FCC RF Test Report

APPLICANT	:	Sony Mobile Communications Inc.
EQUIPMENT	:	GSM/WCDMA/LTE Phone + Bluetooth, DTS/UNII a/b/g/n/ac, ANT+, and NFC
BRAND NAME	:	Sony
FCC ID	:	PY7-PM0882
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DSS) Spread Spectrum Transmitter

The product was received on Jul. 16, 2015 and testing was completed on Sep. 07, 2015. 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.

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APPENDIX A. TEST RESULT OF RADIATED EMISSION

APPENDIX B. RADIATED SPURIOUS EMISSION

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR571619A	Rev. 01	Initial issue of report	Sep. 03, 2015
FR571619A	Rev. 02	Revising standard from ANSI C63.10-2013 to ANSI C63.10-2009	Sep. 07, 2015

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(1)	Number of Channels	≥ 15Chs	Pass	-
3.2	15.247(a)(1)	Hopping Channel Separation	≥ 2/3 of 20dB BW	Pass	-
3.3	15.247(a)(1)	Dwell Time of Each Channel	≤ 0.4sec in 31.6sec period	Pass	-
3.4	15.247(a)(1)	20dB Bandwidth	NA	Pass	-
3.5	15.247(b)(1)	Peak Output Power	≤ 125 mW	Pass	-
3.6	15.247(d)	Conducted Band Edges	≤ 20dBc	Pass	-
3.7	15.247(d)	Conducted Spurious Emission	≤ 20dBc	Pass	-
3.8	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 9.28 dB at 43.770 MHz
3.9	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 19.80 dB at 0.678 MHz
3.10	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

Remark: The FR571619A report reuses test data from the FR571617A report.

1 General Description

1.1 Applicant

Sony Mobile Communications Inc.
Nya Vattentornet, 22188 Lund, Sweden

1.2 Manufacturer

Sony Mobile Communications Inc.
1-8-15 Konan, Minato-ku, Tokyo, 108-0075, Japan

1.3 Product Feature of Equipment Under Test

GSM/WCDMA/LTE, Bluetooth, DTS/UNII a/b/g/n/ac, ANT+, NFC, and GPS

Product Specification subjective to this standard	
Antenna Type/Gain	Monopole Antenna type with gain -2.16 dBi

EUT Information List				
IMEI	HW Version	SW Version	S/N	Performed Test Item
004402455123178	A	32.0.A.0.287	CB5A273TPX	RF conducted measurement
004402455122311			CB5A273TF4	Radiated Spurious Emission
004402455122410			CB5A273THY	Conducted Emission

Accessory List	
AC Adapter	Model No. : UCH20
	Type No. : AC-0061-US
	S/N : 2115W15500021 (for radiated spurious emission) 5815W22500112 (for conducted emission)
Earphone	Model No. : MDR-NC31E
	Type No. : AG-1110
USB Cable	Model No. : UCB11
	Type No. : AI-0120
	S/N : 1522A731000010A (for radiated spurious emission) 1512A73E0001BD0 (for conducted emission)

Note:

1. Above EUT list and accessory list used are electrically identical per declared by manufacturer.
2. Above the accessories list are used to exercise the EUT during test.
3. For other wireless features of this EUT, test report will be issued separately.

1.4 Modification of EUT

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

1.5 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.**		
	TH05-HY	CO05-HY	03CH07-HY

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

1.6 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
- 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.

2 Test Configuration of Equipment Under Test

2.1 Descriptions of Test Mode

Preliminary tests were performed in different data rates and recorded the RF output power in the following table:

Channel	Frequency	Bluetooth RF Output Power (Peak)		
		Data Rate / Modulation		
		GFSK	π/4-DQPSK	8-DPSK
		1Mbps	2Mbps	3Mbps
Ch00	2402MHz	7.82 dBm	6.57 dBm	6.59 dBm
Ch39	2441MHz	**9.40** dBm	8.17 dBm	8.26 dBm
Ch78	2480MHz	6.67 dBm	5.65 dBm	5.69 dBm

Remark:

1. All the test data for each data rate were verified, but only the worst case was reported.
2. The data rate was set in 1Mbps for all the test items due to the highest RF output power.

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, and different data rates were conducted to determine the final configuration (Y plane as worst plane) from all possible combinations, and the worst mode of radiated spurious emissions is Bluetooth 1Mbps mode, and recorded in this report.

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

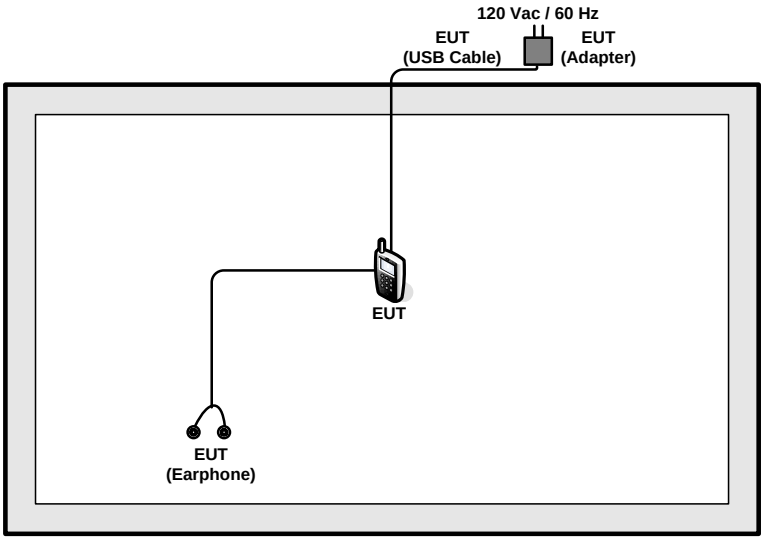
2.2 Test Mode

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

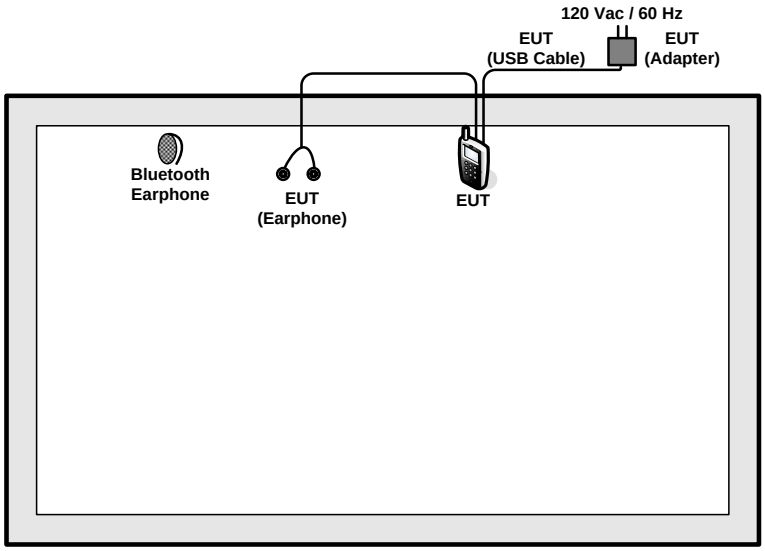
Summary table of Test Cases			
Test Item	**Data Rate / Modulation**		
	Bluetooth BR 1Mbps GFSK	**Bluetooth EDR 2Mbps π/4-DQPSK**	**Bluetooth EDR 3Mbps 8-DPSK**
Conducted Test Cases	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz	Mode 4: CH00_2402 MHz Mode 5: CH39_2441 MHz Mode 6: CH78_2480 MHz	Mode 7: CH00_2402 MHz Mode 8: CH39_2441 MHz Mode 9: CH78_2480 MHz
Radiated Test Cases	**Bluetooth BR 1Mbps GFSK**	**Bluetooth EDR 2Mbps π/4-DQPSK**	**Bluetooth EDR 3Mbps 8-DPSK**
	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz	Mode 4: CH00_2402 MHz Mode 5: CH39_2441 MHz Mode 6: CH78_2480 MHz	Mode 7: CH00_2402 MHz Mode 8: CH39_2441 MHz Mode 9: CH78_2480 MHz
AC Conducted Emission	Mode 1 :: Bluetooth Link + USB Cable (Charging from Adapter) + Earphone		
Remark: For radiated test cases, the worst mode data rate 1Mbps was reported only, because this data rate has the highest RF output power at preliminary tests, and the conducted spurious emissions and conducted band edge measurement for each data rate are no worse than 1Mbps, and no other significantly frequencies found in conducted spurious emission.			

2.3 Connection Diagram of Test System

<Bluetooth 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.	Bluetooth Earphone	Sony	SBH20	PY7-RD0010	Unshielded, 0.75m	N/A
2.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.5 EUT Operation Test Setup

For Bluetooth test items, an engineering test program was provided and enabled to make EUT 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 Number of Channel Measurement

3.1.1 Limits of Number of Hopping Frequency

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

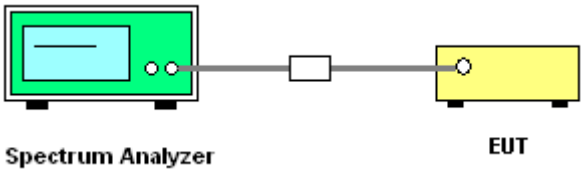
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedure

1. The testing follows ANSI C63.10-2009 clause 7.7.3.
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. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings: Span = the frequency band of operation; RBW ≥ 1 % of the span; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
6. The number of hopping frequency used is defined as the number of total channel.
7. Record the measurement data derived from spectrum analyzer.

3.1.4 Test Setup

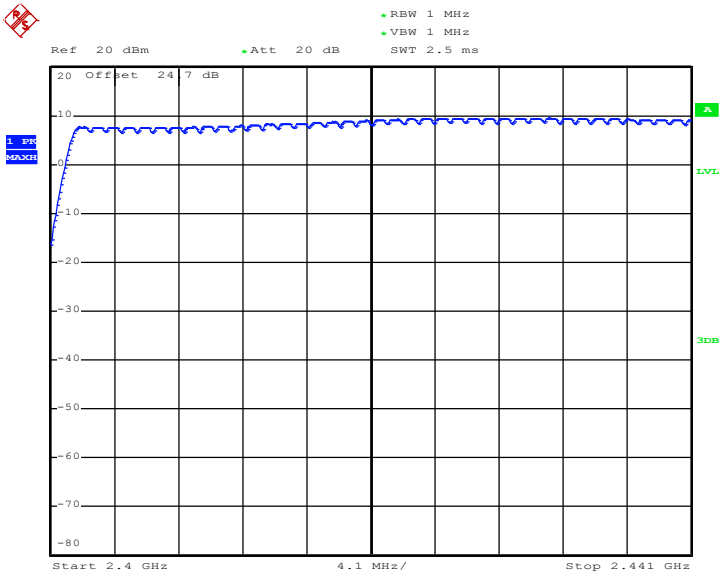


3.1.5 Test Result of Number of Hopping Frequency

Test Mode :	1Mbps	**Temperature :**	24~26℃
Test Engineer :	Stuart Lin and Dered Hsu	**Relative Humidity :**	50~53%

Number of Hopping (Channel)	Adaptive Frequency Hopping (Channel)	Limits (Channel)	Pass/Fail
79	20	> 15	Pass

Number of Hopping Channel Plot on Channel 00 - 78



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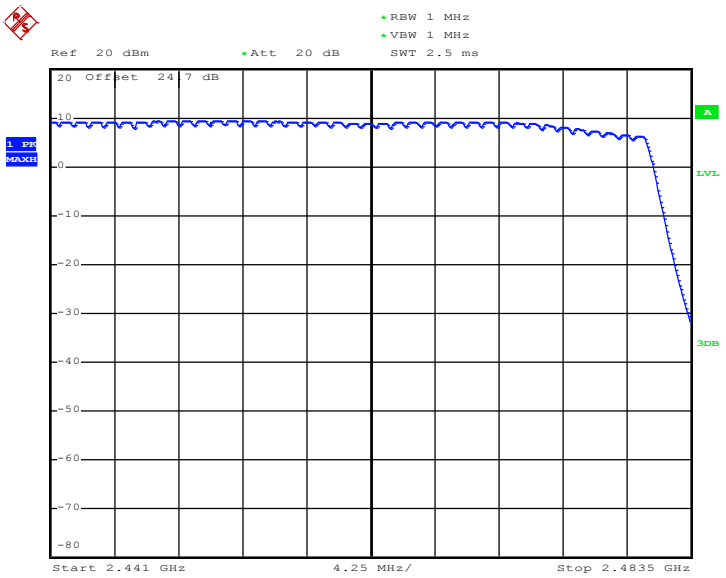


Date: 7.SEP.2015 19:33:35

3.2 Hopping Channel Separation Measurement

3.2.1 Limit of Hopping Channel Separation

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

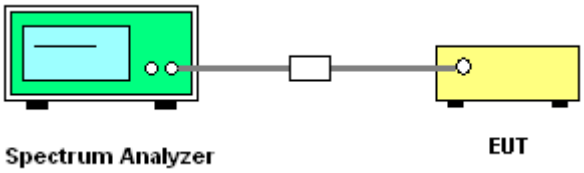
3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

1. The testing follows ANSI C63.10-2009 clause 7.7.2.
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. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peaks of two adjacent channels;
   RBW ≥ 1 % of the span; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
6. Measure and record the results in the test report.

3.2.4 Test Setup

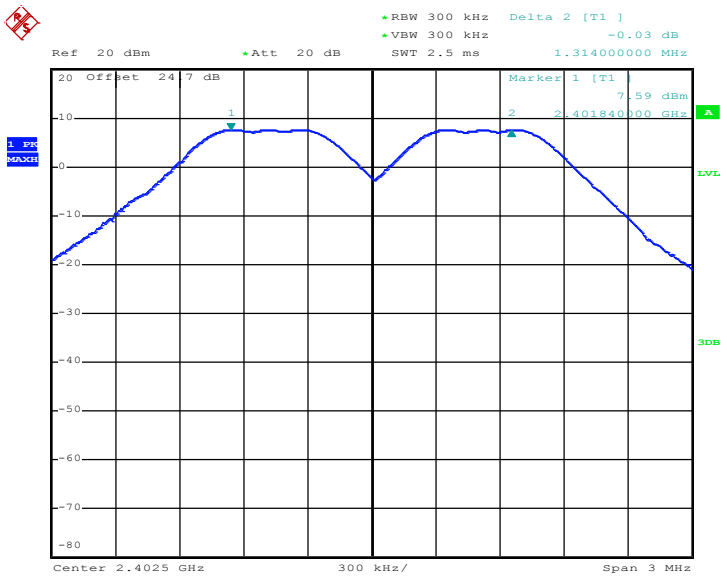


3.2.5 Test Result of Hopping Channel Separation

Test Mode :	1Mbps	**Temperature :**	24~26℃
Test Engineer :	Stuart Lin and Dered Hsu	**Relative Humidity :**	50~53%

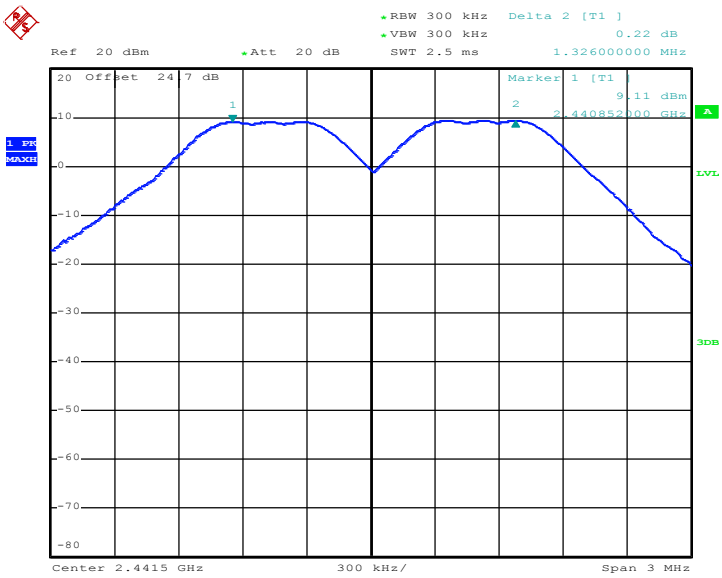
Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.314	0.4560	Pass
39	2441	1.326	0.5280	Pass
78	2480	1.020	0.5093	Pass

Channel Separation Plot on Channel 00 - 01



Date: 19.AUG.2015 15:30:47

Channel Separation Plot on Channel 39 - 40



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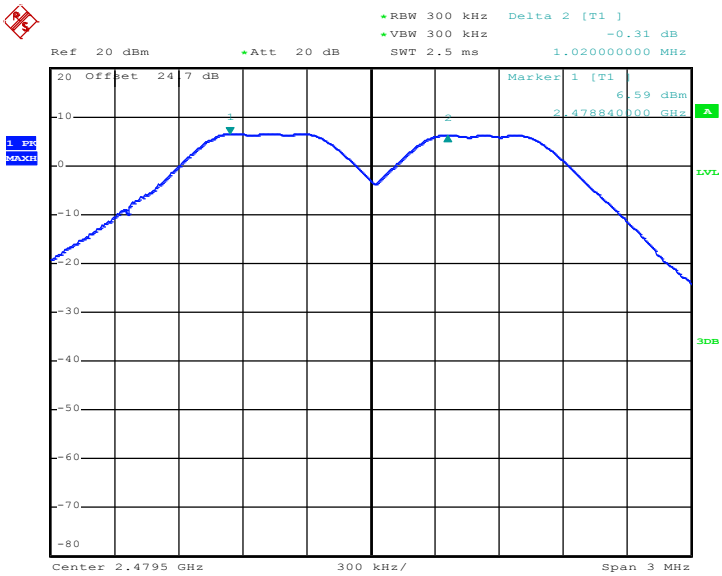
Channel Separation Plot on Channel 77 - 78

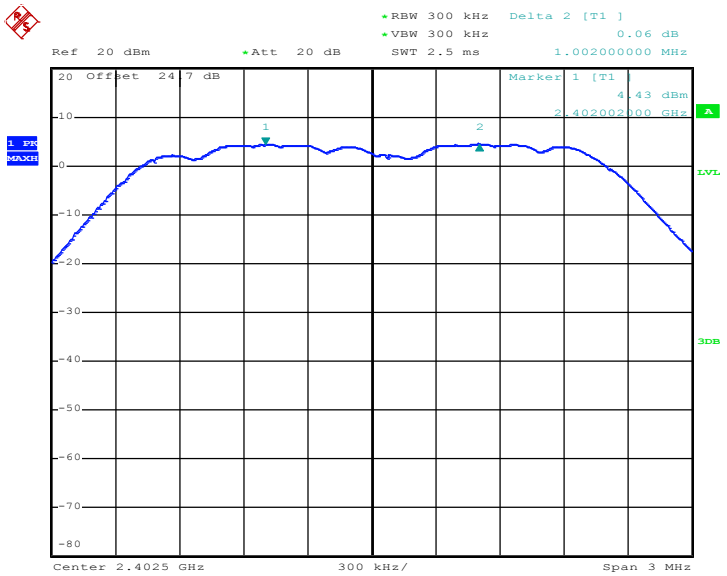


Date: 19.AUG.2015 15:37:28

Test Mode :	2Mbps	**Temperature :**	24~26℃
Test Engineer :	Stuart Lin and Dered Hsu	**Relative Humidity :**	50~53%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.002	0.8240	Pass
39	2441	1.008	0.8240	Pass
78	2480	1.002	0.8240	Pass

Channel Separation Plot on Channel 00 - 01



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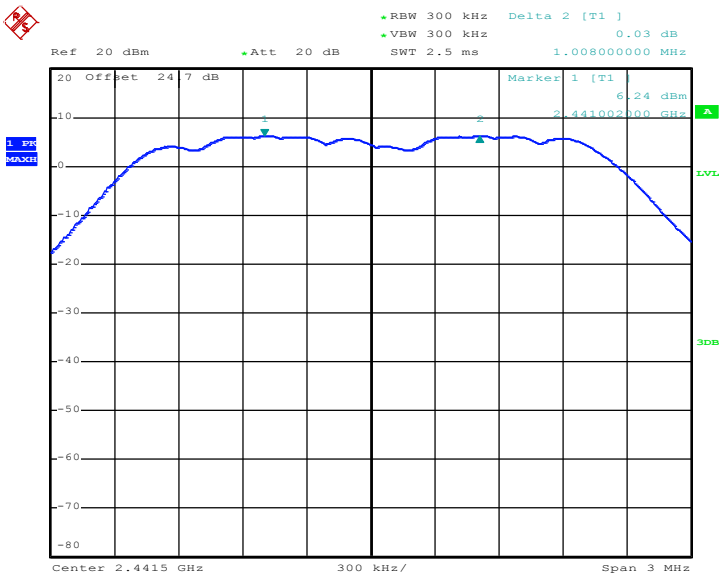
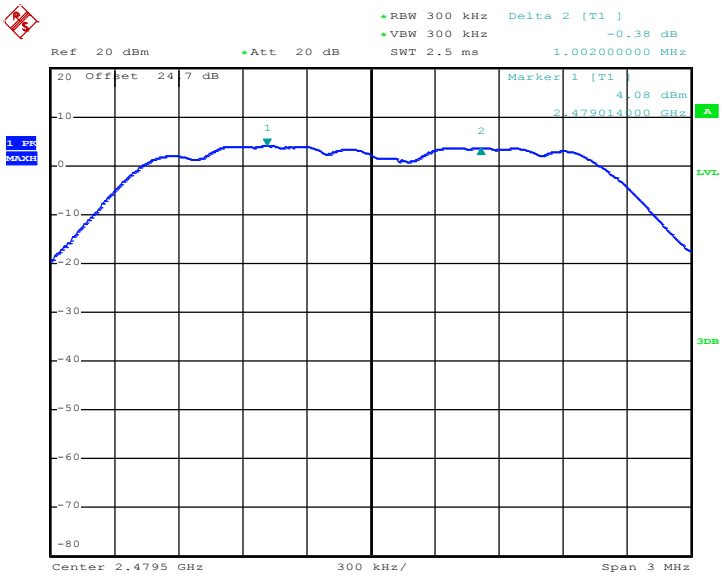
Channel Separation Plot on Channel 39 - 40



Date: 19.AUG.2015 15:45:01

Channel Separation Plot on Channel 77 - 78

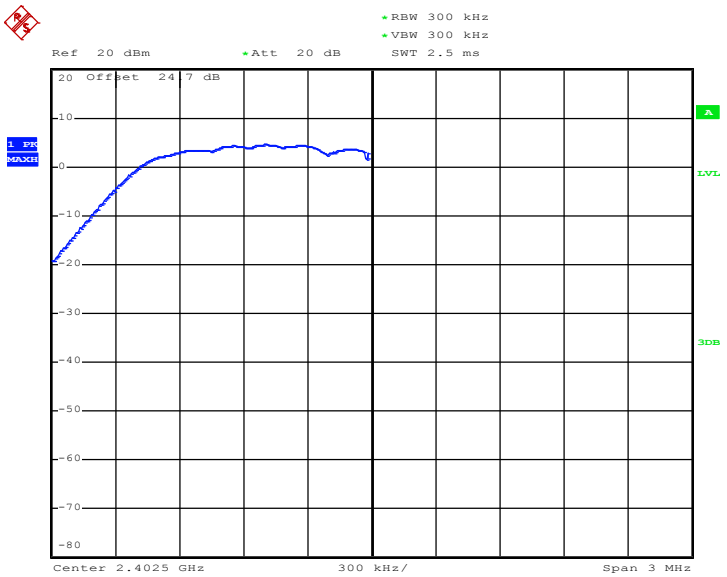


Date: 19.AUG.2015 15:47:57

Test Mode :	3Mbps	**Temperature :**	24~26℃
Test Engineer :	Stuart Lin and Dered Hsu	**Relative Humidity :**	50~53%

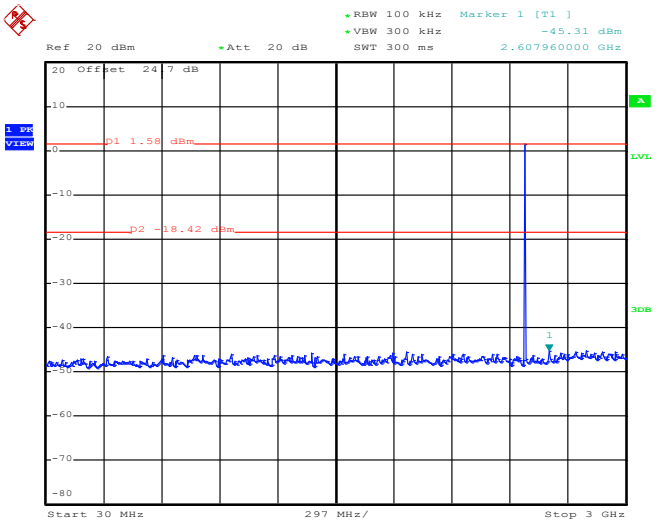
Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.008	0.7480	Pass
39	2441	1.002	0.7600	Pass
78	2480	1.002	0.7600	Pass

Channel Separation Plot on Channel 00 - 01



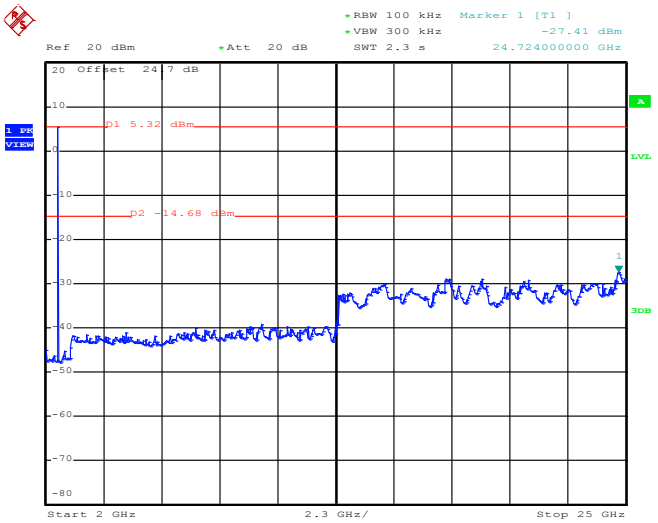
Test Mode :	1Mbps	**Temperature :**	24~26℃
Test Channel :	78	**Relative Humidity :**	50~53%
		Test Engineer :	Stuart Lin and Dered Hsu

1Mbps CSE Plot on Ch 78 between 30MHz ~ 3 GHz



Date: 9.AUG.2015 11:19:39

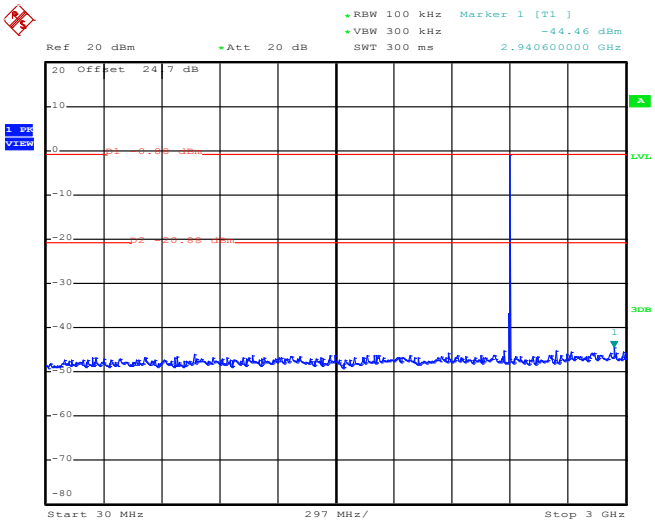
1Mbps CSE Plot on Ch 78 between 2 GHz ~ 25 GHz



Date: 9.AUG.2015 11:20:00

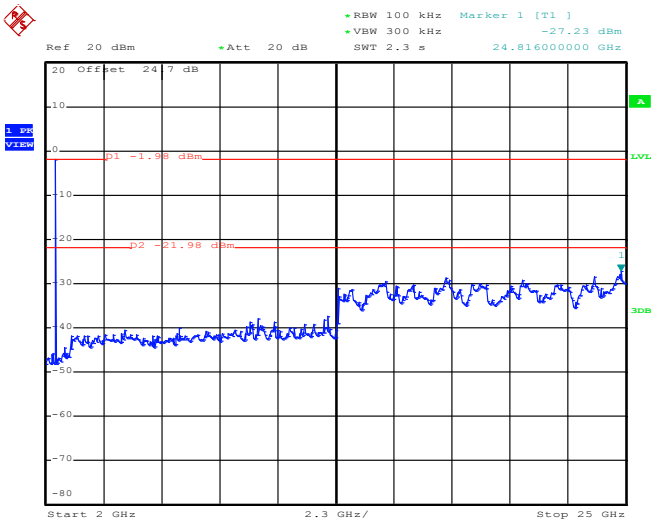
Test Mode :	2Mbps	**Temperature :**	24~26℃
Test Channel :	00	**Relative Humidity :**	50~53%
		Test Engineer :	Stuart Lin and Dered Hsu

2Mbps CSE Plot on Ch 00 between 30MHz ~ 3 GHz



Date: 9.AUG.2015 11:31:39

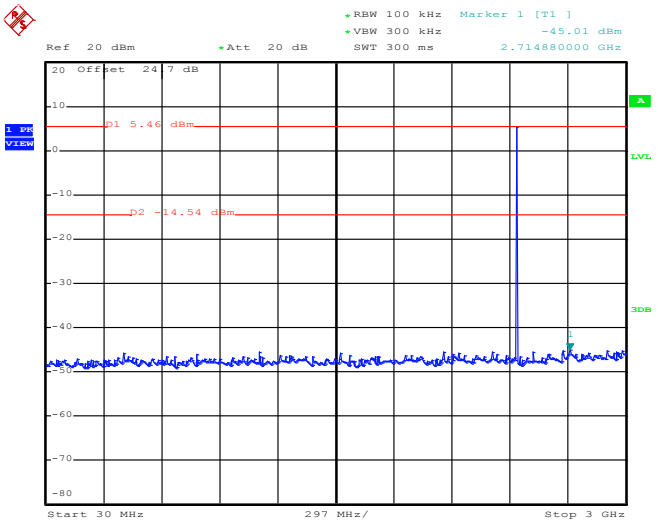
2Mbps CSE Plot on Ch 00 between 2 GHz ~ 25 GHz



Date: 9.AUG.2015 11:32:01

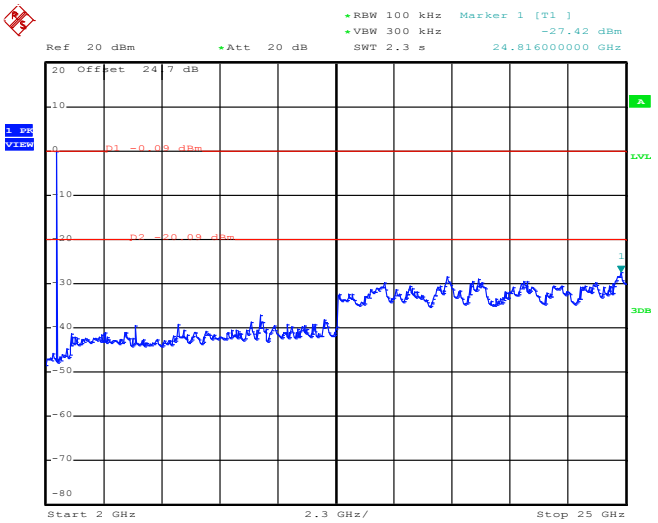
Test Mode :	2Mbps	**Temperature :**	24~26℃
Test Channel :	39	**Relative Humidity :**	50~53%
		Test Engineer :	Stuart Lin and Dered Hsu

2Mbps CSE Plot on Ch 39 between 30MHz ~ 3 GHz



Date: 9.AUG.2015 12:47:13

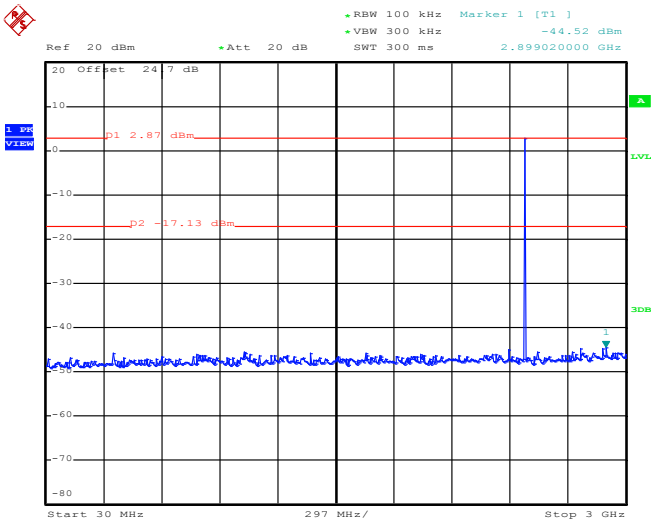
2Mbps CSE Plot on Ch 39 between 2 GHz ~ 25 GHz



Date: 9.AUG.2015 12:47:35

Test Mode :	2Mbps	**Temperature :**	24~26℃
Test Channel :	78	**Relative Humidity :**	50~53%
		Test Engineer :	Stuart Lin and Dered Hsu

2Mbps CSE Plot on Ch 78 between 30MHz ~ 3 GHz



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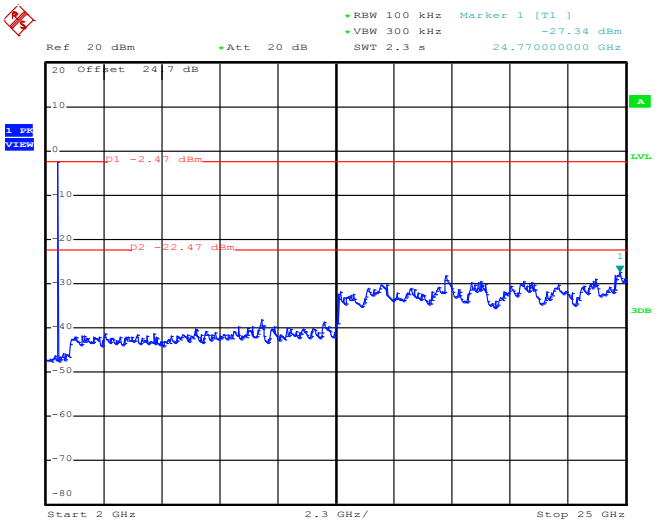
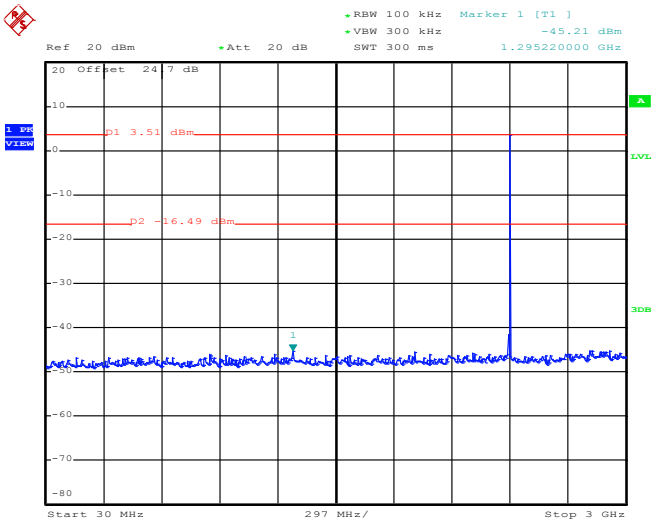
2Mbps CSE Plot on Ch 78 between 2 GHz ~ 25 GHz



Date: 9.AUG.2015 12:52:36

Test Mode :	3Mbps	**Temperature :**	24~26℃
Test Channel :	00	**Relative Humidity :**	50~53%
		Test Engineer :	Stuart Lin and Dered Hsu

3Mbps CSE Plot on Ch 00 between 30MHz ~ 3 GHz



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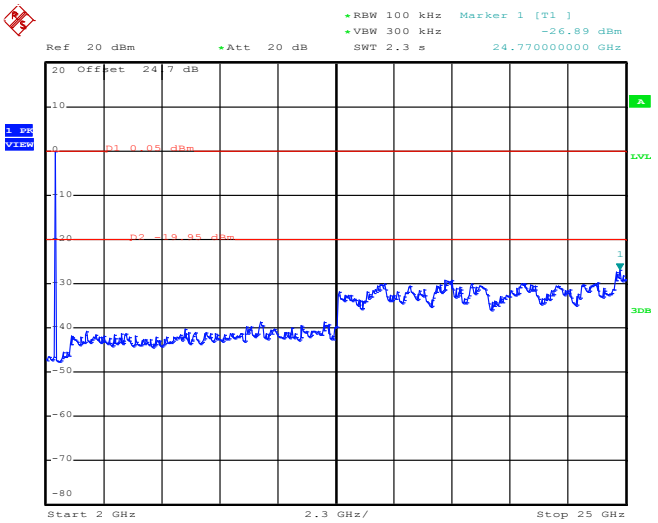
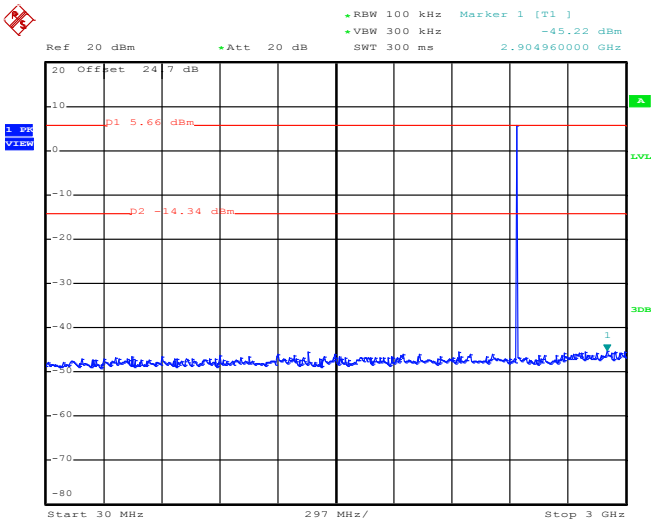
3Mbps CSE Plot on Ch 00 between 2 GHz ~ 25 GHz



Date: 9.AUG.2015 12:42:37

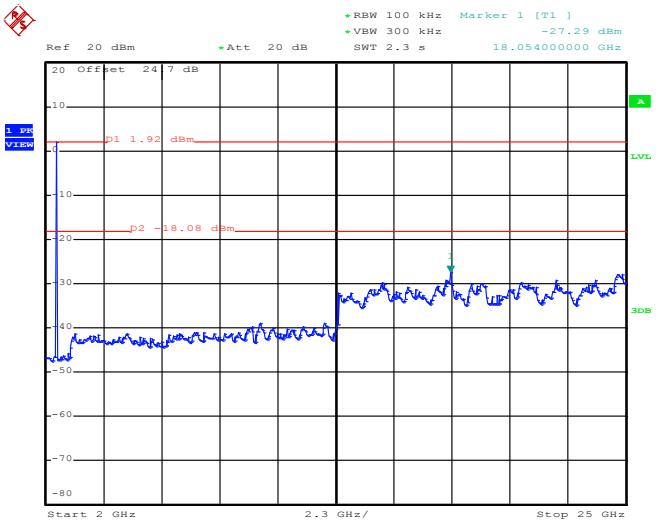
Test Mode :	3Mbps	**Temperature :**	24~26℃
Test Channel :	39	**Relative Humidity :**	50~53%
		Test Engineer :	Stuart Lin and Dered Hsu

3Mbps CSE Plot on Ch 39 between 30MHz ~ 3 GHz



Date: 9.AUG.2015 12:37:32

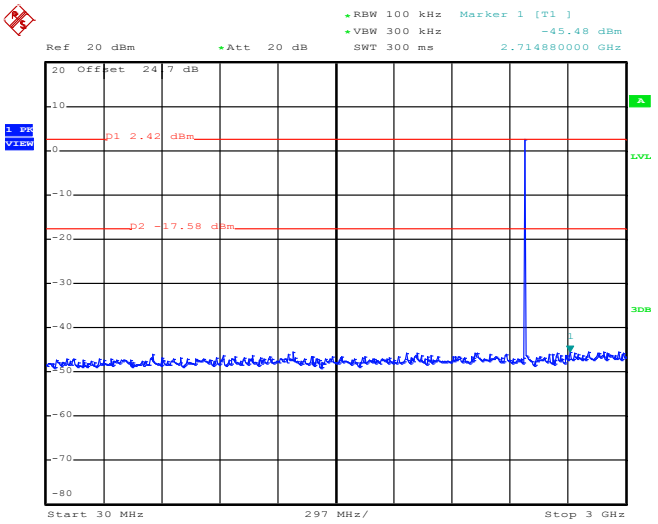
3Mbps CSE Plot on Ch 39 between 2 GHz ~ 25 GHz



Date: 9.AUG.2015 12:37:54

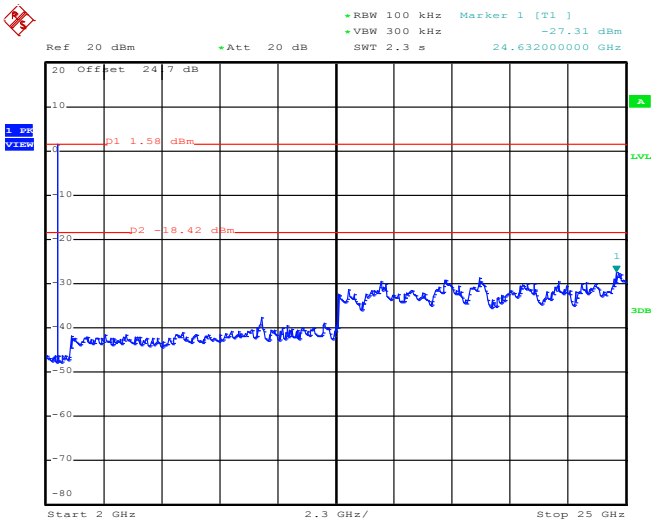
Test Mode :	3Mbps	**Temperature :**	24~26℃
Test Channel :	78	**Relative Humidity :**	50~53%
		Test Engineer :	Stuart Lin and Dered Hsu

3Mbps CSE Plot on Ch 78 between 30MHz ~ 3 GHz



Date: 9.AUG.2015 12:35:19

3Mbps CSE Plot on Ch 78 between 2 GHz ~ 25 GHz



Date: 9.AUG.2015 12:35:41

3.8 Radiated Band Edges and Spurious Emission Measurement

3.8.1 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. 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

3.8.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

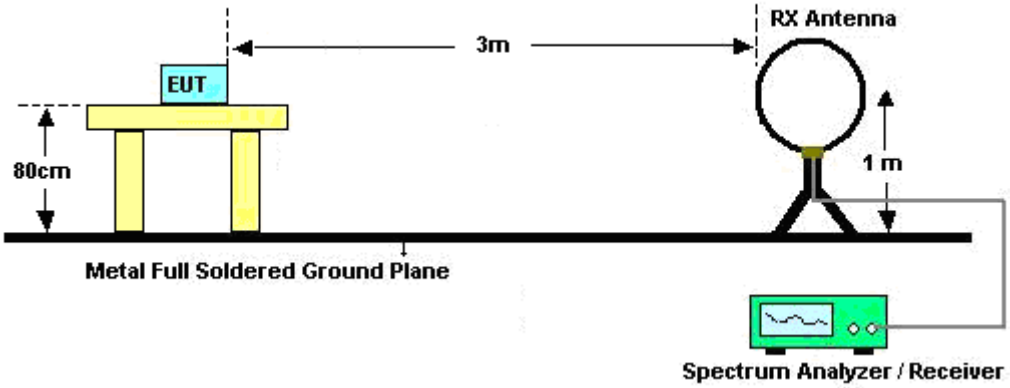
3.8.3 Test Procedures

1. 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.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. For each suspected emission, 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 to comply with the guidelines.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. 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, RBW=1MHz for f>1GHz ; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak
   (3) For average measurement: use duty cycle correction factor method per 15.35(c).
   Duty cycle = On time/100 milliseconds
   On time = $N_1*L_1+N_2*L_2+...+N_{n-1}*LN_{n-1}+N_n*L_n$
   Where N_1 is number of type 1 pulses, L_1 is length of type 1 pulses, etc.
   Average Emission Level = Peak Emission Level + 20*log(Duty cycle)
6. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

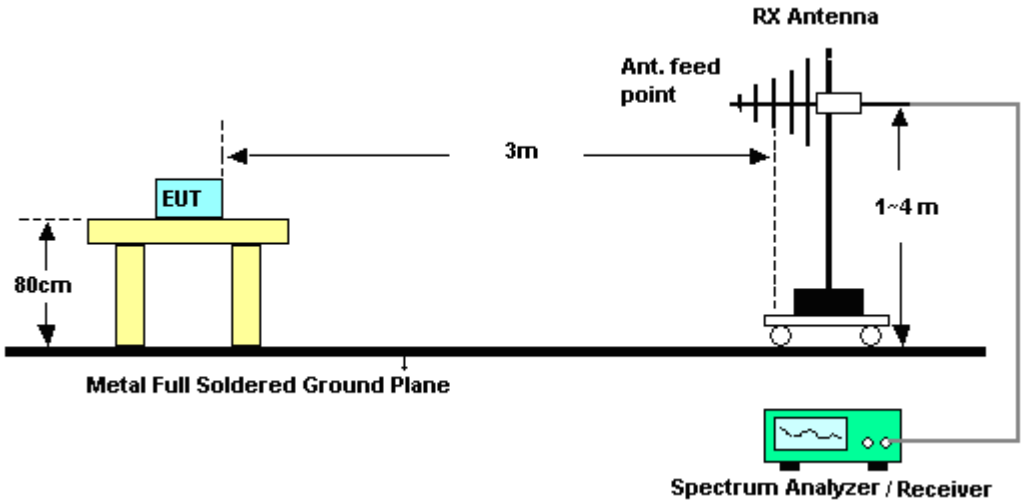
Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.76dB) derived from 20log (dwell time/100ms). This correction is only for signals that hop with the fundamental signal, such as band-edge and harmonic. Other spurious signals that are independent of the hopping signal would not use this correction.

3.8.4 Test Setup

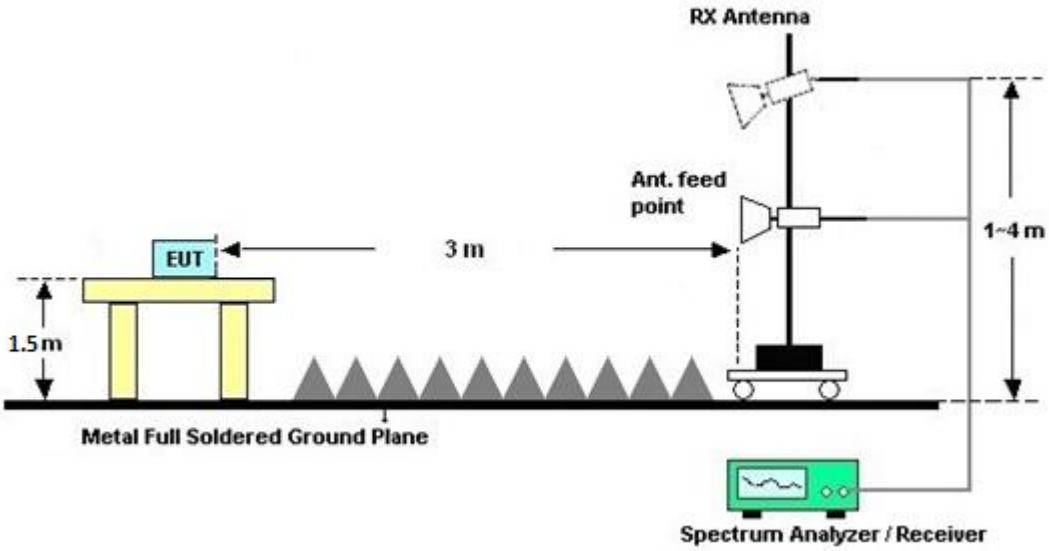
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

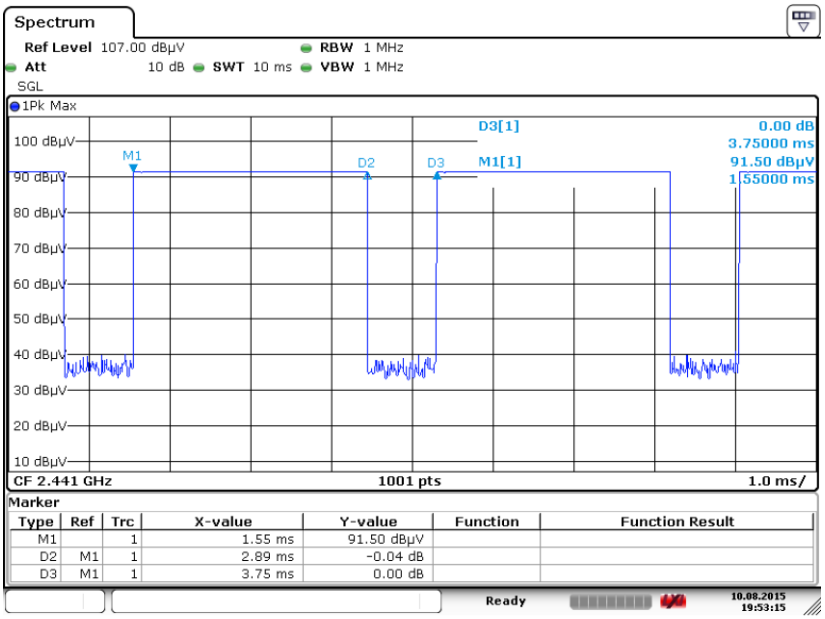


3.8.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

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.

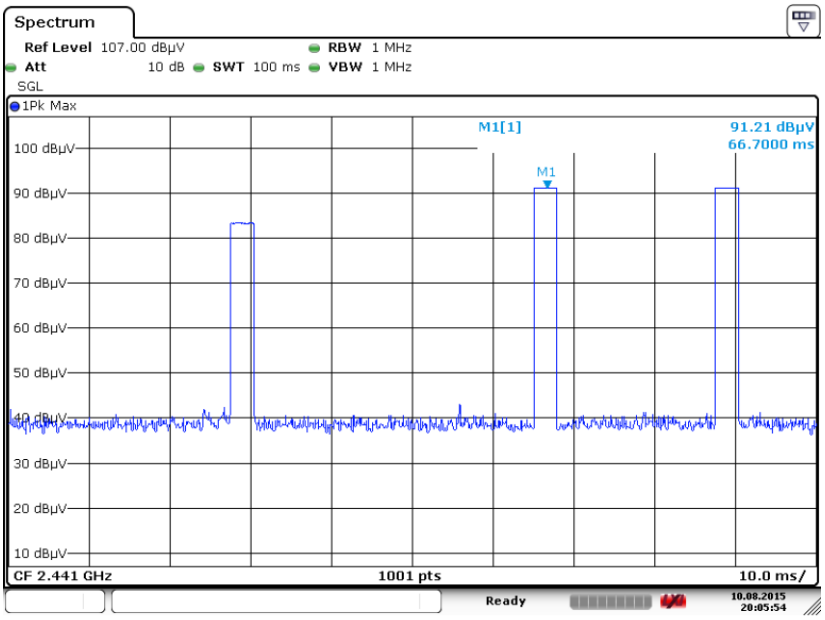
3.8.6 Duty cycle correction factor for average measurement

DH5 on time (One Pulse) Plot on Channel 39



Date: 10.AUG.2015 19:53:15

DH5 on time (Count Pulses) Plot on Channel 39

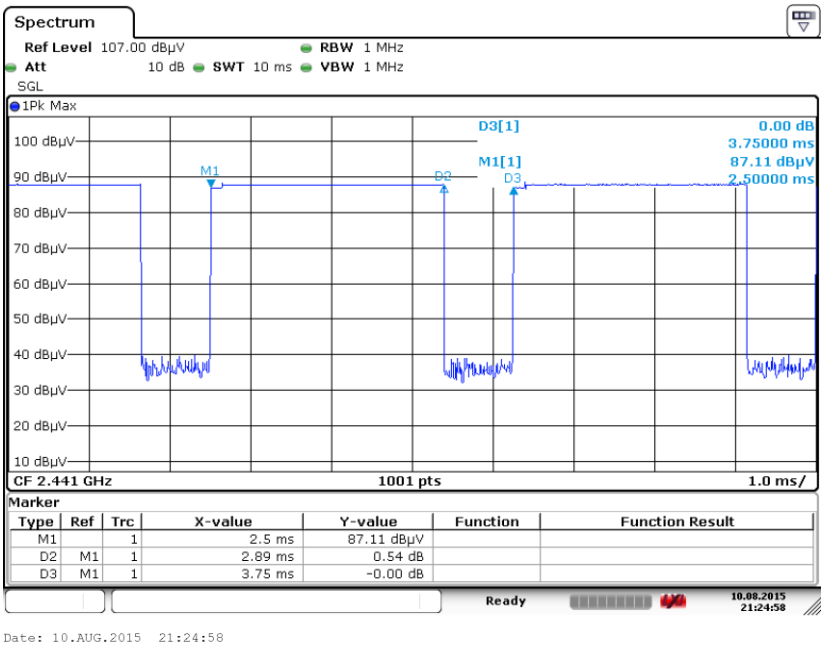


Date: 10.AUG.2015 20:05:53

Note:

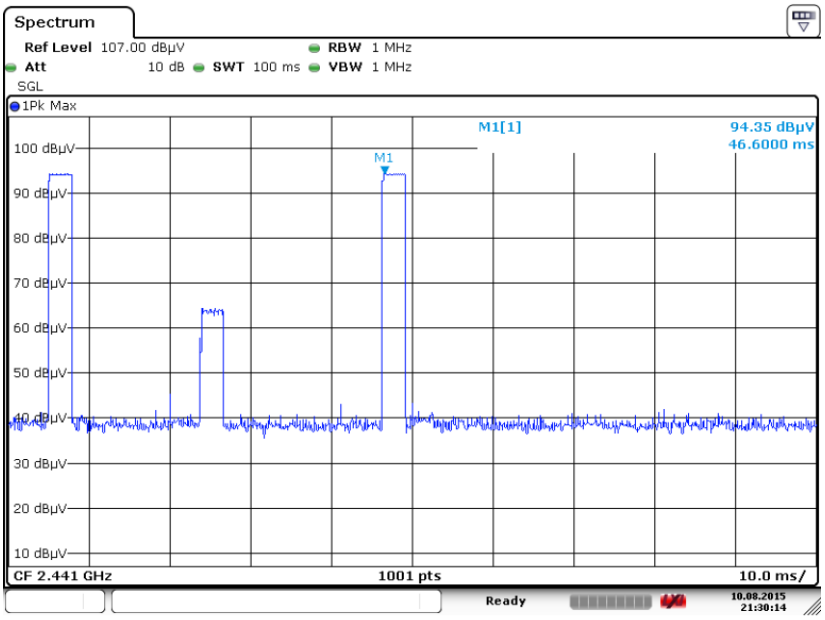
1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.89 / 100 = 5.78 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.76 dB
3. DH5 has the highest duty cycle worst case and is reported.

2DH5 on time (One Pulse) Plot on Channel 39



Date: 10.AUG.2015 21:24:58

2DH5 on time (Count Pulses) Plot on Channel 39

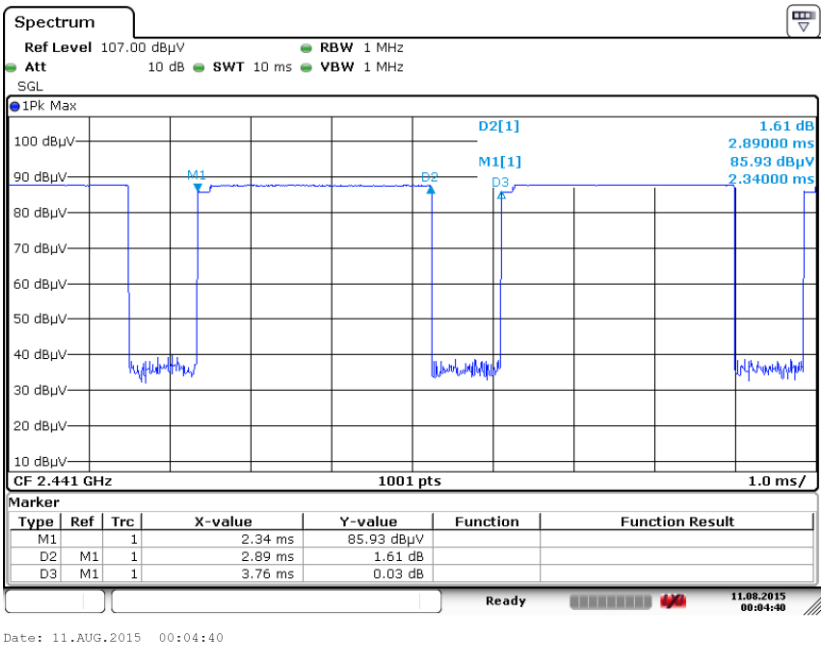


Date: 10.AUG.2015 21:30:14

Note:

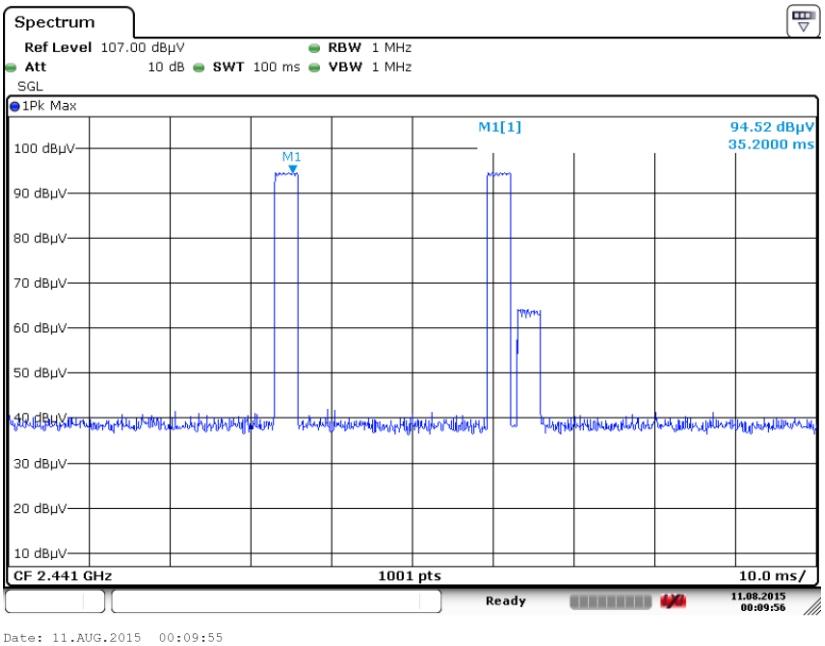
1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.89 / 100 = 5.78 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.76 dB
3. 2DH5 has the highest duty cycle worst case and is reported.

3DH5 on time (One Pulse) Plot on Channel 39



Date: 11.AUG.2015 00:04:40

3DH5 on time (Count Pulses) Plot on Channel 39



Date: 11.AUG.2015 00:09:55

Note:

1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.89 / 100 = 5.78 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.76 dB
3. 3DH5 has the highest duty cycle worst case and is reported.

Duty Cycle Correction Factor Consideration for AFH mode:

Bluetooth normal hopping rate is 1600Hz and reduced to 800Hz in AFH mode; due to the reduced number of hopping frequencies, with the same packet configuration the dwell time in each channel frequency within 100msec period is longer in AFH mode than normal mode.

In AFH mode, the minimum hopping frequencies are 20, to get the longest dwell time DH5 packet is observed; the period to have DH5 packet completing one hopping sequence is

2.89 ms x 20 channels = 57.8 ms

There cannot be 2 complete hopping sequences within 100ms period, considering the random hopping behavior, maximum 2 hops can be possibly observed within the period. [100ms / 57.6ms] = 2 hops

Thus, the maximum possible ON time:

2.89 ms x 2 = 5.78 ms

Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

20 x log(5.78 ms/100ms) = -24.76 dB

3.8.7 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A and Appendix B.

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

Please refer to Appendix A and Appendix B.

3.9 AC Conducted Emission Measurement

3.9.1 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.

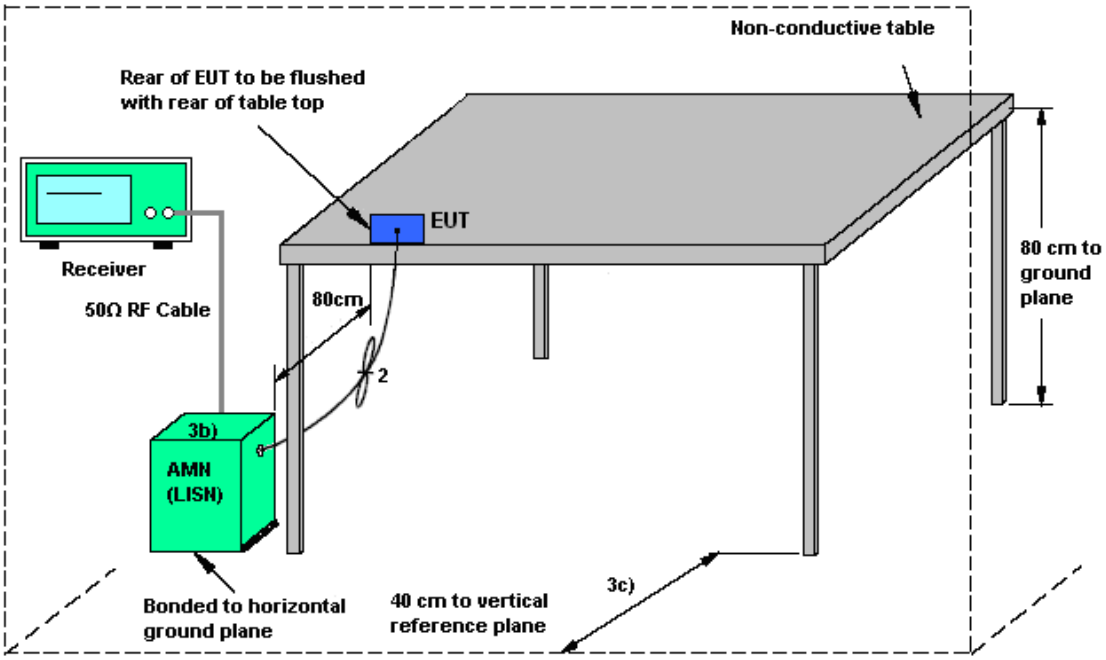
3.9.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.9.3 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.

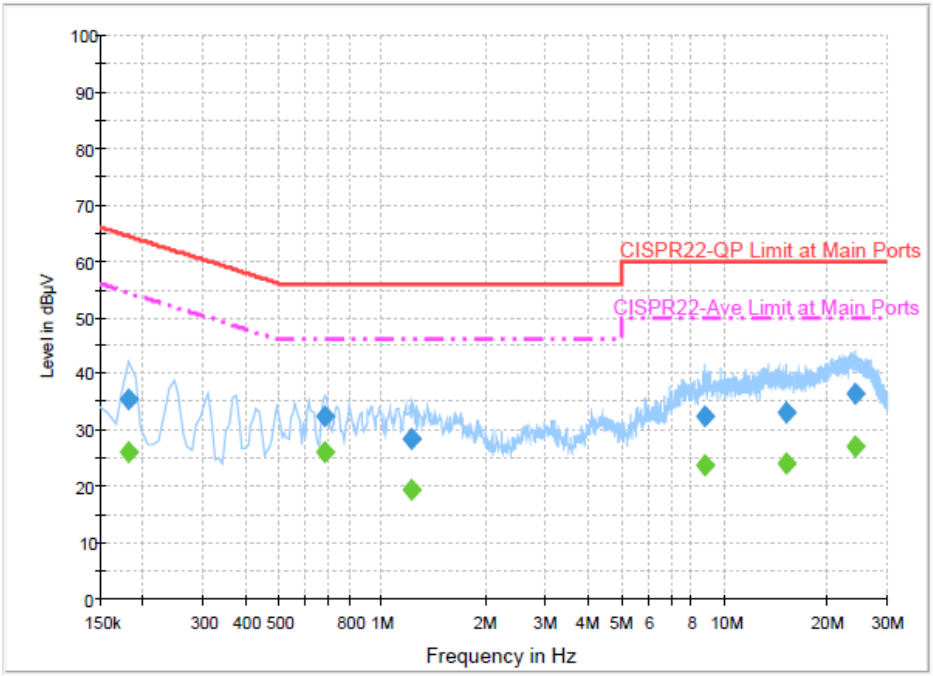
3.9.4 Test Setup



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

3.9.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	**Temperature :**	23~25℃
Test Engineer :	Eric Jeng	**Relative Humidity :**	58~61%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	Bluetooth Link + USB Cable (Charging from Adapter) + Earphone		



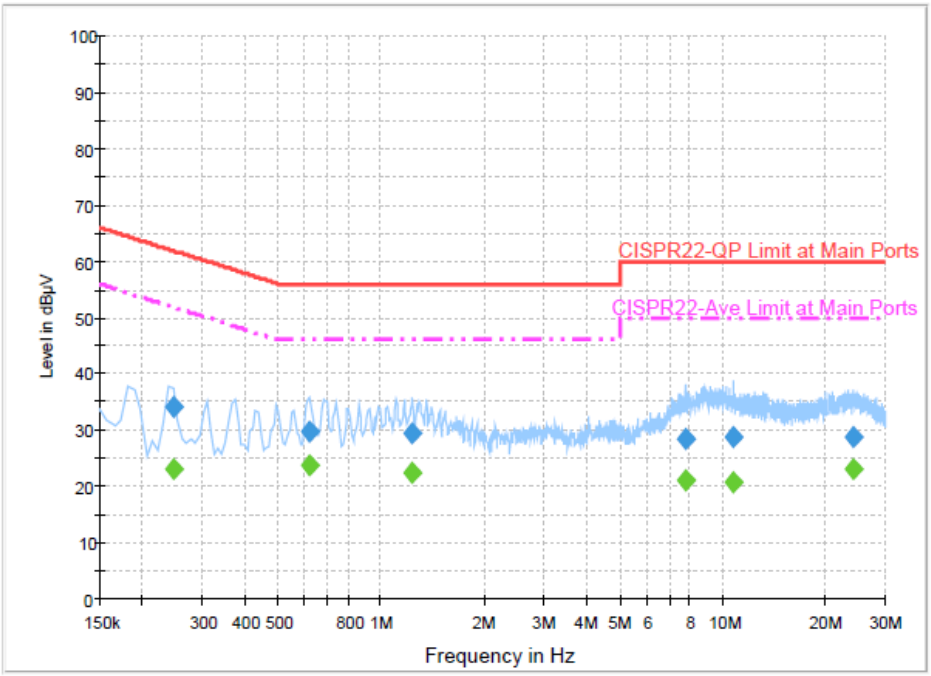
Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	35.5	Off	L1	19.5	28.9	64.4
0.678000	32.4	Off	L1	19.6	23.6	56.0
1.222000	28.3	Off	L1	19.6	27.7	56.0
8.758000	32.4	Off	L1	19.8	27.6	60.0
15.214000	33.2	Off	L1	20.0	26.8	60.0
24.134000	36.6	Off	L1	20.0	23.4	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	26.0	Off	L1	19.5	28.4	54.4
0.678000	26.2	Off	L1	19.6	19.8	46.0
1.222000	19.3	Off	L1	19.6	26.7	46.0
8.758000	23.9	Off	L1	19.8	26.1	50.0
15.214000	24.0	Off	L1	20.0	26.0	50.0
24.134000	27.1	Off	L1	20.0	22.9	50.0

Test Mode :	Mode 1	**Temperature :**	23~25
Test Engineer :	Eric Jeng	**Relative Humidity :**	58~61
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	Bluetooth Link + USB Cable (Charging from Adapter) + Earphone		



Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.246000	34.2	Off	N	19.5	27.7	61.9
0.622000	29.9	Off	N	19.4	26.1	56.0
1.238000	29.3	Off	N	19.6	26.7	56.0
7.774000	28.3	Off	N	19.8	31.7	60.0
10.790000	28.6	Off	N	19.8	31.4	60.0
24.238000	28.8	Off	N	20.1	31.2	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.246000	23.0	Off	N	19.5	28.9	51.9
0.622000	23.8	Off	N	19.4	22.2	46.0
1.238000	22.5	Off	N	19.6	23.5	46.0
7.774000	20.9	Off	N	19.8	29.1	50.0
10.790000	20.6	Off	N	19.8	29.4	50.0
24.238000	23.1	Off	N	20.1	26.9	50.0

3.10 Antenna Requirements

3.10.1 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.

3.10.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.10.3 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
Power Meter	Agilent	E4416A	GB41292344	300MHz~40GHz	Jan. 14, 2015	Aug. 04, 2015 ~ Sep. 07, 2015	Jan. 13, 2016	Conducted (TH05-HY)
Power Sensor	Agilent	E9327A	US40441548	300MHz~40GHz	Jan. 14, 2015	Aug. 04, 2015 ~ Sep. 07, 2015	Jan. 13, 2016	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz-40GHz	Jun. 18, 2015	Aug. 04, 2015 ~ Sep. 07, 2015	Jun. 17, 2016	Conducted (TH05-HY)
Hygrometer	Testo	608-H1	34897199	N/A	May 04, 2015	Aug. 04, 2015 ~ Sep. 07, 2015	May 03, 2016	Conducted (TH05-HY)
RF Cable	HARBOUR INDUSTRIES	LL142	Infinet CA3601-3601-DLL	0.1MHz~40GHz	Mar. 06, 2015	Aug. 04, 2015 ~ Sep. 07, 2015	Mar. 05, 2016	Conducted (TH05-HY)
Bilog Antenna	Schaffner	CBL6111C	2726	30MHz ~ 1GHz	Sep. 27, 2014	Aug. 05, 2015 ~ Aug. 13, 2015	Sep. 26, 2015	Radiation (03CH07-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz~18GHz	Jul. 20, 2015	Aug. 05, 2015 ~ Aug. 13, 2015	Jul. 19, 2016	Radiation (03CH07-HY)
Loop Antenna	TESEQ	HLA 6120	31244	9kHZ~30MHz	Feb. 02, 2015	Aug. 05, 2015 ~ Aug. 13, 2015	Feb. 01, 2016	Radiation (03CH07-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Aug. 30, 2014	Aug. 05, 2015 ~ Aug. 13, 2015	Aug. 29, 2015	Radiation (03CH07-HY)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 03, 2014	Aug. 05, 2015 ~ Aug. 13, 2015	Nov. 02, 2015	Radiation (03CH07-HY)
Hygrometer	Testo	608-H1	34897197	N/A	May. 04, 2015	Aug. 05, 2015 ~ Aug. 13, 2015	May. 03, 2016	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1590075	1GHz ~ 18GHz	Apr. 20, 2015	Aug. 05, 2015 ~ Aug. 13, 2015	Apr. 19, 2016	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz-1000MHz	Mar. 12, 2015	Aug. 05, 2015 ~ Aug. 13, 2015	Mar. 11, 2016	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Oct. 21, 2014	Aug. 05, 2015 ~ Aug. 13, 2015	Oct. 20, 2015	Radiation (03CH07-HY)
Signal Analyzer	Rohde & Schwarz	FSV 30	101749	10Hz~30GHz	Mar. 10, 2015	Aug. 05, 2015 ~ Aug. 13, 2015	Mar. 09, 2016	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY84209521	1GHz~40GHz	Dec. 04, 2014	Aug. 05, 2015 ~ Aug. 13, 2015	Dec. 03, 2015	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY84209521	9KHz~1GHz	Dec. 04, 2014	Aug. 05, 2015 ~ Aug. 13, 2015	Dec. 03, 2015	Radiation (03CH07-HY)
Controller	ChainTek	Chaintek 3000	N/A	Control Turn table	N/A	Aug. 05, 2015 ~ Aug. 13, 2015	N/A	Radiation (03CH07-HY)
Controller	Max-Full	MF7802	MF780208368	Control Ant Mast	N/A	Aug. 05, 2015 ~ Aug. 13, 2015	N/A	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Aug. 05, 2015 ~ Aug. 13, 2015	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 degree	N/A	Aug. 05, 2015 ~ Aug. 13, 2015	N/A	Radiation (03CH07-HY)
Preamplifier	MITEQ	JS44-18004000-33-8P	1840917	18GHz ~ 40GHz	Jun. 02, 2015	Aug. 05, 2015 ~ Aug. 13, 2015	Jun. 01, 2016	Radiation (03CH07-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Test Software	Audix	E3	6.2009-8-24	N/A	N/A	Aug. 05, 2015 ~ Aug. 13, 2015	N/A	Radiation (03CH07HY)
Filter	Wainwright	WLKS1200-8SS	SN3	1.2G Low Pass	Oct. 01, 2014	Aug. 05, 2015 ~ Aug. 13, 2015	Sep. 30, 2015	Radiation (03CH07HY)
Filter	Microwave	H3G018G1	SN477220	3.0G High Pass	Oct. 01, 2014	Aug. 05, 2015 ~ Aug. 13, 2015	Sep. 30, 2015	Radiation (03CH07HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz – 2.75GHz	Dec. 01, 2014	Aug. 15, 2015	Nov. 30, 2015	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Apr. 20, 2015	Aug. 15, 2015	Apr. 19, 2016	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 02, 2014	Aug. 15, 2015	Dec. 01, 2015	Conduction (CO05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Aug. 15, 2015	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 07, 2015	Aug. 15, 2015	Jan. 06, 2016	Conduction (CO05-HY)
Test Software	N/A	EMC32	8.40.0	N/A	N/A	Aug. 15, 2015	N/A	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))	**4.80**

Appendix A. Radiated Spurious Emission

Test Engineer :	Wei Chen, Nick Yu, and James Chiu	Temperature :	21~23°C
		Relative Humidity :	60~63%

<1Mbps>

2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

BT	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BT CH00 2402MHz		2387.22	48.29	-25.71	74	42.63	32.18	7.75	34.27	263	41	P	H
		2387.22	23.53	-30.47	54	-	-	-	-	-	-	A	H
	*	2402	102.43	-	-	96.8	32.18	7.75	34.3	263	41	P	H
	*	2402	77.67	-	-	-	-	-	-	-	-	A	H
													H
		2369.93	49.01	-24.99	74	43.44	32.16	7.68	34.27	197	283	P	V
		2369.93	24.25	-29.75	54	-	-	-	-	-	-	A	V
	*	2402	102.31	-	-	96.68	32.18	7.75	34.3	197	283	P	V
	*	2402	77.55	-	-	-	-	-	-	-	-	A	V
													V
BT CH 39 2441MHz		2387.14	48.93	-25.07	74	43.27	32.18	7.75	34.27	200	26	P	H
		2387.14	24.17	-29.83	54	-	-	-	-	-	-	A	H
	*	2440.91	102.4	-	-	96.72	32.24	7.83	34.39	200	26	P	H
	*	2440.91	77.64	-	-	-	-	-	-	-	-	A	H
		2490.31	47.99	-26.01	74	42.21	32.3	7.91	34.43	200	26	P	H
		2490.31	23.23	-30.77	54	-	-	-	-	-	-	A	H
		2335.08	48.94	-25.06	74	43.45	32.11	7.6	34.22	243	277	P	V
		2335.08	24.18	-29.82	54	-	-	-	-	-	-	A	V
	*	2440.91	102.3	-	-	96.62	32.24	7.83	34.39	243	277	P	V
	*	2440.91	77.54	-	-	-	-	-	-	-	-	A	V
		2493.54	47.78	-26.22	74	42.05	32.3	7.91	34.48	243	277	P	V
		2493.54	23.02	-30.98	54	-	-	-	-	-	-	A	V

BT CH 78 2480MHz	*	2479.98	99.45	-	-	93.69	32.28	7.91	34.43	198	38	P	H
	*	2479.98	74.69	-	-	-	-	-	-	-	-	A	H
		2484.39	49.53	-24.47	74	43.77	32.28	7.91	34.43	198	38	P	H
		2484.39	24.77	-29.23	54	-	-	-	-	-	-	A	H
													H
													H
	*	2479.91	100.56	-	-	94.8	32.28	7.91	34.43	220	273	P	V
	*	2479.91	75.8	-	-	-	-	-	-	-	-	A	V
		2483.69	51.61	-22.39	74	45.85	32.28	7.91	34.43	220	273	P	V
		2483.69	26.85	-27.15	54	-	-	-	-	-	-	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

BT (Harmonic @ 3m)

BT	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BT CH 00 2402MHz		4806	40.77	-33.23	74	55.08	34.25	11.11	59.67	100	0	P	H
		4806	16.01	-37.99	54	-	-	-	-	-	-	A	H
													H
													H
		4806	40.75	-33.25	74	55.06	34.25	11.11	59.67	100	0	P	V
		4806	15.99	-38.01	54	-	-	-	-	-	-	A	V
													V
													V
BT CH 39 2441MHz		4884	40.51	-33.49	74	54.57	34.3	11.21	59.57	100	0	P	H
		4884	15.75	-38.25	54	-	-	-	-	-	-	A	H
		7320	41.86	-32.14	74	49.67	35.6	15.08	58.49	100	0	P	H
		7320	17.1	-36.9	54	-	-	-	-	-	-	A	H
		4884	41.16	-32.84	74	55.22	34.3	11.21	59.57	100	0	P	V
		4884	16.4	-37.6	54	-	-	-	-	-	-	A	V
		7320	42.73	-31.27	74	50.54	35.6	15.08	58.49	100	0	P	V
		7320	17.97	-36.03	54	-	-	-	-	-	-	A	V
BT CH 78 2480MHz		4962	40.26	-33.74	74	54.02	34.37	11.32	59.45	100	0	P	H
		4962	15.5	-38.5	54	-	-	-	-	-	-	A	H
		7440	41.92	-32.08	74	49.83	35.6	15.13	58.64	100	0.	P	H
		7440	17.16	-36.84	54	-	-	-	-	-	-	A	H
		4960	41.64	-32.36	74	55.4	34.37	11.32	59.45	100	0	P	V
		4960	16.88	-37.12	54	-	-	-	-	-	-	A	V
		7440	42.96	-31.04	74	50.87	35.6	15.13	58.64	100	0	P	V
		7440	18.2	-35.8	54	-	-	-	-	-	-	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

<2Mbps>

2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

BT	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BT CH00 2402MHz		2369.67	48.56	-25.44	74	42.99	32.16	7.68	34.27	156	29	P	H
		2369.67	23.8	-30.2	54	-	-	-	-	-	-	A	H
	*	2402.04	97.94	-	-	92.31	32.18	7.75	34.3	156	29	P	H
	*	2402.04	73.18	-	-	-	-	-	-	-	-	A	H
													H
													H
		2348.35	49.35	-24.65	74	43.81	32.11	7.68	34.25	125	274	P	V
		2348.35	24.59	-29.41	54	-	-	-	-	-	-	A	V
	*	2402.04	98.77	-	-	93.14	32.18	7.75	34.3	125	274	P	V
	*	2402.04	74.01	-	-	-	-	-	-	-	-	A	V
													V
													V
BT CH 39 2441MHz		2362.44	48.58	-25.42	74	43.02	32.13	7.68	34.25	200	26	P	H
		2362.44	23.82	-30.18	54	-	-	-	-	-	-	A	H
	*	2441.29	99.72	-	-	94.04	32.24	7.83	34.39	200	26	P	H
	*	2441.29	74.96	-	-	-	-	-	-	-	-	A	H
		2491.07	48.23	-25.77	74	42.45	32.3	7.91	34.43	200	26	P	H
		2491.07	23.47	-30.53	54	-	-	-	-	-	-	A	H
		2387.9	48.25	-25.75	74	42.59	32.18	7.75	34.27	245	277	P	V
		2387.9	23.49	-30.51	54	-	-	-	-	-	-	A	V
	*	2441.29	98.9	-	-	93.22	32.24	7.83	34.39	245	277	P	V
	*	2441.29	74.14	-	-	-	-	-	-	-	-	A	V
		2490.88	48.95	-25.05	74	43.17	32.3	7.91	34.43	245	277	P	V
		2490.88	24.19	-29.81	54	-	-	-	-	-	-	A	V

BT CH 78 2480MHz	*	2480.12	96.91	-	-	91.15	32.28	7.91	34.43	198	25	P	H
	*	2480.12	72.15	-	-	-	-	-	-	-	-	A	H
		2490.69	48.47	-25.53	74	42.69	32.3	7.91	34.43	198	25	P	H
		2490.69	23.71	-30.29	54	-	-	-	-	-	-	A	H
													H
													H
	*	2480.05	98.4	-	-	92.64	32.28	7.91	34.43	104	296	P	V
	*	2480.05	73.64	-	-	-	-	-	-	-	-	A	V
		2483.5	52.45	-21.55	74	46.69	32.28	7.91	34.43	104	296	P	V
		2483.5	27.69	-26.31	54	-	-	-	-	-	-	A	V
													V
													V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

BT (Harmonic @ 3m)

BT	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BT CH 00 2402MHz		4806	41.71	-32.29	74	56.02	34.25	11.11	59.67	100	0	P	H
		4806	16.95	-37.05	54	-	-	-	-	-	-	A	H
													H
													H
		4806	40.46	-33.54	74	54.77	34.25	11.11	59.67	100	0	P	V
		4806	15.7	-38.3	54	-	-	-	-	-	-	A	V
													V
													V
BT CH 39 2441MHz		4882	41.41	-32.59	74	55.47	34.3	11.21	59.57	100	0	P	H
		4882	16.65	-37.35	54	-	-	-	-	-	-	A	H
		7323	41.93	-32.07	74	49.74	35.6	15.08	58.49	100	0	P	H
		7323	17.17	-36.83	54	-	-	-	-	-	-	A	H
		4882	39.71	-34.29	74	53.77	34.3	11.21	59.57	100	0	P	V
		4882	14.95	-39.05	54	-	-	-	-	-	-	A	V
		7323	42.63	-31.37	74	50.44	35.6	15.08	58.49	100	0	P	V
		7323	17.87	-36.13	54	-	-	-	-	-	-	A	V
BT CH 78 2480MHz		4962	41.69	-32.31	74	55.45	34.37	11.32	59.45	100	0	P	H
		4962	16.93	-37.07	54	-	-	-	-	-	-	A	H
		7440	42.31	-31.69	74	50.22	35.6	15.13	58.64	100	0	P	H
		7440	17.55	-36.45	54	-	-	-	-	-	-	A	H
		4960	41.31	-32.69	74	55.07	34.37	11.32	59.45	400	0	P	V
		4960	16.55	-37.45	54	-	-	-	-	-	-	A	V
		7440	42.43	-31.57	74	50.34	35.6	15.13	58.64	100	0	P	V
		7440	17.67	-36.33	54	-	-	-	-	-	-	A	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

2.4GHz BT (LF)

BT	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BT LF		59.43	22.47	-17.53	40	45.9	6.08	1.77	31.28			P	H
		180.93	22.75	-20.75	43.5	42.1	8.88	2.69	30.92			P	H
		257.34	26.22	-19.78	46	40.74	13.52	2.96	31			P	H
		461.7	28.5	-17.5	46	38.11	17.42	3.77	30.8	100	0	P	H
		693.4	25.6	-20.4	46	31.12	20.54	4.35	30.41			P	H
		977.6	30.17	-23.83	54	30.56	24.96	4.94	30.29			P	H
													H
													H
													H
													H
													H
													H
		43.77	30.72	-9.28	40	48.95	11.2	1.77	31.2	100	0	P	V
		150.69	16.26	-27.24	43.5	33.96	10.8	2.61	31.11			P	V
		250.86	19.57	-26.43	46	35.05	12.56	2.96	31			P	V
		413.4	26.23	-19.77	46	37.19	16.35	3.52	30.83			P	V
		692.7	28.6	-17.4	46	34.13	20.53	4.35	30.41			P	V
		988.1	29.53	-24.47	54	29.91	24.84	5.03	30.25			P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

<3Mbps>

2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

BT	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BT CH00 2402MHz		2366.81	48.22	-25.78	74	42.68	32.13	7.68	34.27	155	20	P	H
		2366.81	23.46	-30.54	54	-	-	-	-	-	-	A	H
	*	2402.17	98.29	-	-	92.66	32.18	7.75	34.3	155	20	P	H
	*	2402.17	73.53	-	-	-	-	-	-	-	-	A	H
													H
													H
		2312.08	48.81	-25.19	74	43.33	32.07	7.6	34.19	197	283	P	V
		2312.08	24.05	-29.95	54	-	-	-	-	-	-	A	V
	*	2402.04	98.28	-	-	92.65	32.18	7.75	34.3	197	283	P	V
	*	2402.04	73.52	-	-	-	-	-	-	-	-	A	V
													V
													V
BT CH 39 2441MHz		2357.5	48.88	-25.12	74	43.32	32.13	7.68	34.25	199	30	P	H
		2357.5	24.12	-29.88	54	-	-	-	-	-	-	A	H
	*	2441.29	99.9	-	-	94.22	32.24	7.83	34.39	199	30	P	H
	*	2441.29	75.14	-	-	-	-	-	-	-	-	A	H
		2499.05	47.86	-26.14	74	42.13	32.3	7.91	34.48	199	30	P	H
		2499.05	23.1	-30.9	54	-	-	-	-	-	-	A	H
		2340.02	48.04	-25.96	74	42.5	32.11	7.68	34.25	150	329	P	V
		2340.02	23.28	-30.72	54	-	-	-	-	-	-	A	V
	*	2441.1	99.66	-	-	93.98	32.24	7.83	34.39	150	329	P	V
	*	2441.1	74.9	-	-	-	-	-	-	-	-	A	V
		2492.97	47.89	-26.11	74	42.16	32.3	7.91	34.48	150	329	P	V
		2492.97	23.13	-30.87	54	-	-	-	-	-	-	A	V

BT CH 78 2480MHz	*	2480.05	97.2	-	-	91.44	32.28	7.91	34.43	198	27	P	H
	*	2480.05	72.44	-	-	-	-	-	-	-	-	A	H
		2487.33	48.72	-25.28	74	42.96	32.28	7.91	34.43	198	27	P	H
		2487.33	23.96	-30.04	54	-	-	-	-	-	-	A	H
													H
													H
	*	2480.05	98.58	-	-	92.82	32.28	7.91	34.43	105	296	P	V
	*	2480.05	73.82	-	-	-	-	-	-	-	-	A	V
		2484.53	48.75	-25.25	74	42.99	32.28	7.91	34.43	105	296	P	V
		2484.53	23.99	-30.01	54	-	-	-	-	-	-	A	V
													V
													V
Remark	5. No other spurious found. 6. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

BT (Harmonic @ 3m)

BT	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BT CH 00 2402MHz		4804	42.08	-31.92	74	55.68	34.25	11.11	58.96	100	0	P	H
		4804	17.32	-36.68	54	-	-	-	-	-	-	A	H
													H
													H
		4804	41.63	-32.37	74	55.23	34.25	11.11	58.96	100	0	P	V
		4804	16.87	-37.13	54	-	-	-	-	-	-	A	V
													V
													V
BT CH 39 2441MHz		4882	40.33	-33.67	74	54.39	34.3	11.21	59.57	100	0	P	H
		7323	42.53	-31.47	74	50.34	35.6	15.08	58.49	100	0	P	H
													H
													H
		4882	40.29	-33.71	74	54.35	34.3	11.21	59.57	100	0	P	V
		7323	42.97	-31.03	74	50.78	35.6	15.08	58.49	100	0	P	V
													V
													V
BT CH 78 2480MHz		4962	40.94	-33.06	74	54.7	34.37	11.32	59.45	100	0	P	H
		4962	16.18	-37.82	54	-	-	-	-	-	-	A	H
		7440	42.77	-31.23	74	50.68	35.6	15.13	58.64	100	0	P	H
		7440	18.01	-35.99	54	-	-	-	-	-	-	A	H
		4960	41.6	-32.4	74	55.36	34.37	11.32	59.45	100	0	P	V
		4960	16.84	-37.16	54	-	-	-	-	-	-	A	V
		7440	42.27	-31.73	74	50.18	35.6	15.13	58.64	100	0	P	V
		7440	17.51	-36.49	54	-	-	-	-	-	-	A	V
Remark	5. No other spurious found. 6. All results are PASS against Peak and Average limit line.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

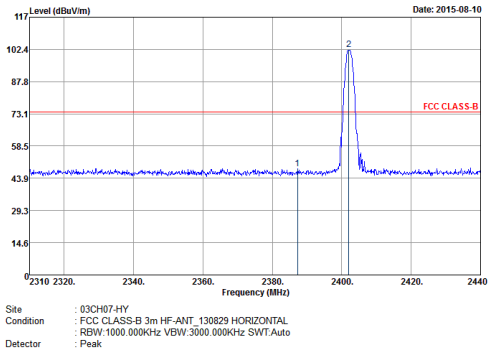
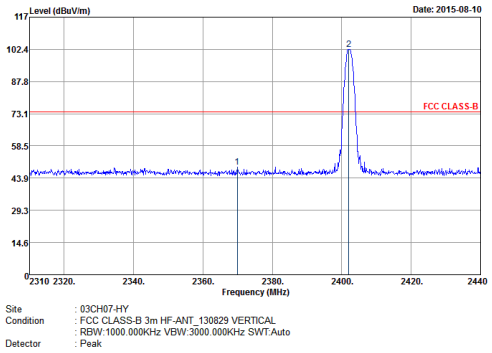
Both peak and average measured complies with the limit line, so test result is "PASS".

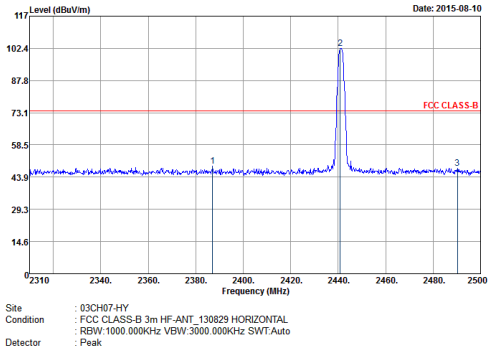
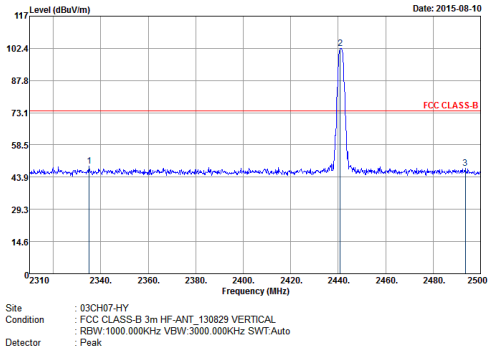
Appendix B. Radiated Spurious Emission

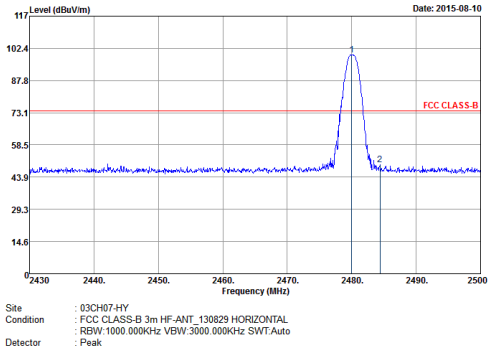
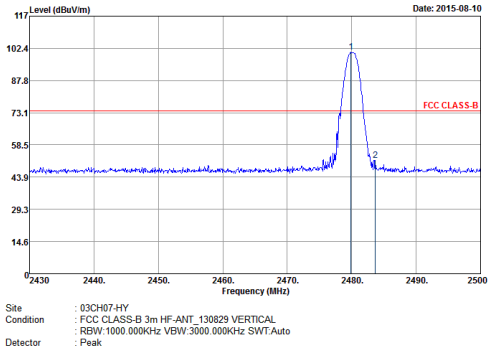
<1Mbps>

2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

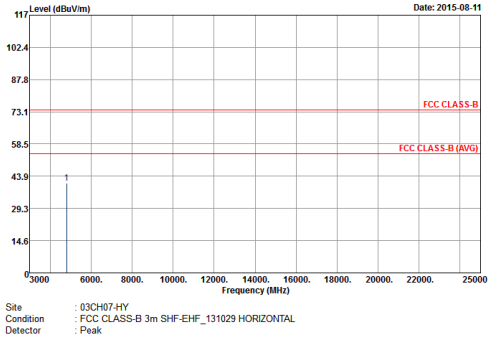
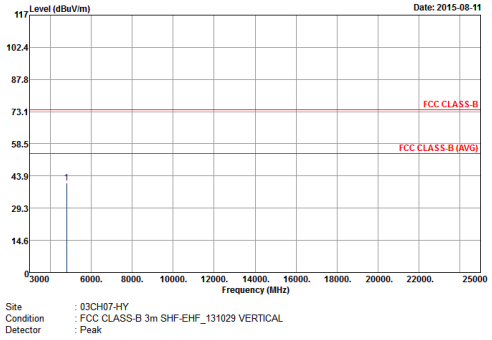
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH00 2402MHz	
1	Horizontal	Vertical
Peak		

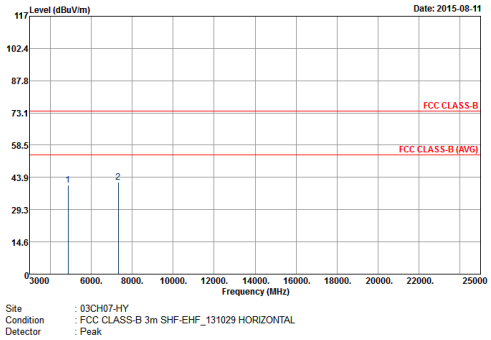
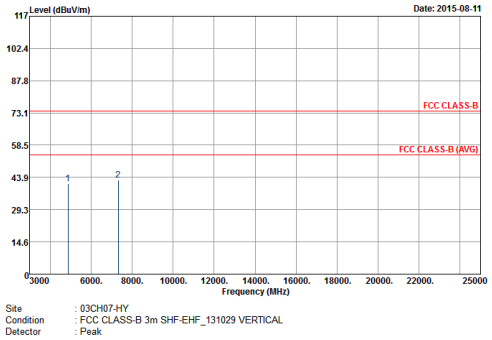
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH39 2441MHz	
1	Horizontal	Vertical
Peak		

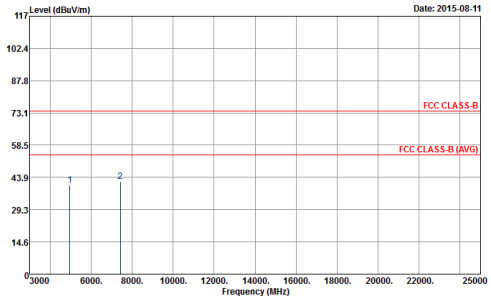
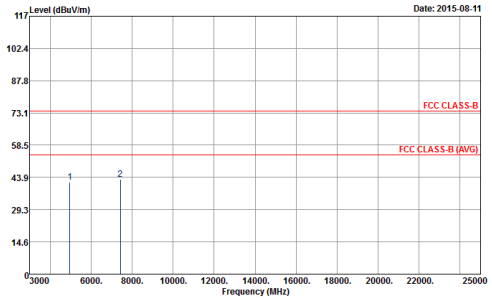
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
1	Horizontal	Vertical
Peak		

2.4GHz 2400~2483.5MHz

BT (Harmonic @ 3m)

BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH00 2402MHz	
1	Horizontal	Vertical
Peak		

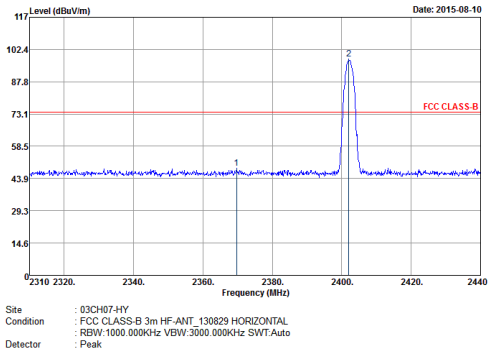
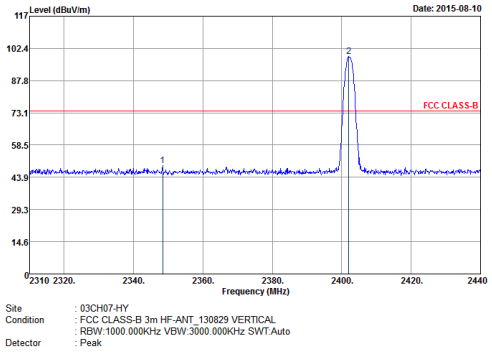
BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH39 2441MHz	
1	Horizontal	Vertical
Peak		

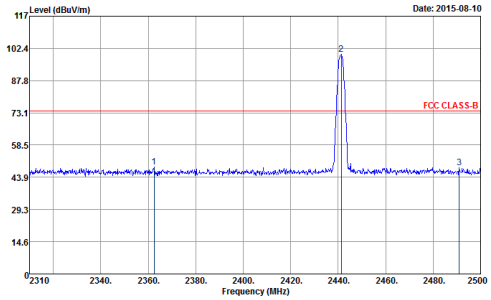
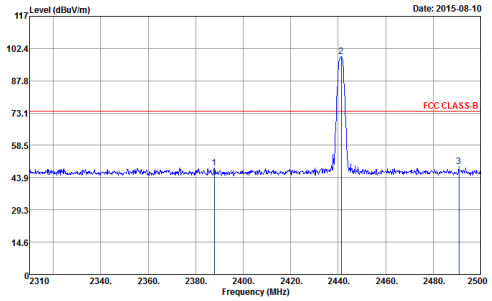
BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH78 2480MHz	
1	Horizontal	Vertical
Peak	 Site : 03CH07-HY Condition : FCC CLASS-B 3m SHF-EHF_131029 HORIZONTAL Detector : Peak	 Site : 03CH07-HY Condition : FCC CLASS-B 3m SHF-EHF_131029 VERTICAL Detector : Peak

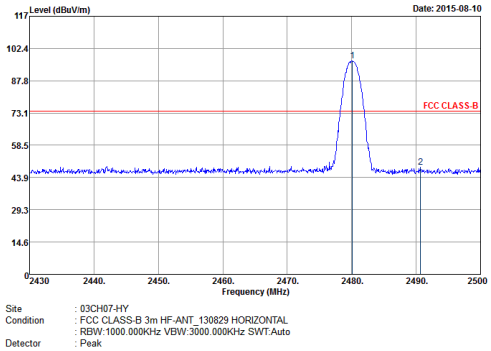
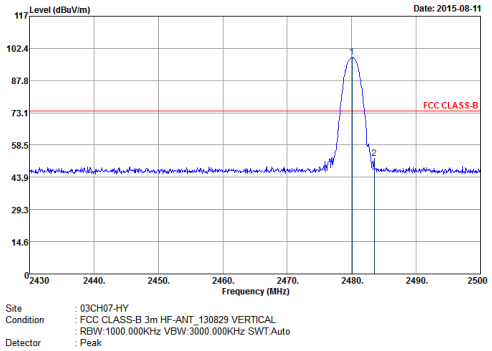
<2Mbps>

2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

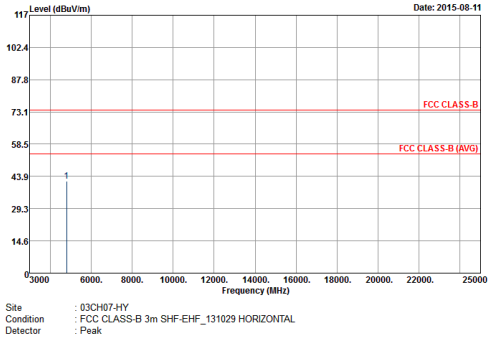
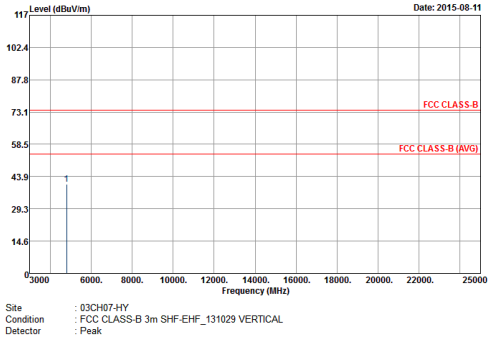
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH00 2402MHz	
1	Horizontal	Vertical
Peak		

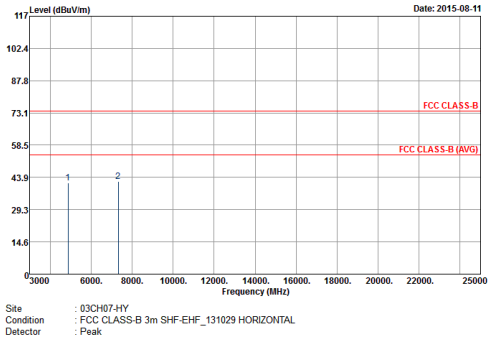
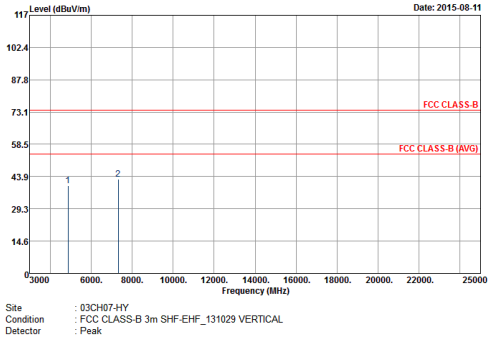
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH39 2441MHz	
1	Horizontal	Vertical
Peak		

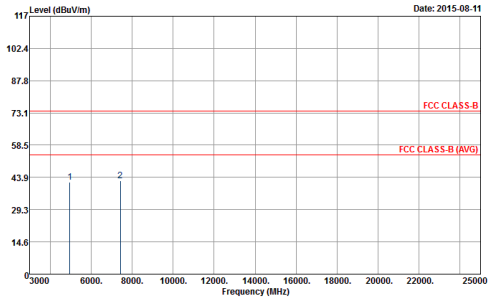
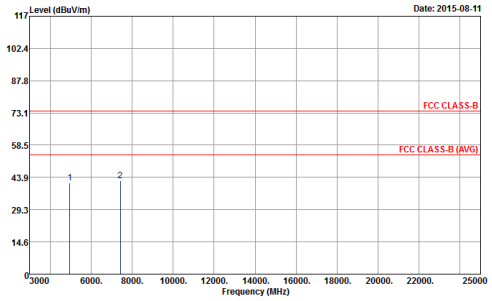
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
1	Horizontal	Vertical
Peak		

2.4GHz 2400~2483.5MHz

BT (Harmonic @ 3m)

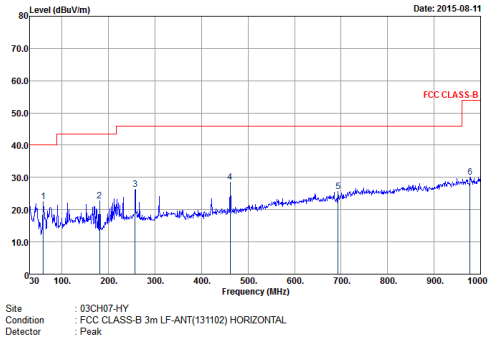
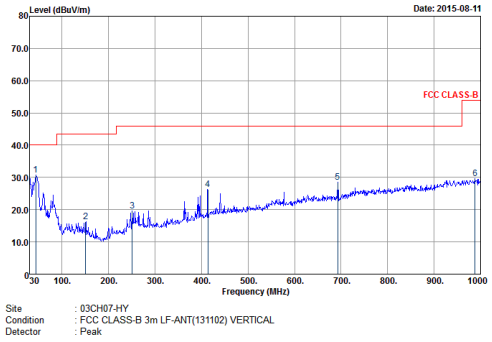
BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH00 2402MHz	
1	Horizontal	Vertical
Peak		

BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH39 2441MHz	
1	Horizontal	Vertical
Peak		

BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH78 2480MHz	
1	Horizontal	Vertical
Peak	 Site : 03CH07-HY Condition : FCC CLASS-B 3m SHF-EHF_131029 HORIZONTAL Detector : Peak	 Site : 03CH07-HY Condition : FCC CLASS-B 3m SHF-EHF_131029 VERTICAL Detector : Peak

Emission below 1GHz

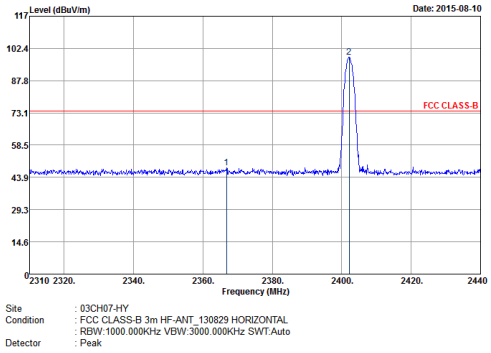
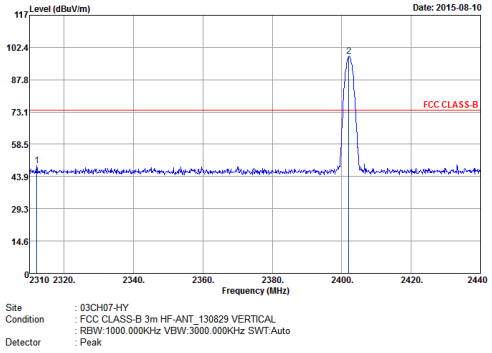
2.4GHz BT (LF)

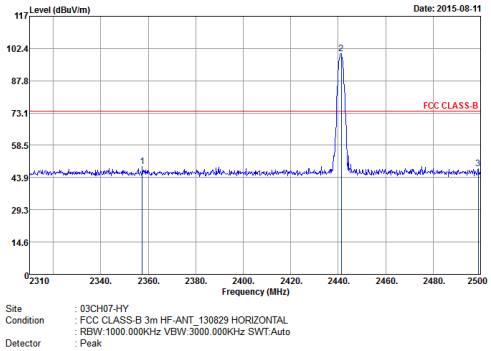
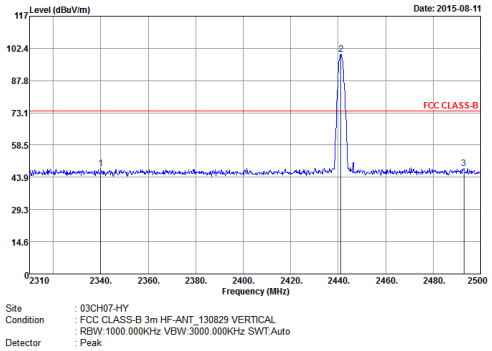
BT	2.4GHz 2400~2483.5MHz	
ANT	BT LF	
1	Horizontal	Vertical
Peak		

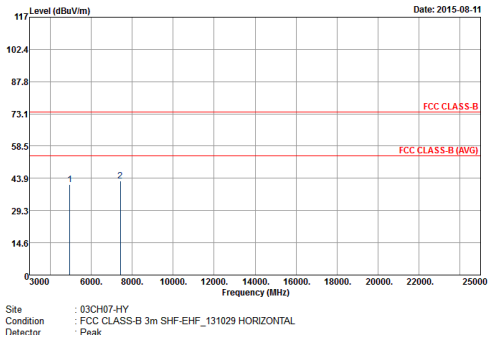
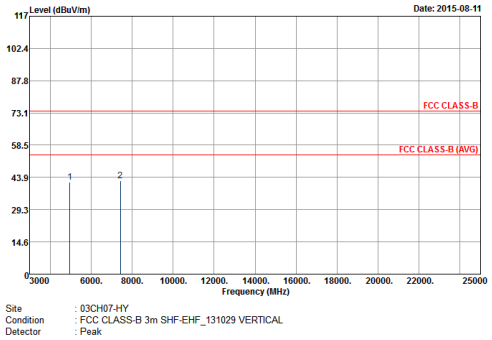
<3Mbps>

2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

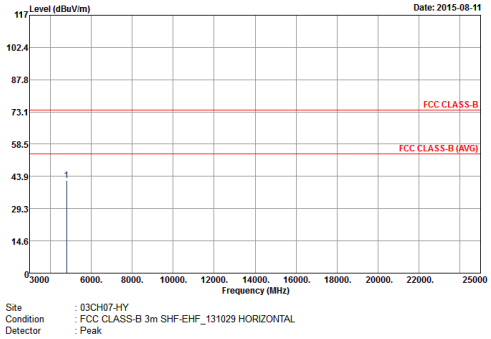
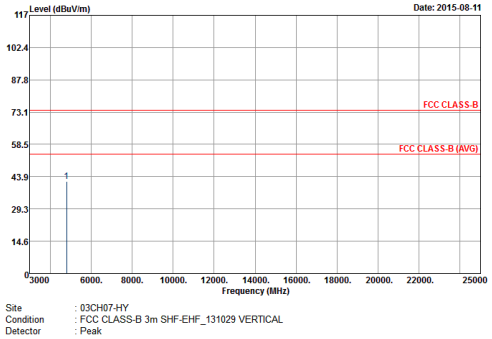
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH00 2402MHz	
1	Horizontal	Vertical
Peak		

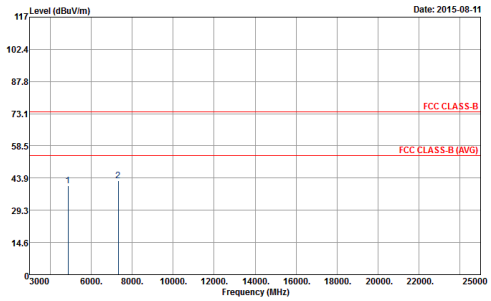
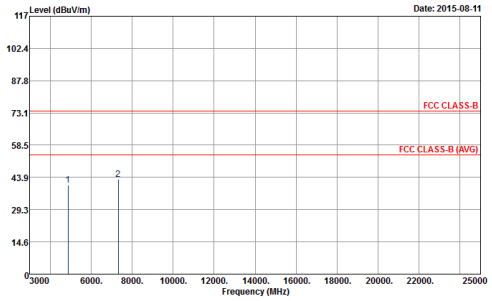
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH39 2441MHz	
1	Horizontal	Vertical
Peak		

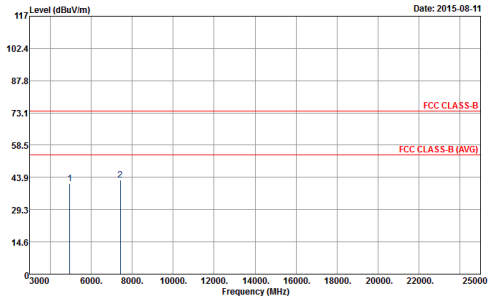
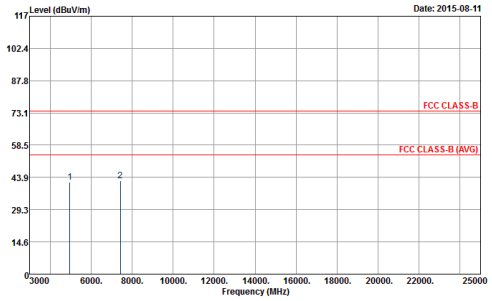
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
1	Horizontal	Vertical
Peak		

2.4GHz 2400~2483.5MHz

BT (Harmonic @ 3m)

BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH00 2402MHz	
1	Horizontal	Vertical
Peak		

BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH39 2441MHz	
1	Horizontal	Vertical
Peak	 Site : 03CH07-HY Condition : FCC CLASS-B 3m SHF-EHF_131029 HORIZONTAL Detector : Peak	 Site : 03CH07-HY Condition : FCC CLASS-B 3m SHF-EHF_131029 VERTICAL Detector : Peak

BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH78 2480MHz	
1	Horizontal	Vertical
Peak	 Site : 03CH07-HY Condition : FCC CLASS-B 3m SHF-EHF_131029 HORIZONTAL Detector : Peak	 Site : 03CH07-HY Condition : FCC CLASS-B 3m SHF-EHF_131029 VERTICAL Detector : Peak