FCC EMC Test Report

FCC ID:O86T1500

Product: 10.1 Inch Full Ruggedized Tablet

Trade Name: N/A

Model Number: xTablet T1500

Prepared for

MobileDemand, LC.

1501 Boyson Square Drive Suite 101 Hiawatha, Iowa52233, United States.

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.

1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street,
Bao'an District, Shenzhen P.R. China

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Website: www.ntek.org.cn

TEST RESULT CERTIFICATION

Applicant's name	:	MobileDemand, LC.
Address	:	1501 Boyson Square Drive Suite 101 Hiawatha, Iowa52233, United States.
Manufacturer's Name	:	Emdoor Information Co.,Ltd.
Address	:	3A 1/F Jinfulai Tower,No.49-1,Dabao Road,Baoan 28 District,Shenzhen, China.
Product description		
Product name	:	10.1 Inch Full Ruggedized Tablet
Model and/or type reference	:	xTablet T1500
Standards	:	47 CFR FCC part15 subpart B, 10-1-2015 ANSI C63.4:2014

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with Part 15 of FCC Rules. And it is applicable only to the tested sample identified in the report.

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Date of Test	:	
Date (s) of performance of tests	:	16 Dec. 2015 ~13 Jan. 2016
Date of Issue	:	13 Jan. 2016
Test Result	:	**Pass**

Testing Engineer : Bing He

(Bing He)

Technical Manager : Jane Lv

(Jane Lv)

Authorized Signatory : Sam. Chen

(Sam Chen)

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1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC part15 subpart B, 10-1-2015 ANSI C63.4: 2014	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	

NOTE:

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

(2) For client's request and manual description, the test will not be executed.

1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd
Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.
FCC Registration Number:238937; IC Registration Number:9270A-1
CNAS Registration Number:L5516

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** %.

Test Item	Measurement Frequency Range	K	U(dB)
AC Mains Conducted Emission	0.009kHz ~ 0.15MHz	2	2.66
AC Mains Conducted Emission	0.15MHz ~ 30MHz	2	2.80
Telecom Conducted Emission (Cat 3)	0.15MHz ~ 30MHz	2	2.40
Telecom Conducted Emission (Cat 5)	0.15MHz ~ 30MHz	2	2.58
Radiated Emission	30MHz ~ 1000MHz	2	2.64
Radiated Emission	1000MHz ~ 6000MHz	2	2.40
Radiated Emission	6000MHz ~ 18000MHz	2	2.52
Power Clamp	30MHz ~ 300MHz	2	2.20

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	10.1 Inch Full Ruggedized Tablet
Model Name	xTablet T1500
Additional Model Number(s)	N/A
Model Difference	N/A
Product Description	The EUT is a 10.1 Inch Full Ruggedized Tablet. Connecting I/O port: USB, HDMI, Earphone 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.
Power Source	AC Voltage
Power Rating	Input: AC 110-240V Output: DC 5V, 3A

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	Runing with Full System
Mode 2	Camera Recording

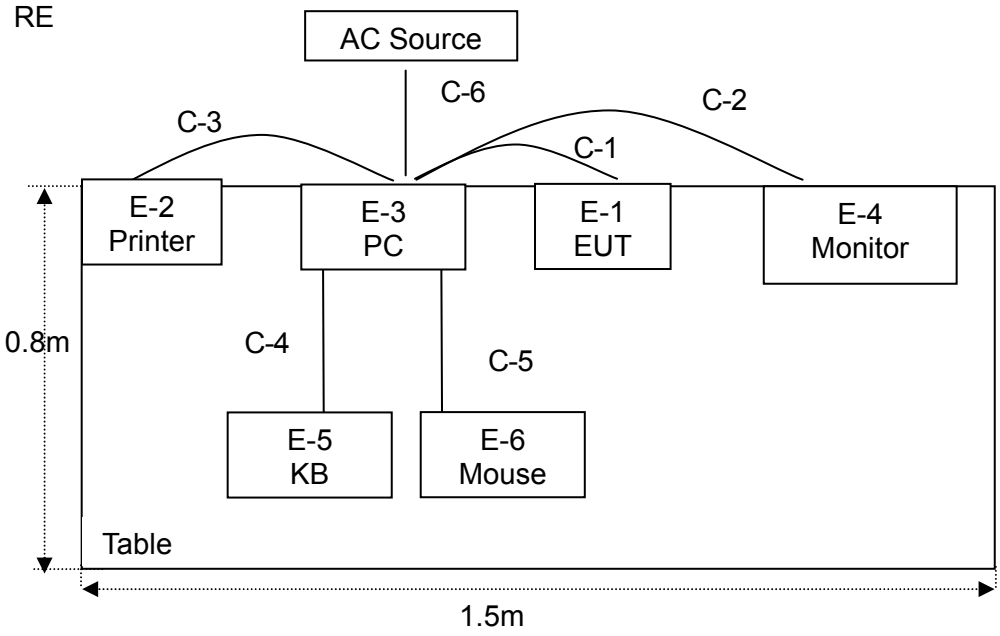
For Conducted Test	
Final Test Mode	Description
Mode 1	Runing with Full System
Mode 2	Camera Recording

For Radiated Test	
Final Test Mode	Description
Mode 1	Runing with Full System
Mode 2	Camera Recording

Note: All the modes were tested and the data of the worst modes(mode 1) are put in the following pages.

2.3 DESCRIPTION OF TEST SETUP

RE



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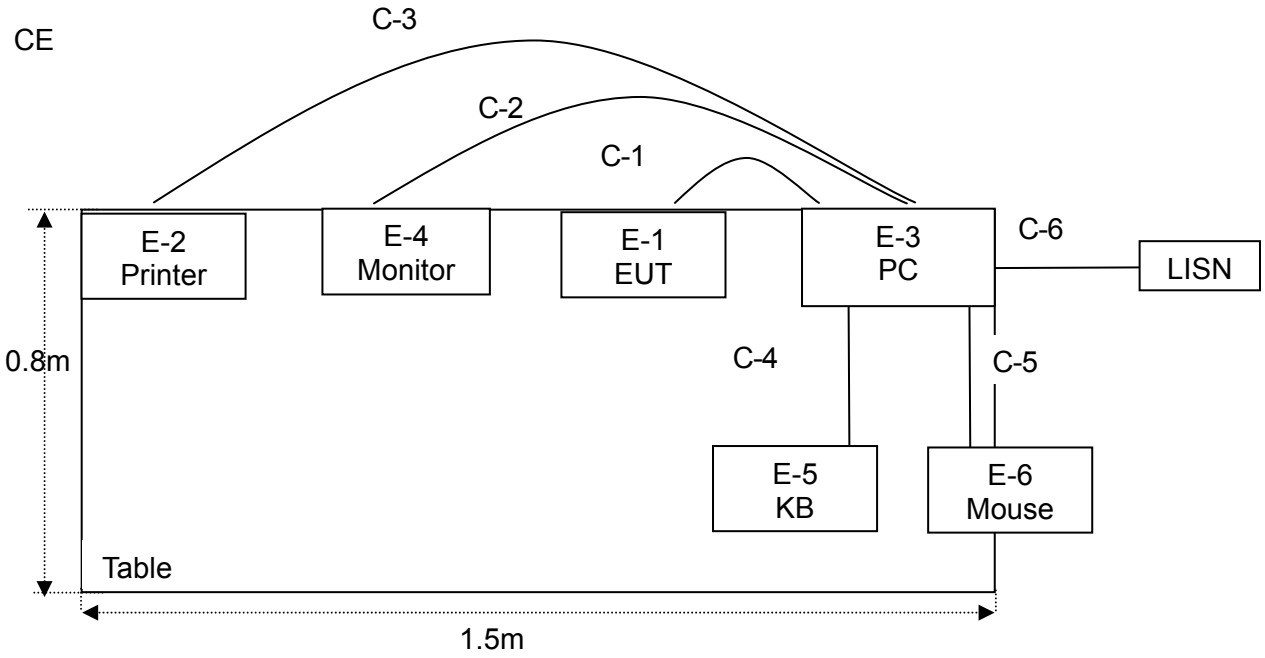


2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

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	10.1 Inch Full Ruggedized Tablet	N/A	xTablet T1500	N/A	EUT
E-2	Printer	Canon	L11121E	LBP2900	
E-3	Personal computer	DELL	FT4Y23X	34413561645	
E-4	Monitor	DELL	IN2020MB	cn-0y6mhx-74261-11f-67e s	
E-5	Keyboard	DELL	SK-8185	OY526KUS	
E-6	Mouse	DELL	MS111-P	cn-011d3v-71581-11e-1th7	

Item	Cable Type	Shielded Type	Ferrite Core	Length	Note
C-1	USB Cable	NO	YES	1.2m	
C-2	VGA	NO	NO	1.0m	
C-3	USB Cable	NO	NO	1.2m	
C-4	USB Cable	NO	NO	1.0m	
C-5	USB Cable	NO	NO	1.0m	
C-6	Power Line	NO	NO	1.2m	

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.
(3) “YES” means “shielded” “with core”; “NO” means “unshielded” “without core”.

2.5 MEASUREMENT INSTRUMENTS LIST

2.5.1 CONDUCTED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	LISN	R&S	ENV216	101490	Nov. 20, 2015	Nov. 19, 2016	1 year
2	LISN	R&S	ENV216	101313	Nov. 20, 2015	Nov. 19, 2016	1 year
3	50Ω Switch	Anritsu	MP59B	6200983704	Aug. 24, 2015	Aug. 23, 2016	1 year
4	Low frequency cable	N/A	C-01	N/A	Jun. 28, 2015	Jun. 27, 2016	1 year
5	EMI Test Receiver	R&S	ESCI	101160	Jun. 28, 2015	Jun. 27, 2016	1 year

2.5.2 RADIATED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Bilog Antenna	TESEQ	CBL6111D	31216	Aug. 24, 2015	Aug. 23, 2016	1 year
2	Test Cable	N/A	R-03	N/A	Jun. 28, 2015	Jun. 27, 2016	1 year
3	Test Cable	N/A	R-01	N/A	Jun. 28, 2015	Jun. 27, 2016	1 year
4	EMI Test Receiver	R&S	ESPI7	101318	Jun. 28, 2015	Jun. 27, 2016	1 year
5	Antenna Mast	EM	SC100_1	N/A	N/A	N/A	N/A
6	Turn Table	EM	SC100	060531	N/A	N/A	N/A
7	50Ω Switch	Anritsu	MP59B	6200983705	Aug. 24, 2015	Aug. 23, 2016	1 year
8	Broadband Horn Antenna	EM	EM-AH-10180	2011071402	Jun. 26, 2015	Jun. 25, 2016	1 year
9	Pre-Amplifier	EM	EM30180	60538	Dec. 25, 2015	Dec. 24, 2016	1 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

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

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

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.

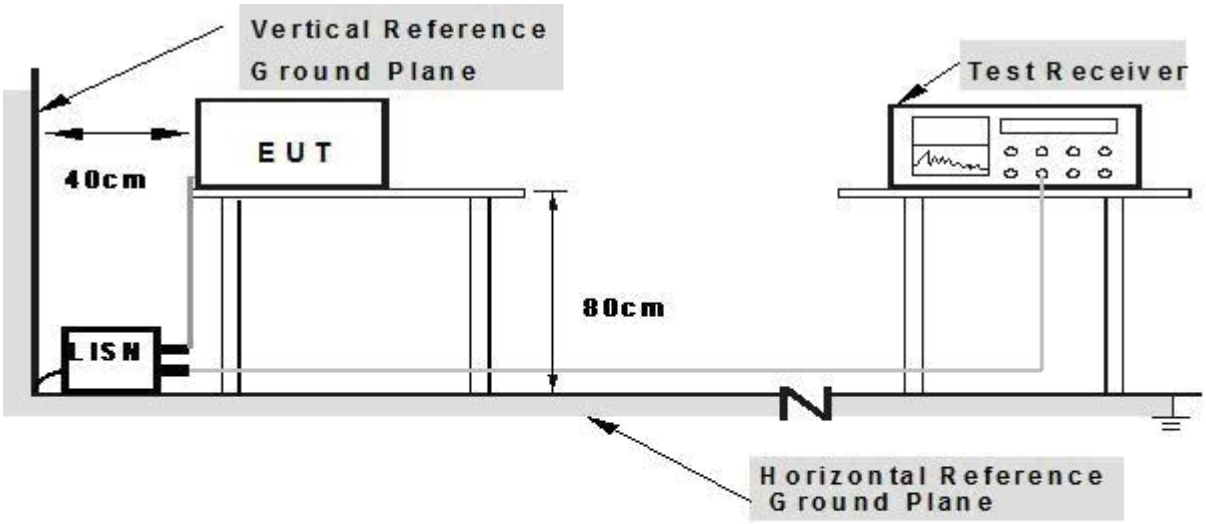
The following table is the setting of the receiver

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 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

3.1.4 EUT OPERATING CONDITIONS

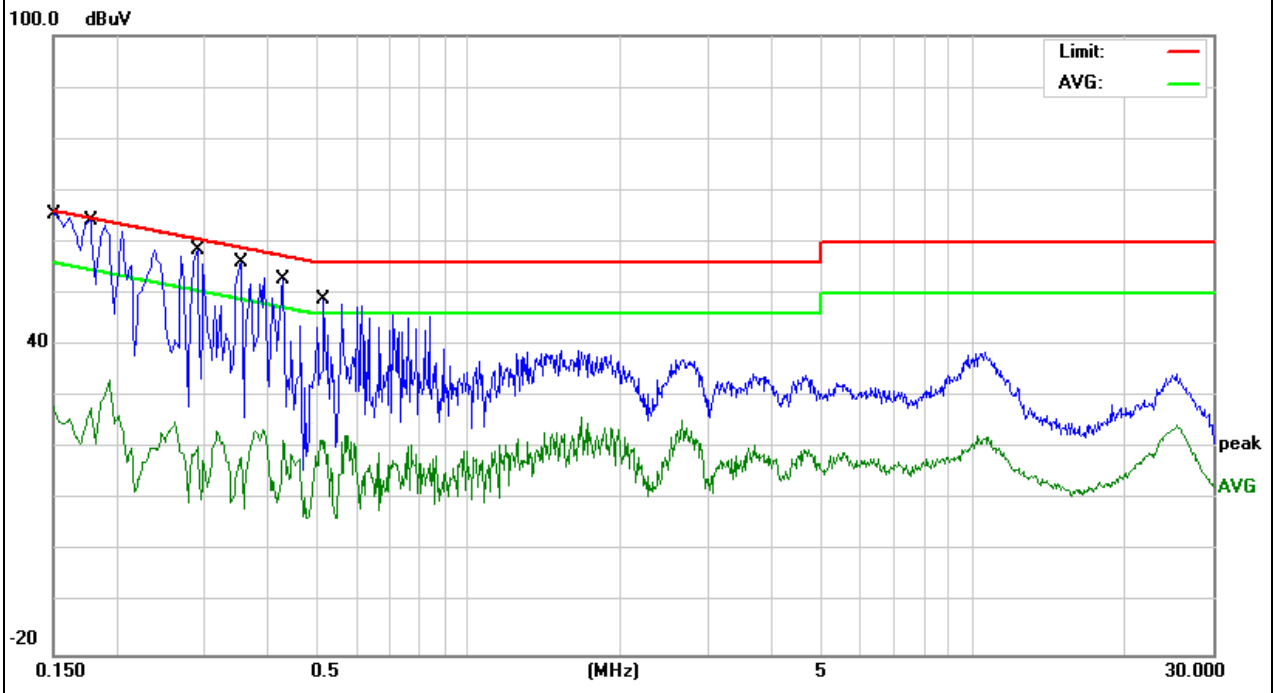
The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.1.5 TEST RESULTS

EUT:	10.1 Inch Full Ruggedized Tablet	Model Name. :	xTablet T1500
Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010hPa	Test Date:	2016-01-11
Test Mode:	Mode 1	Phase:	L
Test Voltage:	DC 5V From Adapter AC 120V/60Hz		

Freq. (MHz)	Reading (dBμV)	Factor (dB)	Measurement (dBμV)	Limit (dBμV)	Over (dB)	Detector
0.1524	44.18	10.12	54.30	65.86	-11.56	QP
0.1524	16.15	10.12	26.27	55.86	-29.59	AVG
0.1758	42.48	10.12	52.60	64.68	-12.08	QP
0.1758	16.03	10.12	26.15	54.68	-28.53	AVG
0.2878	35.46	10.14	45.60	60.59	-14.99	QP
0.2878	9.22	10.14	19.36	50.59	-31.23	AVG
0.3537	46.00	10.09	56.09	58.87	-2.78	QP
0.3537	8.22	10.09	18.31	48.87	-30.56	AVG
0.4299	42.79	9.97	52.76	57.25	-4.49	QP
0.4299	11.46	9.97	21.43	47.25	-25.82	AVG
0.5180	39.17	9.80	48.97	56.00	-7.03	QP
0.5180	11.73	9.80	21.53	46.00	-24.47	AVG

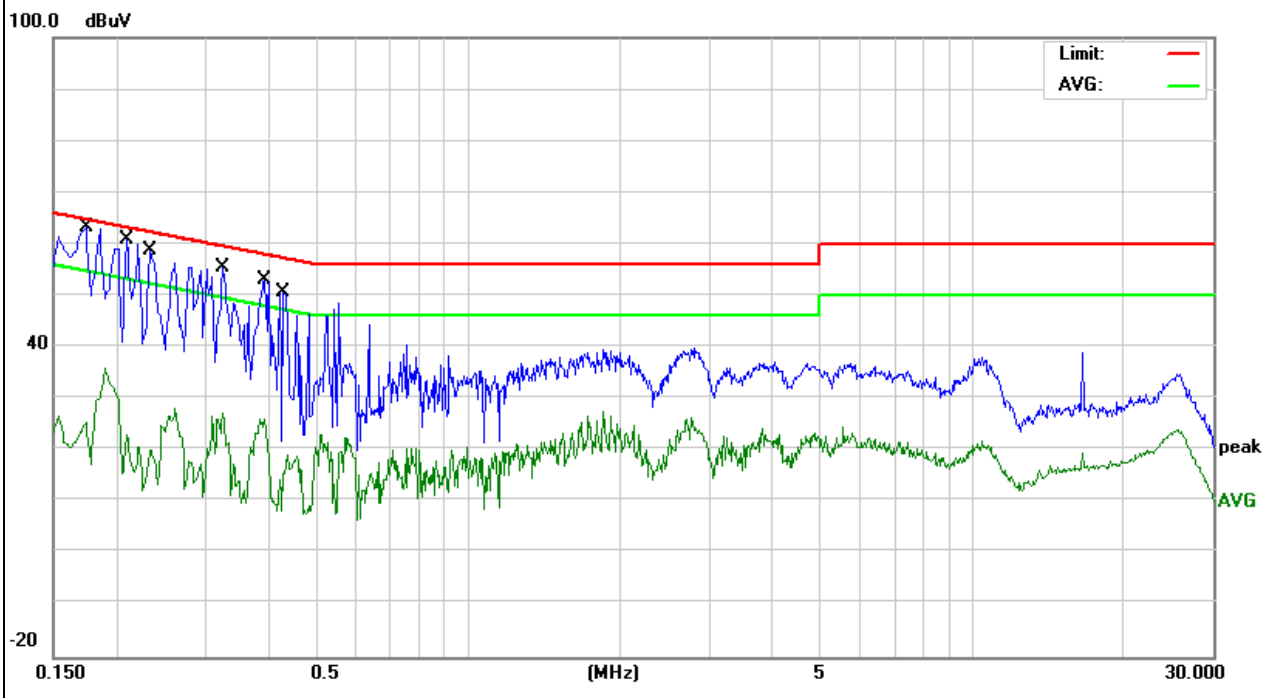
Remark:
Factor = Insertion Loss + Cable Loss.



EUT:	10.1 Inch Full Ruggedized Tablet	Model Name. :	xTablet T1500
Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010hPa	Test Date:	2016-01-11
Test Mode:	Mode 1	Phase:	N
Test Voltage:	DC 5V From Adapter AC 120V/60Hz		

Freq. (MHz)	Reading (dBμV)	Factor (dB)	Measurement (dBμV)	Limit (dBμV)	Over (dB)	Detector
0.1720	40.45	10.05	50.50	64.86	-14.36	QP
0.1720	14.60	10.05	24.65	54.86	-30.21	AVG
0.2099	39.57	10.03	49.60	63.21	-13.61	QP
0.2099	13.00	10.03	23.03	53.21	-30.18	AVG
0.2340	48.61	10.06	58.67	62.30	-3.63	QP
0.2340	10.09	10.06	20.15	52.30	-32.15	AVG
0.3260	45.27	10.11	55.38	59.55	-4.17	QP
0.3260	17.08	10.11	27.19	49.55	-22.36	AVG
0.3940	42.91	10.05	52.96	57.98	-5.02	QP
0.3940	16.07	10.05	26.12	47.98	-21.86	AVG
0.4299	40.70	9.98	50.68	57.25	-6.57	QP
0.4299	5.46	9.98	15.44	47.25	-31.81	AVG

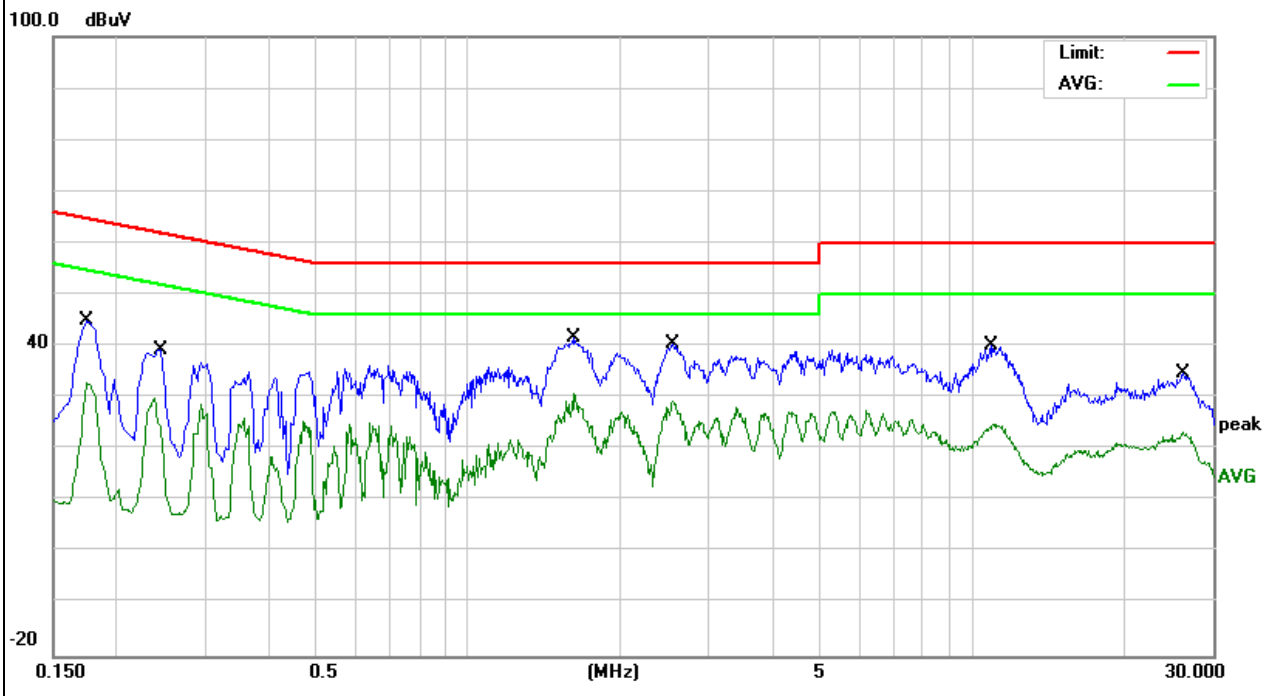
Remark:
Factor = Insertion Loss + Cable Loss.



EUT:	10.1 Inch Full Ruggedized Tablet	Model Name. :	xTablet T1500
Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010hPa	Test Date:	2016-01-11
Test Mode:	Mode 1	Phase:	L
Test Voltage:	DC 5V From Adapter AC 240V/60Hz		

Freq. (MHz)	Reading (dBμV)	Factor (dB)	Measurement (dBμV)	Limit (dBμV)	Over (dB)	Detector
0.1739	34.69	10.12	44.81	64.77	-19.96	QP
0.1739	22.52	10.12	32.64	54.77	-22.13	AVG
0.2459	29.17	10.13	39.30	61.89	-22.59	QP
0.2459	11.08	10.13	21.21	51.89	-30.68	AVG
1.6180	31.79	9.78	41.57	56.00	-14.43	QP
1.6180	20.74	9.78	30.52	46.00	-15.48	AVG
2.5379	30.68	9.74	40.42	56.00	-15.58	QP
2.5379	19.37	9.74	29.11	46.00	-16.89	AVG
10.8619	30.24	9.79	40.03	60.00	-19.97	QP
10.8619	15.05	9.79	24.84	50.00	-25.16	AVG
26.1380	24.85	9.99	34.84	60.00	-25.16	QP
26.1380	13.18	9.99	23.17	50.00	-26.83	AVG

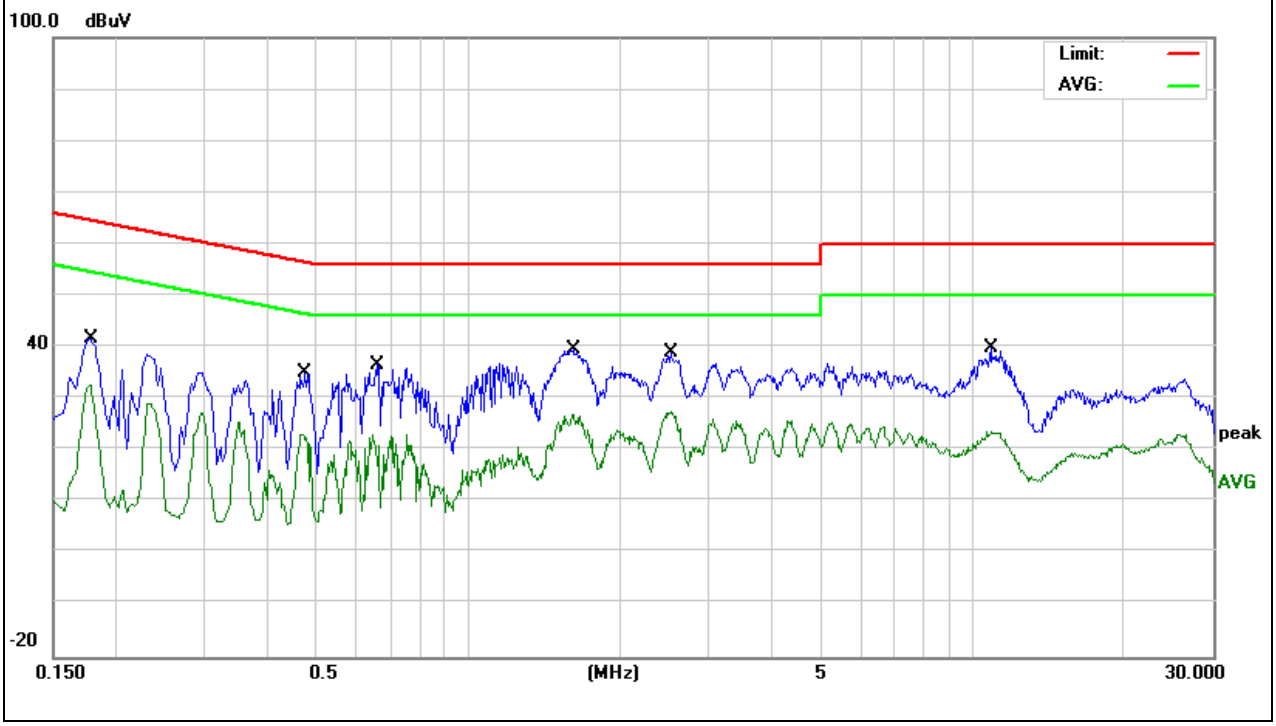
Remark:
Factor = Insertion Loss + Cable Loss.



EUT:	10.1 Inch Full Ruggedized Tablet	Model Name. :	xTablet T1500
Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010hPa	Test Date:	2016-01-11
Test Mode:	Mode 1	Phase:	N
Test Voltage:	DC 5V From Adapter AC 240V/60Hz		

Freq. (MHz)	Reading (dBμV)	Factor (dB)	Measurement (dBμV)	Limit (dBμV)	Over (dB)	Detector
0.1767	31.64	10.05	41.69	64.63	-22.94	QP
0.1767	22.45	10.05	32.50	54.63	-22.13	AVG
0.4740	25.24	9.88	35.12	56.44	-21.32	QP
0.4740	12.12	9.88	22.00	46.44	-24.44	AVG
0.6542	26.87	9.81	36.68	56.00	-19.32	QP
0.6542	11.02	9.81	20.83	46.00	-25.17	AVG
1.6060	29.70	9.80	39.50	56.00	-16.50	QP
1.6060	17.22	9.80	27.02	46.00	-18.98	AVG
2.5140	29.15	9.74	38.89	56.00	-17.11	QP
2.5140	17.60	9.74	27.34	46.00	-18.66	AVG
10.8859	30.14	9.77	39.91	60.00	-20.09	QP
10.8859	13.76	9.77	23.53	50.00	-26.47	AVG

Remark:
Factor = Insertion Loss + Cable Loss.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	☐Class A (at 3m)	☒Class B (at 3m)
	dBμV/m	dBμV/m
30 ~ 88	49.0	40.0
88 ~ 216	53.5	43.5
216 ~ 960	56.5	46.0
Above 960	59.5	54.0

Notes:

(1) The limit for radiated test was performed according to as following: FCC PART 15B /ICES-003.

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

(3) Emission level (dBμV/m)=20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

a. The measuring distance of at 10 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. 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.

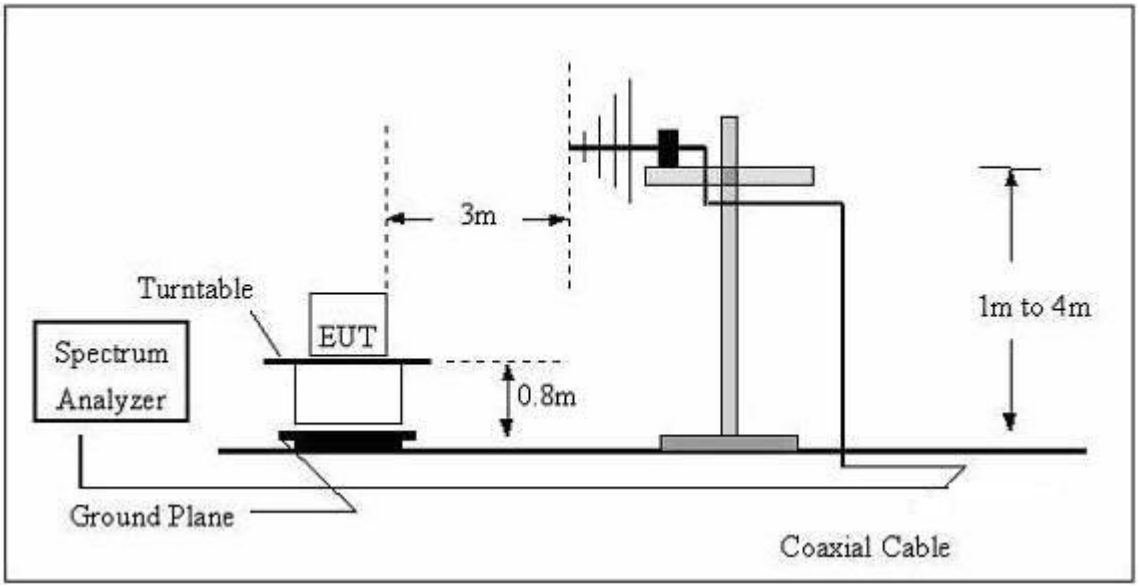
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.

e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.

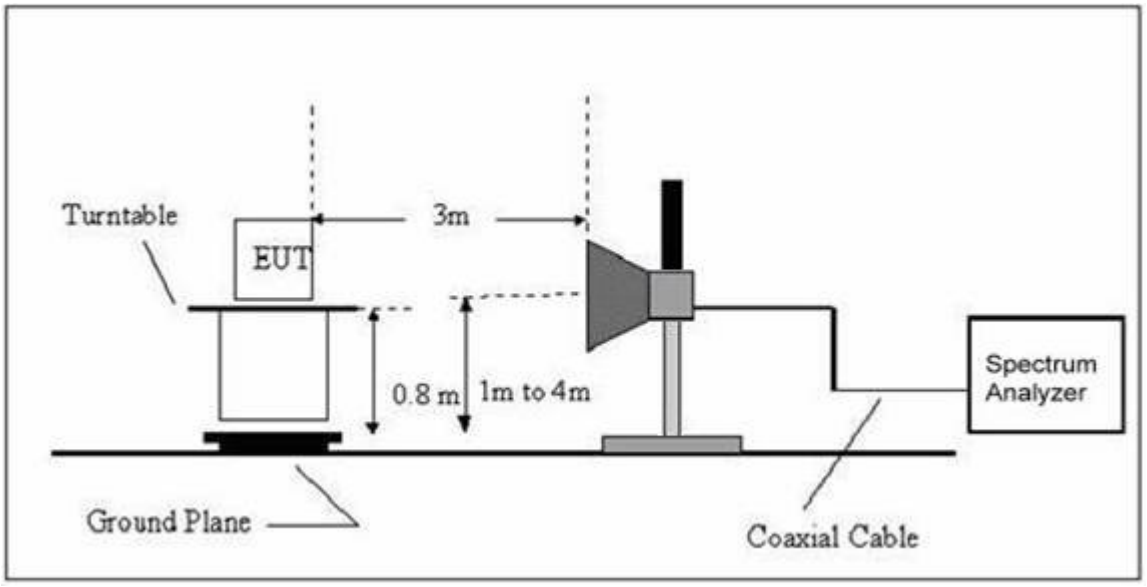
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.2.3 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1GHz



3.2.4 EUT OPERATING CONDITIONS

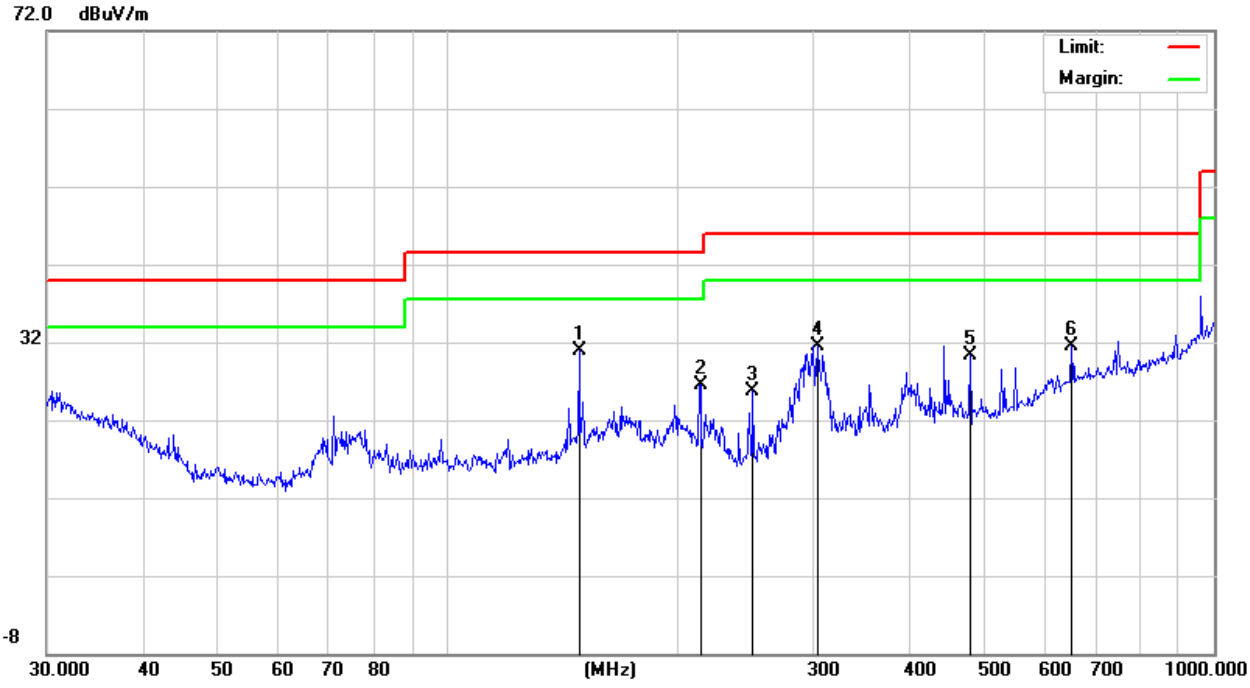
The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.5 TEST RESULTS

EUT:	10.1 Inch Full Ruggedized Tablet	Model Name :	xTablet T1500
Temperature:	24℃	Relative Humidity:	54%
Pressure:	1010hPa	Test Date:	2016-01-11
Test Mode:	Mode 1	Polarization:	Horizontal
Test Power:	DC 5V From Adapter AC 120V/60Hz		

Freq. (MHz)	Reading (dBμV/m)	Factor (dB)	Measurement (dBμV/m)	Limit (dBμV/m)	Over (dB)	Detector
148.441	19.41	11.57	30.98	43.50	-12.52	QP
213.763	15.55	11.03	26.58	43.50	-16.92	QP
250.301	14.84	10.88	25.72	46.00	-20.28	QP
303.544	18.85	12.74	31.59	46.00	-14.41	QP
480.528	13.66	16.56	30.22	46.00	-15.78	QP
651.942	11.06	20.39	31.45	46.00	-14.55	QP

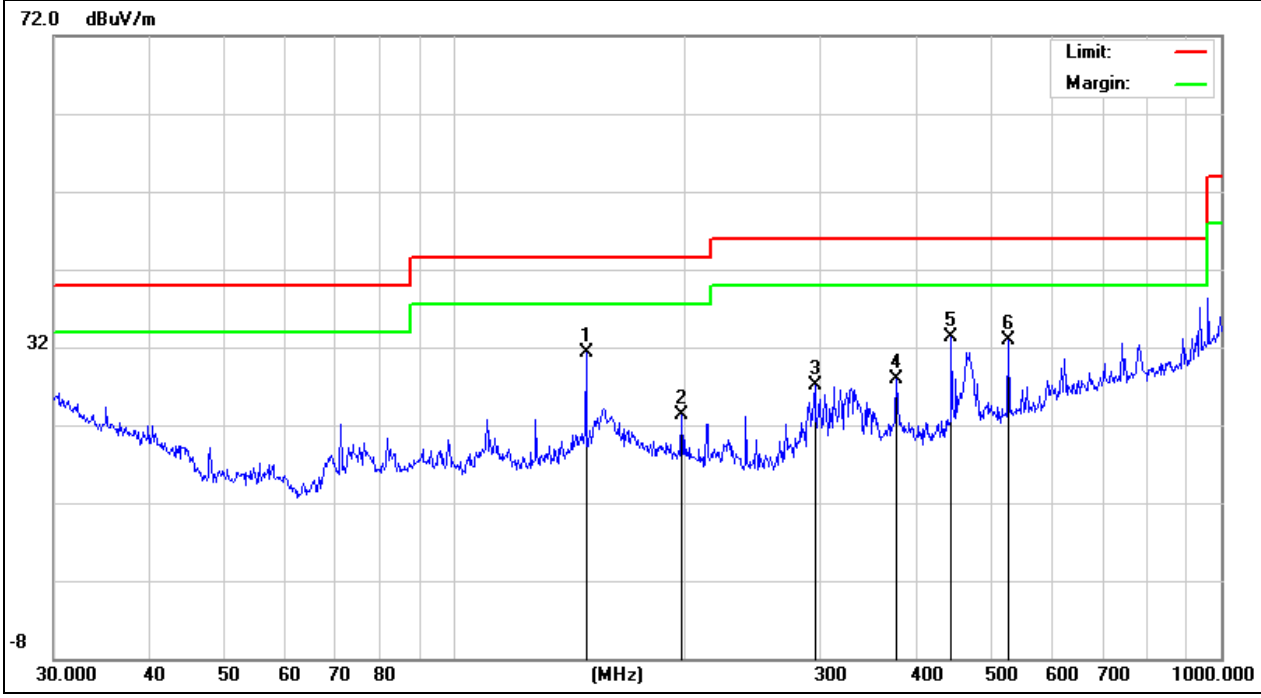
Remark:
Factor = Antenna Factor + Cable Loss.



EUT:	10.1 Inch Full Ruggedized Tablet	Model Name :	xTablet T1500
Temperature:	24℃	Relative Humidity:	54%
Pressure:	1010hPa	Test Date:	2016-01-11
Test Mode:	Mode 1	Polarization:	Vertical
Test Power:	DC 5V From Adapter AC 120V/60Hz		

Freq. (MHz)	Reading (dBμV/m)	Factor (dB)	Measurement (dBμV/m)	Limit (dBμV/m)	Over (dB)	Detector
148.4410	19.69	11.57	31.26	43.50	-12.24	QP
197.8926	11.91	11.45	23.36	43.50	-20.14	QP
295.1469	14.62	12.45	27.07	46.00	-18.93	QP
377.2590	12.94	14.91	27.85	46.00	-18.15	QP
444.8514	17.47	15.87	33.34	46.00	-12.66	QP
528.2458	15.30	17.58	32.88	46.00	-13.12	QP

Remark:
Factor = Antenna Factor + Cable Loss.



3.2.6 TEST RESULTS(Above 1GHz)

The Testing have been conformed to 6*5825MHz=34950MHz, and the worst result was report as below:

EUT:	10.1 Inch Full Ruggedized Tablet	Model Name :	xTablet T1500
Temperature:	24℃	Relative Humidity:	54%
Pressure:	1010hPa	Test Date:	2016-01-11
Test Mode:	Mode 1	Polarization:	Horizontal
Test Power:	DC 5V From Adapter AC 120V/60Hz		

Freq. (MHz)	Reading (dBμV/m)	Factor (dB)	Measurement (dBμV/m)	Limit (dBμV/m)	Over (dB)	Detector
1852.1840	62.78	-9.58	53.20	74.00	-20.80	peak
1852.1840	43.83	-9.58	34.25	54.00	-19.75	AVG
3069.8890	57.36	-5.96	51.40	74.00	-22.60	peak
3069.8890	40.65	-5.96	34.69	54.00	-19.31	AVG
4424.5140	53.15	-0.25	52.90	74.00	-21.10	peak
4424.5140	35.39	-0.25	35.14	54.00	-18.86	AVG

Remark:
Factor = Antenna Factor + Cable Loss.

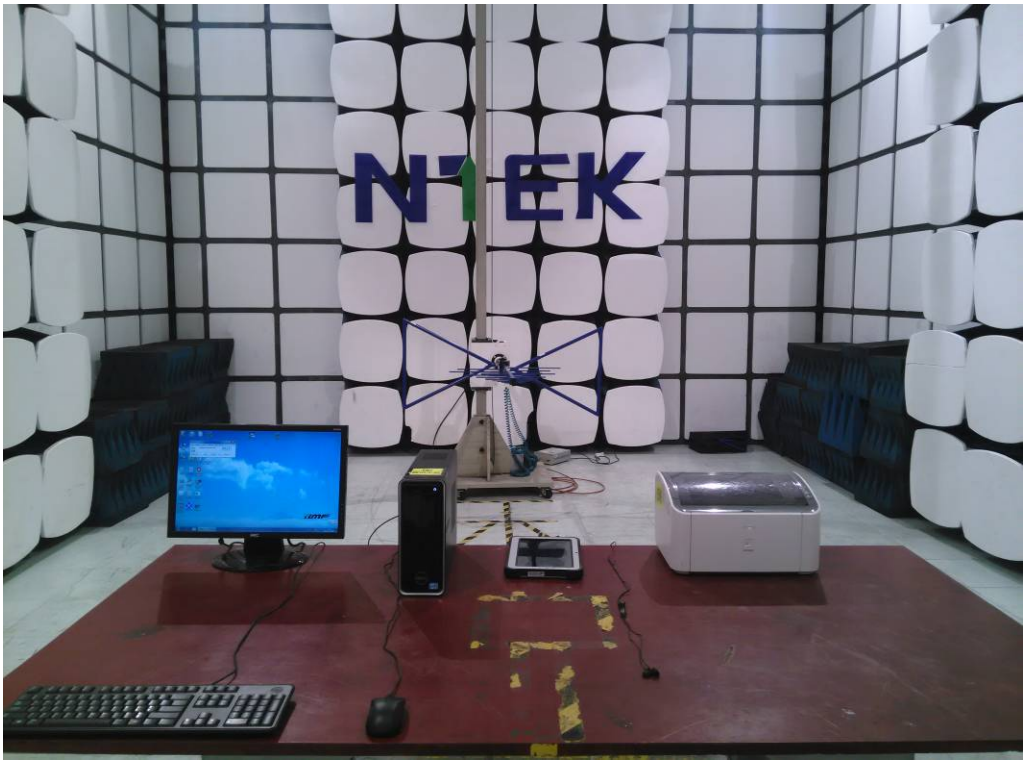
EUT:	10.1 Inch Full Ruggedized Tablet	Model Name :	xTablet T1500
Temperature:	24℃	Relative Humidity:	54%
Pressure:	1010hPa	Test Date:	2016-01-11
Test Mode:	Mode 1	Polarization:	Vertical
Test Power:	DC 5V From Adapter AC 120V/60Hz		

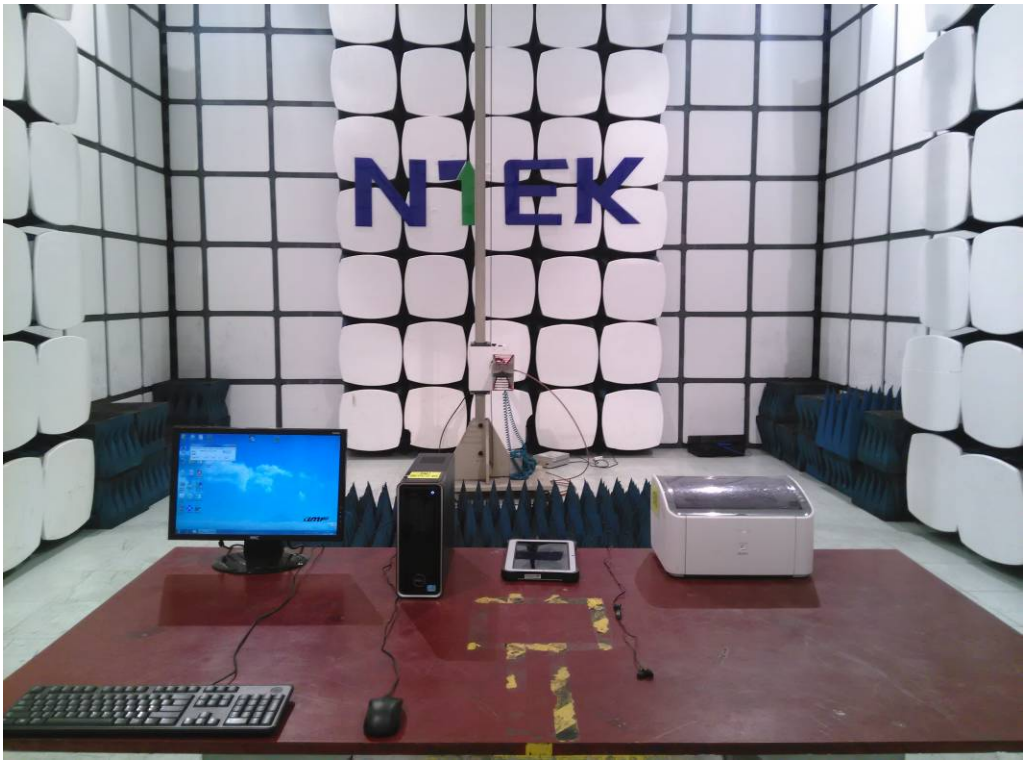
Freq. (MHz)	Reading (dBμV/m)	Factor (dB)	Measurement (dBμV/m)	Limit (dBμV/m)	Over (dB)	Detector
1669.3650	64.37	-10.37	54.00	74.00	-20.00	peak
1669.3650	44.99	-10.37	34.62	54.00	-19.38	AVG
3119.7950	56.54	-5.90	50.64	74.00	-23.36	peak
3119.7950	41.02	-5.90	35.12	54.00	-18.88	AVG
4594.1660	53.92	-0.12	53.80	74.00	-20.20	peak
4594.1660	34.40	-0.12	34.28	54.00	-19.72	AVG

Remark:
Factor = Antenna Factor + Cable Loss.

4. EUT TEST PHOTO

Radiated Measurement Photos





Conducted Measurement Photos