

FCC RF Test Report

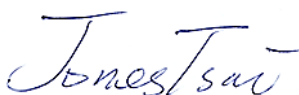
APPLICANT : VERTU Corporation Limited
EQUIPMENT : Cellular Telephone
BRAND NAME : VERTU
MODEL NAME : SIGNATURE TOUCH
TYPE (LTE) : RM-980V
TYPE (WCDMA) : RM-980C
FCC ID : P7QRM-980V
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Mar. 03, 2014 and testing was completed on May 21, 2014. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown to be compliant 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



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR430314B	Rev. 01	Initial issue of report	May 26, 2014

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	RSS-210 A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	RSS-Gen 4.6.1	99% Bandwidth	-	Pass	-
3.2	15.247(b)(1)	RSS-210 A8.1(b)	Peak Output Power	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	RSS-210 A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}$	Pass	-
3.4	15.247(d)	RSS-210 A8.5	Conducted Band Edges and Spurious Emission	$\leq 20\text{dBc}$	Pass	-
3.5	15.247(d)	RSS-210 A8.5	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 9.65 dB at 86.700 MHz
3.6	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 9.10 dB at 0.150 MHz
3.7	15.203 & 15.247(b)	RSS-210 A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

VERTU Corporation Limited

Beacon Hill Road, Church Crookham, Hampshire GU52 8DY, United Kingdom

1.2 Manufacturer

VERTU Corporation Limited

Beacon Hill Road, Church Crookham, Hampshire GU52 8DY, United Kingdom

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Cellular Telephone
Brand Name	VERTU
Model Name	SIGNATURE TOUCH
Type (LTE)	RM-980V
Type (WCDMA)	RM-980C
FCC ID	P7QRM-980V
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/LTE/NFC WLAN 2.4GHz 802.11b/g/n HT20/ WLAN 5GHz 802.11a/n HT20/HT40/ WLAN 5GHz 802.11ac VHT20/VHT40/VHT80/ Bluetooth v3.0 + EDR/Bluetooth v4.0 LE
HW Version	F2
SW Version	1_160_0001
Sample #1	LTE SKU
Sample #2	WCDMA SKU
Sample #3	LTE SKU with 2 nd EMMC
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. There are three different types of EUT sample #1, sample #2 and sample #3. For WWAN bands, Sample 1 support WCDMA and LTE bands, sample #2 only support WCDMA band and LTE band is disabled by software. Sample #1 and Sample #3 are different for EMMC. We choose sample #1 to perform all tests.

List of Accessory:

Specification of Accessory		
AC Adapter	Brand Name	VERTU
	Model Name	AC-32V
Battery	Brand Name	VERTU
	Model Name	BP-9V
Car Charger	Brand Name	VERTU
	Model Name	DC-30V
Portable Power Charger	Brand Name	VERTU
	Model Name	DC-15V
Earphone 1	Brand Name	VERTU
	Model Name	WH-4V
Earphone 2	Brand Name	VERTU
	Model Name	WH-5V
USB Cable	Brand Name	VERTU
	Model Name	CA-225DV
Wireless Charger	Brand Name	VERTU
	Model Name	AC-35V

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
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	2.05 dBm (0.0016 W)
99% Occupied Bandwidth	1.058MHz
Antenna Type	PIFA Antenna with gain -2.00 dBi
Type of Modulation	Bluetooth v4.0 LE : GFSK

1.5 Modification of EUT

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

1.6 Testing Site

Test Site	SPORTON INTERNATIONAL INC.			
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978			
Test Site No.	Sporton Site No.			FCC/IC Registration No.
	TH02-HY	CO05-HY	03CH06-HY 03CH07-HY	722060/4086B-1

Note: The test site complies with ANSI C63.4 2003 requirement.

1.7 Applied 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 v03r01
- ♦ ANSI C63.4-2003
- ♦ IC RSS-210 Issued 8
- ♦ IC RSS-Gen Issue 3
- ♦ NOTICE 2012-DRS0126

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. 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 v4.0 LE RF Output Power
		Data Rate / Modulation
		GFSK
		1Mbps
Ch00	2402MHz	1.45 dBm
Ch19	2440MHz	2.05 dBm
Ch39	2480MHz	1.25 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.

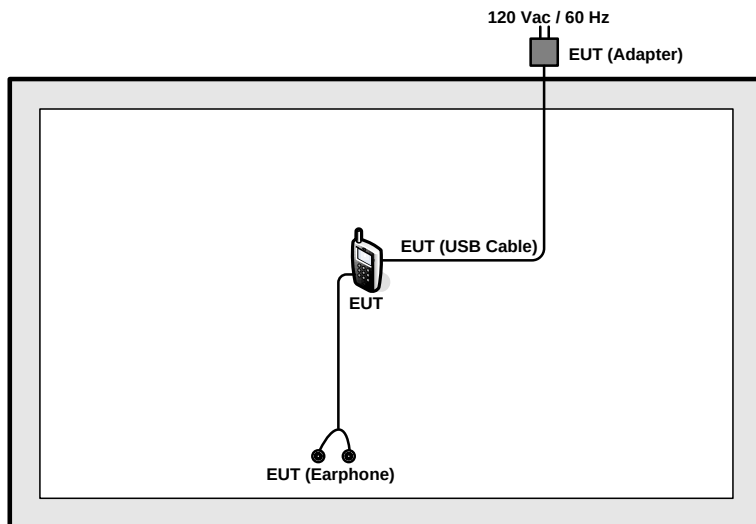
2.2 Test Mode

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

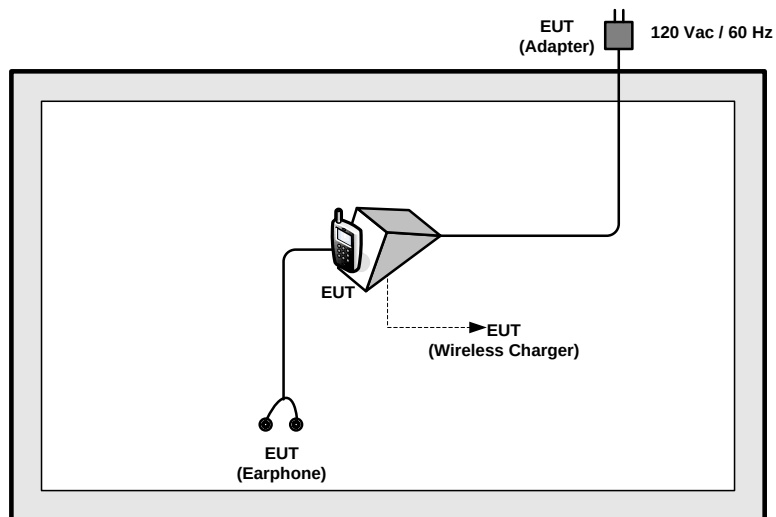
Summary table of Test Cases	
Test Item	Data Rate / Modulation
	Bluetooth v4.0 LE / GFSK
Conducted TCs	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps
Radiated TCs	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps Mode 4: Bluetooth Tx CH39_2480 MHz_1Mbps + WPC Charging
AC Conducted Emission	Mode 1: LTE Band 2 Idle + WLAN 2.4GHz Link + Bluetooth Link + NFC Tx + Earphone 1 + USB Cable (Data Link with Notebook) Mode 2: LTE Band 2 Idle + WLAN 5GHz Link + Bluetooth Link + NFC Tx + Earphone 1 + USB Cable (Data Link with Notebook) Mode 3: GSM1900 Idle + WLAN (2.4GHz) Link + Bluetooth Link + WPC Charging + GPS Rx + Earphone 2 + Wireless charger (Charging from Adapter)
Remark: The worst case of conducted emission is mode 1; only the test data of it is reported.	

2.3 Connection Diagram of Test System

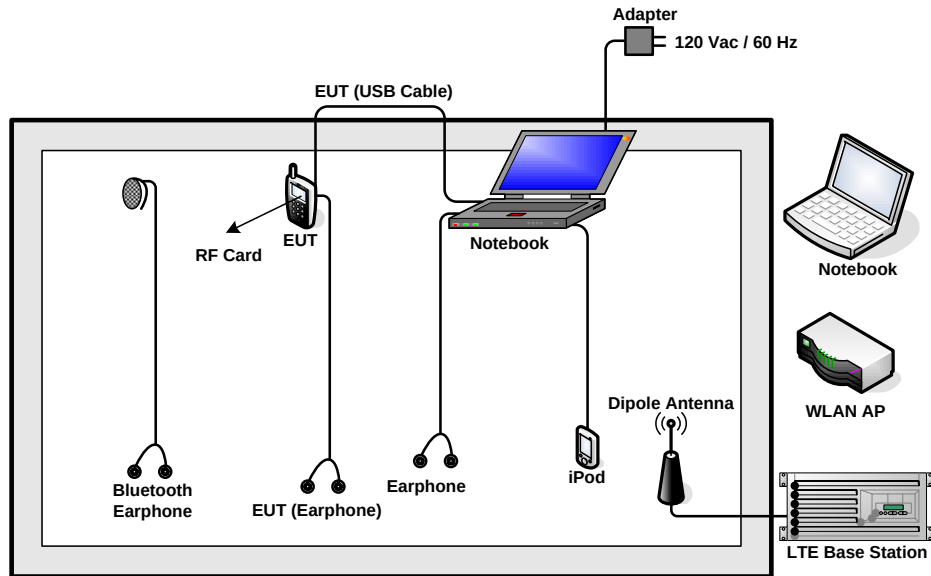
<Bluetooth v4.0 LE Tx Mode>



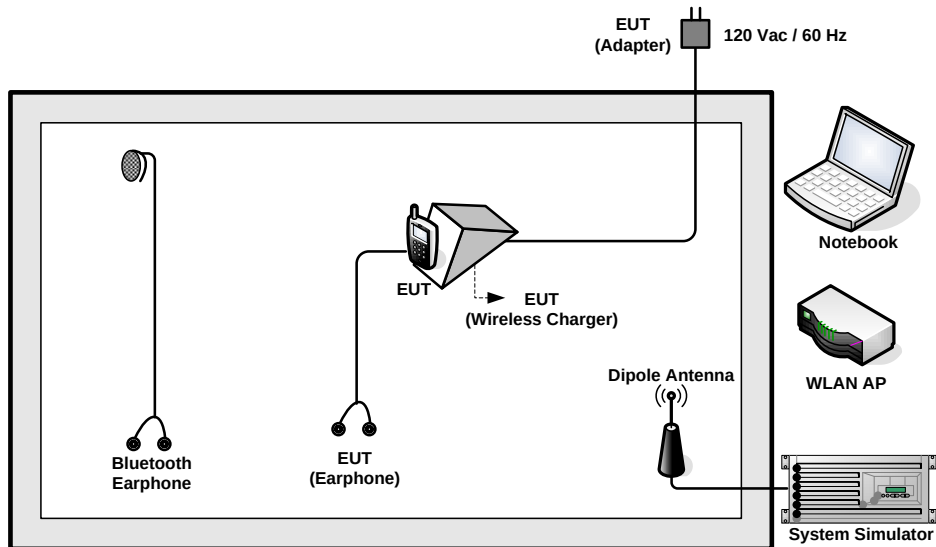
<Bluetooth v4.0 LE Tx Mode with WPC Charging>



<AC Conducted Emission Mode>



<AC Conducted Emission Mode for WPC Charging Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	R&S	CMW 500	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	TOPWARD	3303D	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Notebook	Lenovo	G480	N/A	N/A	AC I/P: Unshielded, 0.9 m DC O/P: Shielded, 1.8 m
6.	Bluetooth Earphone	Sony Erricsson	MW600	PY700A2029	N/A	N/A
7.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
8.	Earphone	Apple	A1285	FCC DoC	Unshielded, 1.2 m	N/A
9.	RF Card	Metro Taipei	Easy Card	N/A	N/A	N/A

2.5 EUT Operation Test Setup

For Bluetooth v4.0 LE function, the engineering test program was provided and enabled to make EUT continuous transmit/receive.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.



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 5.4 dB and 20dB attenuator.

$$\begin{aligned}\text{Offset (dB)} &= \text{RF cable loss (dB)} + \text{attenuator factor (dB)} \\ &= 5.4 + 20 = 25.4 \text{ (dB)}\end{aligned}$$

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

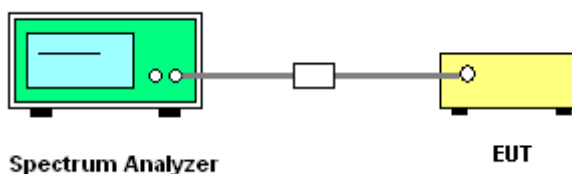
3.1.2 Measuring Instruments

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 v03r01.
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. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 30kHz and set the Video bandwidth (VBW) = 100kHz.
6. Measure and record the results in the test report.

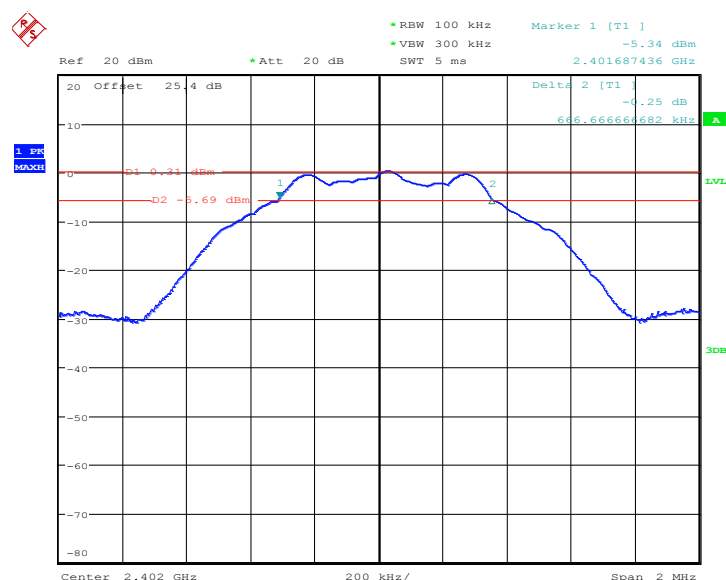
3.1.4 Test Setup





Test Mode :		Bluetooth v4.0 LE	Temperature :		24~26℃
Test Engineer :		Alex Lee	Relative Humidity :		50~53%

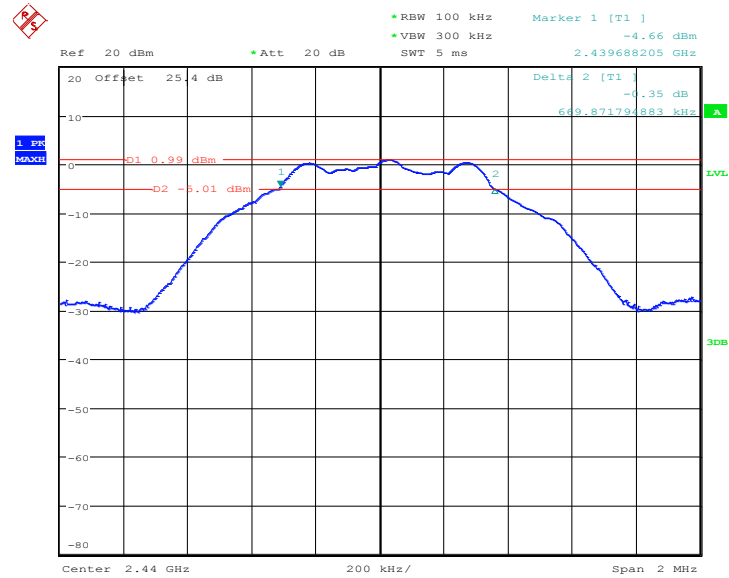
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
00	2402	0.667	0.5	Pass
19	2440	0.670	0.5	Pass
39	2480	0.673	0.5	Pass



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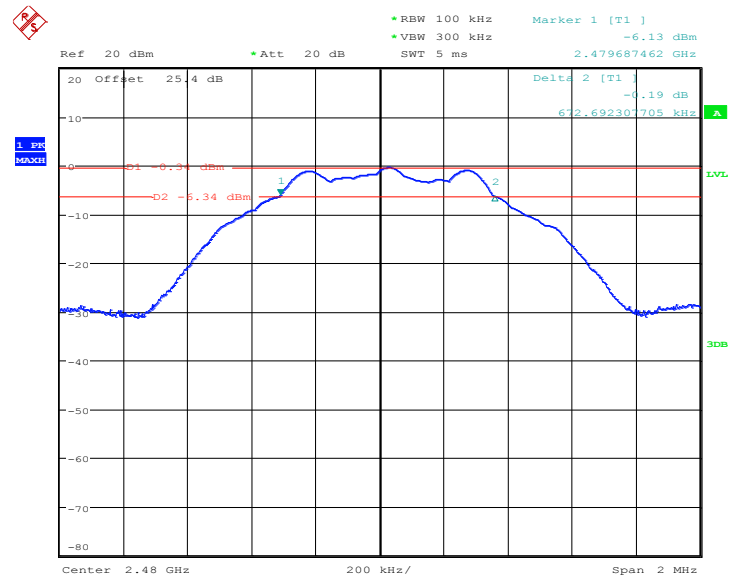


6 dB Bandwidth Plot on Channel 19



Date: 1.APR.2014 17:14:42

6 dB Bandwidth Plot on Channel 39



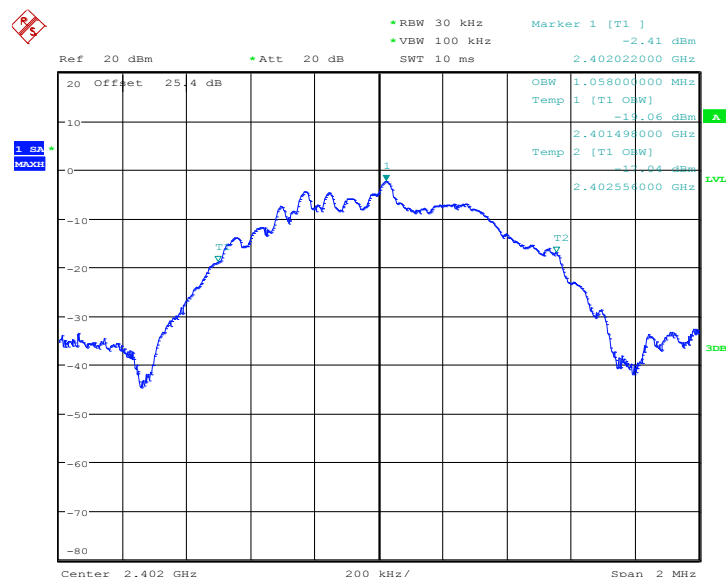
Date: 1.APR.2014 17:18:24

3.1.6 Test Result of 99% Occupied Bandwidth

Test Mode :	Bluetooth v4.0 LE	Temperature :	24~26℃
Test Engineer :	Alex Lee	Relative Humidity :	50~53%

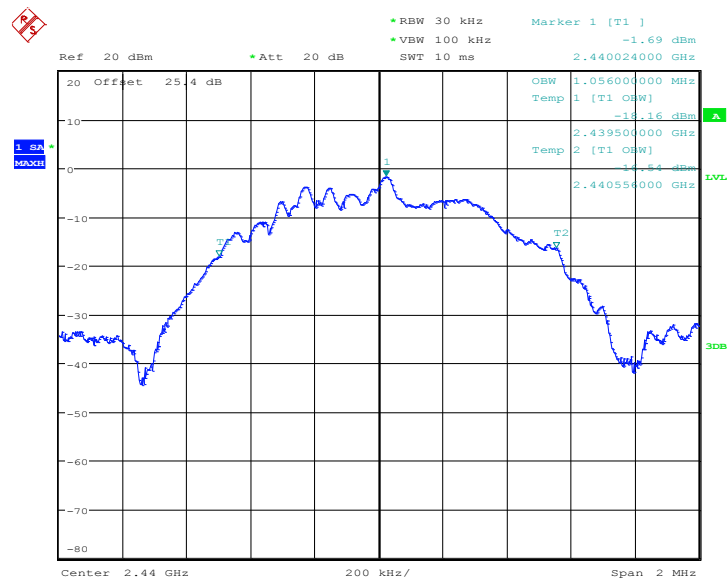
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	1.058
19	2440	1.056
39	2480	1.056

99% Bandwidth Plot on Channel 00



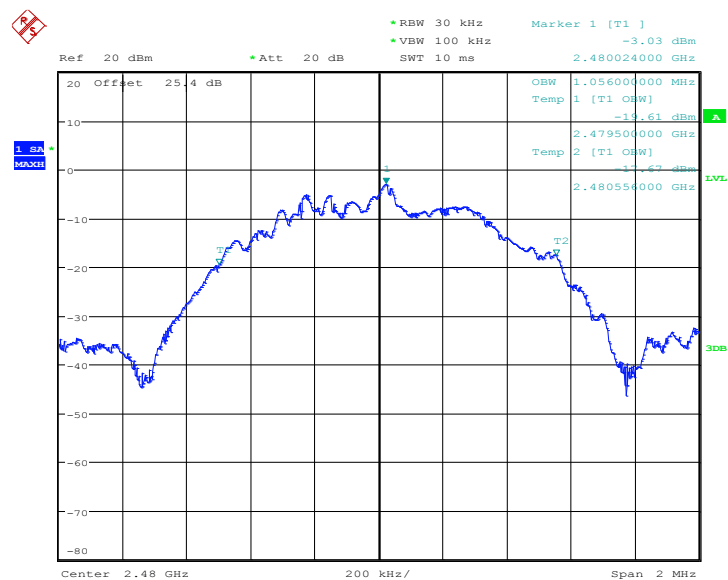
Date: 1.APR.2014 17:13:16

99% Occupied Bandwidth Plot on Channel 19



Date: 1.APR.2014 17:15:55

99% Occupied Bandwidth Plot on Channel 39



Date: 1.APR.2014 17:19:49

Note : The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

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.

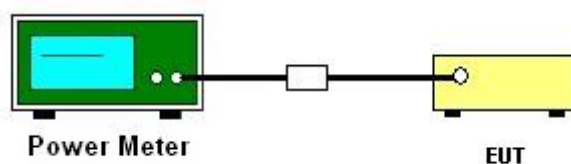
3.2.2 Measuring Instruments

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 v03r01.
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 Mode :	Bluetooth v4.0 LE	Temperature :	24~26℃
Test Engineer :	Alex Lee	Relative Humidity :	50~53%

Channel	Frequency (MHz)	RF Power (dBm)		
		GFSK	Max. Limits (dBm)	Pass/Fail
		1 Mbps		
00	2402	1.45	30.00	Pass
19	2440	2.05	30.00	Pass
39	2480	1.25	30.00	Pass

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.

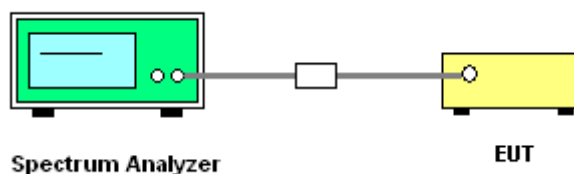
3.3.2 Measuring Instruments

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 v03r01
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 Mode :	Bluetooth v4.0 LE	Temperature :	24~26℃
Test Engineer :	Alex Lee	Relative Humidity :	50~53%

Channel	Frequency (MHz)	Power Density		Max. Limits (dBm/3kHz)	Pass/Fail
		PSD/100kHz (dBm)	PSD/3kHz (dBm)		
00	2402	0.30	-14.82	8	Pass
19	2440	0.97	-14.04	8	Pass
39	2480	-0.35	-15.44	8	Pass

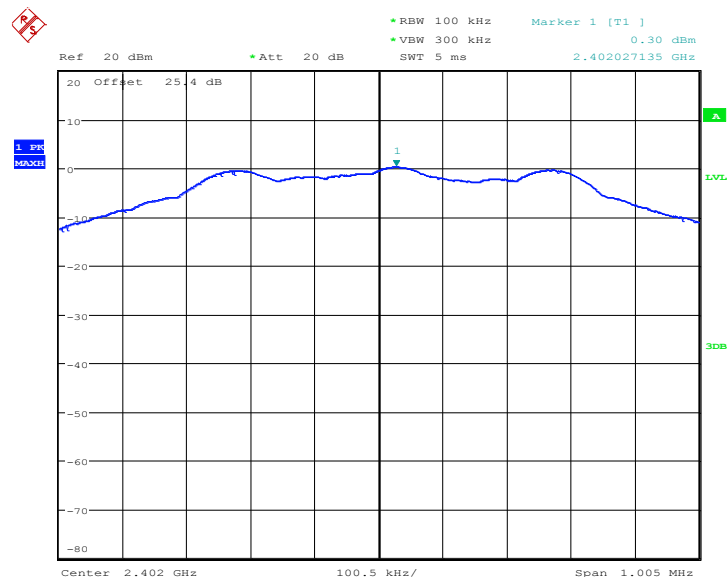
Note:

1. Measured power density (dBm) has offset with cable loss.
2. The Measured power density (dBm)/ 100kHz is reference level and used as 20dBc down for Conducted Band Edges and Conducted Spurious Emission limit line.



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

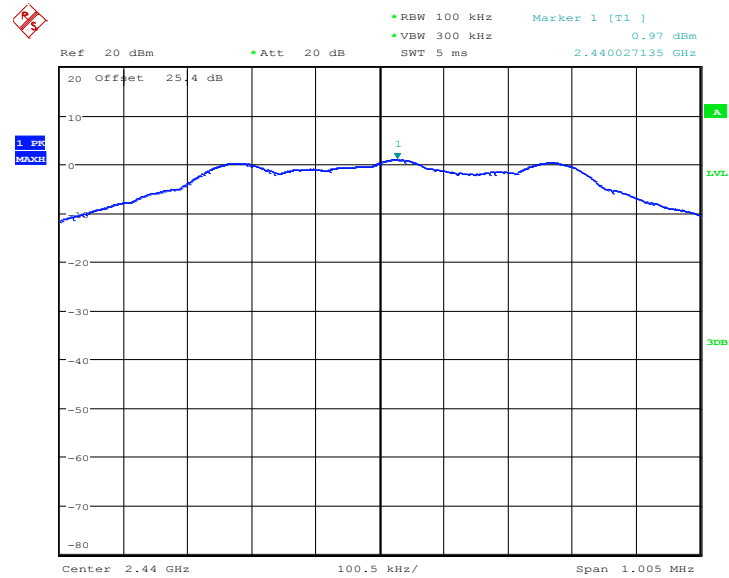
PSD 100kHz Plot on Channel 00



Date: 1.APR.2014 17:12:17

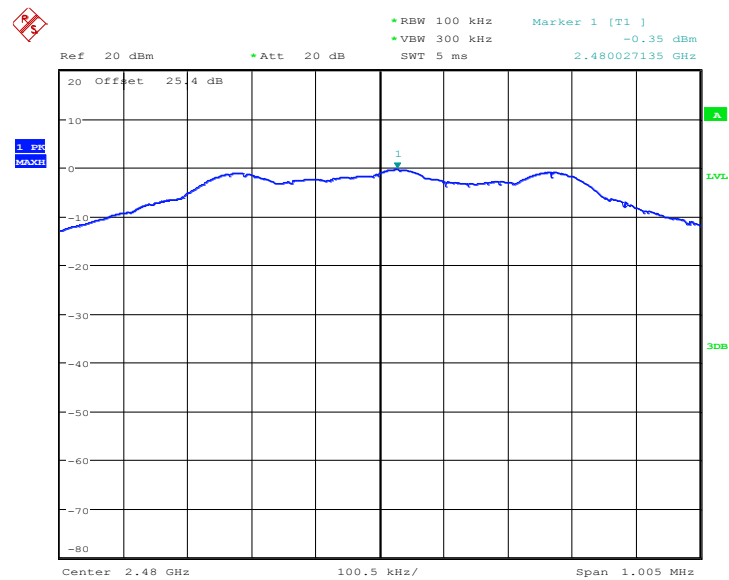


PSD 100kHz Plot on Channel 19



Date: 1.APR.2014 17:15:08

PSD 100kHz Plot on Channel 39

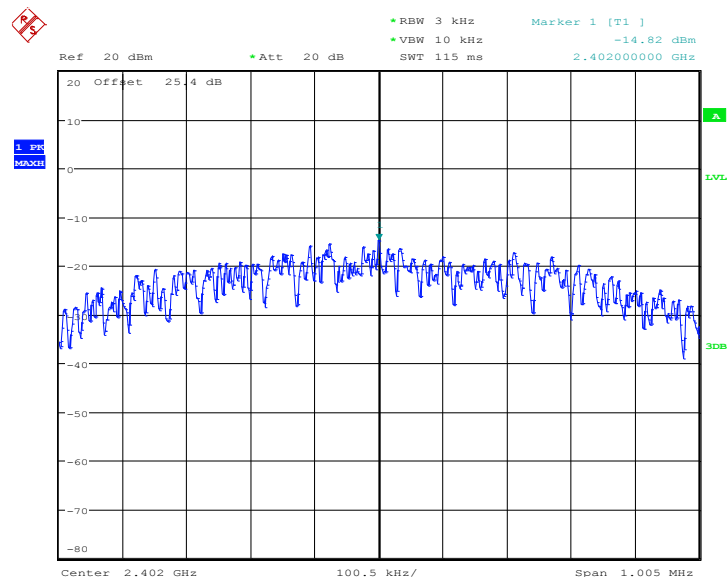


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3.3.7 Test Result of Power Spectral Density Plots (3kHz)

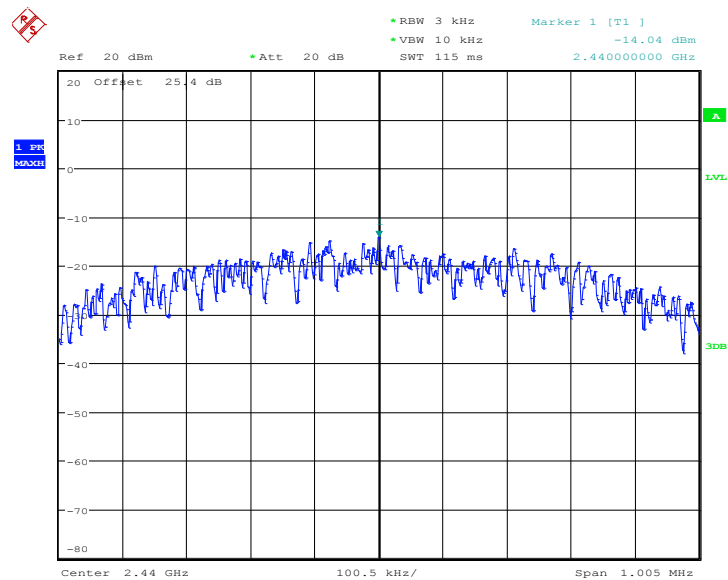
PSD 3kHz Plot on Channel 00



Date: 1.APR.2014 17:12:09

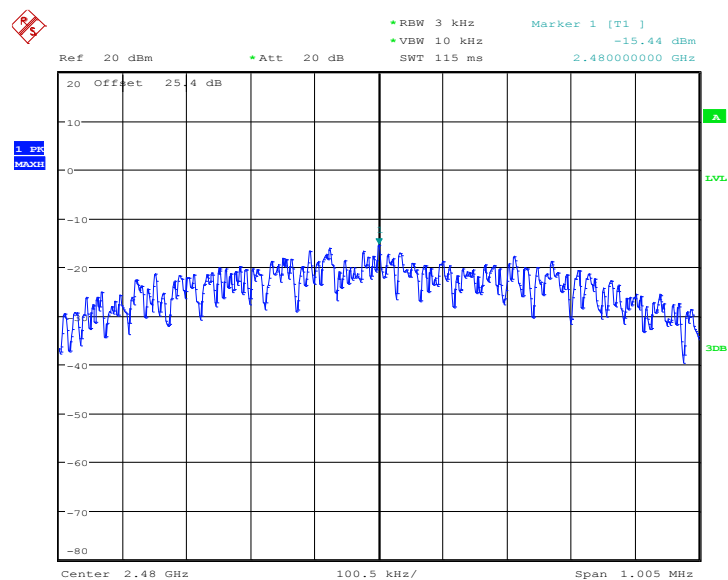


PSD 3kHz Plot on Channel 19



Date: 1.APR.2014 17:15:00

PSD 3kHz Plot on Channel 39



Date: 1.APR.2014 17:18:42

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.

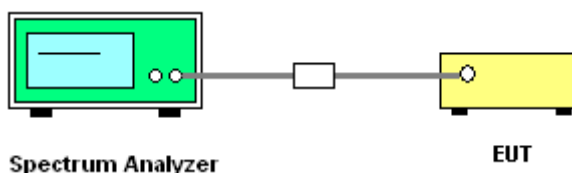
3.4.2 Measuring Instruments

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 v03r01.
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.

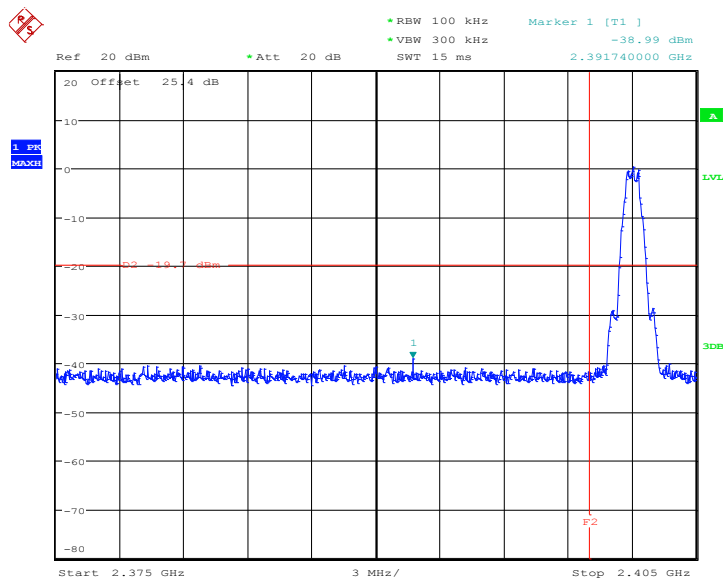
3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges

Test Mode :	Bluetooth v4.0 LE	Temperature :	24~26℃
Test Channel :	00 and 39	Relative Humidity :	50~53%
		Test Engineer :	Alex Lee

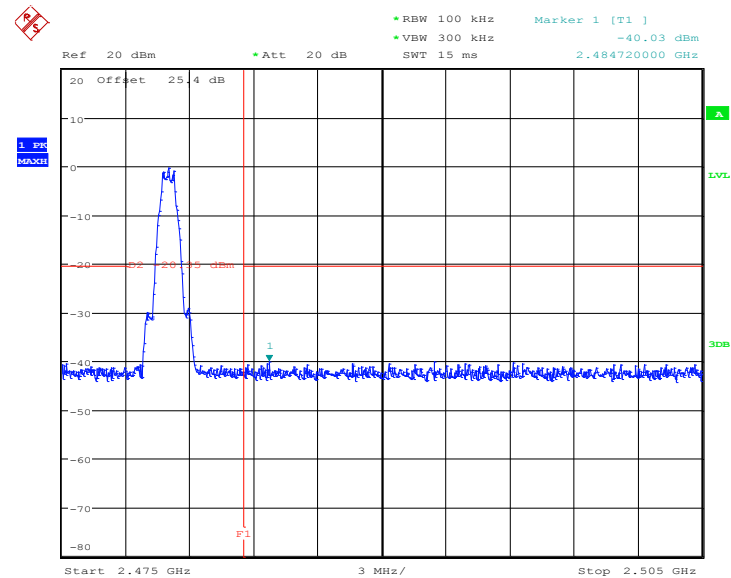
Low Band Edge Plot on Channel 00



Date: 1.APR.2014 17:12:30



High Band Edge Plot on Channel 39

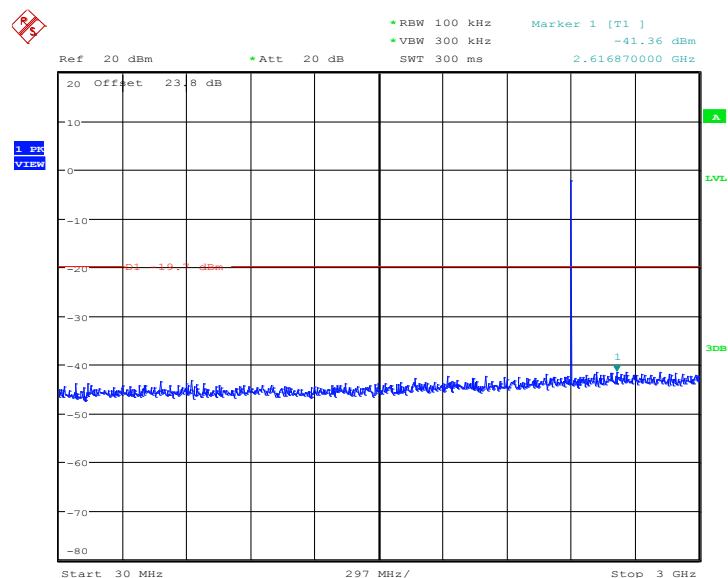


Date: 1.APR.2014 17:19:03

3.4.6 Test Result of Conducted Spurious Emission

Test Mode :	Bluetooth v4.0 LE	Temperature :	24~26℃
Test Channel :	00	Relative Humidity :	50~53%
		Test Engineer :	Alex Lee

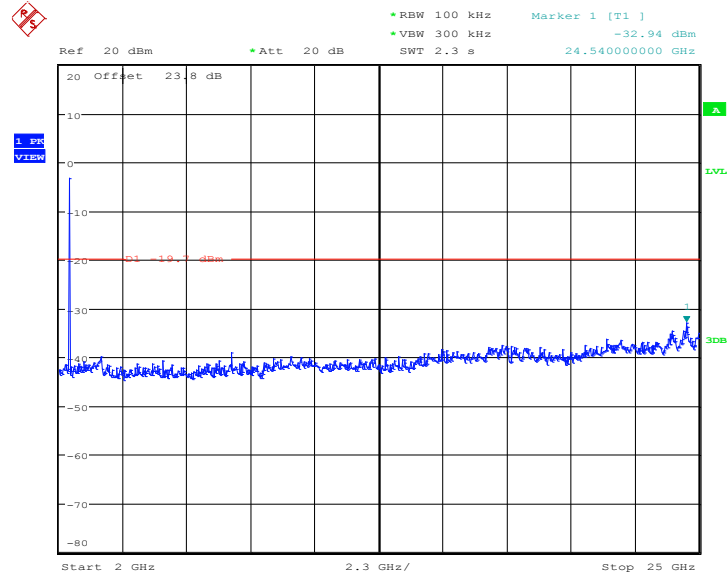
**Conducted Spurious Emission Plot on Bluetooth LE 1Mbps
GFSK Channel 00**



Date: 1.APR.2014 17:12:48



Conducted Spurious Emission Plot on Bluetooth LE 1Mbps
GFSK Channel 00

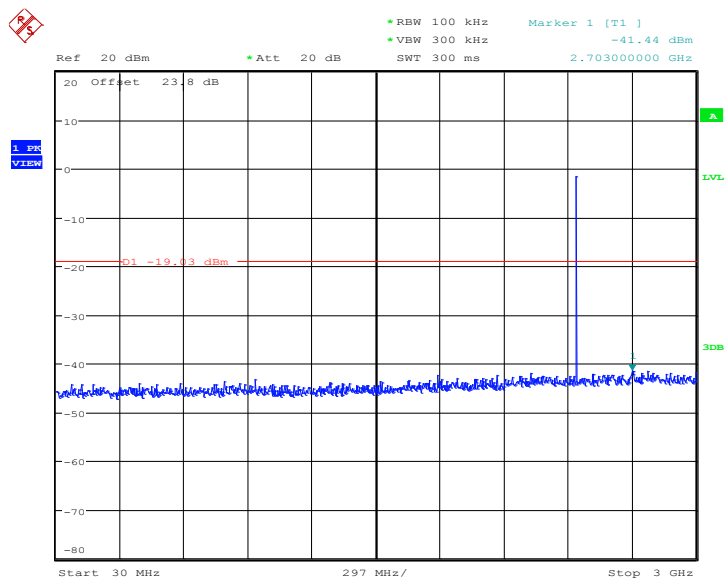


Date: 1.APR.2014 17:13:06



Test Mode :	Bluetooth v4.0 LE	Temperature :	24~26°C
Test Channel :	19	Relative Humidity :	50~53%
		Test Engineer :	Alex Lee

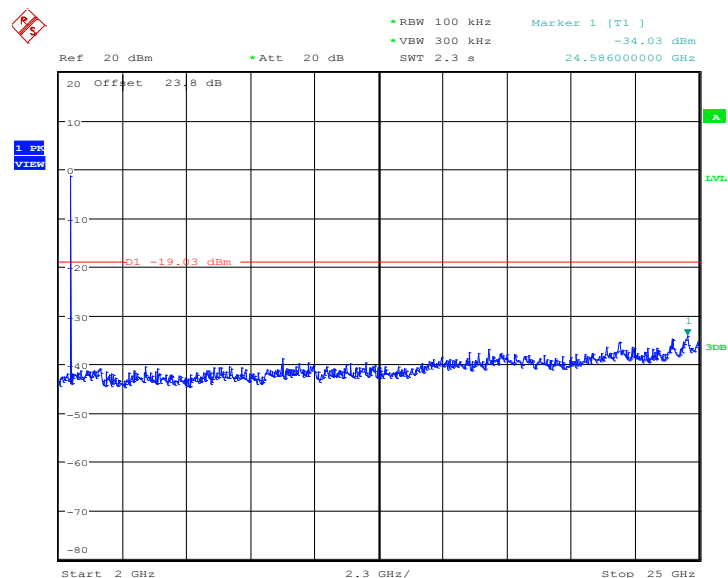
Conducted Spurious Emission Plot on Bluetooth LE 1Mbps
GFSK Channel 19



Date: 1.APR.2014 17:15:27



Conducted Spurious Emission Plot on Bluetooth LE 1Mbps
GFSK Channel 19

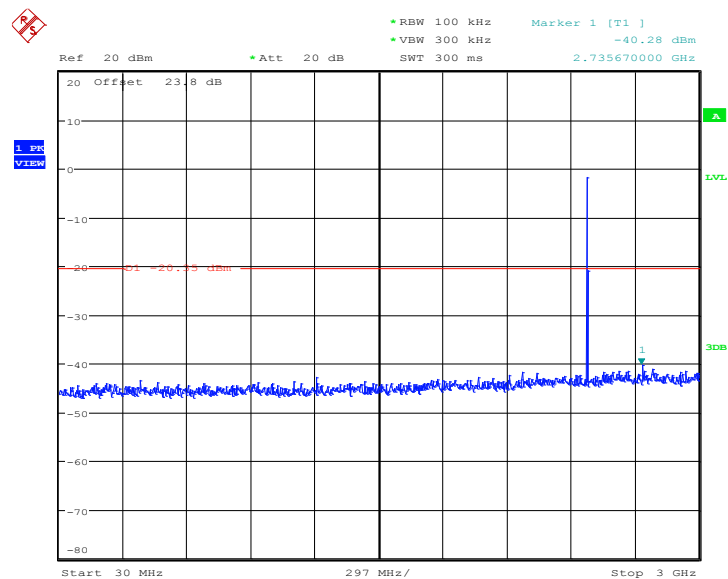


Date: 1.APR.2014 17:15:45



Test Mode :	Bluetooth v4.0 LE	Temperature :	24~26°C
Test Channel :	39	Relative Humidity :	50~53%
		Test Engineer :	Alex Lee

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps
GFSK Channel 39



Date: 1.APR.2014 17:19:21



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 v03r01.
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 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; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.

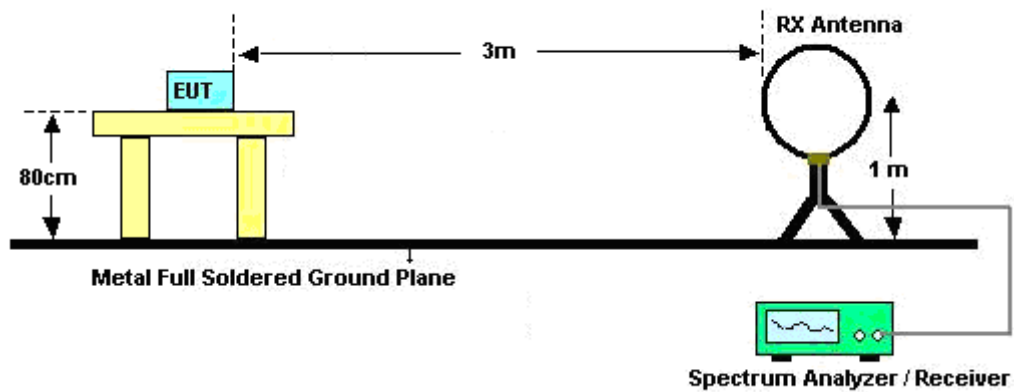
For average measurement:

 - $VBW = 10$ Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, 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.

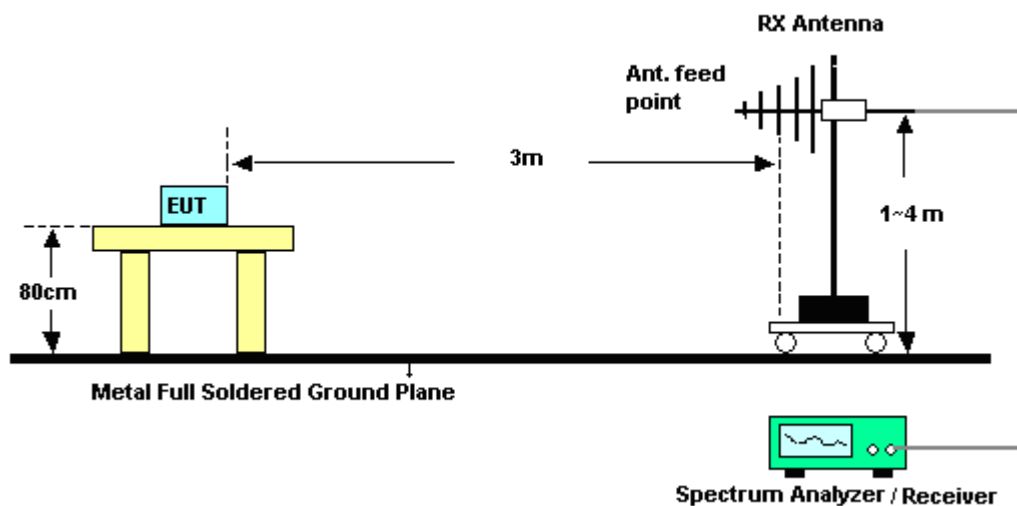
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
Bluetooth v4.0 LE	62.24	0.391	2.558	3kHz

3.5.4 Test Setup

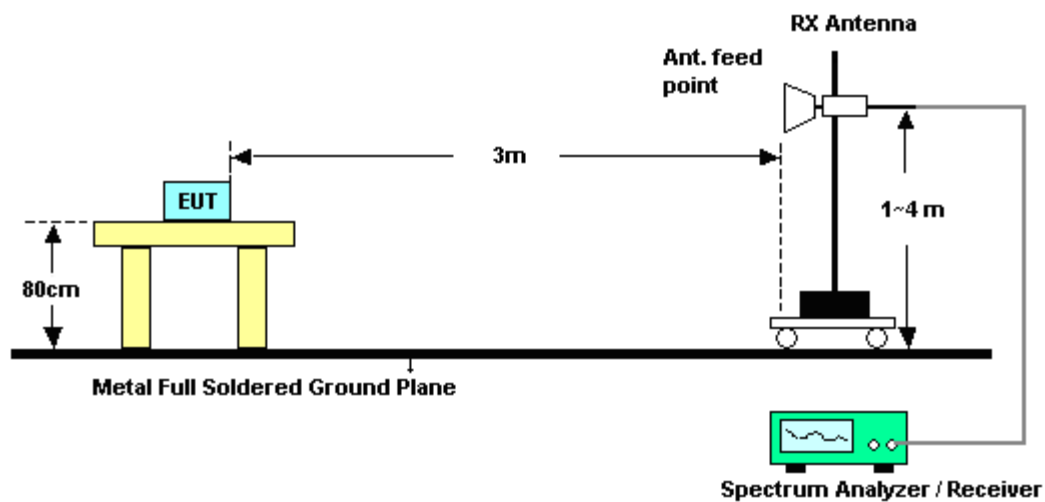
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Result of Radiated Spurious at Band Edges

Test Mode :	Mode 1	Temperature :	25~26°C
Test Channel :	00	Relative Humidity :	44~45%
		Test Engineer :	Gavin Wu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV /m)	Over Limit (dB)	Limit Line (dBμV /m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2318.73	51.94	-22.06	74	48.08	31.86	6.35	34.35	127	15	Peak
2389.11	40.73	-13.27	54	36.69	31.92	6.45	34.33	127	15	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV /m)	Over Limit (dB)	Limit Line (dBμV /m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2385.33	52.16	-21.84	74	48.14	31.9	6.45	34.33	100	61	Peak
2366.97	40.92	-13.08	54	36.94	31.89	6.42	34.33	100	61	Average

Test Mode :	Mode 3	Temperature :	25~26°C
Test Channel :	39	Relative Humidity :	44~45%
		Test Engineer :	Gavin Wu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV /m)	Over Limit (dB)	Limit Line (dBμV /m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2488.99	51.92	-22.08	74	47.63	32	6.59	34.3	121	12	Peak
2495.26	41	-13	54	36.7	32	6.59	34.29	121	12	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV /m)	Over Limit (dB)	Limit Line (dBμV /m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2498.29	52.18	-21.82	74	47.88	32	6.59	34.29	100	107	Peak
2495.56	40.98	-13.02	54	36.68	32	6.59	34.29	100	107	Average

<Bluetooth v4.0 LE Tx Mode with WPC Charging Mode>

Test Mode :	Mode 4	Temperature :	25~26°C
Test Channel :	39	Relative Humidity :	44~45%
		Test Engineer :	Gavin Wu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV /m)	Over Limit (dB)	Limit Line (dBμV /m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2498.71	52.41	-21.59	74	48.11	32	6.59	34.29	103	283	Peak
2498.44	40.94	-13.06	54	36.64	32	6.59	34.29	103	283	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV /m)	Over Limit (dB)	Limit Line (dBμV /m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2499.55	52.12	-21.88	74	47.82	32	6.59	34.29	200	200	Peak
2499.61	40.96	-13.04	54	36.66	32	6.59	34.29	200	200	Average

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

Note: Pre-scanned all test modes and only choose the worst case mode recorded in the test report for radiated spurious emission below 30MHz.

<Bluetooth v4.0 LE Tx Mode with WPC Charging Mode >

Test Mode :	Mode 4	Temperature :	23~25°C
Test Channel :	39	Relative Humidity :	43~45%
Test Engineer :	Eric Shih	Polarization :	Horizontal

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
0.01793	35.28	-87.26	122.54	14.73	20.26	0.29	-	-	Average
0.08061	26.14	-83.34	109.48	5.74	20.11	0.29	-	-	Average
0.10562	21.89	-85.24	107.13	1.53	20.07	0.29	-	-	QP
0.1222	24.4	-81.46	105.86	4.05	20.06	0.29	-	-	Average
0.1551	53.92	-49.87	103.79	33.59	20.04	0.29	-	-	Average
0.46416	44.93	-49.34	94.27	24.64	20	0.29	-	-	Average
1.496	47.49	-16.61	64.1	27.17	20.01	0.31	100	224	QP
10.832	36.06	-33.94	70	15.9	19.77	0.39	-	-	QP
19.933	37.76	-32.24	70	17.2	20.13	0.43	-	-	QP
28.345	36.38	-33.62	70	15.57	20.31	0.5	-	-	QP



Test Mode :	Mode 4	Temperature :	23~25°C
Test Channel :	39	Relative Humidity :	43~45%
Test Engineer :	Eric Shih	Polarization :	Vertical

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
0.04837	37.12	-76.79	113.91	16.66	20.17	0.29	-	-	Average
0.08073	24.39	-85.07	109.46	3.99	20.11	0.29	-	-	Average
0.0967	28.26	-79.64	107.9	7.9	20.07	0.29	-	-	QP
0.14504	26.63	-77.74	104.37	6.3	20.04	0.29	-	-	Average
0.15544	50.11	-53.66	103.77	29.78	20.04	0.29	-	-	Average
0.218	49.37	-51.46	100.83	29.06	20.02	0.29	-	-	Average
1.241	47.5	-18.23	65.73	27.18	20.01	0.31	100	25	QP
11.16	35.48	-34.52	70	15.32	19.77	0.39	-	-	QP
20.986	39.04	-30.96	70	18.38	20.23	0.43	-	-	QP
26.995	36.45	-33.55	70	15.58	20.39	0.48	-	-	QP

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

Note: Pre-scanned all test modes and only choose the worst case mode recorded in the test report for radiated spurious emission below 1GHz.

Test Mode :	Mode 1	Temperature :	25~26°C
Test Channel :	00	Relative Humidity :	44~45%
Test Engineer :	Gavin Wu	Polarization :	Horizontal
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2402	91.5	-	-	87.46	31.92	6.45	34.33	127	15	Peak
2402	90.38	-	-	86.34	31.92	6.45	34.33	127	15	Average
4803	47.31	-26.69	74	58.3	34.41	10.16	55.56	100	0	Peak

Note: Other harmonics are lower than background noise.

Test Mode :	Mode 1	Temperature :	25~26°C
Test Channel :	00	Relative Humidity :	44~45%
Test Engineer :	Gavin Wu	Polarization :	Vertical
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2402	88.72	-	-	84.68	31.92	6.45	34.33	100	61	Peak
2402	87.62	-	-	83.58	31.92	6.45	34.33	100	61	Average
4803	46.49	-27.51	74	57.48	34.41	10.16	55.56	100	0	Peak

Note: Other harmonics are lower than background noise.

Test Mode :	Mode 2	Temperature :	25~26°C
Test Channel :	19	Relative Humidity :	44~45%
Test Engineer :	Gavin Wu	Polarization :	Horizontal
Remark :	1. 2440 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2440	92.43	-	-	88.27	31.96	6.52	34.32	100	13	Peak
2440	91.36	-	-	87.2	31.96	6.52	34.32	100	13	Average
4881	46.81	-27.19	74	57.93	34.37	10.19	55.68	100	0	Peak
7320	47.89	-26.11	74	57.59	35.6	10.94	56.24	100	0	Peak

Note: Other harmonics are lower than background noise.

Test Mode :	Mode 2	Temperature :	25~26°C
Test Channel :	19	Relative Humidity :	44~45%
Test Engineer :	Gavin Wu	Polarization :	Vertical
Remark :	1. 2440 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2440	89.91	-	-	85.75	31.96	6.52	34.32	100	63	Peak
2440	88.72	-	-	84.56	31.96	6.52	34.32	100	63	Average
4881	46.97	-27.03	74	58.09	34.37	10.19	55.68	100	0	Peak
7320	48.05	-25.95	74	57.75	35.6	10.94	56.24	100	0	Peak

Note: Other harmonics are lower than background noise.

Test Mode :	Mode 3	Temperature :	25~26°C
Test Channel :	39	Relative Humidity :	44~45%
Test Engineer :	Gavin Wu	Polarization :	Horizontal
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
153.66	23.55	-19.95	43.5	43.52	10.4	1.38	31.75	-	-	Peak
188.49	25.58	-17.92	43.5	46.8	9.06	1.47	31.75	-	-	Peak
205.77	26.03	-17.47	43.5	47.07	9.15	1.56	31.75	100	182	Peak
311.9	23.97	-22.03	46	40.3	13.46	1.94	31.73	-	-	Peak
338.5	23.22	-22.78	46	39.02	13.95	2.01	31.76	-	-	Peak
391	20.33	-25.67	46	34.45	15.53	2.16	31.81	-	-	Peak
2480	92.51	-	-	88.23	31.99	6.59	34.3	121	12	Peak
2480	91.43	-	-	87.15	31.99	6.59	34.3	121	12	Average
4959	46.61	-27.39	74	57.92	34.32	10.21	55.84	100	0	Peak
7440	47.74	-26.26	74	57.31	35.53	10.9	56	100	0	Peak

Note: Other harmonics are lower than background noise.

Test Mode :	Mode 3	Temperature :	25~26°C
Test Channel :	39	Relative Humidity :	44~45%
Test Engineer :	Gavin Wu	Polarization :	Vertical
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
41.88	27.35	-12.65	40	46.81	11.58	0.75	31.79	101	234	Peak
50.79	22.7	-17.3	40	45.38	8.3	0.8	31.78	-	-	Peak
151.5	22.82	-20.68	43.5	42.62	10.6	1.35	31.75	-	-	Peak
314	21.52	-24.48	46	37.78	13.52	1.95	31.73	-	-	Peak
388.9	19.39	-26.61	46	33.58	15.46	2.16	31.81	-	-	Peak
665.4	21.57	-24.43	46	31.32	19.45	2.83	32.03	-	-	Peak
2480	89.63	-	-	85.35	31.99	6.59	34.3	100	107	Peak
2480	88.46	-	-	84.18	31.99	6.59	34.3	100	107	Average
4959	46.53	-27.47	74	57.84	34.32	10.21	55.84	100	0	Peak
7440	48.65	-25.35	74	58.22	35.53	10.9	56	100	0	Peak

Note: Other harmonics are lower than background noise.

<Bluetooth v4.0 LE Tx Mode with WPC Charging Mode >

Test Mode :	Mode 4	Temperature :	25~26°C
Test Channel :	39	Relative Humidity :	44~45%
Test Engineer :	Gavin Wu	Polarization :	Horizontal
Remark :	1. 2481 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
137.73	25.29	-18.21	43.5	44.44	11.3	1.3	31.75	-	-	Peak
183.9	25.35	-18.15	43.5	46.58	9.06	1.46	31.75	-	-	Peak
186.06	25.93	-17.57	43.5	47.19	9.02	1.47	31.75	-	-	Peak
314	30.33	-15.67	46	46.59	13.52	1.95	31.73	102	326	Peak
396.6	22.67	-23.33	46	36.6	15.71	2.18	31.82	-	-	Peak
595.4	21.38	-24.62	46	31.33	19.35	2.75	32.05	-	-	Peak
2481	92.38	-	-	88.1	31.99	6.59	34.3	103	283	Average
2481	93.52	-	-	89.24	31.99	6.59	34.3	103	283	Peak
4959	40.58	-33.42	74	56.53	34.32	10.21	60.48	100	0	Peak
7440	42.73	-31.27	74	56.88	35.53	10.9	60.58	100	0	Peak

Note: 1. Other harmonics are lower than background noise.

Test Mode :	Mode 4	Temperature :	25~26°C
Test Channel :	39	Relative Humidity :	44~45%
Test Engineer :	Gavin Wu	Polarization :	Vertical
Remark :	1. 2481 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
47.28	29.86	-10.14	40	51.91	8.95	0.78	31.78	-	-	Peak
74.55	28.85	-11.15	40	53.16	6.5	0.96	31.77	-	-	Peak
86.7	30.35	-9.65	40	53.12	7.96	1.03	31.76	101	108	Peak
315.4	21.04	-24.96	46	37.27	13.55	1.95	31.73	-	-	Peak
371.4	21.62	-24.38	46	36.37	14.92	2.12	31.79	-	-	Peak
458.9	21.18	-24.82	46	33.56	17.17	2.33	31.88	-	-	Peak
2481	92.63	-	-	88.35	31.99	6.59	34.3	200	200	Average
2481	93.62	-	-	89.34	31.99	6.59	34.3	200	200	Peak
4959	41.03	-32.97	74	56.98	34.32	10.21	60.48	100	0	Peak
7440	42.6	-31.4	74	56.75	35.53	10.9	60.58	100	0	Peak

Note: 1. Other harmonics are lower than background noise.

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 (dB μ V)	
	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.

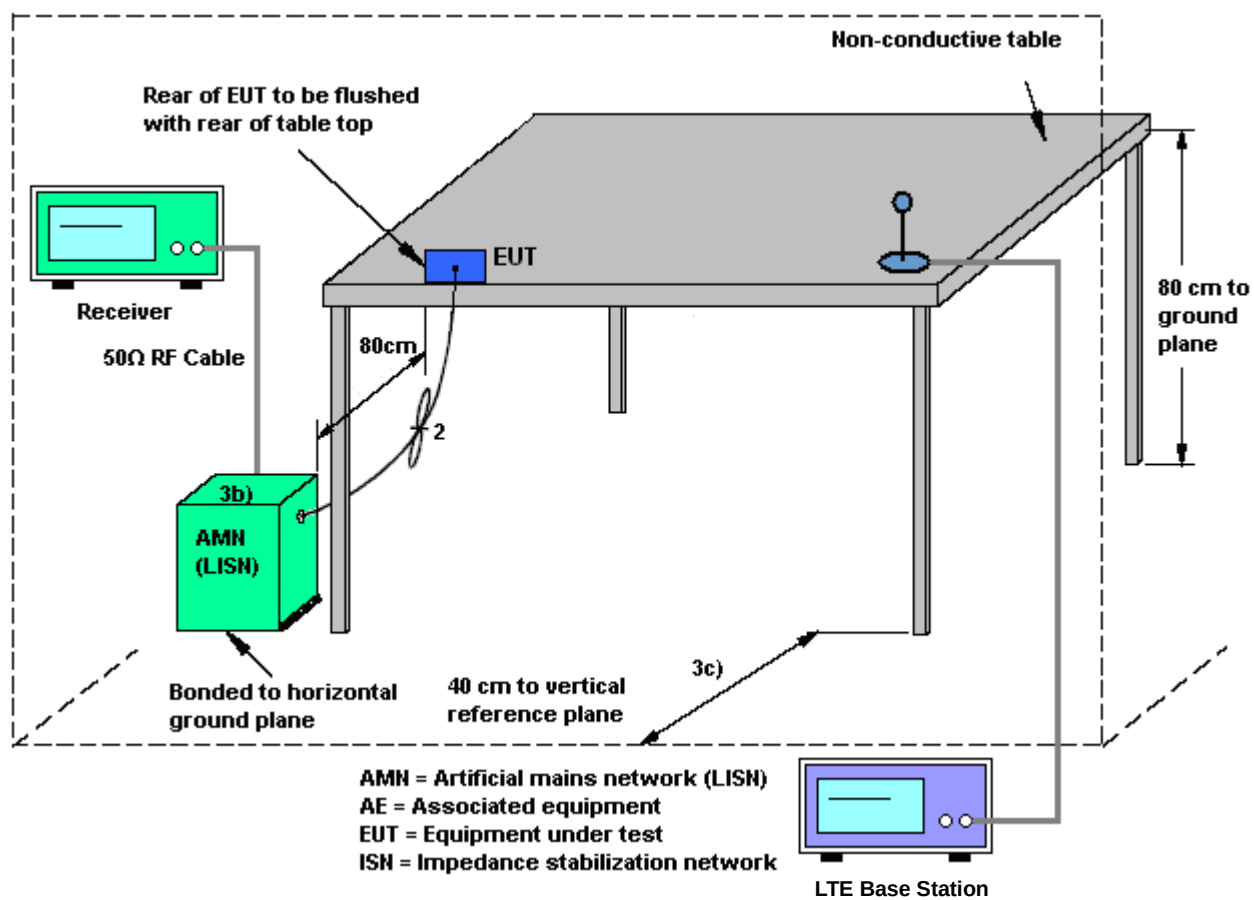
3.6.2 Measuring Instruments

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 with Maximum Hold Mode.

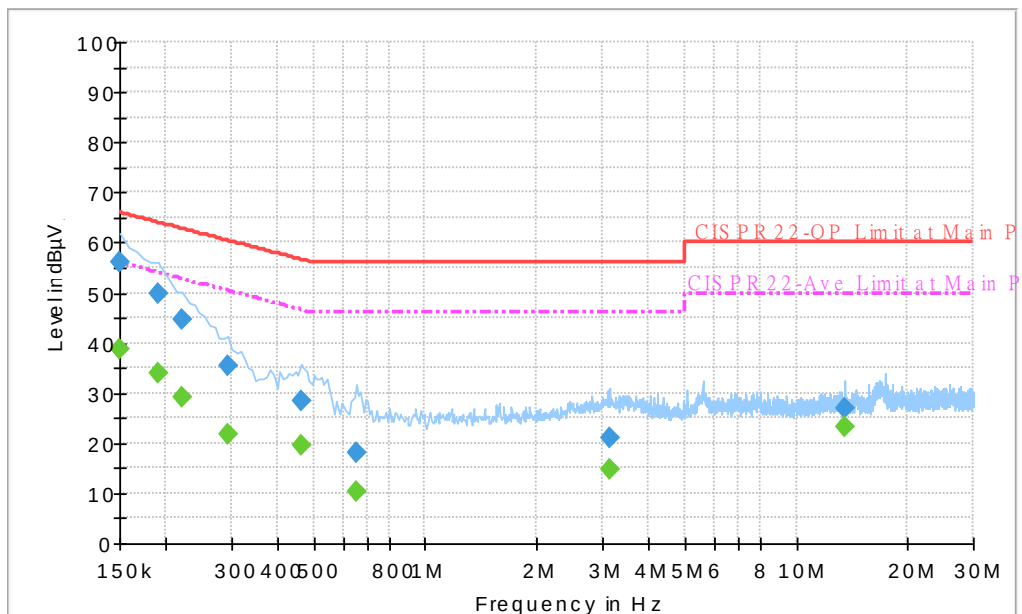
3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	LTE Band 2 Idle + WLAN 2.4GHz Link + Bluetooth Link + NFC Tx + Earphone 1 + USB Cable (Data Link with Notebook)		

ENV216 Auto Test



Final Result : Quasi-Peak

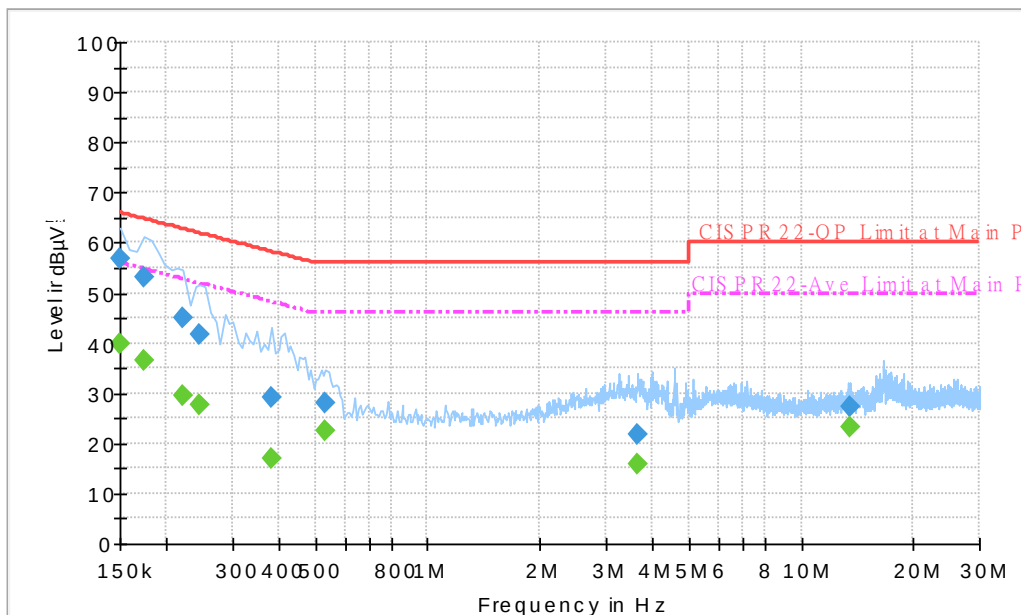
Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	56.2	Off	L1	19.4	9.8	66.0
0.190000	49.8	Off	L1	19.4	14.2	64.0
0.222000	44.6	Off	L1	19.4	18.1	62.7
0.294000	35.3	Off	L1	19.4	25.1	60.4
0.462000	28.4	Off	L1	19.3	28.3	56.7
0.654000	18.0	Off	L1	19.4	38.0	56.0
3.134000	20.9	Off	L1	19.6	35.1	56.0
13.558000	27.1	Off	L1	19.8	32.9	60.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	38.7	Off	L1	19.4	17.3	56.0
0.190000	33.8	Off	L1	19.4	20.2	54.0
0.222000	29.1	Off	L1	19.4	23.6	52.7
0.294000	21.7	Off	L1	19.4	28.7	50.4
0.462000	19.7	Off	L1	19.3	27.0	46.7
0.654000	10.2	Off	L1	19.4	35.8	46.0
3.134000	14.9	Off	L1	19.6	31.1	46.0
13.558000	23.1	Off	L1	19.8	26.9	50.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	LTE Band 2 Idle + WLAN 2.4GHz Link + Bluetooth Link + NFC Tx + Earphone 1 + USB Cable (Data Link with Notebook)		

ENV216 Auto Test


Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	56.9	Off	N	19.4	9.1	66.0
0.174000	53.1	Off	N	19.3	11.7	64.8
0.222000	44.9	Off	N	19.4	17.8	62.7
0.246000	41.6	Off	N	19.4	20.3	61.9
0.382000	29.0	Off	N	19.3	29.2	58.2
0.534000	28.0	Off	N	19.4	28.0	56.0
3.646000	21.8	Off	N	19.6	34.2	56.0
13.558000	27.2	Off	N	19.9	32.8	60.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	39.9	Off	N	19.4	16.1	56.0
0.174000	36.7	Off	N	19.3	18.1	54.8
0.222000	29.7	Off	N	19.4	23.0	52.7
0.246000	27.5	Off	N	19.4	24.4	51.9
0.382000	16.8	Off	N	19.3	31.4	48.2
0.534000	22.4	Off	N	19.4	23.6	46.0
3.646000	16.0	Off	N	19.6	30.0	46.0
13.558000	23.4	Off	N	19.9	26.6	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
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 07, 2013	Apr. 01, 2014	Jun. 06, 2014	Conducted (TH02-HY)
Power Meter	Agilent	E4416A	GB41292344	300MHz~40GHz	Jan. 28, 2014	Apr. 01, 2014	Jan. 27, 2015	Conducted (TH02-HY)
Power Sensor	Agilent	E9327A	US40441548	300MHz~40GHz	Jan. 28, 2014	Apr. 01, 2014	Jan. 27, 2015	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP30	101067	9kHz ~ 30GHz	Nov. 20, 2013	Mar. 28, 2014~ May 21, 2014	Nov. 19, 2014	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/0003	20MHz ~ 1000MHz	May 06, 2013	Mar. 28, 2014	May 05, 2014	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/0003	20MHz ~ 1000MHz	May 06, 2014	May 21, 2014	May 05, 2015	Radiation (03CH06-HY)
Bilog Antenna	Schaffner	CBL6112B	2885	30MHz -2GHz	Oct. 10, 2013	Mar. 28, 2014~ May 21, 2014	Oct. 09, 2014	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 02, 2013	Mar. 28, 2014~ May 21, 2014	Aug. 01, 2014	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9kHz ~ 1GHz	Apr. 12, 2013	Mar. 28, 2014	Apr. 11, 2014	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9kHz ~1GHz	Apr. 16, 2014	May 21, 2014	Apr. 15, 2015	Radiation (03CH06-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 18, 2013	Mar. 28, 2014~ May 21, 2014	Jul. 17, 2014	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170251	15GHz ~ 40GHz	Oct. 03, 2013	Mar. 28, 2014~ May 21, 2014	Oct. 02, 2014	Radiation (03CH06-HY)
Preamplifier	Agilent	8449B	3008A01917	1GHz ~ 26.5GHz	Feb. 10, 2014	Mar. 28, 2014~ May 21, 2014	Feb. 19, 2015	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0 - 360 degree	N/A	Mar. 28, 2014~ May 21, 2014	N/A	Radiation (03CH06-HY)
Antenna Mast	MF	MF-7802	MF780208212	1 m ~ 4 m	N/A	Mar. 28, 2014~ May 21, 2014	N/A	Radiation (03CH06-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 15, 2013	Mar. 27, 2014~ May 19, 2014	Nov. 14, 2014	Conduction (CO05-HY)
Two-LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2013	Mar. 27, 2014~ May 19, 2014	Dec. 11, 2014	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 04, 2013	Mar. 27, 2014~ May 19, 2014	Dec. 03, 2014	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Mar. 27, 2014~ May 19, 2014	N/A	Conduction (CO05-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Sep. 06, 2013	May 21, 2014	Sep. 05, 2014	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	860004/0001	9 kHz~30 MHz	Jul. 03, 2012	May 21, 2014	Jul. 02, 2014	Radiation (03CH07-HY)
Bilog Antenna	Schaffner	CBL6111C	2726	30MHz ~ 1GHz	Oct. 10, 2013	May 21, 2014	Oct. 09, 2014	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10 MHz ~ 1000MHz 32dB GAIN	Mar. 17, 2014	May 21, 2014	Mar. 16, 2015	Radiation (03CH07-HY)
Turn Table	ChainTek	ChainTek 3000	N/A	0 ~ 360 degree	N/A	May 21, 2014	N/A	Radiation (03CH07-HY)
Antenna Mast	ChainTek	ChainTek 3000	N/A	N/A	N/A	May 21, 2014	N/A	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.26
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.50
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