



FCC RADIO TEST REPORT

FCC ID : 2ARRN-4275
Equipment : Echo Loop
Model Name : H9K87E
H9K87F
H9K87G
H9K87H
Applicant : Exoseven plus One LLC
418 North Main Street 2nd Floor/Suite
200 Royal Oak, MI 48067
Standard : FCC Part 15 Subpart C §15.247

The product was received on Apr. 08, 2019 and testing was started from Aug. 09, 2019 and completed on Sep. 16, 2019. We, Sporton International (USA) 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 report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (USA) Inc., the test report shall not be reproduced except in full.

Approved by: Ken Chen

Sporton International (USA) Inc.
1175 Montague Expressway, Milpitas, CA 95035



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History of this test report

Report No.	Version	Description	Issued Date
FR190805001B	01	Initial issue of report	Sep. 19, 2019

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)
3.1	15.247(a)(2)	6dB Bandwidth	Pass
3.1	2.1049	99% Occupied Bandwidth	Reporting only
3.2	15.247(b)(3)	Output Power	Pass
3.3	15.247(e)	Power Spectral Density	Pass
3.4	15.247(d)	Conducted Band Edges and Spurious Emission	Pass
3.5	15.247(d)	Radiated Band Edges and Spurious Emission	Pass
3.6	15.207	AC Conducted Emission	Pass
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Echo LOOP
Model Name	H9K87E H9K87F H9K87G H9K87H
FCC ID	2ARRN-4275
Sample 1 (Size7)	Model Name: H9K87E
Sample 2 (Size10)	Model Name: H9K87F
Sample 3 (Size11)	Model Name: H9K87G
Sample 4 (Size12)	Model Name: H9K87H
EUT supports Radios application	Bluetooth BR/EDR/LE

1.2 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx/Rx Frequency Range	2402 MHz ~ 2480 MHz
Number of Channels	40
Carrier Frequency of Each Channel	40 Channel(37 hopping + 3 advertising channel)
Maximum Output Power to Antenna	10.660 dBm (0.0116 W) for 1Mbps 10.460 dBm (0.0111 W) for 2Mbps
99% Occupied Bandwidth	1.025 MHz for 1Mbps 2.042 MHz for 1Mbps
Antenna Type	PIFA Antenna type with gain 1.1 dBi for Sample 1 PIFA Antenna type with gain 0.0 dBi for Sample 2 PIFA Antenna type with gain 1.5 dBi for Sample 3 PIFA Antenna type with gain 0.4 dBi for Sample 4
Type of Modulation	Bluetooth - LE : GFSK

1.3 Modification of EUT

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



1.4 Testing Location

Test Site	Sporton International (USA) Inc.		
Test Site Location	1175 Montague Expressway, Milpitas, CA 95035 TEL : 408 9043300		
Test Site No.	Sporton Site No.		
	TH01-CA	CO01-CA	03CH02-CA

1.5 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 v05r02
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01
- ♦ ANSI C63.10-2013

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



2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	0	2402	21	2444
	1	2404	22	2446
	2	2406	23	2448
	3	2408	24	2450
	4	2410	25	2452
	5	2412	26	2454
	6	2414	27	2456
	7	2416	28	2458
	8	2418	29	2460
	9	2420	30	2462
	10	2422	31	2464
	11	2424	32	2466
	12	2426	33	2468
	13	2428	34	2470
	14	2430	35	2472
	15	2432	36	2474
	16	2434	37	2476
	17	2436	38	2478
	18	2438	39	2480
	19	2440	-	-
	20	2442	-	-

2.2 Test Mode

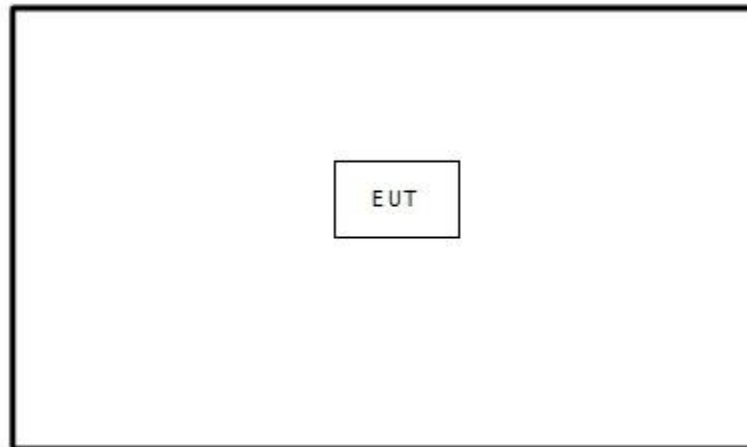
- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane for Sample 3 and Z plane for Sample 1 & 2) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

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

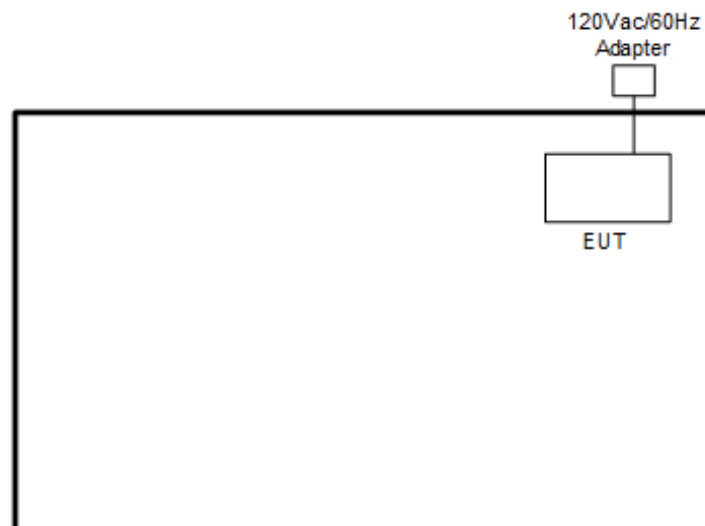
Summary table of Test Cases	
Test Item	Data Rate / Modulation
	Bluetooth – LE / GFSK
Conducted Test Cases	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps Mode 4: Bluetooth Tx CH00_2402 MHz_2Mbps Mode 5: Bluetooth Tx CH19_2440 MHz_2Mbps Mode 6: Bluetooth Tx CH39_2480 MHz_2Mbps
Radiated Test Cases	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps Mode 4: Bluetooth Tx CH00_2402 MHz_2Mbps Mode 5: Bluetooth Tx CH19_2440 MHz_2Mbps Mode 6: Bluetooth Tx CH39_2480 MHz_2Mbps
AC Conducted Emission	Mode 1: Bluetooth TX + Adapter 2 Charging

2.3 Connection Diagram of Test System

<Bluetooth – LE Tx Mode>



<AC Conducted Emission Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Adapter 1	N/A	PSC57CP	N/A	N/A	N/A
2.	Adapter 2	N/A	FANA7R	N/A	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “RTLBTAPP” was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 4.2 + 10 = 14.2 \text{ (dB)}\end{aligned}$$

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

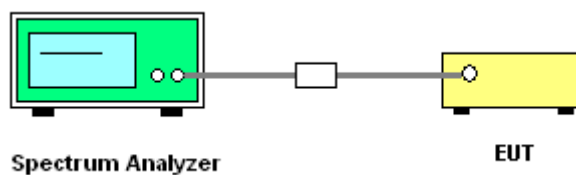
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 11.8.1 (6dB BW).
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) $\geq 3 * RBW$.
6. Measure and record the results in the test report.

3.1.4 Test Setup



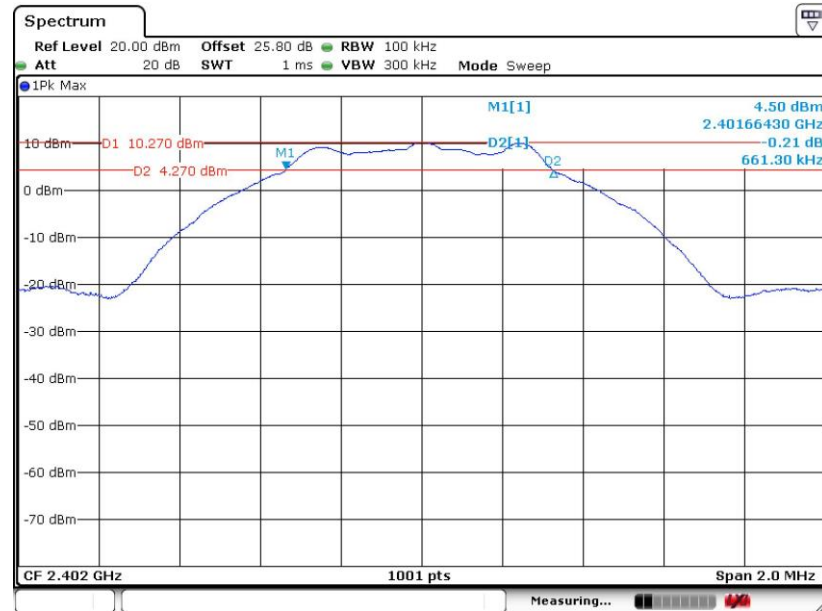


3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

<1Mbps>

6 dB Bandwidth Plot on Channel 00



Date: 16.SEP.2019 13:44:53

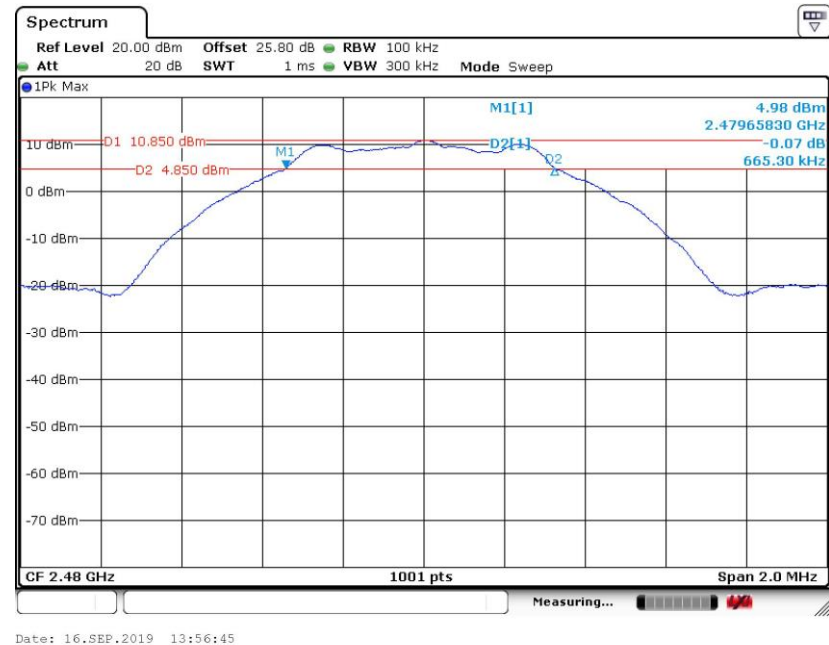
6 dB Bandwidth Plot on Channel 19



Date: 16.SEP.2019 13:50:56

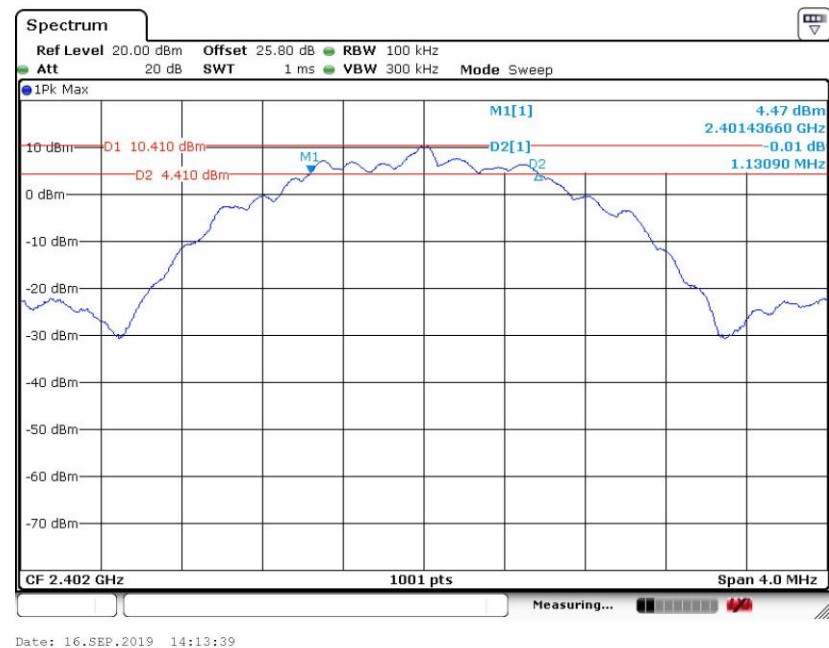


6 dB Bandwidth Plot on Channel 39



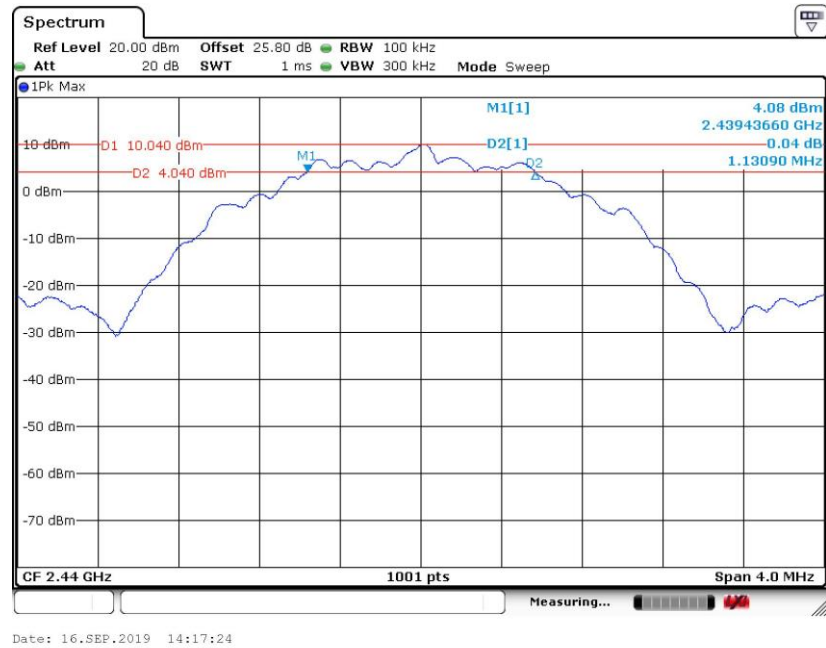
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6 dB Bandwidth Plot on Channel 00

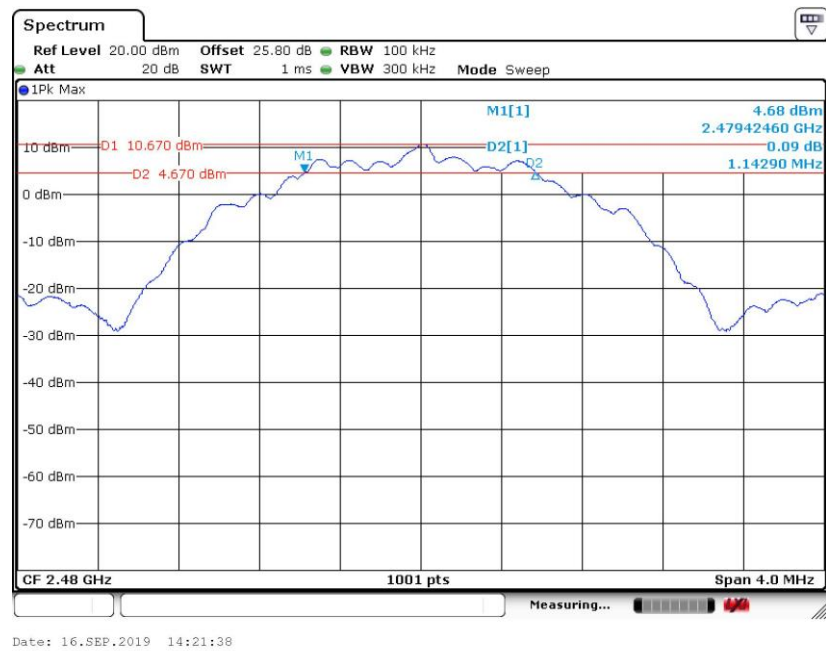




6 dB Bandwidth Plot on Channel 19



6 dB Bandwidth Plot on Channel 39



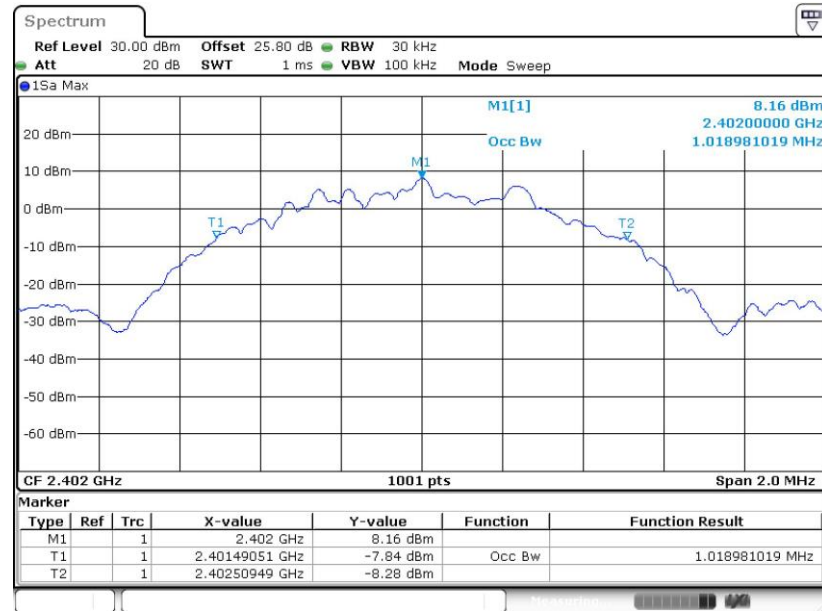


3.1.6 Test Result of 99% Occupied Bandwidth

Please refer to Appendix A.

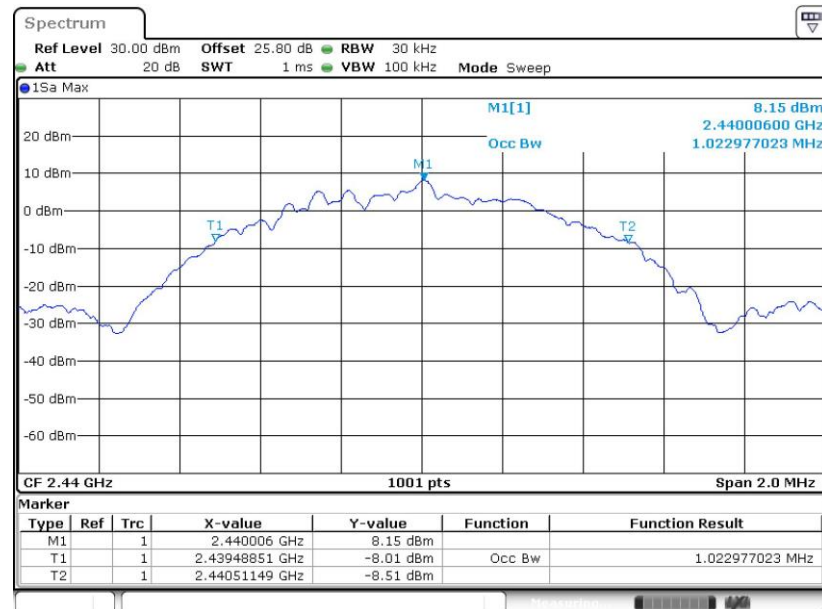
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99% Bandwidth Plot on Channel 00

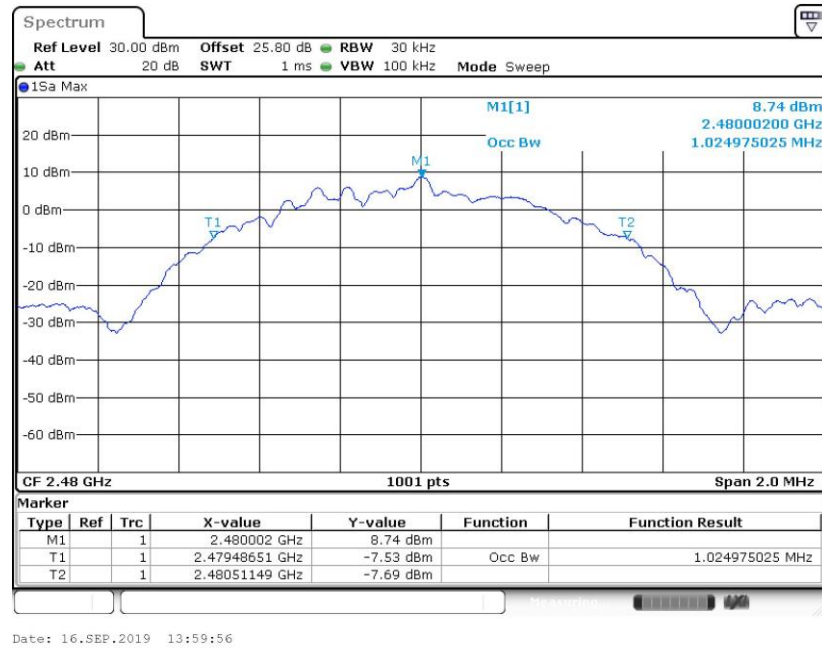
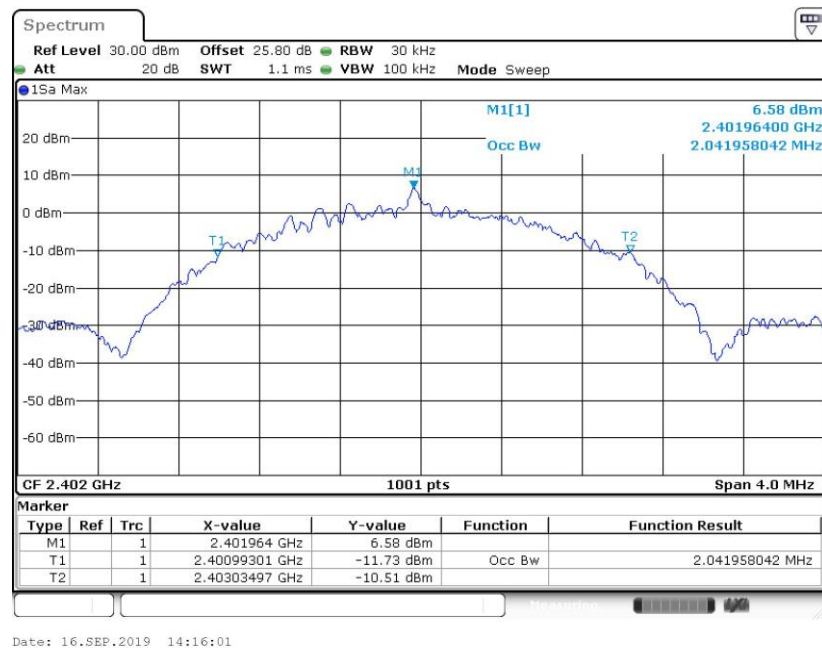


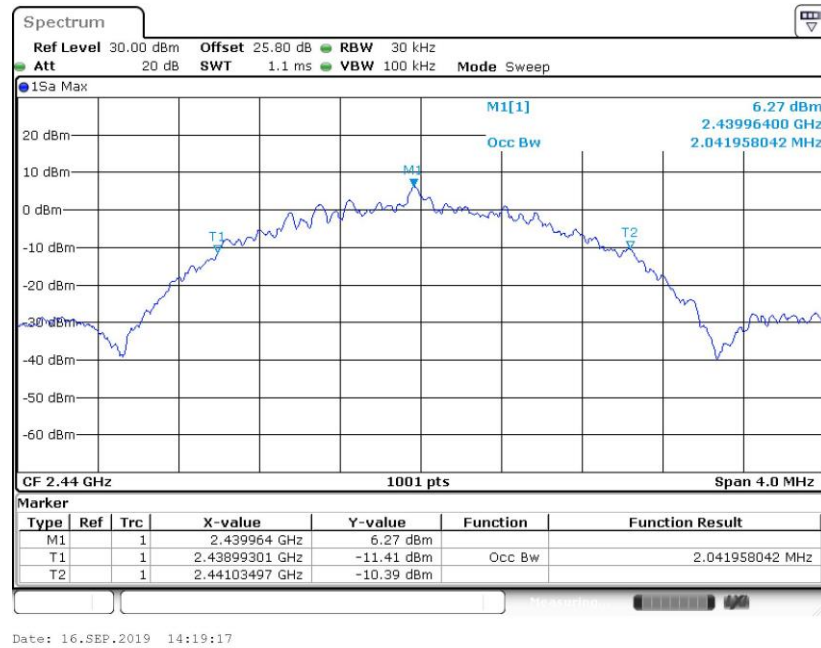
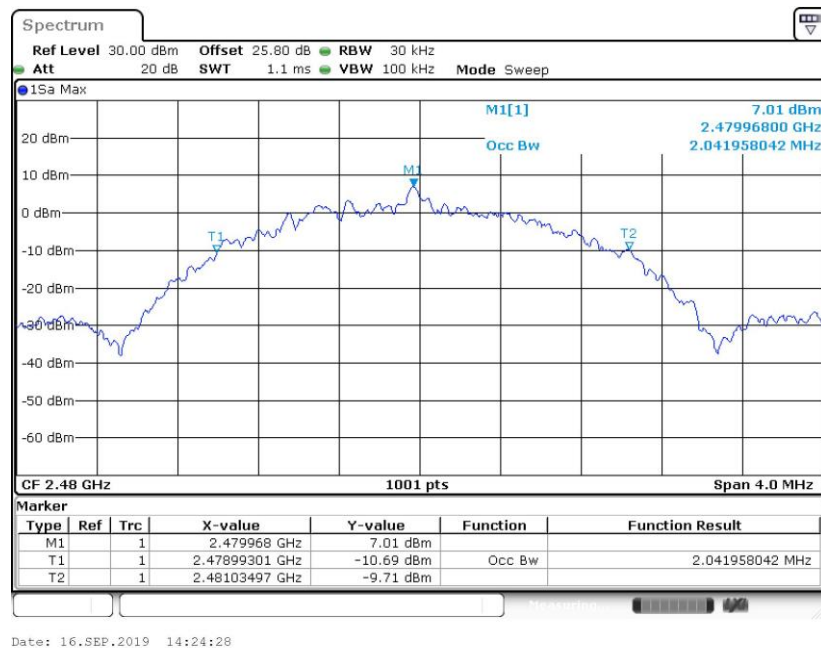
Date: 16.SEP.2019 13:47:36

99% Occupied Bandwidth Plot on Channel 19



Date: 16.SEP.2019 13:54:09

99% Occupied Bandwidth Plot on Channel 39

<2Mbps>
99% Bandwidth Plot on Channel 00


99% Occupied Bandwidth Plot on Channel 19

99% Occupied Bandwidth Plot on Channel 39


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

3.2 Output Power Measurement

3.2.1 Limit of Output Power

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

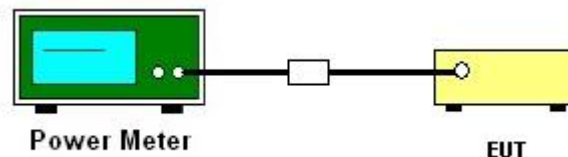
3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

3.2.3 Test Procedures

1. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
2. The RF output of EUT was connected to the power meter by RF cable and attenuator.
3. The path loss was compensated to the results for each measurement.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

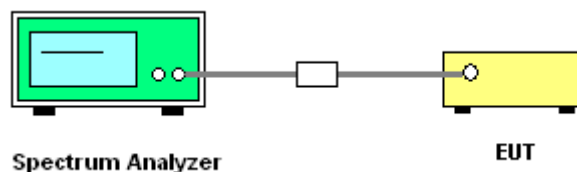
3.3.2 Measuring Instruments

See list of measuring equipment of this test report.

3.3.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.10.2 Method PKPSD.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
7. The Measured power density (dBm)/ 100kHz is a reference level and used as 20dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

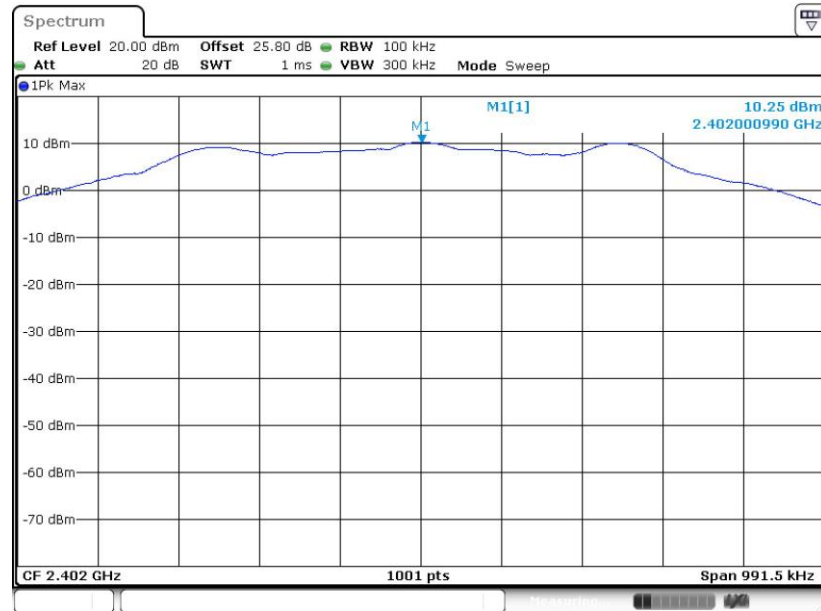
Please refer to Appendix A.



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

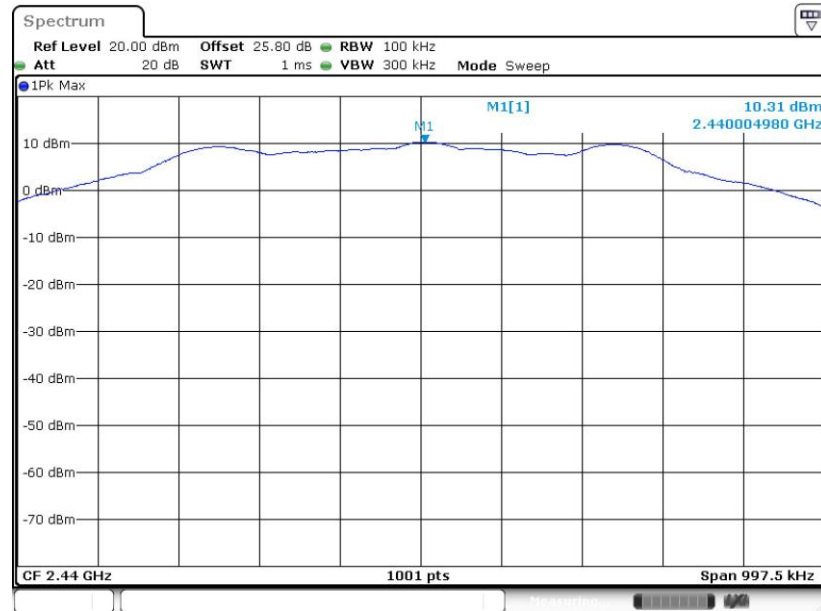
<1Mbps>

PSD 100kHz Plot on Channel 00



Date: 16.SEP.2019 13:45:43

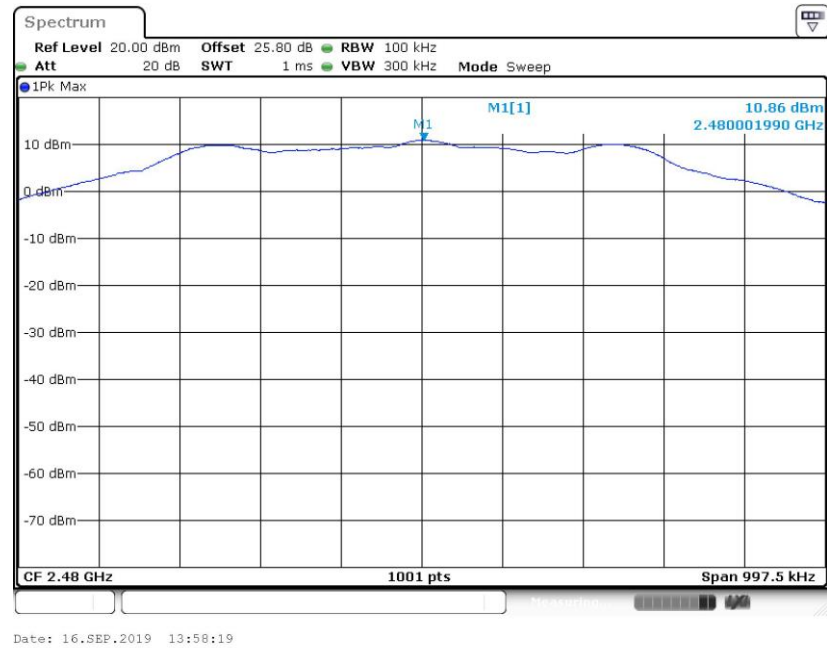
PSD 100kHz Plot on Channel 19



Date: 16.SEP.2019 13:52:22

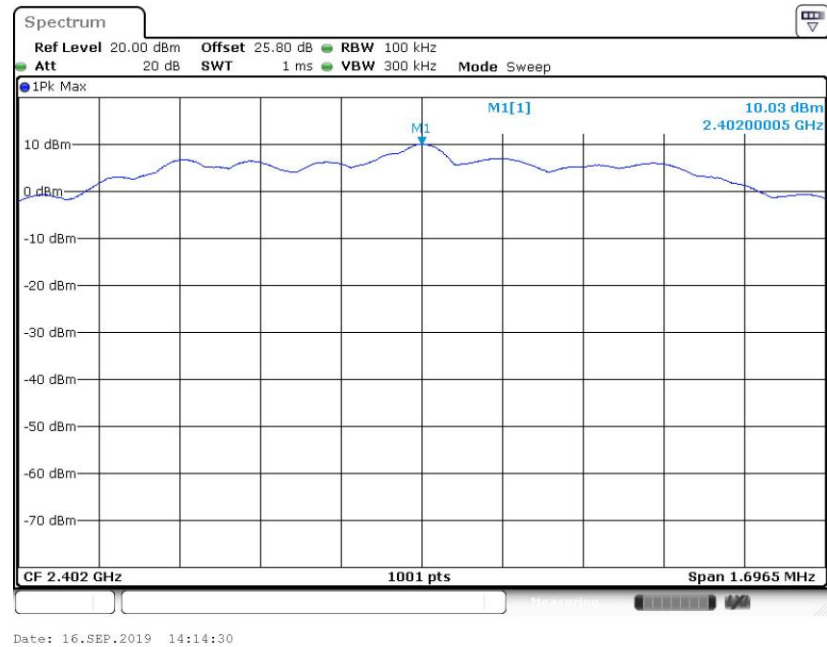


PSD 100kHz Plot on Channel 39



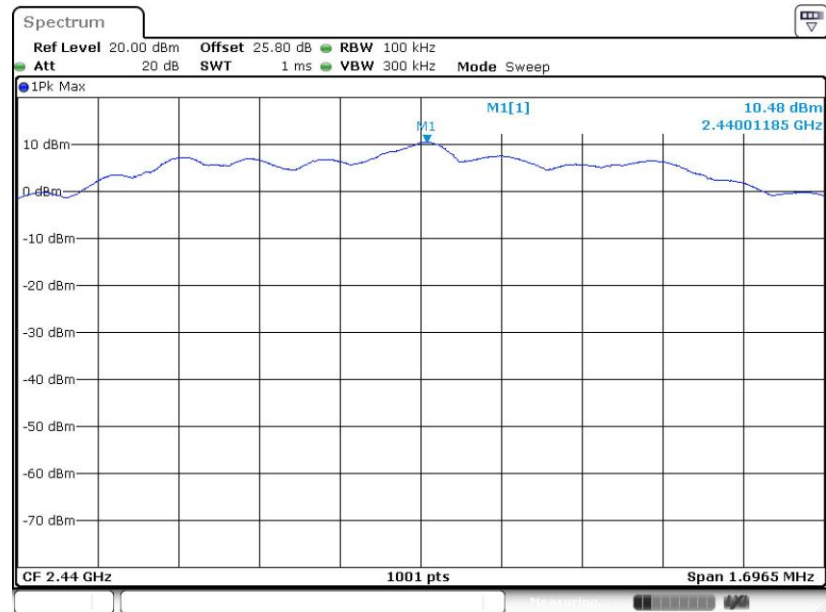
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PSD 100kHz Plot on Channel 00



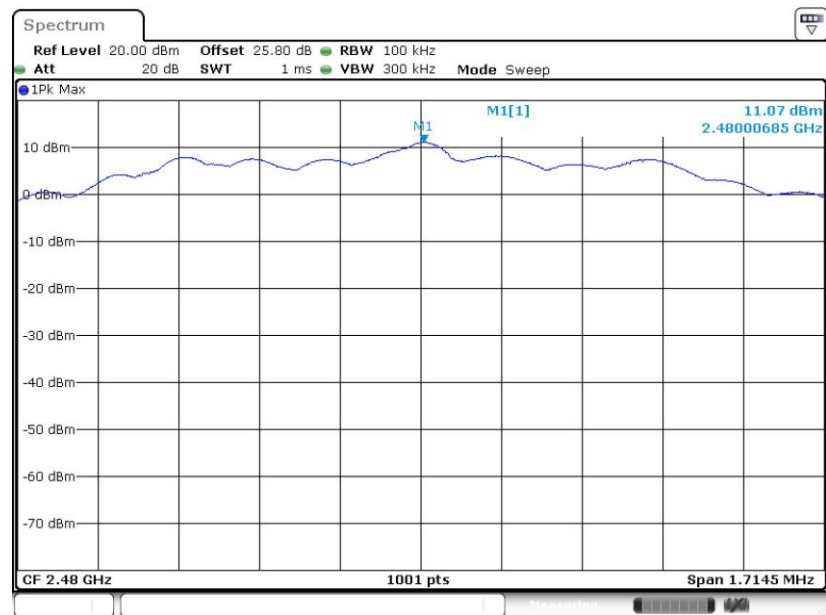


PSD 100kHz Plot on Channel 19



Date: 16.SEP.2019 14:18:27

PSD 100kHz Plot on Channel 39

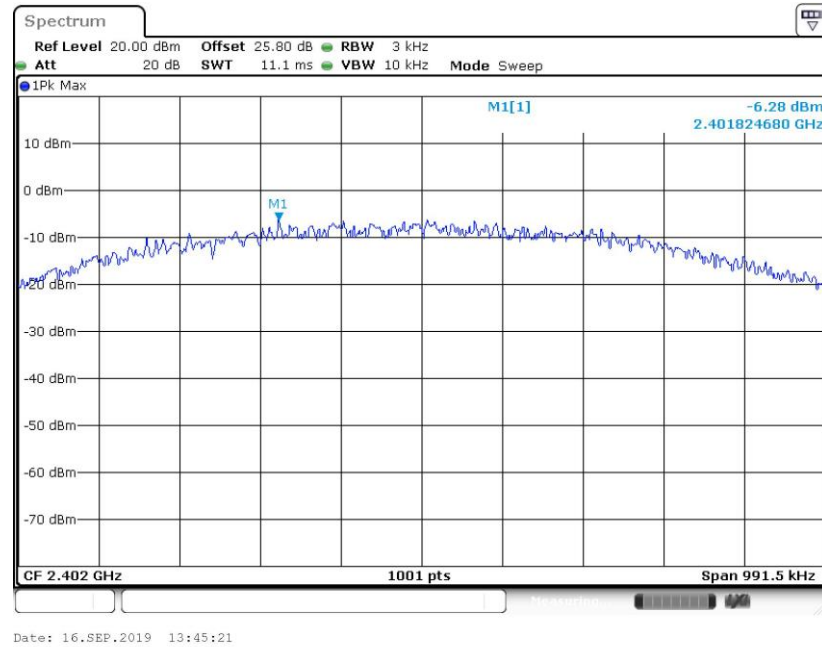


Date: 16.SEP.2019 14:22:55

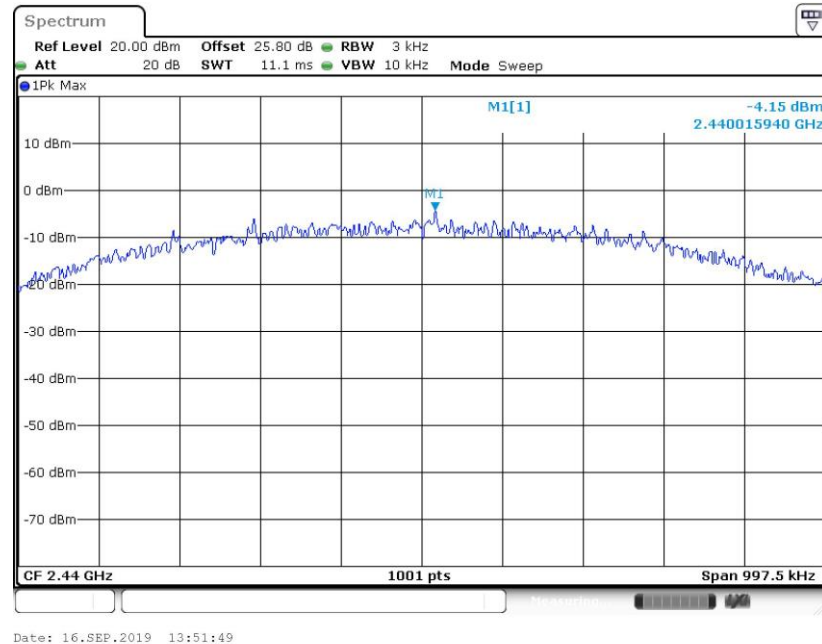
3.3.7 Test Result of Power Spectral Density Plots (3kHz)

<1Mbps>

PSD 3kHz Plot on Channel 00

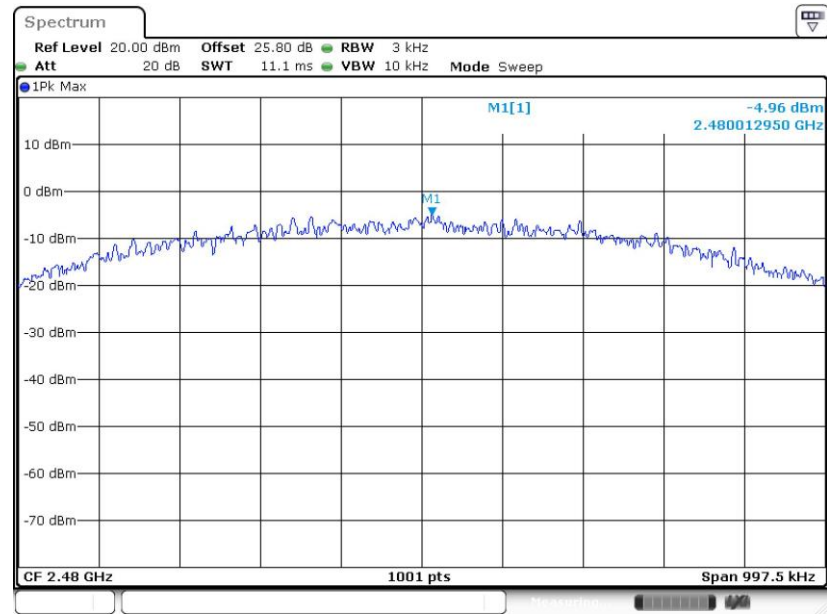


PSD 3kHz Plot on Channel 19





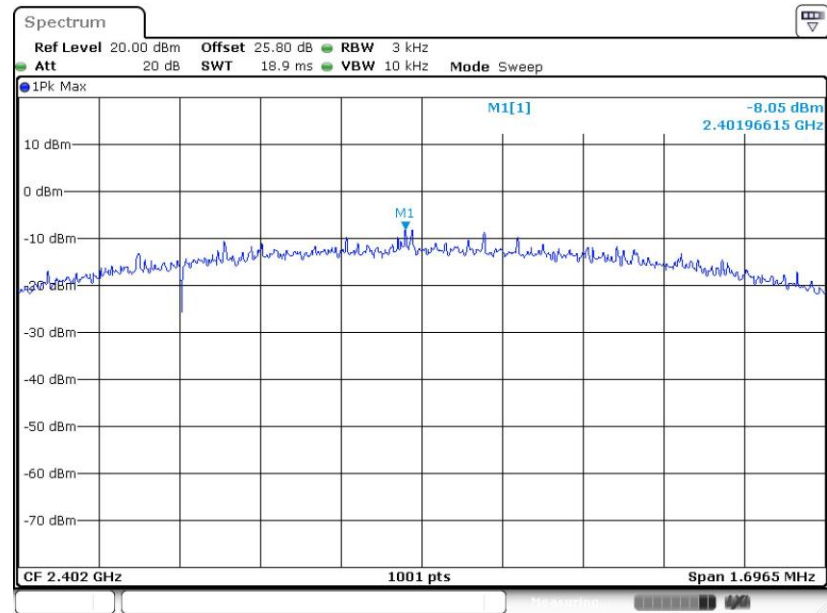
PSD 3kHz Plot on Channel 39



Date: 16.SEP.2019 13:57:51

<2Mbps>

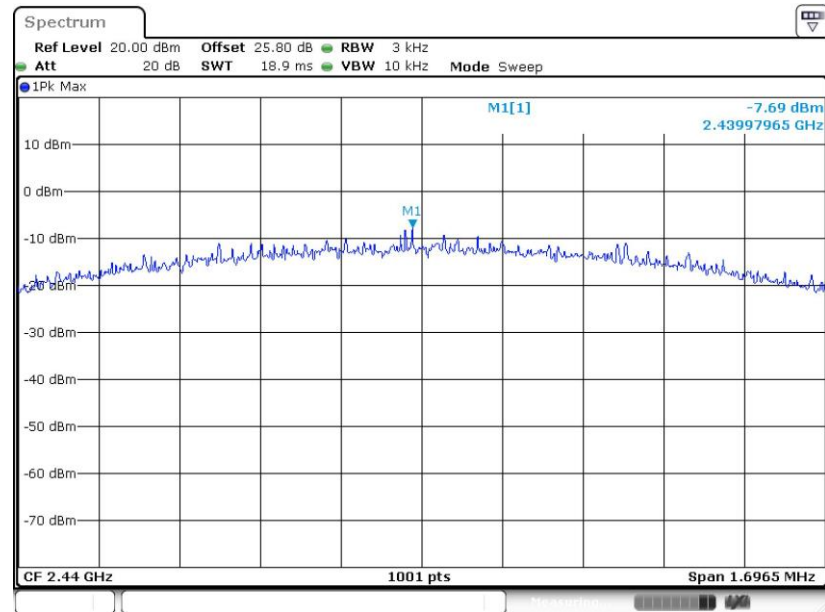
PSD 3kHz Plot on Channel 00



Date: 16.SEP.2019 14:14:04

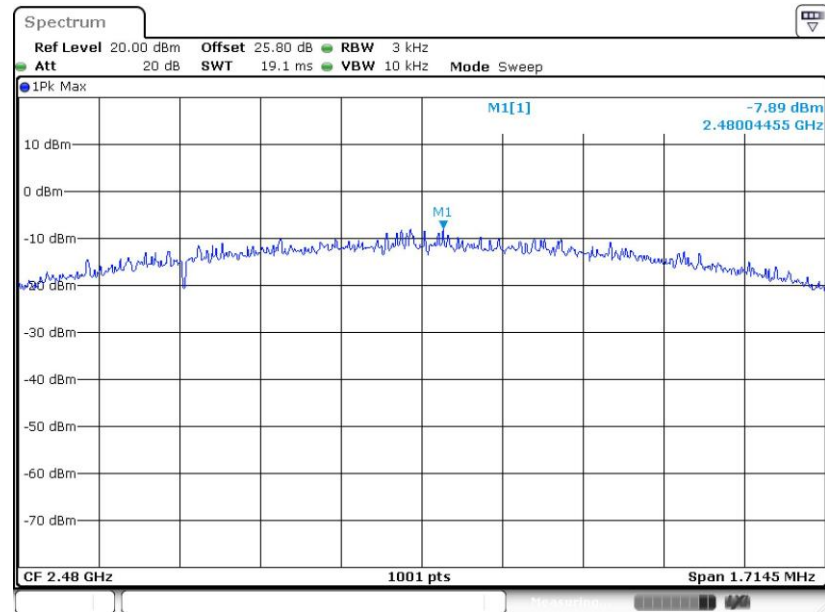


PSD 3kHz Plot on Channel 19



Date: 16.SEP.2019 14:17:59

PSD 3kHz Plot on Channel 39



Date: 16.SEP.2019 14:22:26

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

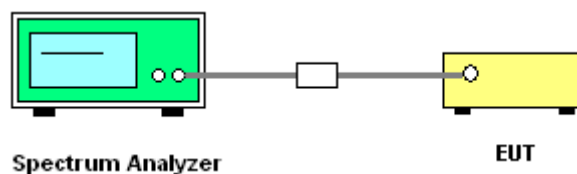
3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

3.4.3 Test Procedure

1. The testing follows the ANSI C63.10 Section 11.11.3 Emission level measurement.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup

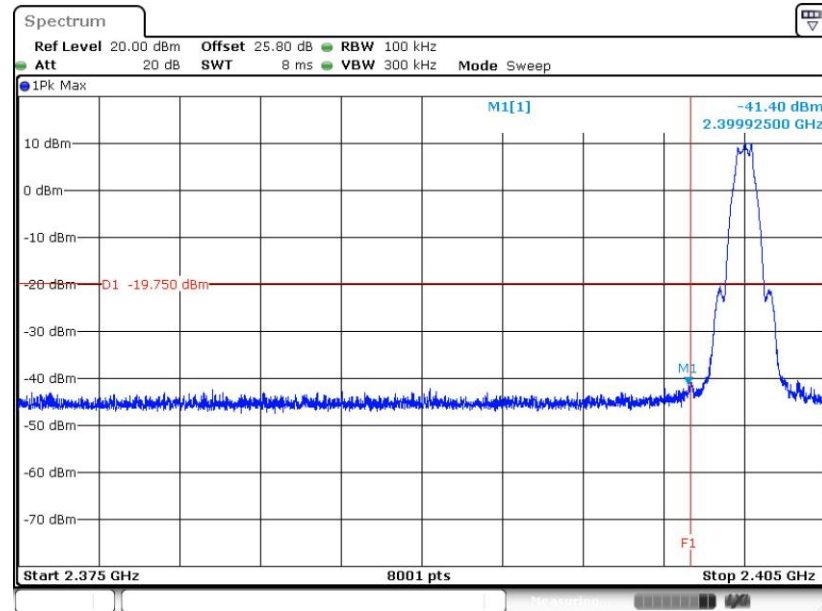




3.4.5 Test Result of Conducted Band Edges Plots

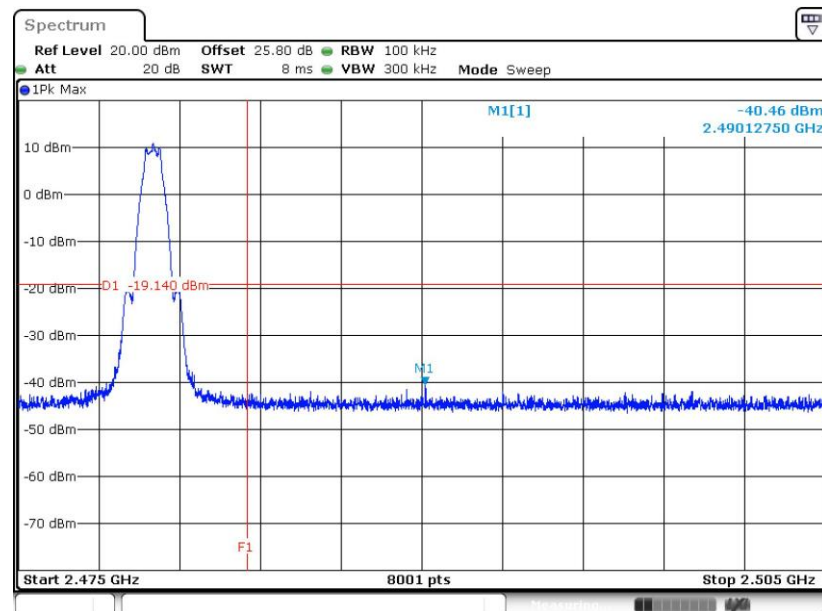
<1Mbps>

Low Band Edge Plot on Channel 00



Date: 16.SEP,2019 13:46:32

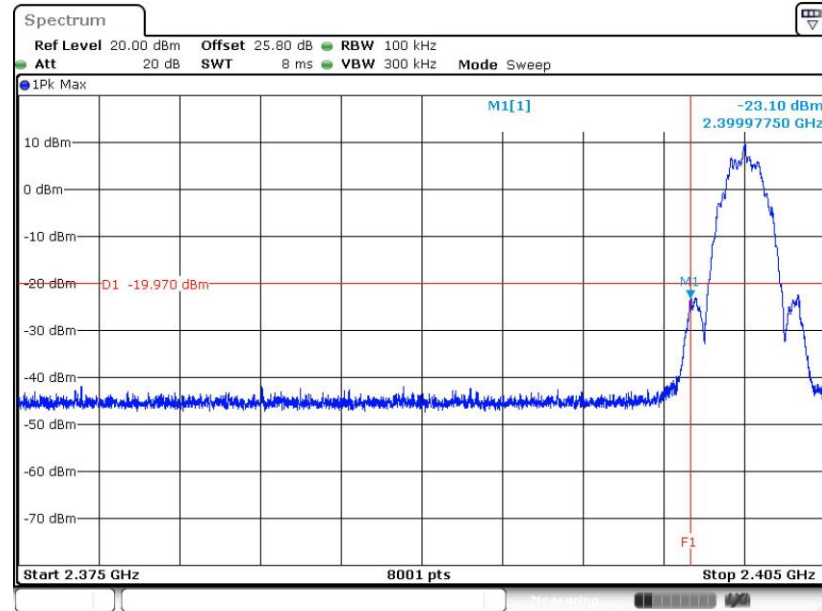
High Band Edge Plot on Channel 39



Date: 16.SEP,2019 13:59:00

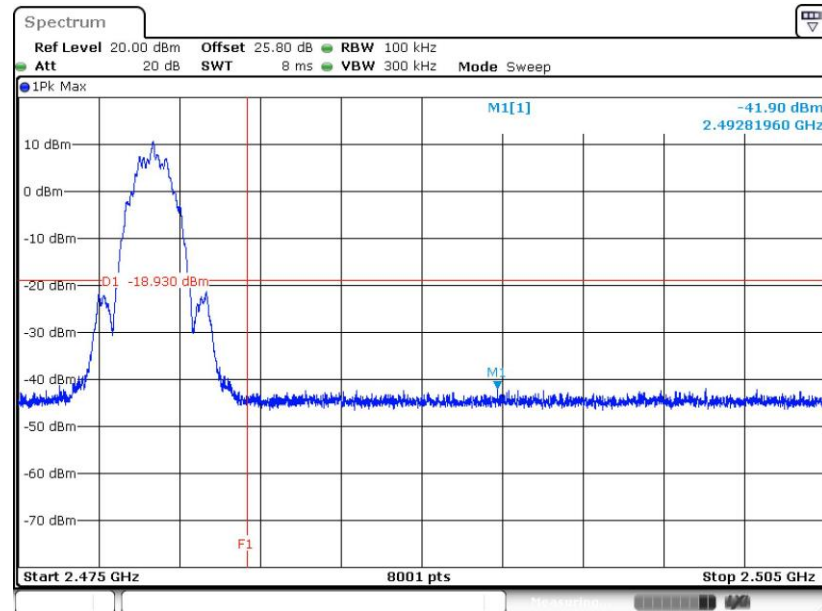
<2Mbps>

Low Band Edge Plot on Channel 00



Date: 16.SEP.2019 14:15:06

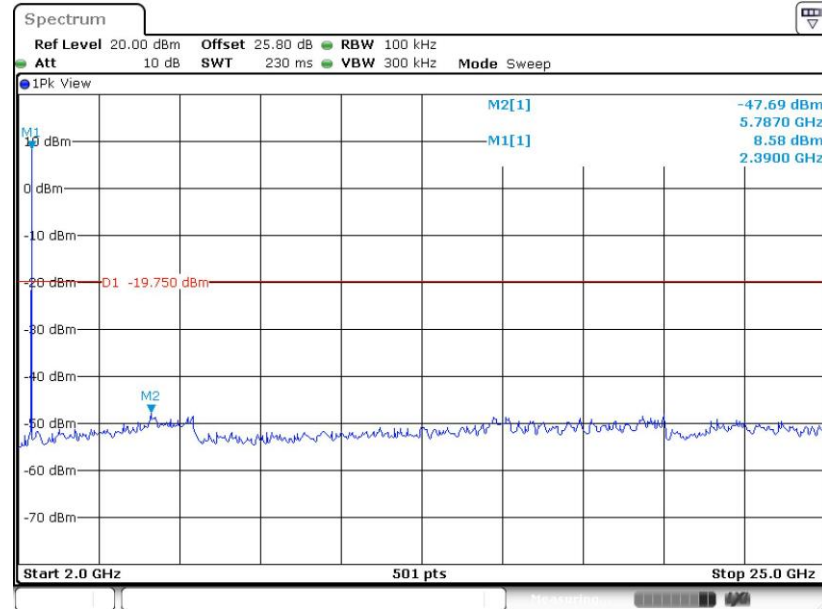
High Band Edge Plot on Channel 39



Date: 16.SEP.2019 14:23:35

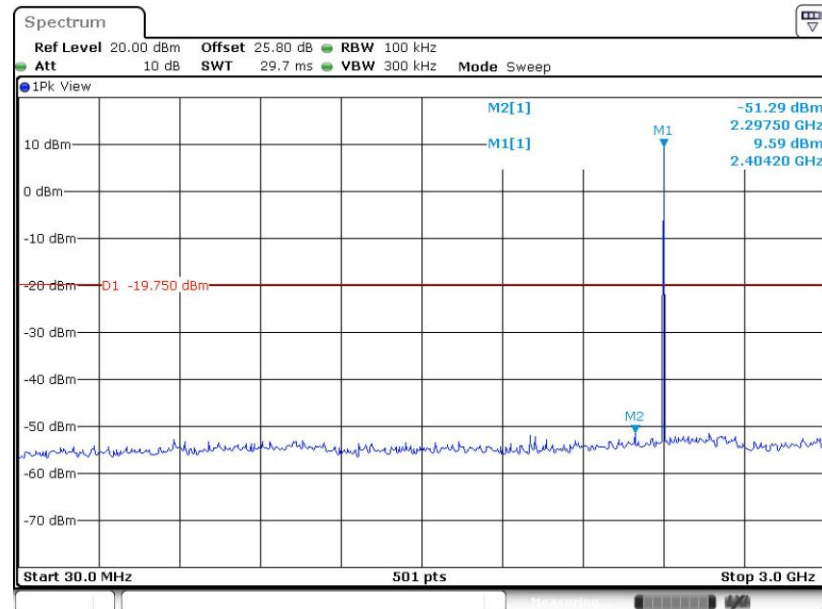
3.4.6 Test Result of Conducted Spurious Emission Plots

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



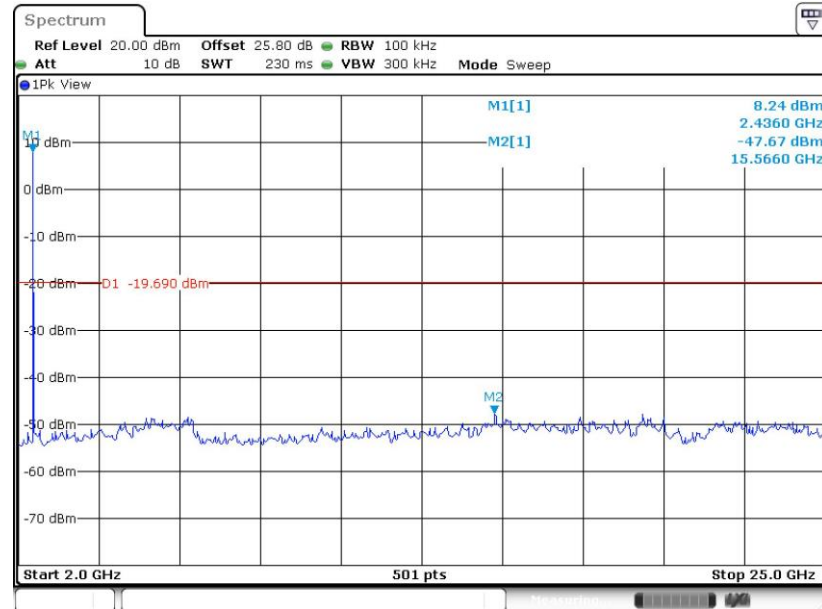
Date: 16.SEP.2019 13:47:09

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



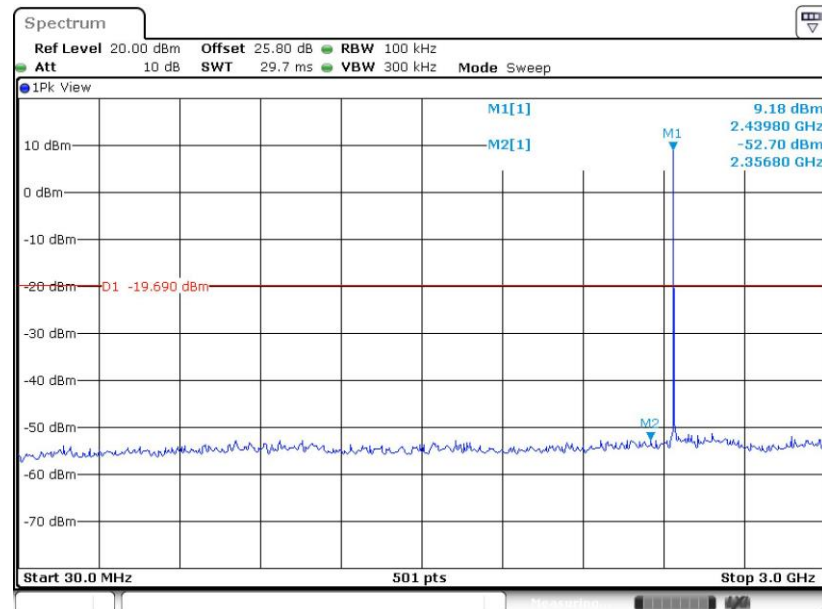
Date: 16.SEP.2019 13:46:54

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



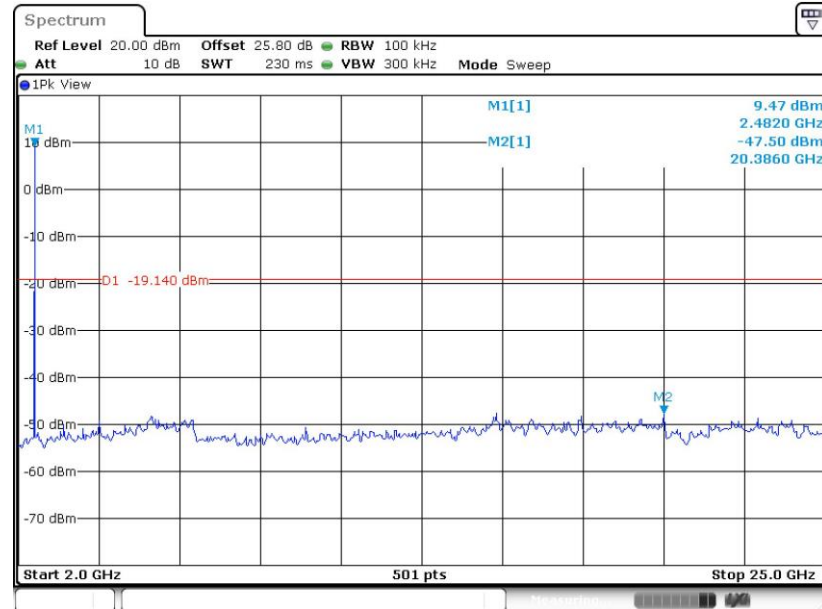
Date: 16.SEP.2019 13:53:17

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



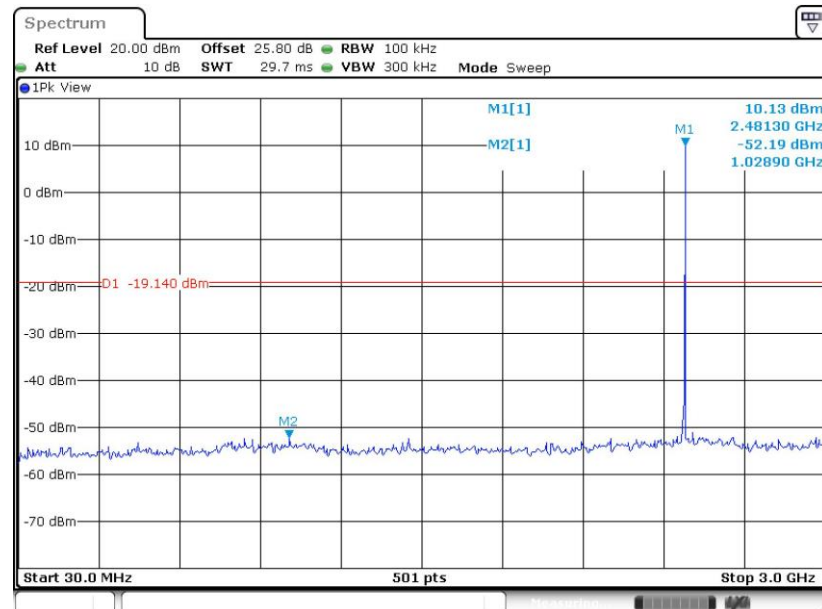
Date: 16.SEP.2019 13:53:00

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



Date: 16.SEP.2019 13:59:35

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

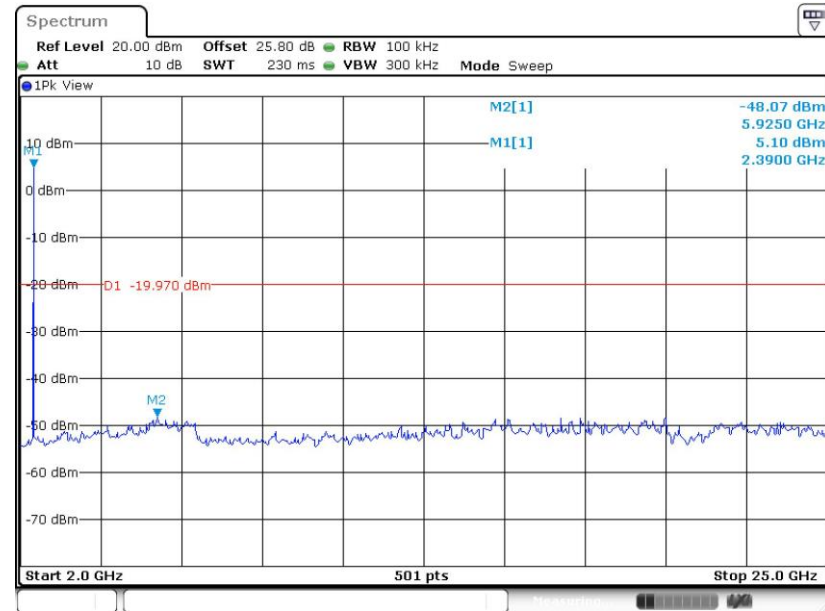


Date: 16.SEP.2019 13:59:23

<2Mbps>

Conducted Spurious Emission Plot on Bluetooth LE 2Mbps

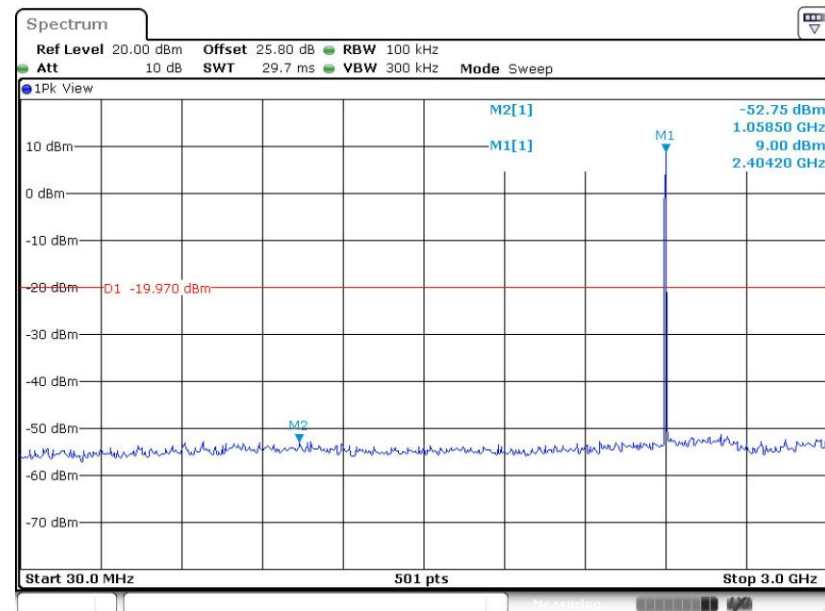
GFSK Channel 00



Date: 16.SEP.2019 14:15:37

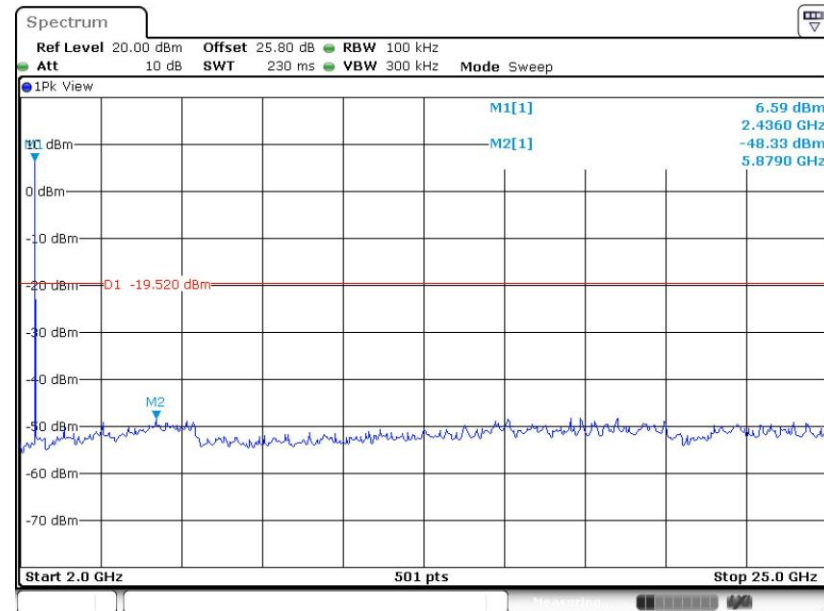
Conducted Spurious Emission Plot on Bluetooth LE 2Mbps

GFSK Channel 00



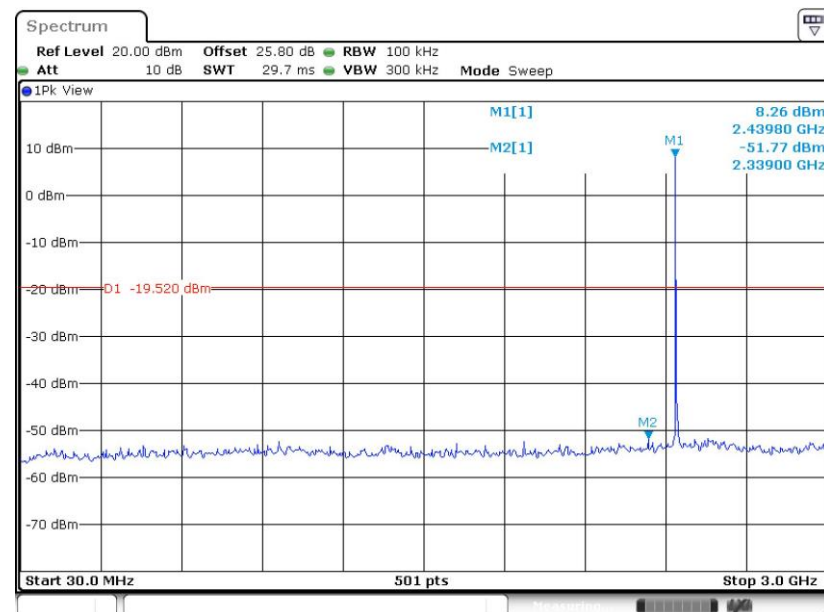
Date: 16.SEP.2019 14:15:25

Conducted Spurious Emission Plot on Bluetooth LE 2Mbps GFSK Channel 19



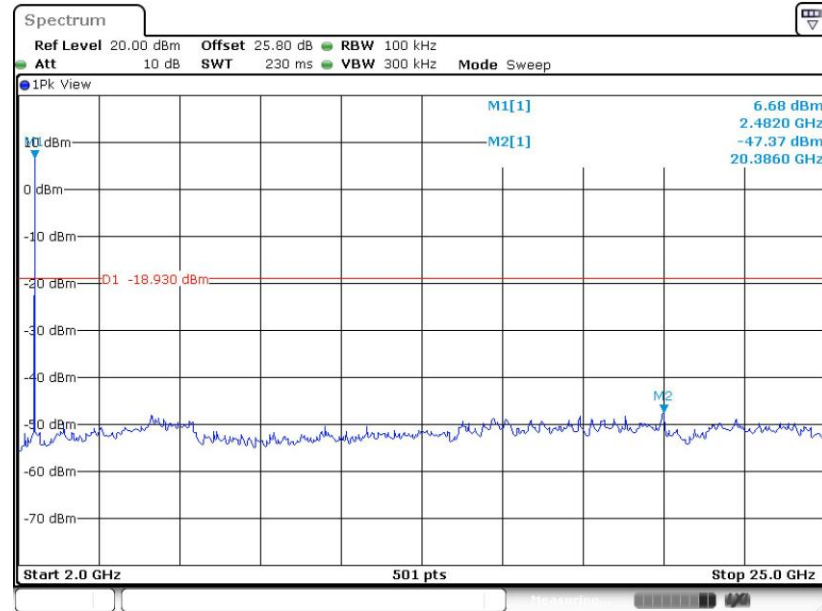
Date: 16.SEP.2019 14:18:55

Conducted Spurious Emission Plot on Bluetooth LE 2Mbps GFSK Channel 19



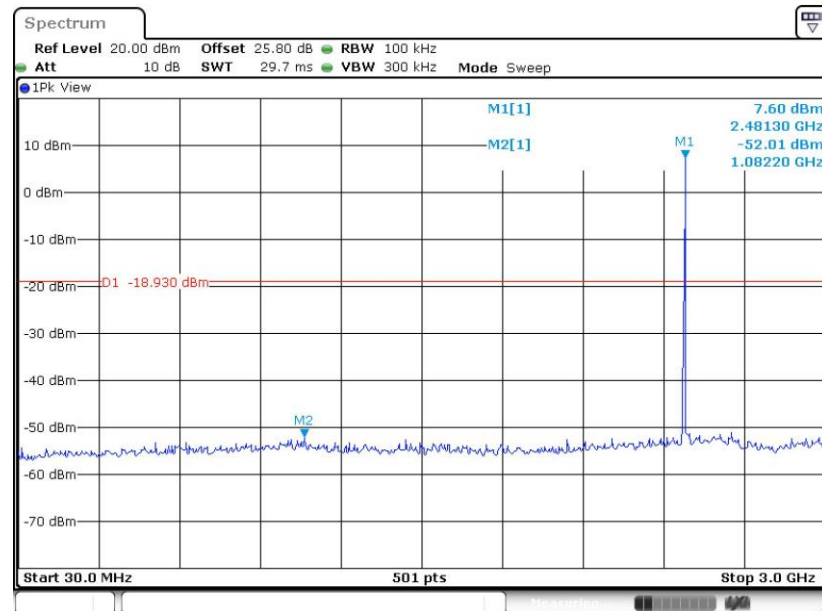
Date: 16.SEP.2019 14:18:42

Conducted Spurious Emission Plot on Bluetooth LE 2Mbps GFSK Channel 39



Date: 16.SEP.2019 14:24:03

Conducted Spurious Emission Plot on Bluetooth LE 2Mbps GFSK Channel 39



Date: 16.SEP.2019 14:23:51

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.5.2 Measuring Instruments

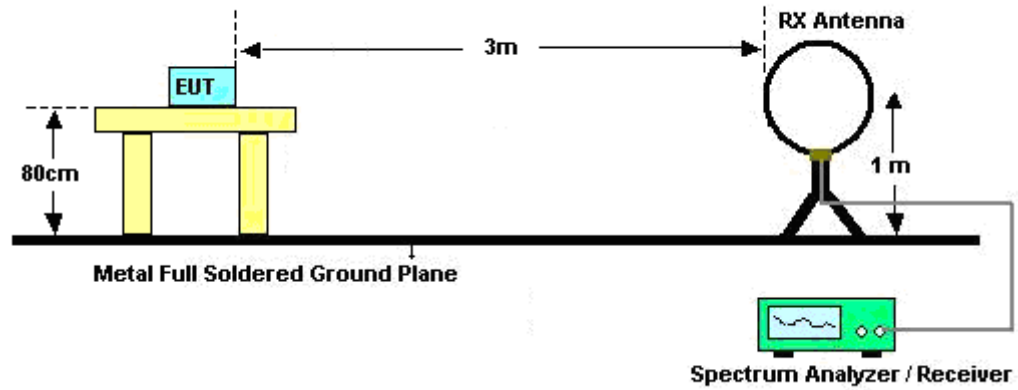
See list of measuring equipment of this test report.

3.5.3 Test Procedures

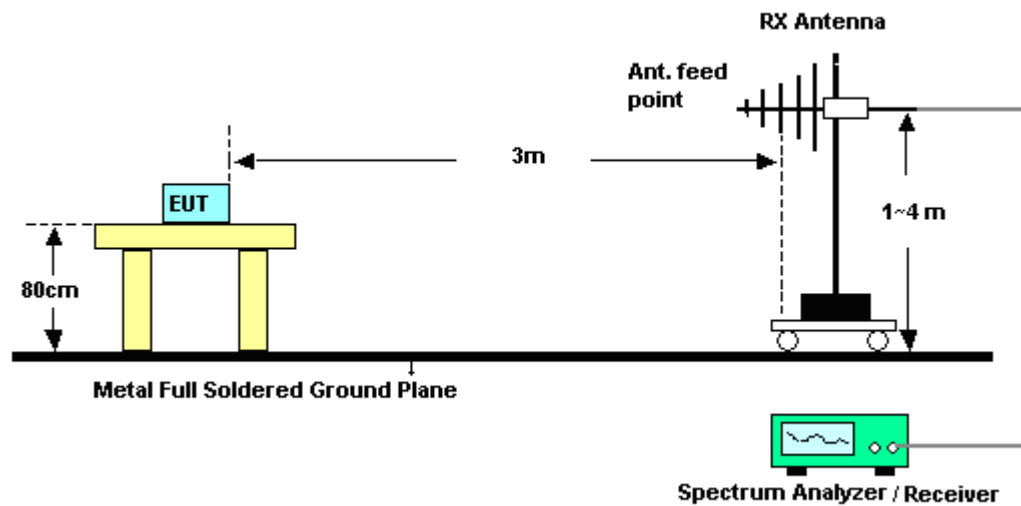
1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the 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 testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
8. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1 \text{ GHz}$; $\text{VBW} \geq \text{RBW}$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1 \text{ GHz}$ for peak measurement.
For average measurement:
 - $\text{VBW} = 10 \text{ Hz}$, when duty cycle is no less than 98 percent.
 - $\text{VBW} \geq 1/T$, 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.

3.5.4 Test Setup

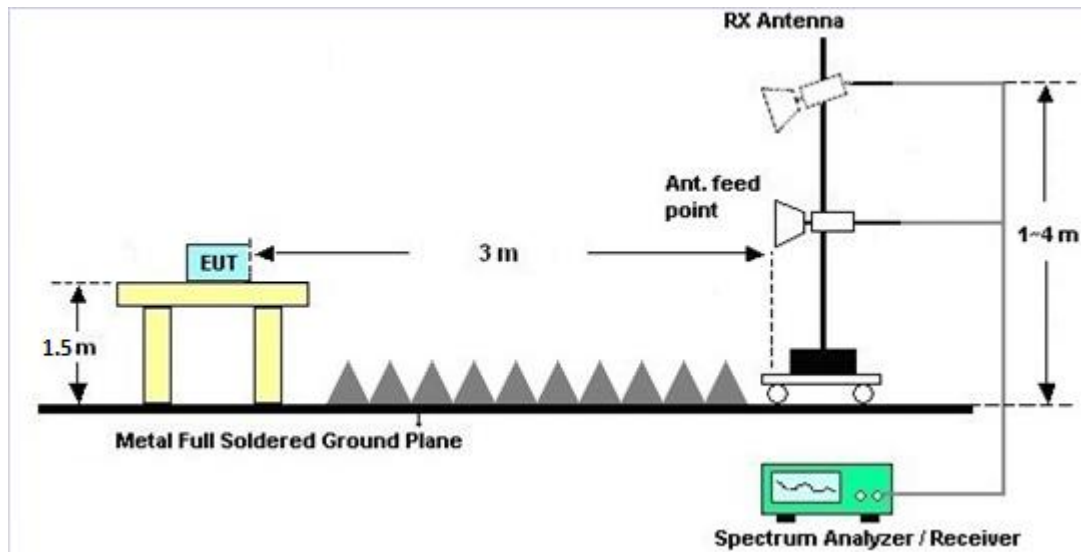
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test 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.

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C and D.

3.5.7 Duty Cycle

Please refer to Appendix E.

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

Please refer to Appendix C and D.

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

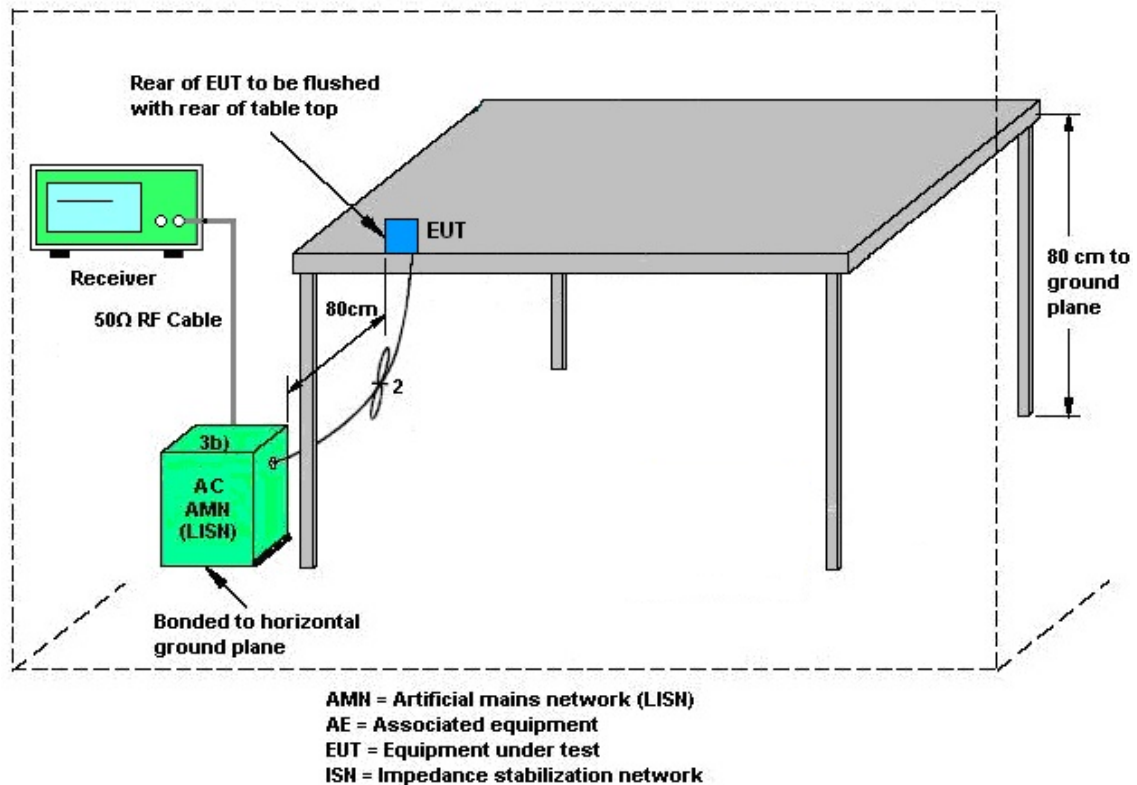
3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

3.6.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Sensor	DARE	RPR3006W	RPR6W-1 901027	10MHz~6GHz	Jun. 27, 2019	Sep. 16, 2019	Jun. 26, 2020	Conducted (TH01-CA)
Spectrum Analyzer	Rohde & Schwarz	FSV 40	101545	10Hz~40GHz	May 17, 2019	Sep. 16, 2019	May 16, 2020	Conducted (TH01-CA)
Switch Box & RF Cable	EM	EMSW18	SW107090 2	N/A	Apr. 07, 2019	Sep. 16, 2019	Apr. 06, 2020	Conducted (TH01-CA)
LISN	TESEQ	NNB51	47407	N/A	Jun. 26, 2019	Aug. 20, 2019	Jun. 25, 2020	Conduction (CO01-CA)
EMI Test Receiver	R&S	ESR7	102177	9KHz~7GHz	Jun. 27, 2019	Aug. 20, 2019	Jun. 26, 2020	Conduction (CO01-CA)
Pulse limiter with 10dB attenuation	R&S	VTSD 9561-F N	9561-F- N00412	N/A	Jun. 11, 2019	Aug. 20, 2019	Jun. 10, 2020	Conduction (CO01-CA)
Test Software	EMC32	N/A	N/A	N/A	N/A	Aug. 20, 2019	N/A	Conduction (CO01-CA)
Bilog Antenna	TESEQ	6111D	50392	30MHz~1GHz	May 15, 2019	Aug. 09, 2019~ Sep. 12, 2019	May 14, 2020	Radiation (03CH02-CA)
Horn Antenna	SCHWARZBECK	BBHA 9120D	01894	1GHz~18GHz	Jul. 22, 2019	Aug. 09, 2019~ Sep. 12, 2019	Jul. 21, 2020	Radiation (03CH02-CA)
Amplifier	SONOMA	310N	372241	N/A	Jul. 26, 2019	Aug. 09, 2019~ Sep. 12, 2019	Jul. 25, 2020	Radiation (03CH02-CA)
Preamplifier	Keysight	83017A	MY532703 21	1GHz~26.5GHz	Sep. 27, 2018	Aug. 09, 2019~ Sep. 12, 2019	Sep. 26, 2019	Radiation (03CH02-CA)
Preamplifier	Jet-Power	JPA0118-55-303	17100018 00055007	1GHz~18GHz	Apr. 01, 2019	Aug. 09, 2019~ Sep. 12, 2019	Mar. 31, 2020	Radiation (03CH02-CA)
EMI Test Receiver	R&S	ESU26	100049	20Hz~26.5GHz	Jul. 31, 2019	Aug. 09, 2019~ Sep. 12, 2019	Jul. 30, 2020	Radiation (03CH02-CA)
Filter	Wainwright	WLK12-1200-127 2-11000-40SS	SN2	1.2G Low Pass	Aug. 02, 2019	Aug. 09, 2019~ Sep. 12, 2019	Aug. 01, 2020	Radiation (03CH02-CA)
Filter	Wainwright	WHKX12-2700-3 000-18000-60ST	SN10	3G Highpass	Aug. 02, 2019	Aug. 09, 2019~ Sep. 12, 2019	Aug. 01, 2020	Radiation (03CH02-CA)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Aug. 09, 2019~ Sep. 12, 2019	N/A	Radiation (03CH02-CA)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Aug. 09, 2019~ Sep. 12, 2019	N/A	Radiation (03CH02-CA)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	1.7
---	-----

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.4
---	-----

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	6.5
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	6.3
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Jordan Huang	Temperature:	21~25	°C
Test Date:	2019/9/16	Relative Humidity:	51~54	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

Mod.	Data Rate	NTx	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
BLE	1Mbps	1	0	2402	1.019	0.661	0.50	Pass
BLE	1Mbps	1	19	2440	1.023	0.665	0.50	Pass
BLE	1Mbps	1	39	2480	1.025	0.665	0.50	Pass

TEST RESULTS DATA
Average Power Table

Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Average Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	1Mbps	1	0	2402	10.01	30.00	1.50	11.51	36.00	Pass
BLE	1Mbps	1	19	2440	10.07	30.00	1.50	11.57	36.00	Pass
BLE	1Mbps	1	39	2480	10.66	30.00	1.50	12.16	36.00	Pass

TEST RESULTS DATA
Peak Power Density

Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
BLE	1Mbps	1	0	2402	10.25	-6.28	1.50	8.00	Pass
BLE	1Mbps	1	19	2440	10.31	-4.15	1.50	8.00	Pass
BLE	1Mbps	1	39	2480	10.86	-4.96	1.50	8.00	Pass

Note: PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 30dBc limit.

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Jordan Huang	Temperature:	21~25	°C
Test Date:	2019/9/16	Relative Humidity:	51~54	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

Mod.	Data Rate	NTx	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
BLE5.0	2Mbps	1	0	2402	2.042	1.131	0.50	Pass
BLE5.0	2Mbps	1	19	2440	2.042	1.131	0.50	Pass
BLE5.0	2Mbps	1	39	2480	2.042	1.143	0.50	Pass

TEST RESULTS DATA
Average Power Table

Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Average Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE5.0	2Mbps	1	0	2402	9.74	30.00	1.50	11.24	36.00	Pass
BLE5.0	2Mbps	1	19	2440	9.87	30.00	1.50	11.37	36.00	Pass
BLE5.0	2Mbps	1	39	2480	10.46	30.00	1.50	11.96	36.00	Pass

TEST RESULTS DATA
Peak Power Density

Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
BLE5.0	2Mbps	1	0	2402	10.03	-8.05	1.50	8.00	Pass
BLE5.0	2Mbps	1	19	2440	10.48	-7.69	1.50	8.00	Pass
BLE5.0	2Mbps	1	39	2480	11.07	-7.89	1.50	8.00	Pass

Note: PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 30dBc limit.



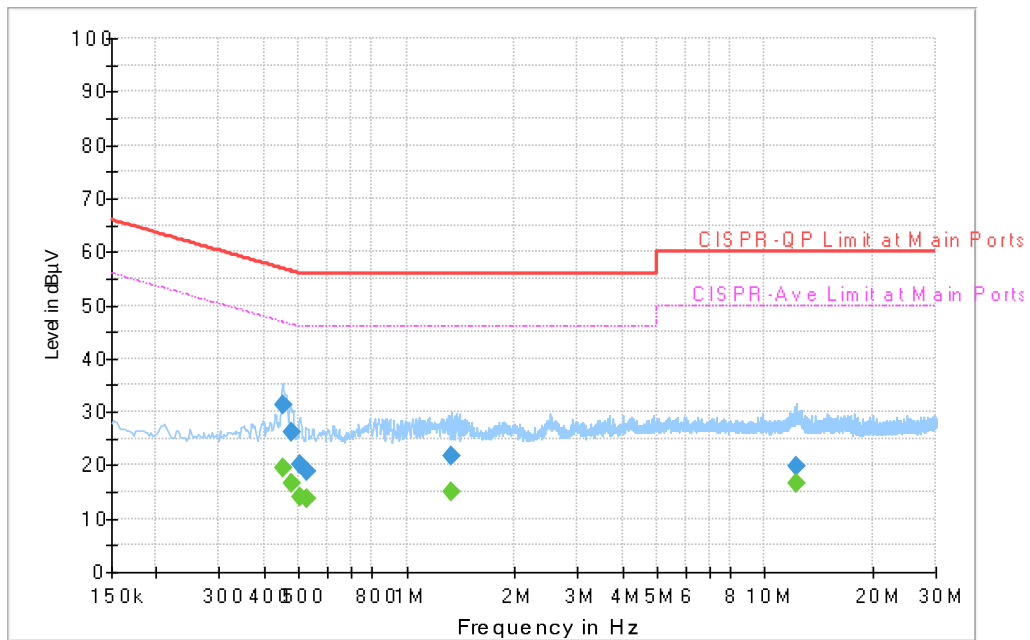
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Eric Jeng	Temperature :	22~25°C
		Relative Humidity :	52~55%

EUT Information

Test Site : CO01-CA
 Project No : 190805001
 TestMode : Mode 1
 Test Voltage : 120Vac/60Hz
 Phase : Line

Full Spectrum



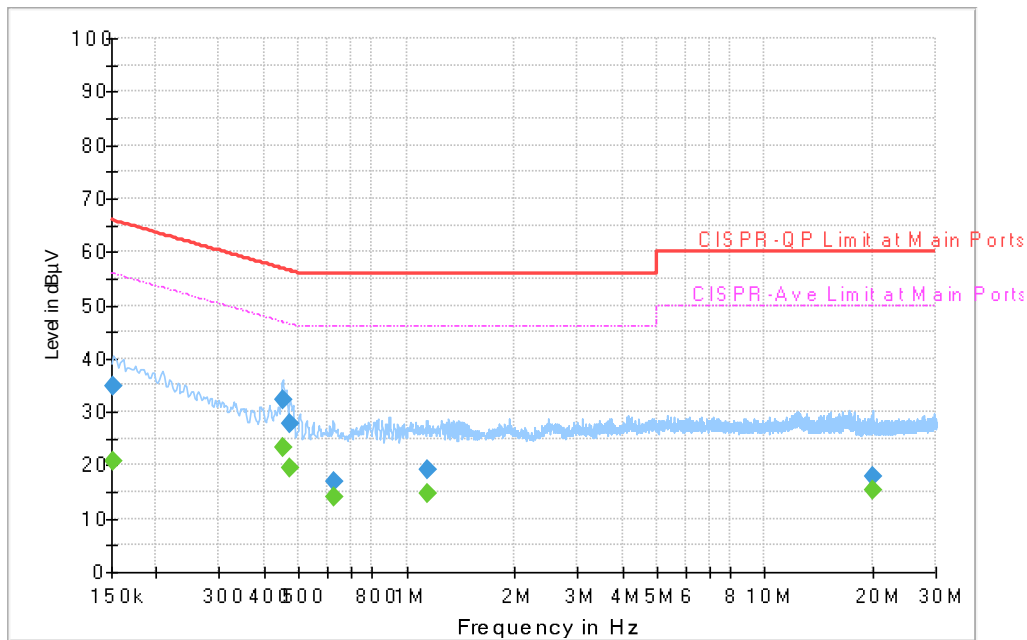
Final_Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
0.451572	---	19.43	46.85	27.42	L1	OFF	20.0
0.451572	31.34	---	56.85	25.51	L1	OFF	20.0
0.475080	---	16.74	46.43	29.69	L1	OFF	20.0
0.475080	26.07	---	56.43	30.36	L1	OFF	20.0
0.505878	---	14.06	46.00	31.94	L1	OFF	20.0
0.505878	20.13	---	56.00	35.87	L1	OFF	20.0
0.525228	---	13.70	46.00	32.30	L1	OFF	20.0
0.525228	18.76	---	56.00	37.24	L1	OFF	20.0
1.336884	---	14.89	46.00	31.11	L1	OFF	20.0
1.336884	21.87	---	56.00	34.13	L1	OFF	20.0
12.297948	---	16.72	50.00	33.28	L1	OFF	20.2
12.297948	19.91	---	60.00	40.09	L1	OFF	20.2

EUT Information

Test Site : CO01-CA
 Project No : 190805001
 Test Mode : Mode 1
 Test Voltage : 120Vac/60Hz
 Phase : Neutral

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
0.151418	---	20.85	55.92	35.07	N	OFF	20.0
0.151418	34.86	---	65.92	31.06	N	OFF	20.0
0.451410	---	23.23	46.85	23.62	N	OFF	20.0
0.451410	32.16	---	56.85	24.69	N	OFF	20.0
0.472920	---	19.51	46.46	26.95	N	OFF	20.0
0.472920	27.95	---	56.46	28.51	N	OFF	20.0
0.627000	---	13.99	46.00	32.01	N	OFF	20.0
0.627000	16.92	---	56.00	39.08	N	OFF	20.0
1.139280	---	14.65	46.00	31.35	N	OFF	20.0
1.139280	19.06	---	56.00	36.94	N	OFF	20.0
19.954500	---	15.33	50.00	34.67	N	OFF	20.3
19.954500	17.76	---	60.00	42.24	N	OFF	20.3



Appendix C. Radiated Spurious Emission

Test Engineer :	HAO SYU	Temperature :	23~26°C
		Relative Humidity :	41~49%

<Sample 1>

<2Mbps>

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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BLE CH 39 2480MHz	*	2480	104.28	-	-	90.37	27.56	17.47	31.12	362	176	P	H
	*	2480	102.33	-	-	88.42	27.56	17.47	31.12	362	176	A	H
		2484.28	57.84	-16.16	74	43.91	27.57	17.48	31.12	362	176	P	H
		2483.52	47.04	-6.96	54	33.11	27.57	17.48	31.12	362	176	A	H
	*	2480	100.03	-	-	86.08	27.6	17.47	31.12	354	271	P	V
	*	2480	98.04	-	-	84.09	27.6	17.47	31.12	354	271	A	V
		2497.72	58.01	-15.99	74	43.97	27.65	17.5	31.11	354	271	P	V
		2483.68	46.12	-7.88	54	32.15	27.61	17.48	31.12	354	271	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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BLE CH 39 2480MHz		4960	44.34	-29.66	74	60.65	31.44	11.44	59.19	100	0	P	H
		7440	46.27	-27.73	74	54.89	36.27	14.23	59.12	100	0	P	H
		4960	40.21	-33.79	74	56.29	31.67	11.44	59.19	100	0	P	V
		7440	45.33	-28.67	74	53.88	36.34	14.23	59.12	100	0	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	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BLE LF		32.91	21.43	-18.57	40	29.26	23.62	0.98	32.43	-	-	P	H
		119.24	20.38	-23.12	43.5	33.53	17.5	1.74	32.39	-	-	P	H
		353.01	20.52	-25.48	46	29.53	20.62	2.91	32.54	-	-	P	H
		568.35	26.7	-19.3	46	29.72	26.1	3.7	32.82	-	-	P	H
		749.74	30.44	-15.56	46	30.53	28.2	4.46	32.75	-	-	P	H
		941.8	33.82	-12.18	46	29.84	30.57	5	31.59	100	0	P	H
		30	22.45	-17.55	40	29.25	24.7	0.93	32.43	-	-	P	V
		264.74	20	-26	46	29.33	20.29	2.82	32.44	-	-	P	V
		449.04	24.79	-21.21	46	30.93	22.98	3.54	32.66	-	-	P	V
		633.34	28.24	-17.76	46	30.69	26.37	4.04	32.86	-	-	P	V
		750.71	30.35	-15.65	46	30.45	28.19	4.46	32.75	-	-	P	V
		958.29	33.78	-12.22	46	29.16	30.97	5.06	31.41	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



<Sample 2>

<2Mbps>

2.4GHz 2400~2483.5MHz**BLE (Band Edge @ 3m)**

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 39 2480MHz	*	2480	102.88	-	-	88.97	27.56	17.47	31.12	320	182	P	H
	*	2480	100.1	-	-	86.19	27.56	17.47	31.12	320	182	A	H
		2493.12	57.38	-16.62	74	43.4	27.6	17.49	31.11	320	182	P	H
		2483.64	45.87	-8.13	54	31.94	27.57	17.48	31.12	320	182	A	H
	*	2480	98.39	-	-	84.44	27.6	17.47	31.12	398	96	P	V
	*	2480	94.74	-	-	80.79	27.6	17.47	31.12	398	96	A	V
		2489	56.78	-17.22	74	42.78	27.63	17.49	31.12	398	96	P	V
		2491.56	45.44	-8.56	54	31.43	27.63	17.49	31.11	398	96	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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BLE CH 39 2480MHz		4960	40.84	-33.16	74	57.15	31.44	11.44	59.19	100	0	P	H
		7440	45.29	-28.71	74	53.91	36.27	14.23	59.12	100	0	P	H
		4960	40.37	-33.63	74	56.45	31.67	11.44	59.19	100	0	P	V
		7440	45.42	-28.58	74	53.97	36.34	14.23	59.12	100	0	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	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BLE LF		31.94	21.04	-18.96	40	28.71	23.83	0.97	32.47	-	-	P	H
		74.62	13.8	-26.2	40	32.07	12.76	1.42	32.45	-	-	P	H
		269.59	18.28	-27.72	46	28.67	19.2	2.82	32.41	-	-	P	H
		561.56	25.39	-20.61	46	28.18	26.1	3.67	32.56	-	-	P	H
		721.61	29.69	-16.31	46	30.49	27.2	4.45	32.45	-	-	P	H
		942.77	32.62	-13.38	46	28.27	30.61	5	31.26	100	0	P	H
		32.91	21.77	-18.23	40	29.64	23.62	0.98	32.47	-	-	P	V
		74.62	16.92	-23.08	40	35.19	12.76	1.42	32.45	-	-	P	V
		400.54	21.24	-24.76	46	28.81	21.82	3.08	32.47	-	-	P	V
		559.62	25.32	-20.68	46	28.14	26.08	3.66	32.56	-	-	P	V
		754.59	28.94	-17.06	46	28.75	28.11	4.47	32.39	-	-	P	V
		953.44	32.9	-13.1	46	28.14	30.87	5.03	31.14	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



<Sample 3>

<1Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 00 2402MHz		2369.745	56.76	-17.24	74	43.42	27.23	17.29	31.18	396	360	P	H
		2389.485	44.8	-9.2	54	31.36	27.29	17.32	31.17	396	360	A	H
	*	2402	90.41	-	-	76.91	27.32	17.34	31.16	396	360	P	H
	*	2402	89.67	-	-	76.17	27.32	17.34	31.16	396	360	A	H
		2381.715	57.21	-16.79	74	43.74	27.33	17.31	31.17	122	298	P	V
		2389.38	44.83	-9.17	54	31.33	27.35	17.32	31.17	122	298	A	V
	*	2402	105.16	-	-	91.59	27.39	17.34	31.16	122	298	P	V
	*	2402	104.17	-	-	90.6	27.39	17.34	31.16	122	298	A	V
BLE CH 19 2440MHz		2346.96	56.58	-17.42	74	43.35	27.16	17.26	31.19	379	184	P	H
		2386.16	44.58	-9.42	54	31.15	27.28	17.32	31.17	379	184	A	H
	*	2440	91.08	-	-	77.37	27.44	17.41	31.14	379	184	P	H
	*	2440	90.18	-	-	76.47	27.44	17.41	31.14	379	184	A	H
		2497.2	56.56	-17.44	74	42.56	27.61	17.5	31.11	379	184	P	H
		2491.04	45.44	-8.56	54	31.47	27.59	17.49	31.11	379	184	A	H
		2364.72	55.85	-18.15	74	42.45	27.29	17.29	31.18	103	299	P	V
		2386.8	44.79	-9.21	54	31.29	27.35	17.32	31.17	103	299	A	V
	*	2440	105.75	-	-	91.99	27.49	17.41	31.14	103	299	P	V
	*	2440	104.76	-	-	91	27.49	17.41	31.14	103	299	A	V
		2489.44	56.45	-17.55	74	42.45	27.63	17.49	31.12	103	299	P	V
		2498.88	45.56	-8.44	54	31.52	27.65	17.5	31.11	103	299	A	V



FCC RADIO TEST REPORT

Report No. : FR190805001B

BLE CH 39 2480MHz	*	2480	91.25	-	-	77.34	27.56	17.47	31.12	362	360	P	H
	*	2480	90.43	-	-	76.52	27.56	17.47	31.12	362	360	A	H
		2495.12	57.06	-16.94	74	43.07	27.6	17.5	31.11	362	360	P	H
		2496.12	45.39	-8.61	54	31.39	27.61	17.5	31.11	362	360	A	H
	*	2480	106.5	-	-	92.55	27.6	17.47	31.12	100	302	P	V
	*	2480	105.03	-	-	91.08	27.6	17.47	31.12	100	302	A	V
		2497.88	58.68	-15.32	74	44.64	27.65	17.5	31.11	100	302	P	V
		2483.52	45.72	-8.28	54	31.75	27.61	17.48	31.12	100	302	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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BLE CH 00 2402MHz		4804	39.47	-34.53	74	55.55	31.22	11.86	59.16	100	0	P	H
		4804	39.63	-34.37	74	55.57	31.36	11.86	59.16	100	0	P	V
BLE CH 19 2440MHz		4880	40.22	-33.78	74	56.41	31.33	11.66	59.18	100	0	P	H
		7320	44.95	-29.05	74	54.03	35.96	14.13	59.17	100	0	P	H
		4880	39.8	-34.2	74	55.81	31.51	11.66	59.18	100	0	P	V
		7320	45.35	-28.65	74	54.36	36.03	14.13	59.17	100	0	P	V
BLE CH 39 2480MHz		4960	39.43	-34.57	74	55.74	31.44	11.44	59.19	100	0	P	H
		7440	44.73	-29.27	74	53.35	36.27	14.23	59.12	100	0	P	H
		4960	40.79	-33.21	74	56.87	31.67	11.44	59.19	100	0	P	V
		7440	45.15	-28.85	74	53.7	36.34	14.23	59.12	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



<Sample 3>

<2Mbps>

2.4GHz 2400~2483.5MHz**BLE (Band Edge @ 3m)**

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 00 2402MHz		2331.735	56.52	-17.48	74	43.37	27.11	17.24	31.2	396	360	P	H
		2381.4	44.71	-9.29	54	31.31	27.26	17.31	31.17	396	360	A	H
	*	2402	93.31	-	-	79.81	27.32	17.34	31.16	396	360	P	H
	*	2402	91.31	-	-	77.81	27.32	17.34	31.16	396	360	A	H
		2358.09	57.11	-16.89	74	43.75	27.27	17.28	31.19	124	301	P	V
		2366.595	44.78	-9.22	54	31.38	27.29	17.29	31.18	124	301	A	V
	*	2402	105.84	-	-	92.27	27.39	17.34	31.16	124	301	P	V
	*	2402	104.01	-	-	90.44	27.39	17.34	31.16	124	301	A	V
BLE CH 19 2440MHz		2389.68	55.77	-18.23	74	42.33	27.29	17.32	31.17	398	49	P	H
		2375.76	44.76	-9.24	54	31.39	27.25	17.3	31.18	398	49	A	H
	*	2440	90.22	-	-	76.51	27.44	17.41	31.14	398	49	P	H
	*	2440	88.15	-	-	74.44	27.44	17.41	31.14	398	49	A	H
		2490.72	56.99	-17.01	74	43.03	27.59	17.49	31.12	398	49	P	H
		2495.52	45.38	-8.62	54	31.38	27.61	17.5	31.11	398	49	A	H
		2322.8	56.77	-17.23	74	43.59	27.17	17.22	31.21	101	300	P	V
		2384.72	44.74	-9.26	54	31.25	27.34	17.32	31.17	101	300	A	V
	*	2440	106.66	-	-	92.9	27.49	17.41	31.14	101	300	P	V
	*	2440	104.75	-	-	90.99	27.49	17.41	31.14	101	300	A	V
		2484.4	56.83	-17.17	74	42.86	27.61	17.48	31.12	101	300	P	V
		2490.16	45.36	-8.64	54	31.36	27.63	17.49	31.12	101	300	A	V



FCC RADIO TEST REPORT

Report No. : FR190805001B

BLE CH 39 2480MHz	*	2480	91.82	-	-	77.91	27.56	17.47	31.12	361	360	P	H
	*	2480	89.89	-	-	75.98	27.56	17.47	31.12	361	360	A	H
		2490.76	57.09	-16.91	74	43.12	27.59	17.49	31.11	361	360	P	H
		2498.2	45.41	-8.59	54	31.41	27.61	17.5	31.11	361	360	A	H
	*	2480	106.31	-	-	92.36	27.6	17.47	31.12	103	301	P	V
	*	2480	104.08	-	-	90.13	27.6	17.47	31.12	103	301	A	V
		2483.52	56.86	-17.14	74	42.89	27.61	17.48	31.12	103	301	P	V
		2483.52	47.08	-6.92	54	33.11	27.61	17.48	31.12	103	301	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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BLE CH 00 2402MHz		4804	39.62	-34.38	74	55.7	31.22	11.86	59.16	100	0	P	H
		4804	40.95	-33.05	74	56.89	31.36	11.86	59.16	100	0	P	V
BLE CH 19 2440MHz		4880	39.63	-34.37	74	55.82	31.33	11.66	59.18	100	0	P	H
		7320	45.29	-28.71	74	54.37	35.96	14.13	59.17	100	0	P	H
		4880	39.68	-34.32	74	55.69	31.51	11.66	59.18	100	0	P	V
		7320	46.67	-27.33	74	55.68	36.03	14.13	59.17	100	0	P	V
BLE CH 39 2480MHz		4960	39.94	-34.06	74	56.25	31.45	11.43	59.19	100	0	P	H
		7440	45.09	-28.91	74	53.71	36.27	14.23	59.12	100	0	P	H
		4960	39.96	-34.04	74	56.04	31.68	11.43	59.19	100	0	P	V
		7440	44.62	-29.38	74	53.17	36.34	14.23	59.12	100	0	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	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BLE LF		76.56	14.27	-25.73	40	32.33	12.96	1.43	32.45	-	-	P	H
		265.71	20.49	-25.51	46	29.94	20.13	2.83	32.41	-	-	P	H
		478.14	22.64	-23.36	46	27.99	23.6	3.59	32.54	-	-	P	H
		635.28	27.05	-18.95	46	29.17	26.41	4.04	32.57	-	-	P	H
		804.06	29.03	-16.97	46	28.57	28.02	4.63	32.19	-	-	P	H
		958.29	32.48	-13.52	46	27.54	30.97	5.06	31.09	100	0	P	H
		72.68	21.63	-18.37	40	40	12.6	1.48	32.45	-	-	P	V
		204.6	17.22	-26.28	43.5	32.19	15.16	2.28	32.41	-	-	P	V
		417.03	21.95	-24.05	46	28.62	22.58	3.24	32.49	-	-	P	V
		554.77	25.87	-20.13	46	29.02	25.77	3.64	32.56	-	-	P	V
		778.84	29.48	-16.52	46	29.12	28.1	4.54	32.28	-	-	P	V
		951.5	32.31	-13.69	46	27.62	30.83	5.02	31.16	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



<Sample 4>

<1Mbps>

2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

BT	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BT CH 78 2480MHz	*	2480	94	-	-	90.07	27.56	7.49	31.12	287	23	P	H
	*	2480	69.27	-	-	-	-	-	-	-	-	A	H
		2494.04	47.36	-26.64	74	43.35	27.6	7.52	31.11	287	23	P	H
		2494.04	22.63	-31.37	54	-	-	-	-	-	-	A	H
	*	2480	105.36	-	-	101.39	27.6	7.49	31.12	100	302	P	V
	*	2480	80.63	-	-	-	-	-	-	-	-	A	V
		2483.8	53.34	-20.66	74	49.35	27.61	7.5	31.12	100	302	P	V
		2483.8	28.61	-25.39	54	-	-	-	-	-	-	A	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

BT (Harmonic @ 3m)

BT	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BT CH 78 2480MHz		4960	40.08	-33.92	74	56.39	31.44	11.44	59.19	100	0	P	H
		4960	15.35	-38.65	54	-	-	-	-	-	-	A	H
		7440	45.5	-28.5	74	54.12	36.27	14.23	59.12	100	0	P	H
		7440	20.77	-33.23	54	-	-	-	-	-	-	A	H
		4960	41.73	-32.27	74	57.81	31.67	11.44	59.19	100	0	P	V
		4960	17	-37	54	-	-	-	-	-	-	A	V
		7440	44.67	-29.33	74	53.22	36.34	14.23	59.12	100	0	P	V
		7440	19.94	-34.06	54	-	-	-	-	-	-	A	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												



Emission below 1GHz

2.4GHz BT (LF)

BT	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BT LF		140.58	15.41	-28.09	43.5	28.16	17.6	2.07	32.42	-	-	P	H
		265.71	19.24	-26.76	46	28.69	20.13	2.83	32.41	-	-	P	H
		472.32	23.27	-22.73	46	28.65	23.55	3.59	32.52	-	-	P	H
		652.74	26.78	-19.22	46	28.75	26.45	4.14	32.56	-	-	P	H
		741.01	29.11	-16.89	46	29.01	28.04	4.46	32.4	-	-	P	H
		958.29	31.36	-14.64	46	26.42	30.97	5.06	31.09	100	0	P	H
		132.82	15.89	-27.61	43.5	28.67	17.7	1.95	32.43	-	-	P	V
		264.74	18.56	-27.44	46	27.86	20.29	2.82	32.41	-	-	P	V
		476.2	23.04	-22.96	46	28.38	23.6	3.59	32.53	-	-	P	V
		638.19	27.43	-18.57	46	29.48	26.46	4.06	32.57	-	-	P	V
		794.36	29.28	-16.72	46	28.78	28.11	4.6	32.21	-	-	P	V
		953.44	32.51	-13.49	46	27.75	30.87	5.03	31.14	100	0	P	V
Remark	3. No other spurious found. 4. All results are PASS against limit line.												



<Sample 4>

<2Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 39 2480MHz	*	2480	89.15	-	-	75.24	27.56	17.47	31.12	100	245	P	H
	*	2480	86.91	-	-	73	27.56	17.47	31.12	100	245	A	H
		2496.92	57.2	-16.8	74	43.2	27.61	17.5	31.11	100	245	P	H
		2492.72	45.39	-8.61	54	31.41	27.6	17.49	31.11	100	245	A	H
	*	2480	103.64	-	-	89.69	27.6	17.47	31.12	100	245	P	V
	*	2480	101.7	-	-	87.75	27.6	17.47	31.12	100	245	A	V
		2491.92	57.23	-16.77	74	43.22	27.63	17.49	31.11	100	245	P	V
		2483.56	46.47	-7.53	54	32.5	27.61	17.48	31.12	100	245	A	V
Remark	5. No other spurious found. 6. 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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BLE CH 39 2480MHz		4960	40.95	-33.05	74	57.26	31.44	11.44	59.19	100	0	P	H
		7440	44.95	-29.05	74	53.57	36.27	14.23	59.12	100	0	P	H
		4960	43.1	-30.9	74	59.18	31.67	11.44	59.19	100	0	P	V
		7440	44.52	-29.48	74	53.07	36.34	14.23	59.12	100	0	P	V
Remark	5. No other spurious found. 6. All results are PASS against Peak and Average limit line.												



Emission below 1GHz

2.4GHz BLE (LF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BLE LF		70.74	14.86	-25.14	40	33.31	12.47	1.53	32.45	-	-	P	H
		257.95	18.27	-27.73	46	28.02	19.83	2.83	32.41	-	-	P	H
		468.44	22.82	-23.18	46	28.3	23.47	3.57	32.52	-	-	P	H
		596.48	26.21	-19.79	46	29.36	25.6	3.84	32.59	-	-	P	H
		764.29	28.79	-17.21	46	28.54	28.1	4.5	32.35	-	-	P	H
		953.44	32.54	-13.46	46	27.78	30.87	5.03	31.14	100	0	P	H
		71.71	18.34	-21.66	40	36.71	12.57	1.51	32.45	-	-	P	V
		100.81	18.47	-25.03	43.5	33.13	16.08	1.68	32.42	-	-	P	V
		260.86	18.5	-27.5	46	27.87	20.22	2.82	32.41	-	-	P	V
		507.24	24.71	-21.29	46	29.68	23.94	3.63	32.54	-	-	P	V
		725.49	27.96	-18.04	46	28.53	27.42	4.45	32.44	-	-	P	V
		951.5	33.04	-12.96	46	28.35	30.83	5.02	31.16	100	0	P	V
Remark	5. No other spurious found. 6. 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	Peak or Average
H/V	Horizontal or Vertical



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

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 00 2402MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =
Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path 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) + Path 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 D. Radiated Spurious Emission Plots

Test Engineer :	HAO SYU	Temperature :	23~26°C
		Relative Humidity :	41~49%

Note symbol

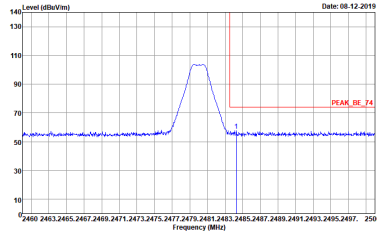
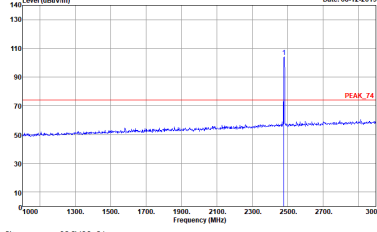
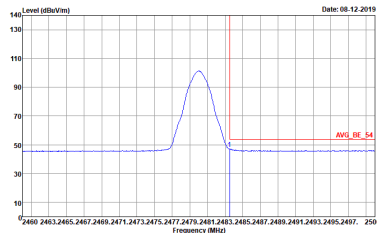
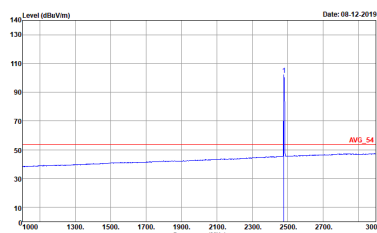
-L	Low channel location
-R	High channel location

<Sample 1>

<2Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 14 Plane : Z_StandAlone	 Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 14 Plane : Z_StandAlone
Avg.	 Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 14 Plane : Z_StandAlone	 Site : 03CH02-CA Condition : AVG_54 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 14 Plane : Z_StandAlone



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Vertical	Fundamental
Peak	Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 14 Plane : Z_StandAlone	Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 14 Plane : Z_StandAlone
Avg.	Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 14 Plane : Z_StandAlone	Site : 03CH02-CA Condition : AVG_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 14 Plane : Z_StandAlone



2.4GHz 2400~2483.5MHz

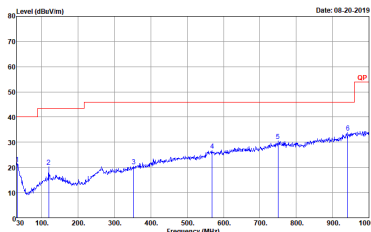
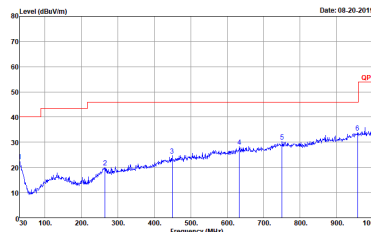
BLE (Harmonic @ 3m)

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Vertical
Peak	Level (dBuV/m) Date: 08-18-2019 Frequency (MHz) Site : 03CH02-CA Condition : PEAK_74 3m HORN 9120D-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 14 Plane : Z_StandAlone	Level (dBuV/m) Date: 08-18-2019 Frequency (MHz) Site : 03CH02-CA Condition : PEAK_74 3m HORN 9120D-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 14 Plane : Z_StandAlone



Emission below 1GHz

2.4GHz BLE (LF)

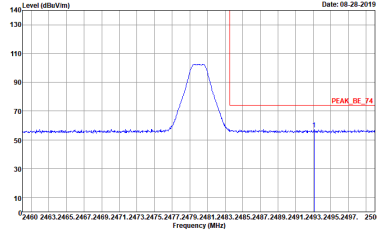
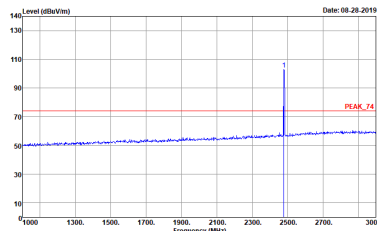
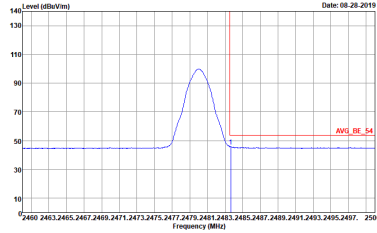
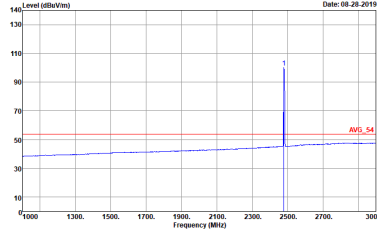
BLE	2.4GHz 2400~2483.5MHz	
	BLE LF	
	Horizontal	Vertical
QP / Peak	 Site : 03CH02-CA Condition : QP-3m BtLOG 6111D-LF_50392 HORIZONTAL Detector : Peak Project : 190805001 Mode : 22	 Site : 03CH02-CA Condition : QP-3m BtLOG 6111D-LF_50392 VERTICAL Detector : Peak Project : 190805001 Mode : 22

<Sample 2>

<2Mbps>

2.4GHz 2400~2483.5MHz

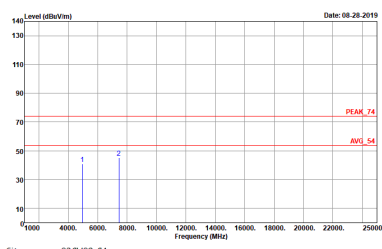
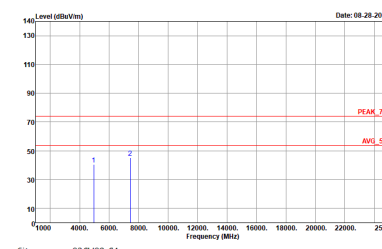
BLE (Band Edge @ 3m)

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : 190805001 Mode : 13 Plane : Z_StandAlone	 Site : 03CH02-CA Condition : PEAK_F4 3m HORN 91200-HF_01894 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : 190805001 Mode : 13 Plane : Z_StandAlone
Avg.	 Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 HORIZONTAL Detector : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Project : 190805001 Mode : 13 Plane : Z_StandAlone	 Site : 03CH02-CA Condition : AVG_F4 3m HORN 91200-HF_01894 HORIZONTAL Detector : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Project : 190805001 Mode : 13 Plane : Z_StandAlone



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Vertical	Fundamental
Peak	Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 190805001 Mode : 13 Plane : Z_StandAlone	Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 190805001 Mode : 13 Plane : Z_StandAlone
Avg.	Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 190805001 Mode : 13 Plane : Z_StandAlone	Site : 03CH02-CA Condition : AVG_54 3m HORN 91200-HF_01894 VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 190805001 Mode : 13 Plane : Z_StandAlone

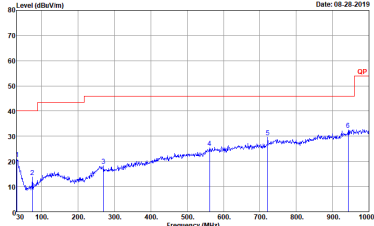
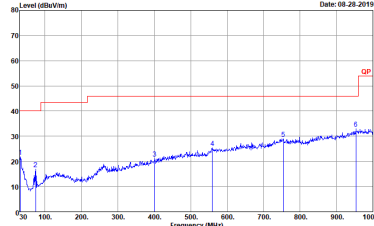
2.4GHz 2400~2483.5MHz
BLE (Harmonic @ 3m)

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Vertical
Peak	 Site : 03CH02-CA Condition : PEAK_74 3m HORN 9120D-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 13 Plane : Z_StandAlone	 Site : 03CH02-CA Condition : PEAK_74 3m HORN 9120D-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 13 Plane : Z_StandAlone



Emission below 1GHz

2.4GHz BLE (LF)

BLE	2.4GHz 2400~2483.5MHz	
	BLE LF	
	Horizontal	Vertical
QP / Peak	 Site : 03CH02-CA Condition : QP-3m B1LOG 6111D-LF_50392 HORIZONTAL Detector : Peak Project : 190805001 Mode : 21	 Site : 03CH02-CA Condition : QP-3m B1LOG 6111D-LF_50392 VERTICAL Detector : Peak Project : 190805001 Mode : 21



<Sample 3>

<1Mbps>

2.4GHz 2400~2483.5MHz

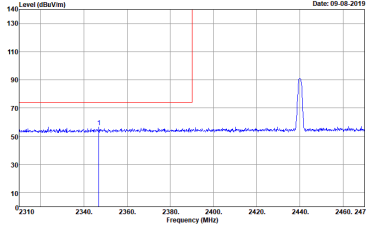
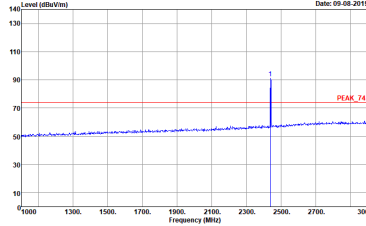
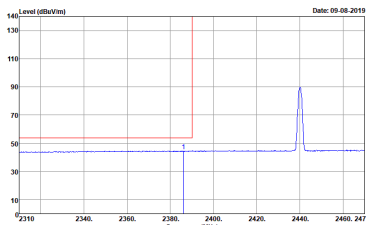
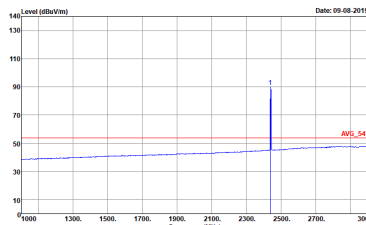
BLE (Band Edge @ 3m)

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH00 2402MHz	
	Horizontal	Fundamental
Peak	Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 190805001 Mode : 4 Plane : Y_StandAlone	Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 190805001 Mode : 4 Plane : Y_StandAlone
Avg.	Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 HORIZONTAL RBW:1000.000KHz VBW:1000KHz SWT:Auto Detector : Peak Project : 190805001 Mode : 4 Plane : Y_StandAlone	Site : 03CH02-CA Condition : AVG_54 3m HORN 91200-HF_01894 HORIZONTAL RBW:1000.000KHz VBW:1000KHz SWT:Auto Detector : Peak Project : 190805001 Mode : 4 Plane : Y_StandAlone

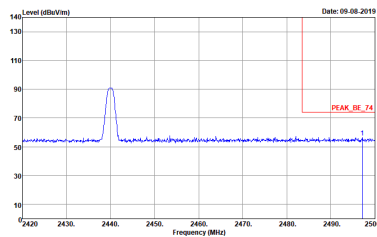
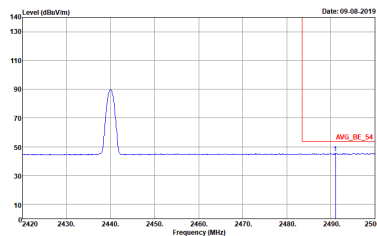


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH00 2402MHz	
	Vertical	Fundamental
Peak	Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 4 Plane : Y_StandAlone	Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 4 Plane : Y_StandAlone
Avg	Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 4 Plane : Y_StandAlone	Site : 03CH02-CA Condition : AVG_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 4 Plane : Y_StandAlone

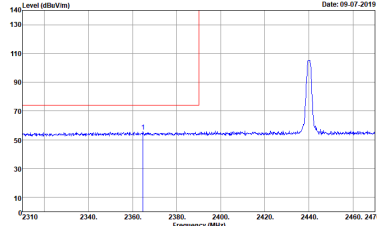
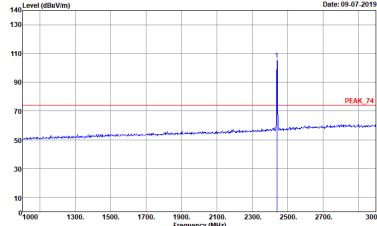
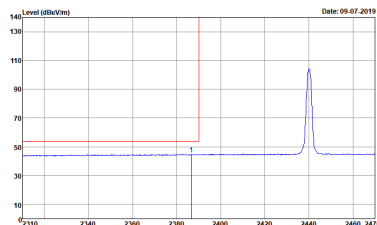
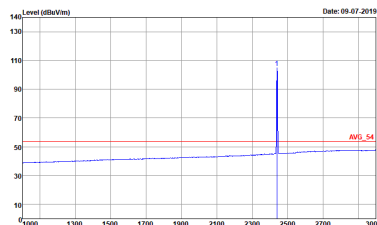


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - L	
	Horizontal	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 5 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 5 Plane : Y_StandAlone
Avg.	 Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 5 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : AVG_54 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 5 Plane : Y_StandAlone

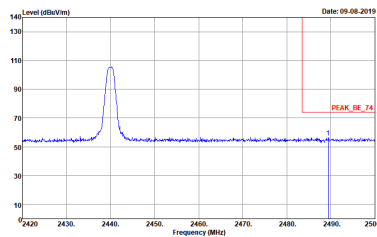
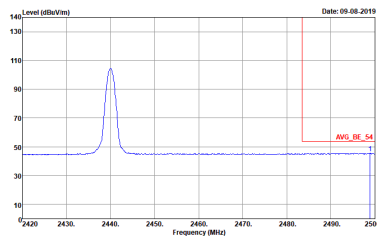


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - R	
	Horizontal	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : S Plane : Y_StandAlone	Left blank
Avg.	 Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : S Plane : Y_StandAlone	Left blank



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - L	
	Vertical	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 5 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 5 Plane : Y_StandAlone
Avg.	 Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 5 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : AVG_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 5 Plane : Y_StandAlone

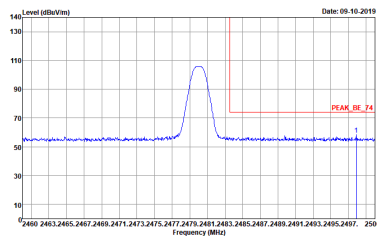
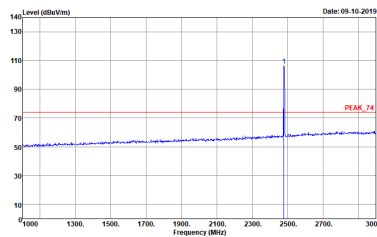
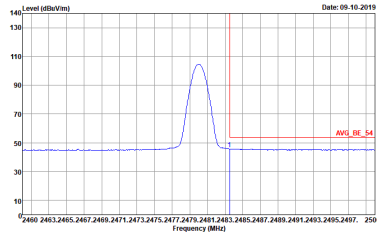
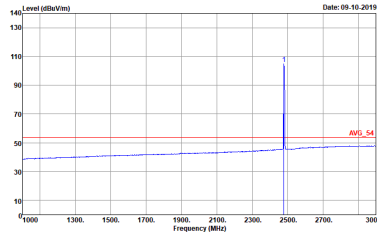


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - R	
	Vertical	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 5 Plane : Y_StandAlone	Left blank
Avg.	 Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 5 Plane : Y_StandAlone	Left blank



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Fundamental
Peak	Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 6 Plane : Y_StandAlone	Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 6 Plane : Y_StandAlone
Avg.	Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 6 Plane : Y_StandAlone	Site : 03CH02-CA Condition : AVG_54 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 6 Plane : Y_StandAlone



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Vertical	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 6 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 6 Plane : Y_StandAlone
Avg.	 Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 6 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : AVG_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 6 Plane : Y_StandAlone



2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH00 2402MHz	
	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 09-10-2019 Frequency (MHz) Site : 03CH02-CA Condition : PEAK_74 3m HORN 9120D-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 4 Plane : Y_StandAlone	Level (dBuV/m) Date: 09-10-2019 Frequency (MHz) Site : 03CH02-CA Condition : PEAK_74 3m HORN 9120D-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 4 Plane : Y_StandAlone



BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH19 2440MHz	
	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 09-10-2019 Frequency (MHz) Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : S Plane : Y_StandAlone	Level (dBuV/m) Date: 09-10-2019 Frequency (MHz) Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : S Plane : Y_StandAlone



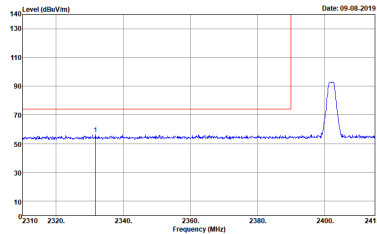
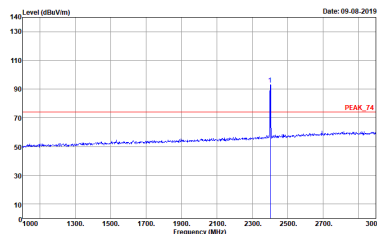
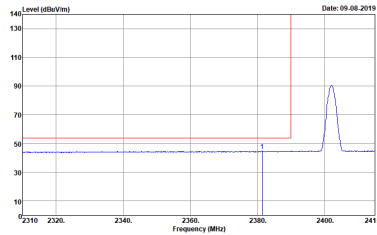
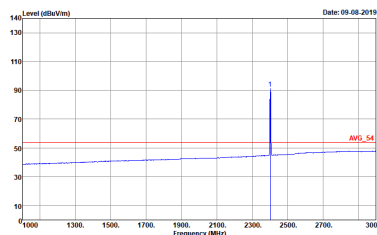
BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Vertical
Peak	Level (dBuV/m) Date: 09-11-2019 Frequency (MHz) Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 6 Plane : Y_StandAlone	Level (dBuV/m) Date: 09-11-2019 Frequency (MHz) Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 6 Plane : Y_StandAlone

<Sample 3>

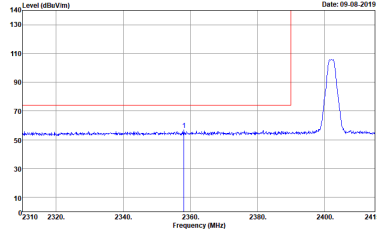
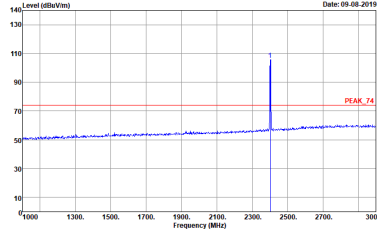
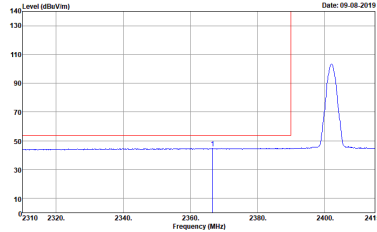
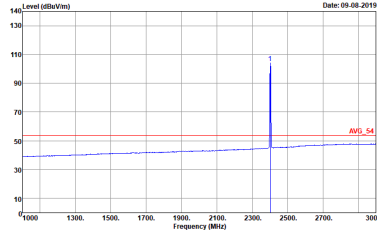
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2.4GHz 2400~2483.5MHz

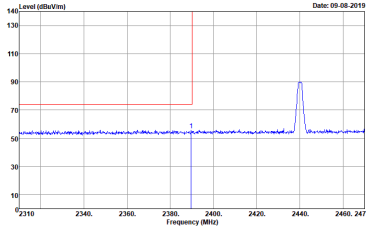
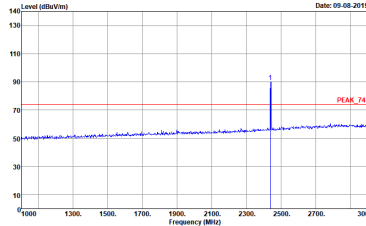
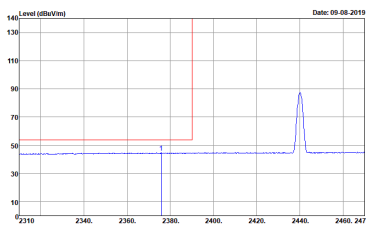
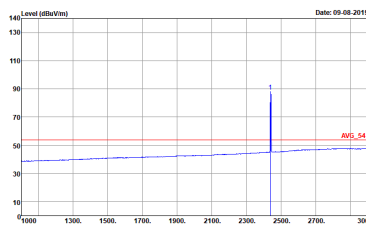
BLE (Band Edge @ 3m)

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH00 2402MHz	
	Horizontal	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 190805001 Mode : 7 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 190805001 Mode : 7 Plane : Y_StandAlone
Avg.	 Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 HORIZONTAL RBW:1000.000KHz VBW:1000KHz SWT:Auto Detector : Peak Project : 190805001 Mode : 7 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : AVG_54 3m HORN 91200-HF_01894 HORIZONTAL RBW:1000.000KHz VBW:1000KHz SWT:Auto Detector : Peak Project : 190805001 Mode : 7 Plane : Y_StandAlone



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH00 2402MHz	
	Vertical	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 7 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 7 Plane : Y_StandAlone
Avg	 Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 7 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : AVG_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 7 Plane : Y_StandAlone

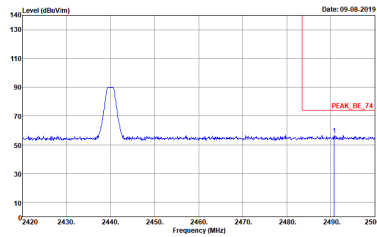
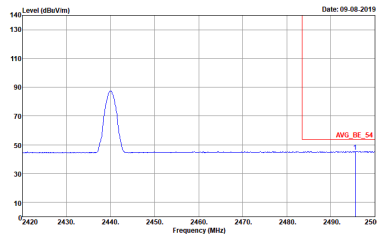


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - L	
	Horizontal	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : B Plane : Y_StandAlone	 Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : B Plane : Y_StandAlone
Avg.	 Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : B Plane : Y_StandAlone	 Site : 03CH02-CA Condition : AVG_54 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : B Plane : Y_StandAlone

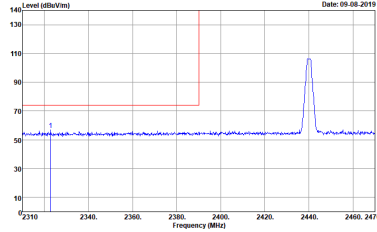
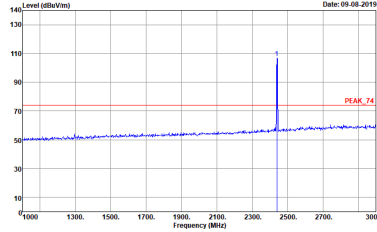
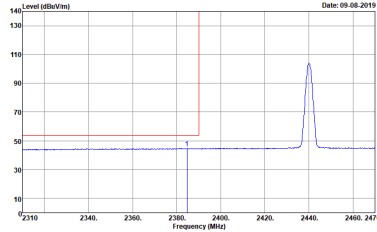
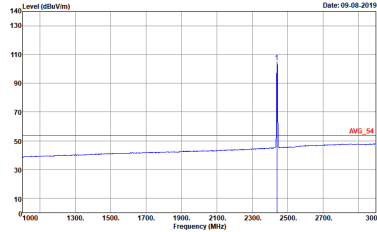


FCC RADIO TEST REPORT

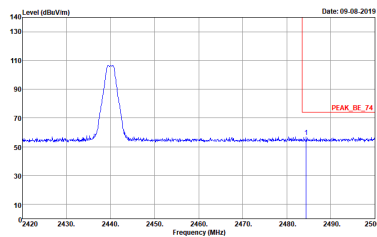
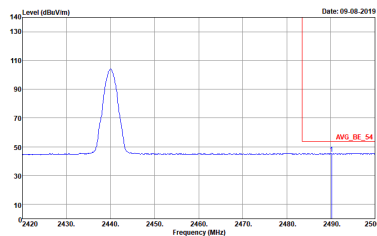
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BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - R	
	Horizontal	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : B Plane : Y_StandAlone	Left blank
Avg.	 Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : B Plane : Y_StandAlone	Left blank

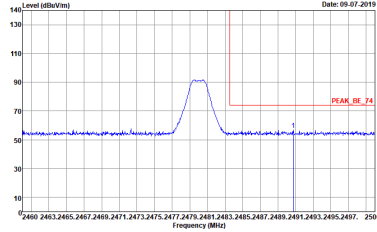
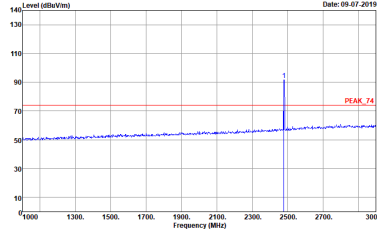
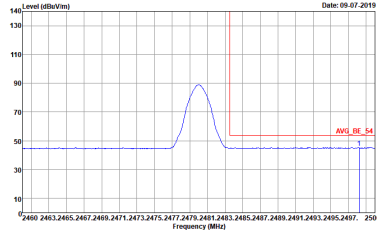
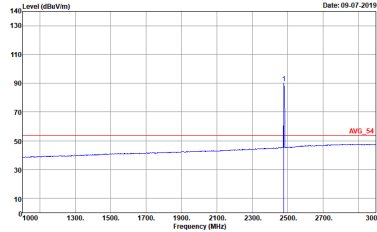


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - L	
	Vertical	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : B Plane : Y_StandAlone	 Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : B Plane : Y_StandAlone
Avg.	 Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : B Plane : Y_StandAlone	 Site : 03CH02-CA Condition : AVG_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : B Plane : Y_StandAlone

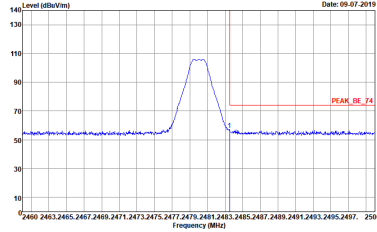
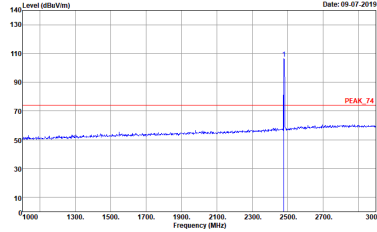
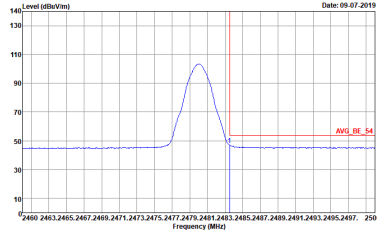
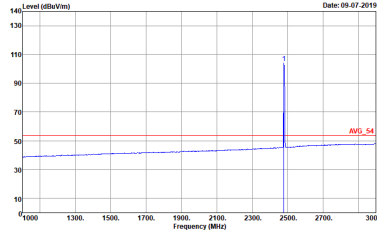


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - R	
	Vertical	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : B Plane : Y_StandAlone	Left blank
Avg.	 Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : B Plane : Y_StandAlone	Left blank



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 9 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 9 Plane : Y_StandAlone
Avg.	 Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 9 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : AVG_54 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 9 Plane : Y_StandAlone



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Vertical	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 9 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 9 Plane : Y_StandAlone
Avg.	 Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 9 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : AVG_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 9 Plane : Y_StandAlone



2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH00 2402MHz	
	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 09-09-2019 PEAK_74 Avg_54 1 Site : 03CH02-CA Condition : PEAK_74 3m HORN 9120D-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 7 Plane : Y_StandAlone	Level (dBuV/m) Date: 09-09-2019 PEAK_74 Avg_54 1 Site : 03CH02-CA Condition : PEAK_74 3m HORN 9120D-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 7 Plane : Y_StandAlone

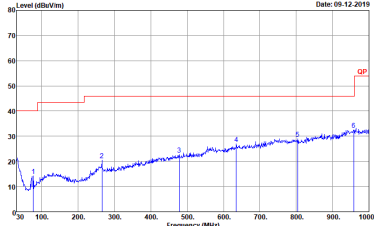
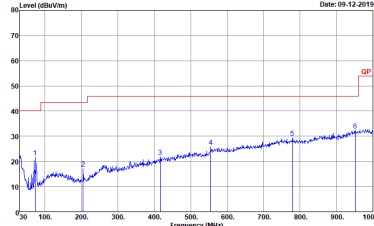


BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH19 2440MHz	
	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 09-09-2019 Frequency (MHz) Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : B Plane : Y_StandAlone	Level (dBuV/m) Date: 09-09-2019 Frequency (MHz) Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : B Plane : Y_StandAlone



BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Vertical
Peak	Level (dBuV/m) Date: 09-09-2019 Frequency (MHz) Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 9 Plane : Y_StandAlone	Level (dBuV/m) Date: 09-09-2019 Frequency (MHz) Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 9 Plane : Y_StandAlone

Emission below 1GHz
2.4GHz BLE (LF)

BLE	2.4GHz 2400~2483.5MHz	
	BLE LF	
	Horizontal	Vertical
QP / Peak	 Site : 03CH02-CA Condition : QP-3m BtLOG 6111D-LF_50392 HORIZONTAL Detector : Peak Project : 190805001 Mode : 17 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : QP-3m BtLOG 6111D-LF_50392 VERTICAL Detector : Peak Project : 190805001 Mode : 17 Plane : Y_StandAlone

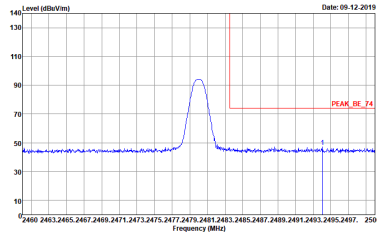
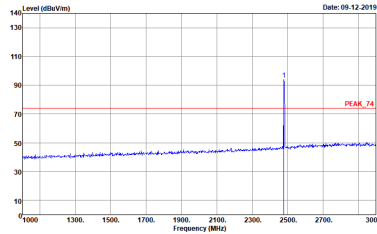


<Sample 4>

<1Mbps>

2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH78 2480MHz	
	Horizontal	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 12 Plane : :Y_StandAlone	 Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 12 Plane : :Y_StandAlone



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH78 2480MHz	
	Vertical	Fundamental
Peak	Level (dBm/Vm) Date: 09-12-2019 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : 190805001 Mode : 12 Plane : Y_StandAlone	Level (dBm/Vm) Date: 09-12-2019 Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : 190805001 Mode : 12 Plane : Y_StandAlone

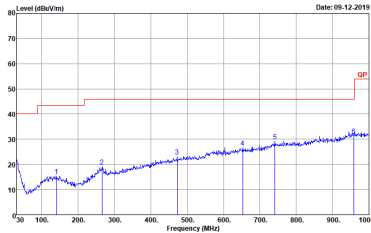
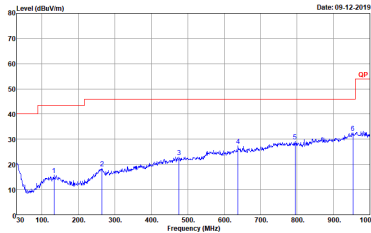


2.4GHz 2400~2483.5MHz

BT (Harmonic @ 3m)

BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BT CH78 2480MHz	
	Horizontal	Vertical
Peak Avg.	Site : 03CH02-CA Condition : PEAK_74 3m HORN 9120D-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 12 Plane : Y_StandAlone	Site : 03CH02-CA Condition : PEAK_74 3m HORN 9120D-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 12 Plane : Y_StandAlone

Emission below 1GHz
2.4GHz BT (LF)

BT	2.4GHz 2400~2483.5MHz	
	BT LF	
	Horizontal	Vertical
QP / Peak	 Site : 03CH02-CA Condition : QP 3m BIL06 6111D-LF_50392 HORIZONTAL Detector : Peak Project : 190805001 Mode : 20 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : QP 3m BIL06 6111D-LF_50392 VERTICAL Detector : Peak Project : 190805001 Mode : 20 Plane : Y_StandAlone

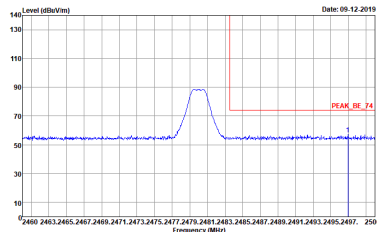
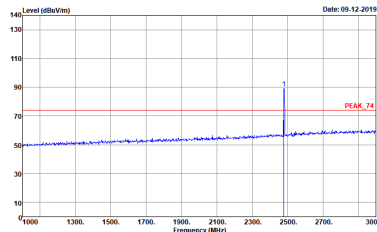


<Sample 4>

<2Mbps>

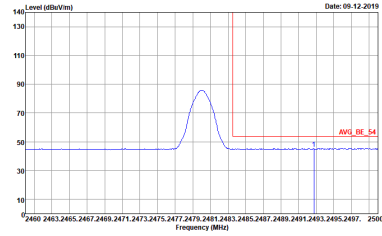
2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

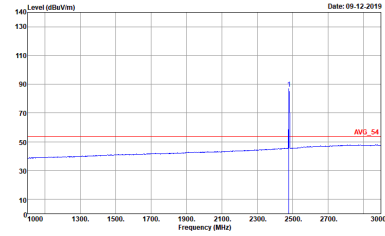
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-1HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 15 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-1HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 15 Plane : Y_StandAlone



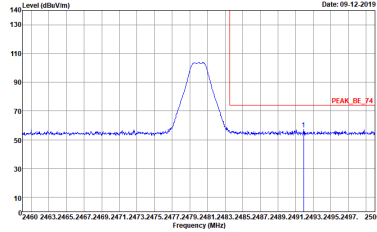
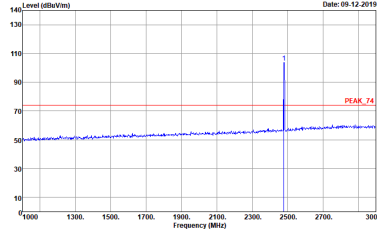
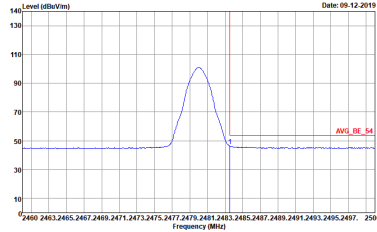
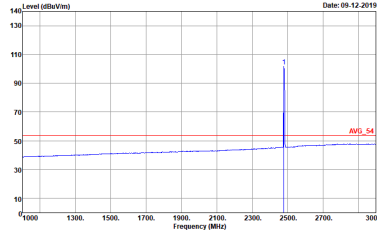
Avg.



Site : 03CH02-CA
Condition : AVG_BE_54 3m HORN 9120D-HF_01894 HORIZONTAL
Detector : Peak
Project : 190805001
Mode : 15
Plane : -Y_StandAlone



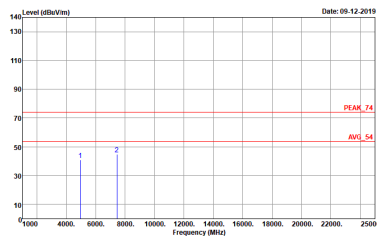
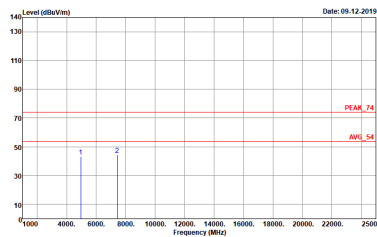
Site : 03CH02-CA
Condition : AVG_54 3m HORN 9120D-HF_01894 HORIZONTAL
Detector : Peak
Project : 190805001
Mode : 15
Plane : -Y_StandAlone

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Vertical	Fundamental
Peak	 Site : 03CH02-CA Condition : PEAK_BE_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 15 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : PEAK_74 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 15 Plane : Y_StandAlone
Avg.	 Site : 03CH02-CA Condition : AVG_BE_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 15 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : AVG_54 3m HORN 91200-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 15 Plane : Y_StandAlone

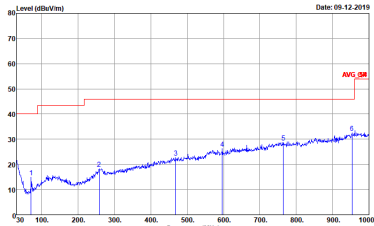
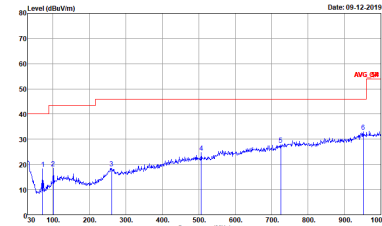


2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Vertical
Peak	 Site : 03CH02-CA Condition : PEAK_74 3m HORN 9120D-HF_01894 HORIZONTAL Detector : Peak Project : 190805001 Mode : 15 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : PEAK_74 3m HORN 9120D-HF_01894 VERTICAL Detector : Peak Project : 190805001 Mode : 15 Plane : Y_StandAlone

Emission below 1GHz
2.4GHz BLE (LF)

BLE	2.4GHz 2400~2483.5MHz	
	BLE LF	
	Horizontal	Vertical
QP / Peak	 Site : 03CH02-CA Condition : QP-3m BIL06 6111D-LF_50392 HORIZONTAL Detector : Peak Project : 190805001 Mode : 23 Plane : Y_StandAlone	 Site : 03CH02-CA Condition : QP-3m BIL06 6111D-LF_50392 VERTICAL Detector : Peak Project : 190805001 Mode : 23 Plane : Y_StandAlone

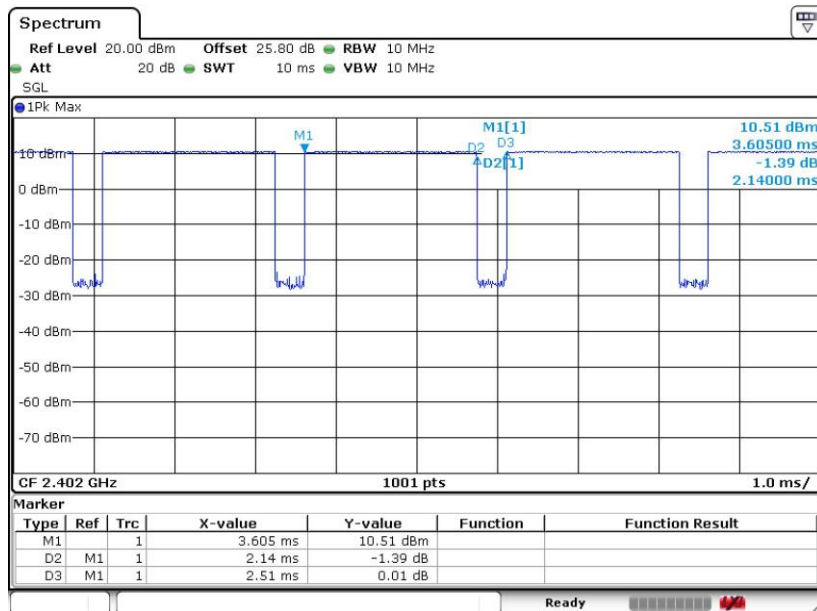


Appendix E. Duty Cycle Plots

Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
Bluetooth –LE for 1Mbps	85.26	2140	0.47	1kHz	0.69
Bluetooth –LE for 2Mbps	57.6	1080	0.93	1kHz	2.40

<1Mbps>

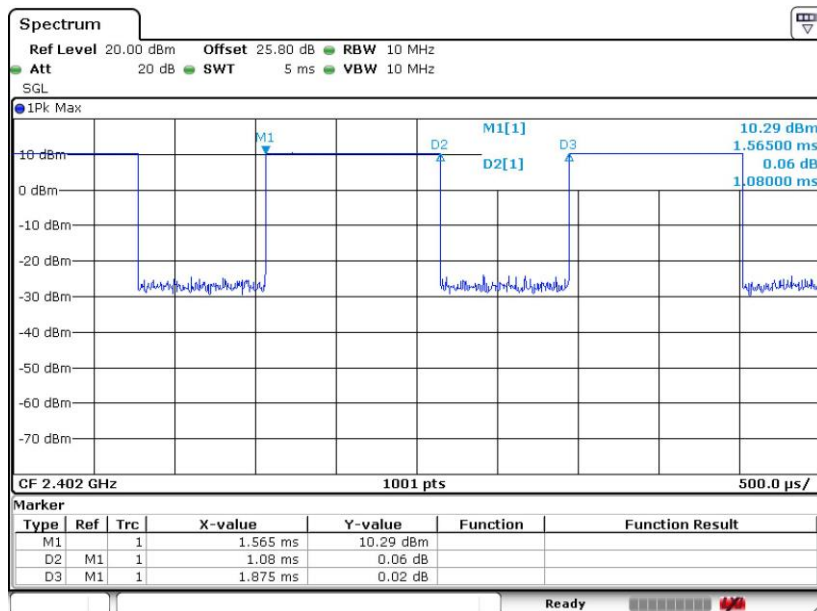
Bluetooth - LE



Date: 16.SEP.2019 13:42:59

<2Mbps>

Bluetooth - LE



Date: 16.SEP.2019 14:10:01