FCC Test Report

Product Name	：	BLE GPS Data Recorder
Trade Name	：	Qstarz
Model No.	：	BL-1000GT, BL-1000ST, BL-1000FT, BL-818GT, CR-1100S, CR-1100F, BL-1000xx(xx=AA~ZZ)
FCC ID.	：	WDYQ1070301

Applicant	：	Qstarz International Co., Ltd.
Address	：	6F-2, No. 160, Sec. 6, Ming Chuan E. Rd., Nei-Hu, Taipei, Taiwan, R.O.C.

Date of Receipt	：	Mar. 01, 2018
Issued Date	：	Mar. 26, 2018
Report No.	：	1830005R-RFUSP01V00-A
Report Version	：	V1.0

Testing Laboratory
3024

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Test Report Certification

Issued Date : Mar. 26, 2018
Report No. : 1830005R-RFUSP01V00-A

Product Name	:	BLE GPS Data Recorder
Applicant	:	Qstarz International Co., Ltd.
Address	:	6F-2, No. 160, Sec. 6, Ming Chuan E. Rd., Nei-Hu, Taipei, Taiwan, R.O.C.
Manufacturer	:	Qstarz International Co., Ltd.
Model No.	:	BL-1000GT, BL-1000ST, BL-1000FT, BL-818GT, CR-1100S, CR-1100F, BL-1000xx(xx=AA~ZZ)
FCC ID.	:	WDYQ1070301
EUT Voltage	:	DC 5V (Power by Notebook PC) DC 3.7V (Power by Battery)
Testing Voltage	:	DC 5V (Power by Notebook PC) DC 3.7V (Power by Battery)
Trade Name	:	Qstarz
Applicable Standard	:	FCC CFR Title 47 Part 15 Subpart C Section 15.247: 2017
Laboratory Name	:	Hsin Chu Laboratory
Address	:	No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 310, Taiwan, R.O.C. TEL: +886-3-582-8001 / FAX: +886-3-582-8958
Test Result	:	Complied

Documented By :

(Demi Chang /Senior Engineering Adm. Specialist)

Tested By :

(Ricky Lee / Senior Engineer)

Approved By :

(Roy Wang / Director)

Revision History

Report No.	Version	Description	Issued Date
1830005R-RFUSP01V00-A	V1.0	Initial issue of report	Mar. 26, 2018

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1. General Information

1.1. EUT Description

Product Name	BLE GPS Data Recorder
Trade Name	Qstarz
Model No.	BL-1000GT, BL-1000ST, BL-1000FT, BL-818GT, CR-1100S, CR-1100F, BL-1000xx(xx=AA~ZZ)
Frequency Range/Channel Number	2402~2480MHz / 40 Channels
Type of Modulation	BLE (GFSK)

Antenna Information	
MFR. / Model No.	INPAQ/ AC A-5020-A2-MC-S
Antenna Type	Soldered on PCB
Antenna Gain	0dBi

Accessories Information	
USB Cable	Non-Shielded, 0.52m

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00	2402 MHz	Channel 10	2422 MHz	Channel 20	2442 MHz	Channel 30	2462 MHz
Channel 01	2404 MHz	Channel 11	2424 MHz	Channel 21	2444 MHz	Channel 31	2464 MHz
Channel 02	2406 MHz	Channel 12	2426 MHz	Channel 22	2446 MHz	Channel 32	2466 MHz
Channel 03	2408 MHz	Channel 13	2428 MHz	Channel 23	2448 MHz	Channel 33	2468 MHz
Channel 04	2410 MHz	Channel 14	2430 MHz	Channel 24	2450 MHz	Channel 34	2470 MHz
Channel 05	2412 MHz	Channel 15	2432 MHz	Channel 25	2452 MHz	Channel 35	2472 MHz
Channel 06	2414 MHz	Channel 16	2434 MHz	Channel 26	2454 MHz	Channel 36	2474 MHz
Channel 07	2416 MHz	Channel 17	2436 MHz	Channel 27	2456 MHz	Channel 37	2476 MHz
Channel 08	2418 MHz	Channel 18	2438 MHz	Channel 28	2458 MHz	Channel 38	2478 MHz
Channel 09	2420 MHz	Channel 19	2440 MHz	Channel 29	2460 MHz	Channel 39	2480 MHz

Note:

1. This device is a BLE GPS Data Recorder including BLE transmitting and GPS/Glonass function.
2. The different of the each model is shown as below:

Item	Model No.	BLE Chip	Micro SD Card Slot + Micro SD Card	Nor Flash	software
1	BL-1000GT	Yes	Yes	No	Different parameter settings
2	BL-1000ST	Yes	Yes	No	Different parameter settings
3	BL-1000FT	Yes	No	Yes	Different parameter settings
4	BL-818GT	Yes	No	Yes	Different parameter settings
5	CR-1100S	No	Yes	No	Different parameter settings
6	CR-1100F	No	No	Yes	Different parameter settings
7	BL-1000xx (xx=AA~ZZ, for different market and software parameter setting.)	Yes	Yes	No	Different parameter settings

Note: Above models are identical in electrical, mechanical and physical design, the difference is times & rate to update GNSS information, configurable setting and memory type.

3. Regards to the frequency band operation; the lowest、middle and highest frequency of channel were selected to perform the test, and then shown on this report.

1.2. Test Mode

DEKRA has verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Test Mode	Mode 1: Transmit_Power by PC Mode 2: Transmit_Power by Battery

Test Items	Modulation	Channel	Result
Conducted Emission	GFSK	19	Complies
Peak Power Output	GFSK	00/19/39	Complies
Radiated Emission	GFSK	00/19/39	Complies
RF antenna conducted test	GFSK	00/19/39	Complies
Radiated Emission Band Edge	GFSK	00/19/39	Complies
Occupied Bandwidth & DTS Bandwidth	GFSK	00/19/39	Complies
Power Density	GFSK	00/19/39	Complies

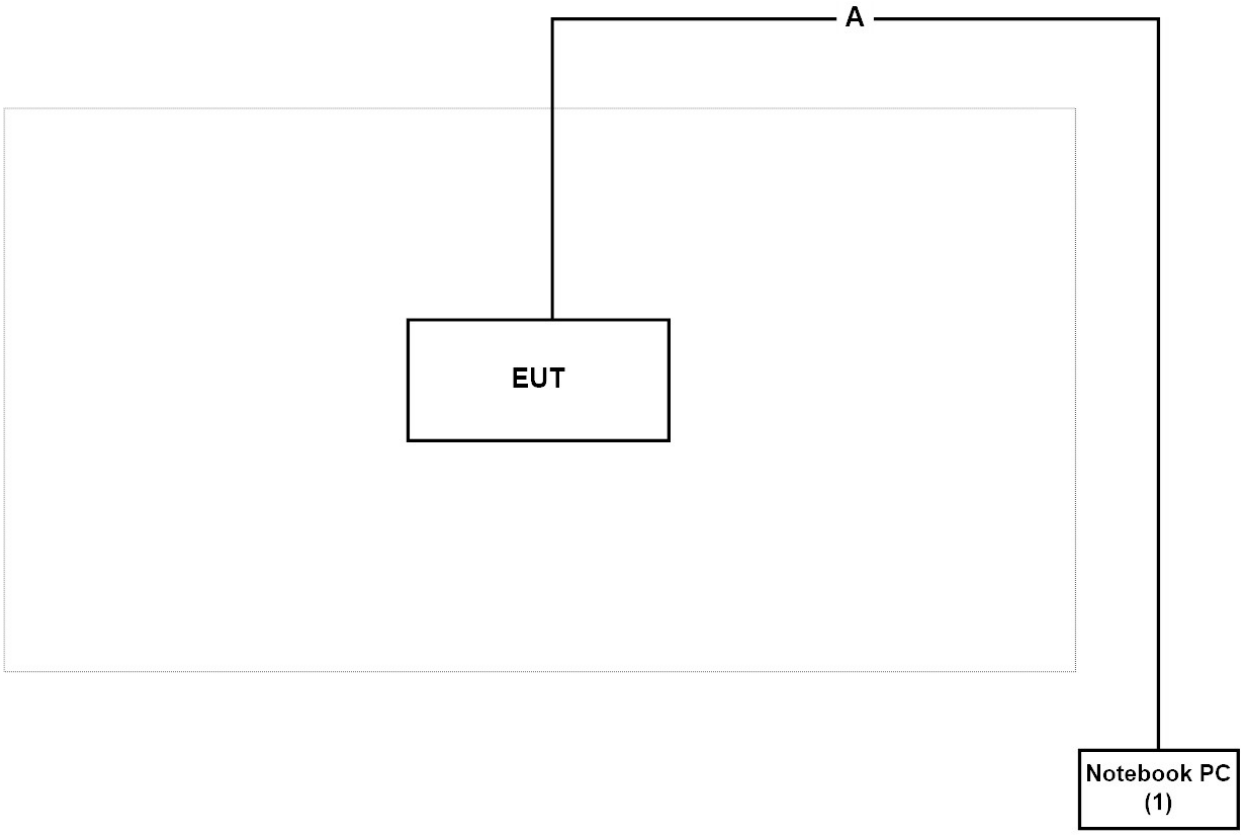
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1	Notebook PC	HP	NX6320	CNU62D1F4K	DoC	Non-Shielded, 1.8m

1.4. Configuration of tested System

Connection Diagram



Signal Cable Type		Signal cable Description
A	USB Cable	Non-Shielded, 10m

1.5. EUT Exercise Software

1	Test system is in accord with EUT user manual (refer to 1.4 configuration of tested system).
2	Execute the software “nRFgo” on the laptop.
3	Configure the test mode, the test channel, and the data rate.
4	Press “Start TX” and “Start RX” to start test.
5	Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual	Test Site
Temperature (°C)	FCC PART 15 C 15.207 Conducted Emission	15 - 35	20	3
Humidity (%RH)		25 - 75	50	
Barometric pressure (mbar)		860 - 1060	950-1000	
Temperature (°C)	FCC PART 15 C 15.247 Peak Power Output	15 - 35	24	3
Humidity (%RH)		25 - 75	45	
Barometric pressure (mbar)		860 - 1060	950-1000	
Temperature (°C)	FCC PART 15 C 15.247 Radiated Emission	15 - 35	25	2
Humidity (%RH)		25 - 75	54	
Barometric pressure (mbar)		860 - 1060	950-1000	
Temperature (°C)	FCC PART 15 C 15.247 RF antenna conducted test	15 - 35	24	3
Humidity (%RH)		25 - 75	45	
Barometric pressure (mbar)		860 - 1060	950-1000	
Temperature (°C)	FCC PART 15 C 15.247 Band Edge	15 - 35	25	2
Humidity (%RH)		25 - 75	50	
Barometric pressure (mbar)		860 - 1060	950-1000	
Temperature (°C)	FCC PART 15 C 15.247 Occupied Bandwidth & DTS Bandwidth	15 - 35	24	3
Humidity (%RH)		25 - 75	45	
Barometric pressure (mbar)		860 - 1060	950-1000	
Temperature (°C)	FCC PART 15 C 15.247 Power Density	15 - 35	24	3
Humidity (%RH)		25 - 75	45	
Barometric pressure (mbar)		860 - 1060	950-1000	

Note: Test site information refers to Laboratory Information.

Laboratory Information

USA : FCC, Registration Number: TW3024

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:
http://www.dekra.com.tw/english/about/certificates.aspx?bval=5
The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site : http://www.dekra.com.tw/index_en.aspx

If you have any comments, Please don't hesitate to contact us. Our test sites as below:

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1.7. List of Test Equipment

Conducted Emission /SR2-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Artificial Mains Network	R&S	ENV4200	848411/010	2018/01/22	2019/01/21
Test Receiver	R&S	ESCS 30	836858/022	2017/04/12	2018/04/11
LISN	R&S	ENV216	100092	2017/07/31	2018/07/30

Peak Power Output / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal & Spectrum Analyzer	R&S	FSV40	101049	2018/01/10	2019/01/09
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04
High Speed Peak Power Meter Dual Input	Anritsu	ML2496A	1602004	2018/01/02	2019/01/01
Pulse Power Sensor	Anritsu	MA2411B	1531043	2018/01/02	2019/01/01
Pulse Power Sensor	Anritsu	MA2411B	1531044	2018/01/02	2019/01/01

Radiated Emission / CB4-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2017/11/21	2018/11/20
Signal & Spectrum Analyzer	R&S	FSV40	101049	2018/01/10	2019/01/09
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04
Bilog Antenna	Teseq	CBL6112D	23191	2017/06/28	2018/06/27
Horn Antenna	Schwarzbeck	BBHA 9120D	639	2017/06/14	2018/06/13
Horn Antenna	Schwarzbeck	BBHA 9170	202	2018/01/31	2019/01/30
Pre-Amplifier	Dekra	AP-025C	201801236	2018/02/26	2019/02/25
Pre-Amplifier	EMCI	EMC11830I	980366	2018/01/08	2019/01/07
Pre-Amplifier	Dekra	AP-400C	201801231	2017/12/13	2018/12/12

RF antenna conducted test / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Spectrum Analyzer	Keysight	N9030B	MY57140404	2017/06/13	2018/06/12
Spectrum Analyzer	Keysight	N9010B	MY57110159	2017/06/05	2018/06/04
Spectrum Analyzer	Agilent	N9010A	US47140172	2017/07/26	2018/07/25
Signal & Spectrum Analyzer	R&S	FSV40	101049	2018/01/10	2019/01/09

Band Edge / CB4-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2017/11/21	2018/11/20
Signal & Spectrum Analyzer	R&S	FSV40	101049	2018/01/10	2019/01/09
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04
Bilog Antenna	Teseq	CBL6112D	23191	2017/06/28	2018/06/27
Horn Antenna	Schwarzbeck	BBHA 9120D	639	2017/06/14	2018/06/13
Horn Antenna	Schwarzbeck	BBHA 9170	202	2018/01/31	2019/01/30
Pre-Amplifier	Dekra	AP-025C	201801236	2018/02/26	2019/02/25
Pre-Amplifier	EMCI	EMC11830I	980366	2018/01/08	2019/01/07
Pre-Amplifier	Dekra	AP-400C	201801231	2017/12/13	2018/12/12

Occupied Bandwidth & DTS Bandwidth / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Spectrum Analyzer	Keysight	N9030B	MY57140404	2017/06/13	2018/06/12
Spectrum Analyzer	Keysight	N9010B	MY57110159	2017/06/05	2018/06/04
Spectrum Analyzer	Agilent	N9010A	US47140172	2017/07/26	2018/07/25
Signal & Spectrum Analyzer	R&S	FSV40	101049	2018/01/10	2019/01/09

Power Density / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Spectrum Analyzer	Keysight	N9030B	MY57140404	2017/06/13	2018/06/12
Spectrum Analyzer	Keysight	N9010B	MY57110159	2017/06/05	2018/06/04
Spectrum Analyzer	Agilent	N9010A	US47140172	2017/07/26	2018/07/25
Signal & Spectrum Analyzer	R&S	FSV40	101049	2018/01/10	2019/01/09

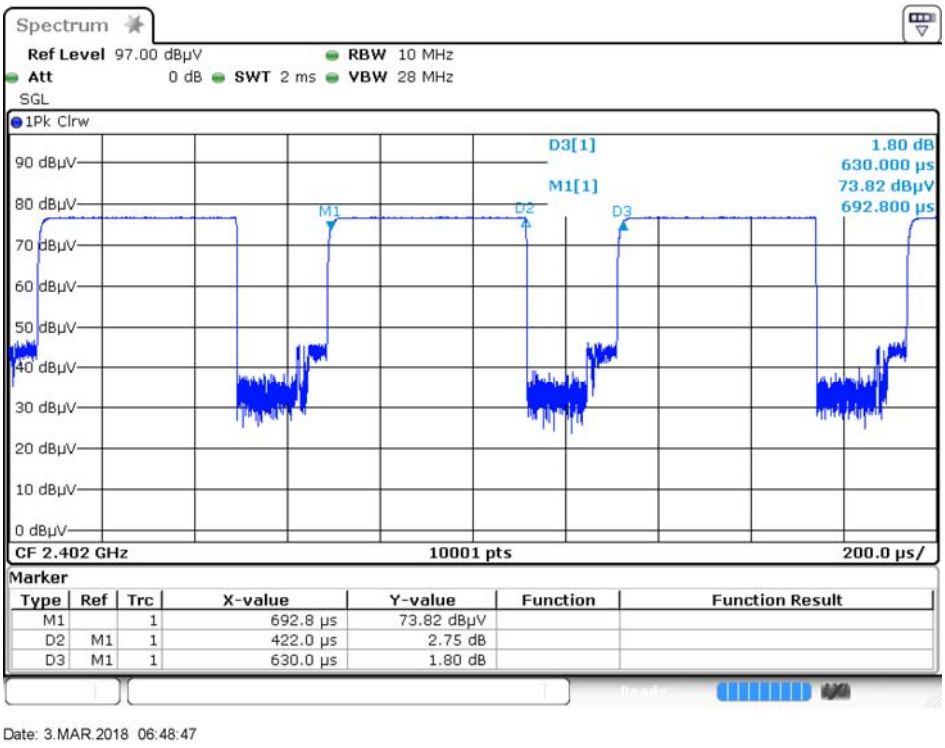
1.8. Measurement Uncertainty

Test Item	Uncertainty
Conducted Emission	± 2.26 dB
Peak Power Output	± 1.27 dB
Radiated Emission (30MHz～1GHz)	± 3.43 dB
Radiated Emission (1GHz～26.5GHz)	± 3.65 dB
RF antenna conducted test	± 1.27 dB
Band Edge	Conducted is defined as ± 1.27 dB Radiated is defined as ± 3.9 dB
Occupied Bandwidth & DTS Bandwidth	± 50 kHz
Power Density	± 1.27 dB

1.9. Duty cycle

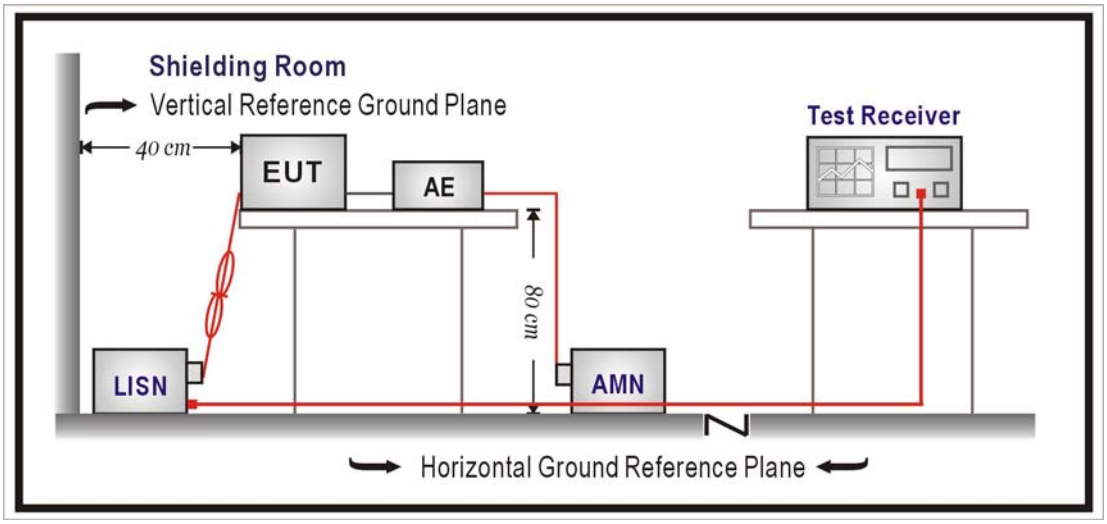
On Time (us)	ON+Off Time (us)	Duty Cycle (%)	Off Set (dB)
422.0	630	≒67	3.481

2402MHz



2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 Limits (dBuV)		
Frequency MHz	QP	AV
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

2.3. Test Procedure

The EUT was setup according to ANSI C63.10:2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs.)

Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

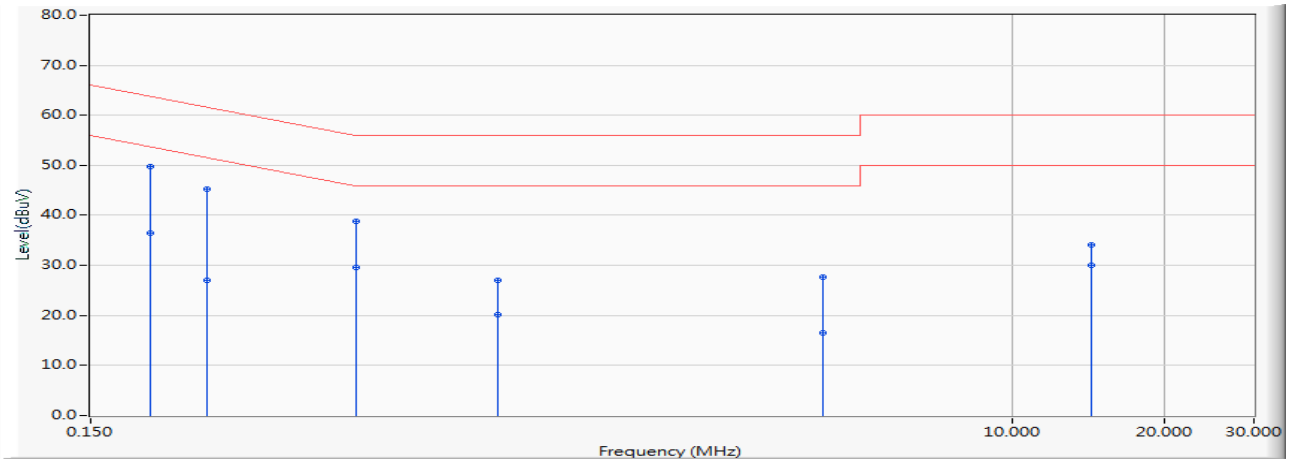
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

2.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.207: 2017

2.5. Test Result

Site : SR2-H	**Time : 2018/03/22**
Limit : CISPR_B_00M_QP	**Margin : 10**
Probe : SR2_LISN(16A)-6_0712 - Line1	**Power : DC 5V (Power by PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC** **802.1.15_BLE_2440MHz**

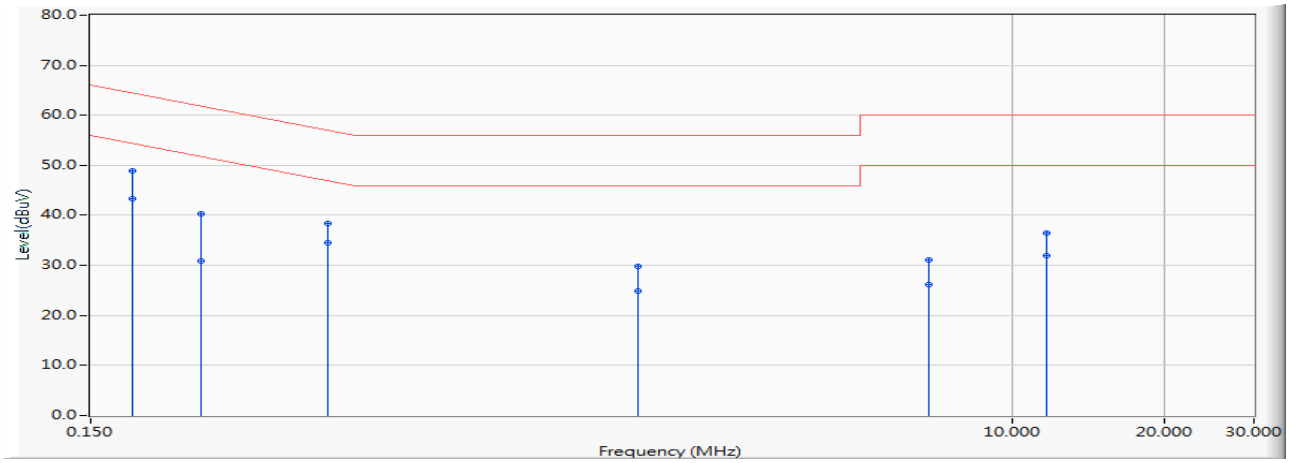


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.197	9.750	39.940	49.690	-14.051	63.741	QUASIPEAK
2		0.197	9.750	26.610	36.360	-17.381	53.741	AVERAGE
3		0.255	9.744	35.470	45.214	-16.363	61.577	QUASIPEAK
4		0.255	9.744	17.340	27.084	-24.493	51.577	AVERAGE
5		0.502	9.729	28.990	38.720	-17.280	56.000	QUASIPEAK
6		0.502	9.729	19.970	29.700	-16.300	46.000	AVERAGE
7		0.959	9.812	17.250	27.062	-28.938	56.000	QUASIPEAK
8		0.959	9.812	10.260	20.072	-25.928	46.000	AVERAGE
9		4.213	9.920	17.680	27.600	-28.400	56.000	QUASIPEAK
10		4.213	9.920	6.660	16.580	-29.420	46.000	AVERAGE
11		14.287	10.207	23.850	34.057	-25.943	60.000	QUASIPEAK
12		14.287	10.207	19.800	30.007	-19.993	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : SR2-H	**Time : 2018/03/22**
Limit : CISPR_B_00M_QP	**Margin : 10**
Probe : SR2_LISN(16A)-6_0712 - Line2	**Power : DC 5V (Power by PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC** **802.1.15_BLE_2440MHz**



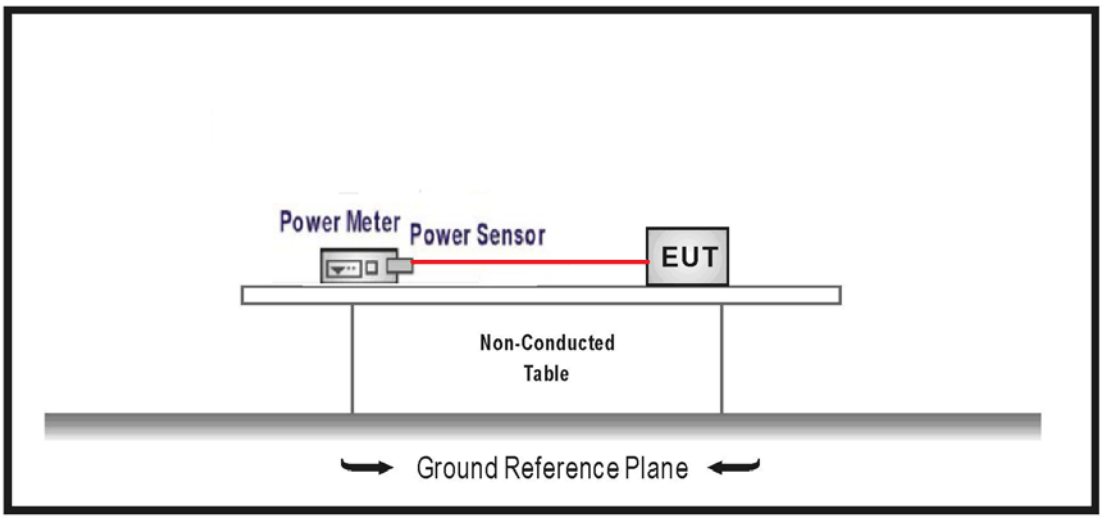
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.181	9.752	39.160	48.912	-15.516	64.428	QUASIPEAK
2	*	0.181	9.752	33.650	43.402	-11.026	54.428	AVERAGE
3		0.248	9.750	30.640	40.390	-21.445	61.835	QUASIPEAK
4		0.248	9.750	21.190	30.940	-20.895	51.835	AVERAGE
5		0.443	9.748	28.750	38.498	-18.508	57.006	QUASIPEAK
6		0.443	9.748	24.840	34.588	-12.418	47.006	AVERAGE
7		1.810	9.844	20.050	29.894	-26.106	56.000	QUASIPEAK
8		1.810	9.844	14.980	24.824	-21.176	46.000	AVERAGE
9		6.810	9.964	21.160	31.124	-28.876	60.000	QUASIPEAK
10		6.810	9.964	16.220	26.184	-23.816	50.000	AVERAGE
11		11.670	10.203	26.320	36.523	-23.477	60.000	QUASIPEAK
12		11.670	10.203	21.770	31.973	-18.027	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

3. Peak Power Output

3.1. Test Setup



3.2. Test procedures

The EUT was setup according to ANSI C63.10: 2013; tested according to DTS test procedure of KDB558074 D01V04 for compliance to FCC 47CFR 15.247 requirements.

3.3. Limits

The maximum peak power shall be less 1 Watt.

3.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247.

3.5. Test Result

Product	BLE GPS Data Recorder		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit_Power by PC		
Date of Test	2018/03/20	Test Site	SR10-H

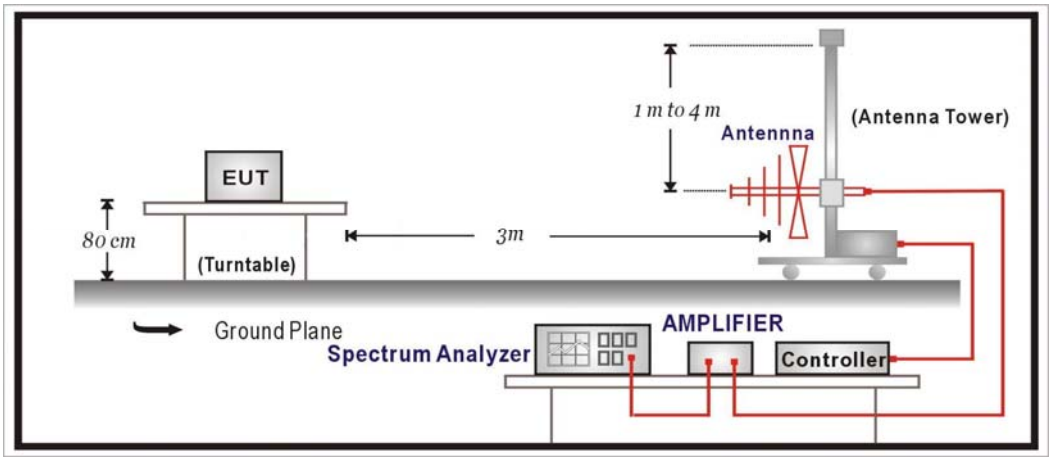
GFSK

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	0.650	≦30.000	Pass
19	2440	0.870	≦30.000	Pass
39	2480	0.560	≦30.000	Pass

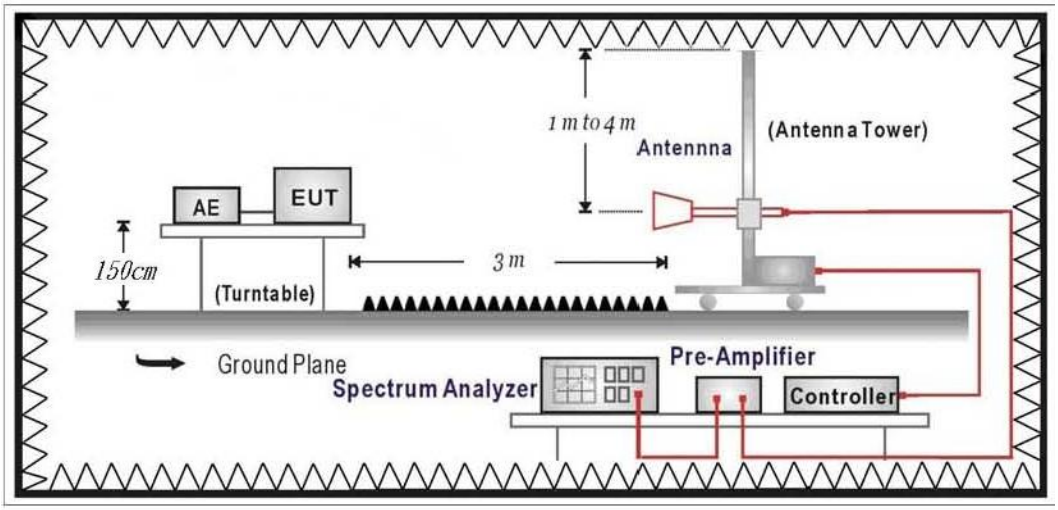
4. Radiated Emission

4.1. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



4.2. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	uV/m	dBuV/m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

Remarks : 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB558074 D01V04 for compliance to FCC 47CFR 15.247 requirements.
The EUT and its simulators are placed on a turn table which is 0.8 or 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level.
The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.
On any frequency or frequencies form 9KHz(inculde The the lowest oscillator frequency generated within the device up to the 10th harmonic) to 1000 MHz, the limits shown are based on measuring equipment employing a quasi-peak detector function and on any frequency or frequencies above 1000 MHz the radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. When average radiated emission measurement are included emission measurement below 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.
The bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

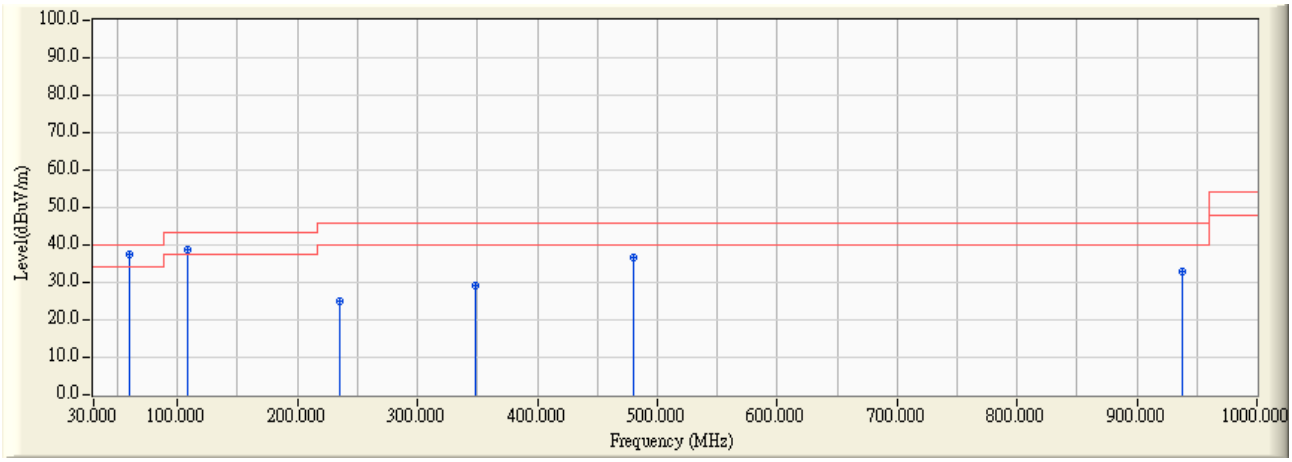
4.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247

4.5. Test Result

30MHz-1GHz Spurious

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB4_CE_Sub_S2_30M-1GHz_1116 - HORIZONTAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.1.15_BLE_2440MHz**

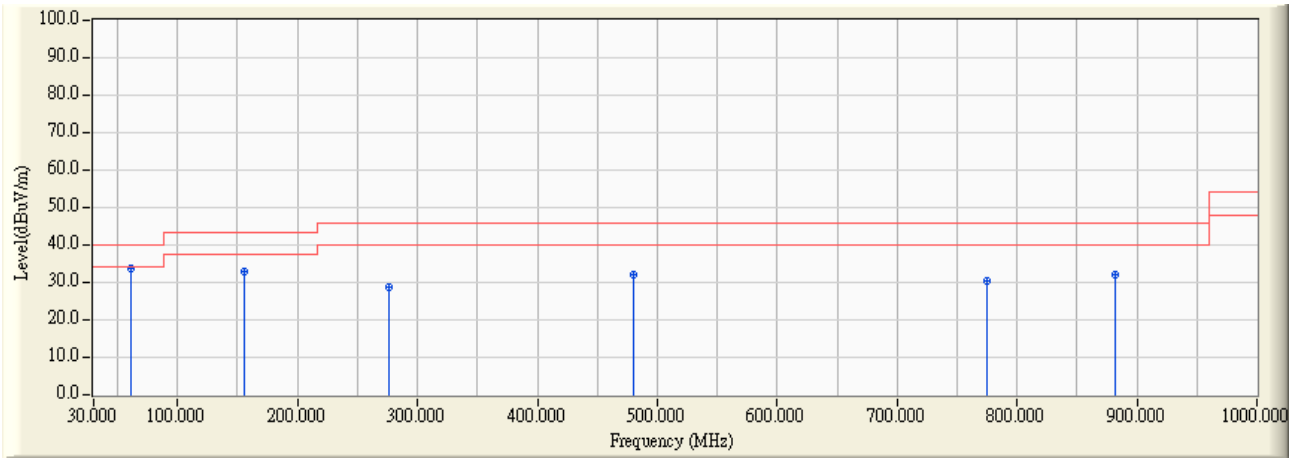


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	60.070	-27.890	65.277	37.387	-2.613	40.000	QUASIPEAK
2		108.085	-28.244	67.197	38.953	-4.547	43.500	QUASIPEAK
3		235.155	-24.745	49.643	24.898	-21.102	46.000	QUASIPEAK
4		348.160	-18.138	47.258	29.121	-16.879	46.000	QUASIPEAK
5		480.080	-14.908	51.733	36.826	-9.174	46.000	QUASIPEAK
6		937.920	-7.635	40.462	32.826	-13.174	46.000	QUASIPEAK

Note:

1. All Reading Levels is Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. The Emission under 30MHz were not included is because their levels are too low.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB4_CE_Sub_S2_30M-1GHz_1116 - VERTICAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC** **802.1.15_BLE_2440MHz**

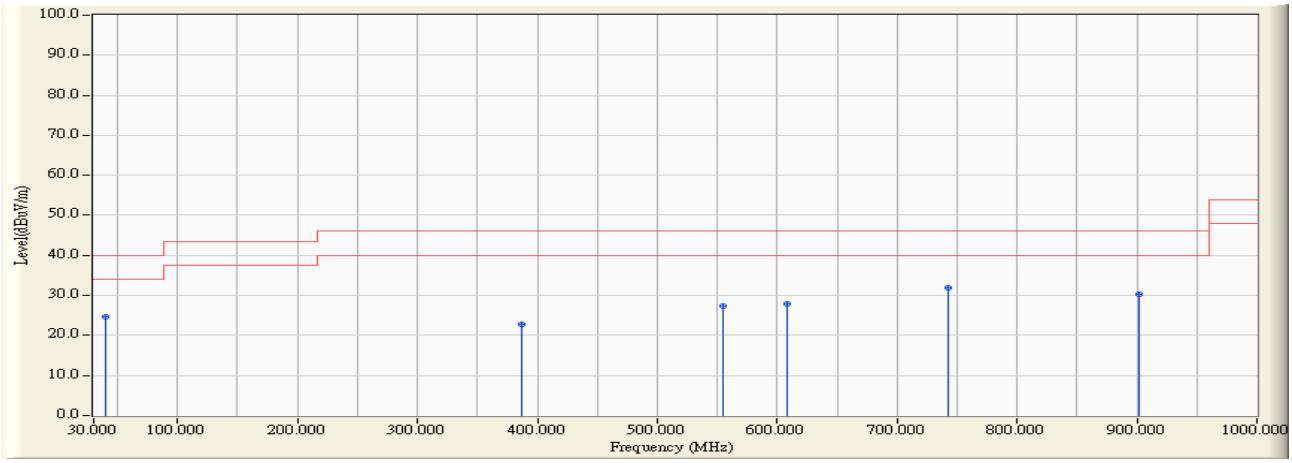


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	60.555	-31.472	65.032	33.560	-6.440	40.000	QUASIPEAK
2		156.100	-22.713	55.599	32.886	-10.614	43.500	QUASIPEAK
3		275.895	-21.106	49.742	28.637	-17.363	46.000	QUASIPEAK
4		480.080	-14.596	46.862	32.267	-13.733	46.000	QUASIPEAK
5		774.960	-9.468	39.939	30.471	-15.529	46.000	QUASIPEAK
6		881.660	-8.410	40.559	32.149	-13.851	46.000	QUASIPEAK

Note:

1. All Reading Levels is Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. The Emission under 30MHz were not included is because their levels are too low.

Site : CB4-H	**Time : 2018/03/21**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB4_CE_Sub_S2_30M-1GHz_1116 - HORIZONTAL	**Power : DC 3.7V (Power by Battery)**
EUT : BLE GPS Data Recorder	**Note : Mode 2: Transmit_Power by Battery 802.1.15_BLE_2440MHz**

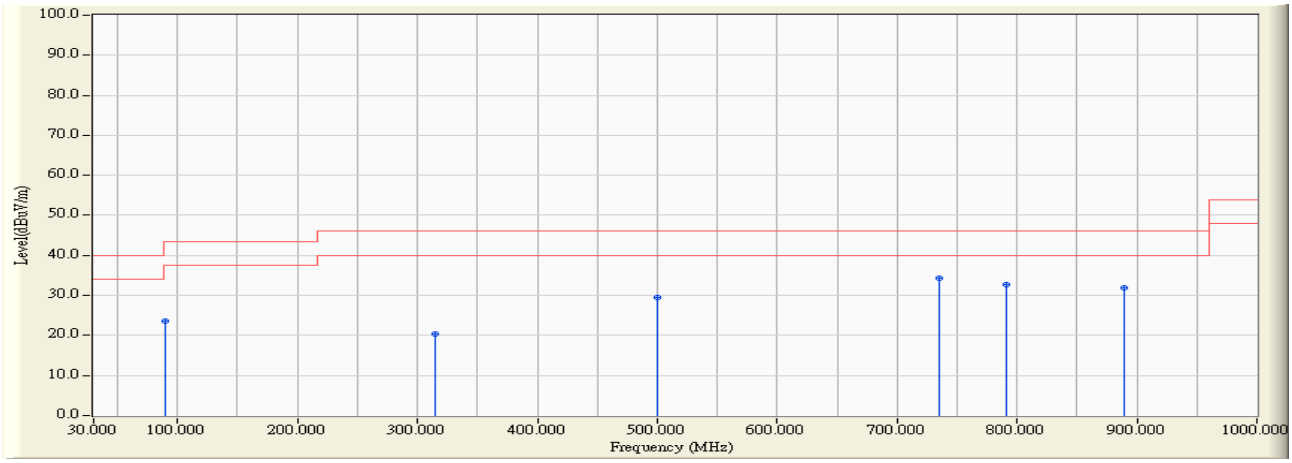


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		39.990	-18.998	43.546	24.547	-15.453	40.000	QUASIPEAK
2		387.409	-16.888	39.786	22.898	-23.102	46.000	QUASIPEAK
3		554.524	-13.279	40.706	27.427	-18.573	46.000	QUASIPEAK
4		608.256	-12.264	40.173	27.910	-18.090	46.000	QUASIPEAK
5	*	742.394	-10.766	42.576	31.810	-14.190	46.000	QUASIPEAK
6		902.040	-8.888	39.207	30.318	-15.682	46.000	QUASIPEAK

Note:

1. All Reading Levels is Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. The Emission under 30MHz were not included is because their levels are too low.

Site : CB4-H	**Time : 2018/03/21**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB4_CE_Sub_S2_30M-1GHz_1116 - VERTICAL	**Power : DC 3.7V (Power by Battery)**
EUT : BLE GPS Data Recorder	**Note : Mode 2: Transmit_Power by Battery 802.1.15_BLE_2440MHz**



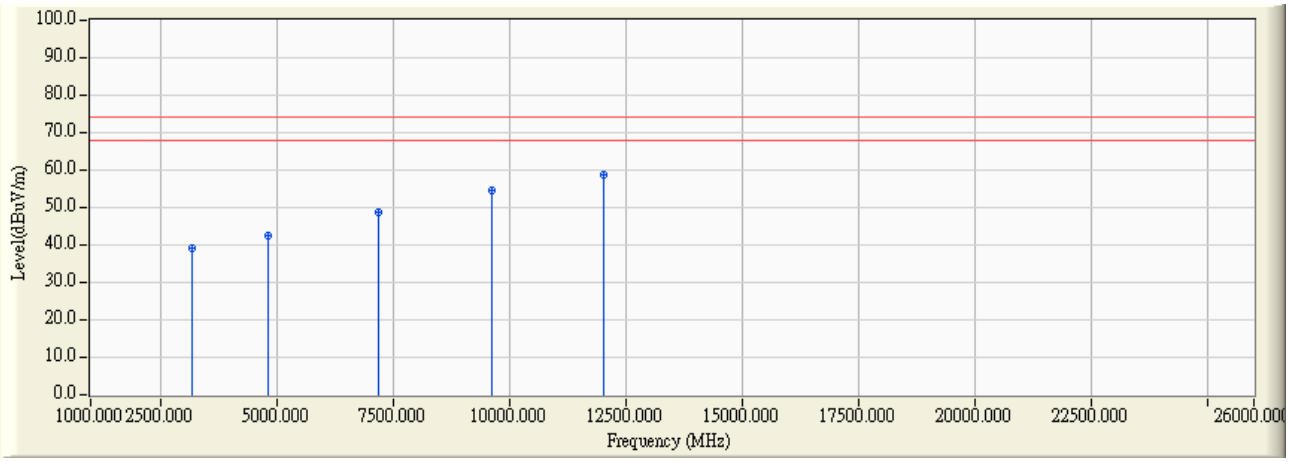
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		90.231	-22.008	45.519	23.511	-19.989	43.500	QUASIPEAK
2		315.248	-19.917	40.237	20.320	-25.680	46.000	QUASIPEAK
3		500.015	-13.994	43.397	29.402	-16.598	46.000	QUASIPEAK
4	*	735.313	-10.236	44.632	34.395	-11.605	46.000	QUASIPEAK
5		791.180	-9.302	42.092	32.790	-13.210	46.000	QUASIPEAK
6		888.849	-8.218	40.035	31.817	-14.183	46.000	QUASIPEAK

Note:

1. All Reading Levels is Quasi-Peak value.
2. “ * ”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. The Emission under 30MHz were not included is because their levels are too low.

Harmonic & Spurious:

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - HORIZONTAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2402MHz**

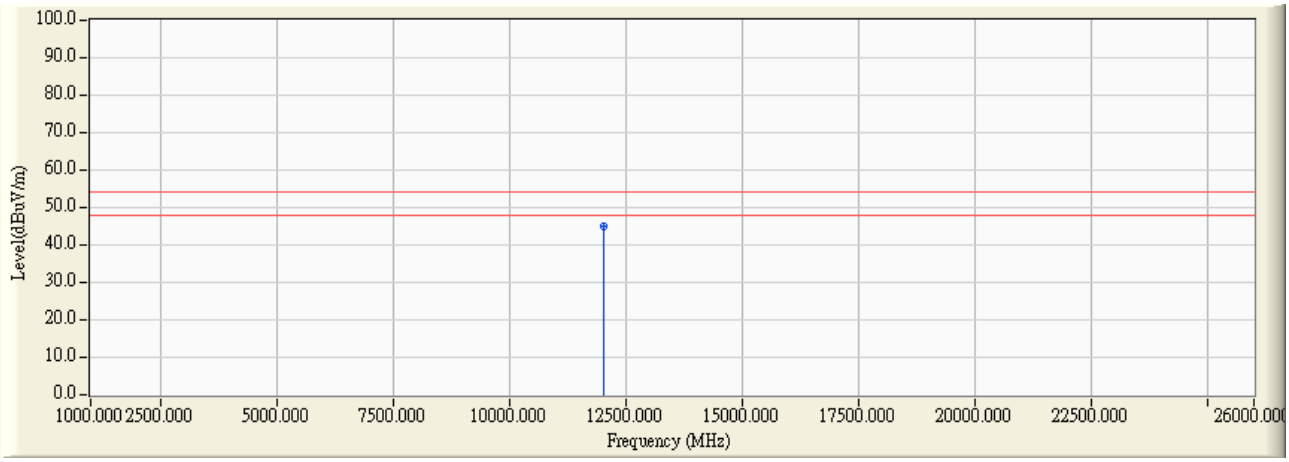


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		3194.900	2.142	37.084	39.226	-34.774	74.000	PEAK
2		4804.040	7.385	35.115	42.500	-31.500	74.000	PEAK
3		7200.830	15.886	32.707	48.593	-25.407	74.000	PEAK
4		9607.440	21.730	32.787	54.517	-19.483	74.000	PEAK
5	*	12017.610	26.118	32.789	58.907	-15.093	74.000	PEAK

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - HORIZONTAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2402MHz**

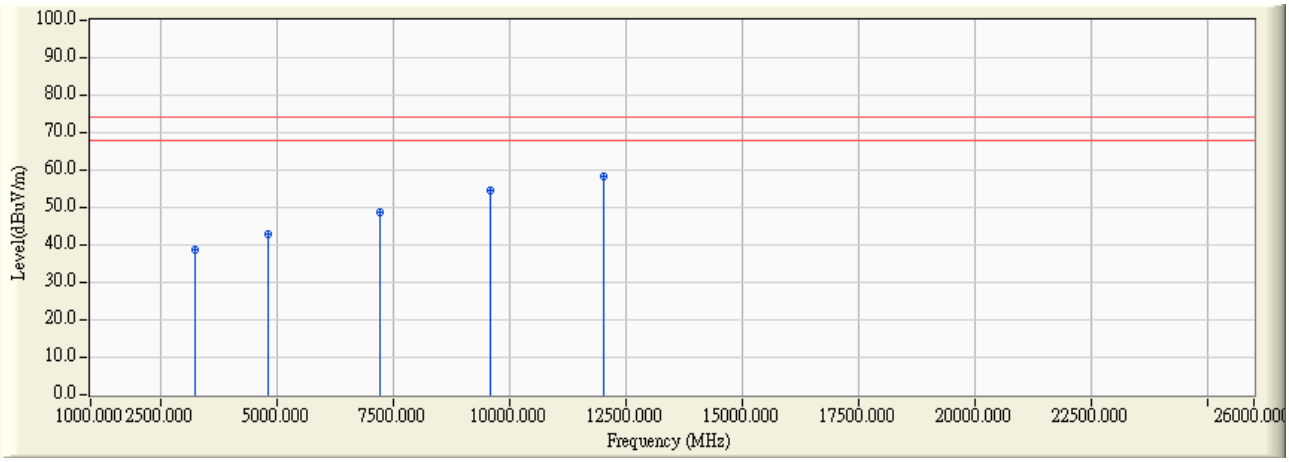


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	12017.610	26.118	18.922	45.040	-8.960	54.000	AVERAGE

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - VERTICAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2402MHz**

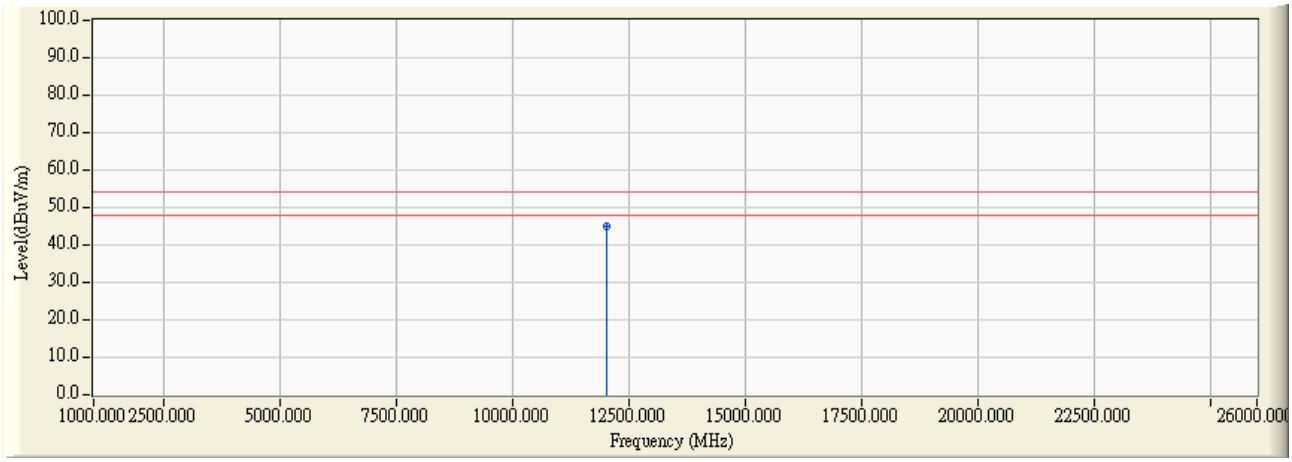


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		3229.100	2.195	36.403	38.598	-35.402	74.000	PEAK
2		4803.950	7.385	35.554	42.939	-31.061	74.000	PEAK
3		7212.160	15.941	32.791	48.732	-25.268	74.000	PEAK
4		9605.200	21.724	32.776	54.500	-19.500	74.000	PEAK
5	*	12016.140	26.121	32.232	58.353	-15.647	74.000	PEAK

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - VERTICAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2402MHz**

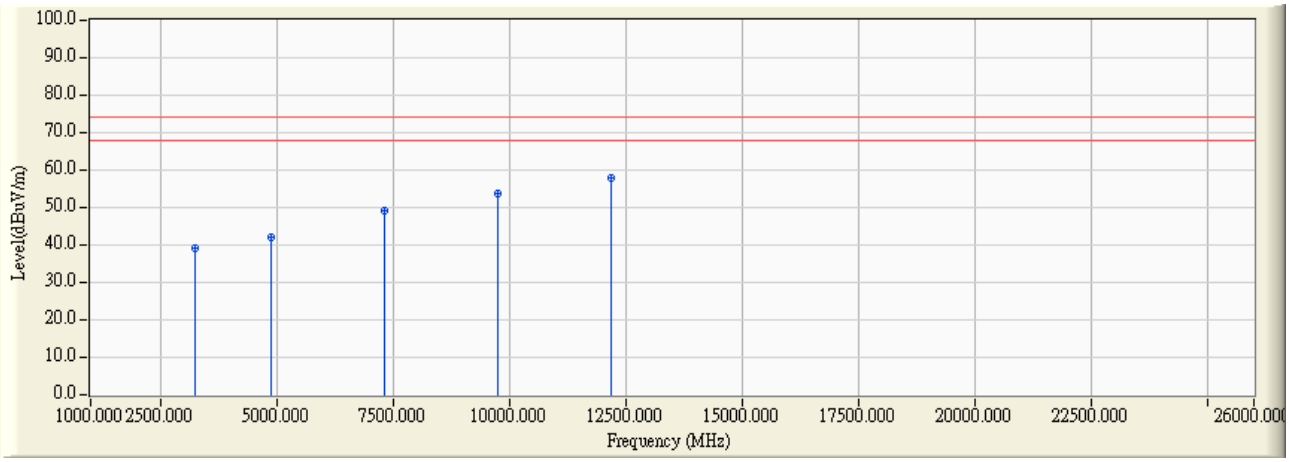


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	12016.140	26.121	18.908	45.029	-8.971	54.000	AVERAGE

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - HORIZONTAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2440MHz**

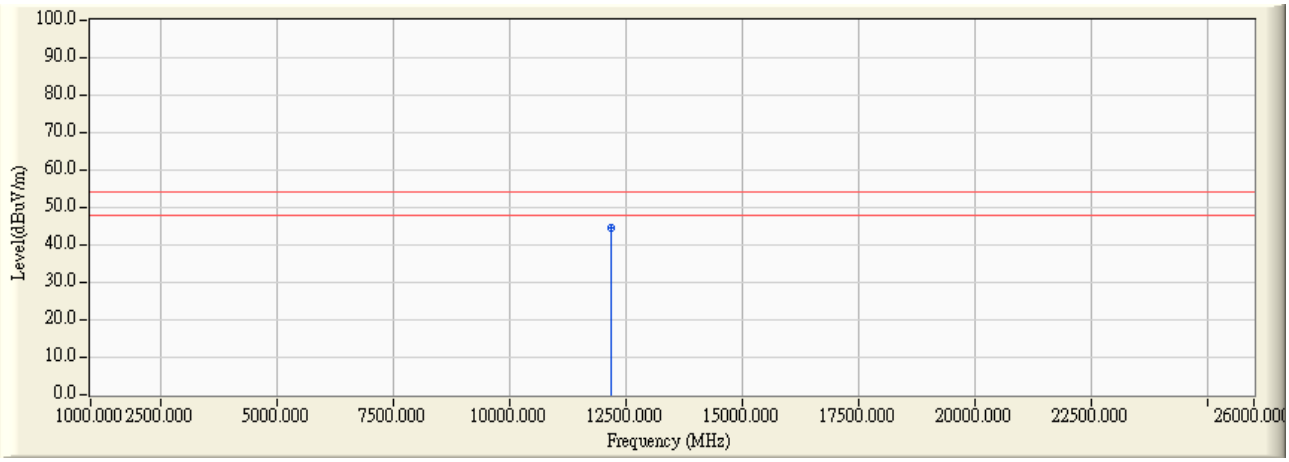


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		3259.200	2.240	36.900	39.140	-34.860	74.000	PEAK
2		4879.540	7.571	34.706	42.278	-31.722	74.000	PEAK
3		7316.800	16.413	32.715	49.128	-24.872	74.000	PEAK
4		9756.970	22.153	31.696	53.848	-20.152	74.000	PEAK
5	*	12197.590	25.780	31.936	57.716	-16.284	74.000	PEAK

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - HORIZONTAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2440MHz**

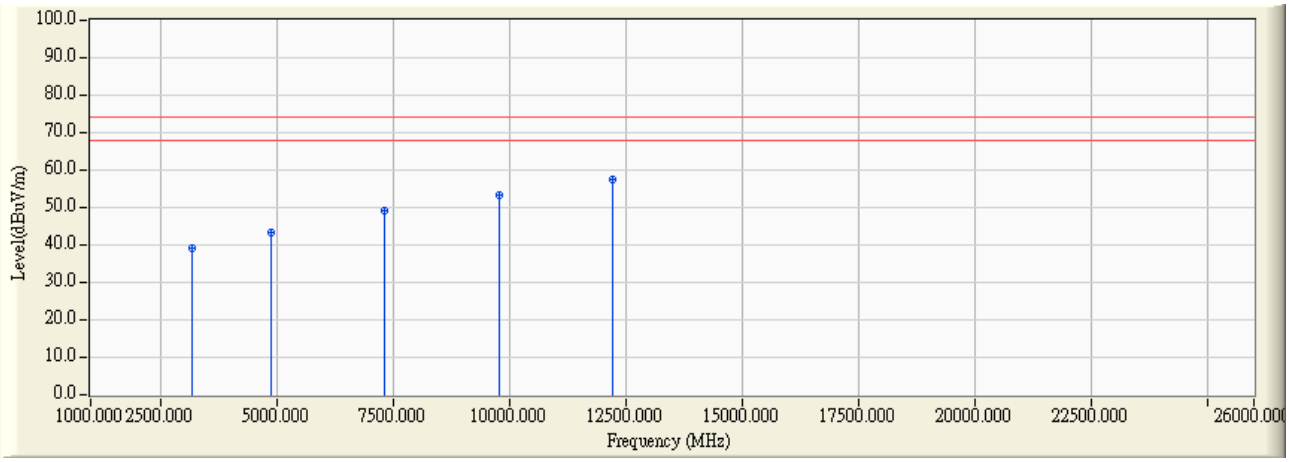


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	12197.590	25.780	18.832	44.612	-9.388	54.000	AVERAGE

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - VERTICAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2440MHz**

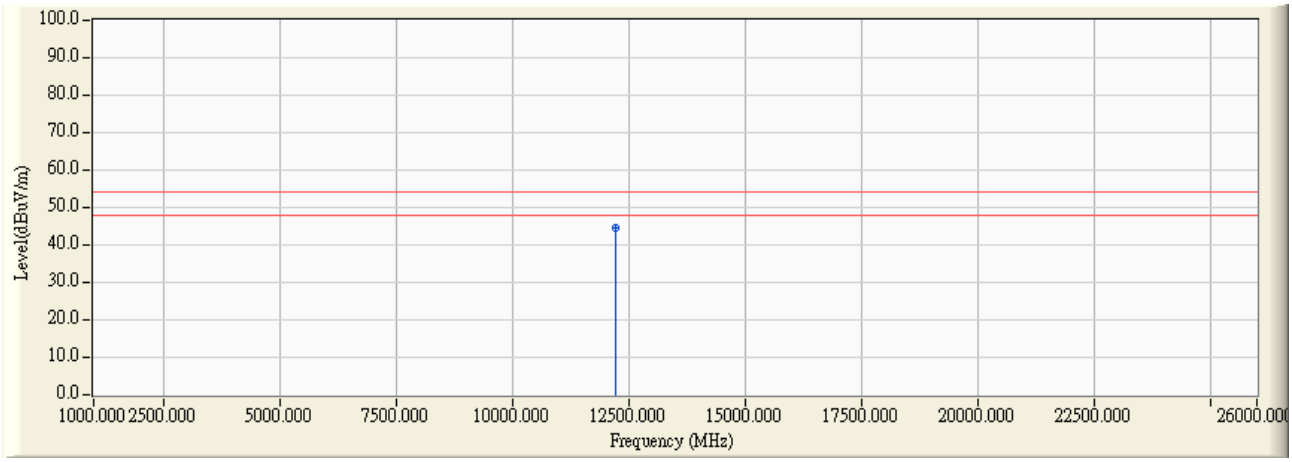


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		3180.950	2.120	36.954	39.075	-34.925	74.000	PEAK
2		4880.670	7.574	35.820	43.394	-30.606	74.000	PEAK
3		7316.900	16.413	32.816	49.229	-24.771	74.000	PEAK
4		9766.990	22.175	31.069	53.243	-20.757	74.000	PEAK
5	*	12207.870	25.760	31.897	57.657	-16.343	74.000	PEAK

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - VERTICAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2440MHz**

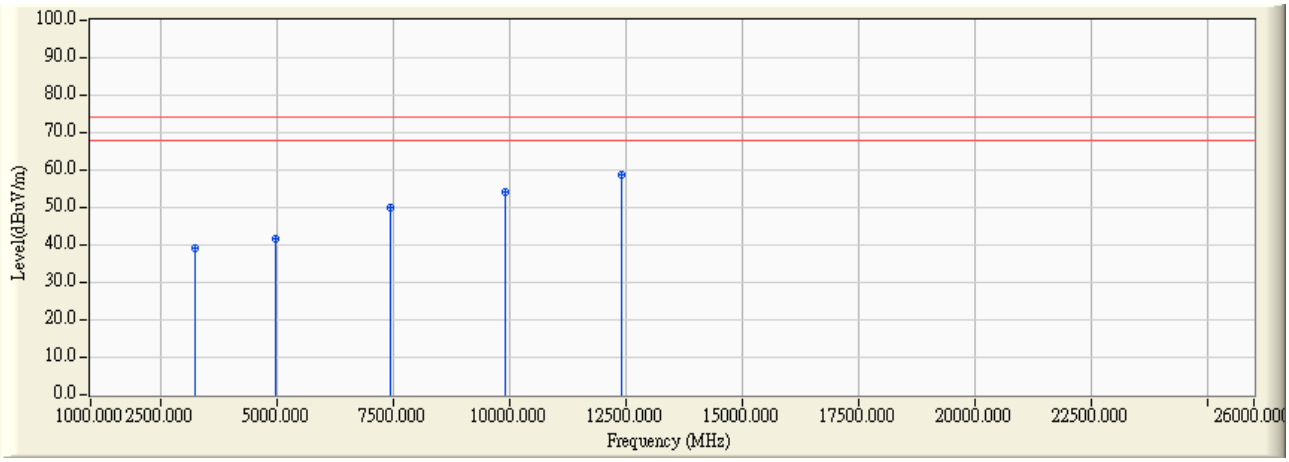


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	12207.870	25.760	18.650	44.410	-9.590	54.000	AVERAGE

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - HORIZONTAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2480MHz**

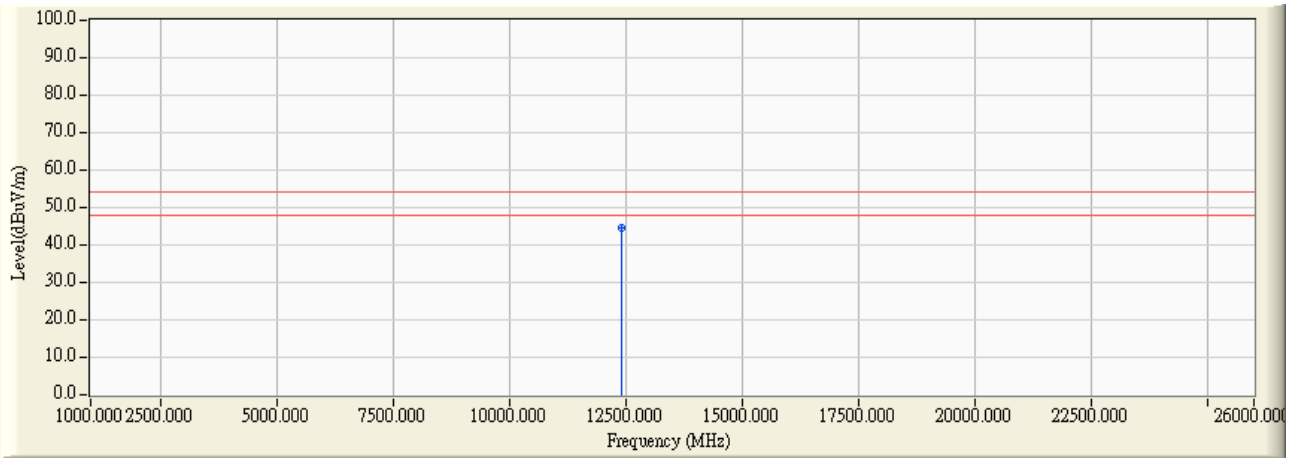


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		3242.600	2.217	37.019	39.235	-34.765	74.000	PEAK
2		4960.030	7.771	33.692	41.463	-32.537	74.000	PEAK
3		7439.600	16.947	33.028	49.974	-24.026	74.000	PEAK
4		9921.170	22.515	31.830	54.345	-19.655	74.000	PEAK
5	*	12398.320	25.411	33.539	58.950	-15.050	74.000	PEAK

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - HORIZONTAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2480MHz**

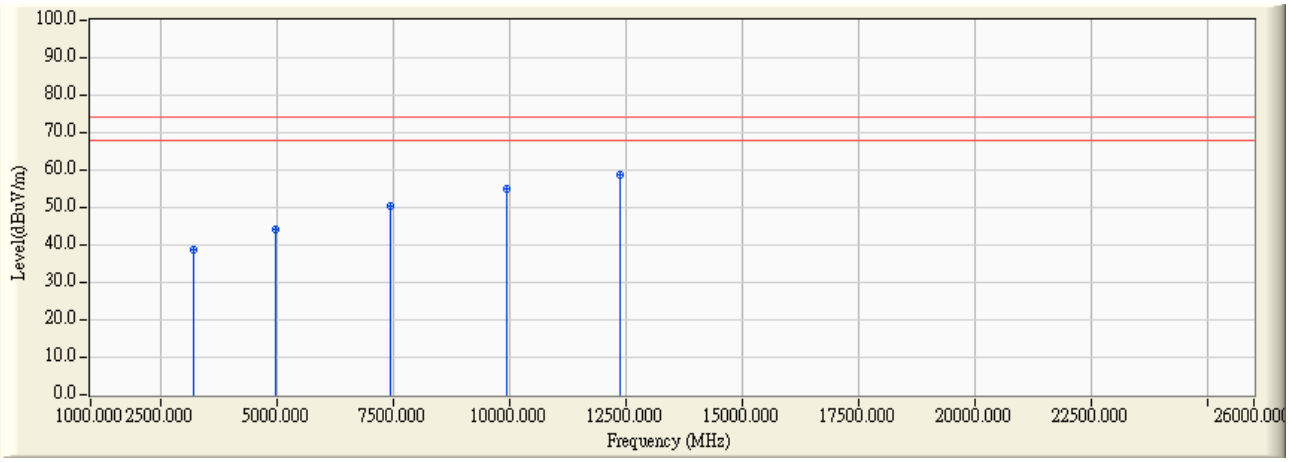


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	12398.320	25.411	19.013	44.424	-9.576	54.000	AVERAGE

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - VERTICAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2480MHz**

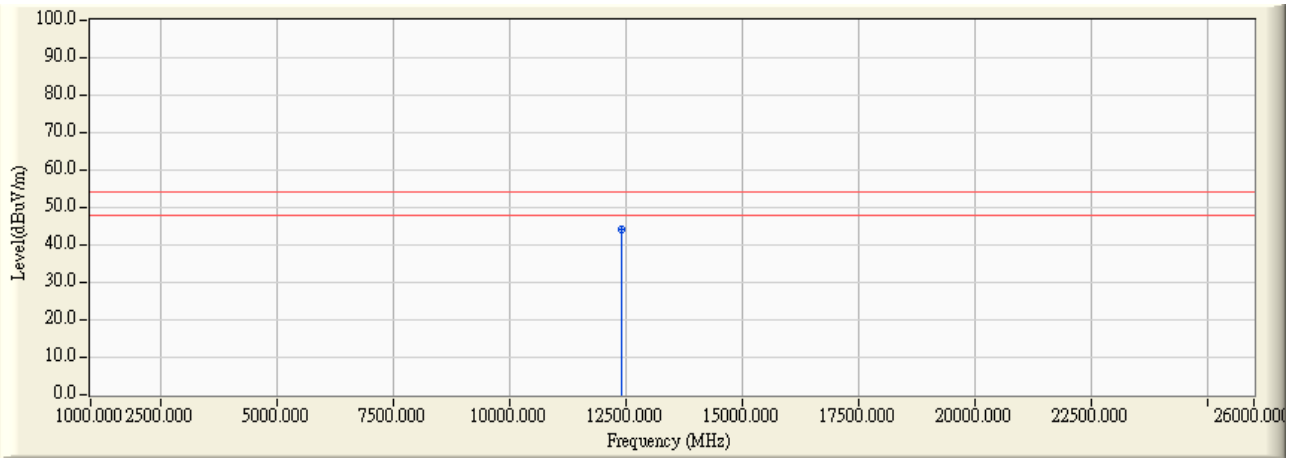


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		3198.550	2.148	36.597	38.745	-35.255	74.000	PEAK
2		4960.780	7.772	36.465	44.237	-29.763	74.000	PEAK
3		7447.160	16.979	33.378	50.358	-23.642	74.000	PEAK
4		9928.960	22.532	32.374	54.906	-19.094	74.000	PEAK
5	*	12391.820	25.423	33.212	58.635	-15.365	74.000	PEAK

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - VERTICAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2480MHz**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	12397.820	25.411	18.893	44.305	-9.695	54.000	AVERAGE

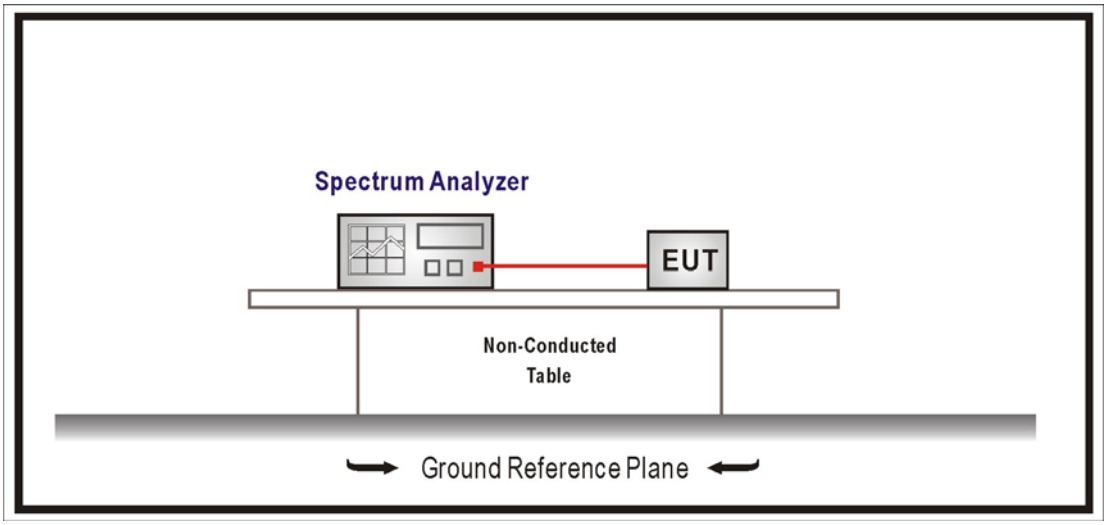
Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 13GHz were not included is because their levels are too low.

5. RF antenna conducted test

5.1. Test Setup

RF Conducted Measurement:



5.2. Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on an RF conducted or radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

5.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB558074 D01V04 for compliance to FCC 47CFR 15.247 requirements. Set RBW = 100 kHz, Set VBW> RBW, scan up through 10th harmonic.

5.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247.

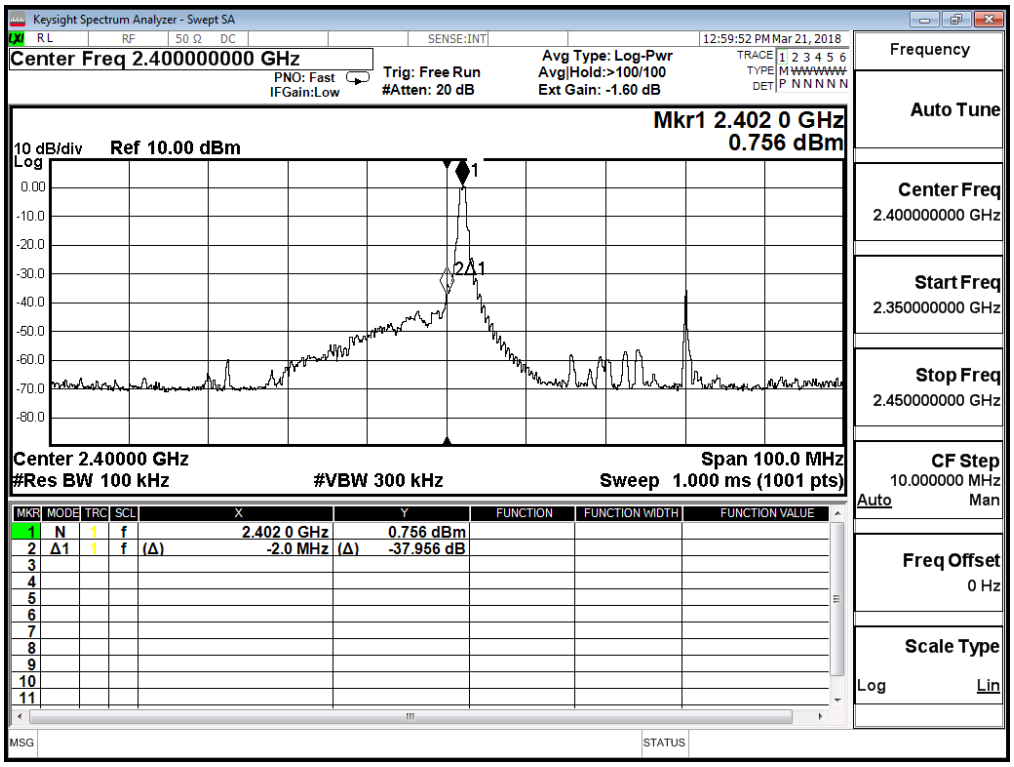
5.5. Test Result

Product	BLE GPS Data Recorder		
Test Item	RF antenna conducted test		
Test Mode	Mode 1: Transmit_Power by PC		
Date of Test	2018/03/21	Test Site	SR10-H

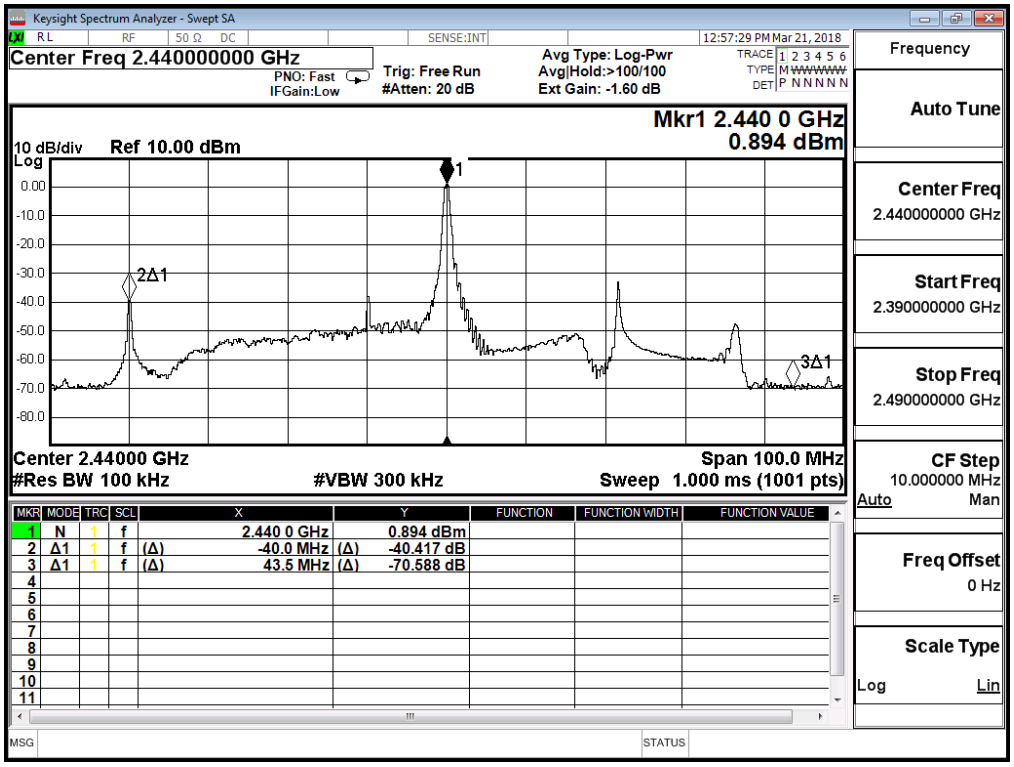
GFSK

Channel	Frequency (MHz)	Measure Level (dBc)	Limit (dBc)	Result
00	2402	37.956	≧20	Pass
19	2440	40.417	≧20	Pass
39	2480	53.695	≧20	Pass

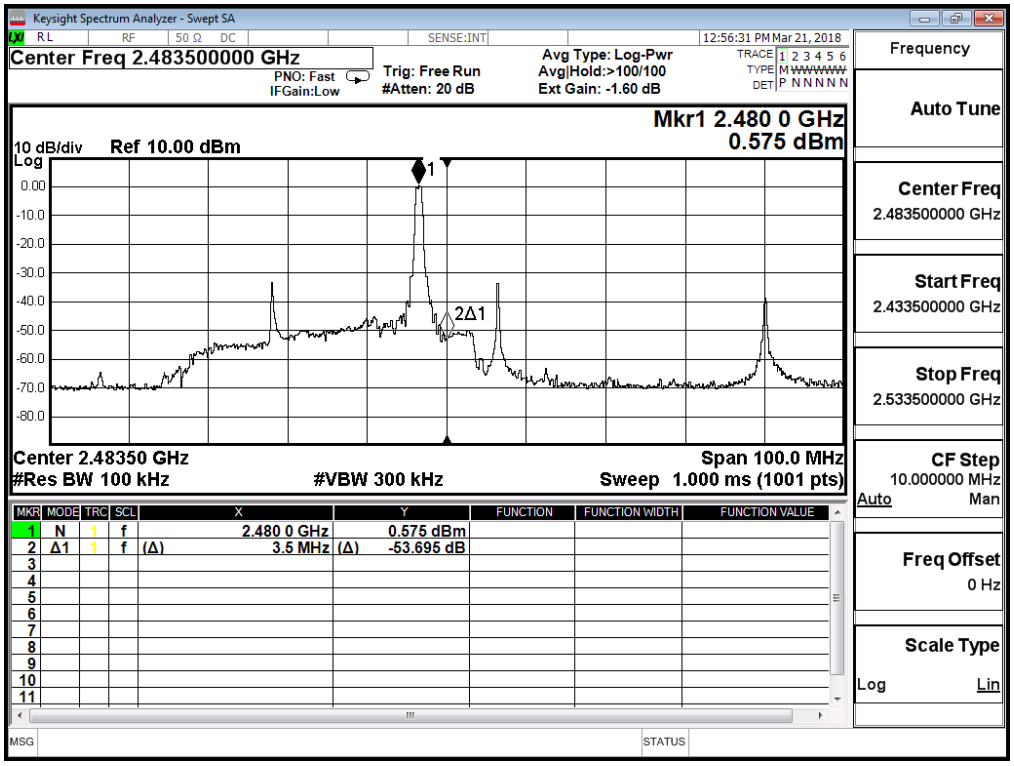
Channel 00



Channel 19

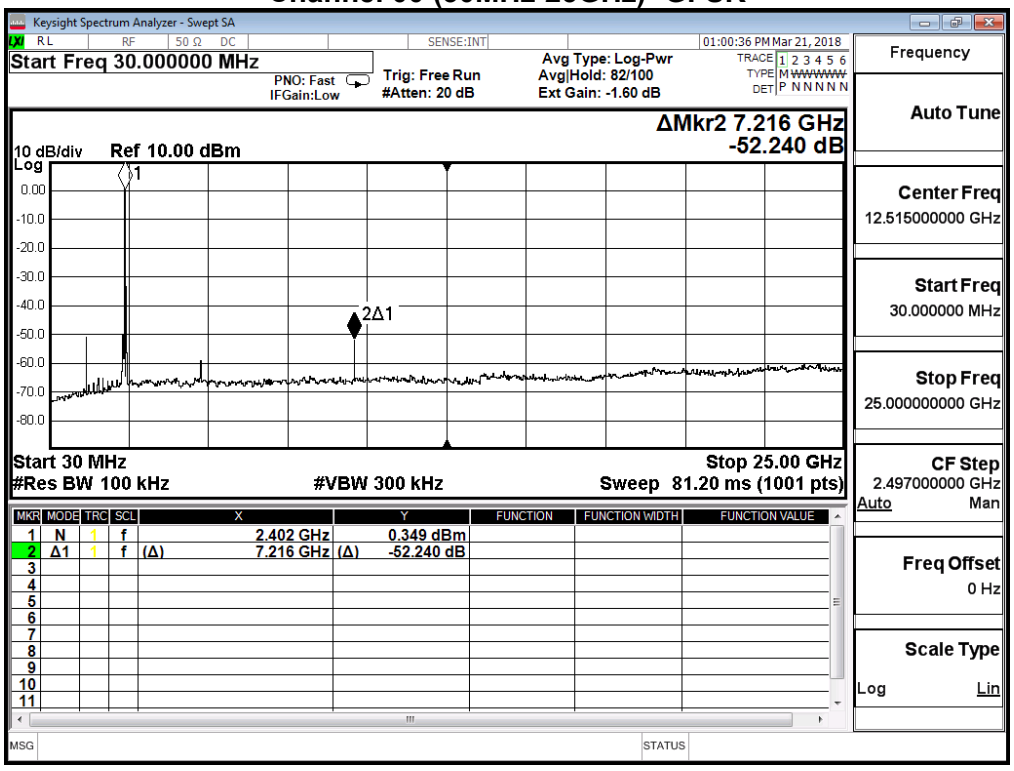


Channel 39

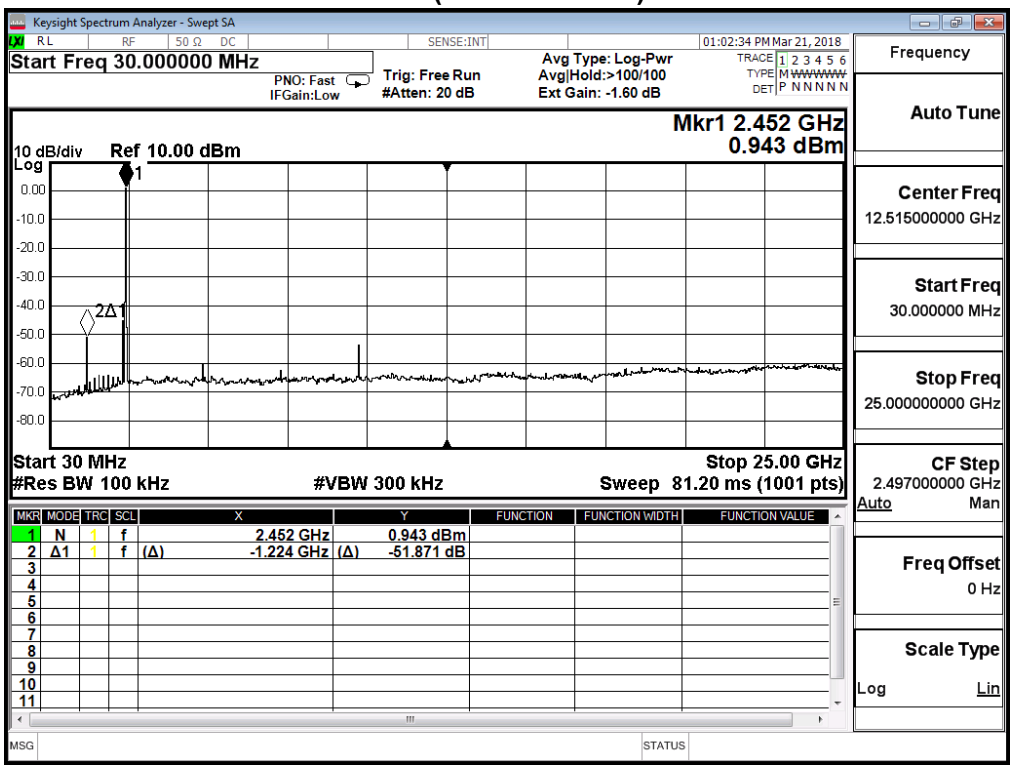


Product	BLE GPS Data Recorder		
Test Item	RF antenna conducted test		
Test Mode	Mode 1: Transmit_Power by PC		
Date of Test	2018/03/21	Test Site	SR10-H

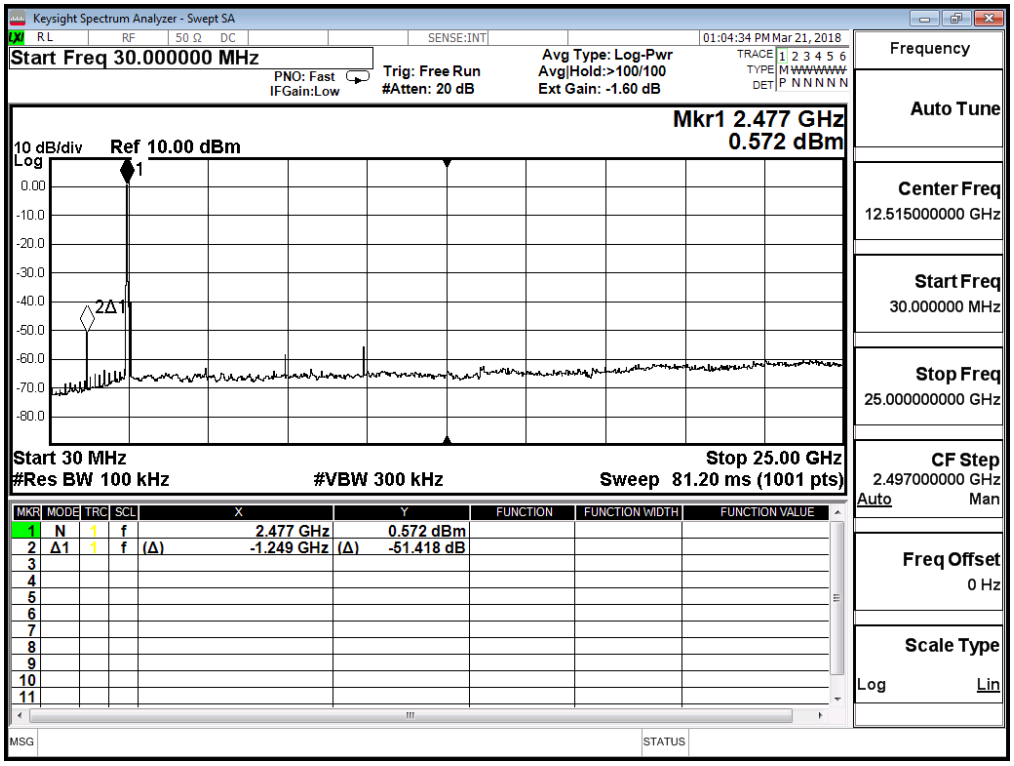
Channel 00 (30MHz-25GHz)- GFSK



Channel 19 (30MHz-25GHz)- GFSK



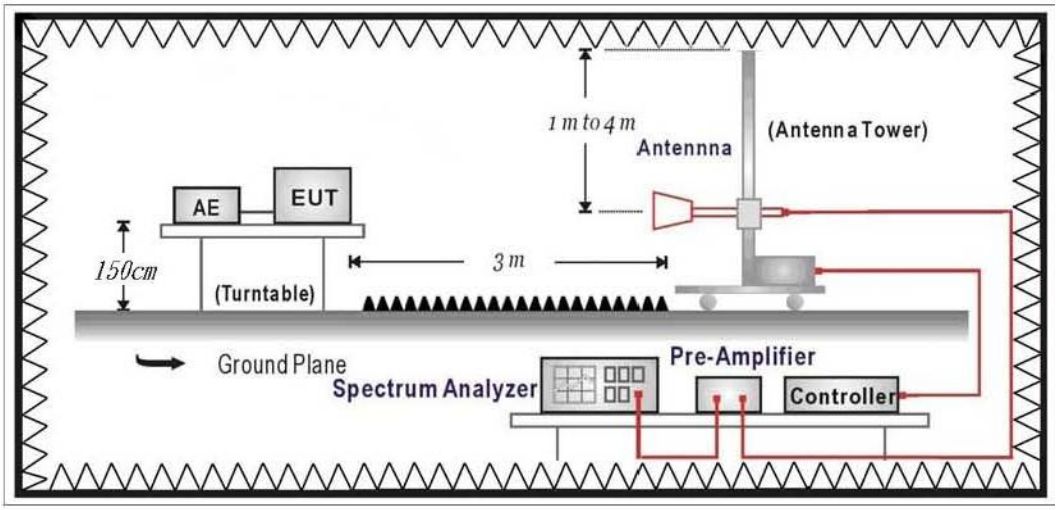
Channel 39 (30MHz-25GHz)- GFSK



6. Band Edge

6.1. Test Setup

RF Radiated Measurement:



6.2. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

6.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB558074 D01V04 for compliance to FCC 47CFR 15.247 requirements.

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

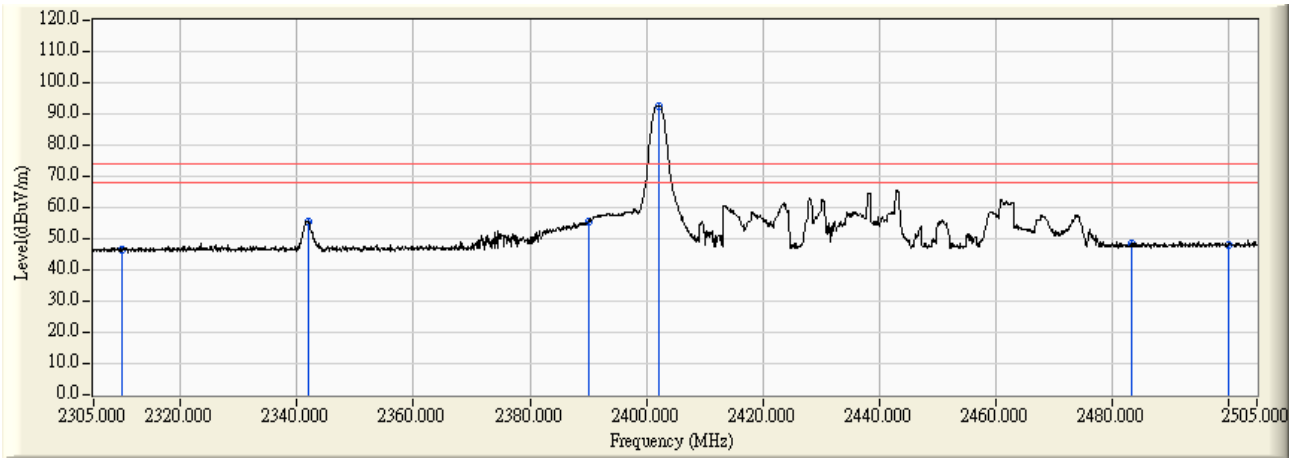
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

6.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247.

6.5. Test Result

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - HORIZONTAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2402MHz**

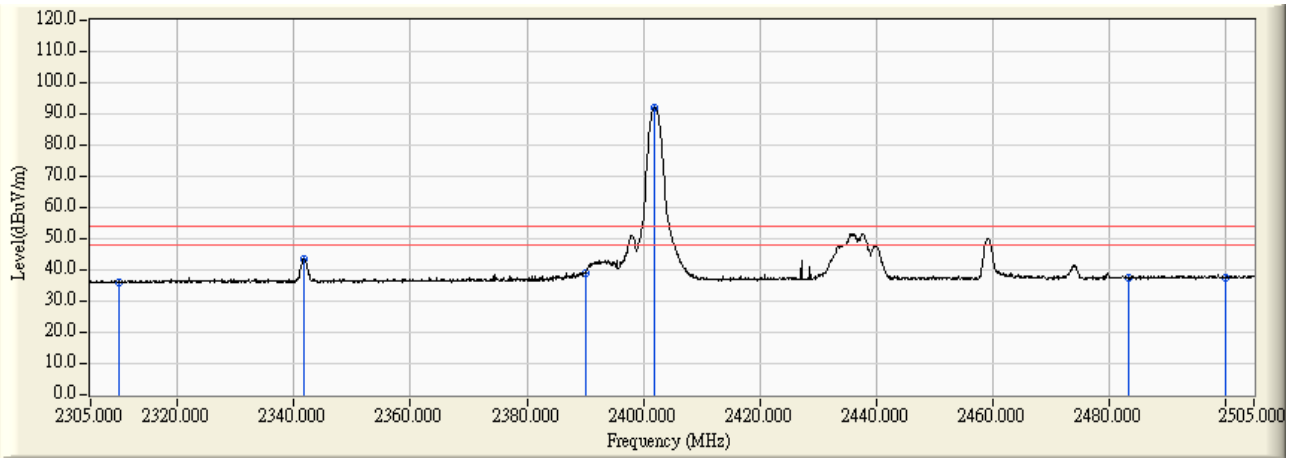


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	13.667	32.856	46.523	-27.477	74.000	PEAK
2		2341.800	13.850	41.854	55.704	-18.296	74.000	PEAK
3		2390.000	14.128	41.379	55.507	-18.493	74.000	PEAK
4	*	2402.300	14.199	78.436	92.635	18.635	74.000	PEAK
5		2483.500	14.658	33.793	48.452	-25.548	74.000	PEAK
6		2500.000	14.751	33.330	48.081	-25.919	74.000	PEAK

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
7. The fundamental for reference only, it’s not restricted by unwanted emission limit.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - HORIZONTAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2402MHz**

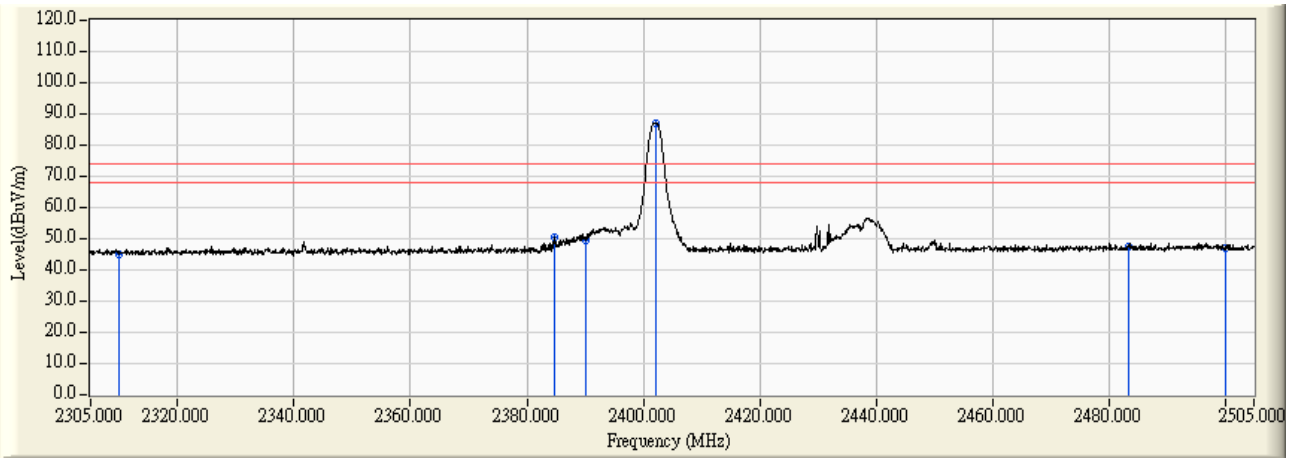


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	13.667	22.388	36.055	-17.945	54.000	AVERAGE
2		2341.600	13.849	29.473	43.322	-10.678	54.000	AVERAGE
3		2390.000	14.128	24.900	39.028	-14.972	54.000	AVERAGE
4	*	2402.000	14.198	78.025	92.222	38.222	54.000	AVERAGE
5		2483.500	14.658	22.726	37.385	-16.615	54.000	AVERAGE
6		2500.000	14.751	22.812	37.563	-16.437	54.000	AVERAGE

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
7. The fundamental for reference only, it’s not restricted by unwanted emission limit.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - VERTICAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2402MHz**

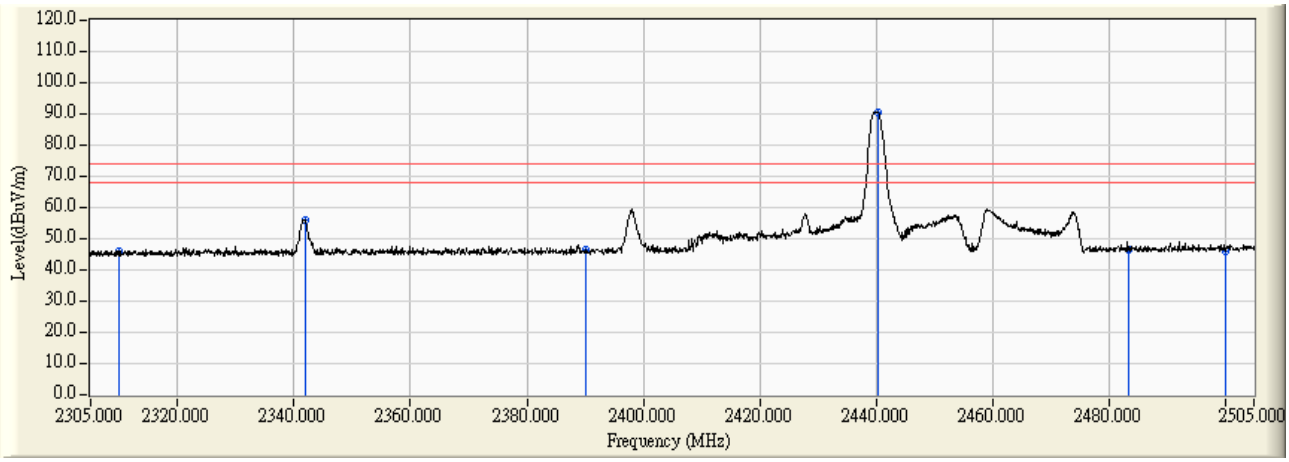


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	13.667	31.541	45.208	-28.792	74.000	PEAK
2		2384.800	14.099	36.547	50.645	-23.355	74.000	PEAK
3		2390.000	14.128	35.540	49.668	-24.332	74.000	PEAK
4	*	2402.300	14.199	72.660	86.859	12.859	74.000	PEAK
5		2483.500	14.658	32.901	47.560	-26.440	74.000	PEAK
6		2500.000	14.751	32.478	47.229	-26.771	74.000	PEAK

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
7. The fundamental for reference only, it’s not restricted by unwanted emission limit.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - HORIZONTAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2440MHz**

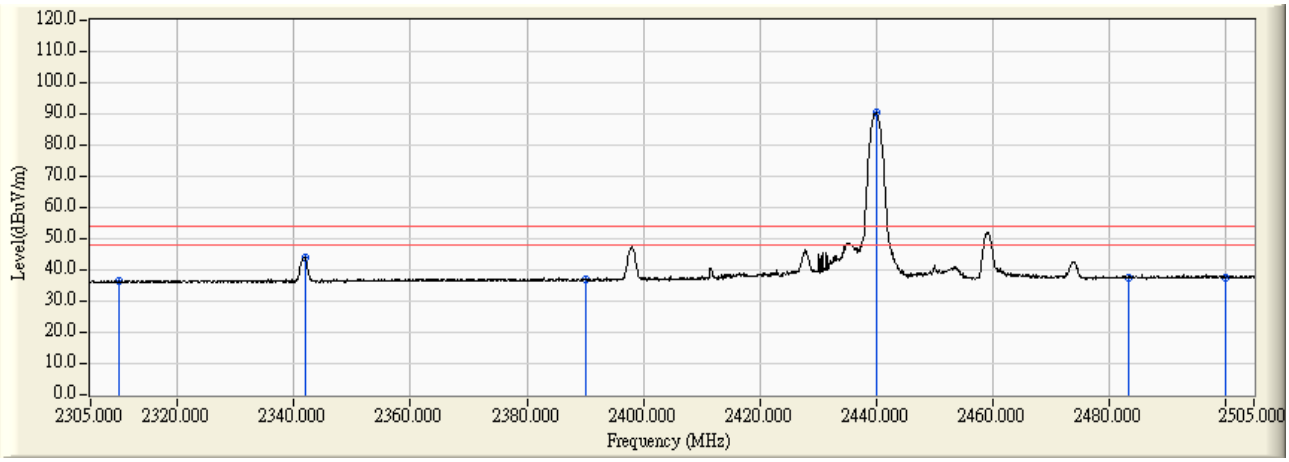


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	13.667	32.529	46.196	-27.804	74.000	PEAK
2		2341.800	13.850	42.115	55.965	-18.035	74.000	PEAK
3		2390.000	14.128	32.454	46.582	-27.418	74.000	PEAK
4	*	2440.300	14.415	76.326	90.740	16.740	74.000	PEAK
5		2483.500	14.658	31.861	46.520	-27.480	74.000	PEAK
6		2500.000	14.751	31.230	45.981	-28.019	74.000	PEAK

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
7. The fundamental for reference only, it’s not restricted by unwanted emission limit.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - HORIZONTAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2440MHz**

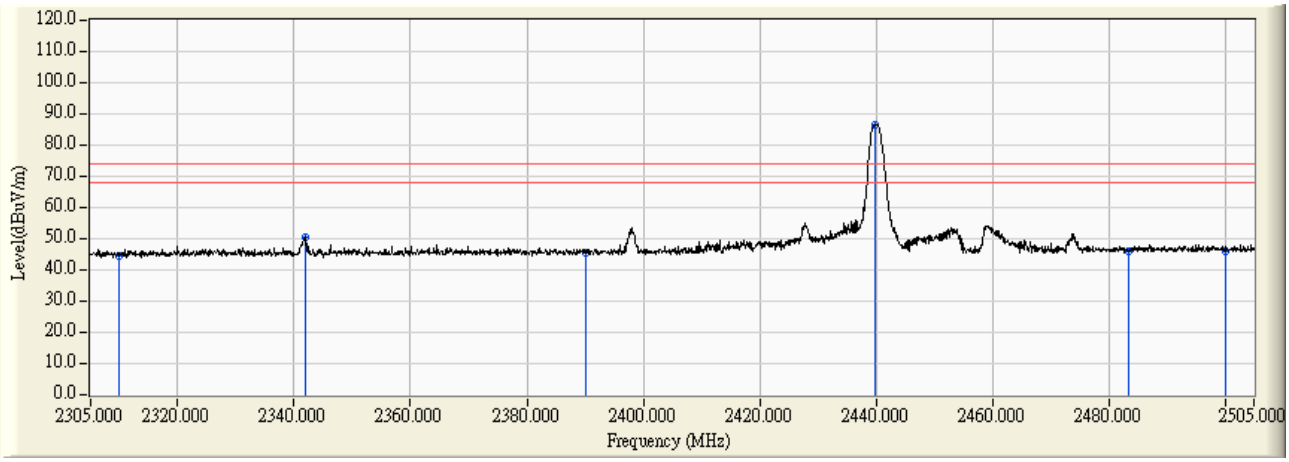


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	13.667	22.701	36.368	-17.632	54.000	AVERAGE
2		2341.800	13.850	30.020	43.870	-10.130	54.000	AVERAGE
3		2390.000	14.128	22.851	36.979	-17.021	54.000	AVERAGE
4	*	2440.000	14.412	75.995	90.407	36.407	54.000	AVERAGE
5		2483.500	14.658	22.822	37.481	-16.519	54.000	AVERAGE
6		2500.000	14.751	22.824	37.575	-16.425	54.000	AVERAGE

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
7. The fundamental for reference only, it’s not restricted by unwanted emission limit.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - VERTICAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2440MHz**

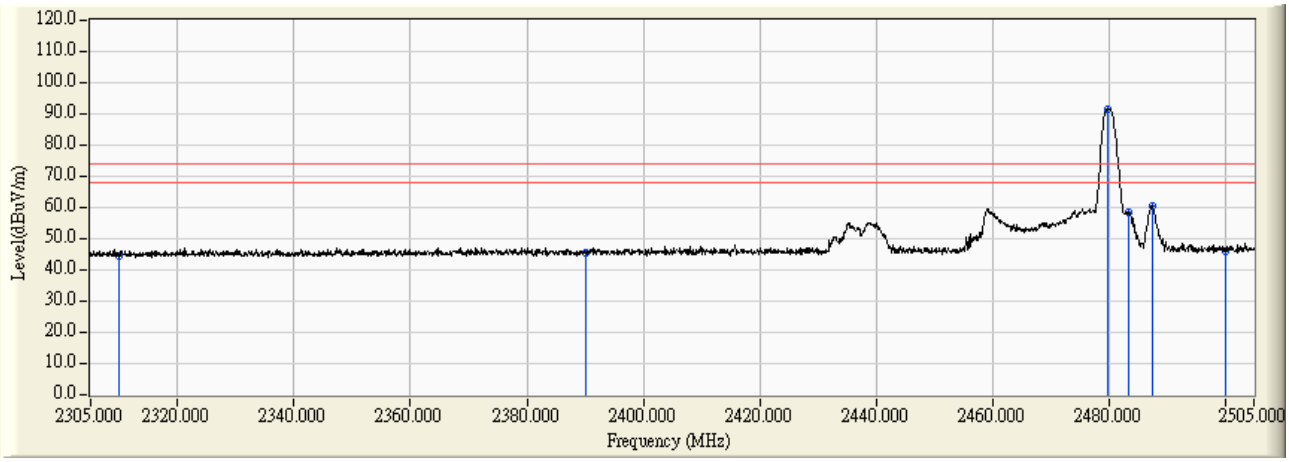


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	13.667	31.072	44.739	-29.261	74.000	PEAK
2		2341.800	13.850	36.498	50.348	-23.652	74.000	PEAK
3		2390.000	14.128	31.224	45.352	-28.648	74.000	PEAK
4	*	2439.800	14.412	72.035	86.446	12.446	74.000	PEAK
5		2483.500	14.658	31.272	45.931	-28.069	74.000	PEAK
6		2500.000	14.751	31.486	46.237	-27.763	74.000	PEAK

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
7. The fundamental for reference only, it’s not restricted by unwanted emission limit.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - HORIZONTAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2480MHz**

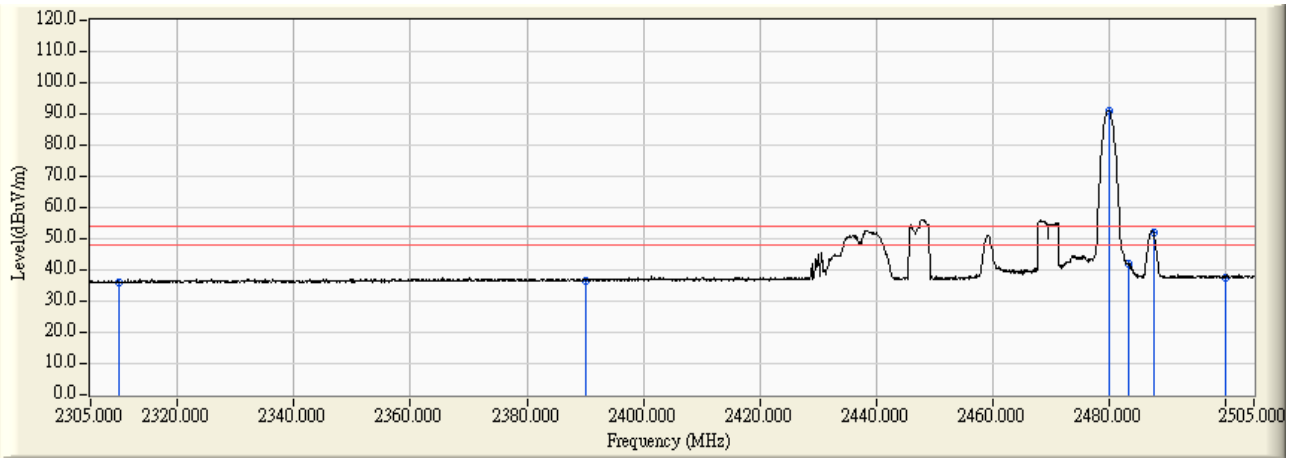


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	13.667	30.998	44.665	-29.335	74.000	PEAK
2		2390.000	14.128	31.306	45.434	-28.566	74.000	PEAK
3	*	2479.800	14.639	76.934	91.572	17.572	74.000	PEAK
4		2483.500	14.658	43.670	58.329	-15.671	74.000	PEAK
5		2487.600	14.682	45.749	60.431	-13.569	74.000	PEAK
6		2500.000	14.751	31.357	46.108	-27.892	74.000	PEAK

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
7. The fundamental for reference only, it’s not restricted by unwanted emission limit.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - HORIZONTAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2480MHz**

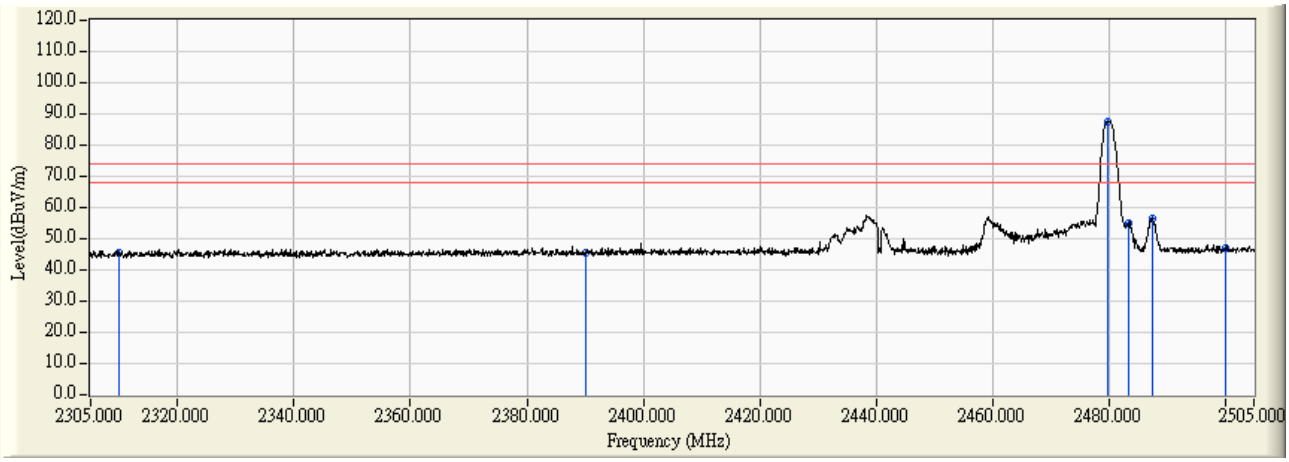


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	13.667	22.311	35.978	-18.022	54.000	AVERAGE
2		2390.000	14.128	22.379	36.507	-17.493	54.000	AVERAGE
3	*	2480.100	14.639	76.582	91.221	37.221	54.000	AVERAGE
4		2483.500	14.658	27.283	41.942	-12.058	54.000	AVERAGE
5		2487.700	14.682	37.144	51.826	-2.174	54.000	AVERAGE
6		2500.000	14.751	22.940	37.691	-16.309	54.000	AVERAGE

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
7. The fundamental for reference only, it’s not restricted by unwanted emission limit.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - VERTICAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2480MHz**

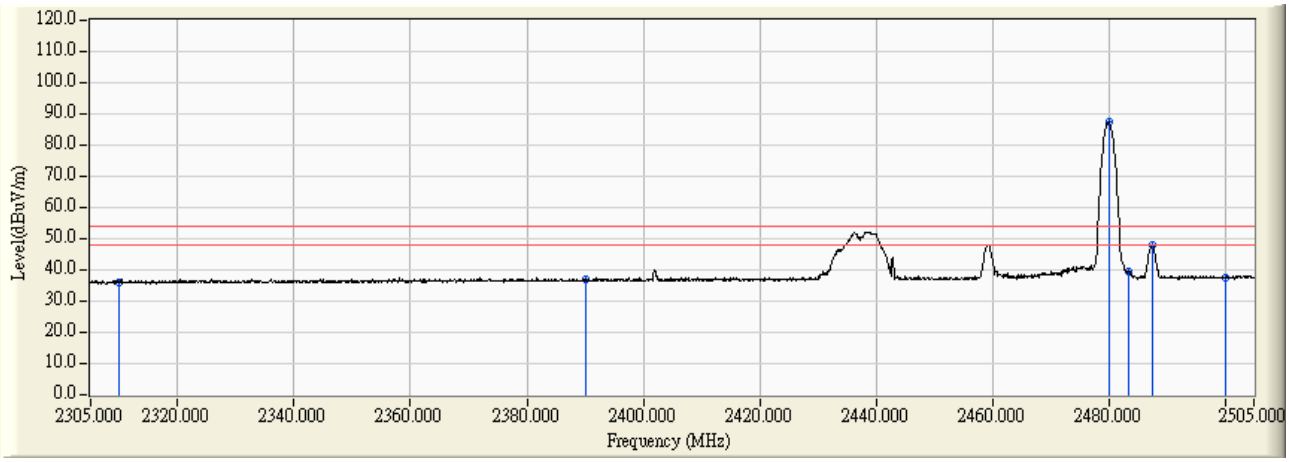


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	13.667	32.064	45.731	-28.269	74.000	PEAK
2		2390.000	14.128	31.462	45.590	-28.410	74.000	PEAK
3	*	2479.800	14.639	73.050	87.688	13.688	74.000	PEAK
4		2483.500	14.658	40.139	54.798	-19.202	74.000	PEAK
5		2487.500	14.681	41.871	56.552	-17.448	74.000	PEAK
6		2500.000	14.751	32.135	46.886	-27.114	74.000	PEAK

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
7. The fundamental for reference only, it’s not restricted by unwanted emission limit.

Site : CB4-H	**Time : 2018/03/19**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 6**
Probe : CB4_FCC_EFS_B432_1-18GHz_3M_1116 - VERTICAL	**Power : DC 5V (Power by Notebook PC)**
EUT : BLE GPS Data Recorder	**Note : Mode 1: Transmit_Power by PC 802.15.1_BLE_2480MHz**



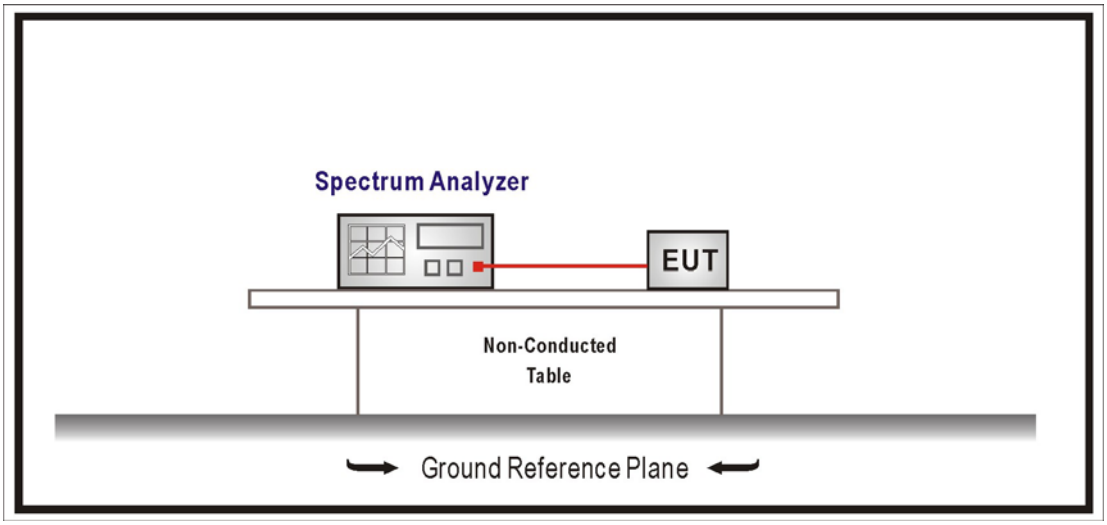
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2310.000	13.667	22.305	35.972	-18.028	54.000	AVERAGE
2		2390.000	14.128	22.716	36.844	-17.156	54.000	AVERAGE
3	*	2480.100	14.639	72.688	87.327	33.327	54.000	AVERAGE
4		2483.500	14.658	24.594	39.253	-14.747	54.000	AVERAGE
5		2487.500	14.681	33.414	48.095	-5.905	54.000	AVERAGE
6		2500.000	14.751	22.596	37.347	-16.653	54.000	AVERAGE

Note:

1. All reading above 1GHz is performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
7. The fundamental for reference only, it’s not restricted by unwanted emission limit.

7. Occupied Bandwidth & DTS Bandwidth

7.1. Test Setup



7.2. Limits

The 6 dB bandwidth: ≧ 500 kHz.
Occupied Bandwidth: NA

7.3. Test Procedures

The EUT was setup according to ANSI C63.10: 2013; tested according to DTS test procedure of KDB558074 D01V04 for compliance to FCC 47CFR 15.247 requirements.
Set RBW = 1% of EBW, Span greater than RBW.

7.4. Test Specification

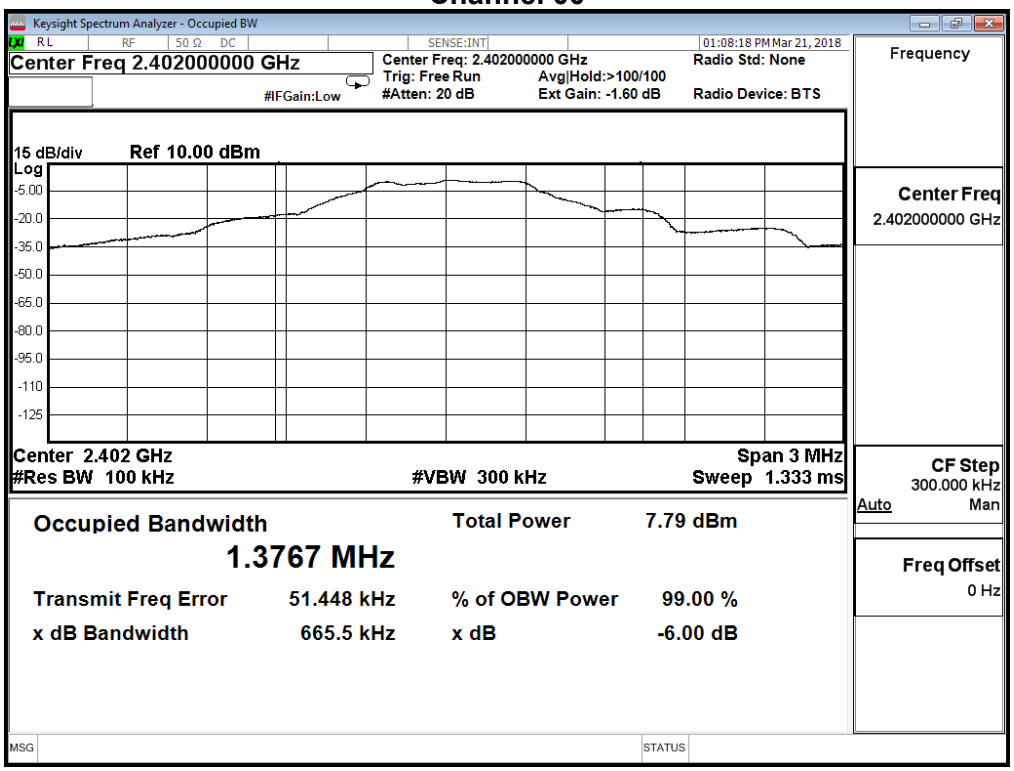
According to FCC Part 15 Subpart C Paragraph 15.247

7.5. Test Result

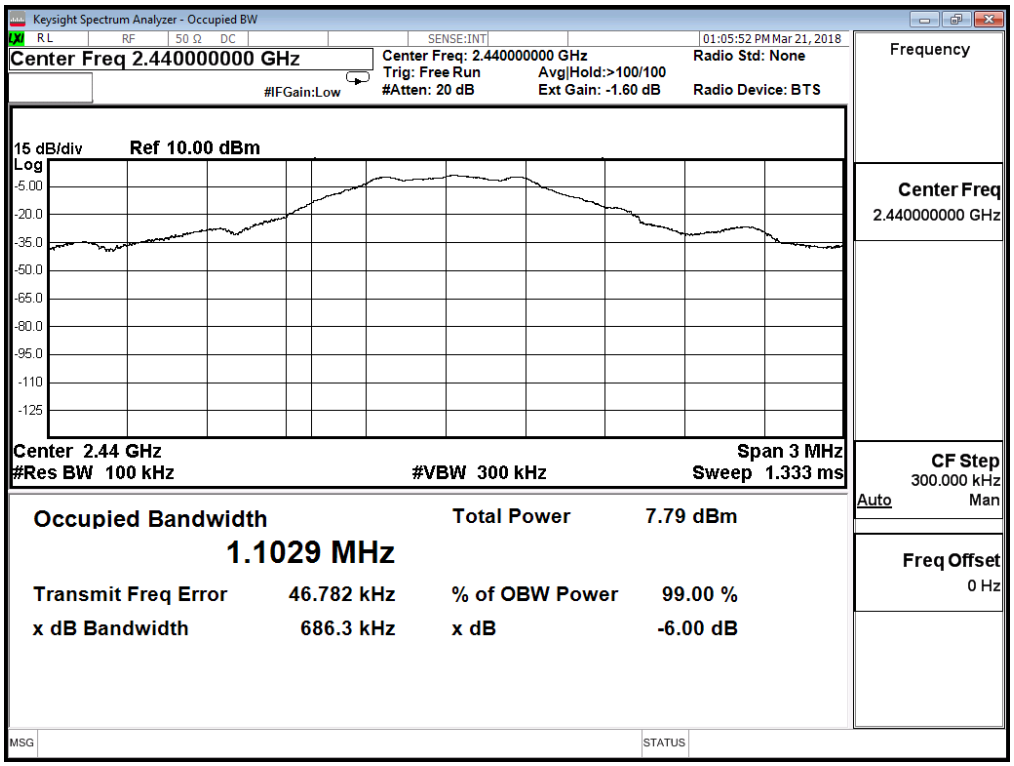
Product	BLE GPS Data Recorder		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit_Power by PC		
Date of Test	2018/03/21	Test Site	SR10-H

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402	1.377	--	Pass
19	2440	1.103	--	Pass
39	2480	1.047	--	Pass

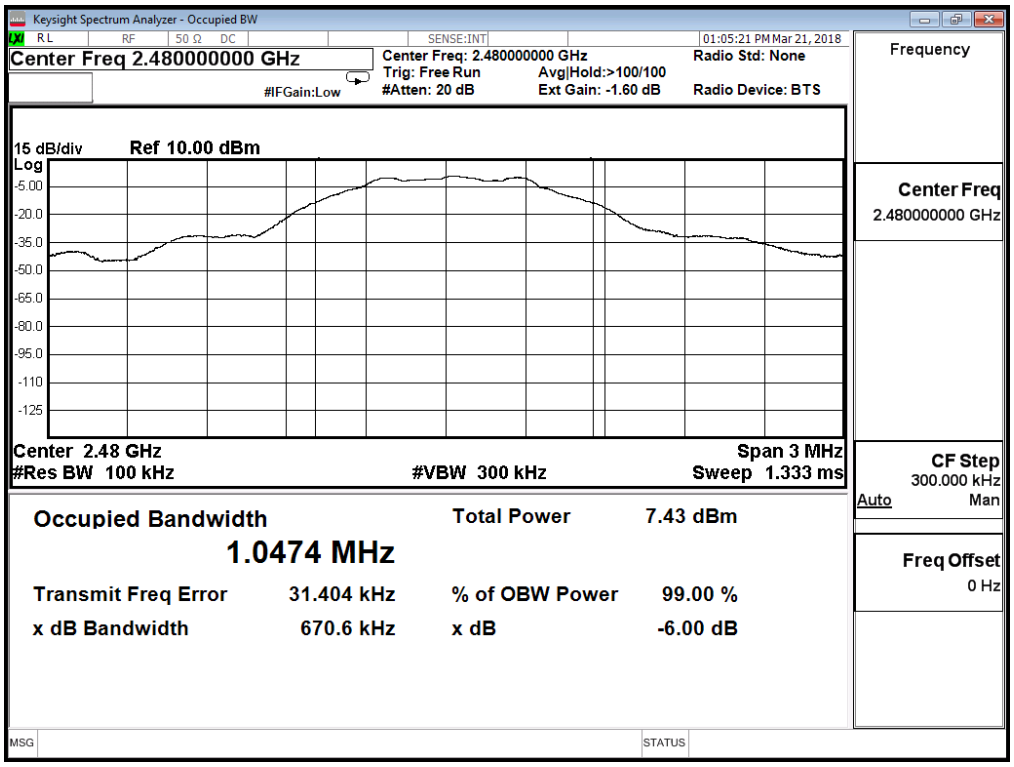
Channel 00



Channel 19



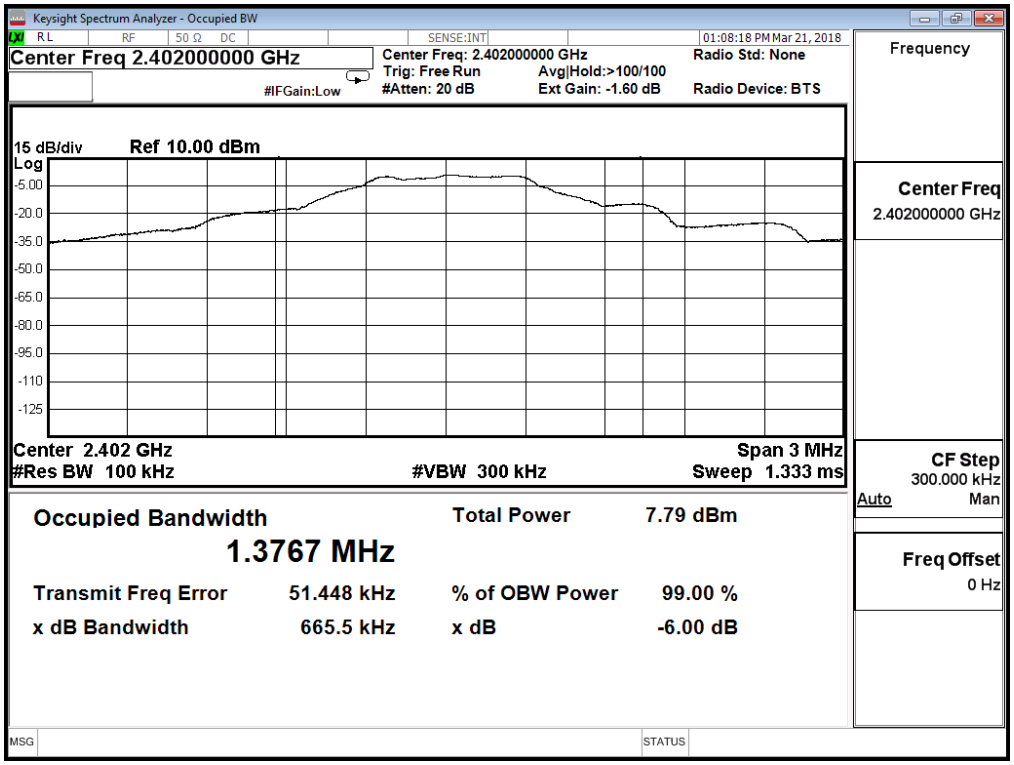
Channel 39



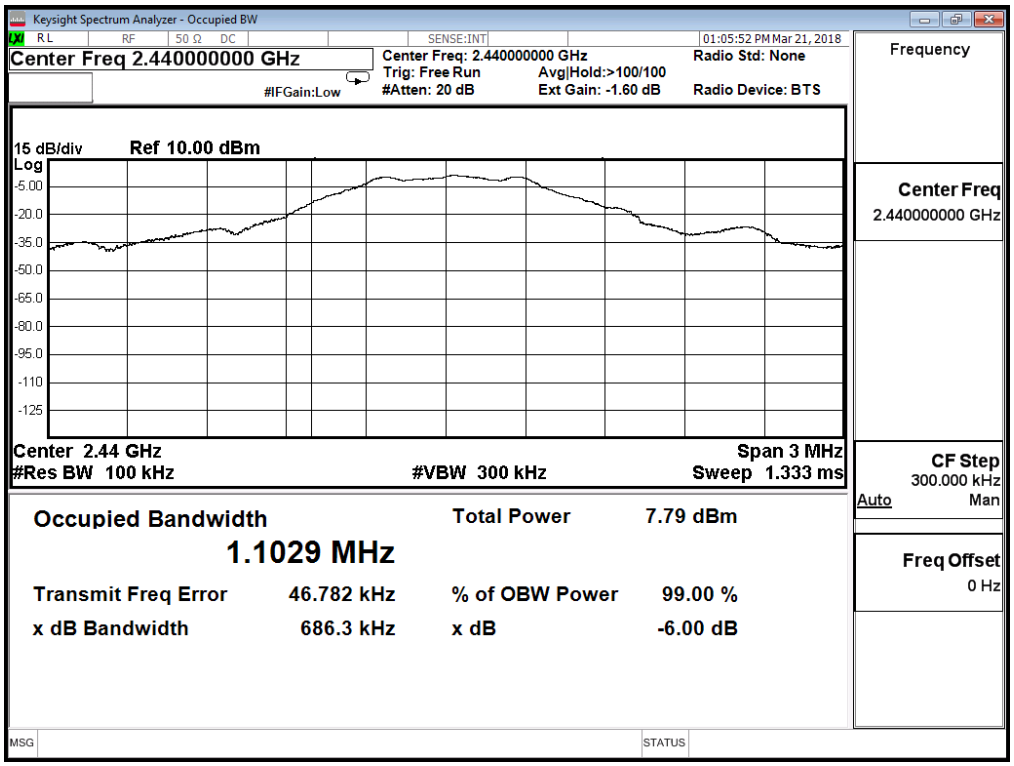
Product	BLE GPS Data Recorder		
Test Item	DTS Bandwidth		
Test Mode	Mode 1: Transmit_Power by PC		
Date of Test	2018/03/21	Test Site	SR10-H

Channel No.	Frequency (MHz)	Measure Level (KHz)	Limit (KHz)	Result
00	2402	665.500	≧500	Pass
19	2440	686.300	≧500	Pass
39	2480	670.600	≧500	Pass

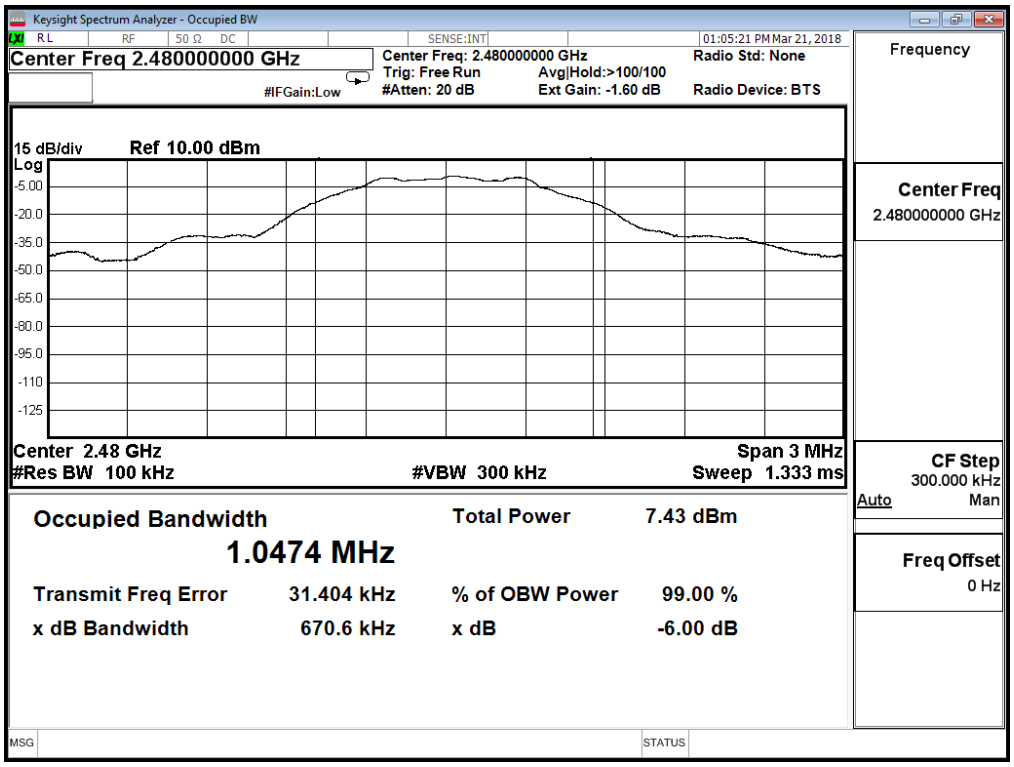
Channel 00



Channel 19

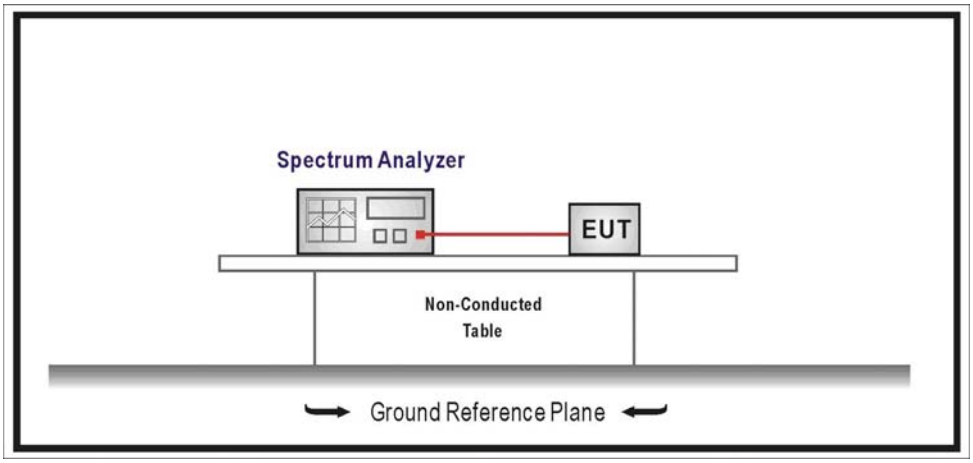


Channel 39



8. Power Density

8.1. Test Setup



8.2. Limits

The peak power spectral density conducted from the intentional radiated to the antenna shall not be greater than +8dBm in any 3kHz band during any time interval of continuous transmission.

8.3. Test Procedures

The EUT was setup according to ANSI C63.10: 2013; tested according to DTS test procedure of KDB558074 D01V04 for compliance to FCC 47CFR 15.247 requirements.

8.4. Test Specification

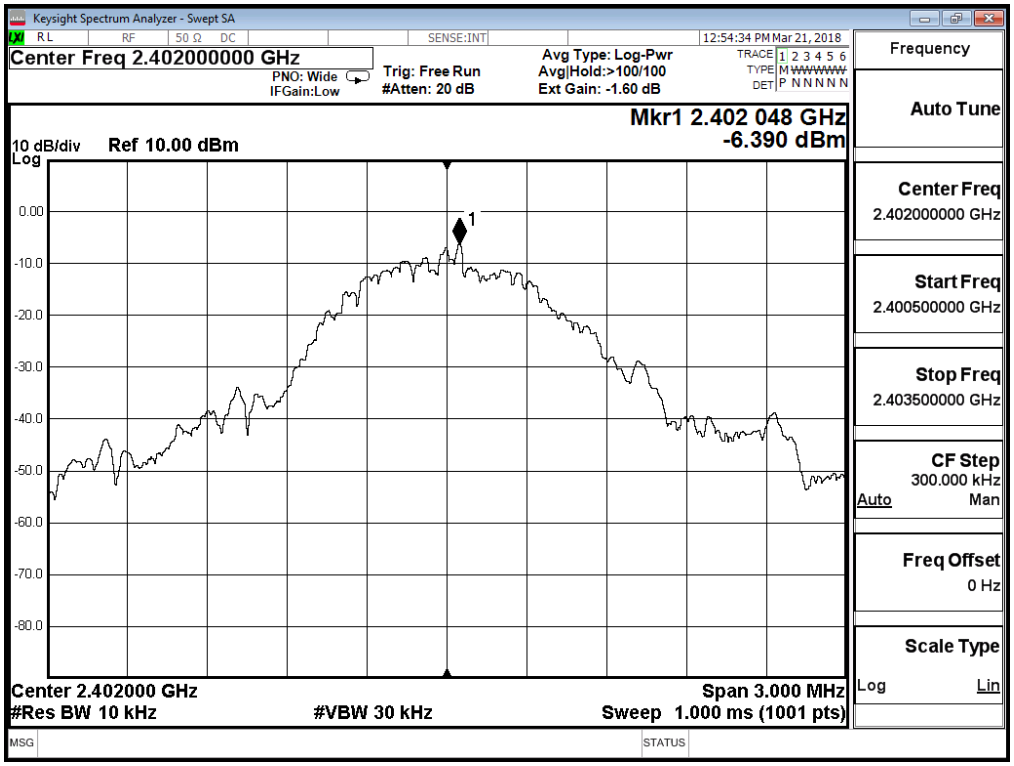
According to FCC Part 15 Subpart C Paragraph 15.247

8.5. Test Result

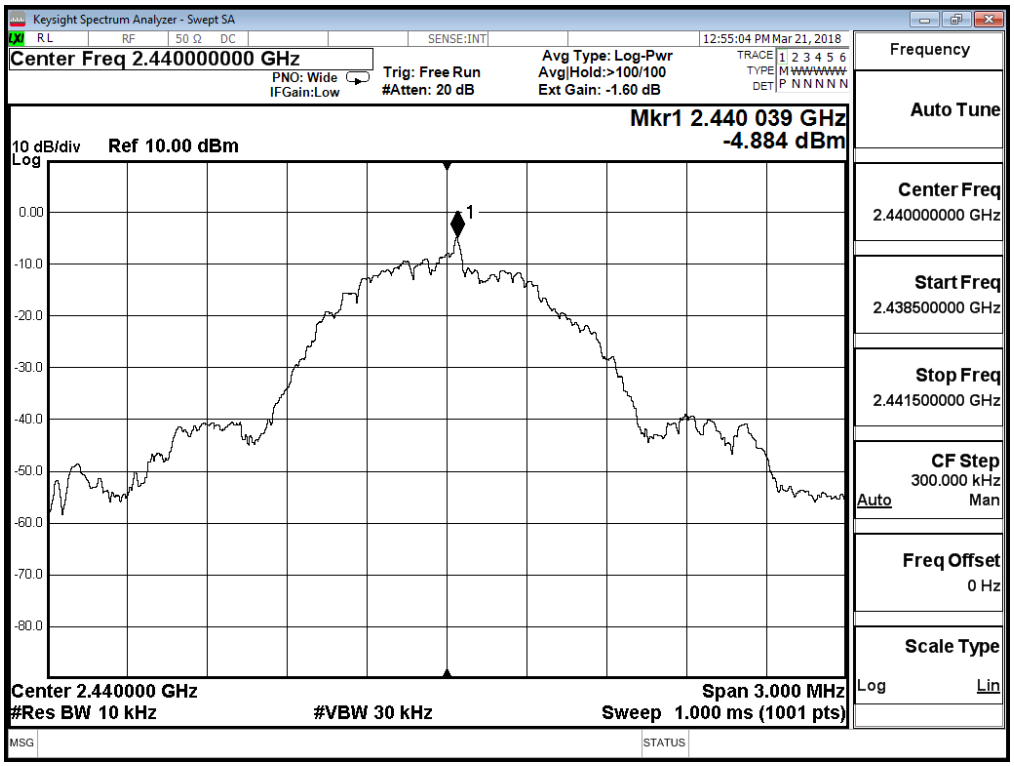
Product	BLE GPS Data Recorder		
Test Item	Power Density		
Test Mode	Mode 1: Transmit_Power by PC		
Date of Test	2018/03/21	Test Site	SR7

Channel No.	Frequency (MHz)	Measure Level (dBm/3kHz)	Limit (dBm/3kHz)	Result
00	2402	-6.390	≦8	Pass
19	2440	-4.884	≦8	Pass
39	2480	-6.429	≦8	Pass

Channel 00



Channel 19



Channel 39