

FCC TEST REPORT
FOR
NIXON TECHNOLOGY COMPANY LIMITED
Multi-tech Card Reader
Model No.: DAC-MTCR-001

Prepared for : NIXON TECHNOLOGY COMPANY LIMITED
Address : 6/F, CAPELLA HTR, 47 HUNG TO ROAD, KWUN TONG, KOWLOON,
HONG KONG

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
Address : 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an
District, Shenzhen, Guangdong, China
Tel : (+86)755-82591330
Fax : (+86)755-82591332
Web : www.LCS-cert.com
Mail : webmaster@LCS-cert.com

Date of receipt of test sample : July 03, 2018
Number of tested samples : 1
Serial number : Prototype
Date of Test : July 04, 2018~ July 10, 2018
Date of Report : July 19, 2018

FCC TEST REPORT
FCC CFR 47 PART 15 C (15.225)

Report Reference No. : LCS180703006AEB

Date of Issue : July 19, 2018

Testing Laboratory Name : Shenzhen LCS Compliance Testing Laboratory Ltd.

Address : 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China

Testing Location/ Procedure : Full application of Harmonised standards [checked]
Partial application of Harmonised standards [unchecked]
Other standard testing method [unchecked]

Applicant's Name : NIXON TECHNOLOGY COMPANY LIMITED

Address : 6/F, CAPELLA HTR, 47 HUNG TO ROAD, KWUN TONG, KOWLOON, HONG KONG

Test Specification

Standard : FCC CFR 47 PART 15 C(15.225)

Test Report Form No. : LCSEMC-1.0

TRF Originator : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF : Dated 2011-03

Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen LCS Compliance Testing Laboratory Ltd. is acknowledged as copyright owner and source of the material. Shenzhen LCS Compliance Testing Laboratory Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Test Item Description : Multi-tech Card Reader

Trade Mark : Delta

Test Model : DAC-MTCR-001

Ratings : Input: DC 12V, 350mA

Result : Positive

Compiled by:

[Handwritten signature of Linda He]

Linda He / Administrators

Supervised by:

[Handwritten signature of Calvin Weng]

Calvin Weng / Technique principal

Approved by:

[Handwritten signature of Gavin Liang]

Gavin Liang / Manager

FCC -- TEST REPORT

Test Report No. : LCS180703006AEB	<u>July 19, 2018</u> Date of issue
---	---------------------------------------

Test Model.....	: DAC-MTCR-001
EUT.....	: Multi-tech Card Reader
Applicant	: NIXON TECHNOLOGY COMPANY LIMITED
Address.....	: 6/F, CAPELLA HTR, 47 HUNG TO ROAD, KWUN TONG, KOWLOON, HONG KONG
Telephone.....	: /
Fax.....	: /
Manufacturer	: NIXON TECHNOLOGY COMPANY LIMITED
Address.....	: 6/F, CAPELLA HTR, 47 HUNG TO ROAD, KWUN TONG, KOWLOON, HONG KONG
Telephone.....	: /
Fax.....	: /
Factory	: NIXON INTELLIGENT SYSTEM(SHENZHEN) CO., LTD
Address.....	: A303-305, Languang science and technology building, 7 new West Road, North of Nanshan District Science and Technology Park, Shenzhen, Guangdong.
Telephone.....	: /
Fax.....	: /

Test Result	Positive
--------------------	-----------------

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Revision	Issue Date	Revisions	Revised By
000	July 19, 2018	Initial Issue	Gavin Liang

TABLE OF CONTENTS

1. GENERAL INFORMATION	6
1.1 Description of Device (EUT)	6
1.2 Host System Configuration List and Details	6
1.3 External I/O	6
1.4 Description of Test Facility	7
1.5 Statement of the Measurement Uncertainty	7
1.6 Measurement Uncertainty	7
1.7 Description of Test Modes	7
2. TEST METHODOLOGY	8
2.1. EUT Configuration	8
2.2. EUT Exercise	8
2.3. General Test Procedures	8
3. SYSTEM TEST CONFIGURATION	9
4. SUMMARY OF TEST RESULT	10
5. RADIATED MEASUREMENT	11
5.1. Radiated Emission	11
5.2. Field Strength of Fundamental Emissions and Mask Measurement	19
6. BANDWIDTH OF THE OPERATING FREQUENCY	21
6.1. Standard Applicable	21
6.2. Test Result	21
7. FREQUENCY STABILITY MEASUREMENT	22
7.1 Standard Applicable	22
7.2 Test Result	22
8. ANTENNA REQUIREMENTS	23
8.1 Standard Applicable	23
8.2 Antenna Connected Construction	23
9. LIST OF MEASURING EQUIPMENTS	24
10. PHOTOGRAPHS OF TEST SETUP	25
11. EXTERIOR PHOTOGRAPHS OF THE EUT	25
12. INTERIOR PHOTOGRAPHS OF THE EUT	25

1. GENERAL INFORMATION

1.1 Description of Device (EUT)

EUT	Multi-tech Card Reader
Test Model	: DAC-MTCR-001
Additional Model No.	: /
Model Declaration	: /
Power Supply	: Input: DC 12V, 350mA
Hardware version	: HY-254101
Software version	: T1CC2541_test.HEX YCKJ_TC_V3.2. hex
Bluetooth Operation frequency	: 2402 – 2480 MHz
Bluetooth Version	: V4.0
Bluetooth Channel Number	: 40 Channels for Bluetooth V4.0 (BT LE)
Bluetooth Channel Spacing	: 2MHz for Bluetooth V4.0 (DTS)
Bluetooth Modulation Type	: GFSK, for Bluetooth V4.0 (DTS)
Antenna Description	: PCB Antenna, 2.80 dBi
RFID Technology	:
Operating Frequency	: 13.56MHz
Channel Number	: 1
Modulation Technology	: ASK
Antenna Description	: PCB Antenna, 0.5dBi (Max.)

1.2 Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate
--	--	--	--	--

1.3 External I/O

I/O Port Description	Quantity	Cable
--	--	--

1.4 Description of Test Facility

FCC Registration Number. is 254912.

Industry Canada Registration Number. is 9642A-1.

ESMD Registration Number. is ARCB0108.

UL Registration Number. is 100571-492.

TUV SUD Registration Number. is SCN1081.

TUV RH Registration Number. is UA 50296516-001

NVLAP Registration Code is 600167-0

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10:2013 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

1.5 Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.6 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Radiation Uncertainty	9KHz~30MHz	3.10dB	(1)
	30MHz~200MHz	2.96dB	(1)
	200MHz~1000MHz	3.10dB	(1)
	1GHz~26.5GHz	3.80dB	(1)
	26.5GHz~40GHz	3.90dB	(1)
Conduction Uncertainty	150kHz~30MHz	1.63dB	(1)
Power disturbance	30MHz~300MHz	1.60dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.7 Description of Test Modes

This test was performed with EUT in X, Y, Z position and the worst case was found when EUT in X position.

The EUT was operated in the engineering mode. All X, Y, Z axis had been tested and the worst case(X axis) was record.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10: 2013, FCC CFR PART 15C 15.225.

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.225 under the FCC Rules Part 15 Subpart C.

2.3. General Test Procedures

2.3.1. Conducted Emissions

According to the requirements in Section 6.2 of ANSI C63.10: 2013, AC power-line conducted emissions shall be measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2. Radiated Emissions

The EUT is placed on a turn table and the turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10: 2013.

3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a continuous transmit condition.

3.2. EUT Exercise Software

The system was configured for RF ID testing in a continuous transmits condition and change test channels by software (RFIDXXX) provided by applicant.

3.3. Special Accessories

No.	Equipment	Manufacturer	Model No.	Serial No.	Length	shielded/ unshielded	Notes
1	PC	Lenovo	Ideapad	A131101550	/	/	DOC
2	Power adapter	Lenovo	CPA-A090	36200414	1.00m	unshielded	DOC

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST RESULT

Applied Standard: FCC Part 15 Subpart C		
Test Items	FCC Rules	Result
Line Conducted Emissions	§15.207(a)	N/A
Field Strength of Fundamental Emissions	§15.225(a)(b)(c)	PASS
Radiated Emissions	§15.225(d) & §15.209	PASS
20dB Bandwidth	§ 2.1049	PASS
Frequency Stability	§15.225(e)	PASS
Antenna Requirement	§15.203	PASS

5. RADIATED MEASUREMENT

5.1. Radiated Emission

5.1.1. Standard Applicable

15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
\1\ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2\)
13.36-13.41			

\1\ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

\2\ Above 38.6

According to §15.247 (d): 20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

5.1.2. Measuring Instruments and Setting

Please refer to equipment list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10 th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB/VB 200Hz/1KHz for QP/AVG
Start ~ Stop Frequency	150kHz~30MHz / RB/VB 9kHz/30KHz for QP/AVG
Start ~ Stop Frequency	30MHz~1000MHz / RB/VB 120kHz/1MHz for QP

5.1.3. Test Procedures

1) Sequence of testing 9 kHz to 30 MHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
- If the EUT is a floor standing device, it is placed on the ground.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Premeasurement:

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna height is 0.8 meter.
- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).
- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

2) Sequence of testing 30 MHz to 1 GHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Premeasurement:

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 to 3 meter.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ($\pm 45^\circ$) and antenna movement between 1 and 4 meter.
- The final measurement will be done with QP detector with an EMI receiver.
- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1 GHz to 18 GHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Premeasurement:

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height scan range is 1 meter to 2.5 meter.
- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ($\pm 45^\circ$) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.
- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

4) Sequence of testing above 18 GHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 1 meter.
- The EUT was set into operation.

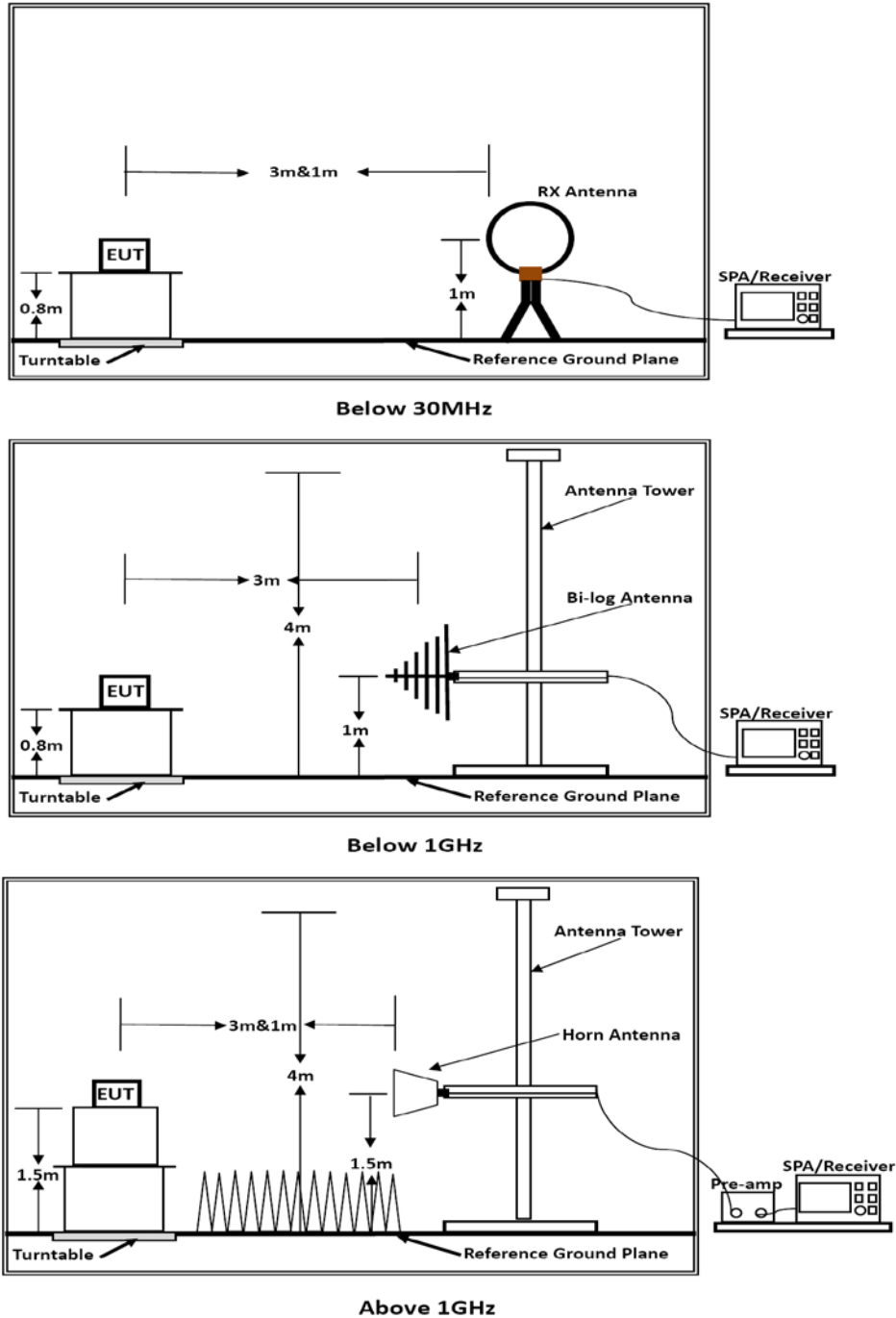
Premeasurement:

- The antenna is moved spherical over the EUT in different polarizations of the antenna.

Final measurement:

- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.
- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

5.1.4. Test Setup Layout



Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.

Distance extrapolation factor = $20 \log (\text{specific distance [3m]} / \text{test distance [1m]})$ (dB);
 Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

1.1.1.5.1.5. Test Results

PASS.

The test data please refer to following page:

9 KHz~30 MHz

Note: Only recorded the worst test result.

Freq. MHz	Antenna Pol.	Reading dBuV	Factor dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark
0.22	H	--	--	--	100.76	--	--
0.86	H	--	--	--	48.91	--	--
4.55	H	32.23	20.26	52.49	69.5	17.01	QP
11.24	H	30.23	20.25	50.48	69.5	19.02	QP
13.56	H	30.55	20.11	50.65	124.0	73.35	QP
14.74	H	32.24	20.06	52.30	69.5	17.20	QP
23.39	H	31.16	19.92	51.08	69.5	18.42	QP
27.33	H	31.11	19.94	51.05	69.5	18.45	QP

*Note: Emission Level= Reading Level + Antenna Factor + Cable Loss

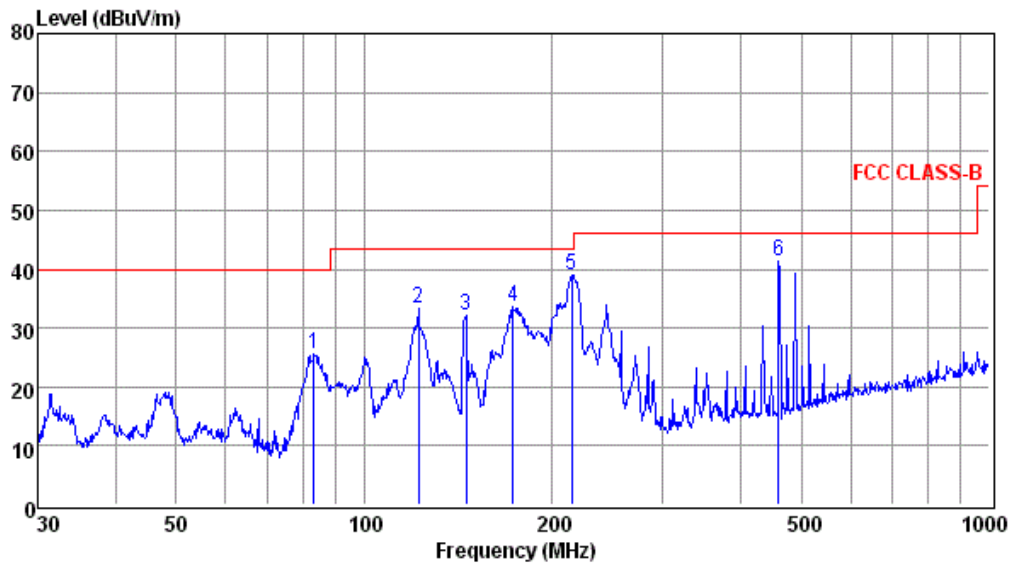
Measured at both 0 degree and 90 degree, recorded worst case at 90 degree.

Margin = Emission Limit – Emission Values

“--” means noise floor.

30 MHz – 1 GHz

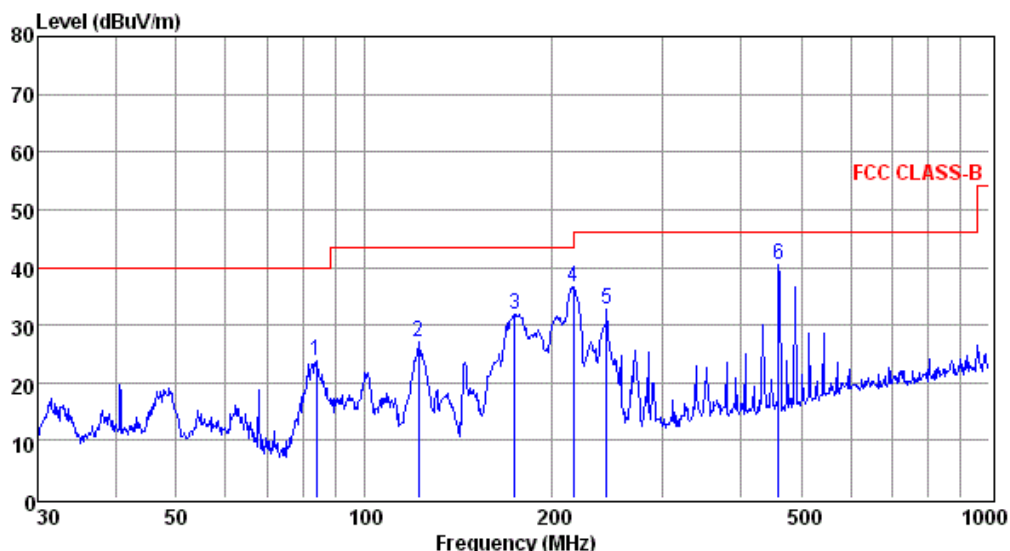
Horizontal



	Freq MHz	Reading dBuV	CabLos dB	Antfac dB/m	Measured dBuV/m	Limit dBuV/m	Over dB	Remark
1	82.94	15.57	0.54	9.58	25.69	40.00	-14.31	QP
2	121.98	22.44	0.70	10.17	33.31	43.50	-10.19	QP
3	145.35	23.05	0.77	8.23	32.05	43.50	-11.45	QP
4	173.21	23.45	0.91	9.20	33.56	43.50	-9.94	QP
5	214.51	27.00	0.95	11.03	38.98	43.50	-4.52	QP
6	460.73	24.43	1.36	15.61	41.40	46.00	-4.60	QP

- Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that ate 20db blow the official limit are not reported

Vertical



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	83.82	13.48	0.54	9.89	23.91	40.00	-16.09	QP
2	121.98	16.10	0.70	10.17	26.97	43.50	-16.53	QP
3	173.81	21.77	0.91	9.24	31.92	43.50	-11.58	QP
4	216.02	24.70	0.88	11.07	36.65	46.00	-9.35	QP
5	244.23	19.80	0.90	12.08	32.78	46.00	-13.22	QP
6	460.73	23.43	1.36	15.61	40.40	46.00	-5.60	QP

- Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that ate 20db blow the official limit are not reported

Note:

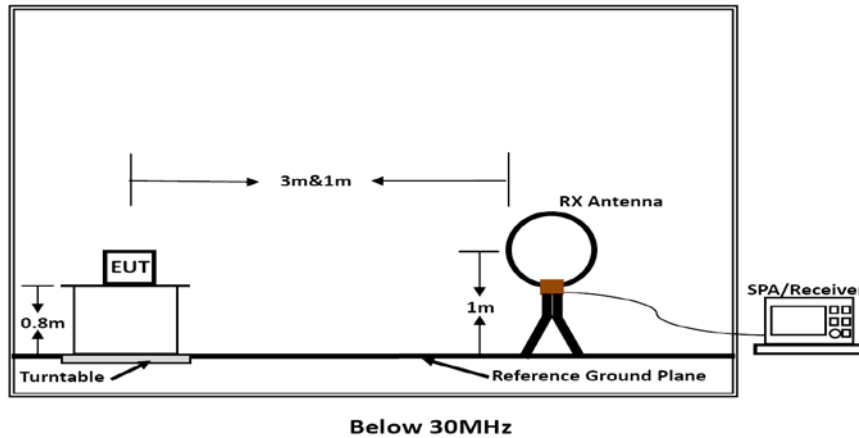
Pre-scan all modes and recorded the worst case results in this report.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

5.2. Field Strength of Fundamental Emissions and Mask Measurement

5.2.1. Block Diagram of Test Setup



5.2.2. Field strength of fundamental emissions limit and Mask limit

The field strength of fundamental emissions shall not exceed 15848 microvolts/meter at 30 meters. The emissions limit in this paragraph is based on measurement instrumentation employing a QP detector.

Frequencies (MHz)	Field Strength (microvolts/meter)	Field Strength (dB μ V/m) at 10m	Field Strength (dB μ V/m) at 3m
13.553 ~ 13.567MHz	15848 at 30m	103.08 (QP)	124 (QP)

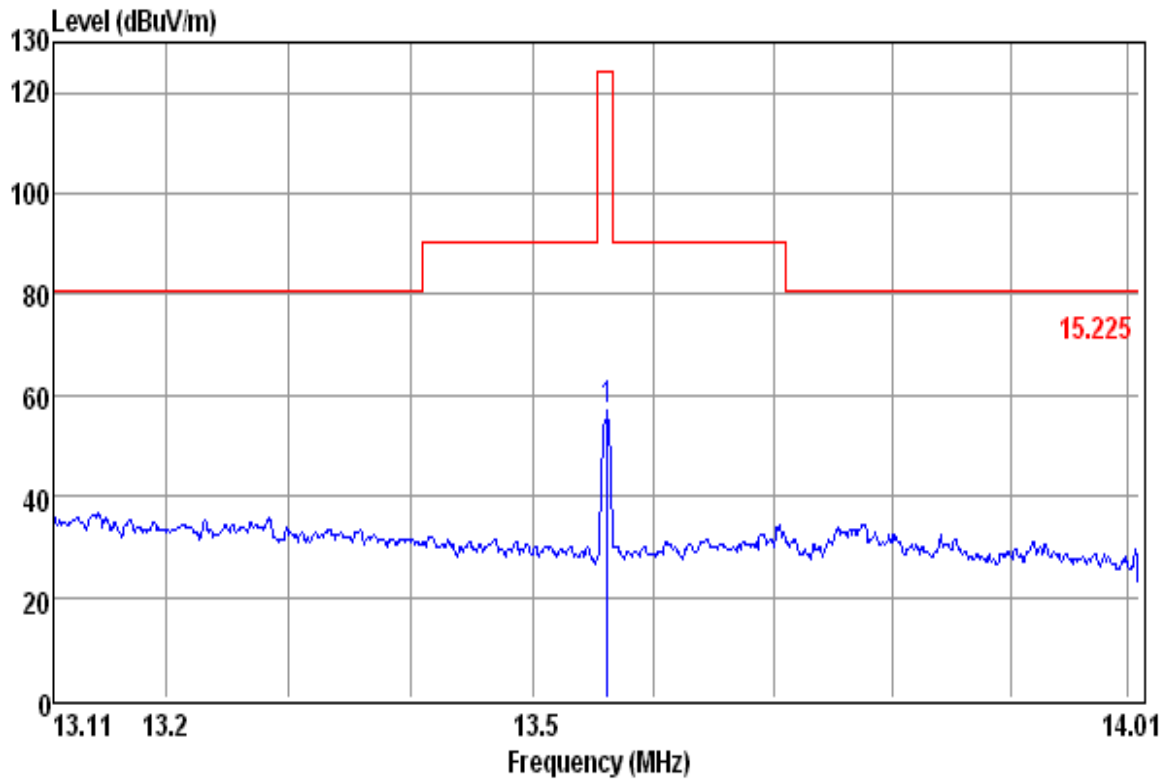
Mask Limit:

Frequency (MHz)	Limit (dB μ V/m)	Distance (m)
1.705-13.110	69.5	3
13.110-13.410	80.5	3
13.410-13.553	90.5	3
13.553-13.567	124.0	3
13.567-13.710	90.5	3
13.710-14.010	80.5	3
14.010-30.000	69.5	3

5.2.3. Test Results

PASS.

The test data please refer to following page:



	Freq.(MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Pol.	Remark
1	13.56	56.79	10.86	67.65	124.00	H	QP

*Note: Factor= Antenna Factor + Cable Loss

Emission level (dBuV/m) = 20 log Emission level (µV/m).

Measured at both 0 degree and 90 degree, recorded worst case at 90 degree

Measured distance is 3m.

All emissions emit from non-NFC function of digital unintentional emissions. All NFC's spurious emissions are below 20dB of limits.

6. BANDWIDTH OF THE OPERATING FREQUENCY

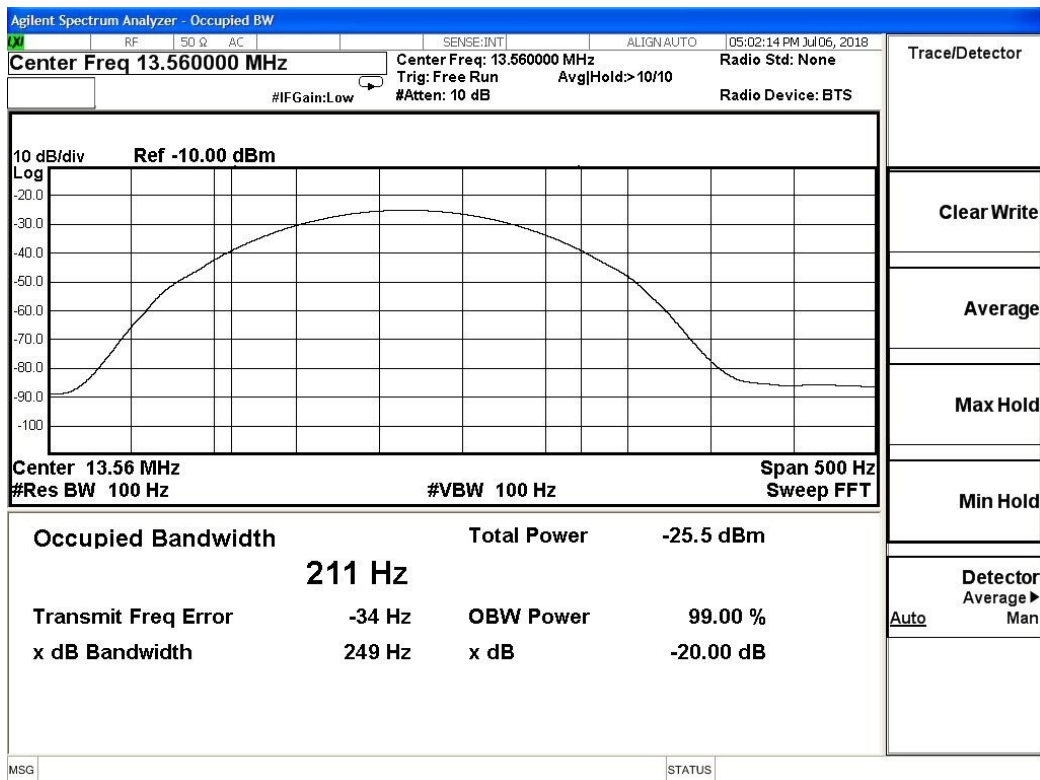
6.1. Standard Applicable

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emissions in the specific band (13.553 ~ 13.567MHz).

6.2. Test Result

EUT	Multi-tech Card Reader
RBW	100Hz
VBW	100Hz
SPAN	500Hz
Carrier Freq. (MHz)	20dB Bandwidth (KHz)
13.56	0.249

Please refer to the test plot



7. FREQUENCY STABILITY MEASUREMENT

7.1 Standard Applicable

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.

7.2 Test Result

Voltage vs. Frequency Stability

Voltage(V)	Measurement Frequency (MHz)
DC 6.70V	13.56032
DC 7.40V	13.56040
DC 8.40V	13.56039
Max. Deviation (MHz)	0.00040
Max. Deviation (ppm)	29.4985

Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)
-20	13.56045
-10	13.56052
0	13.56040
10	13.56047
20	13.56044
30	13.56043
40	13.56040
50	13.56057
Max. Deviation (MHz)	0.00057
Max. Deviation (ppm)	42.0354

8. ANTENNA REQUIREMENTS

8.1 Standard Applicable

According to antenna requirement of §15.203.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The 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 a broken antenna can be re-placed by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

8.2 Antenna Connected Construction

8.2.1. Standard Applicable

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

8.2.2. Antenna Connector Construction

The gains of antenna used for transmitting is 0.5 dBi, and the antenna is a PCB antenna connect to PCB board and no consideration of replacement. Please see EUT photo for details.

BT and RFID share difference antenna.

8.2.3. Results: Compliance.

9. LIST OF MEASURING EQUIPMENTS

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1	Power Meter	R&S	NRVS	100444	2018-06-16	2019-06-15
2	Power Sensor	R&S	NRV-Z81	100458	2018-06-16	2019-06-15
3	Power Sensor	R&S	NRV-Z32	10057	2018-06-16	2019-06-15
4	ESA-E SERIES SPECTRUM ANALYZER	Agilent	E4407B	MY41440754	2017-11-17	2018-11-16
5	MXA Signal Analyzer	Agilent	N9020A	MY49100040	2018-06-16	2019-06-15
6	SPECTRUM ANALYZER	R&S	FSP	100503	2018-06-16	2019-06-15
7	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2018-06-16	2019-06-15
8	Positioning Controller	MF	MF-7082	/	2018-06-16	2019-06-15
9	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
10	EMI Test Receiver	R&S	ESR 7	101181	2018-06-16	2019-06-15
11	AMPLIFIER	QuieTek	QTK-A2525G	CHM10809065	2017-11-17	2018-11-16
12	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2018-06-22	2019-06-21
13	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2018-05-02	2019-05-01
14	Horn Antenna	EMCO	3115	6741	2018-06-22	2019-06-21
15	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	791	2017-09-21	2018-09-20
16	Broadband Preamplifier	SCHWARZBECK	BBV 9719	9719-025	2017-09-21	2018-09-20
17	RF Cable-R03m	Jye Bao	RG142	CB021	2018-06-16	2019-06-15
18	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2018-06-16	2019-06-15
19	TEST RECEIVER	R&S	ESCI	101142	2018-06-16	2019-06-15
20	RF Cable-CON	UTIFLEX	3102-26886-4	CB049	2018-06-16	2019-06-15
21	10dB Attenuator	SCHWARZBECK	MTS-IMP136	261115-001-0032	2018-06-16	2019-06-15
22	Artificial Mains	R&S	ENV216	101288	2018-06-16	2019-06-15
23	RF Control Unit	JS Tonscend Corporation	JS0806-2	178060073	2017-10-28	2018-10-27
24	JS1120-3 BT/WIFI Test Software	JS Tonscend Corporation	JS1120-3	/	N/A	N/A

Note: All equipment is calibrated through GUANGZHOU LISAI CALIBRATION AND TEST CO.,LTD.

10. PHOTOGRAPHS OF TEST SETUP

Please refer to separated files for Test Setup Photos of the EUT.

11. EXTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

12. INTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for Internal Photos of the EUT.

-----THE END OF REPORT-----