

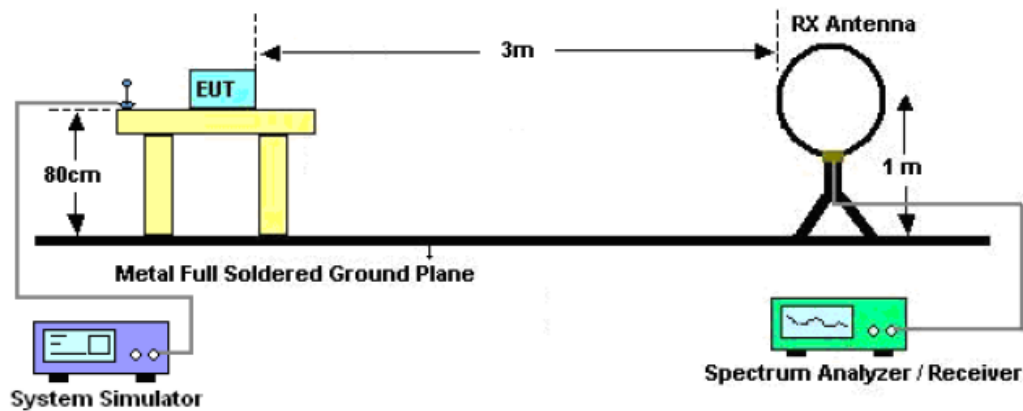
## 11. RADIATED EMISSION

### 11.1. MEASUREMENT PROCEDURE

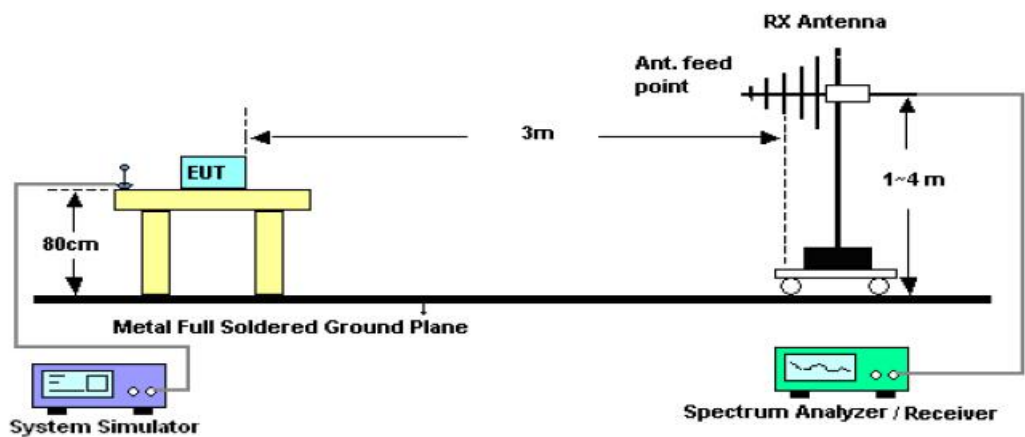
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. 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. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. 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 values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. 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. High - Low scan is not required in this case.

11.2. TEST SETUP

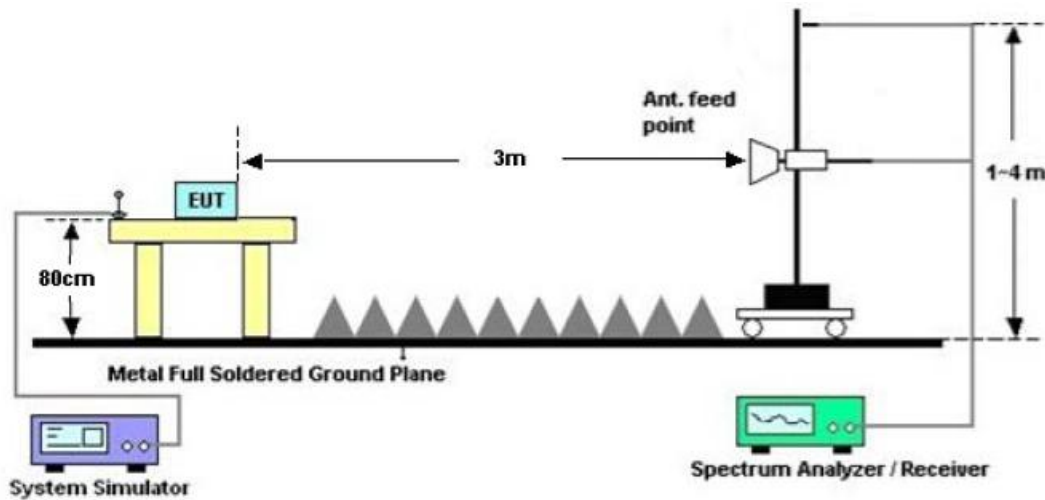
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



### 11.3. LIMITS AND MEASUREMENT RESULT

15.209(a) Limit in the below table 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

Note: All modes were tested For restricted band radiated emission,  
the test records reported below are the worst result compared to other modes.

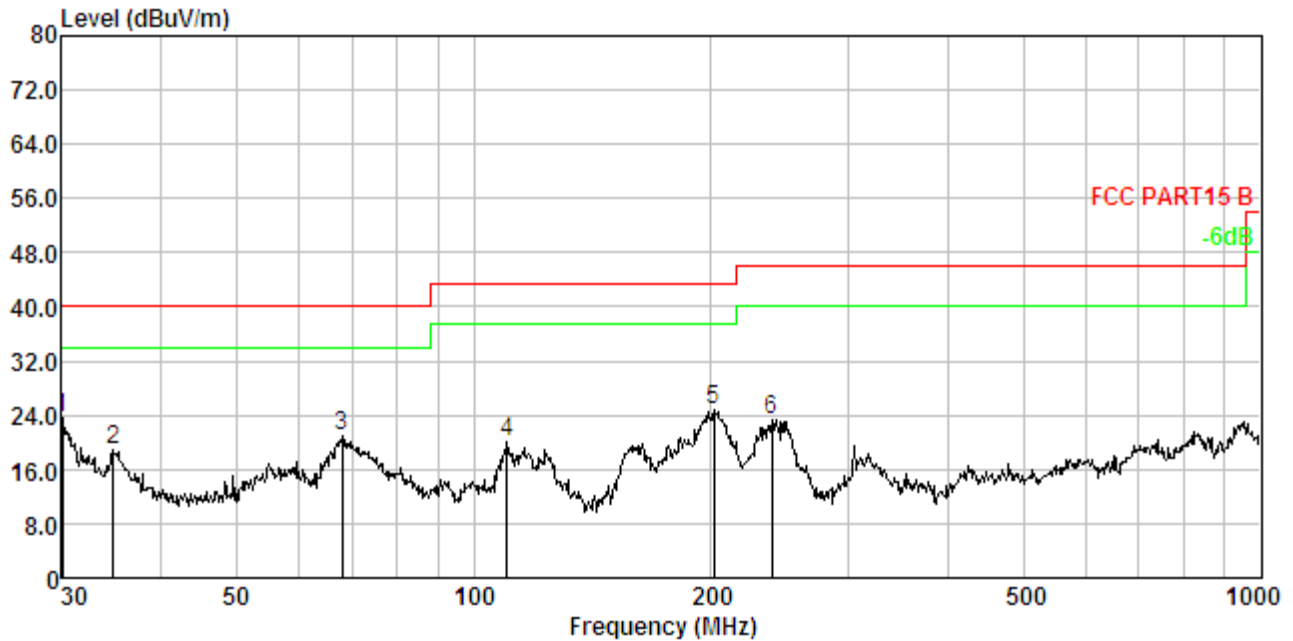
### 11.4. TEST RESULT

#### RADIATED EMISSION BELOW 30MHZ

No emission found between lowest internal used/generated frequencies to 30MHz.

### RADIATED EMISSION BELOW 1GHZ

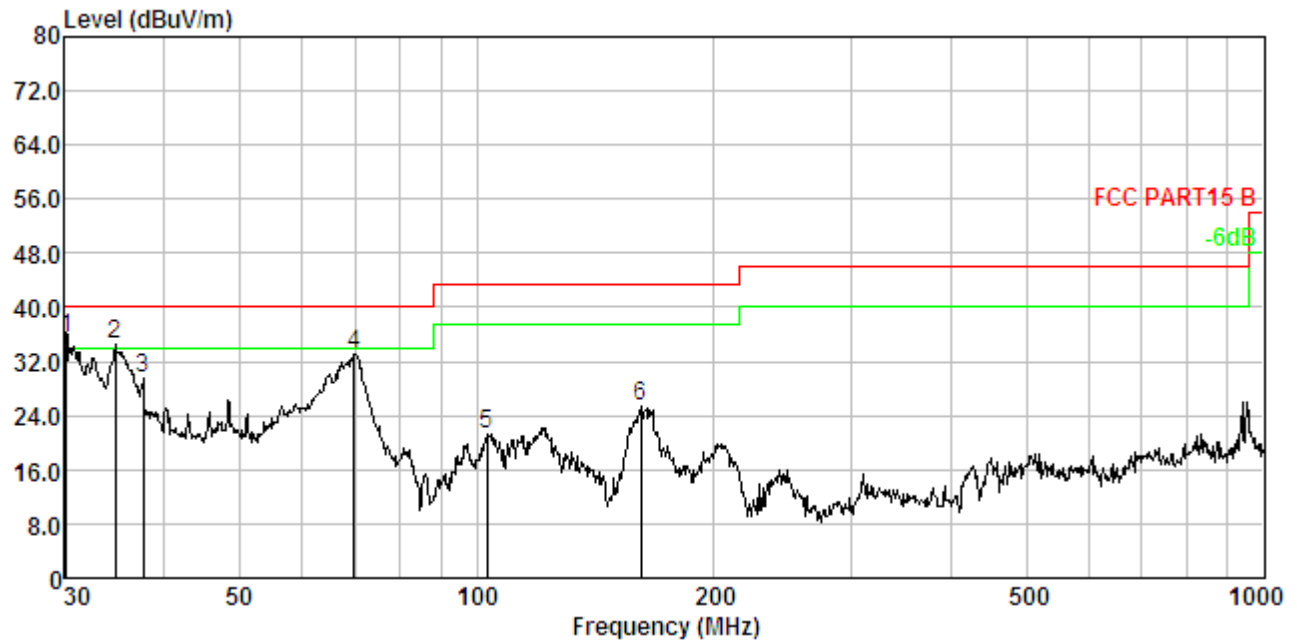
EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2412MHZ	Antenna	Horizontal



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	30.000	1.06	13.24	39.21	29.97	23.54	40.00	-16.46	Peak
2.	34.882	1.19	13.39	34.30	30.02	18.86	40.00	-21.14	Peak
3.	68.151	1.80	10.66	38.79	30.26	20.99	40.00	-19.01	Peak
4.	110.182	2.23	11.09	37.26	30.42	20.16	43.50	-23.34	Peak
5.	202.100	2.78	10.42	42.10	30.63	24.67	43.50	-18.83	Peak
6.	239.147	2.93	11.67	39.44	30.69	23.35	46.00	-22.65	Peak

**RESULT: PASS**

<b>EUT</b>	Tablet PC	<b>Model Name</b>	TBQG1084NB
<b>Temperature</b>	25°C	<b>Relative Humidity</b>	55.4%
<b>Pressure</b>	960hPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	802.11b with date rate 1 2412MHZ	<b>Antenna</b>	Vertical



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	30.105	1.06	13.24	51.08	29.97	35.41	40.00	-4.59	Peak
2.	34.760	1.19	13.38	49.93	30.02	34.48	40.00	-5.52	Peak
3.	37.680	1.26	13.52	44.76	30.05	29.49	40.00	-10.51	Peak
4.	69.845	1.82	10.05	51.44	30.26	33.05	40.00	-6.95	Peak
5.	103.080	2.17	10.50	39.08	30.40	21.35	43.50	-22.15	Peak
6.	161.474	2.58	13.80	39.53	30.56	25.35	43.50	-18.15	Peak

## RESULT: PASS

### Note:

1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.
2. The "Factor" value can be calculated automatically by software of measurement system.
3. All test modes had been pre-tested. The 802.11b at low channel is the worst case and recorded in the report.



EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2437MHZ	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874.043	46.58	3.75	50.33	74	-23.67	peak
4874.070	42.16	3.75	45.91	54	-8.09	AVG
7311.089	41.37	8.16	49.53	74	-24.47	peak
7311.064	37.86	8.16	46.02	54	-7.98	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2437MHZ	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874.081	46.87	3.75	50.62	74	-23.38	peak
4874.081	41.02	3.75	44.77	54	-9.23	AVG
7311.067	38.76	8.16	46.92	74	-27.08	peak
7311.058	34.19	8.16	42.35	54	-11.65	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

<b>EUT</b>	Tablet PC	<b>Model Name</b>	TBQG1084NB
<b>Temperature</b>	25°C	<b>Relative Humidity</b>	55.4%
<b>Pressure</b>	960hPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	802.11b with data rate 1 2462MHZ	<b>Antenna</b>	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4924.027	45.71	3.81	49.52	74	-24.48	peak
4924.053	40.16	3.81	43.97	54	-10.03	AVG
7386.055	38.57	8.19	46.76	74	-27.24	peak
7386.028	34.47	8.19	42.66	54	-11.34	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

<b>EUT</b>	Tablet PC	<b>Model Name</b>	TBQG1084NB
<b>Temperature</b>	25°C	<b>Relative Humidity</b>	55.4%
<b>Pressure</b>	960hPa	<b>Test Voltage</b>	Normal Voltage
<b>Test Mode</b>	802.11b with data rate 1 2462MHZ	<b>Antenna</b>	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4924.044	42.08	3.81	45.89	74	-28.11	peak
4924.029	38.54	3.81	42.35	54	-11.65	AVG
7386.047	40.28	8.19	48.47	74	-25.53	peak
7386.030	35.44	8.19	43.63	54	-10.37	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

## RESULT: PASS

### Note:

Other emissions from 1G to 25 GHz are considered as ambient noise. No recording in the test report.  
Factor = Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.  
The “Factor” value can be calculated automatically by software of measurement system.  
All test modes had been pre-tested. The 802.11b mode is the worst case and recorded in the report.



## **12. BAND EDGE EMISSION**

### **12.1. MEASUREMENT PROCEDURE**

Radiated restricted band edge measurements

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting

### **12.2. TEST SET-UP**

same as 11.2

#### **Note:**

1. Factor=Antenna Factor + Cable loss - Amplifier gain. Field Strength=Factor + Reading level
2. The factor had been edited in the "Input Correction" of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB( $\mu$ V) to represent the Amplitude. Use the F dB( $\mu$ V/m) to represent the Field Strength. So A=F.

12.3. TEST RESULT

EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2412MHZ	Antenna	Horizontal

PK





EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2412MHZ	Antenna	Vertical

PK



*AV*



**RESULT: PASS**

EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2462MHZ	Antenna	Horizontal

PK



AV



RESULT: PASS

EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2462MHZ	Antenna	Vertical

PK





AV



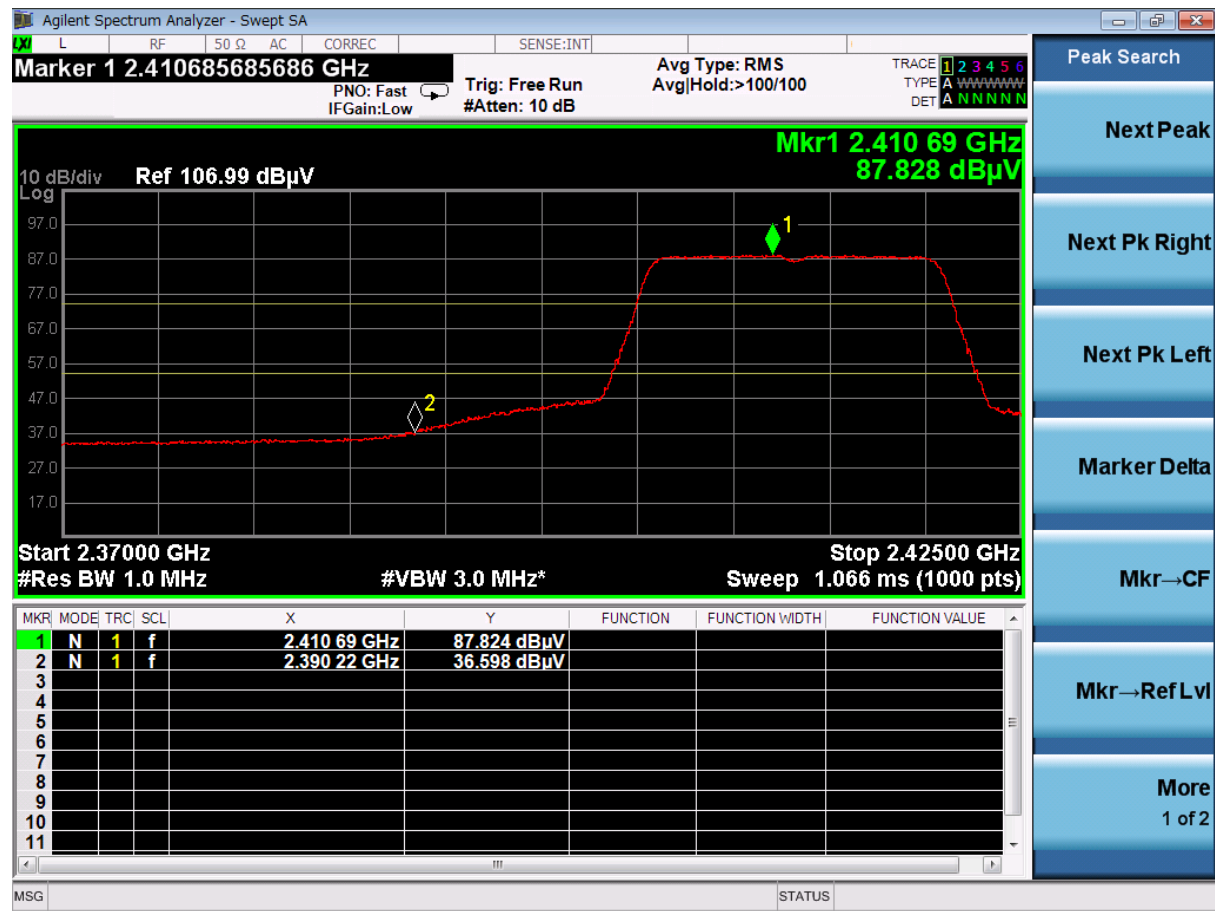
RESULT: PASS

EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11g with data rate 6 2412MHZ	Antenna	Horizontal

PK



AV



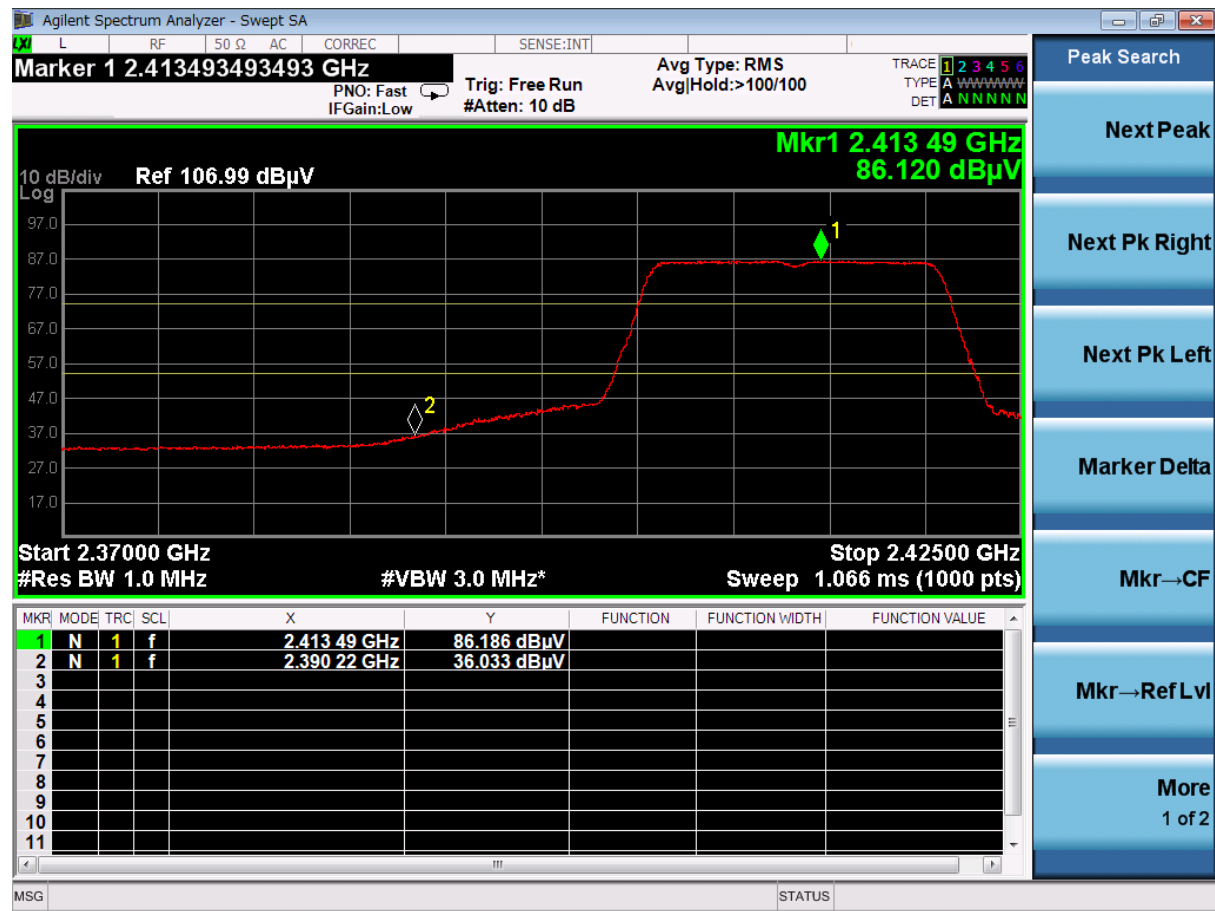
RESULT: PASS

EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11g with data rate 6 2412MHZ	Antenna	Vertical

PK



AV



RESULT: PASS

EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11g with data rate 6 2462MHZ	Antenna	Horizontal

PK



AV



RESULT: PASS

EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11g with data rate 6 2462MHZ	Antenna	Vertical

PK





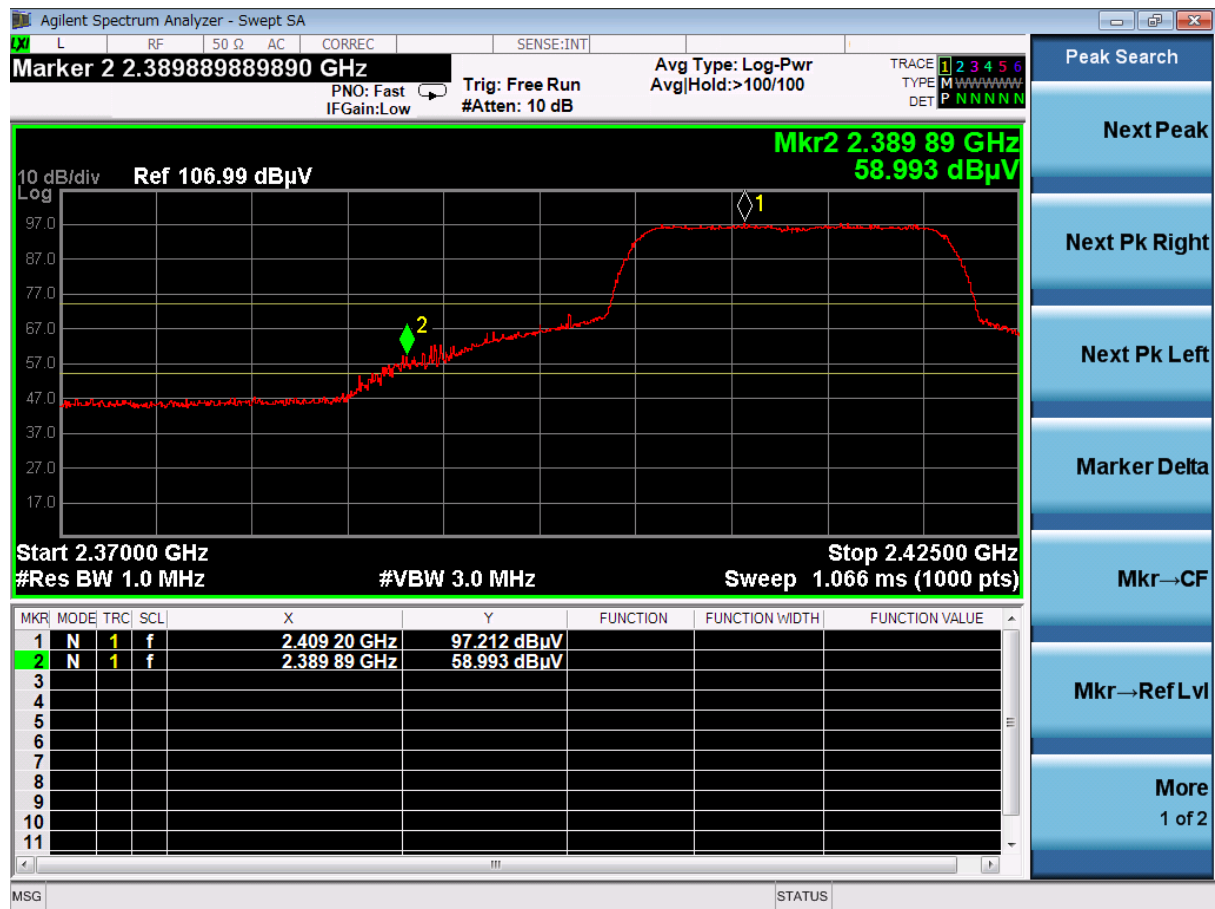
AV



RESULT: PASS

EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 20 with data rate 6.5 2412MHZ	Antenna	Horizontal

PK



AV



RESULT: PASS

EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 20 with data rate 6.5 2412MHZ	Antenna	Vertical

PK





EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 20with data rate 6.5 2462MHZ	Antenna	Horizontal

PK



AV



RESULT: PASS

EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 20 with data rate 6.5 2462MHZ	Antenna	Vertical

PK





AV



**RESULT: PASS**

EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 40 with data rate 6.5 2422MHZ	Antenna	Horizontal

PK



AV



RESULT: PASS

EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 40 with data rate 6.5 2422MHZ	Antenna	Vertical

PK





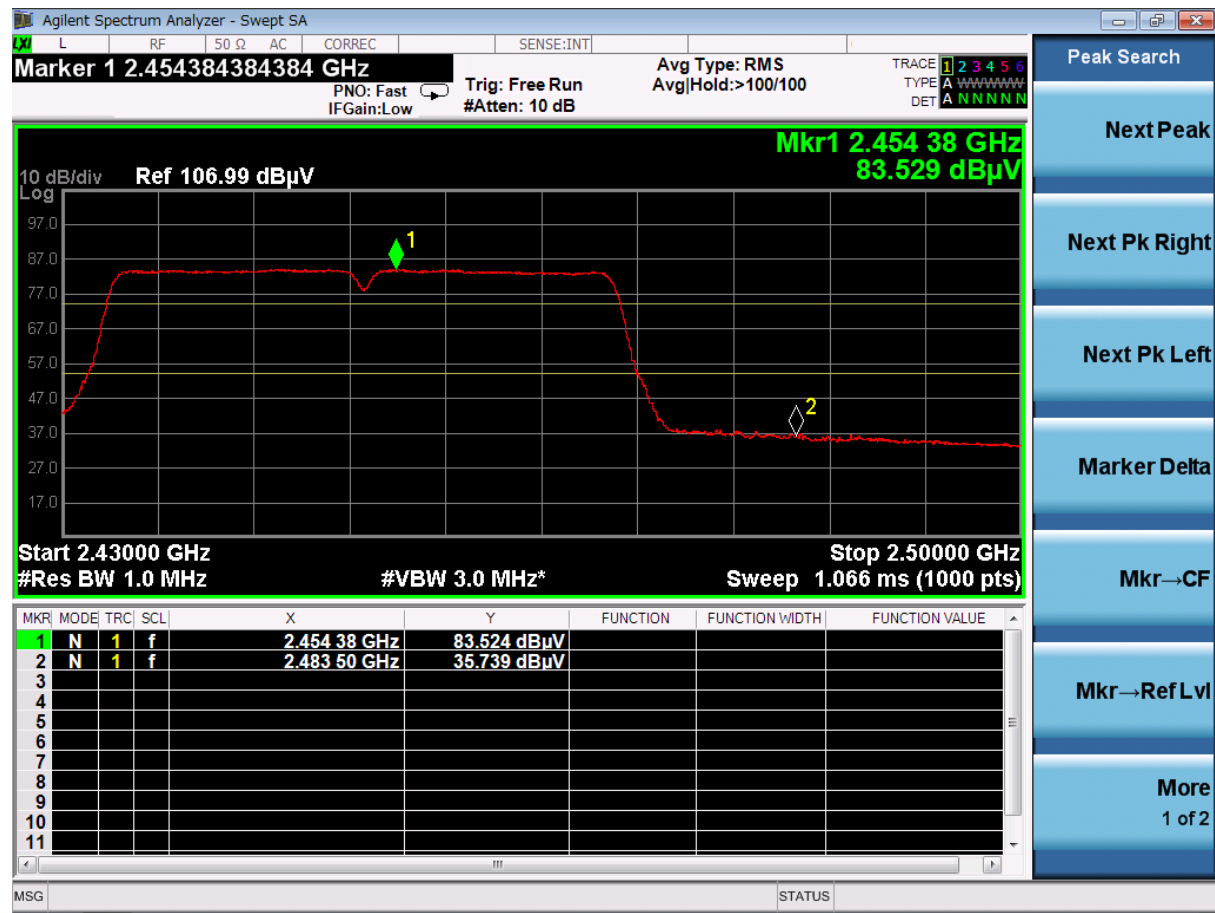
**RESULT: PASS**

EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 40with data rate 6.5 2452MHZ	Antenna	Horizontal

PK



AV



RESULT: PASS

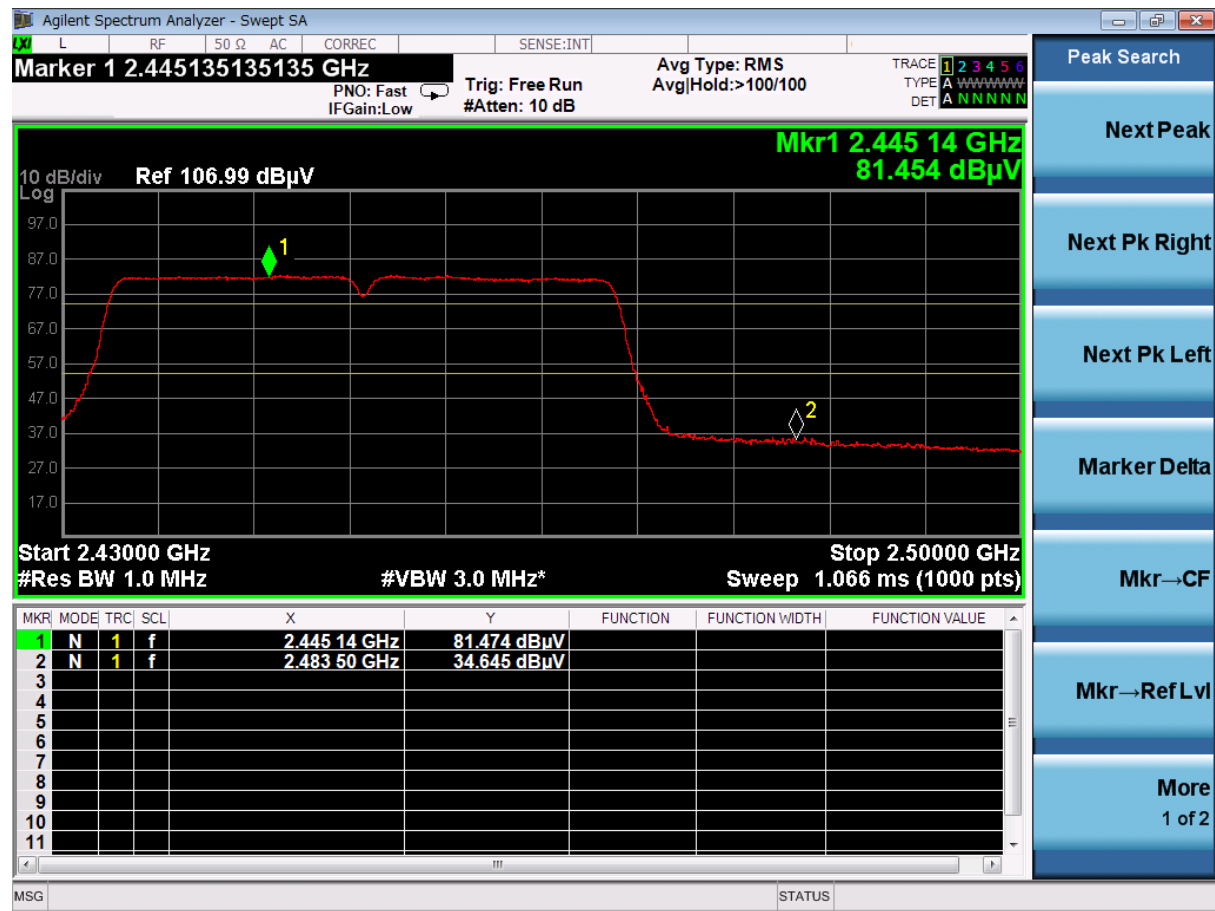
EUT	Tablet PC	Model Name	TBQG1084NB
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 40 with data rate 6.5 2452MHZ	Antenna	Vertical

PK





AV



RESULT: PASS

### 13. FCC LINE CONDUCTED EMISSION TEST

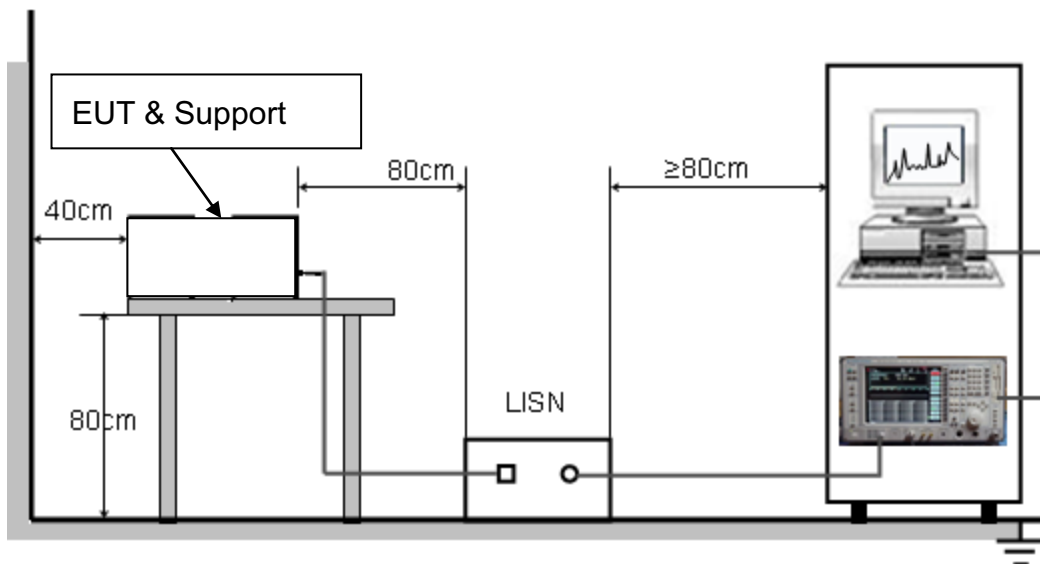
#### 13.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.( dBuV)	Average( dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

#### 13.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



### **13.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST**

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.4.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received charging voltage by adapter which received 120V/60Hz power by a LISN..
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

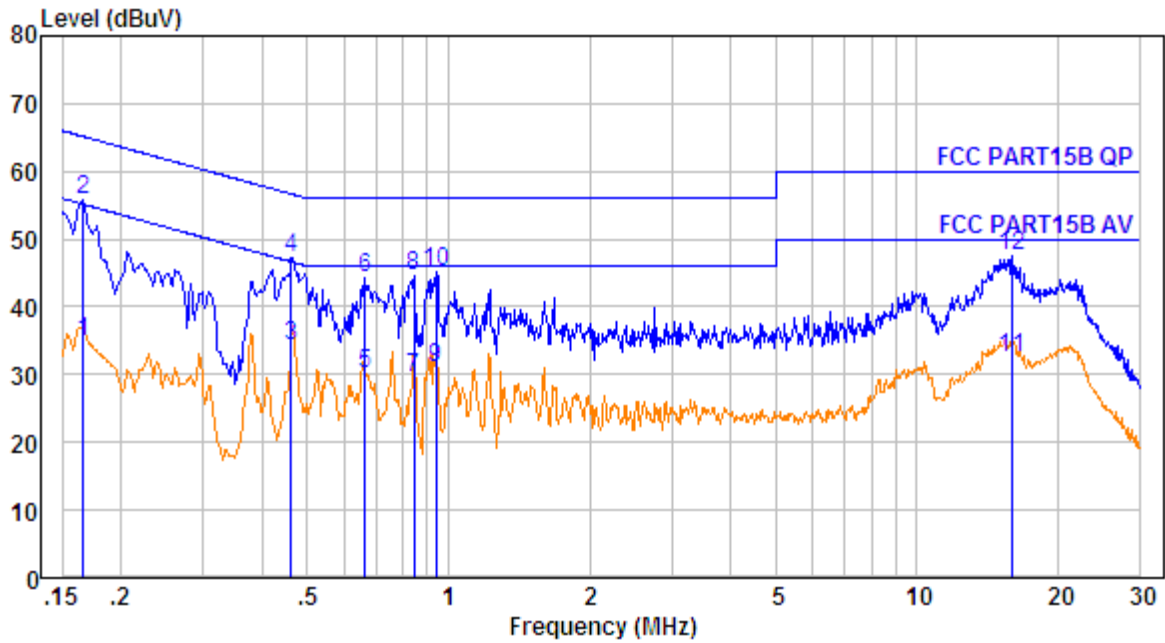
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

### **13.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST**

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

### 13.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

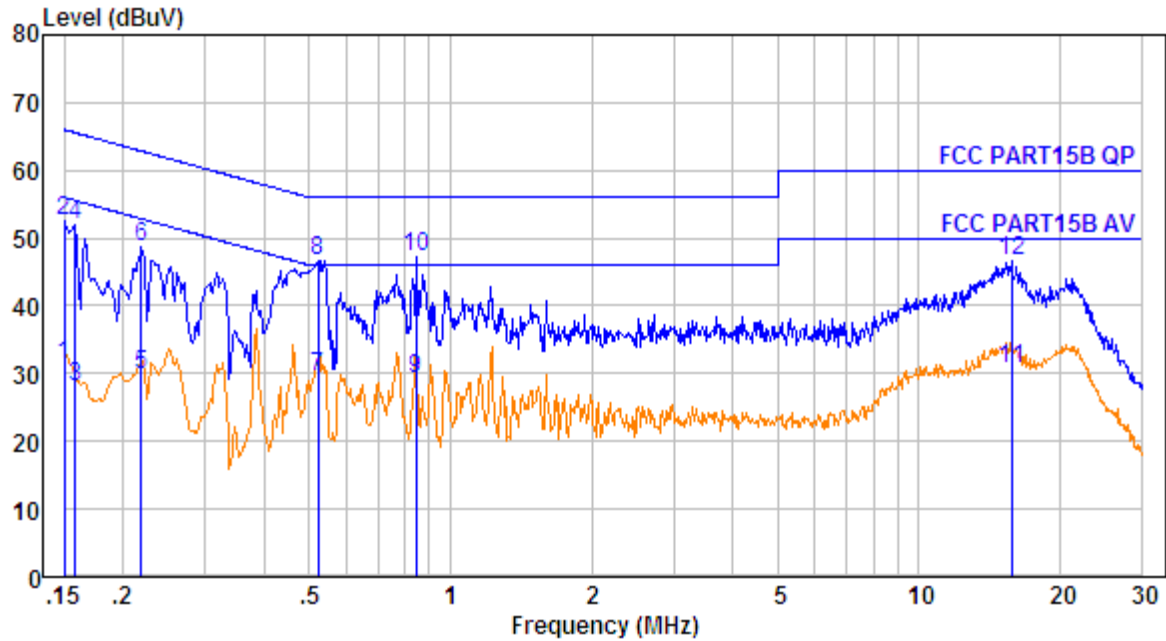
#### LINE CONDUCTED EMISSION TEST LINE 1-L



No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBUV	Emission Level dBUV	Limit dBUV	Over Limit dB	Remark
1.	0.166	10.60	0.60	23.54	34.74	55.16	-20.42	Average
2.	0.166	10.60	0.60	44.54	55.74	65.16	-9.42	QP
3.	0.461	10.64	0.60	23.00	34.24	46.67	-12.43	Average
4.	0.461	10.64	0.60	36.00	47.24	56.67	-9.43	QP
5.	0.665	10.66	0.60	18.94	30.20	46.00	-15.80	Average
6.	0.665	10.66	0.60	32.94	44.20	56.00	-11.80	QP
7.	0.844	10.67	0.60	18.28	29.55	46.00	-16.45	Average
8.	0.844	10.67	0.60	33.28	44.55	56.00	-11.45	QP
9.	0.943	10.67	0.60	19.81	31.08	46.00	-14.92	Average
10.	0.943	10.67	0.60	33.81	45.08	56.00	-10.92	QP
11.	15.970	10.78	0.60	21.13	32.51	50.00	-17.49	Average
12.	15.970	10.78	0.60	36.13	47.51	60.00	-12.49	QP

**RESULT: PASS**

Line Conducted Emission Test Line 2-N

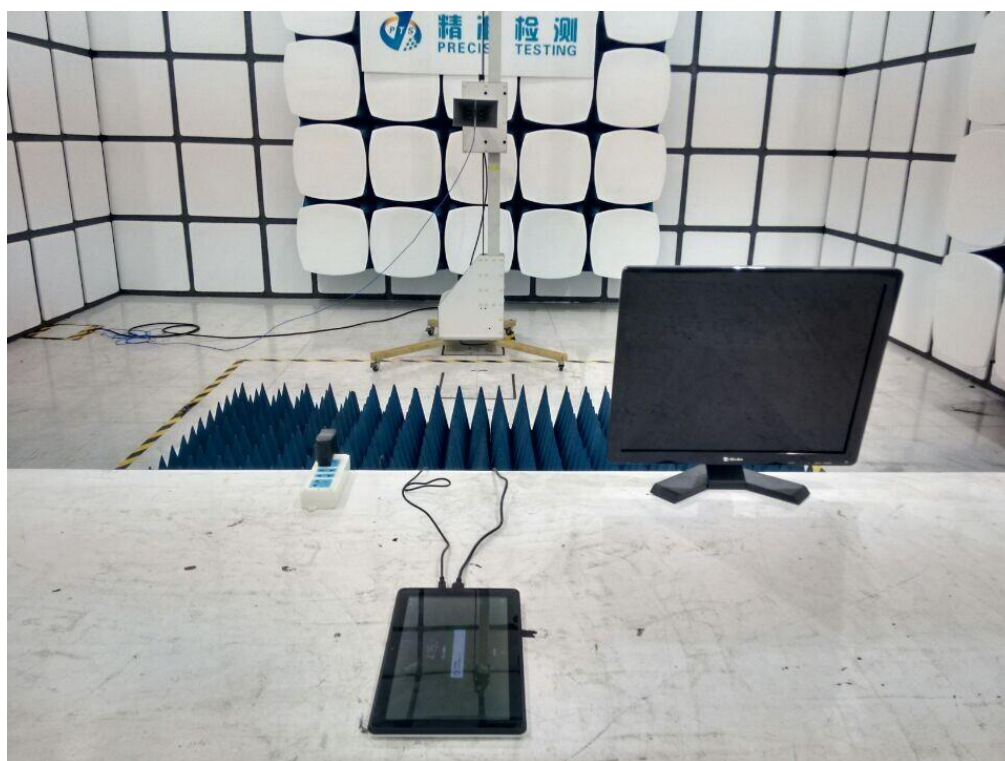
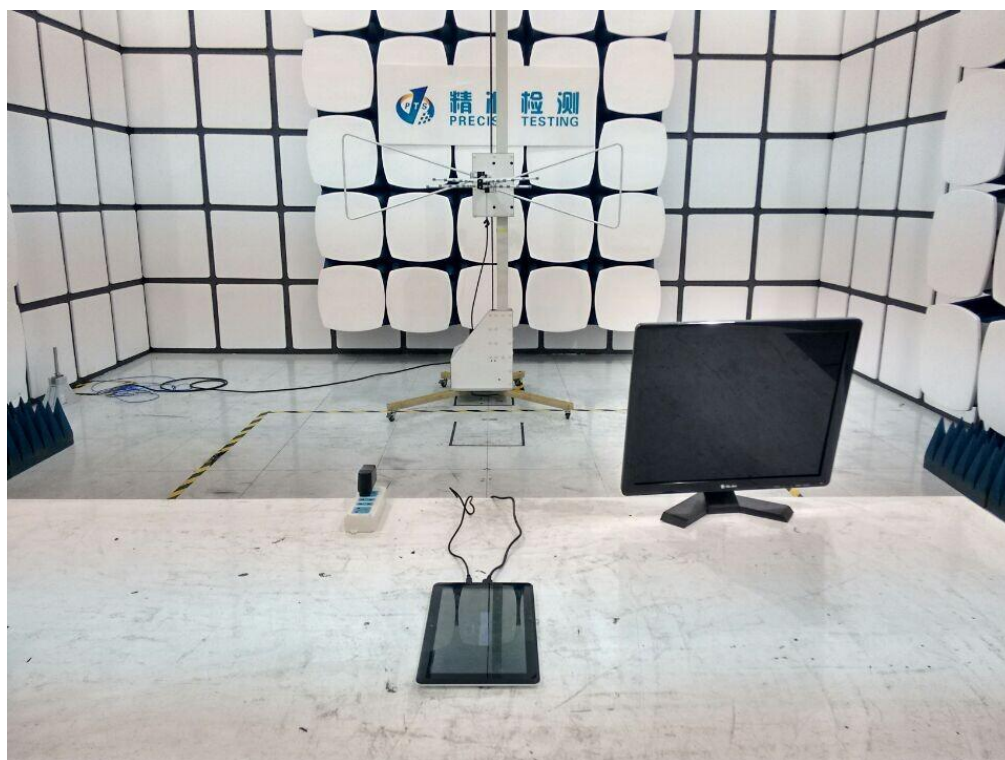


No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBUV	Emission Level dBUV	Limit dBUV	Over Limit dB	Remark
1.	0.150	10.60	0.60	20.21	31.41	56.00	-24.59	Average
2.	0.150	10.60	0.60	41.21	52.41	66.00	-13.59	QP
3.	0.158	10.60	0.60	16.86	28.06	55.56	-27.50	Average
4.	0.158	10.60	0.60	40.86	52.06	65.56	-13.50	QP
5.	0.219	10.61	0.60	18.59	29.80	52.88	-23.08	Average
6.	0.219	10.61	0.60	37.59	48.80	62.88	-14.08	QP
7.	0.521	10.65	0.60	18.41	29.66	46.00	-16.34	Average
8.	0.521	10.65	0.60	35.41	46.66	56.00	-9.34	QP
9.	0.844	10.67	0.60	18.00	29.27	46.00	-16.73	Average
10.	0.844	10.67	0.60	36.00	47.27	56.00	-8.73	QP
11.	15.801	10.78	0.60	19.21	30.59	50.00	-19.41	Average
12.	15.801	10.78	0.60	35.21	46.59	60.00	-13.41	QP

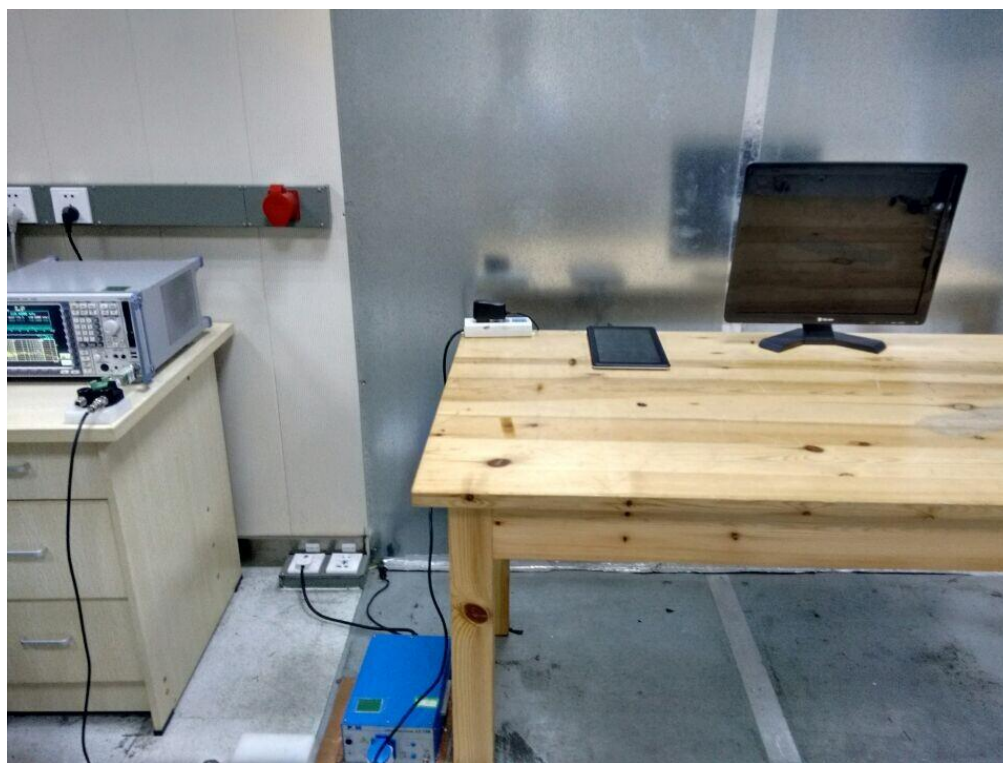
**RESULT: PASS**

## APPENDIX A: PHOTOGRAPHS OF TEST SETUP

### FCC RADIATED EMISSION TEST SETUP



# FCC LINE CONDUCTED EMISSION TEST SETUP





## APPENDIX B: PHOTOGRAPHS OF EUT

### ALL VIEW OF EUT



TOP VIEW OF EUT





BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



BACK VIEW OF EUT



LEFT VIEW OF EUT



RIGHT VIEW OF EUT

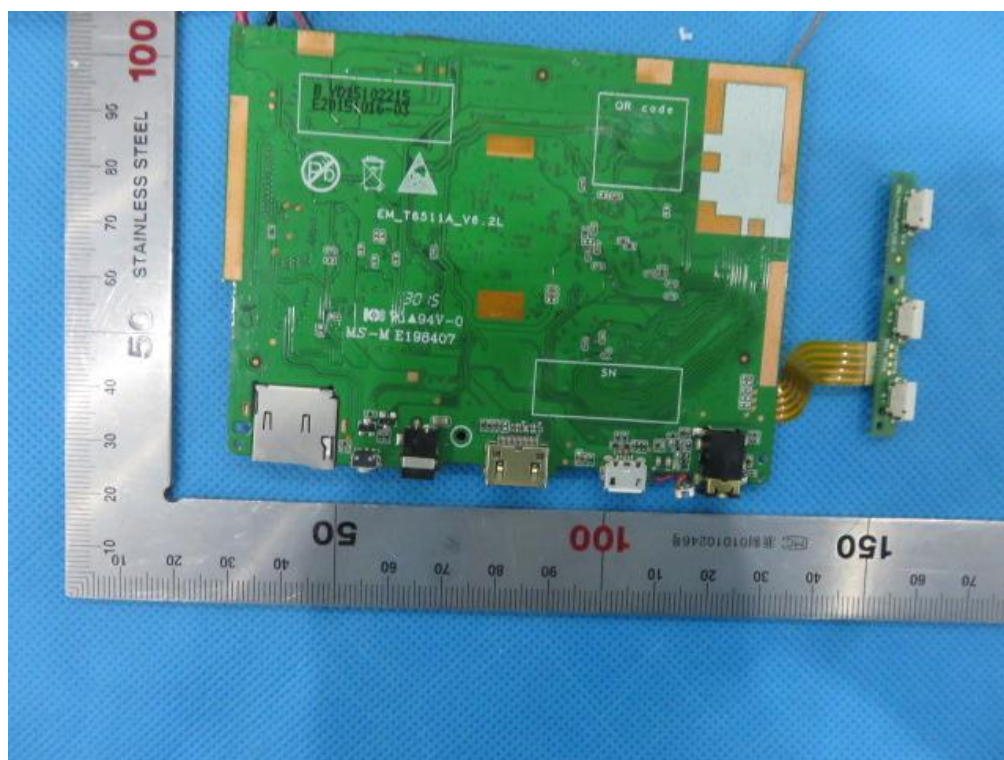


OPEN VIEW OF EUT





INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



ADAPTER LABEL



----END OF REPORT----