FCC RF Test Report

APPLICANT : PAX Technology Limited EQUIPMENT : Mobile Payment Terminal

BRAND NAME : PAX
MODEL NAME : S920
MARKETING NAME : S920

FCC ID : V5PS920FDD-LTE

STANDARD : FCC Part 15 Subpart C §15.225

CLASSIFICATION: (DXX) Low Power Communication Device Transmitter

The product was received on Dec. 23, 2015 and testing was completed on Jan. 11, 2016. We, SPORTON INTERNATIONAL (SHENZHEN) 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 (SHENZHEN) INC., the test report shall not be reproduced except in full.

Prepared by: Andy Yeh / Manager

Approved by: Jones Tsai / Manager

SPORTON INTERNATIONAL (SHENZHEN) INC.

1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. China

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : 1 of 18
Report Issued Date : Jan. 21, 2016

Testing Laboratory

Report No.: FR5D2302D

Table of Contents

REVIS	SION HISTORY	
SUMM	MARY OF THE TEST RESULT	2
	NERAL INFORMATION	
1.1	Applicant	
1.2	Manufacturer	
1.3	Product Details	
1.4	Modification of EUT	
1.5	Testing Location	
1.6	Applicable Standards	
1.7	Test Modes	7
1.8	Test Configurations	8
1.9	Table for Supporting Units	g
2 CON	NDUCTED EMISSION TEST	10
2.1	Measuring Instruments	
2.2	Test setup	
2.3	Test Result of Conducted Emission Test.	
2.4	AC Power Line Conducted Emissions Measurement	
3. CON	NDUCTED TEST ITEMS	12
3.1	Measuring Instruments	12
3.2	Test Setup	12
3.3	Test Result of Conducted Test Items	12
3.4	20dB and 99% OBW Spectrum Bandwidth Measurement	13
3.5	Frequency Stability Measurement	13
4. RAD	DIATED TEST ITEMS	14
4.1	Measuring Instruments	14
4.2	Test Setup	14
4.3	Test Result of Radiated Test Items	14
4.4	Field Strength of Fundamental Emissions and Mask Measurement	
4.5	Radiated Emissions Measurement	16
5. LIS	T OF MEASURING EQUIPMENT	18
ΔPPFI	NDIX A. TEST RESULTS OF CONDUCTED EMISSION TEST	

APPENDIX B. TEST RESULTS OF CONDUCTED TEST ITEMS

- B.1.Test Result of 20dB Spectrum Bandwidth
- B.2 Test Result of Frequency Stability

APPENDIX C. TEST RESULTS OF RADIATED TEST ITEMS

- C.1 Test Result of Field Strength of Fundamental Emissions
- C.2 Results of Radiated Emissions (9 kHz~30MHz)
- C.3 Results of Radiated Emissions (30MHz~1GHz)

APPENDIX D. SETUP PHOTOGRAPHS OF EUT

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : 2 of 18

Report Issued Date: Jan. 21, 2016

Report No.: FR5D2302D

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR5D2302D	Rev. 01	Initial issue of report	Jan. 21, 2016

 ${\it SPORTON\ INTERNATIONAL\ (SHENZHEN)\ INC.}$

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : 3 of 18
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01

SUMMARY OF THE TEST RESULT

	Applied Standard: 47 CFR FCC Part 15 Subpart C / IC RSS-210 issue 8				
Part FCC Rule		Description of Test	Result	Under Limit	
3.1	15 207	AC Power Line Conducted	Complies	3.72 dB at	
3.1	15.207	Emissions	Complies	0.450MHz	
3.2	15 225(a)(b)(a)	Field Strength of	Complies	59.78 dB at	
3.2	15.225(a)(b)(c)	Fundamental Emissions	Complies	13.560 MHz	
3.3	2.1049	20dB Spectrum Bandwidth	Complies	-	
2.0		99% OBW Spectrum	Commiss		
3.3	-	Bandwidth	Complies	-	
	15 225(d)			3.82 dB at	
3.4	15.225(d)	Radiated Emissions	Complies	342.340 MHz for	
15.209				Quasi-Peak	
3.5	15.225(e)	Frequency Stability	Complies	-	
3.6	15.203	Antenna Requirements	Complies	-	

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3 dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±4.8 dB	Confidence levels of 95%

 ${\it SPORTON\ INTERNATIONAL\ (SHENZHEN)\ INC.}$

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : 4 of 18
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01

1. GENERAL INFORMATION

1.1 Applicant

PAX Technology Limited

Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour Road, Wanchai, Hong Kong

1.2 Manufacturer

PAX Computer Technology (Shenzhen) Co., Ltd.

4/F, No.3 Building, Software Park, Second Central Science-Tech Road, High-Tech industrial Park, Shenzhen, Guangdong, P.R.C.

1.3 Product Details

Items	Description
Tx/Rx Frequency Range	13.553 ~ 13.567MHz
Channel Number	1
20dBW	2.66 KHz
99%OBW	2.26 KHz
Antenna Type	PCB 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.

SPORTON INTERNATIONAL (SHENZHEN) INC.

FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE

TEL: 86-755-8637-9589

Page Number : 5 of 18
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01

1.4 Modification of EUT

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

1.5 Testing Location

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.		
	1F & 2F, Building A, Morning Business	Center, No. 4003 ShiGu Rd., Xili Town,	
T4 0'4-14'	Nanshan District, Shenzhen, Guangdo	ong, P. R. China	
Test Site Location	TEL: +86-755-8637-9589		
	FAX: +86-755-8637-9595		
Took Site No	Sporton Site No.		
Test Site No.	TH01-SZ	CO01-SZ	
Test Engineer	Mygai Mo	Jacky Yang	
Temperature	24~26 ℃ 21~23 ℃		
Relative Humidity	50~53%	41~43%	

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.		
	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan		
Test Site Location	warehouse, Nanshan District, Shenzhen, Guangdong, P. R. China		
	TEL: +86-755- 3320-2398		
Test Site No.	Sporton Site No.	FCC Registration No.	
rest site No.	03CH01-SZ		
Test Engineer	Jack Tian	831040	
Temperature	23~25℃		
Relative Humidity 48~52%			

Note: The test site complies with ANSI C63.4 2009 requirement.

SPORTON INTERNATIONAL (SHENZHEN) INC.

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : 6 of 18
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01

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.

SPORTON INTERNATIONAL (SHENZHEN) INC.

FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE

TEL: 86-755-8637-9589

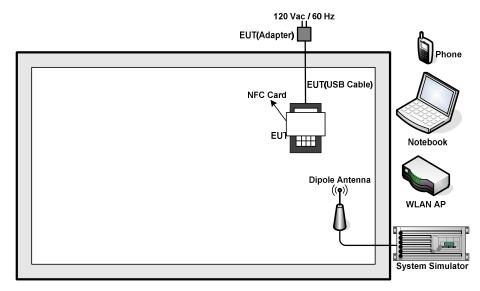
Page Number : 7 of 18 Report Issued Date: Jan. 21, 2016

Report No.: FR5D2302D

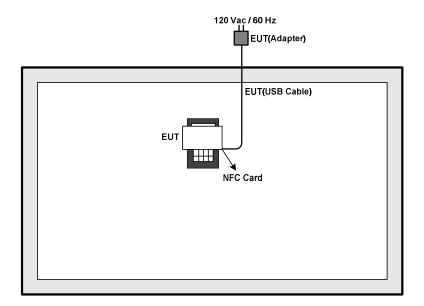
Report No.: FR5D2302D

1.8 Test Configurations

<AC Conducted Emissions>



< For Fundamental Emissions and Mask and Radiated Emissions Measurement >



SPORTON INTERNATIONAL (SHENZHEN) INC.

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : 8 of 18
Report Issued Date : Jan. 21, 2016

1.9 Table for Supporting Units

Support Unit	Manufacturer	Model	FCC ID
System Simulator	Anritsu	MT8820C	N/A
NFC Card	N/A	N/A	N/A
WLAN AP	D-Link	DIR-628	KA2DIR628A2
Iphone	Apple	N/A	N/A
Notebook	Lenovo	E540	FCC DoC

 ${\it SPORTON\ INTERNATIONAL\ (SHENZHEN)\ INC.}$

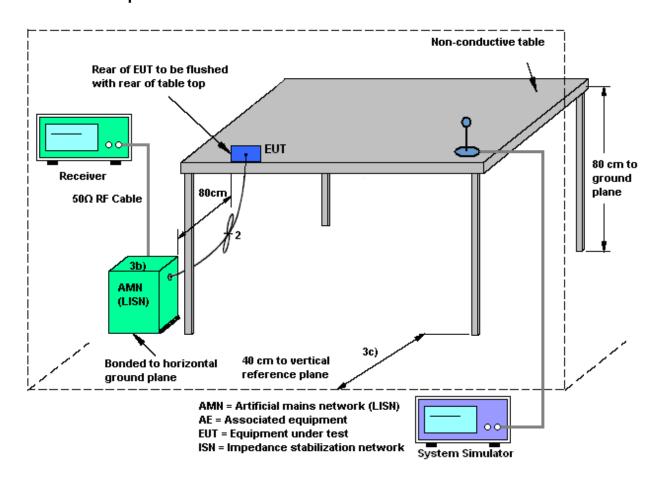
TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : 9 of 18
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01

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.

SPORTON INTERNATIONAL (SHENZHEN) INC.

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : 10 of 18
Report Issued Date : Jan. 21, 2016

Report No.: FR5D2302D

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	Conducted Limit (dBµV)	
(MHz)	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.
- 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.

SPORTON INTERNATIONAL (SHENZHEN) INC.

FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE

TEL: 86-755-8637-9589

Page Number : 11 of 18
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01

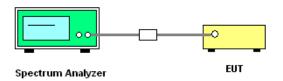
3. CONDUCTED TEST ITEMS

3.1 Measuring Instruments

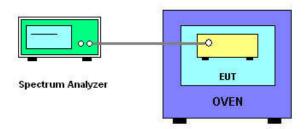
See list of measuring instruments of this test report.

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.

SPORTON INTERNATIONAL (SHENZHEN) INC.

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : 12 of 18
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01

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

Report No.: FR5D2302D

: 13 of 18

: Rev. 01

Report Issued Date: Jan. 21, 2016

Page Number

Report Version

the specific band 13.553~13.567MHz

3.4.2 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer 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.

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 imes 10 6

ppm and the limit is less than ±100ppm.

6. Extreme temperature rule is -20°C~50°C.

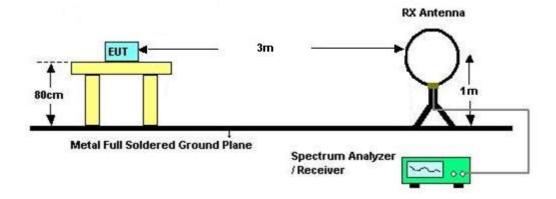
4. RADIATED TEST ITEMS

4.1 Measuring Instruments

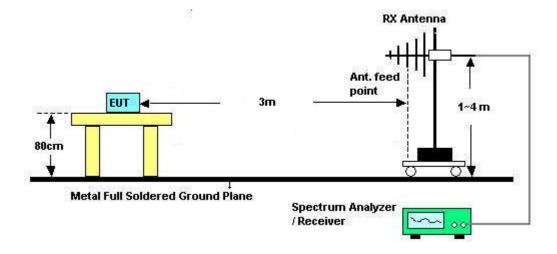
See list of measuring instruments of this test report.

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.

SPORTON INTERNATIONAL (SHENZHEN) INC.

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : 14 of 18 Report Issued Date : Jan. 21, 2016

Report No.: FR5D2302D

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.			
From of Emission (MUT)	Field Strength	Field Strength	Field Strength	Field Strength
Freq. of Emission (MHz)	(µV/m) at 30m	(dBµV/m) at 30m	(dBµV/m) at 10m	(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.
- The height of the receiving antenna was fixed at one meter above ground to find the maximum emissions field strength.
- 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 ($dB\mu V/m$) = 20 log Emission level ($\mu V/m$).

SPORTON INTERNATIONAL (SHENZHEN) INC.

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE

: 15 of 18 Page Number Report Issued Date: Jan. 21, 2016

Report No.: FR5D2302D

4.5 Radiated Emissions Measurement

4.5.1 Limit

The field strength of any emissions which appear outside of 13.553~13.567MHz band shall not exceed the general radiated emissions limits.

Frequencies	Field Strength	Measurement Distance
(MHz)	(μV/m)	(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.

SPORTON INTERNATIONAL (SHENZHEN) INC.

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : 16 of 18
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01

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.
- 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.
- 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.

SPORTON INTERNATIONAL (SHENZHEN) INC.

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : 17 of 18
Report Issued Date : Jan. 21, 2016

Report No.: FR5D2302D

5. LIST OF MEASURING EQUIPMENT

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP30	101400	9kHz~30GHz	Jan. 28, 2015	Jan. 05, 2016	Jan. 27, 2016	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangrou p	LP-150U	H2014081 803	-40~+150°C	Aug. 07, 2015	Jan. 05, 2016	Aug. 06, 2016	Conducted (TH01-SZ)
AC Power Source	Chroma	61602	616020000 891	100Vac~250Vac	Aug. 07, 2015	Jan. 05, 2016	Aug. 06, 2016	Conducted (TH01-SZ)
EMI Test Receiver&SA	Agilent Technologies	N9038A	MY522601 85	20Hz~26.5GHz	May 26, 2015	Jan. 11, 2016	May 25, 2016	Radiation (03CH01-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 06, 2015	Jan. 11, 2016	May 05, 2016	Radiation (03CH01-SZ)
Bilog Antenna	TeseQ	CBL6112D	23188	30MHz-2GHz	Oct. 17, 2015	Jan. 11, 2016	Oct. 16, 2016	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz ~3000MHz / 30 dB	Jan. 28, 2015	Jan. 11, 2016	Jan. 27, 2016	Radiation (03CH01-SZ)
AC Power Source	Chroma	61601	616010001 985	N/A	NCR	Jan. 11, 2016	NCR	Radiation (03CH01-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Jan. 11, 2016	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Jan. 11, 2016	NCR	Radiation (03CH01-SZ)
EMI Receiver	R&S	ESCI7	100724	9kHz~3GHz;	Nov. 23, 2015	Dec. 29, 2015	Nov. 22, 2016	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	103892	9kHz~30MHz	Feb. 02, 2015	Dec. 29, 2015	Feb. 01, 2016	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	MessTec	AN3016	16850	9kHz~30MHz	Feb. 02, 2015	Dec. 29, 2015	Feb. 01, 2016	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000 891	100Vac~250Vac	Aug. 07, 2015	Dec. 29, 2015	Aug. 06, 2016	Conduction (CO01-SZ)
Pulse Limiter	COM-POWER	LIT-153 Transient Limiter	53139	150kHz~30MHz	Oct. 20, 2015	Dec. 29, 2015	Oct. 19, 2016	Conduction (CO01-SZ)

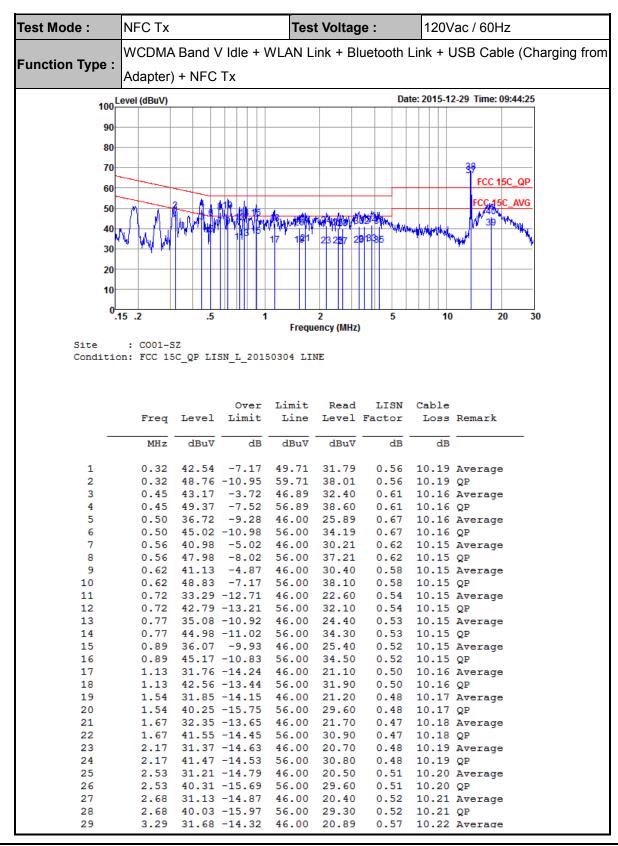
NCR: No Calibration Required

SPORTON INTERNATIONAL (SHENZHEN) INC.

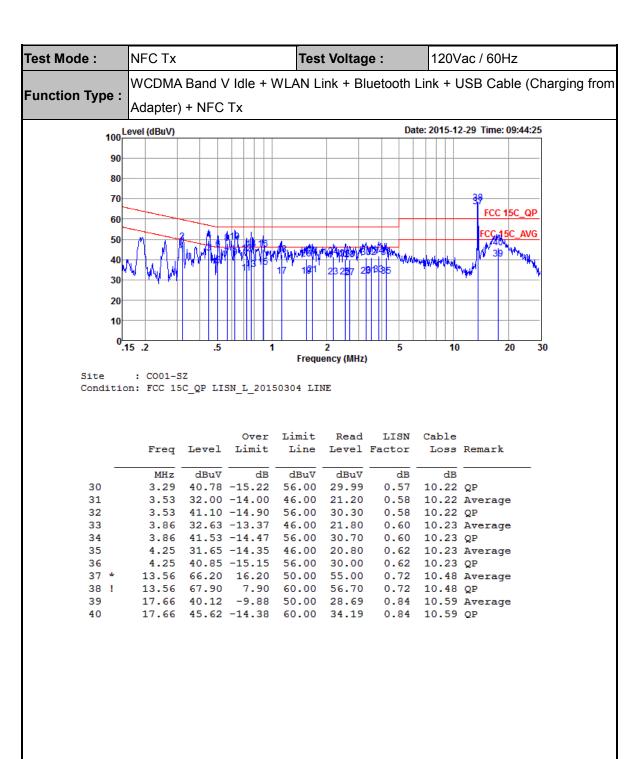
TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : 18 of 18
Report Issued Date : Jan. 21, 2016

Report No.: FR5D2302D

Appendix A. Test Results of Conducted Emission Test



TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : A1 of A6
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01



(1) The EUT is with NFC antenna during testing.

Remark: 13.56MHz is the NFC RF fundamental signal.

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : A2 of A6
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01

NFC Tx 120Vac / 60Hz Test Mode: Test Voltage : WCDMA Band V Idle + WLAN Link + Bluetooth Link + USB Cable (Charging from Function Type: Adapter) + NFC Tx 100 Level (dBuV) Date: 2015-12-29 Time: 09:53:40 90 80 70 FCC 15C_QP 60 2FCC 15C_AVG 50 40 20 10 0<u>.15</u> 5 10 20 Frequency (MHz) Site : CO01-SZ Condition: FCC 15C_QP LISN_N_20150304 NEUTRAL Over Limit Read LISN Cable Freq Level Limit Line Level Factor Loss Remark MHz dBuV dB dBuV dBu₹ dB dB 1 0.45 32.74 -14.19 46.93 22.00 0.58 10.16 Average 0.45 44.74 -12.19 56.93 34.00 0.58 10.16 QP 36.46 -9.54 46.00 25.69 0.61 10.16 Average 3 0.51 0.51 44.36 -11.64 56.00 33.59 0.61 10.16 QP 34.14 -11.86 46.00 23.40 44.44 -11.56 56.00 33.70 5 0.57 0.59 10.15 Average 0.59 10.15 QP 6 0.57 0.63 34.72 -11.28 46.00 24.00 0.57 10.15 Average 44.62 -11.38 56.00 33.90 30.30 -15.70 46.00 19.60 8 0.63 0.57 10.15 QP 9 0.75 30.30 -15.70 0.55 10.15 Average 0.75 43.10 -12.90 56.00 32.40 10 0.55 10.15 QP 0.94 30.71 -15.29 46.00 20.00 11 0.56 10.15 Average 0.94 42.41 -13.59 56.00 31.70 0.56 10.15 QP 12 3.47 29.34 -16.66 46.00 18.50 0.62 10.22 Average 13 14 3.47 38.54 -17.46 56.00 27.70 0.62 10.22 QP 15 4.03 31.66 -14.34 46.00 20.80 0.63 10.23 Average 4.03 40.26 -15.74 56.00 29.40 16 0.63 10.23 QP 17 4.27 29.87 -16.13 46.00 19.00 0.64 10.23 Average 56.00 28.10 50.00 33.39 0.64 10.23 QP 0.71 10.48 Average 4.27 38.97 -17.03 18 19 * 44.58 -5.42 13.56 13.56 50.68 -9.32 60.00 39.49 0.71 10.48 QP

(1) The EUT is with NFC antenna during testing.

Remark: 13.56MHz is the NFC RF fundamental signal.

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : A3 of A6
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01

NFC Tx 120Vac / 60Hz Test Mode: Test Voltage : WCDMA Band V Idle + WLAN Link + Bluetooth Link + USB Cable (Charging from Function Type: Adapter) + NFC Tx 100 Level (dBuV) Date: 2015-12-29 Time: 14:33:34 90 20 70 FCC 15C_QP 60 FCC 15C 50 40 30 20 10 .15 .2 5 10 20 30 Frequency (MHz) : CO01-SZ Site Condition: FCC 15C_QP LISN_L_20150304 LINE Over Limit Read LISN Cable Freq Level Limit Line Level Factor Loss Remark dB dBuV dBuV dBuV dB dB MHz 0.19 43.51 -10.55 54.06 32.70 0.50 10.31 Average 1 2 * 0.19 58.31 -5.75 64.06 47.50 0.50 10.31 QP 39.99 -11.74 51.73 29.20 0.25 0.55 10.24 Average 0.25 52.49 -9.24 61.73 41.70 0.55 10.24 QP 5 0.31 36.76 -13.17 49.93 25.99 0.57 10.20 Average 0.31 46.06 -13.87 59.93 35.29 0.57 10.20 QP 6 37.62 -10.63 48.25 0.55 10.18 Average 0.38 26.89 8 0.38 46.22 -12.03 58.25 35.49 0.55 10.18 QP 32.66 -14.32 46.98 21.90 44.26 -12.72 56.98 33.50 9 0.44 0.60 10.16 Average 10 0.44 0.60 10.16 QP 0.50 33.32 -12.68 46.00 22.49 0.67 10.16 Average 11 0.50 44.72 -11.28 56.00 33.89 12 0.67 10.16 QP 13 0.57 34.57 -11.43 46.00 23.80 0.62 10.15 Average 0.57 45.27 -10.73 56.00 34.50 0.62 10.15 QP 14 15 0.63 33.33 -12.67 46.00 22.60 0.58 10.15 Average 44.73 -11.27 16 0.63 56.00 34.00 0.58 10.15 QP 0.69 36.60 -9.40 46.00 25.90 0.55 10.15 Average 17 0.55 10.15 QP 18 0.69 45.30 -10.70 56.00 34.60 19 0.76 34.18 -11.82 46.00 23.50 0.53 10.15 Average 44.38 -11.62 20 0.76 56.00 33.70 0.53 10.15 QP 0.83 31.88 -14.12 46.00 21.20 21 0.53 10.15 Average 0.53 10.15 QP 22 0.83 45.08 -10.92 56.00 34.40

(2) The NFC antenna is replaced by a dummy load during test.

31.36 -14.64

0.96 43.56 -12.44 56.00 32.90

46.00

20.70

0.51

0.51 10.15 QP

0.96

SPORTON INTERNATIONAL (SHENZHEN) INC.

23

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : A4 of A6
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01

10.15 Average

NFC Tx 120Vac / 60Hz Test Mode: Test Voltage : WCDMA Band V Idle + WLAN Link + Bluetooth Link + USB Cable (Charging from Function Type: Adapter) + NFC Tx 100 Level (dBuV) Date: 2015-12-29 Time: 14:39:56 90 80 70 FCC 15C_QP 60 FCC 15C_AVG 50 Rest of the second 30 20 10 .15 .2 5 10 20 30 Frequency (MHz) : CO01-SZ Condition: FCC 15C QP LISN N 20150304 NEUTRAL Over Limit Read LISN Cable Freq Level Limit Line Level Factor Loss Remark MHz dBuV dB dBu₹ dBu∀ dB dB 0.18 44.51 -9.77 54.28 33.71 0.49 10.31 Average 2 0.18 53.31 -10.97 64.28 42.51 0.49 10.31 QP 0.25 37.90 -13.79 51.69 27.10 0.56 10.24 Average 0.25 49.90 -11.79 61.69 39.10 0.56 10.24 QP 5 0.32 45.78 -3.97 49.75 35.01 0.58 10.19 Average -8.07 59.75 10.19 QP 0.32 51.68 40.91 0.58 38.73 -9.57 48.30 0.56 10.18 Average 7 0.38 27.99 8 0.38 46.93 -11.37 58.30 36.19 0.56 10.18 QP 9 * 0.43 44.03 -3.21 47.24 33.30 0.57 10.16 Average 50.53 -6.71 57.24 39.80 0.57 10 0.43 10.16 QP 0.51 39.46 -6.54 46.00 28.69 0.61 10.16 Average -5.44 56.00 -4.46 46.00 50.56 39.79 12 0.51 0.61 10.16 QP 13 0.56 41.54 30.80 0.59 10.15 Average 0.56 49.64 -6.36 56.00 38.90 14 0.59 10.15 QP 15 0.63 38.12 -7.88 46.00 27.40 0.57 10.15 Average 0.63 48.32 -7.68 56.00 37.60 0.57 10.15 QP 16 17 0.69 38.40 -7.60 46.00 27.70 0.55 10.15 Average 18 0.69 48.10 -7.90 56.00 37.40 0.55 10.15 QP 19 0.74 40.90 -5.10 46.00 30.20 0.55 10.15 Average 49.40 -6.60 56.00 20 0.74 38.70 0.55 10.15 QP 21 0.80 39.70 -6.30 46.00 29.00 0.55 10.15 Average 22 0.80 49.40 -6.60 56.00 38.70 0.55 10.15 QP 36.71 -9.29 46.00 26.00 23 0.88 0.56 10.15 Average 0.88 48.31 -7.69 56.00 37.60 0.56 10.15 QP 46.00 24.90 56.00 35.00 25 0.94 35.61 -10.39 0.56 10.15 Average 26 0.94 45.71 -10.29 0.56 10.15 QP 1.01 34.61 -11.39 27 46.00 23.90 0.56 10.15 Average

56.00 35.00

24.21

46.00

SPORTON INTERNATIONAL (SHENZHEN) INC.

28

29

1.01

1.08

45.71 -10.29

34.92 -11.08

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : A5 of A6
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01

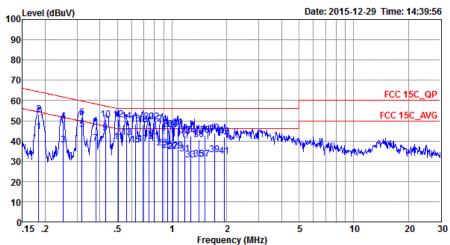
0.56 10.15 QP

10.15 Average

0.56

Test Mode: NFC Tx Test Voltage: 120Vac / 60Hz

Function Type: WCDMA Band V Idle + WLAN Link + Bluetooth Link + USB Cable (Charging from Adapter) + NFC Tx



Site : CO01-SZ

Condition: FCC 15C_QP LISN_N_20150304 NEUTRAL

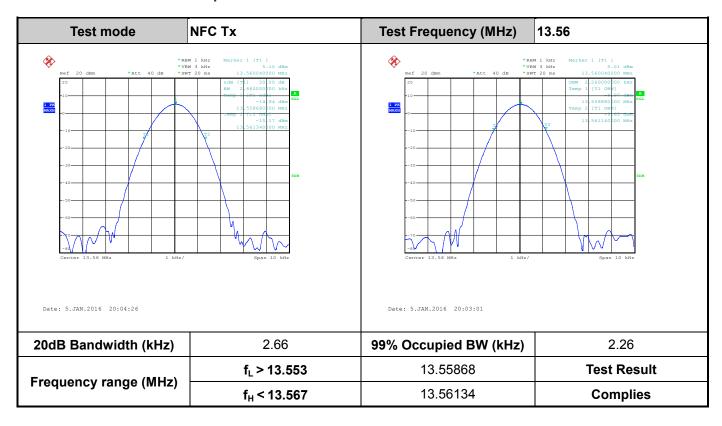
		Over	Limit	Read	LISN	Cable	
Freq	Level	Limit	Line	Level	Factor	Loss	Remark
MHz	dBu∀	dB	dBu∀	dBuV	dB	dB	
1.08	46.32	-9.68	56.00	35.61	0.56	10.15	QP
1.18	33.62	-12.38	46.00	22.90	0.56	10.16	Average
1.18	42.72	-13.28	56.00	32.00	0.56	10.16	QP
1.27	30.73	-15.27	46.00	20.01	0.56	10.16	Average
1.27	42.43	-13.57	56.00	31.71	0.56	10.16	QP
1.40	31.03	-14.97	46.00	20.30	0.56	10.17	Average
1.40	40.43	-15.57	56.00	29.70	0.56	10.17	QP
1.51	31.14	-14.86	46.00	20.40	0.57	10.17	Average
1.51	42.94	-13.06	56.00	32.20	0.57	10.17	QP
1.71	33.35	-12.65	46.00	22.60	0.57	10.18	Average
1.71	43.95	-12.05	56.00	33.20	0.57	10.18	QP
1.94	32.36	-13.64	46.00	21.60	0.57	10.19	Average
1.94	41.96	-14.04	56.00	31.20	0.57	10.19	QP
	MHz 1.08 1.18 1.18 1.27 1.27 1.40 1.40 1.51 1.51 1.71 1.71	MHz dBuV 1.08 46.32 1.18 33.62 1.18 42.72 1.27 30.73 1.27 42.43 1.40 31.03 1.40 40.43 1.51 31.14 1.51 42.94 1.71 33.35 1.71 43.95 1.94 32.36	MHz dBuV dB 1.08 46.32 -9.68 1.18 33.62 -12.38 1.18 42.72 -13.28 1.27 30.73 -15.27 1.27 42.43 -13.57 1.40 31.03 -14.97 1.40 40.43 -15.57 1.51 31.14 -14.86 1.51 42.94 -13.06 1.71 33.35 -12.65 1.71 43.95 -12.05 1.94 32.36 -13.64	MHz dBuV dB dBuV 1.08 46.32 -9.68 56.00 1.18 33.62 -12.38 46.00 1.18 42.72 -13.28 56.00 1.27 30.73 -15.27 46.00 1.27 42.43 -13.57 56.00 1.40 31.03 -14.97 46.00 1.40 40.43 -15.57 56.00 1.51 31.14 -14.86 46.00 1.51 42.94 -13.06 56.00 1.71 33.35 -12.65 46.00 1.71 43.95 -12.05 56.00 1.94 32.36 -13.64 46.00	MHz dBuV dB dBuV dBuV 1.08 46.32 -9.68 56.00 35.61 1.18 33.62 -12.38 46.00 22.90 1.18 42.72 -13.28 56.00 32.00 1.27 30.73 -15.27 46.00 20.01 1.27 42.43 -13.57 56.00 31.71 1.40 31.03 -14.97 46.00 20.30 1.40 40.43 -15.57 56.00 29.70 1.51 31.14 -14.86 46.00 20.40 1.51 42.94 -13.06 56.00 32.20 1.71 33.35 -12.65 46.00 22.60 1.71 43.95 -12.05 56.00 33.20 1.94 32.36 -13.64 46.00 21.60	MHz dBuV dB dBuV dBuV dB 1.08 46.32 -9.68 56.00 35.61 0.56 1.18 33.62 -12.38 46.00 22.90 0.56 1.18 42.72 -13.28 56.00 32.00 0.56 1.27 30.73 -15.27 46.00 20.01 0.56 1.27 42.43 -13.57 56.00 31.71 0.56 1.40 31.03 -14.97 46.00 20.30 0.56 1.40 40.43 -15.57 56.00 29.70 0.56 1.51 31.14 -14.86 46.00 20.40 0.57 1.51 42.94 -13.06 56.00 32.20 0.57 1.71 33.35 -12.65 46.00 22.60 0.57 1.71 43.95 -12.05 56.00 33.20 0.57 1.94 32.36 -13.64 46.00 21.60 0.57	Freq Level Limit Line Level Factor Loss MHz dBuV dB dBuV dB uV dB uV dB dB 1.08 46.32 -9.68 56.00 35.61 0.56 10.15 1.18 33.62 -12.38 46.00 22.90 0.56 10.16 1.18 42.72 -13.28 56.00 32.00 0.56 10.16 1.27 30.73 -15.27 46.00 20.01 0.56 10.16 1.27 42.43 -13.57 56.00 31.71 0.56 10.16 1.40 31.03 -14.97 46.00 20.30 0.56 10.17 1.40 40.43 -15.57 56.00 29.70 0.56 10.17 1.51 31.14 -14.86 46.00 20.40 0.57 10.17 1.51 42.94 -13.06 56.00 32.20 0.57 10.17 1.71 43.95 -12.05

(2) The NFC antenna is replaced by a dummy load during test.

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : A6 of A6
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01

Appendix B. Test Results of Conducted Test Items

B.1 Test Result of 20dB Spectrum Bandwidth



TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : B1 of B2
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01

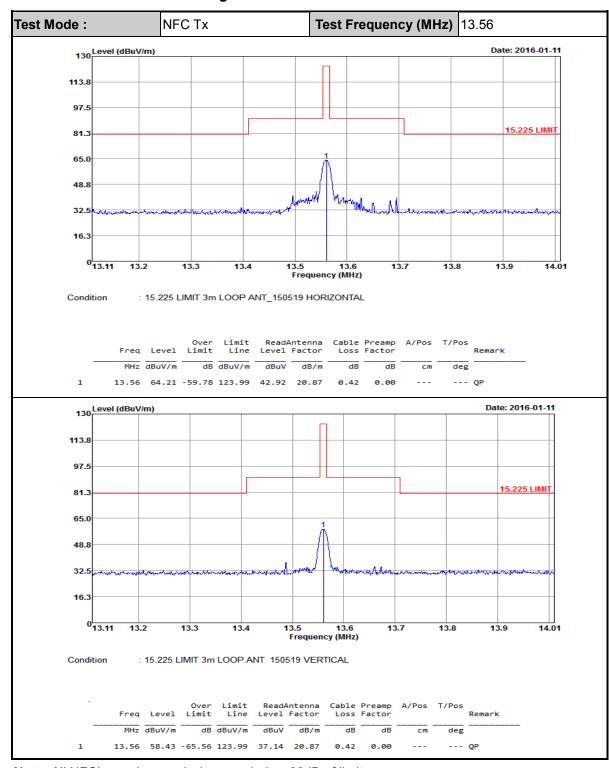
B.2 Test Result of Frequency Stability

Voltage vs. Fre	equency Stability	Temperature vs. Frequency Stability			
Voltago (Vac)	Measurement	Temperature (℃)	Measurement		
Voltage (Vac)	Frequency (MHz)	remperature (C)	Frequency (MHz)		
120	13.560000	-20	13.560000		
102	13.560000	-10	13.560000		
138	13.560010	0	13.560010		
-	-	10	13.560000		
-	-	20	13.560000		
-	-	30	13.560020		
-	-	40	13.560000		
-	-	50	13.560000		
Max.Deviation (MHz)	0.000010	Max.Deviation (MHz)	0.000020		
Max.Deviation (ppm)	0.7375	Max.Deviation (ppm)	1.4749		
Limit	FS < ±100 ppm	Limit	FS < ±100 ppm		
Test Result	PASS	Test Result	PASS		

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : B2 of B2
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01

Appendix C. Test Results of Radiated Test Items

C.1 Test Result of Field Strength of Fundamental Emissions



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

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : C1 of C3
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01

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

Test Mode :	NFC NFC	Tx		Polariz	ation :	Hori	izontal		
Frequency (MHz)	Level	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
0.02007	45.26	-76.3	121.56	16.81	28.3	0.15	-	-	Average
0.06642	48.72	-62.44	111.16	25.67	22.9	0.15	-	-	Average
0.09552	53.23	-54.77	108	30.18	22.9	0.15	-	-	QP
0.12711	38.9	-66.62	105.52	15.98	22.77	0.15	-	-	Average
0.4016	42.69	-52.84	95.53	20.52	22	0.17	-	-	Average
4.286	35.16	-34.84	70	13.17	21.74	0.25	-	-	QP
13.344	41.26	-28.74	70	19.94	20.9	0.42	-	-	QP
21.58	33.3	-36.7	70	10.95	21.82	0.53	-	-	QP
28.22	34.57	-35.43	70	11.27	22.69	0.61	-	-	QP

Test Mode :	NFC	Tx		Polariz	ation :	Vert	ical		
Frequency (MHz)	Level	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
0.02007	45.09	-76.47	121.56	16.64	28.3	0.15	-	-	Average
0.08196	54.09	-55.24	109.33	31.04	22.9	0.15	-	-	Average
0.0912	52.41	-55.99	108.4	29.36	22.9	0.15	-	-	QP
0.12519	41.36	-64.29	105.65	18.44	22.77	0.15	-	-	Average
0.44045	45.3	-49.43	94.73	23.2	21.93	0.17	-	-	Average
3.962	37.03	-32.97	70	15	21.79	0.24	-	-	QP
11.6	33.5	-36.5	70	12	21.11	0.39	-	-	QP
22.372	33.78	-36.22	70	11.31	21.93	0.54	-	-	QP
25.885	34.44	-35.56	70	11.45	22.41	0.58	-	-	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 ($dB\mu V$) + distance extrapolation factor.

SPORTON INTERNATIONAL (SHENZHEN) INC.

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : C2 of C3 Report Issued Date : Jan. 21, 2016

Report No.: FR5D2302D

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

Test Mode) :	Polarization: Horizontal									
Frequency (MHz)	Leve		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
103.72	18.7	1	-24.79	43.5	38.47	12.21	1.38	33.35	-	-	Peak
232.73	25.7	8	-20.22	46	45.78	11.32	1.8	33.12	-	-	Peak
290.93	28.8	9	-17.11	46	46.52	13.48	1.94	33.05	-	-	Peak
342.34	42.1	8	-3.82	46	58.12	14.95	2.04	32.93	100	200	QP
488.81	24.9	2	-21.08	46	37.39	17.74	2.31	32.52	-	-	Peak
800.18	26.3	8	-19.62	46	34.86	20.2	2.91	31.59	-	-	Peak

Test Mode	:	NFC Tx		F	Polarizatio	n :	Vertical			
Frequency (MHz)	Leve	Limit	Limit Line	Read Leve	l Factor		Preamp Factor (dB)	Ant Pos	Table Pos (deg)	Remark
56.19	33.9	1 -6.09	40	58.78		1.14	33.35			Peak
232.73	18.6	3 -27.37	46	38.63	3 11.32	1.8	33.12			Peak
342.34	42.9	6 -3.04	46	58.9	14.95	2.04	32.93	100	200	Peak
473.29	23.5	7 -22.43	3 46	36.3	1 17.52	2.31	32.57			Peak
563.5	21.1	5 -24.85	6 46	32.46	6 18.47	2.48	32.26			Peak

Note:

713.85

22.51

1. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

19.6

2.75

31.85

Peak

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

46

-23.49

3. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor= Level.

32.01

SPORTON INTERNATIONAL (SHENZHEN) INC.

TEL: 86-755-8637-9589 FAX: 86-755-8637-9595 FCC ID: V5PS920FDD-LTE Page Number : C3 of C3
Report Issued Date : Jan. 21, 2016
Report Version : Rev. 01