FCC RF Test Report

APPLICANT	:	FUJITSU LIMITED
EQUIPMENT	:	FUJITSU STYLISTIC Q series
BRAND NAME	:	FUJITSU
MODEL NAME	:	Q507
FCC ID	:	EJE-WB0103
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DSS) Spread Spectrum Transmitter

This is a partial report. The product was received on Mar. 28, 2017 and testing was completed on Jun. 02, 2017. 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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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR732858A	Rev. 01	Initial issue of report	Jun. 01, 2017
FR732858A	Rev. 02	Adding AC Conducted Emission test data	Jun. 05, 2017

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(b)(1)	Peak Output Power	≤ 125 mW	Pass	-
3.2	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 6.37 dB at 34.8500 MHz
3.3	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 14.30 dB at 0.150 MHz
3.4	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

FUJITSU LIMITED

1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki, 211-8588 Japan

1.2 Manufacturer

FUJITSU LIMITED

1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki, 211-8588 Japan

1.3 Product Feature of Equipment Under Test

Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac

Product Specification subjective to this standard	
Integrated WLAN Module	Brand Name: Intel Model Name: 7265D2W
Antenna Type	WLAN: PIFA Antenna Bluetooth: PIFA Antenna

1.4 Modification of EUT

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

1.5 Testing Location

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

Note: The test site complies with ANSI C63.4 2014 requirement.

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.	
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958	
Test Site No.	**Sporton Site No.**	**FCC Registration No.**
	03CH03-KS	306251

Note: The test site complies with ANSI C63.4 2014 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 C63.10-2013

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	0	2402	27	2429	54	2456
	1	2403	28	2430	55	2457
	2	2404	29	2431	56	2458
	3	2405	30	2432	57	2459
	4	2406	31	2433	58	2460
	5	2407	32	2434	59	2461
	6	2408	33	2435	60	2462
	7	2409	34	2436	61	2463
	8	2410	35	2437	62	2464
	9	2411	36	2438	63	2465
	10	2412	37	2439	64	2466
	11	2413	38	2440	65	2467
	12	2414	39	2441	66	2468
	13	2415	40	2442	67	2469
	14	2416	41	2443	68	2470
	15	2417	42	2444	69	2471
	16	2418	43	2445	70	2472
	17	2419	44	2446	71	2473
	18	2420	45	2447	72	2474
	19	2421	46	2448	73	2475
	20	2422	47	2449	74	2476
	21	2423	48	2450	75	2477
	22	2424	49	2451	76	2478
	23	2425	50	2452	77	2479
	24	2426	51	2453	78	2480
	25	2427	52	2454	-	-
	26	2428	53	2455	-	-

2.2 Test Mode

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 emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report, 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.

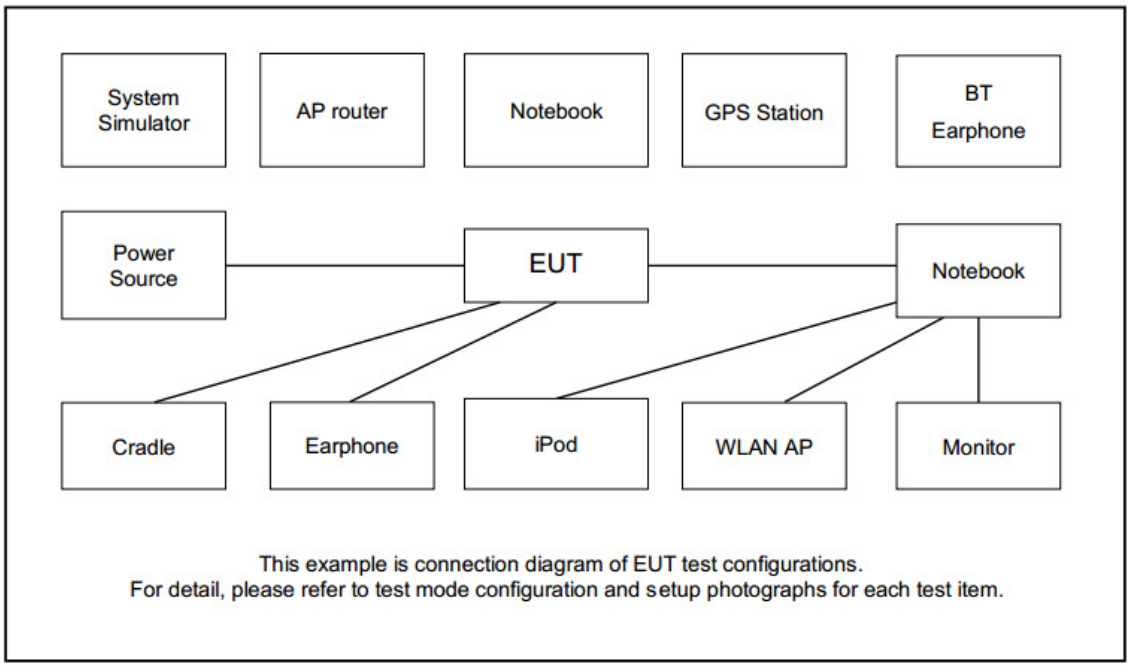
The following summary table is showing all test modes to demonstrate in compliance with the standard.

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**		
	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz		
AC Conducted Emission	Mode 1 :WLAN (2.4GHz) Link + Bluetooth Link + TC + TF		

Remark:

1. TC stands for Test Configuration, and consists of Adapter, USB (USB device), SD Card, earphone, and HDMI Cable.
2. TF stands for Test Function, and consists of H-Pattern, MPEG4 and Camera.
3. 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



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 Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	D-Link	DIR-865L	KA2IR865LA1	N/A	Unshielded, 1.8 m
3.	Notebook	DELL	P20G	FCC DoC/ Contains FCC ID: QDS-BRCM1051	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
5.	LCD Monitor	DELL	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
6.	USB3.0 HD	Lenovo	F310S	FCC DoC	Shielded, 0.5 m	N/A
7.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.5 UT Operation Test Setup

The RF test items, programmed RF utility, “DRTU” installed in the notebook make the EUT provide functions like channel selection and power level for continuous transmitting and receiving signals.

3 Test Result

3.1 Peak Output Power Measurement

3.1.1 Limit of Peak Output Power

Section 15.247 (b) The maximum peak conducted output power of the intentional radiator shall not exceed the following: (1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band 0.125 watts. The power limit for 1Mbps, 2Mbps, 3Mbps and AFH modes are 0.125 watts.

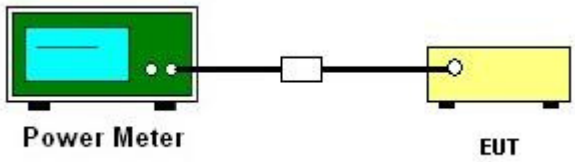
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 7.8.5.
1. 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.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Measure the conducted output power with cable loss and record the results in the test report.
4. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of Peak Output Power

Test Mode :	1Mbps	Temperature :	24~26℃
Test Engineer :	Allen Lin	Relative Humidity :	48~51%

Channel	Frequency (MHz)	RF Power (dBm)		
		GFSK	Max. Limits (dBm)	Pass/Fail
		1 Mbps		
00	2402	6.50	20.97	Pass
39	2441	7.21	20.97	Pass
78	2480	7.70	20.97	Pass

Note: For AFH mode using 20 hopping channels, the maximum output power limit is 20.97dBm.

Test Mode :	2Mbps	Temperature :	24~26℃
Test Engineer :	Allen Lin	Relative Humidity :	48~51%

Channel	Frequency (MHz)	RF Power (dBm)		
		π /4-DQPSK	Max. Limits (dBm)	Pass/Fail
		2 Mbps		
00	2402	3.07	20.97	Pass
39	2441	3.89	20.97	Pass
78	2480	4.56	20.97	Pass

Test Mode :	3Mbps	Temperature :	24~26℃
Test Engineer :	Allen Lin	Relative Humidity :	48~51%

Channel	Frequency (MHz)	RF Power (dBm)		
		8-DPSK	Max. Limits (dBm)	Pass/Fail
		3 Mbps		
00	2402	3.31	20.97	Pass
39	2441	4.10	20.97	Pass
78	2480	4.76	20.97	Pass

3.2 Radiated Band Edges and Spurious Emission Measurement

3.2.1 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 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

3.2.2 Measuring Instruments

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

3.2.3 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

<DH5>

Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.79dB) 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.

<2DH5>

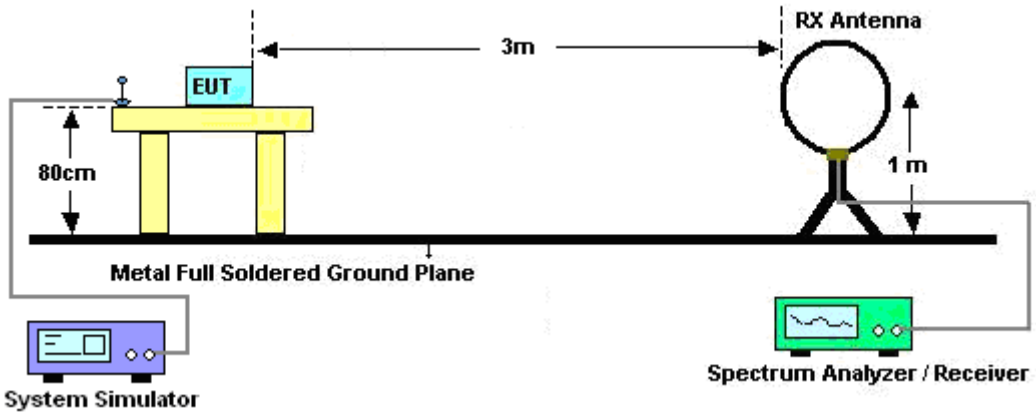
Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.79dB) derived from 20log (dwell time/100ms). This correction is only for signals that hop with the fundamental signal, such as band-edge and harmonic. Other spurious signals that are independent of the hopping signal would not use this correction.

<3DH5>

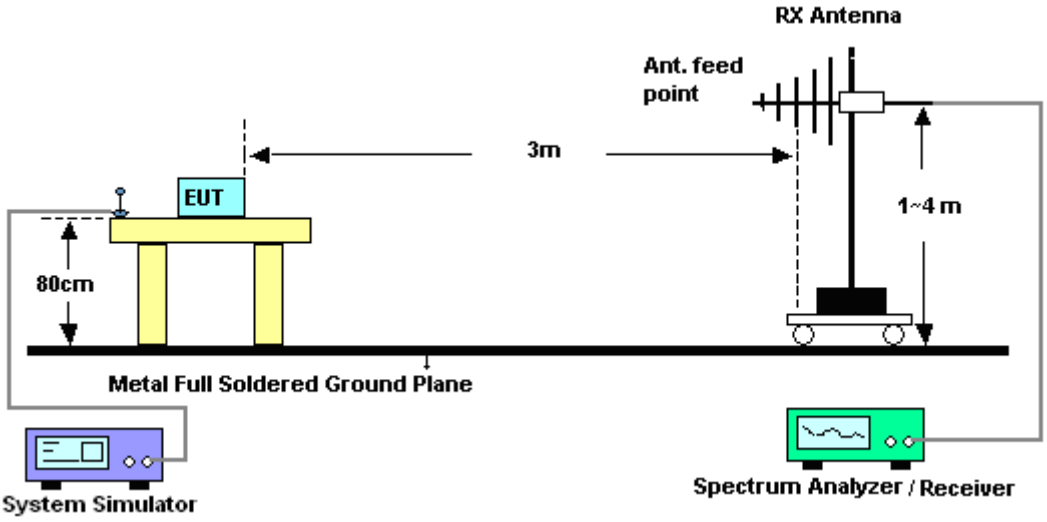
Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.76dB) derived from 20log (dwell time/100ms). This correction is only for signals that hop with the fundamental signal, such as band-edge and harmonic. Other spurious signals that are independent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

3.2.4 Test Setup

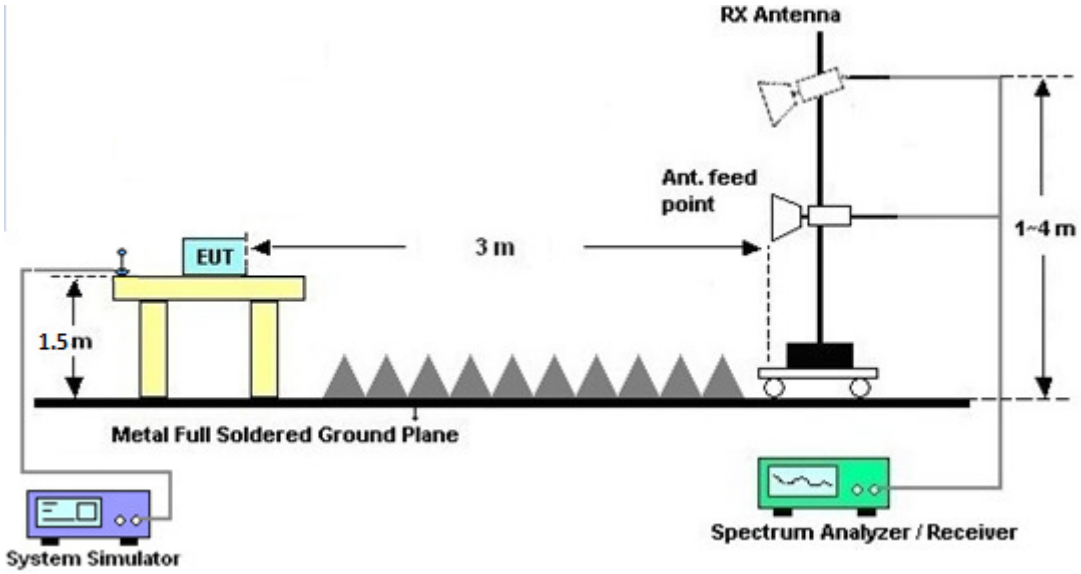
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.2.5 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.

3.2.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A and B.

3.2.7 Duty Cycle

Please refer to Appendix C.

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

Please refer to Appendix A and B.

3.3 AC Conducted Emission Measurement

3.3.1 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.

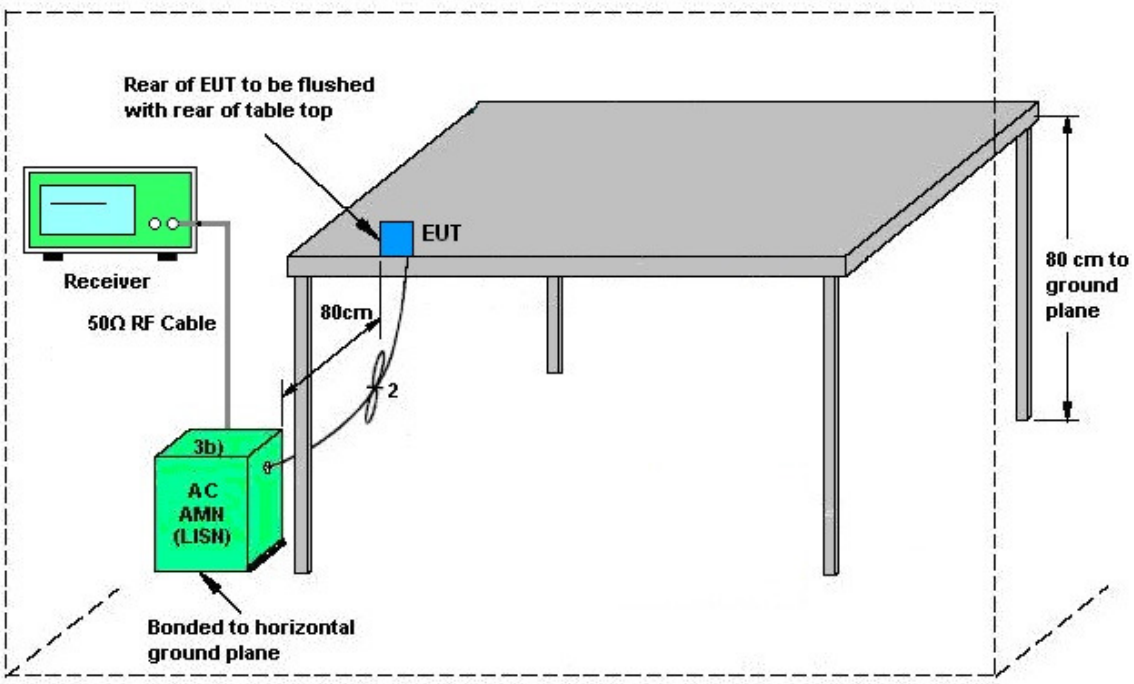
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

7. 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.
8. Connect EUT to the power mains through a line impedance stabilization network (LISN).
9. All the support units are connecting to the other LISN.
10. The LISN provides 50 ohm coupling impedance for the measuring instrument.
11. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
12. Both sides of AC line were checked for maximum conducted interference.
13. The frequency range from 150 kHz to 30 MHz was searched.
14. 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.

3.3.4 Test Setup



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

3.3.5 Test Result of AC Conducted Emission

Please refer to Appendix A.

3.4 Antenna Requirements

3.4.1 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 rule.

3.4.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.4.3 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	Dec. 26, 2016	Apr. 29, 2017	Dec. 25, 2017	Conducted (TH05-HY)
Power Sensor	Agilent	E9327A	US40441548	300MHz~40GHz	Dec. 26, 2016	Apr. 29, 2017	Dec. 25, 2017	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz-40GHz	Jul. 17, 2016	Apr. 29, 2017	Jul. 16, 2017	Conducted (TH05-HY)
BT Base Station(Measure)	Rohde & Schwarz	CBT	101136	BT 3.0	Sep. 21, 2016	Apr. 29, 2017	Sep. 20, 2017	Conducted (TH05-HY)
EMI Test Receiver	Keysight	N9038A	MY56400004	3Hz~8.5GHz;Max 30dBm	Oct. 22, 2016	May 27, 2017 ~ May 29, 2017	Oct. 21, 2017	Radiation (03CH03-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44GHz	Apr. 18, 2017	May 27, 2017 ~ May 29, 2017	Apr. 17, 2018	Radiation (03CH03-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 23, 2016	May 27, 2017 ~ May 29, 2017	Nov. 22, 2017	Radiation (03CH03-KS)
Bilog Antenna	TeseQ	CBL6112D	35406	25MHz-2GHz	Apr. 22, 2017	May 27, 2017 ~ May 29, 2017	Apr. 21, 2018	Radiation (03CH03-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1356	1GHz~18GHz	Apr. 22, 2017	May 27, 2017 ~ May 29, 2017	Apr. 21, 2018	Radiation (03CH03-KS)
SHF-EHF Horn	com-power	AH-840	101070	18GHz ~40GHz	Oct. 19, 2016	May 27, 2017 ~ May 29, 2017	Oct. 18, 2017	Radiation (03CH03-KS)
Amplifier	com-power	PA-103A	161069	1MHz ~1000MHz / 32 dB	Apr. 18, 2017	May 27, 2017 ~ May 29, 2017	Apr. 17, 2018	Radiation (03CH03-KS)
Amplifier	MITEQ	TTA1840-35-HG	1887435	18~40GHz	Oct. 13, 2016	May 27, 2017 ~ May 29, 2017	Oct. 12, 2017	Radiation (03CH03-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Oct. 13, 2016	May 27, 2017 ~ May 29, 2017	Oct. 12, 2017	Radiation (03CH03-KS)
AC Power Source	Chroma	61601	F104090004	N/A	N/A	May 27, 2017 ~ May 29, 2017	N/A	Radiation (03CH03-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	N/A	May 27, 2017 ~ May 29, 2017	N/A	Radiation (03CH03-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	N/A	May 27, 2017 ~ May 29, 2017	N/A	Radiation (03CH03-KS)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jun. 02, 2017	N/A	Conduction (CO05-HY)
DC- LISN	Rohde & Schwarz	ESH3-Z6	100485	0.1MHz-200MHz	Jun. 04, 2016	Jun. 02, 2017	Jun. 03, 2017	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Aug. 30, 2016	Jun. 02, 2017	Aug. 29, 2017	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 29, 2016	Jun. 02, 2017	Nov. 28, 2017	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Dec. 06, 2016	Jun. 02, 2017	Dec. 05, 2017	Conduction (CO05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.7**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.6**

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.5**

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.5**

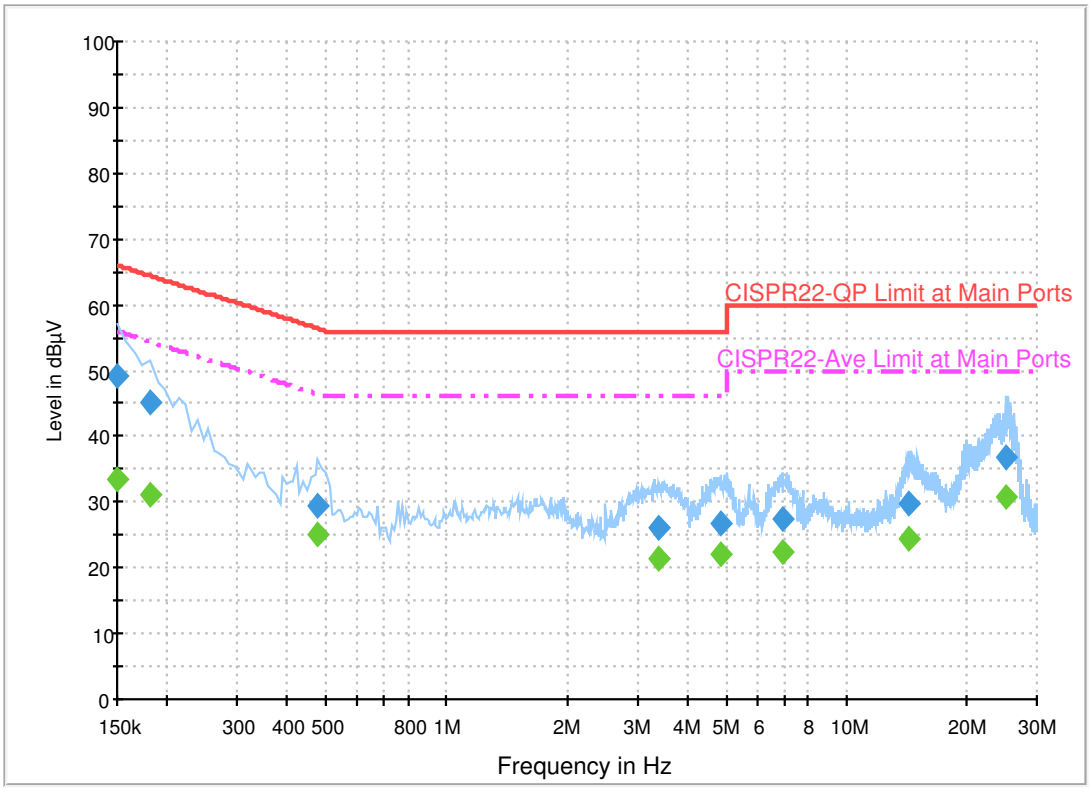
Appendix A. AC Conducted Emission Test Results

Test Engineer :	Marlowe Ho	**Temperature :**	24~25℃
		Relative Humidity :	58~60%

EUT Information

Report NO :	732858
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line

ENV216 Auto Test FCC Power Bar - L



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	49.2	Off	L1	19.6	16.8	66.0
0.182000	45.1	Off	L1	19.6	19.3	64.4
0.478000	29.6	Off	L1	19.6	26.8	56.4
3.382000	26.1	Off	L1	19.6	29.9	56.0
4.846000	26.8	Off	L1	19.8	29.2	56.0
6.934000	27.4	Off	L1	19.9	32.6	60.0
14.350000	29.8	Off	L1	20.3	30.2	60.0
25.198000	36.8	Off	L1	20.8	23.2	60.0

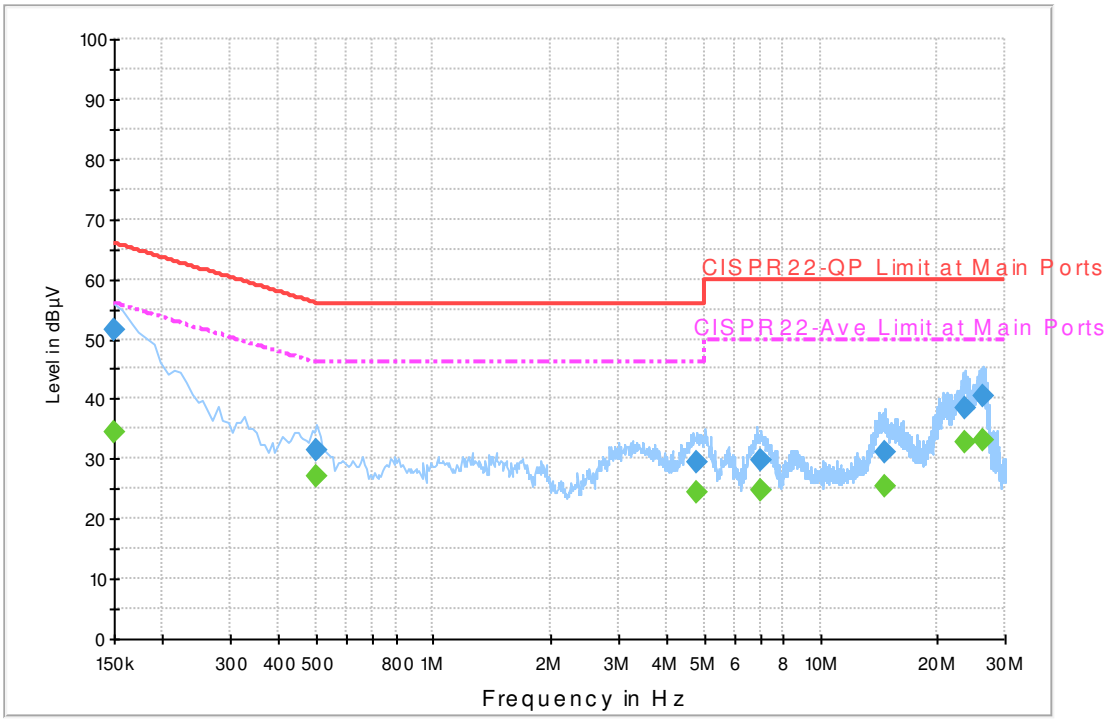
Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	33.5	Off	L1	19.6	22.5	56.0
0.182000	31.2	Off	L1	19.6	23.2	54.4
0.478000	25.0	Off	L1	19.6	21.4	46.4
3.382000	21.3	Off	L1	19.6	24.7	46.0
4.846000	21.9	Off	L1	19.8	24.1	46.0
6.934000	22.5	Off	L1	19.9	27.5	50.0
14.350000	24.5	Off	L1	20.3	25.5	50.0
25.198000	30.6	Off	L1	20.8	19.4	50.0

EUT Information

Report NO :	732858
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Neutral

ENV216 Auto Test FCC Power Bar - N



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	51.7	Off	N	19.5	14.3	66.0
0.502000	31.5	Off	N	19.5	24.5	56.0
4.806000	29.3	Off	N	19.7	26.7	56.0
7.014000	29.9	Off	N	19.9	30.1	60.0
14.758000	31.2	Off	N	20.4	28.8	60.0
23.534000	38.5	Off	N	20.9	21.5	60.0
26.374000	40.4	Off	N	21.0	19.6	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	34.3	Off	N	19.5	21.7	56.0
0.502000	27.0	Off	N	19.5	19.0	46.0
4.806000	24.6	Off	N	19.7	21.4	46.0
7.014000	24.8	Off	N	19.9	25.2	50.0
14.758000	25.4	Off	N	20.4	24.6	50.0
23.534000	32.8	Off	N	20.9	17.2	50.0
26.374000	33.2	Off	N	21.0	16.8	50.0

Appendix B. Radiated Spurious Emission

Test Engineer :	Rich Sun	Temperature :	21~23°C
		Relative Humidity :	41~43%

2.4GHz 2400~2483.5MHz

BT 1Mbps (Band Edge @ 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 CH00 2402MHz		2343.54	48.92	-25.08	74	54.64	25.42	5.41	36.55	360	51	P	H
		2343.54	24.13	-29.87	54	-	-	-	-	-	-	A	H
	*	2402	88.44	-	-	93.59	25.8	5.47	36.42	360	51	P	H
		2402	63.65	-	-	-	-	-	-	-	-	A	H
													H
													H
		2388.39	49.73	-24.27	74	54.88	25.8	5.47	36.42	329	203	P	V
		2388.39	24.94	-29.06	54	-	-	-	-	-	-	A	V
	*	2402	89.71	-	-	94.86	25.8	5.47	36.42	329	203	P	V
		2402	64.92	-	-	-	-	-	-	-	-	A	V
													V
													V
BT CH 39 2441MHz		2378.64	50.24	-23.76	74	55.58	25.67	5.45	36.46	400	48	P	H
		2378.64	25.45	-28.55	54	-	-	-	-	-	-	A	H
	*	2442	92.09	-	-	97.16	25.89	5.49	36.45	400	48	P	H
		2442	67.3	-	-	-	-	-	-	-	-	A	H
		2485.23	49.38	-24.62	74	54.4	25.94	5.51	36.47	400	48	P	H
		2485.23	24.59	-29.41	54	-	-	-	-	-	-	A	H
		2389.17	49.19	-24.81	74	54.34	25.8	5.47	36.42	319	206	P	V
		2389.17	24.4	-29.6	54	-	-	-	-	-	-	A	V
	*	2442	92.21	-	-	97.28	25.89	5.49	36.45	319	206	P	V
		2442	67.42	-	-	-	-	-	-	-	-	A	V
		2497.34	49.11	-24.89	74	54.1	25.97	5.52	36.48	319	206	P	V
		2497.34	24.32	-29.68	54	-	-	-	-	-	-	A	V

BT CH 78 2480MHz	*	2480	89.49	-	-	94.51	25.94	5.51	36.47	362	52	P	H
		2480	64.7	-	-	-	-	-	-	-	-	A	H
		2484.46	49.98	-24.02	74	55	25.94	5.51	36.47	362	52	P	H
		2484.46	25.19	-28.81	54	-	-	-	-	-	-	A	H
													H
													H
	*	2480	92.17	-	-	97.19	25.94	5.51	36.47	302	226	P	V
		2480	67.38	-	-	-	-	-	-	-	-	A	V
		2484.95	51.23	-22.77	74	56.25	25.94	5.51	36.47	302	226	P	V
		2484.95	26.44	-27.56	54	-	-	-	-	-	-	A	V
													V
													V
Remark	1. No other spurious found. 2. 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".

2.4GHz 2400~2483.5MHz

BT 2Mbps (Band Edge @ 3m)

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)
BT CH00 2402MHz		2357.45	49.37	-24.63	74	54.9	25.55	5.43	36.51	360	51	P	H
		2357.45	24.58	-29.42	54	-	-	-	-	-	-	A	H
	*	2402	83.71	-	-	88.86	25.8	5.47	36.42	360	51	P	H
		2402	58.92	-	-	-	-	-	-	-	-	A	H
													H
													H
		2379.29	49.74	-24.26	74	55.08	25.67	5.45	36.46	329	203	P	V
		2379.29	24.95	-29.05	54	-	-	-	-	-	-	A	V
	*	2402	84.88	-	-	90.03	25.8	5.47	36.42	329	203	P	V
		2402	60.09	-	-	-	-	-	-	-	-	A	V
													V
													V
BT CH 39 2441MHz		2374.35	50.43	-23.57	74	55.77	25.67	5.45	36.46	400	48	P	H
		2374.35	25.64	-28.36	54	-	-	-	-	-	-	A	H
	*	2442	87.74	-	-	92.81	25.89	5.49	36.45	400	48	P	H
		2442	62.95	-	-	-	-	-	-	-	-	A	H
		2489.57	49.58	-24.42	74	54.57	25.97	5.52	36.48	400	48	P	H
		2489.57	24.79	-29.21	54	-	-	-	-	-	-	A	H
		2377.21	50.1	-23.9	74	55.44	25.67	5.45	36.46	319	207	P	V
		2377.21	25.31	-28.69	54	-	-	-	-	-	-	A	V
	*	2442	88.15	-	-	93.22	25.89	5.49	36.45	319	207	P	V
		2442	63.36	-	-	-	-	-	-	-	-	A	V
		2492.3	49.3	-24.7	74	54.29	25.97	5.52	36.48	319	207	P	V
		2492.3	24.51	-29.49	54	-	-	-	-	-	-	A	V

BT CH 78 2480MHz	*	2480	84.27	-	-	89.29	25.94	5.51	36.47	362	51	P	H
		2480	59.48	-	-	-	-	-	-	-	-	A	H
		2492.65	49.53	-24.47	74	54.52	25.97	5.52	36.48	362	51	P	H
		2492.65	24.74	-29.26	54	-	-	-	-	-	-	A	H
													H
													H
	*	2480	87.18	-	-	92.2	25.94	5.51	36.47	302	226	P	V
		2480	62.39	-	-	-	-	-	-	-	-	A	V
		2484.74	52.06	-21.94	74	57.08	25.94	5.51	36.47	302	226	P	V
		2484.74	27.27	-26.73	54	-	-	-	-	-	-	A	V
													V
													V
Remark	1. No other spurious found. 2. 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		34.85	27.73	-12.27	40	32.67	25.7	0.71	31.35	-	-	P	H
		46.49	26.41	-13.59	40	38.79	18.2	0.84	31.42	-	-	P	H
		224.97	33.21	-12.79	46	45.85	17.1	1.73	31.47	-	-	P	H
		345.25	36.54	-9.46	46	43.9	21.58	2.29	31.23	100	36	P	H
		599.39	33.7	-12.3	46	38.14	24.21	3.07	31.72			P	H
		800.18	33.21	-12.79	46	32.6	28	3.59	30.98			P	H
												P	H
												P	H
												P	H
												P	H
												P	H
												P	H
		34.85	33.63	-6.37	40	38.57	25.7	0.71	31.35	100	355	P	V
		45.52	26.99	-13.01	40	38.89	18.7	0.83	31.43	-	-	P	V
		199.75	31.4	-12.1	43.5	44.16	17	1.73	31.49	-	-	P	V
		233.7	31.71	-14.29	46	44.31	17.13	1.73	31.46	-	-	P	V
		309.36	35.19	-10.81	46	44.42	19.94	2.17	31.34	-	-	P	V
		600.36	30.91	-15.09	46	35.37	24.2	3.07	31.73	-	-	P	V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against 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".

2.4GHz 2400~2483.5MHz

BT 3Mbps (Band Edge @ 3m)

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)
BT CH00 2402MHz		2373.44	49.04	-24.96	74	54.38	25.67	5.45	36.46	360	51	P	H
		2373.44	24.28	-29.72	54	-	-	-	-	-	-	A	H
	*	2402	83.66	-	-	88.81	25.8	5.47	36.42	360	51	P	H
		2402	58.9	-	-	-	-	-	-	-	-	A	H
													H
													H
		2363.43	49.4	-24.6	74	54.93	25.55	5.43	36.51	329	203	P	V
		2363.43	24.64	-29.36	54	-	-	-	-	-	-	A	V
	*	2402	84.65	-	-	89.8	25.8	5.47	36.42	329	203	P	V
		2402	59.89	-	-	-	-	-	-	-	-	A	V
													V
													V
BT CH 39 2441MHz		2337.3	49.56	-24.44	74	55.28	25.42	5.41	36.55	400	48	P	H
		2337.3	24.8	-29.2	54	-	-	-	-	-	-	A	H
	*	2442	87.81	-	-	92.88	25.89	5.49	36.45	400	48	P	H
		2442	63.05	-	-	-	-	-	-	-	-	A	H
		2495.17	49.91	-24.09	74	54.9	25.97	5.52	36.48	400	48	P	H
		2495.17	25.15	-28.85	54	-	-	-	-	-	-	A	H
		2338.6	49.35	-24.65	74	55.07	25.42	5.41	36.55	319	207	P	V
		2338.6	24.59	-29.41	54	-	-	-	-	-	-	A	V
	*	2442	88.36	-	-	93.43	25.89	5.49	36.45	319	207	P	V
		2442	63.6	-	-	-	-	-	-	-	-	A	V
		2493.14	49.12	-24.88	74	54.11	25.97	5.52	36.48	319	207	P	V
		2493.14	24.36	-29.64	54	-	-	-	-	-	-	A	V

BT CH 78 2480MHz	*	2480	84.64	-	-	89.66	25.94	5.51	36.47	362	51	P	H
		2480	59.88	-	-	-	-	-	-	-	-	A	H
		2484.74	49.87	-24.13	74	54.89	25.94	5.51	36.47	362	51	P	H
		2484.74	25.11	-28.89	54	-	-	-	-	-	-	A	H
													H
													H
	*	2480	87.6	-	-	92.62	25.94	5.51	36.47	302	226	P	V
		2480	62.84	-	-	-	-	-	-	-	-	A	V
		2485.23	50.59	-23.41	74	55.61	25.94	5.51	36.47	302	226	P	V
		2485.23	25.83	-28.17	54	-	-	-	-	-	-	A	V
													V
													V

Remark

1. No other spurious found.
2. 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)

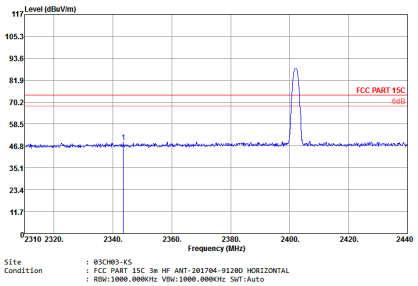
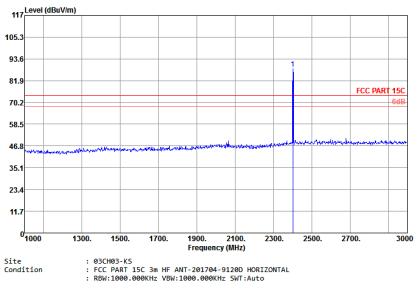
Both peak and average measured complies with the limit line, so test result is "PASS".

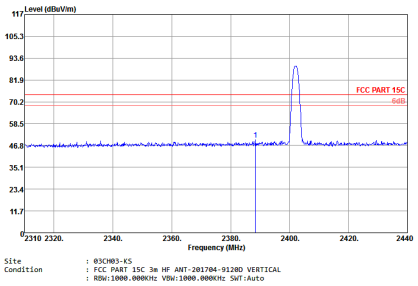
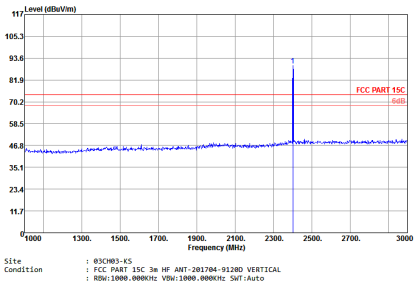
Appendix C. Radiated Spurious Emission Plots

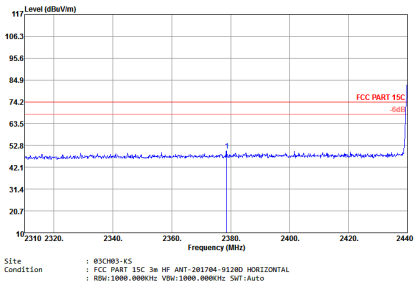
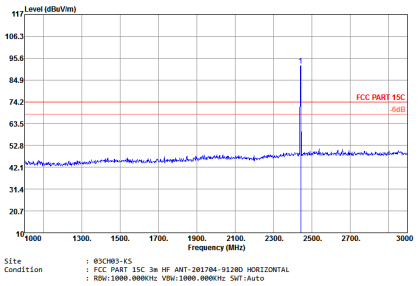
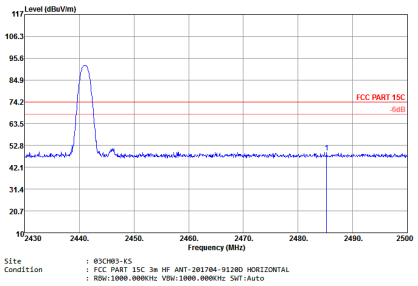
Test Engineer :	Rich Sun	Temperature :	21~23°C
		Relative Humidity :	41~43%

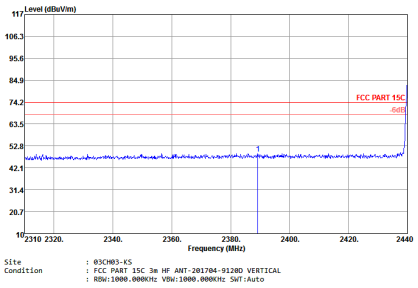
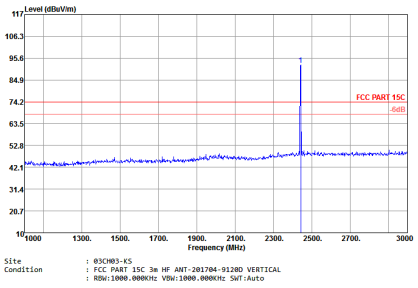
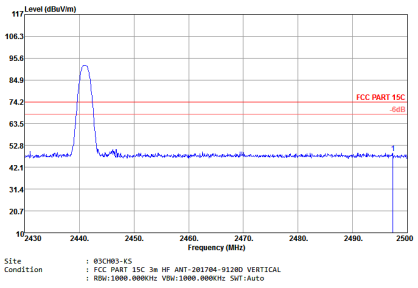
2.4GHz 2400~2483.5MHz

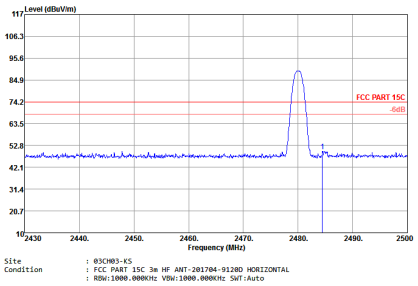
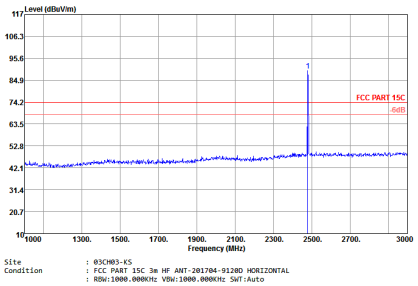
BT 1Mbps (Band Edge @ 3m)

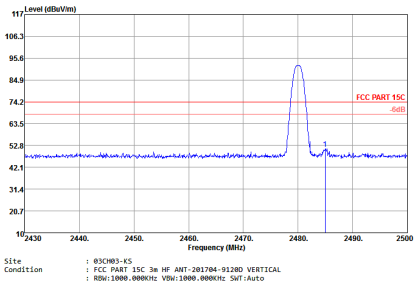
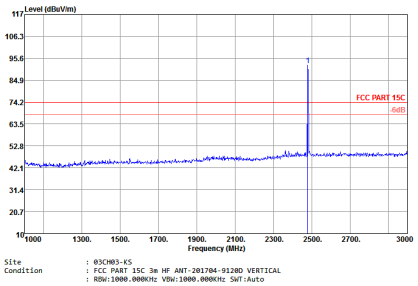
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH00 2402MHz	
	Horizontal	Fundamental
Peak		

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

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH39 2441MHz	
	Horizontal	Fundamental
Peak		
Peak		Left blank

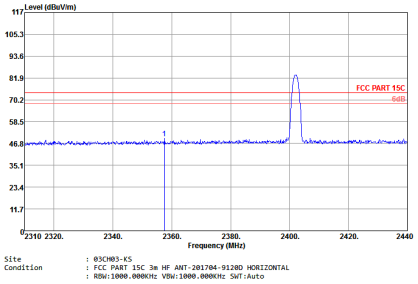
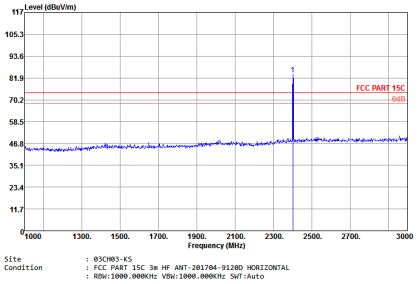
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH39 2441MHz	
	Vertical	Fundamental
Peak		
Peak		Left blank

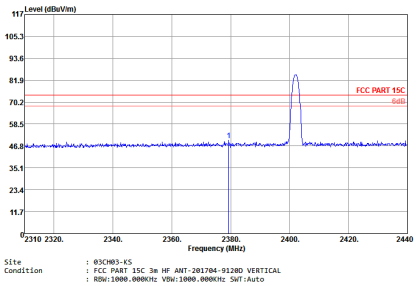
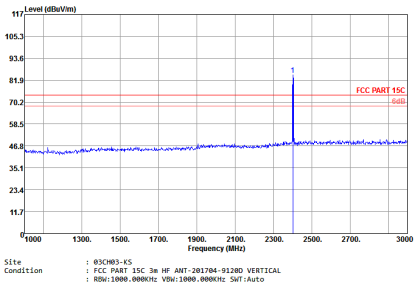
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH78 2480MHz	
	Horizontal	Fundamental
Peak		

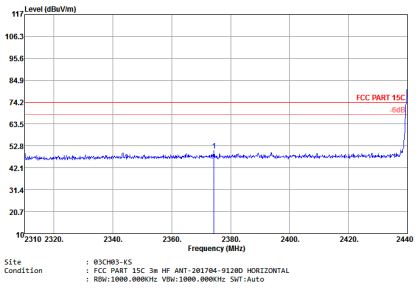
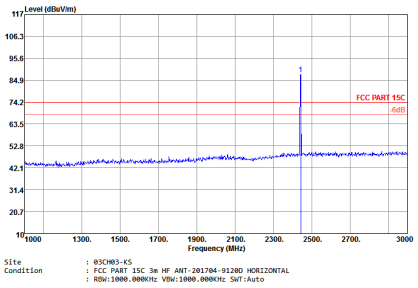
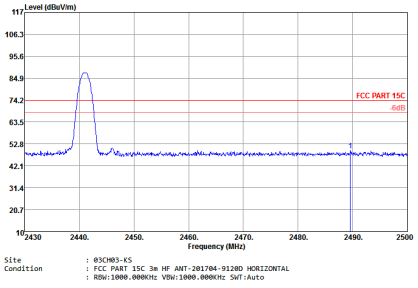
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH78 2480MHz	
	Vertical	Fundamental
Peak		

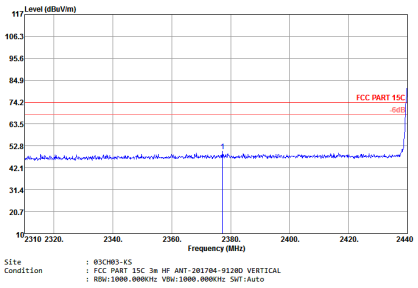
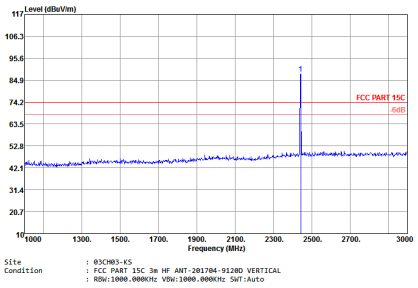
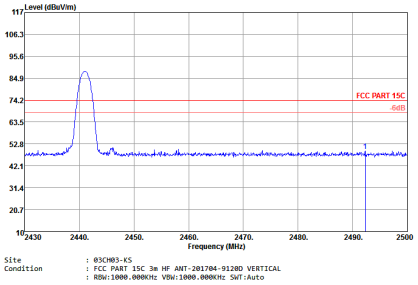
2.4GHz 2400~2483.5MHz

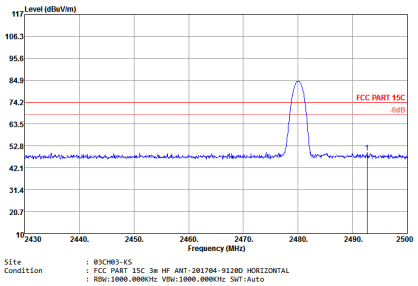
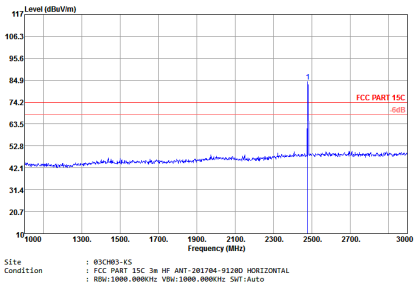
BT 2Mbps (Band Edge @ 3m)

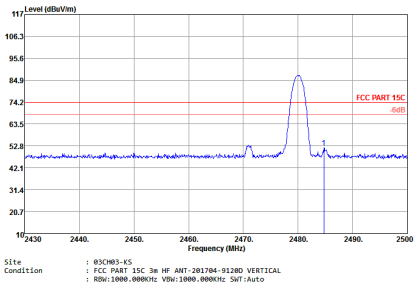
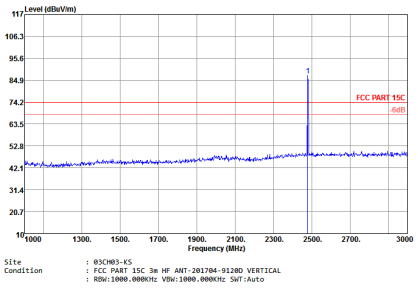
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH00 2402MHz	
	Horizontal	Fundamental
Peak		

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

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH39 2441MHz	
	Horizontal	Fundamental
Peak		
Peak		Left blank

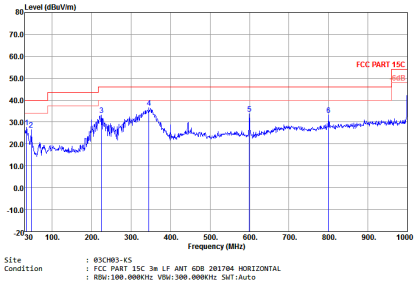
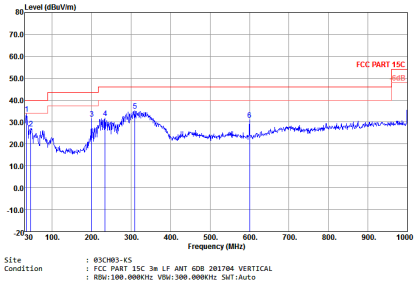
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH39 2441MHz	
	Vertical	Fundamental
Peak		
Peak		Left blank

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

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

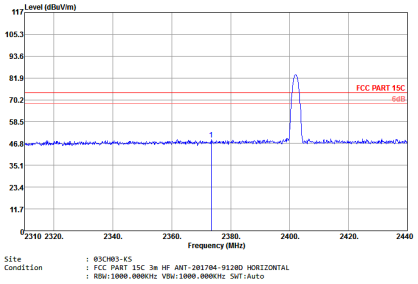
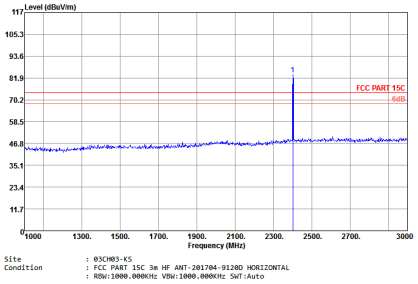
Emission below 1GHz

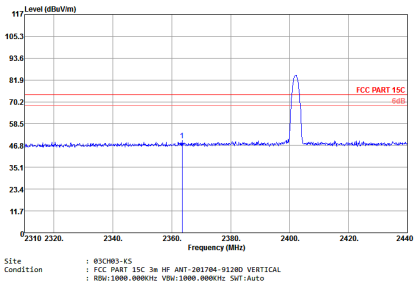
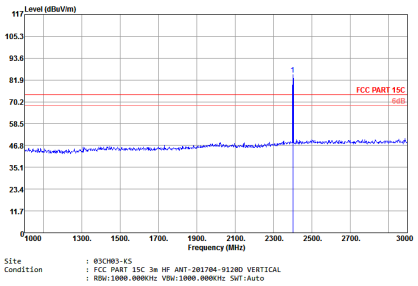
2.4GHz BT (LF)

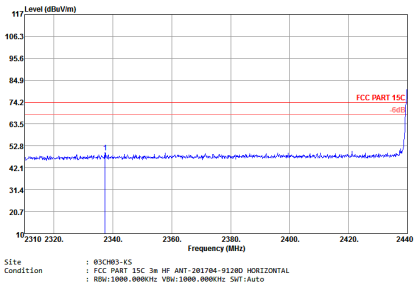
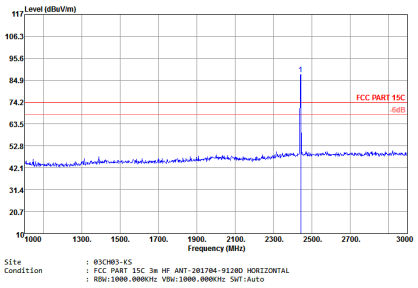
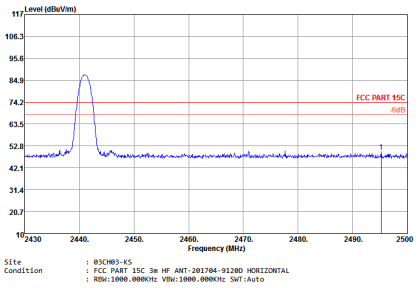
BT	2.4GHz 2400~2483.5MHz	
	BT LF	
	Horizontal	Vertical
QP / Peak		

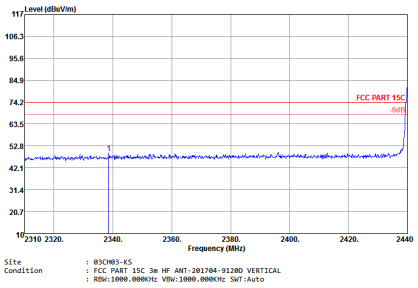
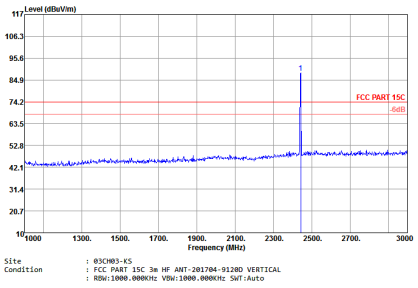
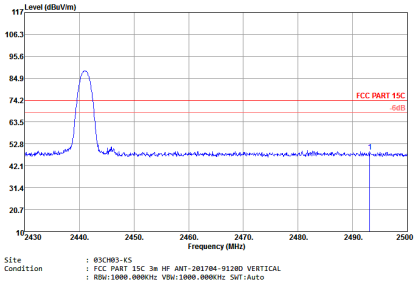
2.4GHz 2400~2483.5MHz

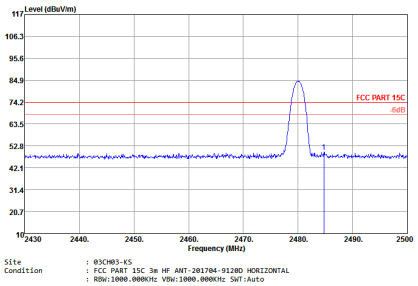
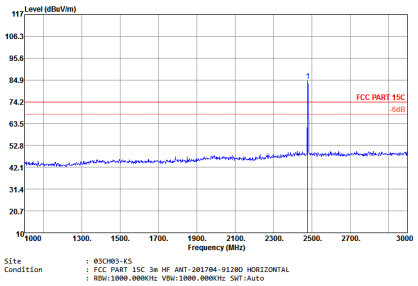
BT 3Mbps (Band Edge @ 3m)

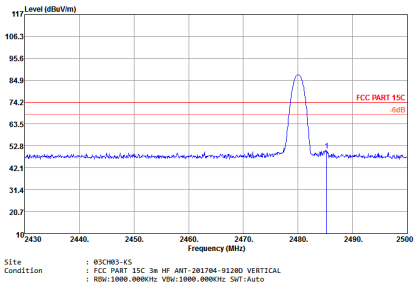
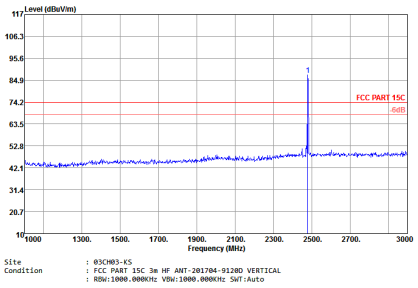
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH00 2402MHz	
	Horizontal	Fundamental
Peak		

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

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH39 2441MHz	
	Horizontal	Fundamental
Peak		
Peak		Left blank

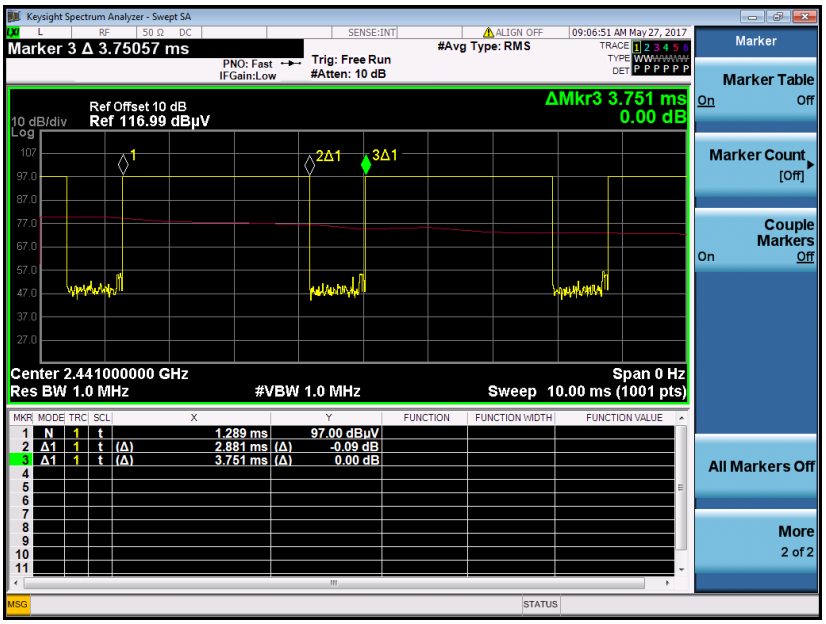
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH39 2441MHz	
	Vertical	Fundamental
Peak		
Peak		Left blank

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

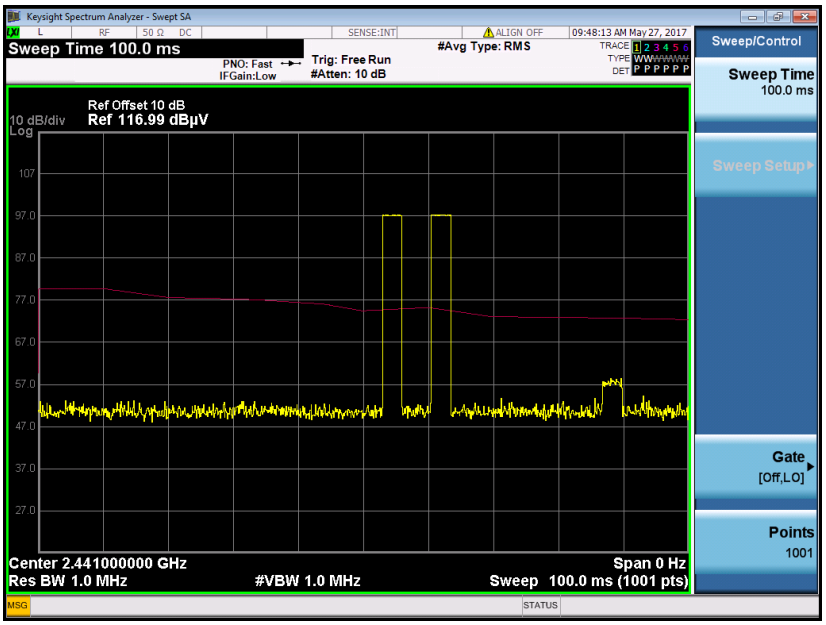
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH78 2480MHz	
	Vertical	Fundamental
Peak		

Appendix D. Duty Cycle Plots

DH5 on time (One Pulse) Plot on Channel 39



on time (Count Pulses) Plot on Channel 39



Note:

1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.88 / 100 = 5.76 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.79 dB
3. DH5 as 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

2.88 ms x 20 channels = 57.6 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

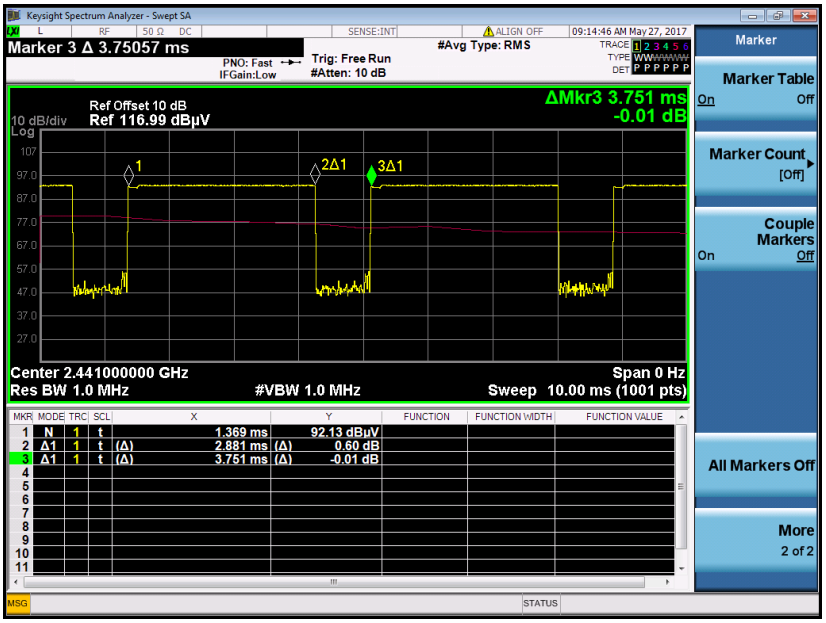
Thus, the maximum possible ON time:

2.88 ms x 2 = 5.76 ms

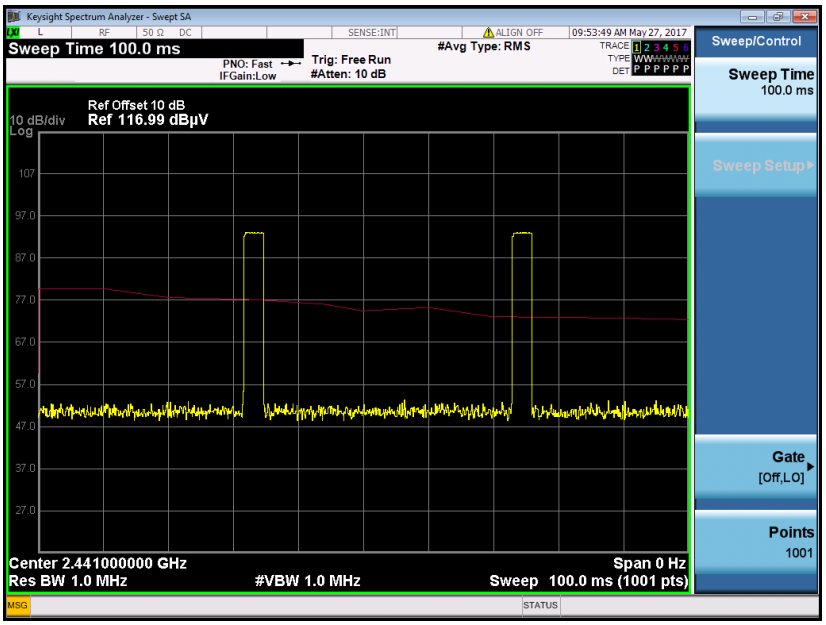
Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

20 x log(5.76 ms/100ms) = -24.79 dB

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



on time (Count Pulses) Plot on Channel 39



Note:

4. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.88 / 100 = 5.76 %
5. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.79 dB
6. 2DH5 as 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

2.88 ms x 20 channels = 57.6 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

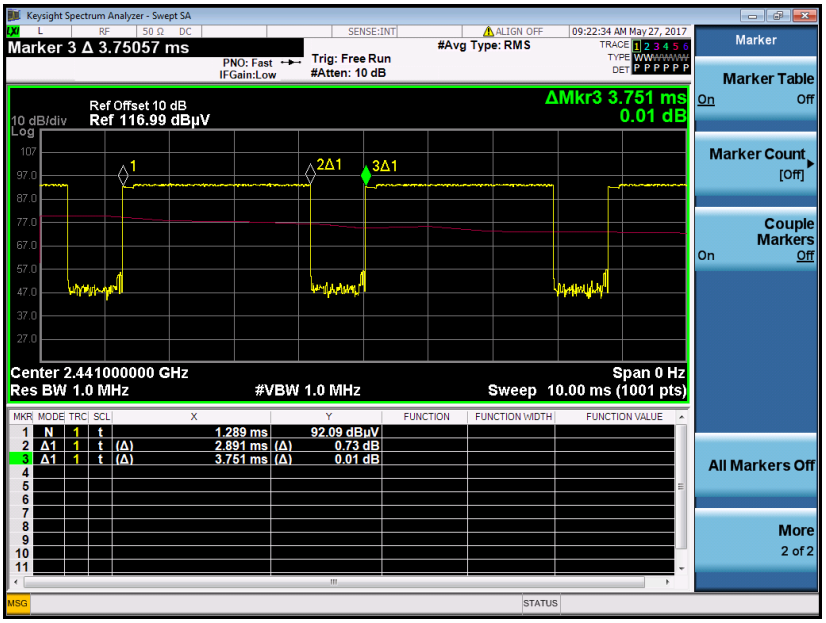
Thus, the maximum possible ON time:

2.88 ms x 2 = 5.76 ms

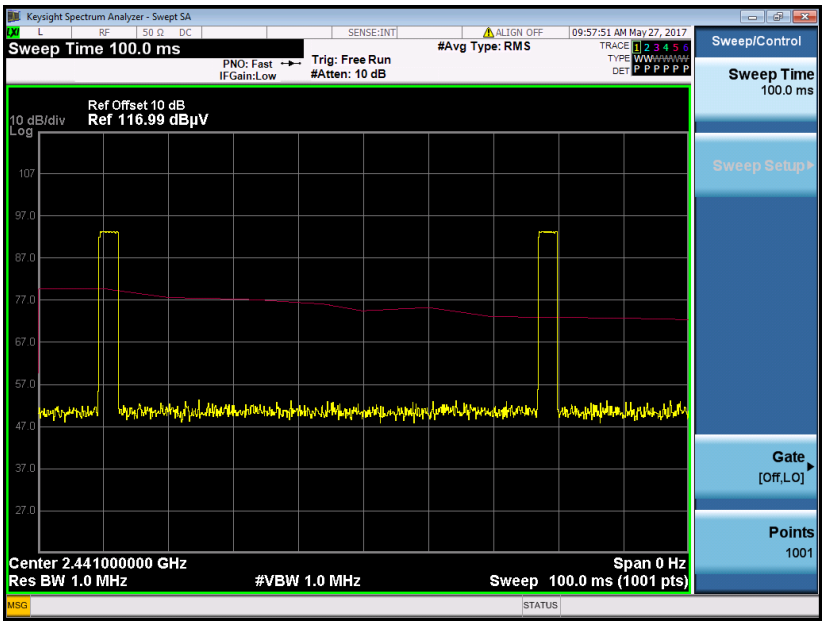
Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

20 x log(5.76 ms/100ms) = -24.79 dB

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



on time (Count Pulses) Plot on Channel 39



Note:

7. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.89 / 100 = 5.78 %
8. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.76 dB
9. 3DH5 as 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