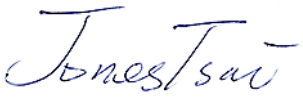
FCC RF Test Report

APPLICANT	:	BungBungame Technology Co.,Ltd.
EQUIPMENT	:	BungBungame Tablet
BRAND NAME	:	BungBungame
MODEL NAME	:	KALOS 2
FCC ID	:	2ADNC-KA2TB115
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Oct. 12, 2015 and testing was completed on Jan. 06, 2016. We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager

Testing Laboratory
1190

SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.

TABLE OF CONTENTS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR5O1213B	Rev. 01	Initial issue of report	Jan. 29, 2016

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.2	15.247(b)(1)	Peak Output Power	≤ 30dBm	Pass	-
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	Conducted Band Edges and Spurious Emission	≤ 20dBc	Pass	-
3.5	15.247(d)	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 7.47 dB at 43.500 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 3.90 dB at 0.454 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

BungBungame Technology Co.,Ltd.
15F., No. 19-11, Sanchong Rd., Nangang Dist., Taipei City 11501, Taiwan (R.O.C

1.2 Manufacturer

Inventec Appliances（Jiangning）Corporation
133, Jiang-Jun Road, Jiangning District, Nanjing

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	BungBungame Tablet
Brand Name	BungBungame
Model Name	KALOS 2
FCC ID	2ADNC-KA2TB115
EUT supports Radios application	NFC/GPS WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth v4.1 EDR/LE
HW Version	PVT
SW Version	1
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	2402 MHz ~ 2480 MHz
Number of Channels	40
Carrier Frequency of Each Channel	40 Channel(37 hopping + 3 advertising channel)
Maximum Output Power to Antenna	4.47 dBm (0.0028 W)
Antenna Type	Chip Antenna type with gain 0.46 dBi
Type of Modulation	Bluetooth LE : GFSK

1.5 Modification of EUT

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

1.6 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	**Sporton Site No.**	
	TH02-HY	CO05-HY

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

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd Rd. Guishan Dist, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	03CH11-HY

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

1.7 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 §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03
- ANSI C63.10-2009

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. FCC permits the use of the 1.5 meter table as an alternative in C63.10-2013 through inquiry tracking number 961829.
3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

2.1 Descriptions of Test Mode

The RF output power was recorded in the following table:

Channel	Frequency	Bluetooth 4.0 – LE RF Output Power
		Data Rate / Modulation
		GFSK
		1Mbps
Ch00	2402MHz	3.53 dBm
Ch19	2440MHz	**4.47** dBm
Ch39	2480MHz	4.13 dBm

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). Pre-scanned tests, X, Y, Z in three orthogonal panels to determine the final configuration (Y plane as worst plane) from all possible combinations.

b. AC power line Conducted Emission was tested under maximum output power.

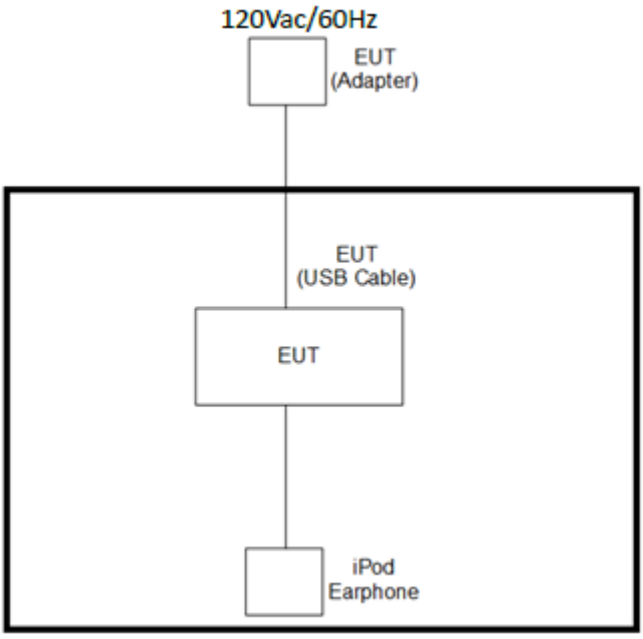
2.2 Test Mode

The following summary table is showing all test modes to demonstrate in compliance with the standard.

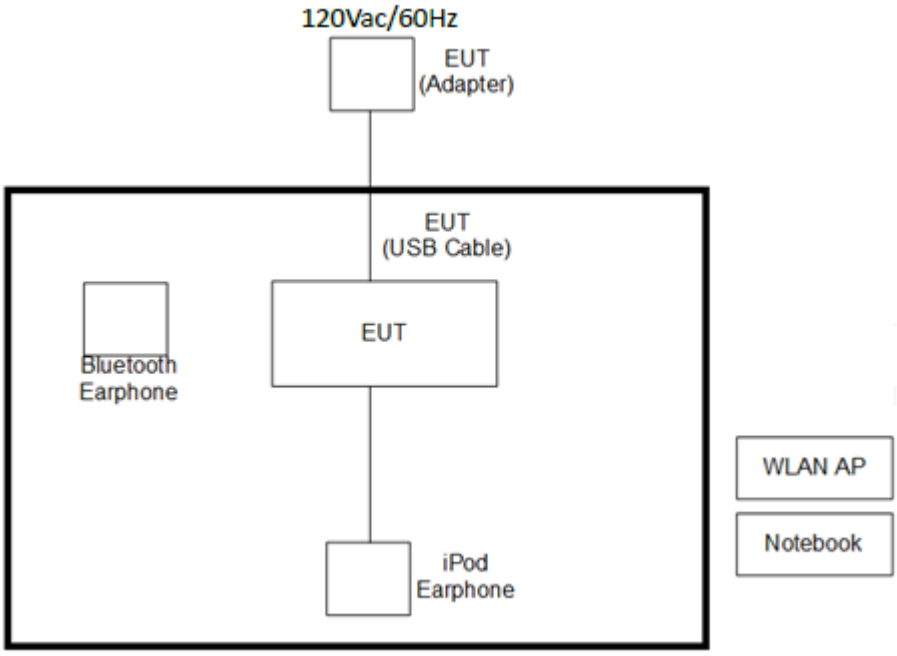
Summary table of Test Cases	
Test Item	**Data Rate / Modulation**
	Bluetooth 4.0 – LE / GFSK
Conducted TCs	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps
Radiated TCs	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps
AC Conducted Emission	Mode 1 :Bluetooth Link + WLAN (2.4GHz) Link + Camera + Earphone + USB Cable (Charging from Adapter)

2.3 Connection Diagram of Test System

<Bluetooth 4.0 – LE Tx Mode>



<AC Conducted Emission Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-Link	DIR-865L	KA2IR865LA1	N/A	Unshielded, 1.8 m
2.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
4.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
5.	SD Card	SanDisk	Micro SD HC	FCC DoC	N/A	N/A

2.5 EUT Operation Test Setup

For Bluetooth function, programmed RF utility, “k2_wifi_controler.exe” installed in the notebook make the EUT provide functions like channel selection and power level for continuous transmitting and receiving signals.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

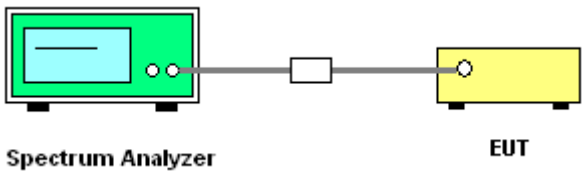
3.1.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. Measure and record the results in the test report.

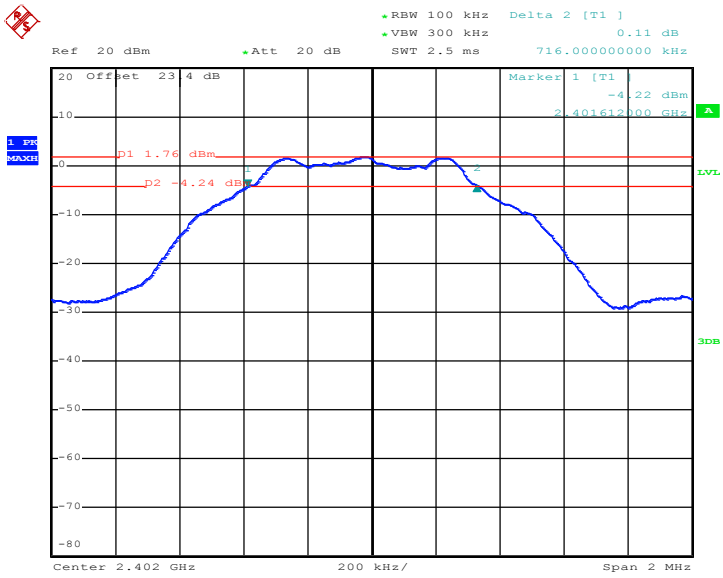
3.1.4 Test Setup



3.1.5 Test Result of 6dB Bandwidth

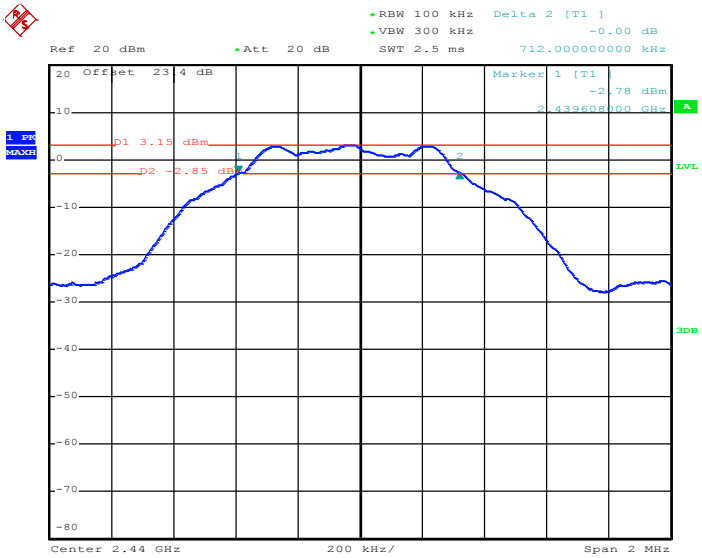
Test data refer to Appendix A.

6 dB Bandwidth Plot on Channel 00



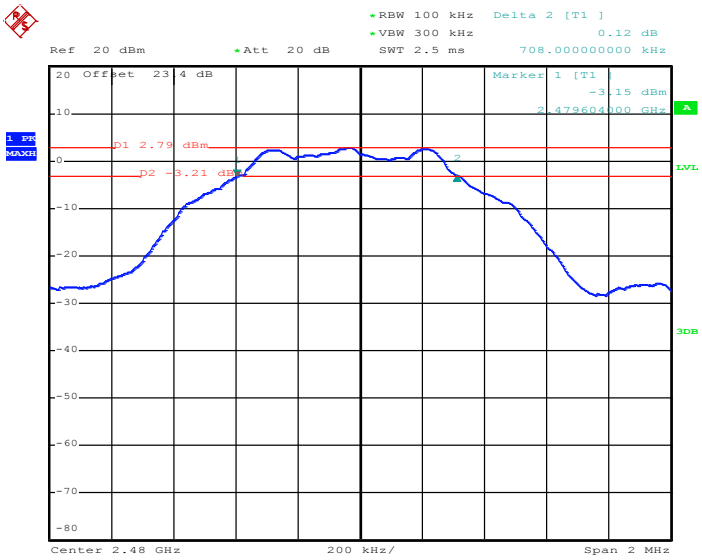
Date: 8.DEC.2015 11:44:52

6 dB Bandwidth Plot on Channel 19



Date: 8.DEC.2015 11:48:28

6 dB Bandwidth Plot on Channel 39



Date: 8.DEC.2015 11:53:24

3.2 Peak Output Power Measurement

3.2.1 Limit of Peak Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

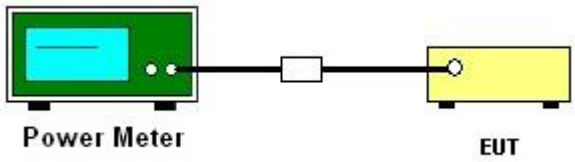
3.2.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v03r03 section 9.1.2 PKPM1 Peak power meter method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Test data refers to Appendix A.

3.2.6 Test Result of Peak Output Power Plots

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

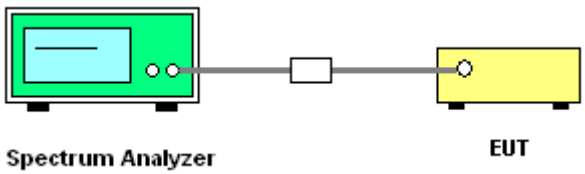
3.3.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
7. The Measured power density (dBm)/ 100kHz is a reference level and used as 20dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

3.3.4 Test Setup

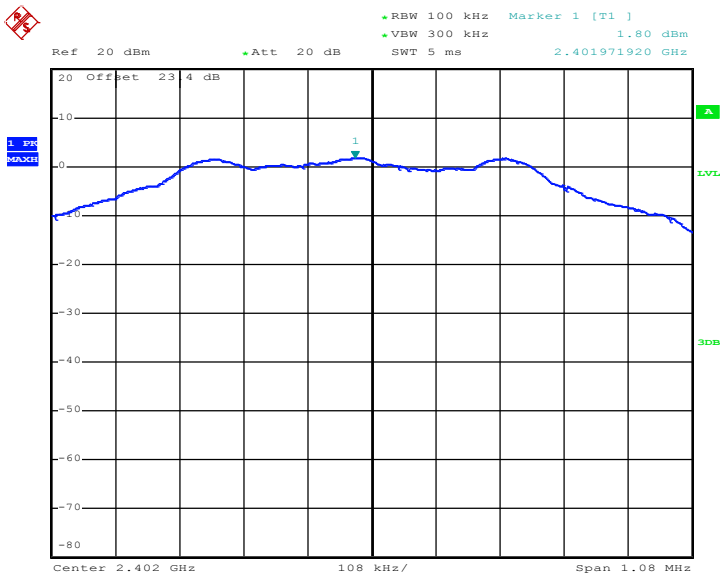


3.3.5 Test Result of Power Spectral Density

Test data refers to Appendix A.

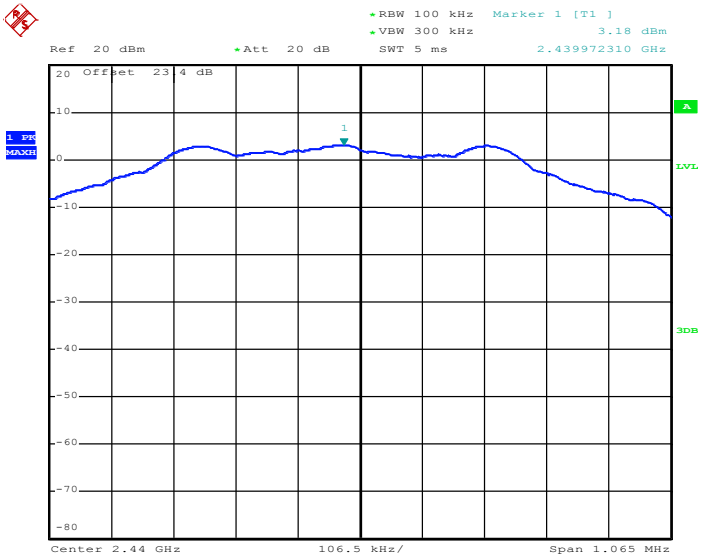
3.3.6 Test Result of Power Spectral Density Plots (100kHz)

PSD 100kHz Plot on Channel 00



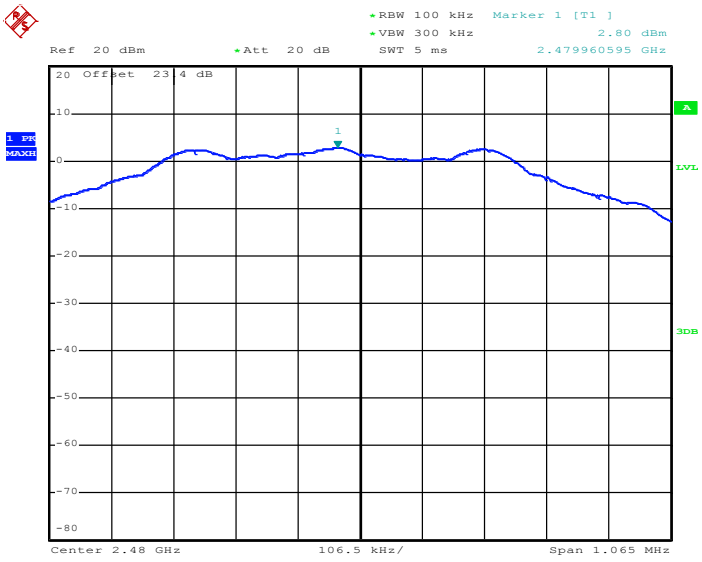
Date: 8.DEC.2015 11:45:31

PSD 100kHz Plot on Channel 19



Date: 8.DEC.2015 11:49:59

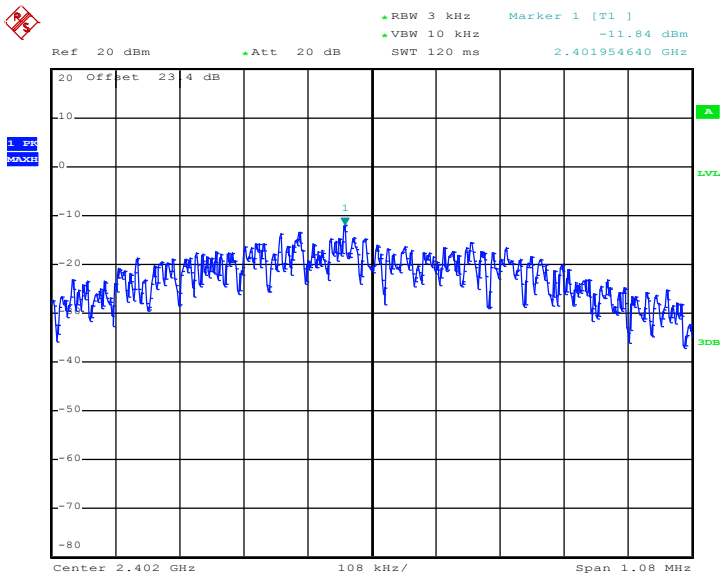
PSD 100kHz Plot on Channel 39



Date: 8.DEC.2015 11:54:01

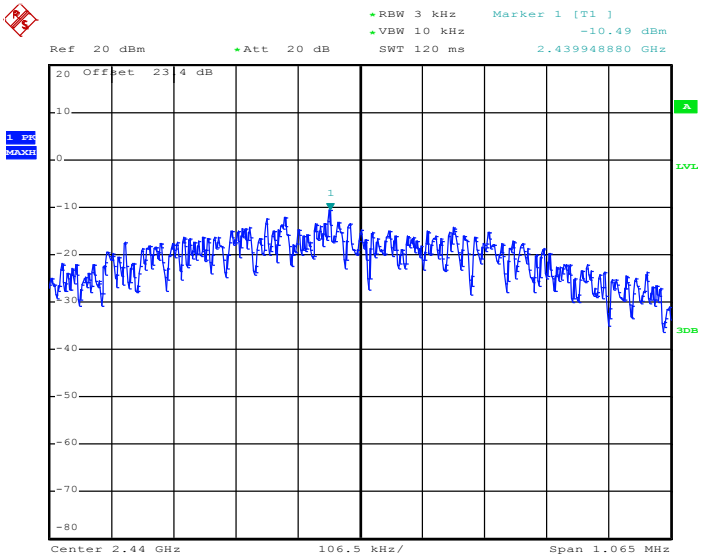
3.3.7 Test Result of Power Spectral Density Plots (3kHz)

PSD 3kHz Plot on Channel 00



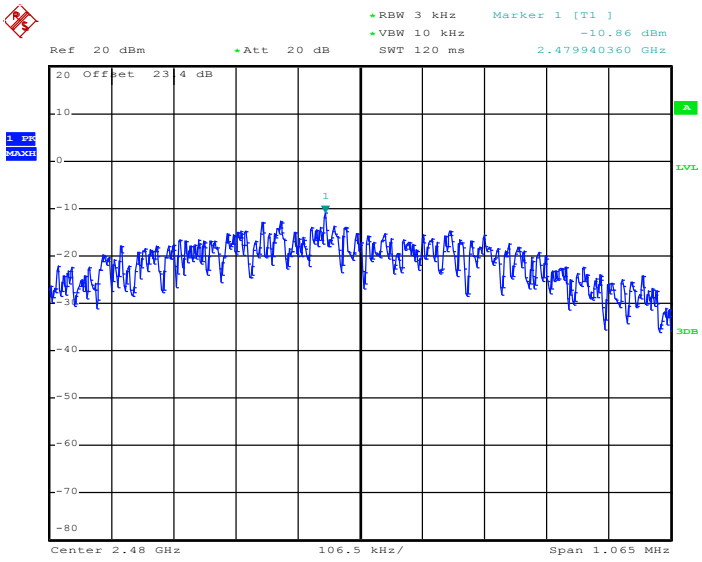
Date: 8.DEC.2015 11:45:15

PSD 3kHz Plot on Channel 19



Date: 8.DEC.2015 11:48:46

PSD 3kHz Plot on Channel 39



Date: 8.DEC.2015 11:53:43

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

3.4.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

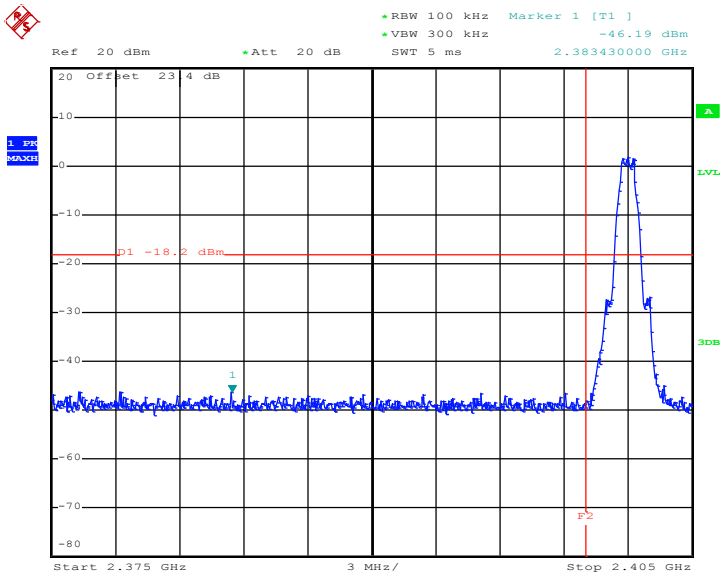
3.4.3 Test Procedure

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup

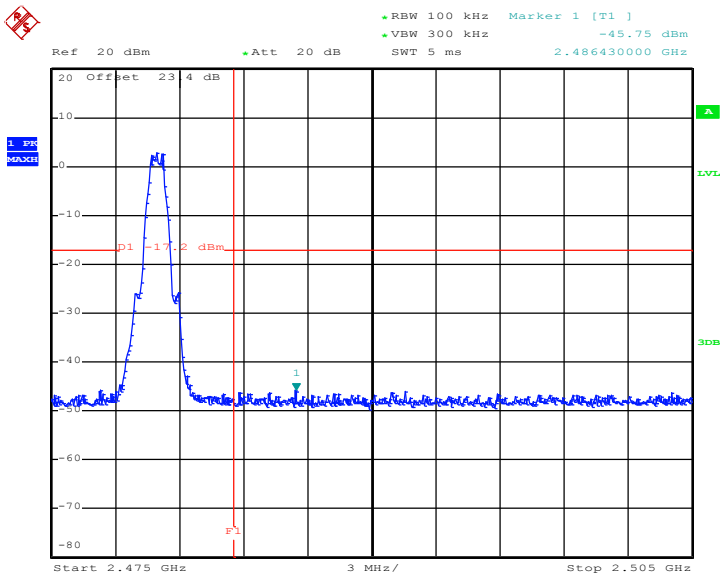
3.4.5 Test Result of Conducted Band Edges Plots

Low Band Edge Plot on Channel 00



Date: 8.DEC.2015 11:45:49

High Band Edge Plot on Channel 39

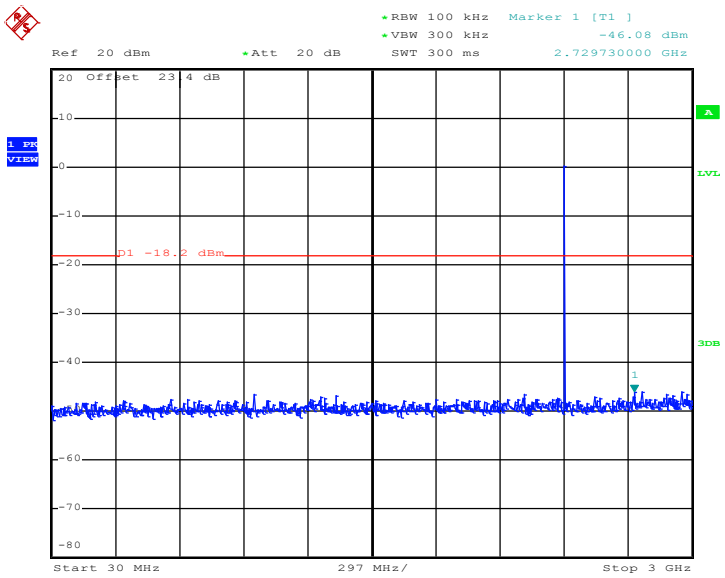


Date: 8.DEC.2015 11:56:28

3.4.6 Test Result of Conducted Spurious Emission Plots

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps

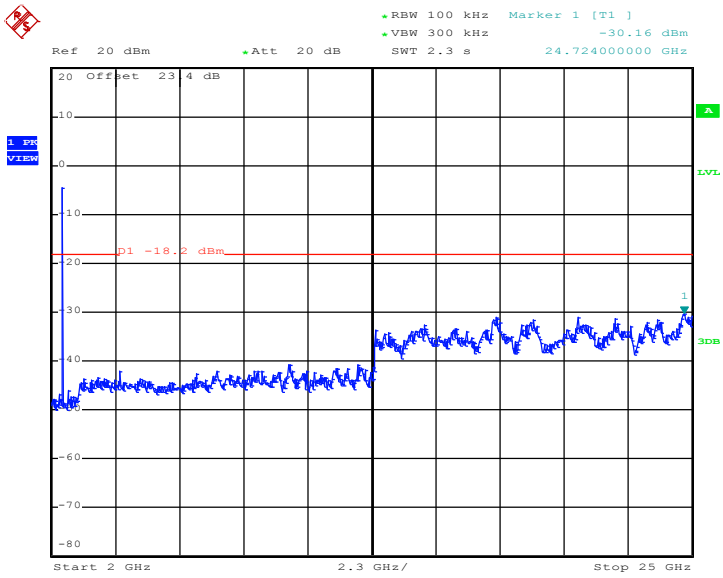
GFSK Channel 00



Date: 8.DEC.2015 11:46:01

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps

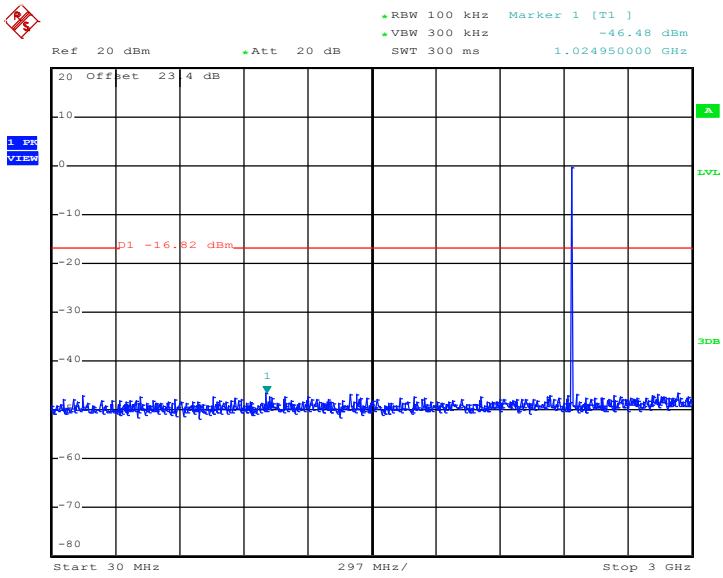
GFSK Channel 00



Date: 8.DEC.2015 11:46:10

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps

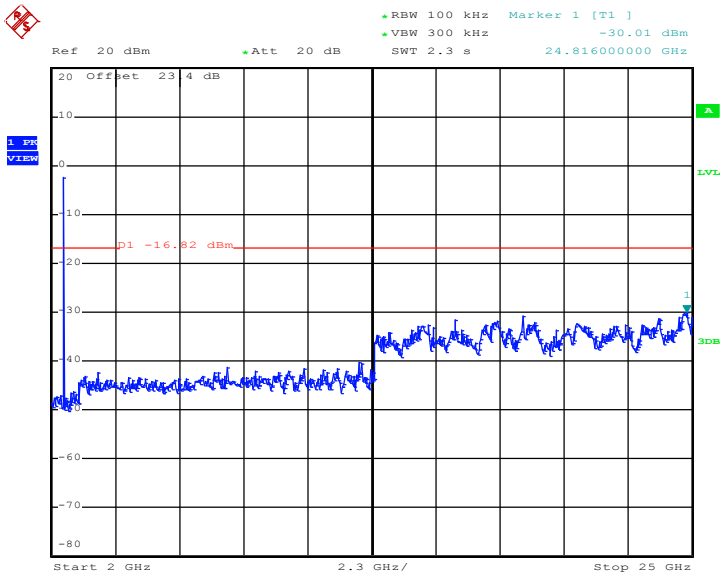
GFSK Channel 19



Date: 8.DEC.2015 11:50:48

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps

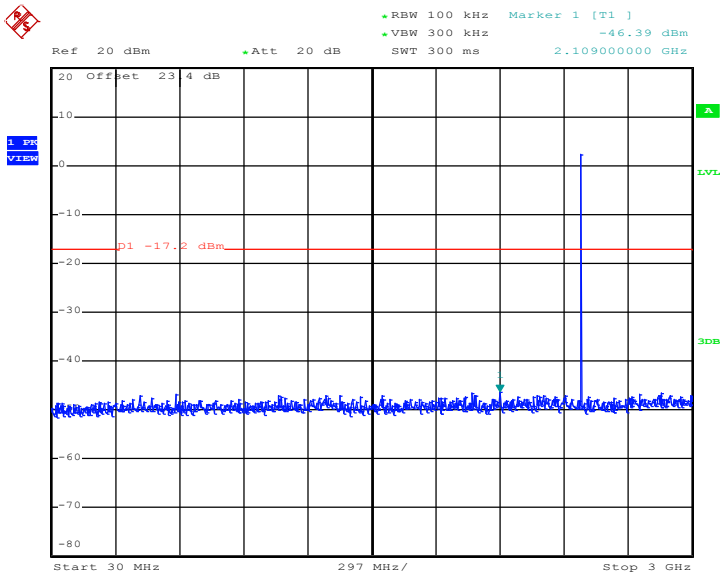
GFSK Channel 19



Date: 8.DEC.2015 11:50:57

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps

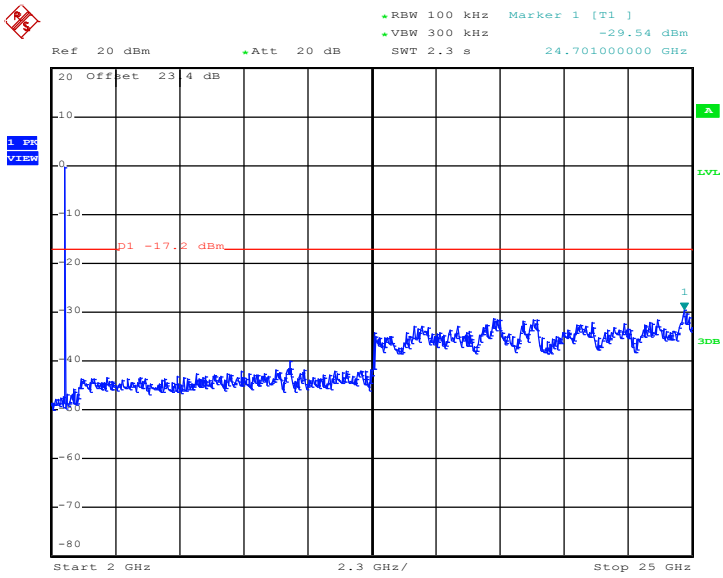
GFSK Channel 39



Date: 8.DEC.2015 11:58:22

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps

GFSK Channel 39



Date: 8.DEC.2015 11:58:30

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (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

3.5.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

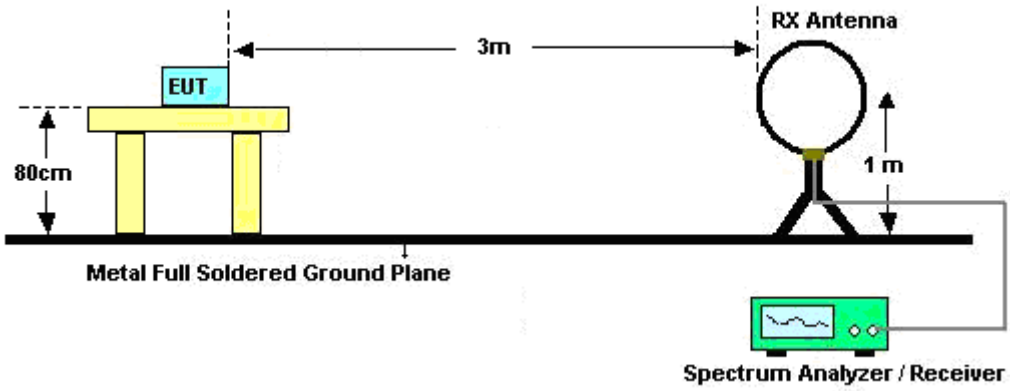
3.5.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

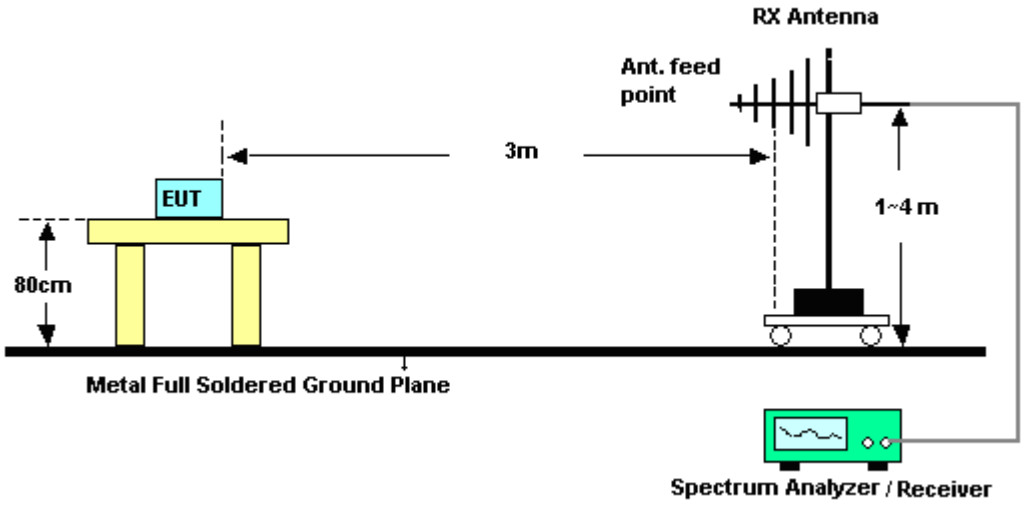
Band	Duty Cycle(%)	T(μs)	1/T(kHz)	VBW Setting
Bluetooth 4.0 - LE	61.54	384	2.60	3kHz

3.5.4 Test Setup

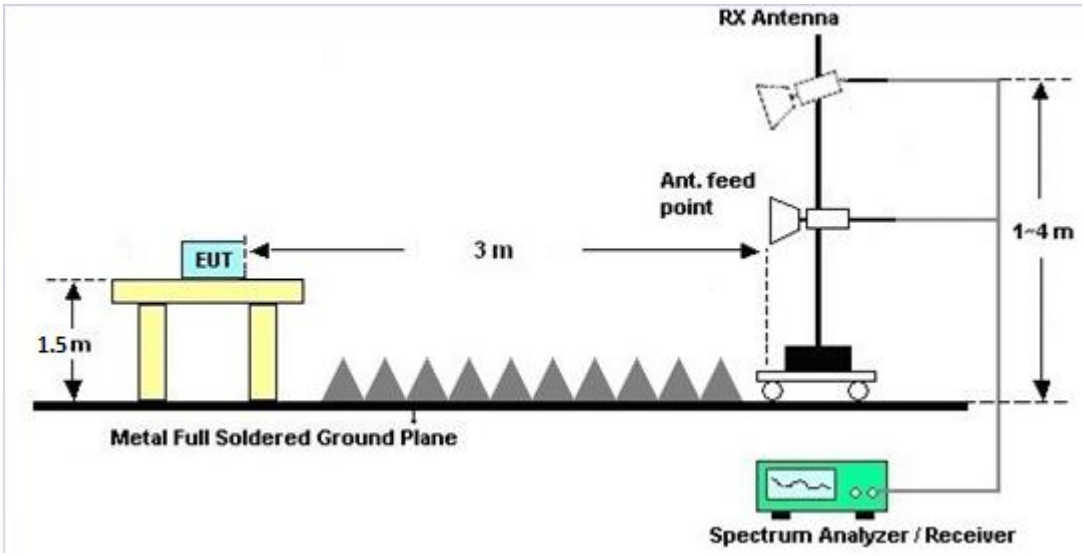
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B.

3.5.7 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix B.

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

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 (MHz)	Conducted limit (dBμV)	
	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.

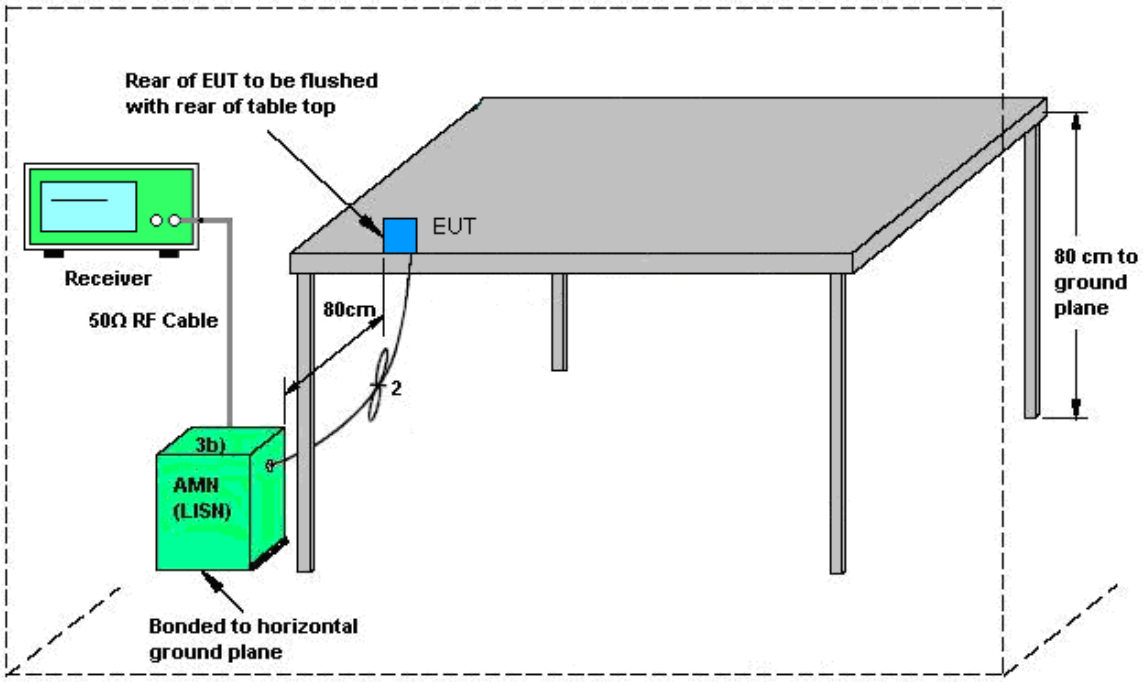
3.6.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.6.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room 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.
8. 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.

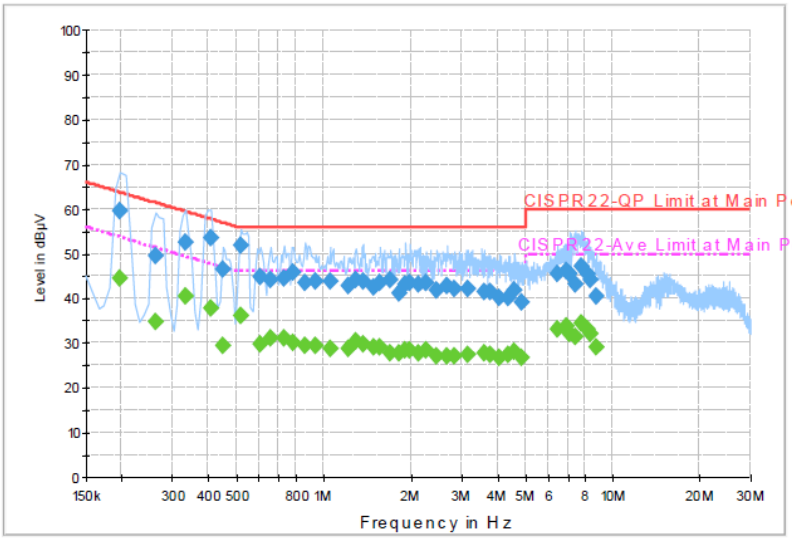
3.6.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.6.5 Test Result of AC Conducted Emission

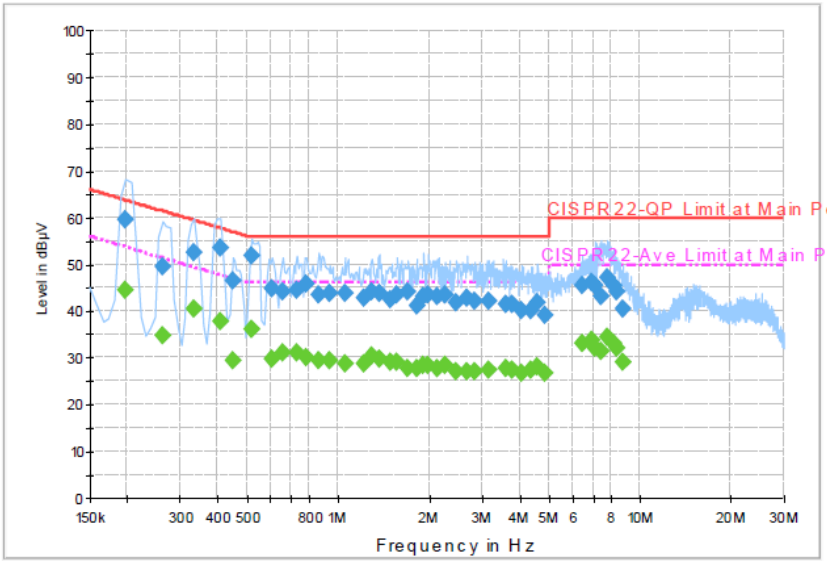
Test Mode :	Mode 1	**Temperature :**	20~21℃
Test Engineer :	Kai Chun Chu	**Relative Humidity :**	53~55%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	Bluetooth Link + WLAN (2.4GHz) Link + Camera + Earphone + USB Cable (Charging from Adapter)		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.198000	59.7	Off	L1	19.7	4.0	63.7
0.262000	49.3	Off	L1	19.7	12.1	61.4
0.334000	52.7	Off	L1	19.7	6.7	59.4
0.406000	53.5	Off	L1	19.7	4.2	57.7
0.446000	46.5	Off	L1	19.6	10.4	56.9
0.518000	51.8	Off	L1	19.7	4.2	56.0
0.606000	44.8	Off	L1	19.7	11.2	56.0
0.654000	44.3	Off	L1	19.6	11.7	56.0
0.734000	44.6	Off	L1	19.7	11.4	56.0
0.782000	45.8	Off	L1	19.6	10.2	56.0
0.862000	43.6	Off	L1	19.7	12.4	56.0
0.942000	43.7	Off	L1	19.7	12.3	56.0
1.054000	43.7	Off	L1	19.7	12.3	56.0
1.214000	42.7	Off	L1	19.6	13.3	56.0
1.294000	44.2	Off	L1	19.6	11.8	56.0
1.366000	43.9	Off	L1	19.6	12.1	56.0
1.486000	42.5	Off	L1	19.7	13.5	56.0
1.574000	43.6	Off	L1	19.6	12.4	56.0
1.710000	44.0	Off	L1	19.7	12.0	56.0
1.822000	41.1	Off	L1	19.7	14.9	56.0
1.926000	43.1	Off	L1	19.7	12.9	56.0
1.990000	43.6	Off	L1	19.6	12.4	56.0

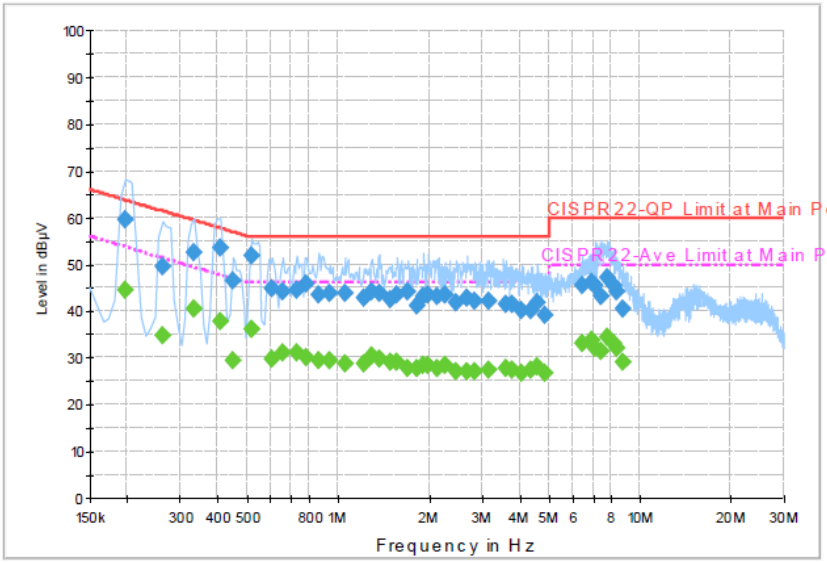
Test Mode :	Mode 1	Temperature :	20~21℃
Test Engineer :	Kai Chun Chu	Relative Humidity :	53~55%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	Bluetooth Link + WLAN (2.4GHz) Link + Camera + Earphone + USB Cable (Charging from Adapter)		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.134000	43.0	Off	L1	19.6	13.0	56.0
2.262000	43.5	Off	L1	19.7	12.5	56.0
2.470000	41.9	Off	L1	19.6	14.1	56.0
2.678000	42.7	Off	L1	19.6	13.3	56.0
2.838000	42.1	Off	L1	19.7	13.9	56.0
3.158000	42.1	Off	L1	19.7	13.9	56.0
3.590000	41.6	Off	L1	19.7	14.4	56.0
3.774000	41.3	Off	L1	19.7	14.7	56.0
4.078000	40.2	Off	L1	19.7	15.8	56.0
4.358000	40.1	Off	L1	19.7	15.9	56.0
4.598000	41.9	Off	L1	19.7	14.1	56.0
4.878000	39.0	Off	L1	19.8	17.0	56.0
6.454000	45.6	Off	L1	19.7	14.4	60.0
6.926000	46.1	Off	L1	19.7	13.9	60.0
7.142000	45.4	Off	L1	19.8	14.6	60.0
7.414000	43.2	Off	L1	19.7	16.8	60.0
7.830000	47.2	Off	L1	19.7	12.8	60.0
8.198000	45.3	Off	L1	19.7	14.7	60.0
8.422000	44.2	Off	L1	19.7	15.8	60.0
8.782000	40.5	Off	L1	19.8	19.5	60.0

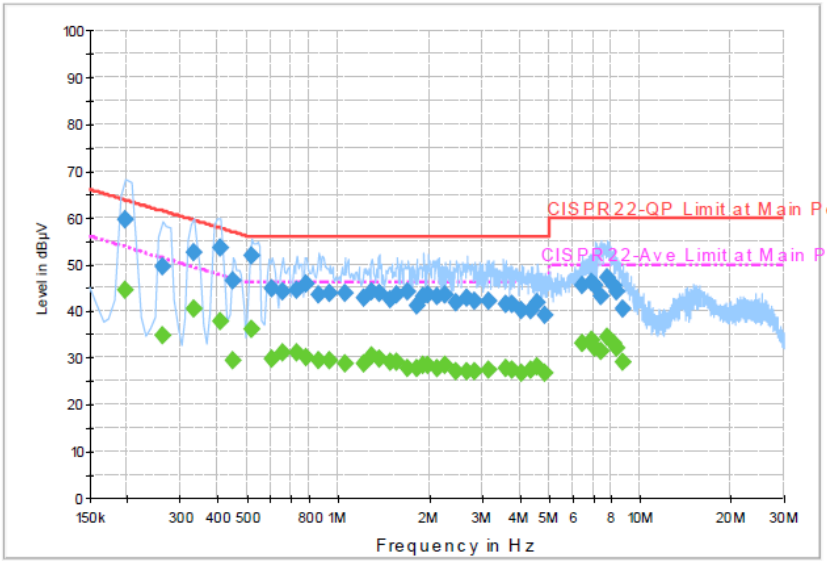
Test Mode :	Mode 1	Temperature :	20~21℃
Test Engineer :	Kai Chun Chu	Relative Humidity :	53~55%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	Bluetooth Link + WLAN (2.4GHz) Link + Camera + Earphone + USB Cable (Charging from Adapter)		



Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.198000	44.5	Off	L1	19.7	9.2	53.7
0.262000	34.8	Off	L1	19.7	16.6	51.4
0.334000	40.5	Off	L1	19.7	8.9	49.4
0.406000	37.9	Off	L1	19.7	9.8	47.7
0.446000	29.4	Off	L1	19.6	17.5	46.9
0.518000	36.0	Off	L1	19.7	10.0	46.0
0.606000	29.8	Off	L1	19.7	16.2	46.0
0.654000	30.9	Off	L1	19.6	15.1	46.0
0.734000	31.3	Off	L1	19.7	14.7	46.0
0.782000	30.2	Off	L1	19.6	15.8	46.0
0.862000	29.4	Off	L1	19.7	16.6	46.0
0.942000	29.3	Off	L1	19.7	16.7	46.0
1.054000	28.8	Off	L1	19.7	17.2	46.0
1.214000	28.6	Off	L1	19.6	17.4	46.0
1.294000	30.4	Off	L1	19.6	15.6	46.0
1.366000	29.9	Off	L1	19.6	16.1	46.0
1.486000	29.1	Off	L1	19.7	16.9	46.0
1.574000	29.2	Off	L1	19.6	16.8	46.0
1.710000	27.9	Off	L1	19.7	18.1	46.0
1.822000	27.7	Off	L1	19.7	18.3	46.0
1.926000	28.3	Off	L1	19.7	17.7	46.0

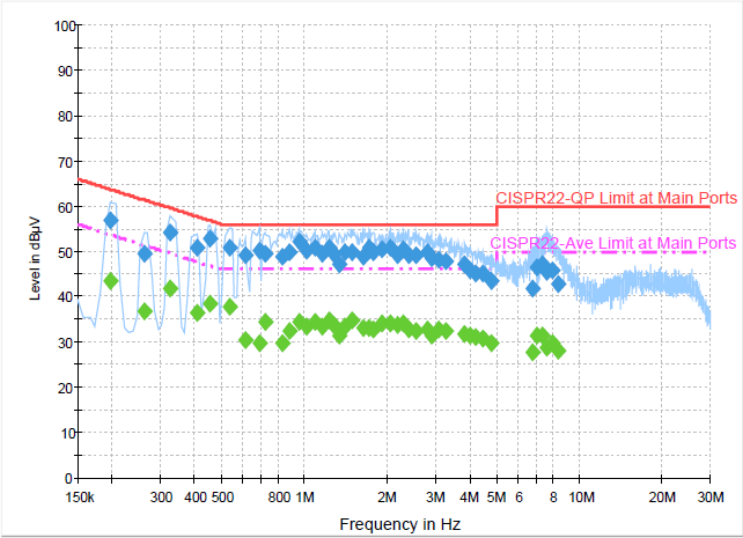
Test Mode :	Mode 1	Temperature :	20~21℃
Test Engineer :	Kai Chun Chu	Relative Humidity :	53~55%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	Bluetooth Link + WLAN (2.4GHz) Link + Camera + Earphone + USB Cable (Charging from Adapter)		



Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.990000	28.5	Off	L1	19.6	17.5	46.0
2.134000	27.6	Off	L1	19.6	18.4	46.0
2.262000	28.4	Off	L1	19.7	17.6	46.0
2.470000	27.2	Off	L1	19.6	18.8	46.0
2.678000	27.2	Off	L1	19.6	18.8	46.0
2.838000	27.2	Off	L1	19.7	18.8	46.0
3.158000	27.3	Off	L1	19.7	18.7	46.0
3.590000	27.9	Off	L1	19.7	18.1	46.0
3.774000	27.4	Off	L1	19.7	18.6	46.0
4.078000	26.9	Off	L1	19.7	19.1	46.0
4.358000	27.4	Off	L1	19.7	18.6	46.0
4.598000	28.2	Off	L1	19.7	17.8	46.0
4.878000	26.9	Off	L1	19.8	19.1	46.0
6.454000	33.2	Off	L1	19.7	16.8	50.0
6.926000	33.6	Off	L1	19.7	16.4	50.0
7.142000	32.3	Off	L1	19.8	17.7	50.0
7.414000	31.3	Off	L1	19.7	18.7	50.0
7.830000	34.3	Off	L1	19.7	15.7	50.0
8.198000	33.0	Off	L1	19.7	17.0	50.0
8.422000	32.2	Off	L1	19.7	17.8	50.0
8.782000	29.1	Off	L1	19.8	20.9	50.0

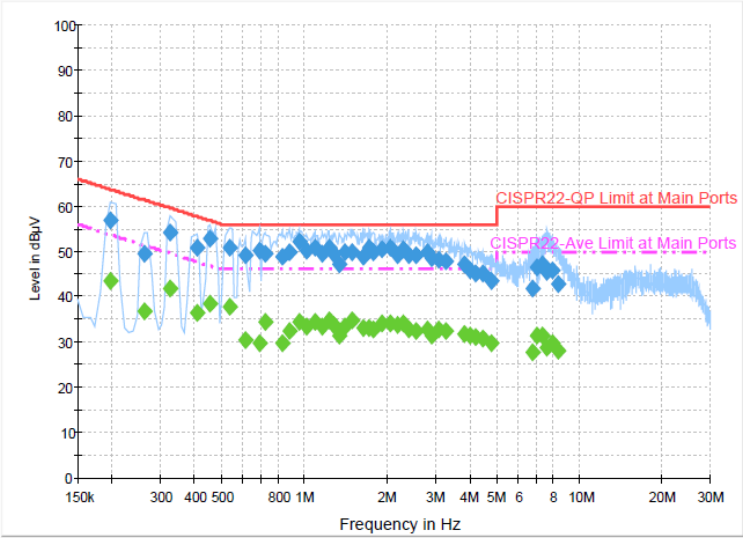
Test Mode :	Mode 1	Temperature :	20~21℃
Test Engineer :	Kai Chun Chu	Relative Humidity :	53~55%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Bluetooth Link + WLAN (2.4GHz) Link + Camera + Earphone + USB Cable (Charging from Adapter)		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.198000	56.9	Off	N	19.7	6.8	63.7
0.262000	49.5	Off	N	19.7	11.9	61.4
0.326000	54.2	Off	N	19.7	5.4	59.6
0.406000	50.9	Off	N	19.7	6.8	57.7
0.454000	52.9	Off	N	19.6	3.9	56.8
0.534000	50.9	Off	N	19.7	5.1	56.0
0.614000	49.2	Off	N	19.6	6.8	56.0
0.686000	50.1	Off	N	19.6	5.9	56.0
0.718000	49.5	Off	N	19.6	6.5	56.0
0.830000	48.8	Off	N	19.6	7.2	56.0
0.886000	49.9	Off	N	19.7	6.1	56.0
0.958000	52.1	Off	N	19.7	3.9	56.0
1.022000	50.1	Off	N	19.7	5.9	56.0
1.094000	50.7	Off	N	19.6	5.3	56.0
1.166000	49.6	Off	N	19.7	6.4	56.0
1.230000	50.9	Off	N	19.6	5.1	56.0
1.278000	49.6	Off	N	19.6	6.4	56.0
1.334000	47.2	Off	N	19.6	8.8	56.0
1.406000	49.8	Off	N	19.6	6.2	56.0
1.486000	49.8	Off	N	19.7	6.2	56.0
1.638000	48.9	Off	N	19.7	7.1	56.0
1.726000	50.9	Off	N	19.7	5.1	56.0

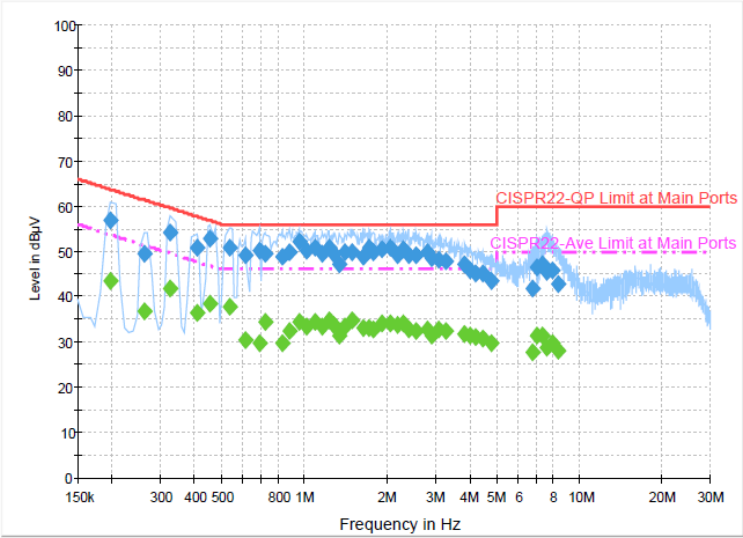
Test Mode :	Mode 1	Temperature :	20~21℃
Test Engineer :	Kai Chun Chu	Relative Humidity :	53~55%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Bluetooth Link + WLAN (2.4GHz) Link + Camera + Earphone + USB Cable (Charging from Adapter)		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.782000	49.9	Off	N	19.7	6.1	56.0
1.918000	50.6	Off	N	19.7	5.4	56.0
2.054000	51.0	Off	N	19.6	5.0	56.0
2.174000	49.2	Off	N	19.6	6.8	56.0
2.302000	50.4	Off	N	19.7	5.6	56.0
2.398000	49.3	Off	N	19.6	6.7	56.0
2.558000	49.1	Off	N	19.7	6.9	56.0
2.814000	49.8	Off	N	19.7	6.2	56.0
2.894000	48.3	Off	N	19.6	7.7	56.0
3.070000	48.0	Off	N	19.6	8.0	56.0
3.286000	47.8	Off	N	19.7	8.2	56.0
3.846000	47.0	Off	N	19.7	9.0	56.0
4.030000	45.9	Off	N	19.7	10.1	56.0
4.214000	45.2	Off	N	19.7	10.8	56.0
4.446000	45.3	Off	N	19.7	10.7	56.0
4.814000	43.4	Off	N	19.7	12.6	56.0
6.790000	41.6	Off	N	19.7	18.4	60.0
7.054000	46.5	Off	N	19.8	13.5	60.0
7.326000	47.1	Off	N	19.7	12.9	60.0
7.670000	45.4	Off	N	19.7	14.6	60.0
8.038000	45.8	Off	N	19.7	14.2	60.0
8.422000	42.9	Off	N	19.8	17.1	60.0

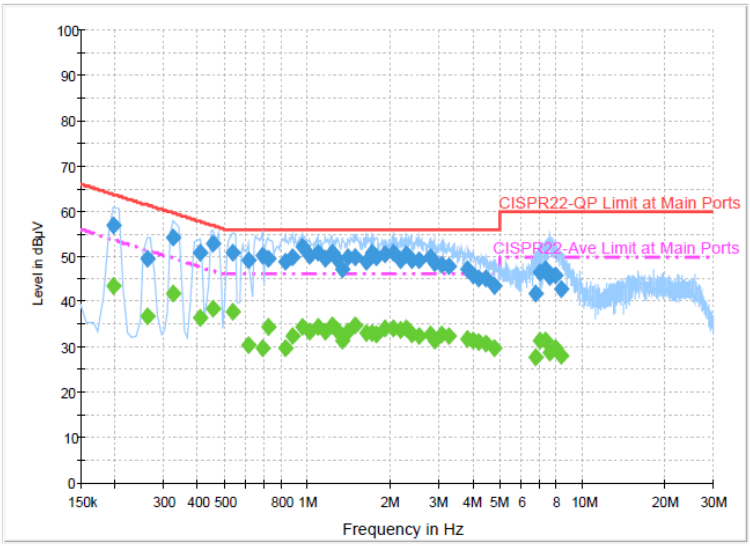
Test Mode :	Mode 1	Temperature :	20~21℃
Test Engineer :	Kai Chun Chu	Relative Humidity :	53~55%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Bluetooth Link + WLAN (2.4GHz) Link + Camera + Earphone + USB Cable (Charging from Adapter)		



Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.198000	43.5	Off	N	19.7	10.2	53.7
0.262000	36.9	Off	N	19.7	14.5	51.4
0.326000	41.9	Off	N	19.7	7.7	49.6
0.406000	36.3	Off	N	19.7	11.4	47.7
0.454000	38.6	Off	N	19.6	8.2	46.8
0.534000	37.8	Off	N	19.7	8.2	46.0
0.614000	30.6	Off	N	19.6	15.4	46.0
0.686000	29.8	Off	N	19.6	16.2	46.0
0.718000	34.5	Off	N	19.6	11.5	46.0
0.830000	29.9	Off	N	19.6	16.1	46.0
0.886000	32.4	Off	N	19.7	13.6	46.0
0.958000	34.5	Off	N	19.7	11.5	46.0
1.022000	33.5	Off	N	19.7	12.5	46.0
1.094000	34.4	Off	N	19.6	11.6	46.0
1.166000	33.6	Off	N	19.7	12.4	46.0
1.230000	34.9	Off	N	19.6	11.1	46.0
1.278000	33.9	Off	N	19.6	12.1	46.0
1.334000	31.5	Off	N	19.6	14.5	46.0
1.406000	33.4	Off	N	19.6	12.6	46.0
1.486000	34.7	Off	N	19.7	11.3	46.0
1.638000	33.1	Off	N	19.7	12.9	46.0
1.726000	33.1	Off	N	19.7	12.9	46.0

Test Mode :	Mode 1	Temperature :	20~21℃
Test Engineer :	Kai Chun Chu	Relative Humidity :	53~55%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Bluetooth Link + WLAN (2.4GHz) Link + Camera + Earphone + USB Cable (Charging from Adapter)		



Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.782000	32.7	Off	N	19.7	13.3	46.0
1.918000	34.0	Off	N	19.7	12.0	46.0
2.054000	34.1	Off	N	19.6	11.9	46.0
2.174000	33.6	Off	N	19.6	12.4	46.0
2.302000	34.0	Off	N	19.7	12.0	46.0
2.398000	32.6	Off	N	19.6	13.4	46.0
2.558000	32.3	Off	N	19.7	13.7	46.0
2.814000	32.8	Off	N	19.7	13.2	46.0
2.894000	31.6	Off	N	19.6	14.4	46.0
3.070000	32.9	Off	N	19.6	13.1	46.0
3.286000	32.6	Off	N	19.7	13.4	46.0
3.846000	31.8	Off	N	19.7	14.2	46.0
4.030000	31.4	Off	N	19.7	14.6	46.0
4.214000	31.1	Off	N	19.7	14.9	46.0
4.446000	30.9	Off	N	19.7	15.1	46.0
4.814000	29.7	Off	N	19.7	16.3	46.0
6.790000	27.6	Off	N	19.7	22.4	50.0
7.054000	31.6	Off	N	19.8	18.4	50.0
7.326000	31.6	Off	N	19.7	18.4	50.0
7.670000	28.9	Off	N	19.7	21.1	50.0
8.038000	29.8	Off	N	19.7	20.2	50.0
8.422000	27.9	Off	N	19.8	22.1	50.0

3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. 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 FCC rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H1	34897199	N/A	May. 04, 2015	Nov. 26, 2015 ~ Dec. 08, 2015	May. 03, 2016	Conducted (TH02-HY)
Power Meter	Agilent	E4416A	GB41292344	300MHz~40GHz	Jan. 14, 2015	Nov. 26, 2015 ~ Dec. 08, 2015	Jan. 13, 2016	Conducted (TH02-HY)
Power Sensor	Agilent	E9327A	US40441548	300MHz~40GHz	Jan. 14, 2015	Nov. 26, 2015 ~ Dec. 08, 2015	Jan. 13, 2016	Conducted (TH02-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 18, 2015	Nov. 26, 2015 ~ Dec. 08, 2015	Jun. 17, 2016	Conducted (TH02-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Sep. 02, 2015	Dec. 28, 2015~ Jan. 06, 2016	Sep. 01, 2016	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Nov. 20, 2015	Dec. 28, 2015~ Jan. 06, 2016	Nov. 19, 2016	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1326	1GHz ~ 18GHz	Oct. 08, 2015	Dec. 28, 2015~ Jan. 06, 2016	Oct. 07, 2016	Radiation (03CH11-HY)
Hygrometer	TECPEL	DTN-303B	TP140325	N/A	Nov. 17, 2015	Dec. 28, 2015~ Jan. 06, 2016	Nov. 16, 2016	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY53270080	1GHz~26.5GHz	Nov. 19, 2015	Dec. 28, 2015~ Jan. 06, 2016	Nov. 18, 2016	Radiation (03CH11-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1902247	1GHz~18GHz	Jul. 01, 2015	Dec. 28, 2015~ Jan. 06, 2016	Jun. 30, 2016	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz ~ 44GHZ	Sep. 24, 2015	Dec. 28, 2015~ Jan. 06, 2016	Sep. 23, 2016	Radiation (03CH11-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY53290053	20Hz to 26.5GHz	Feb. 02, 2015	Dec. 28, 2015~ Jan. 06, 2016	Feb. 01, 2016	Radiation (03CH11-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Dec. 28, 2015~ Jan. 06, 2016	N/A	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Dec. 28, 2015~ Jan. 06, 2016	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0-360 degree	N/A	Dec. 28, 2015~ Jan. 06, 2016	N/A	Radiation (03CH11-HY)
Bilog Antenna	Schaffner	CBL 6112B	2892	30MHz to 2GHz	Oct. 26, 2015	Dec. 28, 2015~ Jan. 06, 2016	Oct. 25, 2016	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170576	18GHz ~ 40GHz	Apr. 20, 2015	Dec. 28, 2015~ Jan. 06, 2016	Apr. 19, 2016	Radiation (03CH11-HY)
Preamplifier	MITEQ	JS44-18004000-33-8P	1840917	18GHz ~ 40GHz	Jun. 02, 2015	Dec. 28, 2015~ Jan. 06, 2016	Jun. 01, 2016	Radiation (03CH11-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Dec. 23, 2015	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Aug. 26, 2015	Dec. 23, 2015	Aug. 25, 2016	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Apr. 20, 2015	Dec. 23, 2015	Apr. 19, 2016	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 02, 2015	Dec. 23, 2015	Dec. 01, 2016	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 07, 2015	Dec. 23, 2015	Jan. 06, 2016	Conduction (CO05-HY)

5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.26**

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.90**

Appendix A. Conducted Test Results