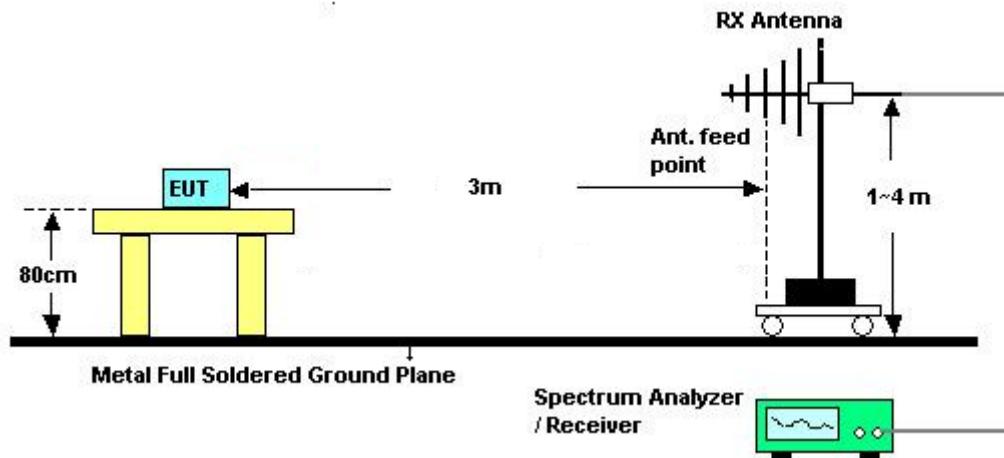
See list of measuring instruments of this test report.

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 IC RSS-210 A2.6			
Description	Compliance with the spectrum mask is tested with RBW set to 9kHz.			
Freq. of Emission (MHz)	Field Strength (μ V/m) at 30m	Field Strength (dB μ V/m) at 30m	Field Strength (dB μ V/m) at 10m	Field Strength (dB μ V/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 (dB μ V/m) = 20 log Emission level (μ V/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 (μ 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

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.
1. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
2. 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.
3. 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.
4. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
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. 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.



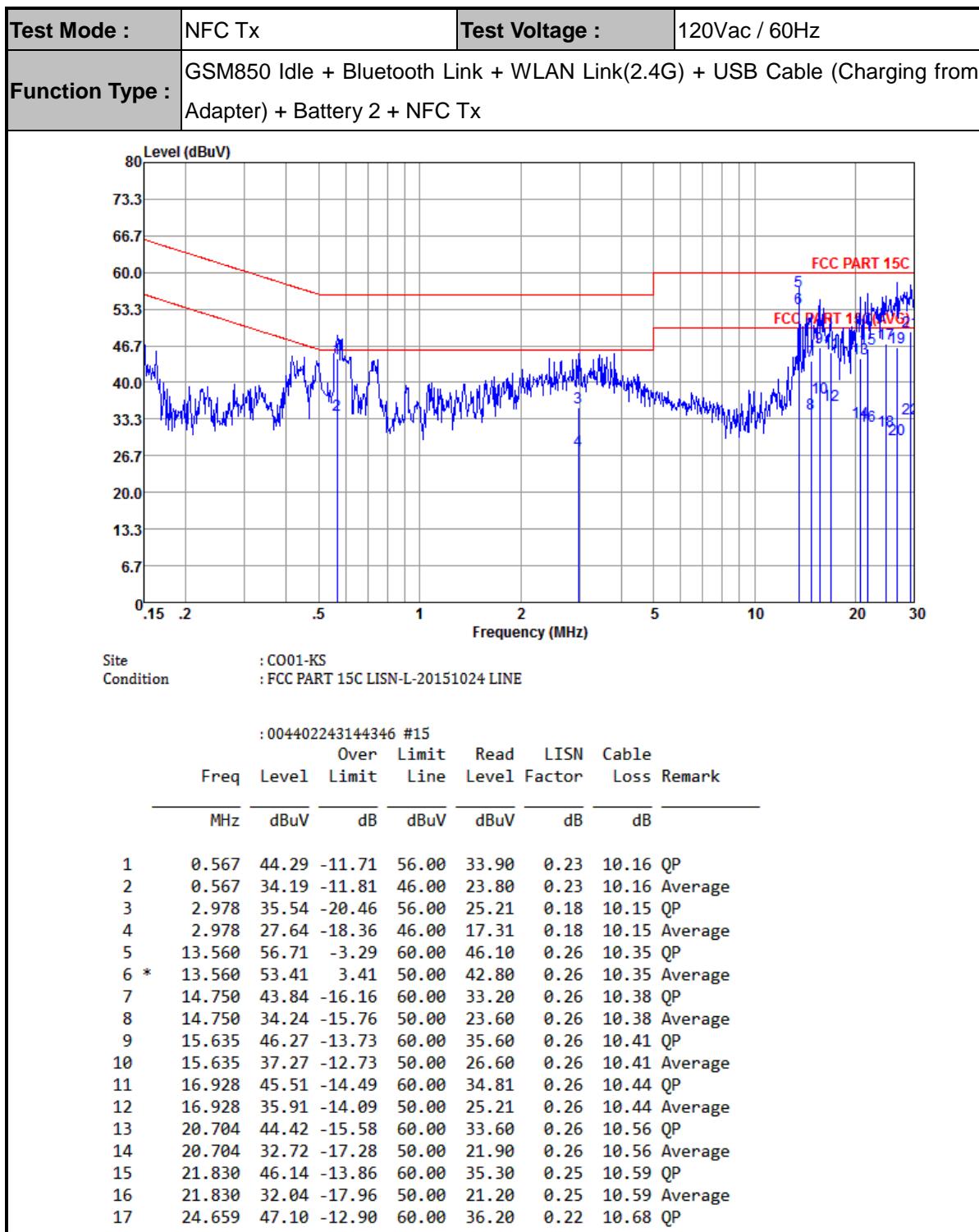
5. LIST OF MEASURING EQUIPMENT

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Oct. 24, 2015	Aug. 11, 2016	Oct. 23, 2016	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Oct. 24, 2015	Aug. 11, 2016	Oct. 23, 2016	Conducted (TH01-KS)
AC Power Source	Chroma	61602	ABP000000 811	AC 0V~300V, 45Hz~1000Hz	Oct. 24, 2015	Aug. 11, 2016	Oct. 23, 2016	Conducted (TH01-KS)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Sep. 02, 2015	Aug. 15, 2016	Sep. 01, 2016	Radiation (03CH07-HY)
Bilog Antenna	TESEQ	CBL 6111D	35419	30MHz to 1GHz	Jan. 13, 2016	Aug. 15, 2016	Jan. 12, 2017	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	Mar. 18, 2016	Aug. 15, 2016	Mar. 17, 2017	Radiation (03CH07-HY)
EMI Test Receiver	Keysight	N9038A (MXE)	MY5413008 5	20Hz ~ 8.4GHz	Nov. 04, 2015	Aug. 15, 2016	Nov. 03, 2016	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9010A	MY5347011 8	10Hz~44GHz	Feb. 27, 2016	Aug. 15, 2016	Feb. 26, 2017	Radiation (03CH07-HY)
Controller	Max-Full	MF7802	MF7802083 68	Control Ant Mast	NCR	Aug. 15, 2016	NCR	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	NCR	Aug. 15, 2016	NCR	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	NCR	Aug. 15, 2016	NCR	Radiation (03CH07-HY)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz; Max 30dBm	Sep. 10, 2015	Aug. 17, 2016	Sep. 09, 2016	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 24, 2015	Aug. 17, 2016	Oct. 23, 2016	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 24, 2015	Aug. 17, 2016	Oct. 23, 2016	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000 811	AC 0V~300V, 45Hz~1000Hz	Oct. 24, 2015	Aug. 17, 2016	Oct. 23, 2016	Conduction (CO01-KS)

NCR: No Calibration Required

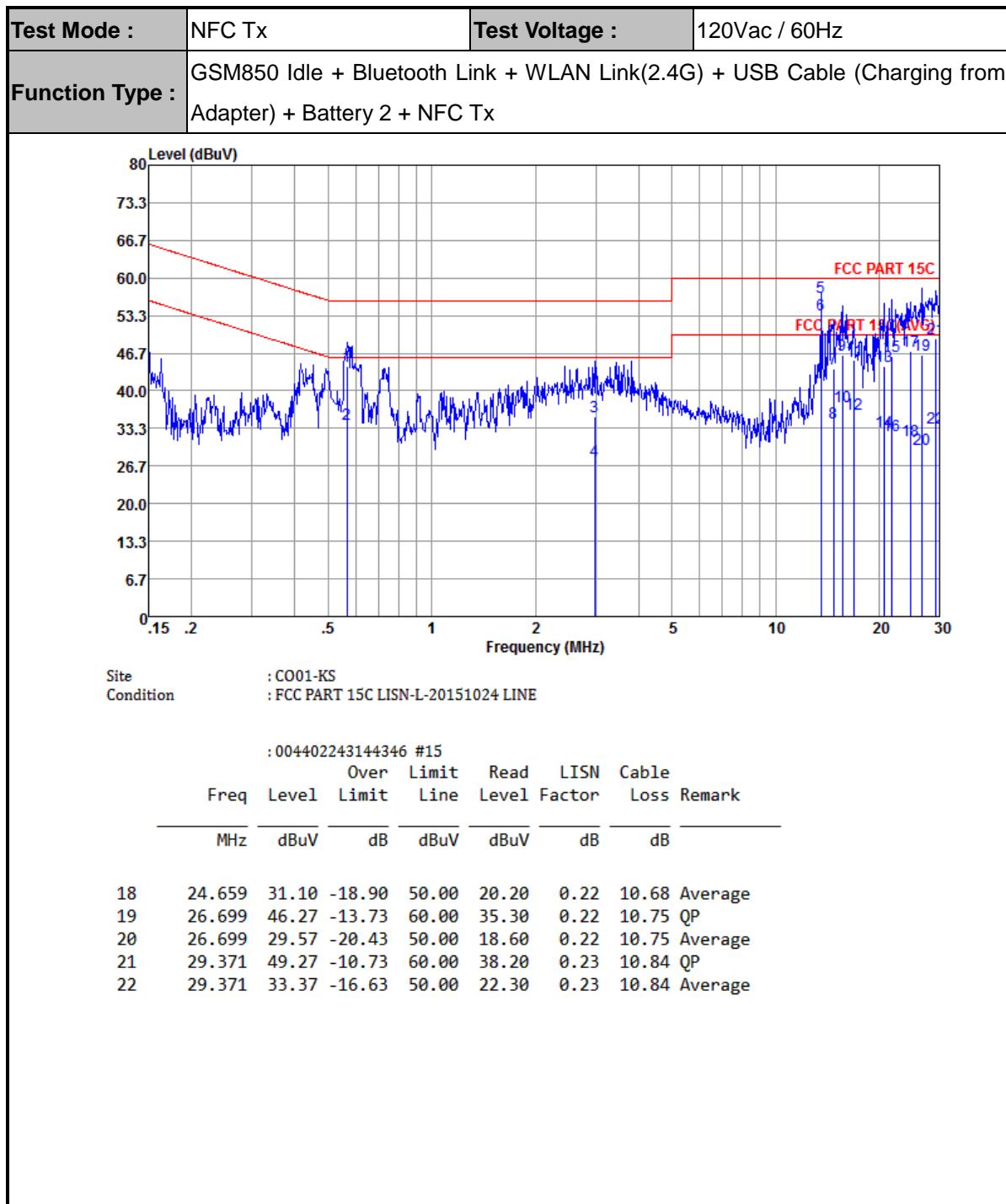


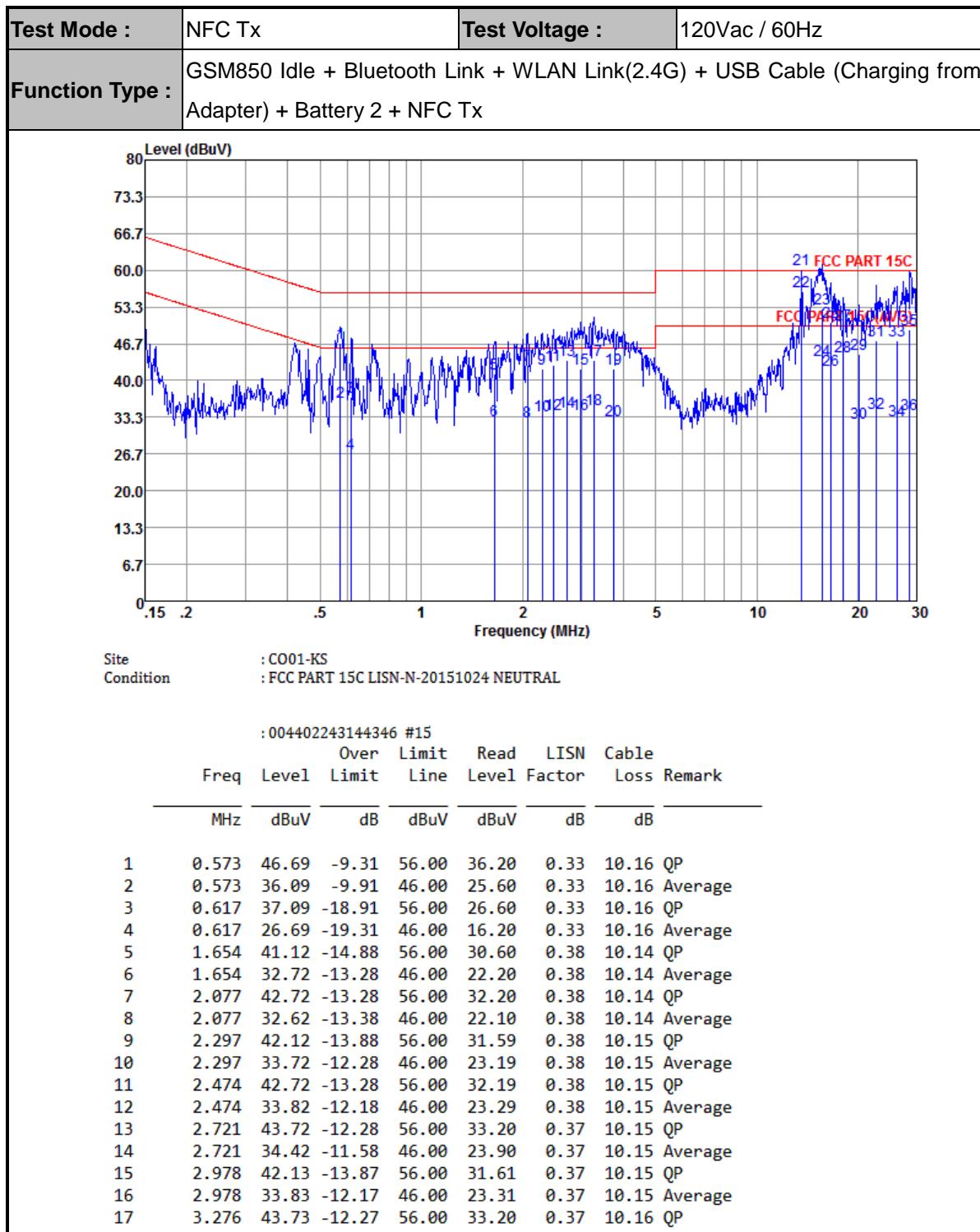
Appendix A. Test Results of Conducted Emission Test

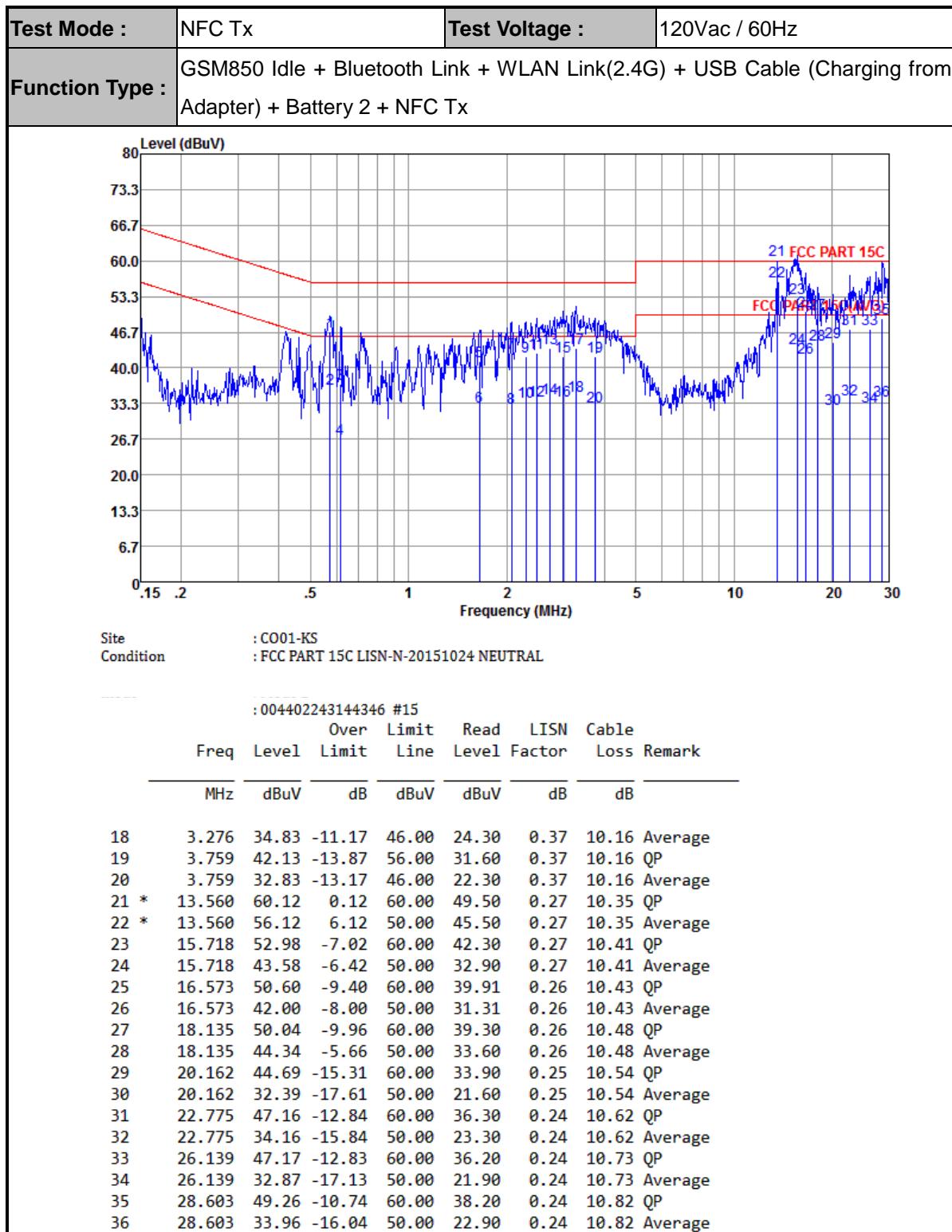


(1) with antenna

Remark: 13.560MHz is the NFC RF fundamental signal.

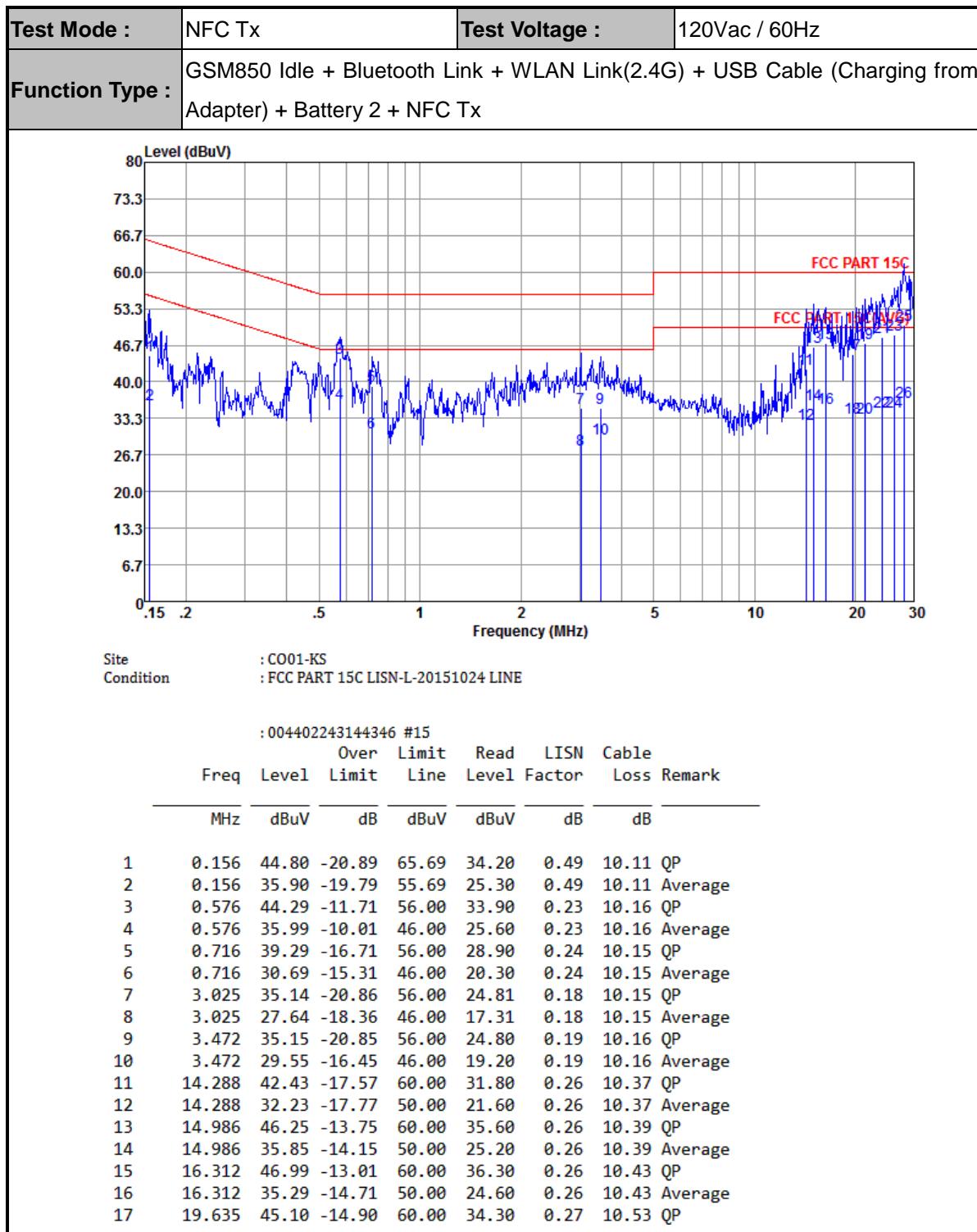






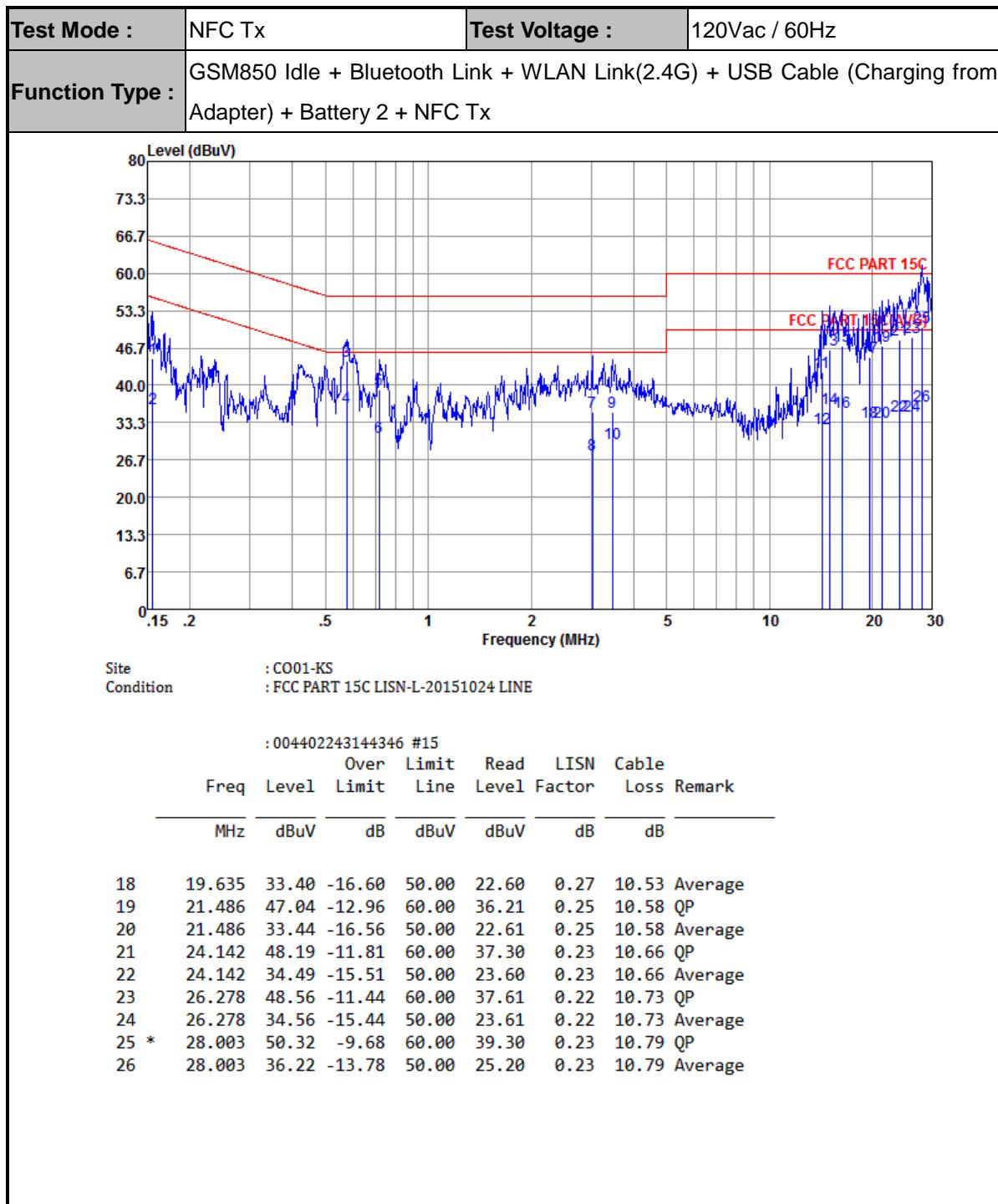
(1) with antenna

Remark: 13.560MHz is the NFC RF fundamental signal.



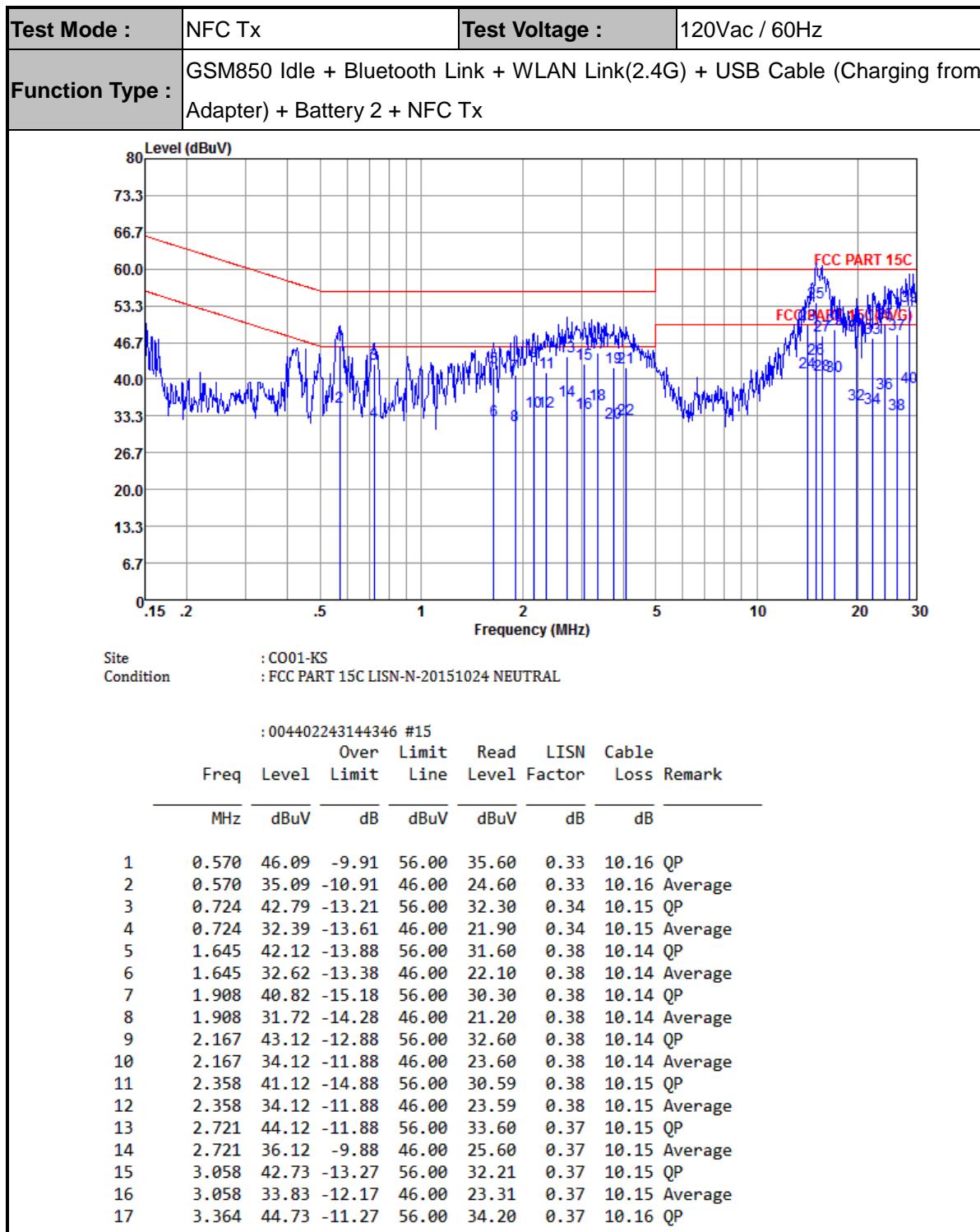
(2) with dummy load

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



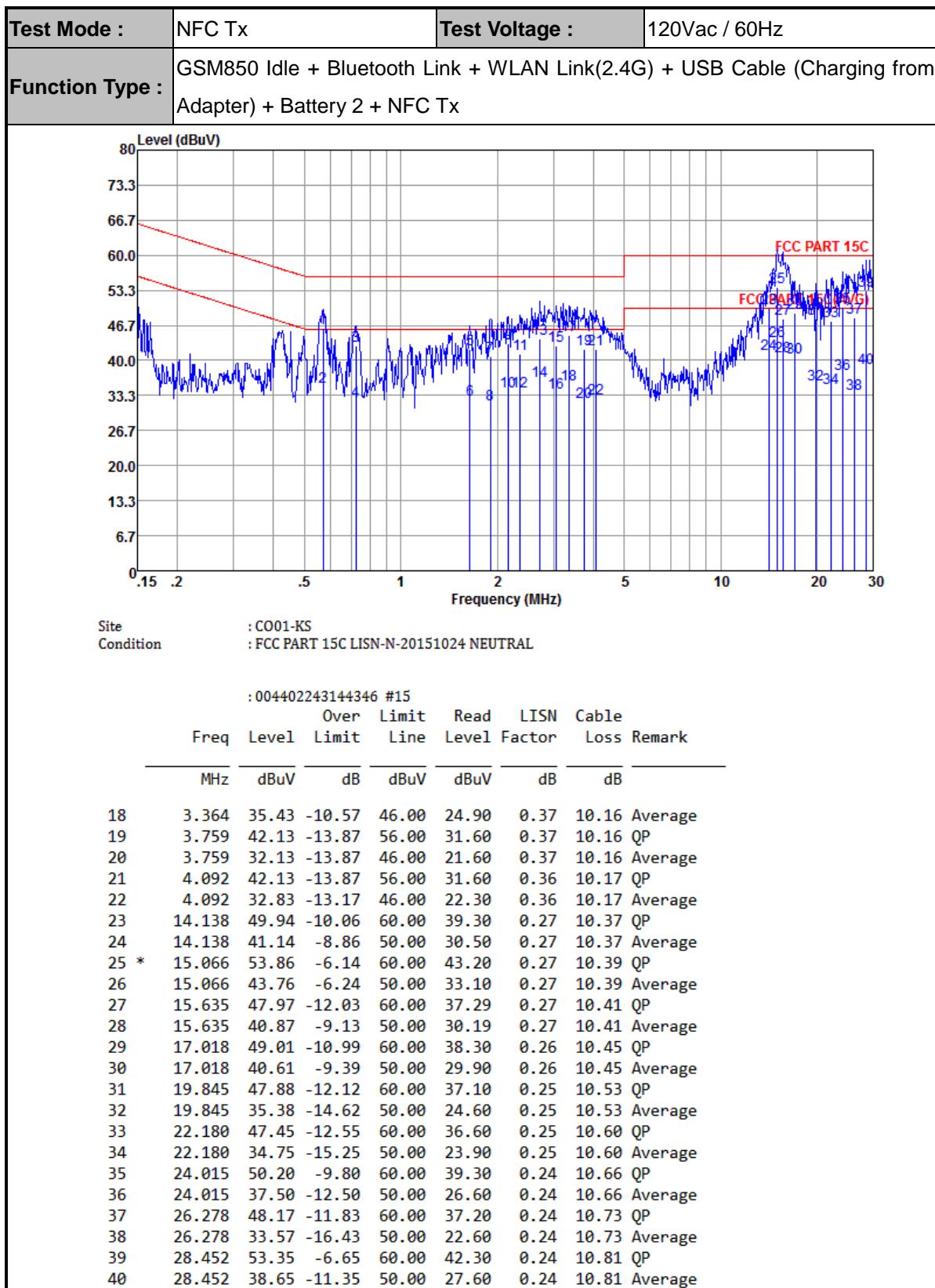
(2) with dummy load

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



(2) with dummy load

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



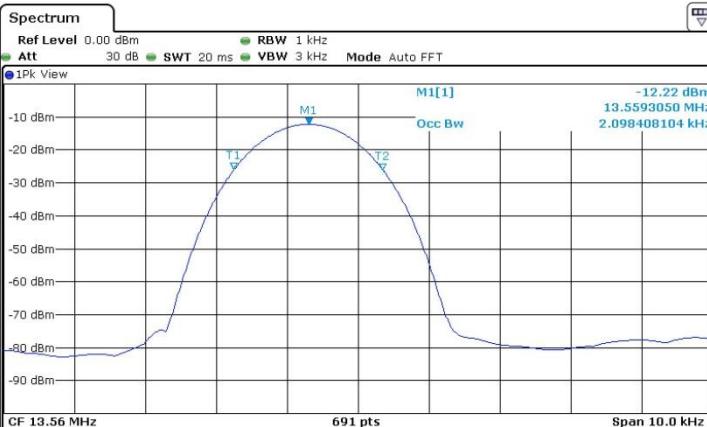
(2) with dummy load

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																																																								
	 <p>Marker</p> <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>1</td> <td></td> <td>13.559276 MHz</td> <td>-11.01 dBm</td> <td>ndB down</td> <td>2.475 kHz</td> </tr> <tr> <td>T1</td> <td>1</td> <td></td> <td>13.558032 MHz</td> <td>-30.93 dBm</td> <td>ndB</td> <td>20.00 dB</td> </tr> <tr> <td>T2</td> <td>1</td> <td></td> <td>13.560507 MHz</td> <td>-30.76 dBm</td> <td>Q factor</td> <td>5479.2</td> </tr> </tbody> </table> <p>Date: 11.AUG.2016 14:17:17</p>	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		13.559276 MHz	-11.01 dBm	ndB down	2.475 kHz	T1	1		13.558032 MHz	-30.93 dBm	ndB	20.00 dB	T2	1		13.560507 MHz	-30.76 dBm	Q factor	5479.2	 <p>Marker</p> <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>1</td> <td></td> <td>13.559305 MHz</td> <td>-12.22 dBm</td> <td></td> <td></td> </tr> <tr> <td>T1</td> <td>1</td> <td></td> <td>13.5582489 MHz</td> <td>-25.95 dBm</td> <td>Occ Bw</td> <td>2.098408104 kHz</td> </tr> <tr> <td>T2</td> <td>1</td> <td></td> <td>13.5603473 MHz</td> <td>-26.08 dBm</td> <td></td> <td></td> </tr> </tbody> </table> <p>Date: 11.AUG.2016 15:44:26</p>	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		13.559305 MHz	-12.22 dBm			T1	1		13.5582489 MHz	-25.95 dBm	Occ Bw	2.098408104 kHz	T2	1		13.5603473 MHz	-26.08 dBm			
Type	Ref	Trc	X-value	Y-value	Function	Function Result																																																					
M1	1		13.559276 MHz	-11.01 dBm	ndB down	2.475 kHz																																																					
T1	1		13.558032 MHz	-30.93 dBm	ndB	20.00 dB																																																					
T2	1		13.560507 MHz	-30.76 dBm	Q factor	5479.2																																																					
Type	Ref	Trc	X-value	Y-value	Function	Function Result																																																					
M1	1		13.559305 MHz	-12.22 dBm																																																							
T1	1		13.5582489 MHz	-25.95 dBm	Occ Bw	2.098408104 kHz																																																					
T2	1		13.5603473 MHz	-26.08 dBm																																																							
20dB Bandwidth (kHz)	2.48	99% OccupiedBW(kHz)	2.10																																																								
Frequency range (MHz)	$f_L > 13.553$	13.558032	Test Result																																																								
	$f_H < 13.567$	13.560507	Complies																																																								



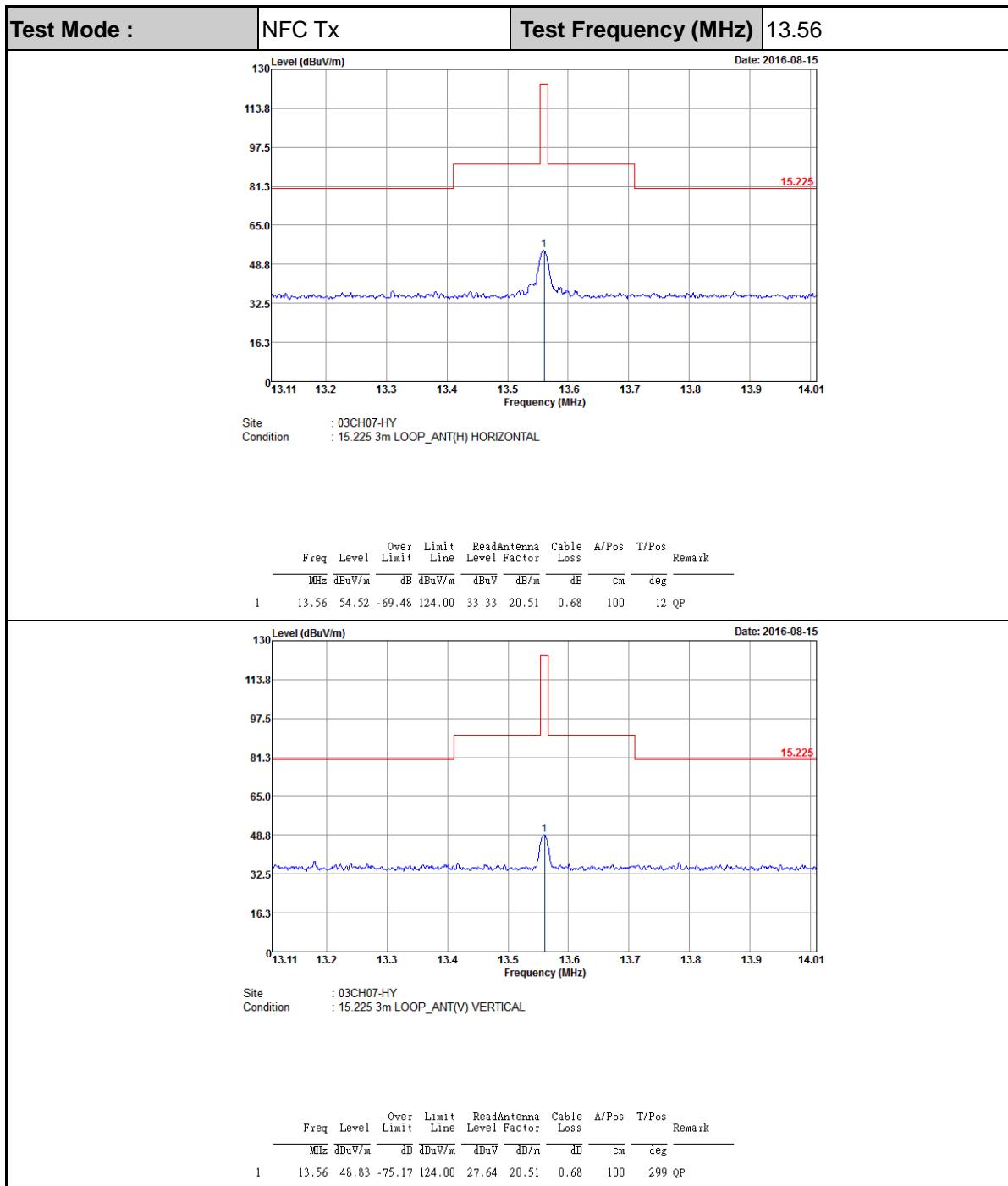
B2. Test Result of Frequency Stability

Voltage vs. Frequency Stability		Temperature vs. Frequency Stability	
Voltage (Vac)	Measurement Frequency (MHz)	Temperature (°C)	Measurement Frequency (MHz)
120	13.559270	-20	13.559364
102	13.559270	-10	13.559378
138	13.559270	0	13.559378
		10	13.559378
		20	13.559364
		30	13.559298
		40	13.559298
		50	13.559306
Max.Deviation (MHz)	-0.000730	Max.Deviation (MHz)	-0.000702
Max.Deviation (ppm)	-53.8348	Max.Deviation (ppm)	-51.7699
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 Emissions (9 kHz~30MHz)

Test Mode :		NFC Tx		Polarization :		Horizontal			
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
0.05306	47.35	-65.76	113.11	27.47	19.2	0.68	-	-	Average
0.06819	44.2	-66.73	110.93	24.52	19	0.68	-	-	Average
0.0903	35.53	-72.96	108.49	16.05	18.8	0.68	-	-	QP
0.12912	41.33	-64.05	105.38	21.86	18.79	0.68	-	-	Average
0.19182	48.87	-53.08	101.95	29.43	18.76	0.68	-	-	Average
0.98566	37.18	-30.55	67.73	17.6	18.9	0.68	-	-	QP
12.56	36.68	-32.82	69.5	15.69	20.31	0.68	-	-	QP
23.974	39	-30.5	69.5	15.89	22.04	1.07	100	28	QP
27.7	38.77	-30.73	69.5	15.44	22.26	1.07	-	-	QP

Test Mode :		NFC Tx		Polarization :		Vertical			
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
0.03996	47.3	-68.27	115.57	27.42	19.2	0.68	-	-	Average
0.07761	46.16	-63.65	109.81	26.48	19	0.68	-	-	Average
0.09236	34.46	-73.83	108.29	14.98	18.8	0.68	-	-	QP
0.1224	38.41	-67.44	105.85	18.94	18.79	0.68	-	-	Average
0.1687	45.5	-57.56	103.06	26.05	18.77	0.68	-	-	Average
0.50502	40.19	-33.35	73.54	20.89	18.62	0.68	-	-	QP
11.472	36.46	-33.04	69.5	15.69	20.09	0.68	-	-	QP
22.759	38.95	-30.55	69.5	15.91	21.97	1.07	-	-	QP
29.2	39.09	-30.41	69.5	15.67	22.35	1.07	100	47	QP

Note:

- 13.56 MHz is fundamental signal which can be ignored.
- The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
- Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);
- Limit line = specific limits (dB μ V) + distance extrapolation factor.



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

Test Mode :		NFC Tx			Polarization :			Horizontal			
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark	
30	29.19	-10.81	40	33.47	26	1.07	31.35	100	11	Peak	
103.71	18.73	-24.77	43.5	31.94	16.76	1.55	31.52	-	-	Peak	
212.79	20.19	-23.31	43.5	33.45	16.32	1.87	31.45	-	-	Peak	
877.5	32.11	-13.89	46	29.62	28.87	4.17	30.55	-	-	Peak	
910.4	33.05	-12.95	46	30.21	29.26	4.12	30.54	-	-	Peak	
948.2	33.75	-12.25	46	30.03	30.18	4.07	30.53	-	-	Peak	

Test Mode :		NFC Tx			Polarization :			Vertical			
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark	
30.27	29.13	-10.87	40	33.41	26	1.07	31.35	100	56	Peak	
79.68	20.63	-19.37	40	37.11	13.79	1.28	31.55	-	-	Peak	
210.9	19.17	-24.33	43.5	32.46	16.3	1.87	31.46	-	-	Peak	
874	32.74	-13.26	46	30.28	28.84	4.17	30.55	-	-	Peak	
916	33.1	-12.9	46	30.14	29.38	4.12	30.54	-	-	Peak	
941.2	33.23	-12.77	46	29.7	29.99	4.07	30.53	-	-	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 (dB μ V/m) = 20 log Emission level (μ V/m).
3. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor= Level.