FCC Part 15C

Measurement And Test Report

For

NEAREX PTE LTD.

80B Bencoolen Street, #12-05 The Bencoolen, Singapore 189648

FCC ID: 2AFM3XIPPOS

May 25, 2015

This Report Concerns: ☒ Original Report	**Equipment Type:** XipPos
Report Number:	MTI150504001RF-2
Test Engineer:	Bill Chen Bill Chen
Reviewed By:	Jason Zheng Jason zheng
Approved & Authorized By:	Hebe Lee Hebe Lee
Test Date:	May 08, 2015 – May 25, 2015
Prepared By:	**Shenzhen Microtest Technology Co.,Ltd** 6F, Zhongbao Building, Gushu, Bao'an District, Shenzhen, P.R.China Tel: +86-755-8885 0135 Fax: +86-755-8885 0136

TEST RESULT CERTIFICATION	
Applicant's name ..... :	**NEAREX PTE LTD.**
Address..... :	80B Bencoolen Street, #12-05 The Bencoolen, Singapore 189648
Manufacture's Name..... :	**NEAREX PTE LTD.**
Address..... :	80B Bencoolen Street, #12-05 The Bencoolen, Singapore 189648
Product description	
Product name .....:	XipPos
Model and/or type reference :	XipPos
Serial Model.....:	N/A
Standards..... :	FCC Part15.225
Test procedure.....	ANSI C63.4-2009

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.225) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.203/15.225(c)	Antenna Requirement	PASSED	
15.215	20dB Bandwidth	PASSED	
15.225(a)	In-Band Emissions	PASSED	
15.225(b)	In-Band Emissions	PASSED	
15.225(c)	In-Band Emissions	PASSED	
15.225(d)/15.209	Out of Band Emissions	PASSED	
15.225(e)	Frequency Stability Tolerance	PASSED	
15.207	Power Line Conducted Emission	PASSED	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

1.1 TEST FACILITY

Shenzhen Toby Technology Co., Ltd.
Add.: 10/F.,A Block,Jiada R&D Bldg.,No.5 Songpingshan, Road, Science&Technology Park, Shenzhen, 518057
FCC Registration No.:811562

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

<table>
<tr><td>Equipment</td><td>XipPos</td></tr>
<tr><td>Trade Name</td><td>N/A</td></tr>
<tr><td>Model Name</td><td>XipPos</td></tr>
<tr><td>Serial Model</td><td>N/A</td></tr>
<tr><td>Model Difference</td><td>N/A</td></tr>
<tr><td>Product Description</td><td>The EUT is a XipPos
<table>
<tr><td>Operation Frequency:</td><td>13.56MHz</td></tr>
<tr><td>Modulation Type:</td><td>ASK</td></tr>
<tr><td>Number Of Channel</td><td>1CH</td></tr>
<tr><td>Antenna Designation:</td><td>Please see Note 3.</td></tr>
<tr><td>Output Power(Conducted):</td><td>N/A</td></tr>
<tr><td>Antenna Gain (dBi)</td><td>0dbi</td></tr>
</table>
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.</td></tr>
<tr><td>Channel List</td><td>Please refer to the Note 2.</td></tr>
<tr><td>Adapter</td><td>Model: K-T50501000U1
Input: 100-240V~50-60Hz 0.15A Max
Output: 5V⎓1000mA</td></tr>
<tr><td>Battery</td><td>DC 3.7V, 600mAh</td></tr>
<tr><td>Connecting I/O Port(s)</td><td>Please refer to the User's Manual</td></tr>
</table>

Note:

1. For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.
2. Channel List

   13.56MHz

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	N/A	N/A	Internal antenna	Internal antenna	0	NFC Antenna

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	NFC mode

For Conducted Emission	
Final Test Mode	Description
Mode 1	NFC mode

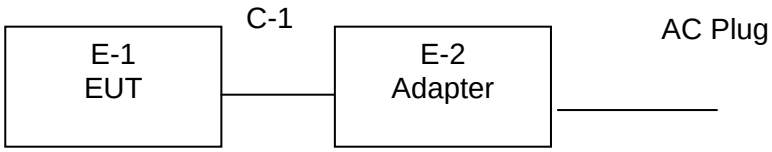
For Radiated Emission	
Final Test Mode	Description
Mode 1	NFC mode

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

(2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	XipPos	N/A	XipPos	N/A	EUT
E-2	Adapter	N/A	K-T50501000U1	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	0.8m	
C-2	NO	NO	0.8m	

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal	Cal.Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Mar. 20, 2015	Mar. 19, 2016
Spectrum Analyzer	ROHDE&SCHWARZ	FSP30	DE25181	Aug. 10, 2014	Aug. 09, 2015
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	101165	Aug. 10, 2014	Aug. 09, 2015
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 07, 2015	Mar. 06, 2016
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Mar. 07, 2015	Mar. 06, 2016
Hom Antenna	ETS-LINDGREN	3117	00143207	Mar. 07, 2015	Mar. 06, 2016
Hom Antenna	ETS-LINDGREN	3117	00143209	Mar. 07, 2015	Mar. 06, 2016
Pre-anplifier	HP	11909A	185903	Mar. 07, 2015	Mar. 06, 2016
Pre-anplifier	HP	8447B	3008A00849	Mar. 07, 2015	Mar. 06, 2016
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 07, 2015	Mar. 06, 2016
Signal Generator	ROHDE&SCHWARZ	SML03	IKW682-054	Feb. 11, 2015	Feb. 10, 2016
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A

Conduction Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal	Cal.Due Date
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	1000321	2014-08-10	2015-08-09
50Ω Coaxial Switch	Anntsu	MP59B	X10321	2014-08-10	2015-08-09
LISN	ROHDE&SCHWARZ	ENV216	101131	2014-08-10	2015-08-09
LISN	SCHWARZBECK	NNBL 8226-2	8226-2/164	2014-08-10	2015-08-09

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

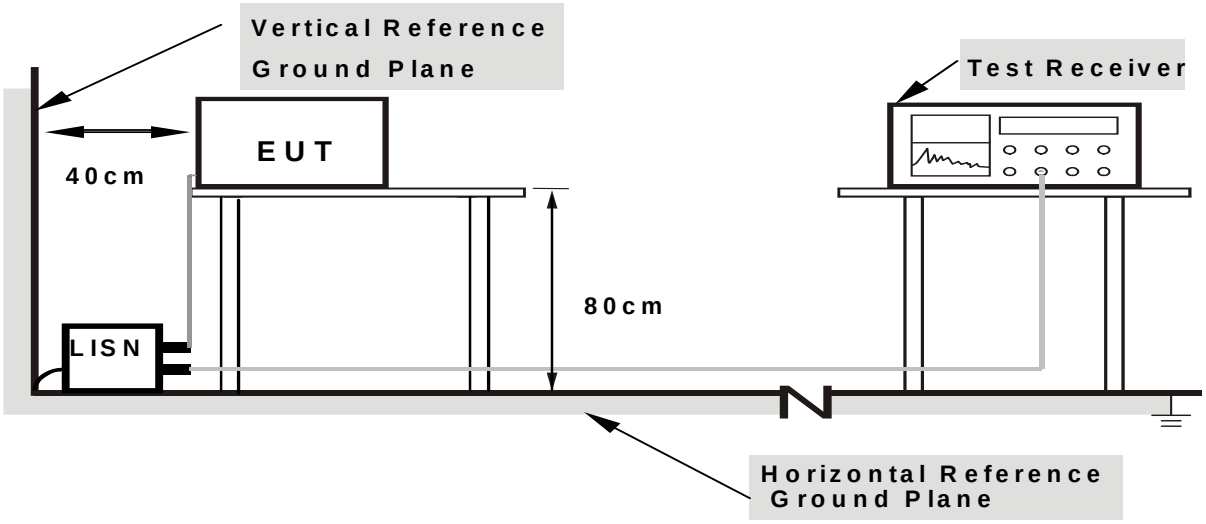
3.1.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



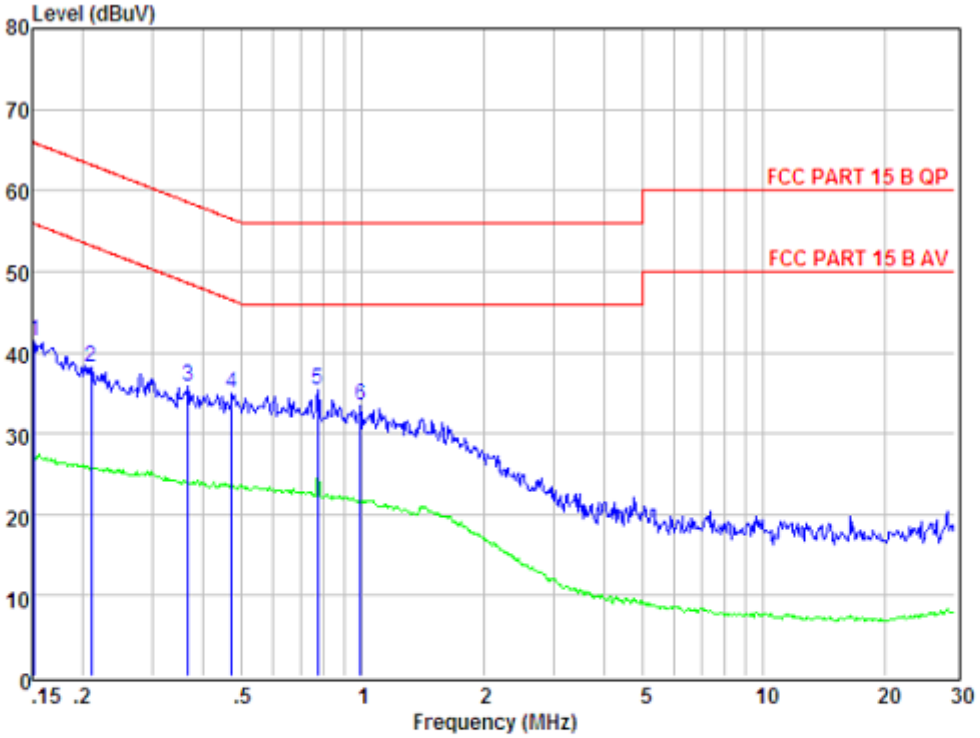
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

EUT：	XipPos	Model Name. ：	XipPos
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5Vfrom adapter AC 120V/60Hz	Test Mode：	Mode 4

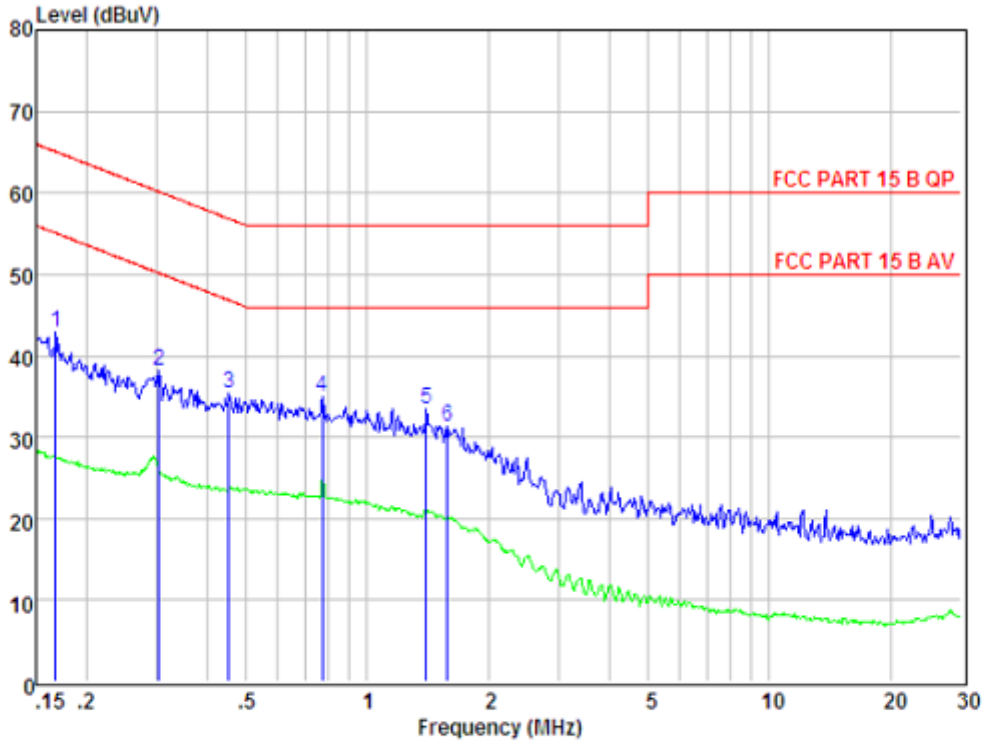


Condition : FCC PART 15 B QP POL: LINE Temp: Hum:

Item	Freq	Read	LISN Factor	Preamp Factor	Cable Lose	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.152	31.51	0.03	-9.72	0.10	41.36	65.91	-24.55	QP
2	0.211	28.29	0.03	-9.72	0.10	38.14	63.18	-25.04	QP
3	0.367	25.87	0.03	-9.72	0.10	35.72	58.56	-22.84	QP
4	0.471	25.12	0.03	-9.72	0.10	34.97	56.49	-21.52	QP
5	0.775	25.53	0.00	-9.71	0.10	35.34	56.00	-20.66	QP
6	0.989	23.69	0.04	-9.71	0.10	33.54	56.00	-22.46	QP

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss

EUT：	XipPos	Model Name. ：	XipPos
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5Vfrom adapter AC 120V/60Hz	Test Mode：	Mode 4



Condition : FCC PART 15 B QP POL: NEUTRAL Temp: Hum:

Item	Freq	Read	LISN Factor	Preamp Factor	Cable Lose	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.168	33.04	0.03	-9.72	0.10	42.89	65.08	-22.19	QP
2	0.303	28.30	0.03	-9.72	0.10	38.15	60.15	-22.00	QP
3	0.452	25.44	0.03	-9.72	0.10	35.29	56.85	-21.56	QP
4	0.775	25.18	0.00	-9.71	0.10	34.99	56.00	-21.01	QP
5	1.403	23.65	0.05	-9.71	0.10	33.51	56.00	-22.49	QP
6	1.585	21.35	0.05	-9.71	0.10	31.21	56.00	-24.79	QP

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

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 (micorvolts/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

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / *10Hz* for Average

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

3.2.2 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

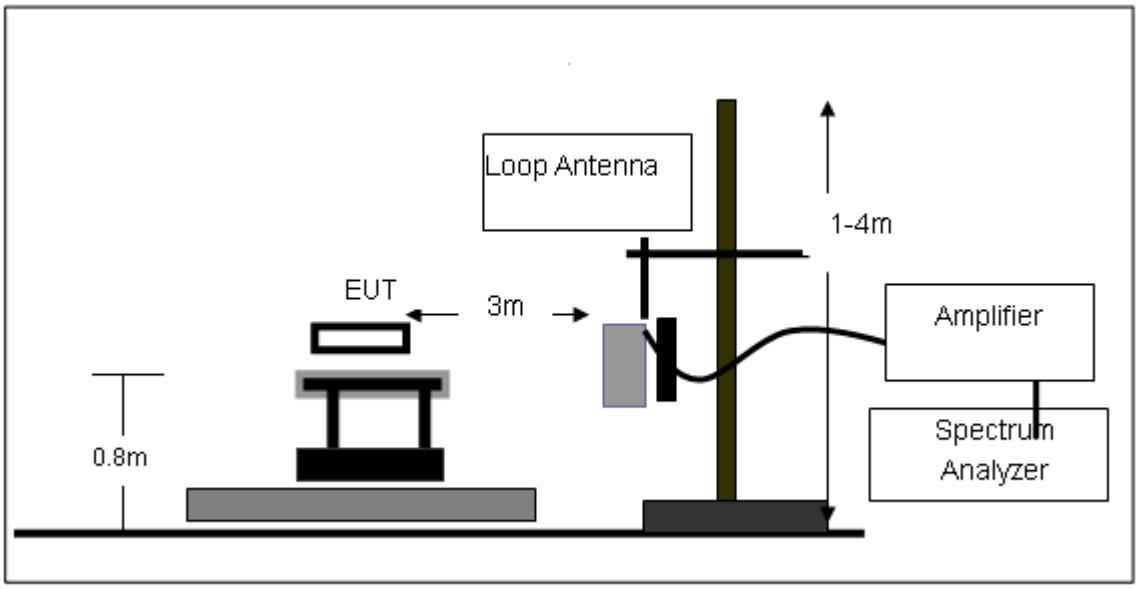
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

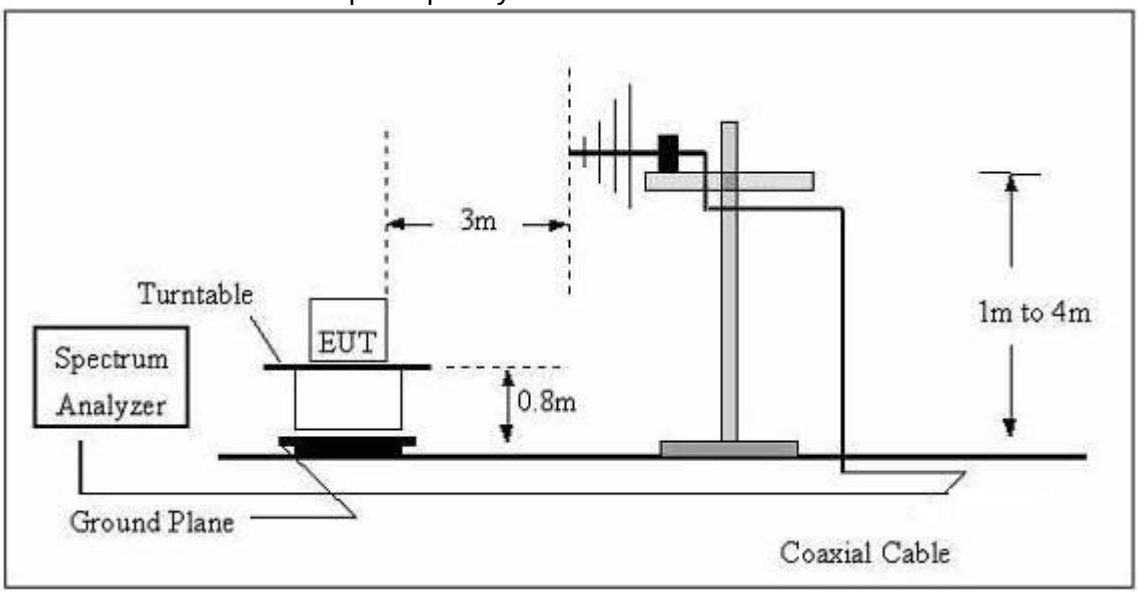
No deviation

3.2.4 TEST SETUP

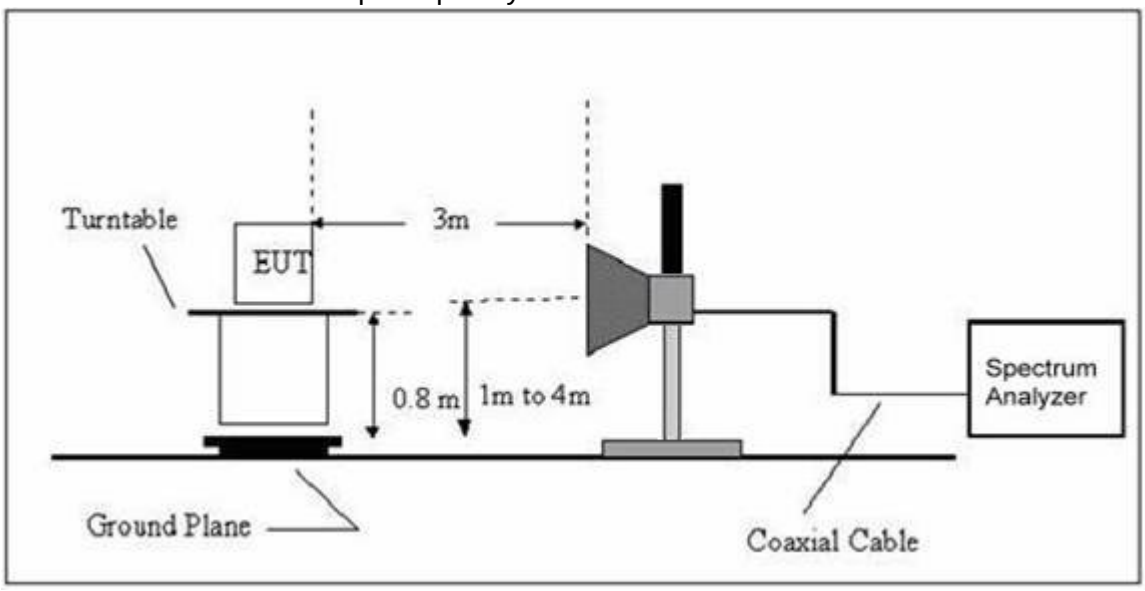
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

EUT：	XipPos	Model Name. ：	XipPos
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 5Vfrom adapter AC 120V/60Hz
Test Mode ：	TX	Polarization :	--

EUT：	XipPos	Model Name ：	XipPos
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 5Vfrom adapter
Test Mode ：	TX		

Frequency band (0.009-1.705MHz)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
--	--	--	--	--	--	--	QP

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

No data in this table means only noise floor detected in this band

Frequency band (1.705-30MHz)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
--	13.56	21.65	26.85	48.50	90.50	42.00	QP

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

NOTE:

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 (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT：	XipPos	Model Name ：	XipPos
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 5Vfrom adapter
Test Mode ：	TX		

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
V	136.7324	13.74	11.37	25.11	43.5	-18.39	QP
V	167.1467	21.23	13.63	34.86	43.5	-8.64	QP
V	392.6245	15.53	16.73	32.26	46	-13.74	QP
V	512.4582	13.33	22.25	35.58	46	-10.42	QP
V	921.2744	15.72	25.87	41.59	46	-4.41	QP
H	176.6637	12.62	13.92	26.54	43.5	-16.96	QP
H	352.7958	21.15	16.88	38.03	46	-7.97	QP
H	462.3472	17.92	18.94	36.86	46	-9.14	QP
H	648.2362	11.25	23.62	34.87	46	-11.13	QP
H	873.5442	14.15	24.18	38.33	46	-7.67	QP

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

4. 20 DB OCCUPY BANDWIDTH

4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.215) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.215	20dB bandwidth	/	13.56	PASS

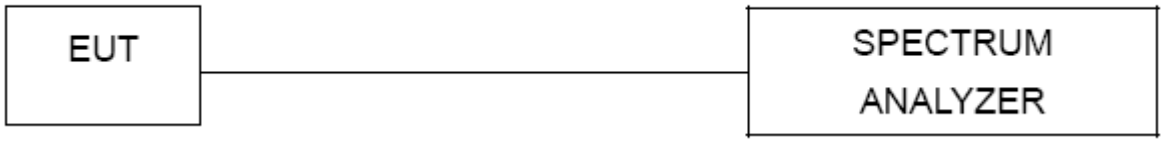
4.1.1 TEST PROCEDURE

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
(2) Spectrum Setting:
Bandwidth: RBW=30 kHz, VBW=100 kHz, detector= Peak

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

4.1.5 TEST RESULTS

EUT：	XipPos	Model Name ：	XipPos
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1015 hPa	Test Voltage ：	DC 5Vfrom adapter
Test Mode ：	NFC mode		

Frequency (MHz)	20dB Bandwidth (KHz)	Limit	Result
13.56	196	/	PASS

5. FREQUENCY STABILITY TOLERANCE

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.225) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.225(e)	Frequency Stability Tolerance	±0.01% of carrier	13.56	PASS

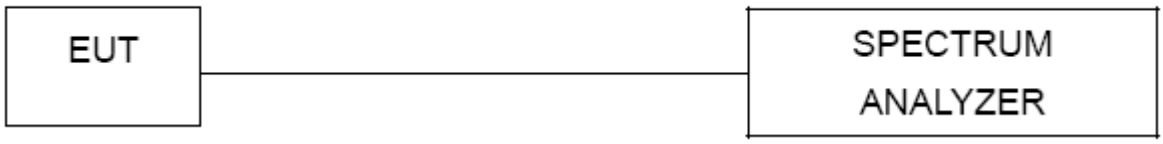
5.1.1 TEST PROCEDURE

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
(2) Spectrum Setting:
RBW=100 kHz, VBW=300 kHz, detector= Peak, Sweep Time =auto.
(3) The EUT was set to the Hopping Mode for Channel Separation Test and continuously transmitting for the Test.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 TEST RESULTS

EUT：	XipPos	Model Name ：	XipPos
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 5Vfrom adapter
Test Mode ：	NFC mode		

Frequency Stability VS Voltage:

Mode	Voltage (Vdc)	Temperature (° C)	Test Result (KHz)	Deviation (kHz)	Result
NFC	3.2	25	13560.01	0.01	Pass
	3.7	25	13560.01	0.01	Pass
	4.2	25	13559.98	0.02	Pass

Frequency Stability VS Temperature:

Mode	Temperature (° C)	Voltage (Vdc)	Test Result (KHz)	Deviation (kHz)	Result
NFC	-20	3.7	13560.01	0.01	Pass
	-10	3.7	13560.01	0.01	Pass
	0	3.7	13560.02	0.02	Pass
	10	3.7	13560.01	0.01	Pass
	20	3.7	13559.99	0.01	Pass
	30	3.7	13560.00	0.00	Pass
	40	3.7	13560.01	0.01	Pass
	50	3.7	13559.98	0.02	Pass

Remark: ±0.01% of 13.56MHz is 1.356KHz

6. ANTENNA REQUIREMENT

6.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, 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.

6.2 EUT ANTENNA

The EUT antenna is External antenna(PIFA antenna,0dbi). It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used.