



FCC RF Test Report

APPLICANT : Qualcomm Atheros, Inc.
EQUIPMENT : 802.11a/b/g/n/ac + BT 4.1 M.2 2230 Type Card
BRAND NAME : Qualcomm Atheros
MODEL NAME : QCNFA364A
FCC ID : PPD-QCNFA364AH
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was installed into Notebook Computer (Brand Name: Lenovo, Model Name: Lenovo Legion Y920-17IKB Laptop, 80YW) during test.

The product was received on Feb. 18, 2017 and testing was completed on Mar. 13, 2017. We, Sporton International (KunShan) 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 (KunShan) INC., the test report shall not be reproduced except in full.

Prepared by: James Huang / Manager

Approved by: Jones Tsai / Manager



Sporton International (KunShan) INC.
No.3-2, Pingxiang Road, Kunshan Development Zone, Jiangsu, China



TABLE OF CONTENTS

SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION.....	5
1.1 Applicant	5
1.2 Product Feature of Equipment Under Test.....	5
1.3 Product Specification of Equipment Under Test.....	5
1.4 Modification of EUT	6
1.5 Testing Location	6
1.6 Applicable Standards.....	6
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST.....	7
2.1 Descriptions of Test Mode	7
2.2 Test Mode	7
2.3 Connection Diagram of Test System.....	8
2.4 EUT Operation Test Setup	8
3 TEST RESULT	9
3.1 Peak and Average Output Power Measurement.....	9
3.2 Radiated Band Edges and Spurious Emission Measurement	11
3.3 Antenna Requirements.....	15
4 LIST OF MEASURING EQUIPMENT.....	16
5 UNCERTAINTY OF EVALUATION.....	17
APPENDIX A. RADIATED SPURIOUS EMISSION	
APPENDIX B. RADIATED SPURIOUS EMISSION PLOTS	
APPENDIX C. DUTY CYCLE PLOTS	
APPENDIX D. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR721810B	Rev. 01	Initial issue of report	Apr. 07, 2017



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
-	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	1
-	-	99% Bandwidth	-	Pass	1
3.1	15.247(b)(3)	Peak and Average Output Power	$\leq 30\text{dBm}$	Pass	-
-	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	1
-	15.247(d)	Conducted Band Edges and Spurious Emission	$\leq 20\text{dBc}$	Pass	1
3.2	15.247(d)	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 4.64 dB at 31.940 MHz
-	15.207	AC Conducted Emission	15.207(a)	Pass	1
3.3	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-
Remark 1: All conducted test items were leverage from module RF report which can refer to Report No. "RF150107E07B-3".					



1 General Description

1.1 Applicant

Qualcomm Atheros, Inc.

1700 Technology Drive, San Jose, CA 95110

1.2 Product Feature of Equipment Under Test

Product Feature	
Equipment	802.11a/b/g/n/ac + BT 4.1 M.2 2230 Type Card
Brand Name	Qualcomm Atheros
Model Name	QCNFA364A
FCC ID	PPD-QCNFA364AH
EUT supports Radios application	WLAN 2.4GHz 802.11b/g/n/ac HT20/HT40/VHT20/VHT40 WLAN 5GHz 802.11a/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth v3.0+EDR, Bluetooth v4.0 LE, Bluetooth v4.1 LE
EUT Stage	Identical Prototype

Host Product Feature	
Equipment	Notebook Computer
Brand Name	Lenovo
Model Name	Lenovo Legion Y920-17IKB Laptop, 80YW
Applicant	Lenovo (Shanghai) Electronics Technology Co., Ltd. NO.68 BUILDING, 199 FENJU RD, China (Shanghai) Pilot Free Trade Zone, Shanghai, 200131 China
Manufacturer	Lenovo PC HK Limited 23/F, Lincoln House, Taikoo Place, 979 King's Road, Quarry Bay Hong Kong

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

1.3 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	2402 MHz ~ 2480 MHz
Number of Channels	40
Carrier Frequency of Each Channel	40 Channel(37 hopping + 3 advertising channel)
Antenna Type / Gain	PIFA Antenna with gain -5.75 dBi
Type of Modulation	Bluetooth LE : GFSK



1.4 Modification of EUT

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

1.5 Testing Location

Test Site	Sporton International (KunShan) INC.	
Test Site Location	No.3-2, Pingxiang Road, Kunshan Development Zone, Jiangsu, China 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
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05
- ♦ 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 Descriptions of Test Mode

The RF output power was recorded in the following table:

Channel	Frequency	Bluetooth LE RF Peak Output Power
		Data Rate / Modulation
		GFSK
		1Mbps
Ch00	2402MHz	-1.01 dBm
Ch19	2440MHz	-0.82 dBm
Ch39	2480MHz	-0.44 dBm

Channel	Frequency	Bluetooth LE RF Average Output Power
		Data Rate / Modulation
		GFSK
		1Mbps
Ch00	2402MHz	-1.78 dBm
Ch19	2440MHz	-1.54 dBm
Ch39	2480MHz	-1.33 dBm

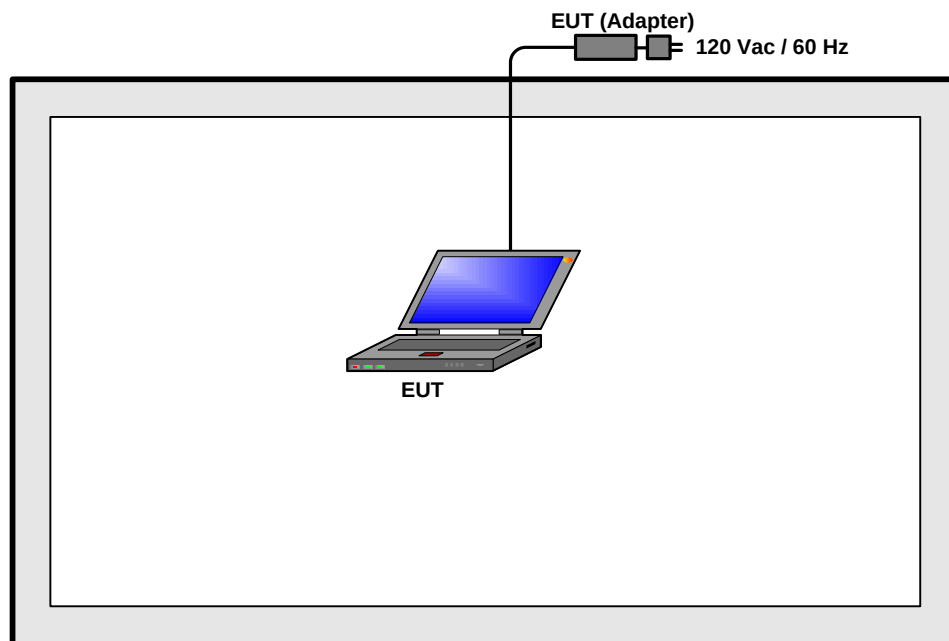
The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

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	Bluetooth – LE
Radiated TCs	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps
	Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps
	Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps

2.3 Connection Diagram of Test System



2.4 EUT Operation Test Setup

For Bluetooth LE test items, an engineering test program was provided and enabled to make EUT transmitting and receiving signals.

3 Test Result

3.1 Peak and Average Output Power Measurement

3.1.1 Limit of Peak and Average Output Power

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

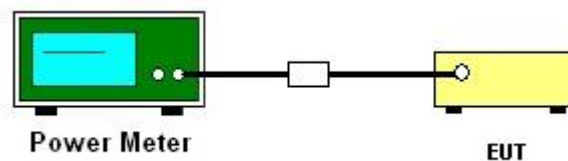
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v03r05.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of Peak Output Power

Test Mode :	1Mbps	Temperature :	21~25°C
Test Engineer :	Silent Hai	Relative Humidity :	51~55%

Channel	Frequency (MHz)	RF Power (dBm)		
		GFSK	Max. Limits (dBm)	Pass/Fail
		1 Mbps		
Ch00	2402MHz	-1.01	30.00	Pass
Ch19	2440MHz	-0.82	30.00	Pass
Ch39	2480MHz	-0.44	30.00	Pass

3.1.6 Test Result of Average Output Power

Test Mode :	1Mbps	Temperature :	21~25°C
Test Engineer :	Silent Hai	Relative Humidity :	51~55%

Channel	Frequency (MHz)	RF Power (dBm)		
		GFSK	Max. Limits (dBm)	Pass/Fail
		1 Mbps		
Ch00	2402MHz	-1.78	-	-
Ch19	2440MHz	-1.54	-	-
Ch39	2480MHz	-1.33	-	-

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. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the 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 section 4.0 of List of Measuring Equipment of this test report is used for test.

3.2.3 Test Procedures

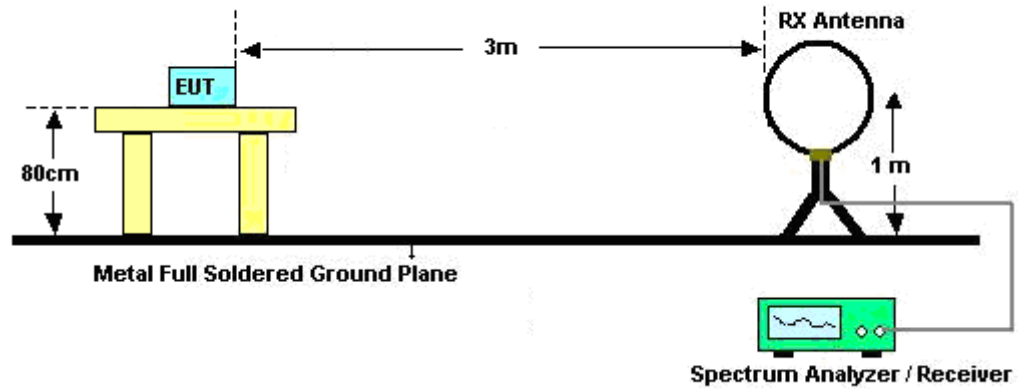
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.

For average measurement:

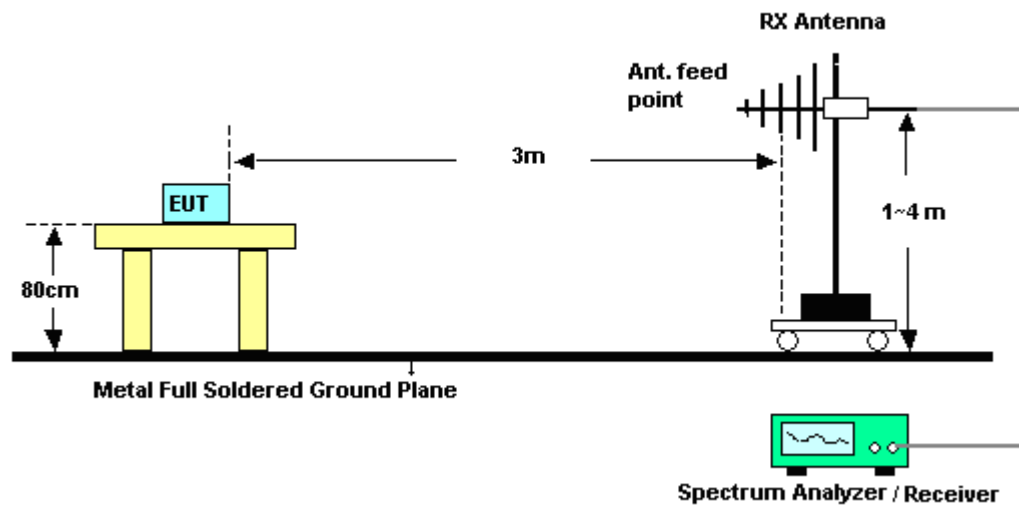
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.2.4 Test Setup

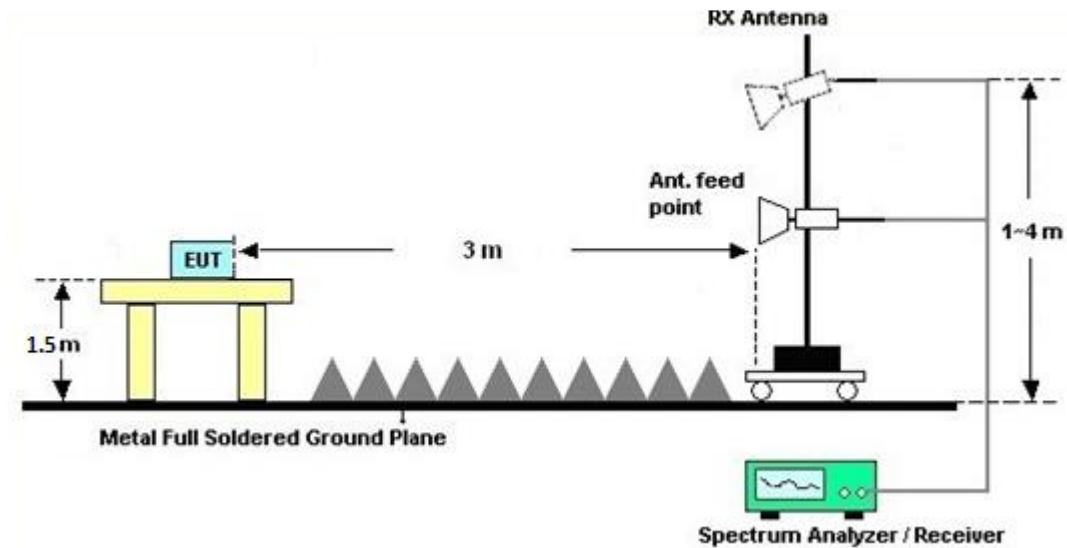
For radiated emissions below 30MHz



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 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 Antenna Requirements

3.3.1 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.

3.3.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.3.3 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	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 19, 2017	Mar. 06, 2017	Jan. 19, 2018	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 19, 2017	Mar. 06, 2017	Jan. 19, 2018	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz; Max 30dBm	Aug. 09, 2016	Mar. 13, 2017	Aug. 08, 2017	Radiation (03CH03-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz~44GHz	Apr. 22, 2016	Mar. 13, 2017	Apr. 21, 2017	Radiation (03CH03-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 23, 2016	Mar. 13, 2017	Nov. 22, 2017	Radiation (03CH03-KS)
Bilog Antenna	TeseQ	CBL6112D	35406	25MHz~2GHz	Apr. 16, 2016	Mar. 13, 2017	Apr. 15, 2017	Radiation (03CH03-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1356	1GHz~18GHz	Apr. 16, 2016	Mar. 13, 2017	Apr. 15, 2017	Radiation (03CH03-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Feb. 15, 2017	Mar. 13, 2017	Feb. 14, 2018	Radiation (03CH03-KS)
Amplifier	SONOMA	310N	187289	9kHz~1GHz	Aug. 09, 2016	Mar. 13, 2017	Aug. 08, 2017	Radiation (03CH03-KS)
Amplifier	MITEQ	TTA1840-35-H G	1887435	18GHz~40GHz	Oct. 13, 2016	Mar. 13, 2017	Oct. 12, 2017	Radiation (03CH03-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Oct. 13, 2016	Mar. 13, 2017	Oct. 12, 2017	Radiation (03CH03-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Mar. 13, 2017	NCR	Radiation (03CH03-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Mar. 13, 2017	NCR	Radiation (03CH03-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Mar. 13, 2017	NCR	Radiation (03CH03-KS)

NCR: No Calibration Required



5 Uncertainty of Evaluation

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

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

Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

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

Uncertainty of Radiated Emission Measurement (18GHz ~ 40GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.7dB
--	-------



Appendix A. Radiated Spurious Emission

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	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)
BLE CH 00 2402MHz		2318.19	50.84	-23.16	74	55.64	26.82	5.39	37.01	346	153	P	H
		2368.5	40.68	-13.32	54	45.36	26.91	5.43	37.02	346	153	A	H
	*	2402	88.9	-	-	93.45	27	5.47	37.02	346	153	P	H
	*	2402	88.25	-	-	92.8	27	5.47	37.02	346	153	A	H
		2389.04	53.73	-20.27	74	58.28	27	5.47	37.02	331	212	P	V
		2389.95	43.32	-10.68	54	47.87	27	5.47	37.02	331	212	A	V
	*	2402	94.31	-	-	98.86	27	5.47	37.02	331	212	P	V
	*	2402	93.63	-	-	98.18	27	5.47	37.02	331	212	A	V
BLE CH 19 2440MHz		2345.23	51.38	-22.62	74	56.12	26.86	5.41	37.01	297	152	P	H
		2378.64	41.15	-12.85	54	45.77	26.95	5.45	37.02	297	152	A	H
	*	2440	91.09	-	-	95.18	27.39	5.49	36.97	297	152	P	H
	*	2440	90.46	-	-	94.55	27.39	5.49	36.97	297	152	A	H
		2489.86	51.16	-22.84	74	54.8	27.77	5.52	36.93	297	152	P	H
		2488.06	42.03	-11.97	54	45.67	27.77	5.52	36.93	297	152	A	H
		2389.95	51.6	-22.4	74	56.15	27	5.47	37.02	358	209	P	V
		2389.95	42.06	-11.94	54	46.61	27	5.47	37.02	358	209	A	V
	*	2440	95.56	-	-	99.65	27.39	5.49	36.97	358	209	P	V
	*	2440	94.89	-	-	98.98	27.39	5.49	36.97	358	209	A	V
		2488.84	51.54	-22.46	74	55.18	27.77	5.52	36.93	358	209	P	V
		2498.26	41.61	-12.39	54	45.25	27.77	5.52	36.93	358	209	A	V



BLE CH 39 2480MHz	*	2480	91.23	-	-	95.02	27.64	5.51	36.94	291	157	P	H
	*	2480	90.58	-	-	94.37	27.64	5.51	36.94	291	157	A	H
		2486.5	52.11	-21.89	74	55.9	27.64	5.51	36.94	291	157	P	H
		2483.5	42.01	-11.99	54	45.8	27.64	5.51	36.94	291	157	A	H
	*	2480	95.54	-	-	99.33	27.64	5.51	36.94	345	211	P	V
	*	2480	94.97	-	-	98.76	27.64	5.51	36.94	345	211	A	V
		2483.56	52.95	-21.05	74	56.74	27.64	5.51	36.94	345	211	P	V
		2483.5	42.79	-11.21	54	46.58	27.64	5.51	36.94	345	211	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE	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)
BLE CH 00 2402MHz		4806	42.01	-31.99	74	39.51	31.48	7.71	36.69	100	360	P	H
		4806	43.05	-30.95	74	40.55	31.48	7.71	36.69	100	360	P	V
BLE CH 19 2440MHz		4878	42.32	-31.68	74	39.63	31.59	7.76	36.66	100	360	P	H
		7320	47.16	-26.84	74	40.01	34.08	9.78	36.71	100	360	P	H
		4878	42.84	-31.16	74	40.15	31.59	7.76	36.66	100	360	P	V
		7320	46.05	-27.95	74	38.9	34.08	9.78	36.71	100	360	P	V
BLE CH 39 2480MHz		4962	42.28	-31.72	74	39.37	31.72	7.82	36.63	100	360	P	H
		7440	45.41	-28.59	74	37.87	34.44	9.87	36.77	100	360	P	H
		4962	43.01	-30.99	74	40.1	31.72	7.82	36.63	100	360	P	V
		7440	46.81	-27.19	74	39.27	34.44	9.87	36.77	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission below 1GHz

2.4GHz BLE (LF)

BLE	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)
2.4GHz BLE LF		33.88	34.28	-5.72	40	39.07	25.84	0.7	31.33	100	91	P	H
		335.55	34.09	-11.91	46	42.43	20.67	2.25	31.26	-	-	P	H
		607.15	31.58	-14.42	46	35.48	24.66	3.09	31.65	-	-	P	H
		633.34	32.6	-13.4	46	35.46	25.3	3.16	31.32	-	-	P	H
		706.09	38.52	-7.48	46	39.52	26.69	3.36	31.05	-	-	P	H
		907.85	33.07	-12.93	46	31.39	28.65	3.87	30.84	-	-	P	H
		31.94	35.36	-4.64	40	39.46	26.52	0.68	31.3	100	26	P	V
		323.91	36.28	-9.72	46	45.24	20.13	2.21	31.3	-	-	P	V
		359.8	36.52	-9.48	46	43.74	21.67	2.33	31.22	-	-	P	V
		455.83	30.19	-15.81	46	33.53	25.24	2.66	31.24	-	-	P	V
		504.33	32.27	-13.73	46	37.26	23.45	2.81	31.25	-	-	P	V
		902.03	31.51	-14.49	46	29.95	28.56	3.85	30.85	-	-	P	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 Ant. 1+2	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)
802.11b CH 01		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
2412MHz		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 Plots

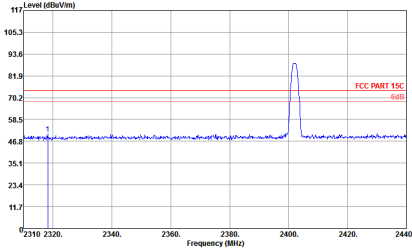
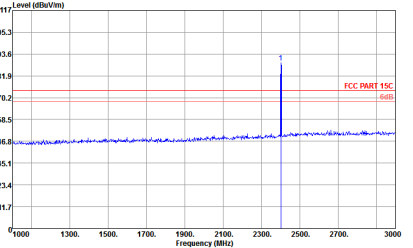
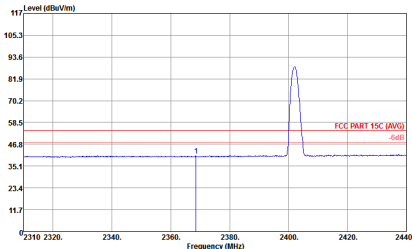
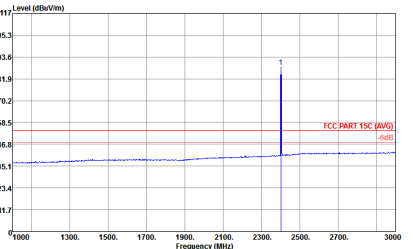
Note symbol

-L	Low channel location
-R	High channel location

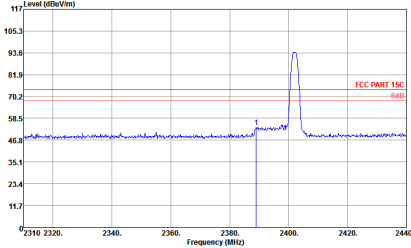
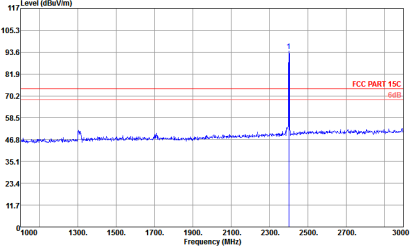
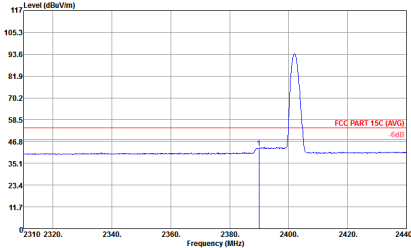
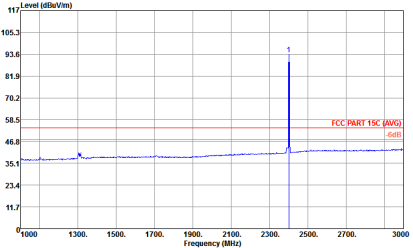


2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE		2.4GHz 2400~2483.5MHz Band Edge @ 3m																																																																				
		BLE CH00 2402MHz																																																																				
	Horizontal	Fundamental																																																																				
Peak	 Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-2015813-91280 HORIZONTAL RSN:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><thead><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr></thead><tbody><tr><td>1</td><td>2318.19</td><td>50.84</td><td>-23.16</td><td>74.00</td><td>55.64</td><td>26.82</td><td>5.39</td><td>37.81</td><td>346</td><td>153 Peak</td><td>HORIZONTAL</td></tr></tbody></table>	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg		1	2318.19	50.84	-23.16	74.00	55.64	26.82	5.39	37.81	346	153 Peak	HORIZONTAL	 Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-2015813-91280 HORIZONTAL RSN:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><thead><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr></thead><tbody><tr><td>1 *</td><td>2482.00</td><td>88.90</td><td>14.90</td><td>74.00</td><td>93.45</td><td>27.00</td><td>5.47</td><td>37.82</td><td>346</td><td>153 Peak</td><td>HORIZONTAL</td></tr></tbody></table>	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg		1 *	2482.00	88.90	14.90	74.00	93.45	27.00	5.47	37.82	346	153 Peak	HORIZONTAL
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																											
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg																																																													
1	2318.19	50.84	-23.16	74.00	55.64	26.82	5.39	37.81	346	153 Peak	HORIZONTAL																																																											
Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																												
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg																																																													
1 *	2482.00	88.90	14.90	74.00	93.45	27.00	5.47	37.82	346	153 Peak	HORIZONTAL																																																											
Avg.	 Site : 03CH03-KS Condition : FCC PART 15C (AVG) 3m HF ANT-2015813-91280 HORIZONTAL RSN:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><thead><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr></thead><tbody><tr><td>1</td><td>2368.50</td><td>40.68</td><td>-13.32</td><td>54.00</td><td>45.36</td><td>26.91</td><td>5.43</td><td>37.82</td><td>346</td><td>153 Average</td><td>HORIZONTAL</td></tr></tbody></table>	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg		1	2368.50	40.68	-13.32	54.00	45.36	26.91	5.43	37.82	346	153 Average	HORIZONTAL	 Site : 03CH03-KS Condition : FCC PART 15C (AVG) 3m HF ANT-2015813-91280 HORIZONTAL RSN:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><thead><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr></thead><tbody><tr><td>1 *</td><td>2482.00</td><td>88.25</td><td>14.25</td><td>54.00</td><td>92.80</td><td>27.00</td><td>5.47</td><td>37.82</td><td>346</td><td>153 Average</td><td>HORIZONTAL</td></tr></tbody></table>	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg		1 *	2482.00	88.25	14.25	54.00	92.80	27.00	5.47	37.82	346	153 Average	HORIZONTAL
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																											
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg																																																													
1	2368.50	40.68	-13.32	54.00	45.36	26.91	5.43	37.82	346	153 Average	HORIZONTAL																																																											
Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																												
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg																																																													
1 *	2482.00	88.25	14.25	54.00	92.80	27.00	5.47	37.82	346	153 Average	HORIZONTAL																																																											

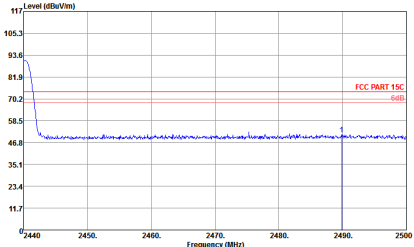
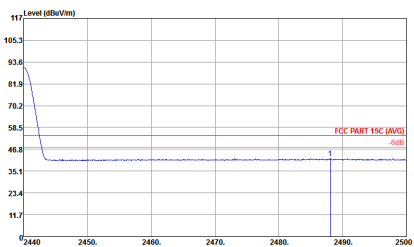


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m																																																																	
	BLE CH00 2402MHz																																																																	
	Vertical	Fundamental																																																																
Peak	 Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-2015813-91280 VERTICAL : RSW:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>Limit</th><th>Line</th><th>Level Factor</th><th>Loss Factor</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2389.04</td><td>53.73</td><td>-20.27</td><td>74.00</td><td>58.28</td><td>27.00</td><td>5.47</td><td>37.02</td><td>331</td><td>212 Peak</td><td>VERTICAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	Limit	Line	Level Factor	Loss Factor	dB	cm	deg		1	2389.04	53.73	-20.27	74.00	58.28	27.00	5.47	37.02	331	212 Peak	VERTICAL	 Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-2015813-91280 VERTICAL : RSW:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>Limit</th><th>Line</th><th>Level Factor</th><th>Loss Factor</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2402.00</td><td>94.31</td><td>20.31</td><td>74.00</td><td>98.06</td><td>27.00</td><td>5.47</td><td>37.02</td><td>331</td><td>212 Peak</td><td>VERTICAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	Limit	Line	Level Factor	Loss Factor	dB	cm	deg		1	2402.00	94.31	20.31	74.00	98.06	27.00	5.47	37.02	331	212 Peak	VERTICAL
Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	Limit	Line	Level Factor	Loss Factor	dB	cm	deg																																																										
1	2389.04	53.73	-20.27	74.00	58.28	27.00	5.47	37.02	331	212 Peak	VERTICAL																																																							
Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	Limit	Line	Level Factor	Loss Factor	dB	cm	deg																																																										
1	2402.00	94.31	20.31	74.00	98.06	27.00	5.47	37.02	331	212 Peak	VERTICAL																																																							
Avg	 Site : 03CH03-KS Condition : FCC PART 15C (AVG) 3m HF ANT-2015813-91280 VERTICAL : RSW:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>Limit</th><th>Line</th><th>Level Factor</th><th>Loss Factor</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2389.95</td><td>43.32</td><td>-18.68</td><td>54.00</td><td>47.87</td><td>27.00</td><td>5.47</td><td>37.02</td><td>331</td><td>212 Average</td><td>VERTICAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	Limit	Line	Level Factor	Loss Factor	dB	cm	deg		1	2389.95	43.32	-18.68	54.00	47.87	27.00	5.47	37.02	331	212 Average	VERTICAL	 Site : 03CH03-KS Condition : FCC PART 15C (AVG) 3m HF ANT-2015813-91280 VERTICAL : RSW:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>Limit</th><th>Line</th><th>Level Factor</th><th>Loss Factor</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2402.00</td><td>93.63</td><td>39.63</td><td>54.00</td><td>98.18</td><td>27.00</td><td>5.47</td><td>37.02</td><td>331</td><td>212 Average</td><td>VERTICAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	Limit	Line	Level Factor	Loss Factor	dB	cm	deg		1	2402.00	93.63	39.63	54.00	98.18	27.00	5.47	37.02	331	212 Average	VERTICAL
Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	Limit	Line	Level Factor	Loss Factor	dB	cm	deg																																																										
1	2389.95	43.32	-18.68	54.00	47.87	27.00	5.47	37.02	331	212 Average	VERTICAL																																																							
Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	Limit	Line	Level Factor	Loss Factor	dB	cm	deg																																																										
1	2402.00	93.63	39.63	54.00	98.18	27.00	5.47	37.02	331	212 Average	VERTICAL																																																							

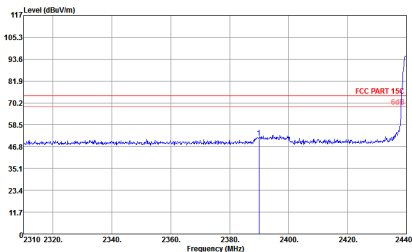
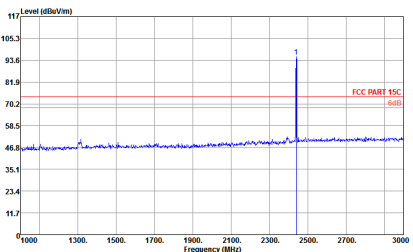
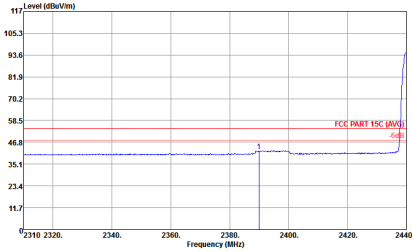
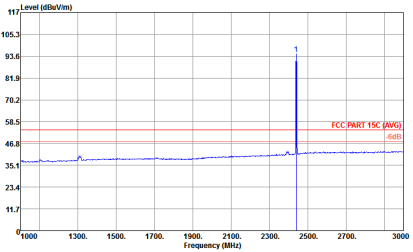


BLE		2.4GHz 2400~2483.5MHz Band Edge @ 3m																																																																
		BLE CH19 2440MHz - L																																																																
	Horizontal	Fundamental																																																																
Peak	Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-2015813-91280 HORIZONTAL : RSW:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2345.23</td><td>51.38</td><td>-22.62</td><td>74.00</td><td>56.12</td><td>26.86</td><td>5.41</td><td>37.01</td><td>297</td><td>152 Peak</td><td>HORIZONTAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg		1	2345.23	51.38	-22.62	74.00	56.12	26.86	5.41	37.01	297	152 Peak	HORIZONTAL	Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-2015813-91280 HORIZONTAL : RSW:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2440.00</td><td>91.09</td><td>17.09</td><td>74.00</td><td>95.18</td><td>27.39</td><td>5.49</td><td>36.97</td><td>297</td><td>152 Peak</td><td>HORIZONTAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg		1	2440.00	91.09	17.09	74.00	95.18	27.39	5.49	36.97	297	152 Peak	HORIZONTAL
	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																								
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg																																																										
1	2345.23	51.38	-22.62	74.00	56.12	26.86	5.41	37.01	297	152 Peak	HORIZONTAL																																																							
Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg																																																										
1	2440.00	91.09	17.09	74.00	95.18	27.39	5.49	36.97	297	152 Peak	HORIZONTAL																																																							
Avg.	Site : 03CH03-KS Condition : FCC PART 15C (AVG) 3m HF ANT-2015813-91280 HORIZONTAL : RSW:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2378.64</td><td>41.15</td><td>-12.85</td><td>54.00</td><td>45.77</td><td>26.95</td><td>5.45</td><td>37.02</td><td>297</td><td>152 Average</td><td>HORIZONTAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg		1	2378.64	41.15	-12.85	54.00	45.77	26.95	5.45	37.02	297	152 Average	HORIZONTAL	Site : 03CH03-KS Condition : FCC PART 15C (AVG) 3m HF ANT-2015813-91280 HORIZONTAL : RSW:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2440.00</td><td>90.46</td><td>36.46</td><td>54.00</td><td>94.15</td><td>27.39</td><td>5.49</td><td>36.97</td><td>297</td><td>152 Average</td><td>HORIZONTAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg		1	2440.00	90.46	36.46	54.00	94.15	27.39	5.49	36.97	297	152 Average	HORIZONTAL
	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																								
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg																																																										
1	2378.64	41.15	-12.85	54.00	45.77	26.95	5.45	37.02	297	152 Average	HORIZONTAL																																																							
Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg																																																										
1	2440.00	90.46	36.46	54.00	94.15	27.39	5.49	36.97	297	152 Average	HORIZONTAL																																																							



BLE		2.4GHz 2400~2483.5MHz Band Edge @ 3m																																			
		BLE CH19 2440MHz - R																																			
	Horizontal	Fundamental																																			
Peak	 Site Condition : 03CH03-K5 : FCC PART 15C 3m HF ANT-2015813-91280 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th><th></th></tr><tr><td>1</td><td>2489.86</td><td>51.16</td><td>-22.84</td><td>74.00</td><td>54.80</td><td>27.77</td><td>5.52</td><td>36.93</td><td>297</td><td>152 Peak</td><td>HORIZONTAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg			1	2489.86	51.16	-22.84	74.00	54.80	27.77	5.52	36.93	297	152 Peak	HORIZONTAL		
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas																										
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg																													
1	2489.86	51.16	-22.84	74.00	54.80	27.77	5.52	36.93	297	152 Peak	HORIZONTAL																										
Avg.	 Site Condition : 03CH03-K5 : FCC PART 15C (AVG) 3m HF ANT-2015813-91280 HORIZONTAL : RBW:1000.000kHz VBW:3.000kHz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th><th></th></tr><tr><td>1</td><td>2489.86</td><td>42.83</td><td>-11.97</td><td>74.00</td><td>45.67</td><td>27.77</td><td>5.52</td><td>36.93</td><td>297</td><td>152 Average</td><td>HORIZONTAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg			1	2489.86	42.83	-11.97	74.00	45.67	27.77	5.52	36.93	297	152 Average	HORIZONTAL		
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas																										
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg																													
1	2489.86	42.83	-11.97	74.00	45.67	27.77	5.52	36.93	297	152 Average	HORIZONTAL																										

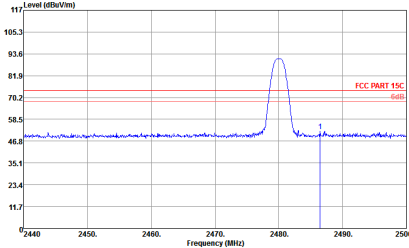
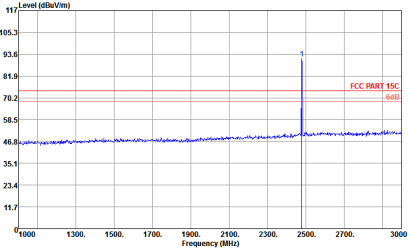
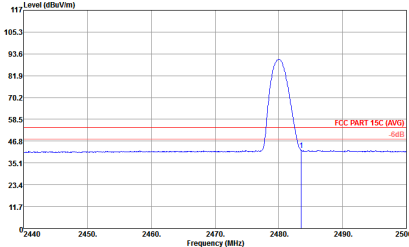
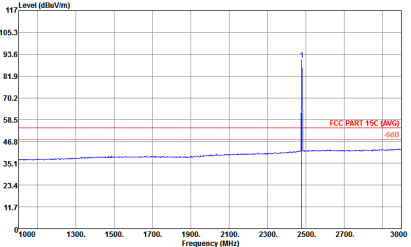


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m																																																																	
	BLE CH19 2440MHz - L																																																																	
	Vertical	Fundamental																																																																
Peak	 Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-2015813-91280 VERTICAL : RSW:1000.0000Hz VSW:3000.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2389.95</td><td>51.08</td><td>-22.40</td><td>74.00</td><td>56.15</td><td>27.00</td><td>5.47</td><td>37.02</td><td>358</td><td>209 Peak</td><td>VERTICAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg		1	2389.95	51.08	-22.40	74.00	56.15	27.00	5.47	37.02	358	209 Peak	VERTICAL	 Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-2015813-91280 VERTICAL : RSW:1000.0000Hz VSW:3000.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2440.00</td><td>95.56</td><td>21.56</td><td>74.00</td><td>99.65</td><td>27.39</td><td>5.49</td><td>36.97</td><td>358</td><td>209 Peak</td><td>VERTICAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg		1	2440.00	95.56	21.56	74.00	99.65	27.39	5.49	36.97	358	209 Peak	VERTICAL
Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg																																																										
1	2389.95	51.08	-22.40	74.00	56.15	27.00	5.47	37.02	358	209 Peak	VERTICAL																																																							
Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg																																																										
1	2440.00	95.56	21.56	74.00	99.65	27.39	5.49	36.97	358	209 Peak	VERTICAL																																																							
Avg.	 Site : 03CH03-KS Condition : FCC PART 15C (AVG) 3m HF ANT-2015813-91280 VERTICAL : RSW:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2389.95</td><td>42.06</td><td>-11.94</td><td>54.00</td><td>46.61</td><td>27.00</td><td>5.47</td><td>37.02</td><td>358</td><td>209 Average</td><td>VERTICAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg		1	2389.95	42.06	-11.94	54.00	46.61	27.00	5.47	37.02	358	209 Average	VERTICAL	 Site : 03CH03-KS Condition : FCC PART 15C (AVG) 3m HF ANT-2015813-91280 VERTICAL : RSW:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2440.00</td><td>94.89</td><td>40.89</td><td>54.00</td><td>98.98</td><td>27.39</td><td>5.49</td><td>36.97</td><td>358</td><td>209 Average</td><td>VERTICAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg		1	2440.00	94.89	40.89	54.00	98.98	27.39	5.49	36.97	358	209 Average	VERTICAL
Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg																																																										
1	2389.95	42.06	-11.94	54.00	46.61	27.00	5.47	37.02	358	209 Average	VERTICAL																																																							
Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg																																																										
1	2440.00	94.89	40.89	54.00	98.98	27.39	5.49	36.97	358	209 Average	VERTICAL																																																							

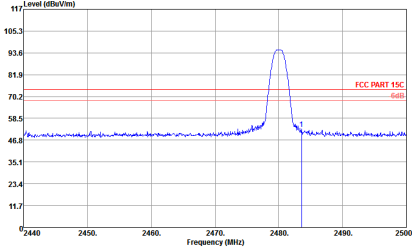
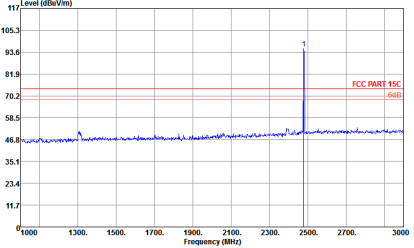
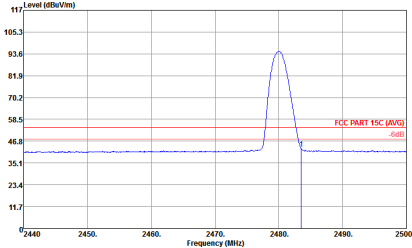
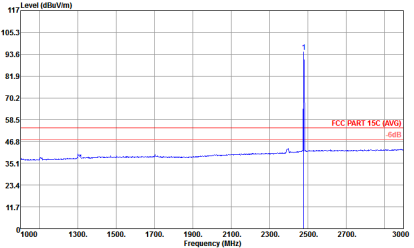


BLE		2.4GHz 2400~2483.5MHz Band Edge @ 3m																																			
		BLE CH19 2440MHz - R																																			
	Vertical	Fundamental																																			
Peak	Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-20150113-91200 VERTICAL : RSN:1000.0000Hz YSW:1000.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>NHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2488.84</td><td>51.54</td><td>-22.46</td><td>74.00</td><td>55.18</td><td>27.77</td><td>5.52</td><td>36.93</td><td>358</td><td>209 Peak</td><td>VERTICAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas	NHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg		1	2488.84	51.54	-22.46	74.00	55.18	27.77	5.52	36.93	358	209 Peak	VERTICAL		
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas																										
NHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg																												
1	2488.84	51.54	-22.46	74.00	55.18	27.77	5.52	36.93	358	209 Peak	VERTICAL																										
Avg.	Site : 03CH03-KS Condition : FCC PART 15C (AVG) 3m HF ANT-20150113-91200 VERTICAL : RSN:1000.0000Hz YSW:1000.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>NHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2498.26</td><td>41.61</td><td>-12.39</td><td>54.00</td><td>45.25</td><td>27.77</td><td>5.52</td><td>36.93</td><td>358</td><td>209 Average</td><td>VERTICAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas	NHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg		1	2498.26	41.61	-12.39	54.00	45.25	27.77	5.52	36.93	358	209 Average	VERTICAL		
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas																										
NHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg																												
1	2498.26	41.61	-12.39	54.00	45.25	27.77	5.52	36.93	358	209 Average	VERTICAL																										



BLE		2.4GHz 2400~2483.5MHz Band Edge @ 3m																																																																
		BLE CH39 2480MHz																																																																
	Horizontal	Fundamental																																																																
Peak	 Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-2015813-91280 HORIZONTAL : RSW:1000.000kHz VSW:3.000kHz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2480.50</td><td>52.11</td><td>-21.89</td><td>74.00</td><td>55.90</td><td>27.64</td><td>5.51</td><td>36.94</td><td>291</td><td>157 Peak</td><td>HORIZONTAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg		1	2480.50	52.11	-21.89	74.00	55.90	27.64	5.51	36.94	291	157 Peak	HORIZONTAL	 Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-2015813-91280 HORIZONTAL : RSW:1000.000kHz VSW:3.000kHz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2480.00</td><td>91.23</td><td>17.23</td><td>74.00</td><td>95.02</td><td>27.64</td><td>5.51</td><td>36.94</td><td>291</td><td>157 Peak</td><td>HORIZONTAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg		1	2480.00	91.23	17.23	74.00	95.02	27.64	5.51	36.94	291	157 Peak	HORIZONTAL
	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																								
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg																																																										
1	2480.50	52.11	-21.89	74.00	55.90	27.64	5.51	36.94	291	157 Peak	HORIZONTAL																																																							
Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg																																																										
1	2480.00	91.23	17.23	74.00	95.02	27.64	5.51	36.94	291	157 Peak	HORIZONTAL																																																							
Avg.	 Site : 03CH03-KS Condition : FCC PART 15C (AVG) 3m HF ANT-2015813-91280 HORIZONTAL : RSW:1000.000kHz VSW:3.000kHz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2483.50</td><td>42.01</td><td>-11.99</td><td>74.00</td><td>45.80</td><td>27.64</td><td>5.51</td><td>36.94</td><td>291</td><td>157 Average</td><td>HORIZONTAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg		1	2483.50	42.01	-11.99	74.00	45.80	27.64	5.51	36.94	291	157 Average	HORIZONTAL	 Site : 03CH03-KS Condition : FCC PART 15C (AVG) 3m HF ANT-2015813-91280 HORIZONTAL : RSW:1000.000kHz VSW:3.000kHz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2480.00</td><td>90.58</td><td>36.58</td><td>74.00</td><td>94.37</td><td>27.64</td><td>5.51</td><td>36.94</td><td>291</td><td>157 Average</td><td>HORIZONTAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg		1	2480.00	90.58	36.58	74.00	94.37	27.64	5.51	36.94	291	157 Average	HORIZONTAL
Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg																																																										
1	2483.50	42.01	-11.99	74.00	45.80	27.64	5.51	36.94	291	157 Average	HORIZONTAL																																																							
Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg																																																										
1	2480.00	90.58	36.58	74.00	94.37	27.64	5.51	36.94	291	157 Average	HORIZONTAL																																																							

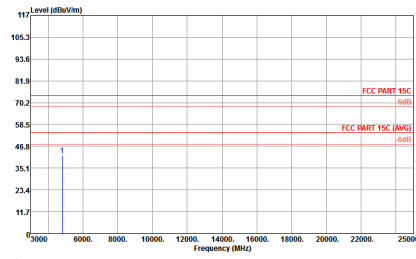
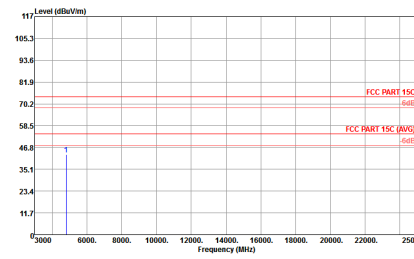


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m																																																																	
	BLE CH39 2480MHz																																																																	
	Vertical	Fundamental																																																																
Peak	 Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-2015813-91280 VERTICAL : RSW:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2483.56</td><td>92.95</td><td>-21.05</td><td>74.00</td><td>56.74</td><td>27.64</td><td>5.51</td><td>36.94</td><td>345</td><td>211 Peak</td><td>VERTICAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	cm	deg		1	2483.56	92.95	-21.05	74.00	56.74	27.64	5.51	36.94	345	211 Peak	VERTICAL	 Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-2015813-91280 VERTICAL : RSW:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2480.00</td><td>95.54</td><td>21.54</td><td>74.00</td><td>99.33</td><td>27.64</td><td>5.51</td><td>36.94</td><td>345</td><td>211 Peak</td><td>VERTICAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	cm	deg		1	2480.00	95.54	21.54	74.00	99.33	27.64	5.51	36.94	345	211 Peak	VERTICAL
Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	cm	deg																																																										
1	2483.56	92.95	-21.05	74.00	56.74	27.64	5.51	36.94	345	211 Peak	VERTICAL																																																							
Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	cm	deg																																																										
1	2480.00	95.54	21.54	74.00	99.33	27.64	5.51	36.94	345	211 Peak	VERTICAL																																																							
Avg.	 Site : 03CH03-KS Condition : FCC PART 15C (AVG) 3m HF ANT-2015813-91280 VERTICAL : RSW:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2483.50</td><td>42.79</td><td>-11.21</td><td>54.00</td><td>46.58</td><td>27.64</td><td>5.51</td><td>36.94</td><td>345</td><td>211 Average</td><td>VERTICAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	cm	deg		1	2483.50	42.79	-11.21	54.00	46.58	27.64	5.51	36.94	345	211 Average	VERTICAL	 Site : 03CH03-KS Condition : FCC PART 15C (AVG) 3m HF ANT-2015813-91280 VERTICAL : RSW:1000.0000Hz VSW:3.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>2480.00</td><td>94.97</td><td>48.97</td><td>54.00</td><td>98.76</td><td>27.64</td><td>5.51</td><td>36.94</td><td>345</td><td>211 Average</td><td>VERTICAL</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	cm	deg		1	2480.00	94.97	48.97	54.00	98.76	27.64	5.51	36.94	345	211 Average	VERTICAL
Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	cm	deg																																																										
1	2483.50	42.79	-11.21	54.00	46.58	27.64	5.51	36.94	345	211 Average	VERTICAL																																																							
Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	cm	deg																																																										
1	2480.00	94.97	48.97	54.00	98.76	27.64	5.51	36.94	345	211 Average	VERTICAL																																																							

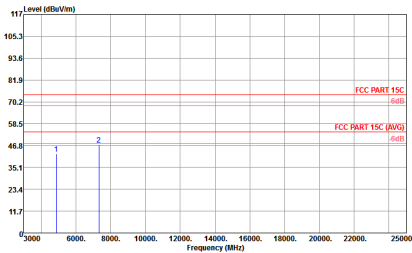
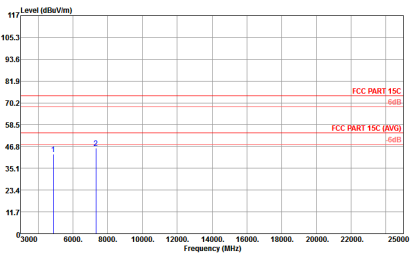


2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE		2.4GHz 2400~2483.5MHz Harmonic @ 3m																																																																
		BLE CH00 2402MHz																																																																
		Horizontal	Vertical																																																															
Peak Avg.	 Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-20150113-01200 HORIZONTAL RSW:1000.0000Hz VSW:3000.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>4886.00</td><td>42.01</td><td>-31.99</td><td>74.00</td><td>39.51</td><td>31.48</td><td>7.71</td><td>36.69</td><td>100</td><td>360 Peak</td><td>HORIZONTAL</td></tr></table>	Freq	Level	Over Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	dB	cm	deg		1	4886.00	42.01	-31.99	74.00	39.51	31.48	7.71	36.69	100	360 Peak	HORIZONTAL	 Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-20150113-01200 VERTICAL RSW:1000.0000Hz VSW:3000.0000Hz SMT:Auto <table><tr><th>Freq</th><th>Level</th><th>Over Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>4886.00</td><td>43.05</td><td>-30.95</td><td>74.00</td><td>40.55</td><td>31.48</td><td>7.71</td><td>36.69</td><td>100</td><td>360 Peak</td><td>VERTICAL</td></tr></table>	Freq	Level	Over Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	dB	cm	deg		1	4886.00	43.05	-30.95	74.00	40.55	31.48	7.71	36.69	100	360 Peak	VERTICAL
	Freq	Level	Over Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																								
MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	dB	cm	deg																																																										
1	4886.00	42.01	-31.99	74.00	39.51	31.48	7.71	36.69	100	360 Peak	HORIZONTAL																																																							
Freq	Level	Over Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																									
MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	dB	cm	deg																																																										
1	4886.00	43.05	-30.95	74.00	40.55	31.48	7.71	36.69	100	360 Peak	VERTICAL																																																							



BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m																																																																																																	
	BLE CH19 2440MHz																																																																																																	
	Horizontal	Vertical																																																																																																
Peak	 Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-2015012-01200 HORIZONTAL : RSW:1000.0000Hz VSW:3000.0000Hz SMT:Auto <table><tr><th></th><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>Limit</th><th>Line</th><th>Level Factor</th><th>Loss Factor</th><th></th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>4878.00</td><td>42.32</td><td>-31.68</td><td>74.00</td><td>39.63</td><td>31.59</td><td>7.76</td><td>36.66</td><td>100</td><td>360 Peak</td><td>HORIZONTAL</td></tr><tr><td>2</td><td>7328.00</td><td>47.16</td><td>-26.84</td><td>74.00</td><td>40.03</td><td>34.00</td><td>9.78</td><td>36.71</td><td>100</td><td>360 Peak</td><td>HORIZONTAL</td></tr></table>		Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas		MHz	dBuV/m	Limit	Line	Level Factor	Loss Factor		dB	cm	deg		1	4878.00	42.32	-31.68	74.00	39.63	31.59	7.76	36.66	100	360 Peak	HORIZONTAL	2	7328.00	47.16	-26.84	74.00	40.03	34.00	9.78	36.71	100	360 Peak	HORIZONTAL	 Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-2015012-01200 VERTICAL : RSW:1000.0000Hz VSW:3000.0000Hz SMT:Auto <table><tr><th></th><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>Limit</th><th>Line</th><th>Level Factor</th><th>Loss Factor</th><th></th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>4878.00</td><td>42.84</td><td>-31.16</td><td>74.00</td><td>40.15</td><td>31.59</td><td>7.76</td><td>36.66</td><td>100</td><td>360 Peak</td><td>VERTICAL</td></tr><tr><td>2</td><td>7328.00</td><td>46.05</td><td>-27.95</td><td>74.00</td><td>38.30</td><td>34.00</td><td>9.78</td><td>36.71</td><td>100</td><td>360 Peak</td><td>VERTICAL</td></tr></table>		Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas		MHz	dBuV/m	Limit	Line	Level Factor	Loss Factor		dB	cm	deg		1	4878.00	42.84	-31.16	74.00	40.15	31.59	7.76	36.66	100	360 Peak	VERTICAL	2	7328.00	46.05	-27.95	74.00	38.30	34.00	9.78	36.71	100	360 Peak	VERTICAL
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																																																							
	MHz	dBuV/m	Limit	Line	Level Factor	Loss Factor		dB	cm	deg																																																																																								
1	4878.00	42.32	-31.68	74.00	39.63	31.59	7.76	36.66	100	360 Peak	HORIZONTAL																																																																																							
2	7328.00	47.16	-26.84	74.00	40.03	34.00	9.78	36.71	100	360 Peak	HORIZONTAL																																																																																							
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																																																							
	MHz	dBuV/m	Limit	Line	Level Factor	Loss Factor		dB	cm	deg																																																																																								
1	4878.00	42.84	-31.16	74.00	40.15	31.59	7.76	36.66	100	360 Peak	VERTICAL																																																																																							
2	7328.00	46.05	-27.95	74.00	38.30	34.00	9.78	36.71	100	360 Peak	VERTICAL																																																																																							
Avg.																																																																																																		

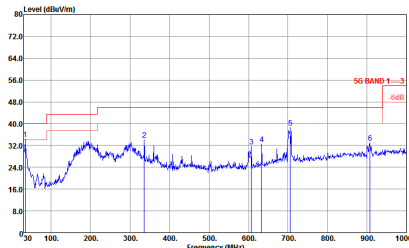
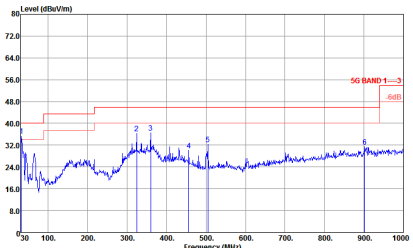


BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m																																																																																																											
	BLE CH39 2480MHz																																																																																																											
	Horizontal	Vertical																																																																																																										
Peak	Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-20150113-01200 HORIZONTAL : RSW:1000.0000Hz VSW:3000.0000Hz SMT:Auto <table><tr><th></th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>Freq</th><th>Level</th><th>Limit</th><th>Level Factor</th><th>Loss Factor</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dB</th><th>dB</th><th></th><th></th><th></th></tr><tr><td>1</td><td>4962.00</td><td>42.28</td><td>-31.72</td><td>74.00</td><td>39.37</td><td>31.72</td><td>7.82</td><td>36.63</td><td>100</td><td>360</td><td>Peak</td><td>HORIZONTAL</td></tr><tr><td>2</td><td>7440.00</td><td>45.41</td><td>-28.59</td><td>74.00</td><td>37.87</td><td>34.44</td><td>9.87</td><td>36.77</td><td>100</td><td>360</td><td>Peak</td><td>HORIZONTAL</td></tr></table>		Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	Freq	Level	Limit	Level Factor	Loss Factor	dB	cm	deg		MHz	dBuV/m	dB	dBuV/m	dB	dB				1	4962.00	42.28	-31.72	74.00	39.37	31.72	7.82	36.63	100	360	Peak	HORIZONTAL	2	7440.00	45.41	-28.59	74.00	37.87	34.44	9.87	36.77	100	360	Peak	HORIZONTAL	Site : 03CH03-KS Condition : FCC PART 15C 3m HF ANT-20150113-01200 VERTICAL : RSW:1000.0000Hz VSW:3000.0000Hz SMT:Auto <table><tr><th></th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>Freq</th><th>Level</th><th>Limit</th><th>Level Factor</th><th>Loss Factor</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dB</th><th>dB</th><th></th><th></th><th></th></tr><tr><td>1</td><td>4962.00</td><td>43.81</td><td>-30.99</td><td>74.00</td><td>40.10</td><td>31.72</td><td>7.82</td><td>36.63</td><td>100</td><td>360</td><td>Peak</td><td>VERTICAL</td></tr><tr><td>2</td><td>7440.00</td><td>46.81</td><td>-27.19</td><td>74.00</td><td>39.27</td><td>34.44</td><td>9.87</td><td>36.77</td><td>100</td><td>360</td><td>Peak</td><td>VERTICAL</td></tr></table>		Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	Freq	Level	Limit	Level Factor	Loss Factor	dB	cm	deg		MHz	dBuV/m	dB	dBuV/m	dB	dB				1	4962.00	43.81	-30.99	74.00	40.10	31.72	7.82	36.63	100	360	Peak	VERTICAL	2	7440.00	46.81	-27.19	74.00	39.27	34.44	9.87	36.77	100	360	Peak	VERTICAL
		Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																																																																			
Freq	Level	Limit	Level Factor	Loss Factor	dB	cm	deg																																																																																																					
MHz	dBuV/m	dB	dBuV/m	dB	dB																																																																																																							
1	4962.00	42.28	-31.72	74.00	39.37	31.72	7.82	36.63	100	360	Peak	HORIZONTAL																																																																																																
2	7440.00	45.41	-28.59	74.00	37.87	34.44	9.87	36.77	100	360	Peak	HORIZONTAL																																																																																																
	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																																																																				
Freq	Level	Limit	Level Factor	Loss Factor	dB	cm	deg																																																																																																					
MHz	dBuV/m	dB	dBuV/m	dB	dB																																																																																																							
1	4962.00	43.81	-30.99	74.00	40.10	31.72	7.82	36.63	100	360	Peak	VERTICAL																																																																																																
2	7440.00	46.81	-27.19	74.00	39.27	34.44	9.87	36.77	100	360	Peak	VERTICAL																																																																																																



Emission below 1GHz

2.4GHz BLE (LF)

BLE	2.4GHz 2400~2483.5MHz																																																																																																																																																																																																																	
	BLE LF																																																																																																																																																																																																																	
	Horizontal	Vertical																																																																																																																																																																																																																
QP / Peak	 Site : 03CH03-KS Condition : 5G BAND 1----3 3m LF ANT 600 HORIZONTAL RISU:100.000000Hz VBU:300.000000Hz SMT:Auto <table><tr><th></th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th></th><th>Freq</th><th>Level</th><th>Limit</th><th>Line</th><th>Level Factor</th><th>Loss Factor</th><th></th><th></th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>33.88</td><td>34.28</td><td>-5.72</td><td>46.00</td><td>39.87</td><td>25.84</td><td>0.70</td><td>31.33</td><td>100</td><td>91 Peak</td><td>HORIZONTAL</td></tr><tr><td>2</td><td>335.55</td><td>34.89</td><td>-11.91</td><td>46.00</td><td>42.43</td><td>29.87</td><td>2.25</td><td>31.26</td><td>---</td><td>---</td><td>Peak</td><td>HORIZONTAL</td></tr><tr><td>3</td><td>607.15</td><td>31.58</td><td>-14.42</td><td>46.00</td><td>35.48</td><td>24.66</td><td>3.89</td><td>31.65</td><td>---</td><td>---</td><td>Peak</td><td>HORIZONTAL</td></tr><tr><td>4</td><td>633.34</td><td>32.08</td><td>-13.98</td><td>46.00</td><td>35.46</td><td>25.30</td><td>3.16</td><td>31.32</td><td>---</td><td>---</td><td>Peak</td><td>HORIZONTAL</td></tr><tr><td>5</td><td>706.89</td><td>38.52</td><td>-7.48</td><td>46.00</td><td>39.52</td><td>26.69</td><td>3.36</td><td>31.05</td><td>---</td><td>---</td><td>Peak</td><td>HORIZONTAL</td></tr><tr><td>6</td><td>907.85</td><td>33.87</td><td>-12.93</td><td>46.00</td><td>31.39</td><td>28.65</td><td>3.87</td><td>30.64</td><td>---</td><td>---</td><td>Peak</td><td>HORIZONTAL</td></tr></table>		Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas		Freq	Level	Limit	Line	Level Factor	Loss Factor				MHz	dBuV/m	dB	dBuV/m	dB/m	dB	cm	deg	1	33.88	34.28	-5.72	46.00	39.87	25.84	0.70	31.33	100	91 Peak	HORIZONTAL	2	335.55	34.89	-11.91	46.00	42.43	29.87	2.25	31.26	---	---	Peak	HORIZONTAL	3	607.15	31.58	-14.42	46.00	35.48	24.66	3.89	31.65	---	---	Peak	HORIZONTAL	4	633.34	32.08	-13.98	46.00	35.46	25.30	3.16	31.32	---	---	Peak	HORIZONTAL	5	706.89	38.52	-7.48	46.00	39.52	26.69	3.36	31.05	---	---	Peak	HORIZONTAL	6	907.85	33.87	-12.93	46.00	31.39	28.65	3.87	30.64	---	---	Peak	HORIZONTAL	 Site : 03CH03-KS Condition : 5G BAND 1----3 3m LF ANT 600 VERTICAL RISU:100.000000Hz VBU:300.000000Hz SMT:Auto <table><tr><th></th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th></th><th>Freq</th><th>Level</th><th>Limit</th><th>Line</th><th>Level Factor</th><th>Loss Factor</th><th></th><th></th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>33.94</td><td>35.36</td><td>-4.64</td><td>46.00</td><td>39.46</td><td>26.52</td><td>0.68</td><td>31.38</td><td>100</td><td>26 Peak</td><td>VERTICAL</td></tr><tr><td>2</td><td>323.91</td><td>36.28</td><td>-9.72</td><td>46.00</td><td>45.24</td><td>28.13</td><td>2.23</td><td>31.38</td><td>---</td><td>---</td><td>Peak</td><td>VERTICAL</td></tr><tr><td>3</td><td>359.80</td><td>36.52</td><td>-9.48</td><td>46.00</td><td>43.74</td><td>23.67</td><td>2.33</td><td>31.22</td><td>---</td><td>---</td><td>Peak</td><td>VERTICAL</td></tr><tr><td>4</td><td>455.83</td><td>36.19</td><td>-15.81</td><td>46.00</td><td>33.53</td><td>25.24</td><td>2.66</td><td>31.24</td><td>---</td><td>---</td><td>Peak</td><td>VERTICAL</td></tr><tr><td>5</td><td>584.33</td><td>32.27</td><td>-13.73</td><td>46.00</td><td>37.26</td><td>23.45</td><td>2.81</td><td>31.25</td><td>---</td><td>---</td><td>Peak</td><td>VERTICAL</td></tr><tr><td>6</td><td>902.83</td><td>31.51</td><td>-14.49</td><td>46.00</td><td>29.95</td><td>28.56</td><td>3.85</td><td>30.85</td><td>---</td><td>---</td><td>Peak</td><td>VERTICAL</td></tr></table>		Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas		Freq	Level	Limit	Line	Level Factor	Loss Factor				MHz	dBuV/m	dB	dBuV/m	dB/m	dB	cm	deg	1	33.94	35.36	-4.64	46.00	39.46	26.52	0.68	31.38	100	26 Peak	VERTICAL	2	323.91	36.28	-9.72	46.00	45.24	28.13	2.23	31.38	---	---	Peak	VERTICAL	3	359.80	36.52	-9.48	46.00	43.74	23.67	2.33	31.22	---	---	Peak	VERTICAL	4	455.83	36.19	-15.81	46.00	33.53	25.24	2.66	31.24	---	---	Peak	VERTICAL	5	584.33	32.27	-13.73	46.00	37.26	23.45	2.81	31.25	---	---	Peak	VERTICAL	6	902.83	31.51	-14.49	46.00	29.95	28.56	3.85	30.85	---	---	Peak	VERTICAL
		Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																																																																																																																																																																									
	Freq	Level	Limit	Line	Level Factor	Loss Factor																																																																																																																																																																																																												
	MHz	dBuV/m	dB	dBuV/m	dB/m	dB	cm	deg																																																																																																																																																																																																										
1	33.88	34.28	-5.72	46.00	39.87	25.84	0.70	31.33	100	91 Peak	HORIZONTAL																																																																																																																																																																																																							
2	335.55	34.89	-11.91	46.00	42.43	29.87	2.25	31.26	---	---	Peak	HORIZONTAL																																																																																																																																																																																																						
3	607.15	31.58	-14.42	46.00	35.48	24.66	3.89	31.65	---	---	Peak	HORIZONTAL																																																																																																																																																																																																						
4	633.34	32.08	-13.98	46.00	35.46	25.30	3.16	31.32	---	---	Peak	HORIZONTAL																																																																																																																																																																																																						
5	706.89	38.52	-7.48	46.00	39.52	26.69	3.36	31.05	---	---	Peak	HORIZONTAL																																																																																																																																																																																																						
6	907.85	33.87	-12.93	46.00	31.39	28.65	3.87	30.64	---	---	Peak	HORIZONTAL																																																																																																																																																																																																						
	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas																																																																																																																																																																																																										
	Freq	Level	Limit	Line	Level Factor	Loss Factor																																																																																																																																																																																																												
	MHz	dBuV/m	dB	dBuV/m	dB/m	dB	cm	deg																																																																																																																																																																																																										
1	33.94	35.36	-4.64	46.00	39.46	26.52	0.68	31.38	100	26 Peak	VERTICAL																																																																																																																																																																																																							
2	323.91	36.28	-9.72	46.00	45.24	28.13	2.23	31.38	---	---	Peak	VERTICAL																																																																																																																																																																																																						
3	359.80	36.52	-9.48	46.00	43.74	23.67	2.33	31.22	---	---	Peak	VERTICAL																																																																																																																																																																																																						
4	455.83	36.19	-15.81	46.00	33.53	25.24	2.66	31.24	---	---	Peak	VERTICAL																																																																																																																																																																																																						
5	584.33	32.27	-13.73	46.00	37.26	23.45	2.81	31.25	---	---	Peak	VERTICAL																																																																																																																																																																																																						
6	902.83	31.51	-14.49	46.00	29.95	28.56	3.85	30.85	---	---	Peak	VERTICAL																																																																																																																																																																																																						

Appendix C. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
Bluetooth LE	64.81	0.406	2.463	3kHz

Bluetooth LE

