FCC CO-LOCATION RADIO TEST REPORT

FCC ID	**:**	**2AP68-7277**
Equipment	**:**	**Digital Media Receiver**
Model Name	**:**	**SXP16E**
Applicant	**:**	**Temple Energy LLC 13894 S. Bangerter Pkwy, Ste. 200 Draper, UT 84020**
Standard	**:**	**FCC Part 15 Subpart E §15.407**

The testing was completed on Oct. 22, 2018. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Joseph Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FR842409-01F	01	Initial issue of report	Nov. 01, 2018
FR842409-01F	02	Add description of worst case in section 2 on page 7	Nov. 07, 2018

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)
3.1	15.407(b)	Unwanted Emissions	Pass
3.2	15.203 15.407(a)	Antenna Requirement	Pass

Reviewed by: Wii Chang

Report Producer: Yimin Ho

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Digital Media Receiver
Model Name	SXP16E
FCC ID	2AP68-7277
EUT supports Radios application	WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE

1.2 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	2400 MHz ~ 2483.5 MHz 5180 MHz ~ 5240 MHz
Antenna Type / Gain	**<Bluetooth LE>** FPC Inverted-F Antenna type with gain 3.45 dBi **<2400 MHz ~ 2483.5 MHz>** Ant. 1 : PCB printed Inverted-F Antenna type with gain 1.74 dBi Ant. 2 : PCB printed Inverted-F Antenna type with gain 3.45 dBi **<5180 MHz ~ 5240 MHz>** Ant. 1 : PCB printed Inverted-F Antenna type with gain 4.19 dBi Ant. 2 : PCB printed Inverted-F Antenna type with gain 1.40 dBi
Type of Modulation	Bluetooth LE : GFSK 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)

1.3 Modification of EUT

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

1.4 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW0007 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	03CH15-HY

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

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 E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
- 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

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation 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 two configurations, with accessories and without accessories. The worst case (without accessories) was recorded in this report.

2.1 Carrier Frequency and Channel

2400-2483.5 MHz Bluetooth LE (1Mbps)		2400-2483.5 MHz 802.11g		2400-2483.5 MHz 802.11 n HT20	
Channel	**Freq. (MHz)**	**Channel**	**Freq. (MHz)**	**Channel**	**Freq. (MHz)**
39	2480	06	2437	01	2412
-	-	-	-	11	2462

5150-5250 MHz 802.11a		5150-5250 MHz 802.11ac VHT 80	
Channel	**Freq. (MHz)**	**Channel**	**Freq. (MHz)**
48	5240	42	5210

2.2 Test Mode

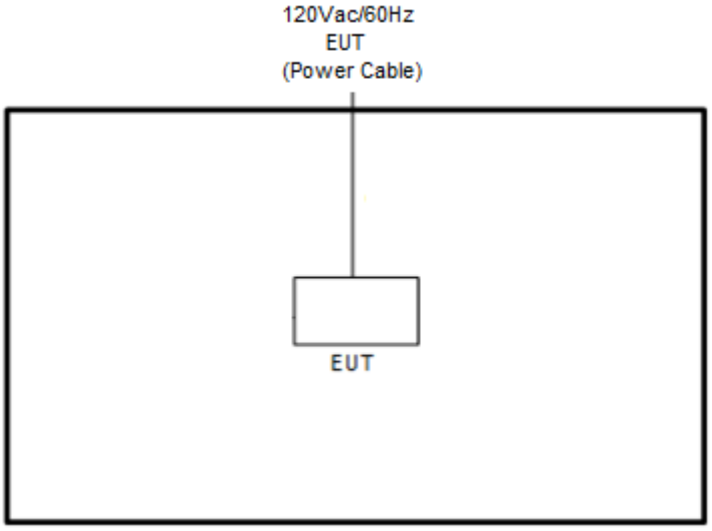
Final test modes are considering the modulation and worse data rates as below table.

<Co-Location>

Modulation	Data Rate
802.11g + Bluetooth LE	**6 Mbps + 2 Mbps**
802.11a + Bluetooth LE	**6 Mbps + 2 Mbps**
802.11n HT20 + Bluetooth LE	**MCS0 + 2 Mbps**
802.11ac VHT80 + Bluetooth LE	**MCS0 + 2 Mbps**

2.3 Connection Diagram of Test System

<Co-location Mode>



2.4 EUT Operation Test Setup

The RF test items, utility “cmd” 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.

3 Test Result

3.1 Unwanted Emissions Measurement

3.1.1 Limit of Unwanted Emissions

(1) Unwanted spurious emissions fallen in restricted bands shall comply with the general field strength limits as below table,

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

Note: The following formula is used to convert the EIRP to field strength.

$$E=\frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts)

EIRP (dBm)	Field Strength at 3m (dBμV/m)
- 27	68.3

(2) KDB789033 D02 v02r01 G)2)c)

(i) Section 15.407(b)(1) to (b)(3) specify the unwanted emission limits for the U-NII-1 and U-NII-2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz.[3]

(ii) Section 15.407(b)(4) specifies the unwanted emission limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). The emission limits are in terms of a Peak detector. An alternative to the band emissions mask is specified in Section 15.407(b)(4)(ii). The alternative limits are based on the highest antenna gain specified in the filing. There are also marketing and importation restrictions for the devices using the alternative limit.[4]

Note 3: An out-of-band emission that complies with both the average and peak limits of Section 15.209 is not required to satisfy the -27 dBm/MHz peak emission limit.

Note 4: Only devices with antenna gains of 10 dBi or less may be approved using the emission limits specified in Section 15.247(d) till March 2, 2018; all other devices operating in this band must use the mask specified in Section 15.407(b)(4)(i).

3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.

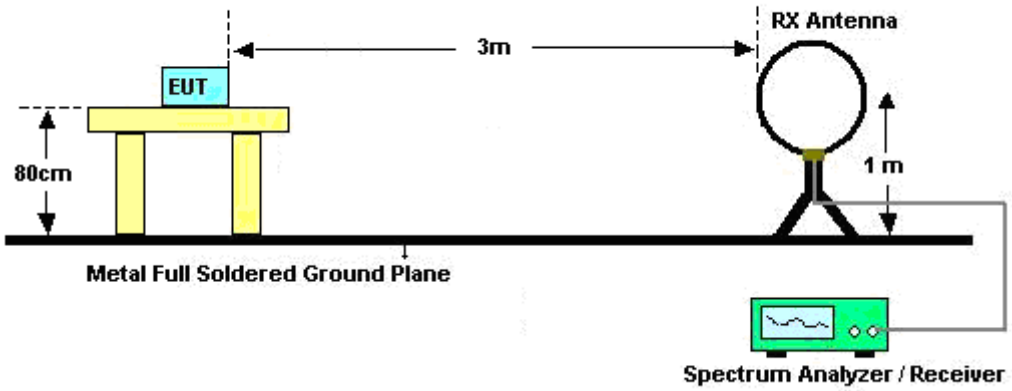
   (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

   (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

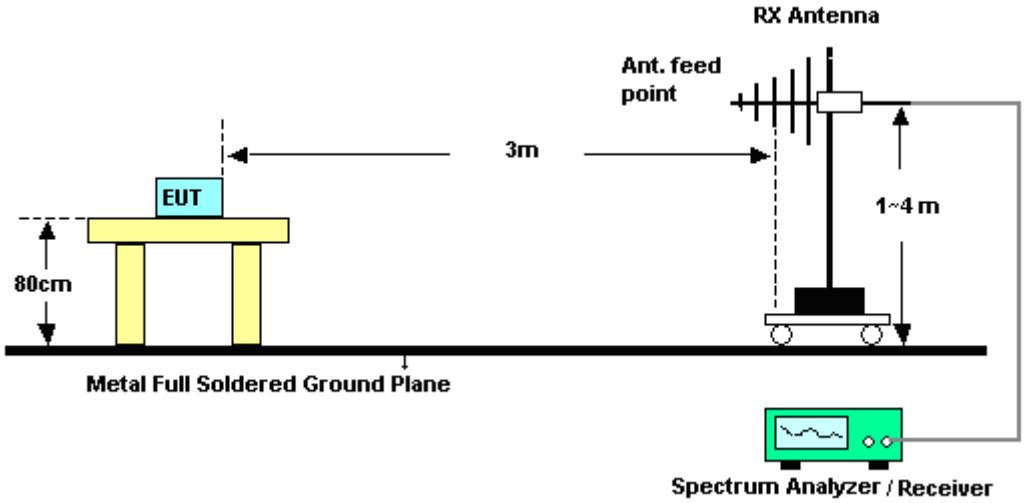
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz
   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
2. 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.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
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.

3.1.4 Test Setup

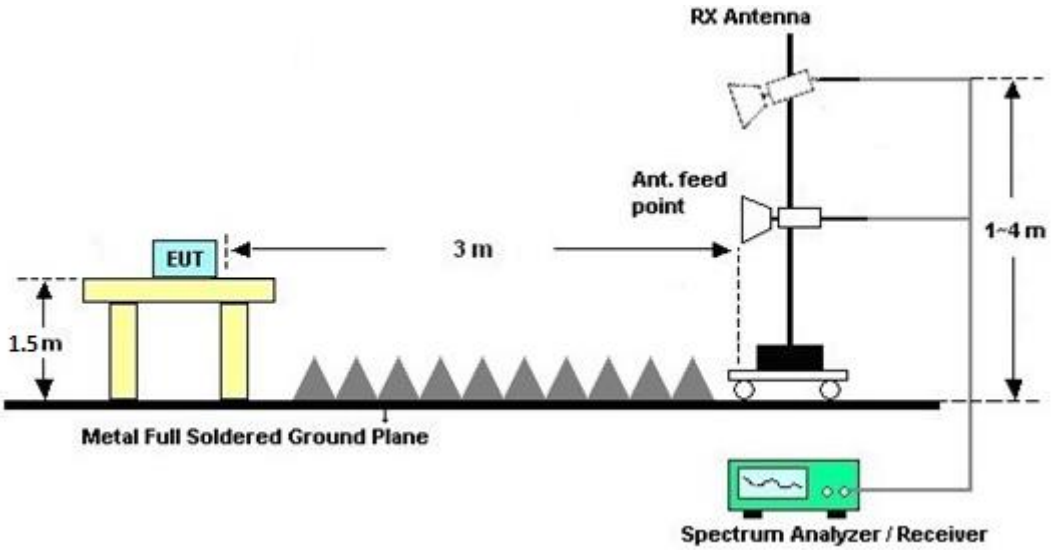
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.1.5 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.

3.1.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A and B.

3.1.7 Duty Cycle

Please refer to Appendix C.

3.1.8 Test Result of Radiated Spurious Emissions (30MHz ~ 10th Harmonic)

Please refer to Appendix A and B.

3.2 Antenna Requirements

3.2.1 Standard Applicable

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.2.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.2.3 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
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 23, 2017	Oct. 11, 2018 ~ Oct. 22, 2018	Nov. 22, 2018	Radiation (03CH15-HY)
Preamplifier	Jet-Power	JPA0118-55-303	171000180000550006	1GHz~18GHz	Jul. 10, 2018	Oct. 11, 2018 ~ Oct. 22, 2018	Jul. 09, 2019	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 26, 2017	Oct. 11, 2018 ~ Oct. 22, 2018	Dec. 25, 2018	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL6111D&00800N1D01N-06	41912&05	30MHz to 1GHz	Jan. 10, 2018	Oct. 11, 2018 ~ Oct. 22, 2018	Jan. 09, 2019	Radiation (03CH15-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY54130085	20Hz ~ 8.4GHz	Oct. 31, 2017	Oct. 11, 2018 ~ Oct. 22, 2018	Oct. 30, 2018	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1212	1GHz ~ 18GHz	May 10, 2018	Oct. 11, 2018 ~ Oct. 22, 2018	May 09, 2019	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1522	1G~18GHz	Sep. 07, 2018	Oct. 11, 2018 ~ Oct. 22, 2018	Sep. 06, 2019	Radiation (03CH15-HY)
Preamplifier	Keysight	83017A	MY53270195	1GHz~26.5GHz	Aug. 23, 2018	Oct. 11, 2018 ~ Oct. 22, 2018	Aug. 22, 2019	Radiation (03CH15-HY)
Spectrum Analyzer	Agilent	E4446A	MY50180136	3Hz~44GHz	Apr. 25, 2018	Oct. 11, 2018 ~ Oct. 22, 2018	Apr. 24, 2019	Radiation (03CH15-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Oct. 11, 2018 ~ Oct. 22, 2018	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Oct. 11, 2018 ~ Oct. 22, 2018	N/A	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 27, 2017	Oct. 11, 2018 ~ Oct. 22, 2018	Nov. 26, 2018	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24	RK-000451	N/A	N/A	Oct. 11, 2018 ~ Oct. 22, 2018	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER / MTJ Cooperation	SUCOFLEX 104 / 000000-MT18A-100	MY36980/4, MY9838/4PE, D3210	30MHz~1GHz	Mar. 15, 2018	Oct. 11, 2018 ~ Oct. 22, 2018	Mar. 14, 2019	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER / MTJ Cooperation	SUCOFLEX 104 / 000000-MT18A-100	MY36980/4, MY9838/4PE, D3210	1GHz~18GHz	Mar. 15, 2018	Oct. 11, 2018 ~ Oct. 22, 2018	Mar. 14, 2019	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30M~40GHz	Mar. 14, 2018	Oct. 11, 2018 ~ Oct. 22, 2018	Mar. 13, 2019	Radiation (03CH15-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.20**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.50**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.20**

Appendix A. Radiated Spurious Emission

Test Engineer :	Watt Tseng, Karl Hou and Big-show Wang	Temperature :	22~25°C
		Relative Humidity :	51~58%

Co-location Mode

2.4GHz 2400~2483.5MHz (Band edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11n_HT20 _Tx_Ch11 2462MHz(Ant1)	*	2462	-	-	74	97.08	27.31	5.96	30.83	305	290	P	H
	*	2462	-	-	54	89.53	27.31	5.96	30.83	305	290	A	H
		2483.64	66.3	-7.7	74	53.85	27.36	5.99	30.82	305	290	P	H
		2483.52	51.56	-2.44	54	39.11	27.36	5.99	30.82	305	290	A	H
	*	2462	-	-	74	96.73	27.31	5.96	30.83	150	218	P	V
	*	2462	-	-	54	89.41	27.31	5.96	30.83	150	218	A	V
		2485.16	64.94	-9.06	74	52.49	27.36	5.99	30.82	150	218	P	V
		2483.52	52.06	-1.94	54	39.61	27.36	5.99	30.82	150	218	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz (Band edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11n_HT20 _Tx_Ch01 2412MHz(Ant2)		2390	64.7	-9.3	74	52.63	27.14	5.86	30.85	282	44	P	H
		2390	50.56	-3.44	54	38.49	27.14	5.86	30.85	282	44	A	H
	*	2412	108.48	-	-	96.33	27.19	5.89	30.85	282	44	P	H
	*	2412	100.94	-	-	88.79	27.19	5.89	30.85	282	44	A	H
		2390	61.89	-12.11	74	49.82	27.14	5.86	30.85	343	311	P	V
		2390	48.36	-5.64	54	36.29	27.14	5.86	30.85	343	311	A	V
	*	2412	105.93	-	-	93.78	27.19	5.89	30.85	343	311	P	V
	*	2412	98.21	-	-	86.06	27.19	5.89	30.85	343	311	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz (Band edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11g_Tx_Ch06 2437MHz (Ant1+2)	*	2480	93.25	-	-	80.82	27.35	5.98	30.82	100	236	P	H
	*	2480	91.41	-	-	78.98	27.35	5.98	30.82	100	236	A	H
		2488.24	54.7	-19.3	74	42.24	27.37	5.99	30.82	100	236	P	H
		2483.56	45.73	-8.27	54	33.28	27.36	5.99	30.82	100	236	A	H
	*	2480	99.13	-	-	86.7	27.35	5.98	30.82	292	35	P	V
	*	2480	97.35	-	-	84.92	27.35	5.98	30.82	292	35	A	V
		2484.72	57.02	-16.98	74	44.57	27.36	5.99	30.82	292	35	P	V
		2483.52	48.19	-5.81	54	35.74	27.36	5.99	30.82	292	35	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (Band edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11ac_VHT80 _Tx_Ch42 5210MHz(Ant1)		5136.24	59.1	-14.9	74	49.02	31.55	8.63	30.1	280	288	P	H
		5149.5	51.15	-2.85	54	41.06	31.56	8.63	30.1	280	288	A	H
	*	5210	98.96	-	-	88.81	31.58	8.68	30.11	280	288	P	H
	*	5210	91.75	-	-	81.6	31.58	8.68	30.11	280	288	A	H
		5359.48	49.72	-24.28	74	39.18	31.64	9.02	30.12	280	288	P	H
		5350.52	43.49	-10.51	54	32.97	31.64	9	30.12	280	288	A	H
		5140.14	55.15	-18.85	74	45.06	31.56	8.63	30.1	369	29	P	V
		5148.72	47.17	-6.83	54	37.08	31.56	8.63	30.1	369	29	A	V
	*	5210	95.89	-	-	85.74	31.58	8.68	30.11	369	29	P	V
	*	5210	88.55	-	-	78.4	31.58	8.68	30.11	369	29	A	V
		5419.68	50.34	-23.66	74	39.69	31.67	9.11	30.13	369	29	P	V
		5440.96	42.97	-11.03	54	32.3	31.68	9.12	30.13	369	29	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (Band edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11a_Tx_Ch48 5240MHz(Ant2)	*	2480	92.97	-	-	90.46	27.35	5.98	30.82	100	233	P	H
	*	2480	91.25	-	-	88.74	27.35	5.98	30.82	100	233	A	H
		2483.88	48.09	-25.91	74	45.56	27.36	5.99	30.82	100	233	P	H
		2483.52	40.16	-13.84	54	37.63	27.36	5.99	30.82	100	233	A	H
	*	2480	98.74	-	-	96.23	27.35	5.98	30.82	301	36	P	V
	*	2480	97.01	-	-	94.5	27.35	5.98	30.82	301	36	A	V
		2483.56	51.39	-22.61	74	48.86	27.36	5.99	30.82	301	36	P	V
		2483.52	45.26	-8.74	54	42.73	27.36	5.99	30.82	301	36	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (Band edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11ac_VHT80 _Tx_Ch42 5210MHz (Ant1+2)		5147.68	58.63	-15.37	74	48.54	31.56	8.63	30.1	278	280	P	H
		5147.94	51.59	-2.41	54	41.5	31.56	8.63	30.1	278	280	A	H
	*	5210	100.9	-	-	90.75	31.58	8.68	30.11	278	280	P	H
	*	5210	93.88	-	-	83.73	31.58	8.68	30.11	278	280	A	H
		5416.6	51.49	-22.51	74	40.84	31.67	9.11	30.13	278	280	P	H
		5379.08	43.53	-10.47	54	32.95	31.65	9.06	30.13	278	280	A	H
		5136.24	55.39	-18.61	74	45.31	31.55	8.63	30.1	100	306	P	V
		5148.72	48.37	-5.63	54	38.28	31.56	8.63	30.1	100	306	A	V
	*	5210	97.27	-	-	87.12	31.58	8.68	30.11	100	306	P	V
	*	5210	90.88	-	-	80.73	31.58	8.68	30.11	100	306	A	V
		5412.12	50.07	-23.93	74	39.43	31.66	9.11	30.13	100	306	P	V
		5372.92	42.94	-11.06	54	32.36	31.65	9.05	30.12	100	306	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11n_HT20 _Tx_Ch11 2462MHz(Ant1)		4924	47.97	-26.03	74	65.95	31.36	8.34	58.14	100	0	P	H
		7386	57.4	-16.6	74	68.14	36.3	10.84	58.32	100	293	P	H
		7386	43.03	-10.97	54	53.77	36.3	10.84	58.32	100	293	A	H
		4924	45.92	-28.08	74	63.9	31.36	8.34	58.14	100	0	P	V
		7386	49.3	-24.7	74	60.04	36.3	10.84	58.32	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11n_HT20 _Tx_Ch01 2412MHz(Ant2)		4824	43.05	-30.95	74	61.43	31.18	8.04	58.06	100	0	P	H
		4824	38.72	-35.28	74	57.1	31.18	8.04	58.06	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11g_Tx_Ch06 2437MHz (Ant1+2)		4874	53.92	-20.08	74	72.1	31.27	8.19	58.1	100	277	P	H
		4874	44.22	-9.78	54	62.4	31.27	8.19	58.1	100	277	A	H
		7311	64.39	-9.61	74	75.35	36.11	10.78	58.34	100	294	P	H
		7311	52.13	-1.87	54	63.09	36.11	10.78	58.34	100	294	A	H
		4874	49.32	-24.68	74	67.5	31.27	8.19	58.1	100	0	P	V
		7311	58.79	-15.21	74	69.75	36.11	10.78	58.34	100	135	P	V
		7311	46.37	-7.63	54	57.33	36.11	10.78	58.34	100	135	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11ac_VHT80 _Tx_Ch42 5210MHz(Ant1)		4960	46.08	-27.92	74	35.01	32.72	8.44	30.09	100	0	P	H
		7440	43.5	-30.5	74	52.81	37.42	10.88	58.31	100	0	P	H
		10420	46.52	-21.68	68.2	54.63	39.99	12.88	61.46	100	0	P	H
		15630	47.1	-26.9	74	54.67	37.9	16.17	62.29	100	0	P	H
		4960	47.15	-26.85	74	36.08	32.72	8.44	30.09	100	0	P	V
		7440	43.44	-30.56	74	52.75	37.42	10.88	58.31	100	0	P	V
		10420	45.59	-22.61	68.2	53.7	39.99	12.88	61.46	100	0	P	V
		15630	45.79	-28.21	74	53.36	37.9	16.17	62.29	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11a_Tx_Ch48 5240MHz(Ant2)		4960	47.19	-26.81	74	36.12	32.72	8.44	30.09	100	0	P	H
		7440	44.61	-29.39	74	53.92	37.42	10.88	58.31	100	0	P	H
		10480	56.21	-11.99	68.2	64.3	40.07	12.89	61.56	100	0	P	H
		15720	63.85	-10.15	74	71.15	37.9	16.27	62.15	221	305	P	H
		15720	53.25	-0.75	54	60.55	37.9	16.27	62.15	221	305	A	H
		4960	47.49	-26.51	74	36.42	32.72	8.44	30.09	100	0	P	V
		7440	43.94	-30.06	74	53.25	37.42	10.88	58.31	100	0	P	V
		10480	54.44	-13.76	68.2	62.53	40.07	12.89	61.56	100	0	P	V
		15720	59.38	-14.62	74	66.68	37.9	16.27	62.15	198	59	P	V
		15720	48.53	-5.47	54	55.83	37.9	16.27	62.15	198	59	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11ac_VHT80 _Tx_Ch42 5210MHz (Ant1+2)		4960	47.58	-26.42	74	36.51	32.72	8.44	30.09	100	0	P	H
		7440	43.59	-30.41	74	52.9	37.42	10.88	58.31	100	0	P	H
		10420	45.56	-22.64	68.2	53.67	39.99	12.88	61.46	100	0	P	H
		15630	45.8	-28.2	74	53.37	37.9	16.17	62.29	100	0	P	H
		4960	47.34	-26.66	74	36.27	32.72	8.44	30.09	100	0	P	V
		7440	43.86	-30.14	74	53.17	37.42	10.88	58.31	100	0	P	V
		10420	45.73	-22.47	68.2	53.84	39.99	12.88	61.46	100	0	P	V
		15630	46.04	-27.96	74	53.61	37.9	16.17	62.29	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 2400~2483.5MHz (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11n_HT20 _Tx_Ch11 2462MHz(Ant1)		87.24	24.07	-15.93	40	40.97	14.44	1.14	32.58	-	-	P	H
		167.97	31.17	-12.33	43.5	46.07	15.91	1.55	32.55	-	-	P	H
		250.05	31.52	-14.48	46	43.1	18.91	1.89	32.53	-	-	P	H
		349.7	33.37	-12.63	46	42.89	20.72	2.21	32.53	-	-	P	H
		549.9	34.73	-11.27	46	38.7	25.64	2.76	32.56	-	-	P	H
		724.9	35.81	-10.19	46	37.24	27.71	3.16	32.42	100	0	P	H
		31.08	27.15	-12.85	40	35.26	23.86	0.68	32.65	100	0	P	V
		167.97	25.63	-17.87	43.5	40.53	15.91	1.55	32.55	-	-	P	V
		250.05	28.57	-17.43	46	40.15	18.91	1.89	32.53	-	-	P	V
		449.8	28.95	-17.05	46	35.64	23.26	2.5	32.54	-	-	P	V
		650	29.34	-16.66	46	32.18	26.55	2.98	32.53	-	-	P	V
		967.1	33.2	-20.8	54	29.44	30.95	3.67	31.13	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Emission below 1GHz

2.4GHz 2400~2483.5MHz (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11n_HT20 _Tx_Ch01 2412MHz(Ant2)		86.97	23.81	-16.19	40	40.75	14.4	1.14	32.58	-	-	P	H
		167.97	26.66	-16.84	43.5	41.56	15.91	1.55	32.55	-	-	P	H
		250.05	31.27	-14.73	46	42.85	18.91	1.89	32.53	-	-	P	H
		349.7	33.6	-12.4	46	43.12	20.72	2.21	32.53	-	-	P	H
		749.4	36.28	-9.72	46	37.2	28.12	3.19	32.36	100	0	P	H
		872.6	36.05	-9.95	46	35.07	29.13	3.48	31.84	-	-	P	H
		32.16	27.25	-12.75	40	35.84	23.37	0.69	32.65	100	0	P	V
		167.97	26.27	-17.23	43.5	41.17	15.91	1.55	32.55	-	-	P	V
		250.05	28.94	-17.06	46	40.52	18.91	1.89	32.53	-	-	P	V
		349.7	28.79	-17.21	46	38.31	20.72	2.21	32.53	-	-	P	V
		650	30.27	-15.73	46	33.11	26.55	2.98	32.53	-	-	P	V
		848.1	33.13	-12.87	46	32.2	29.27	3.45	31.97	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Emission below 1GHz

2.4GHz 2400~2483.5MHz (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11g_Tx_Ch06 2437MHz (Ant1+2)		85.35	22.6	-17.4	40	39.76	14.19	1.13	32.58	-	-	P	H
		167.97	31.25	-12.25	43.5	46.15	15.91	1.55	32.55	-	-	P	H
		250.05	30.71	-15.29	46	42.29	18.91	1.89	32.53	-	-	P	H
		300	33.46	-12.54	46	44.37	19.4	2.07	32.53	-	-	P	H
		549.9	35.05	-10.95	46	39.02	25.64	2.76	32.56	-	-	P	H
		724.9	36.4	-9.6	46	37.83	27.71	3.16	32.42	100	0	P	H
		872.6	36.2	-9.8	46	35.22	29.13	3.48	31.84	-	-	P	H
		32.16	28.61	-11.39	40	37.2	23.37	0.69	32.65	100	0	P	V
		167.97	25.67	-17.83	43.5	40.57	15.91	1.55	32.55	-	-	P	V
		250.05	28.54	-17.46	46	40.12	18.91	1.89	32.53	-	-	P	V
		393.1	28.74	-17.26	46	36.65	22.15	2.39	32.53	-	-	P	V
		700.4	30.31	-15.69	46	32.69	26.86	3.13	32.49	-	-	P	V
		969.2	33.32	-20.68	54	29.59	30.89	3.68	31.11	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Emission below 1GHz

2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11ac_VHT80 _Tx_Ch42 5210MHz(Ant1)		85.08	23.46	-16.54	40	40.66	14.15	1.13	32.58	-	-	P	H
		215.49	25.64	-17.86	43.5	40.28	16.01	1.76	32.54	-	-	P	H
		300	32.57	-13.43	46	43.48	19.4	2.07	32.53	-	-	P	H
		300	32.93	-13.07	46	43.84	19.4	2.07	32.53	-	-	P	H
		724.9	36.22	-9.78	46	37.65	27.71	3.16	32.42	-	-	P	H
		872.6	36.59	-9.41	46	35.61	29.13	3.48	31.84	100	0	P	H
		35.13	26.53	-13.47	40	36.41	22.03	0.72	32.64	-	-	P	V
		215.76	24.44	-19.06	43.5	39.06	16.03	1.76	32.54	-	-	P	V
		250.05	29.95	-16.05	46	41.53	18.91	1.89	32.53	-	-	P	V
		250.05	29.95	-16.05	46	41.53	18.91	1.89	32.53	-	-	P	V
		449.8	28.71	-17.29	46	35.4	23.26	2.5	32.54	-	-	P	V
		736.8	33.83	-12.17	46	34.97	27.96	3.17	32.39	100	0	P	V
		958.7	33.09	-12.91	46	29.22	31.15	3.66	31.2	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Emission below 1GHz

2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11a_Tx_Ch48 5240MHz(Ant2)		30.81	22.93	-17.07	40	30.92	23.98	0.68	32.65	-	-	P	H
		89.13	20.91	-22.59	43.5	37.55	14.69	1.15	32.58	-	-	P	H
		194.7	29.5	-14	43.5	45.24	14.93	1.68	32.54	-	-	P	H
		250.05	31.21	-14.79	46	42.79	18.91	1.89	32.53	-	-	P	H
		549.9	33.44	-12.56	46	37.41	25.64	2.76	32.56	-	-	P	H
		724.9	36.04	-9.96	46	37.47	27.71	3.16	32.42	-	-	P	H
		872.6	36.36	-9.64	46	35.38	29.13	3.48	31.84	100	0	P	H
		31.89	28.65	-11.35	40	37.12	23.49	0.69	32.65	-	-	P	V
		167.97	28.08	-15.42	43.5	42.98	15.91	1.55	32.55	-	-	P	V
		250.05	29.07	-16.93	46	40.65	18.91	1.89	32.53	-	-	P	V
		509.3	30.75	-15.25	46	36.35	24.17	2.66	32.55	-	-	P	V
		750.1	31.23	-14.77	46	32.14	28.13	3.19	32.36	-	-	P	V
		892.9	34.98	-11.02	46	33.7	29.3	3.51	31.74	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Emission below 1GHz

2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE(2M) CH39 2480MHz + 11ac_VHT80 _Tx_Ch42 5210MHz (Ant1+2)		86.43	22.97	-17.03	40	39.98	14.33	1.14	32.58	-	-	P	H
		159.06	27.12	-16.38	43.5	41.35	16.65	1.51	32.55	-	-	P	H
		250.05	31.11	-14.89	46	42.69	18.91	1.89	32.53	-	-	P	H
		549.9	32.86	-13.14	46	36.83	25.64	2.76	32.56	-	-	P	H
		724.9	36.7	-9.3	46	38.13	27.71	3.16	32.42	100	0	P	H
		872.6	35.82	-10.18	46	34.84	29.13	3.48	31.84	-	-	P	H
		30	27.7	-12.3	40	35.34	24.34	0.67	32.65	-	-	P	V
		167.97	30.06	-13.44	43.5	44.96	15.91	1.55	32.55	-	-	P	V
		250.05	28.56	-17.44	46	40.14	18.91	1.89	32.53	-	-	P	V
		396.6	28.7	-17.3	46	36.42	22.32	2.41	32.53	-	-	P	V
		724.9	30.59	-15.41	46	32.02	27.71	3.16	32.42	-	-	P	V
		892.9	34.42	-11.58	46	33.14	29.3	3.51	31.74	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
-	The signal is **Unintentional Radiators**.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

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

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

1. 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)

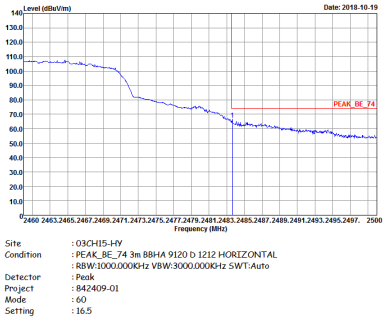
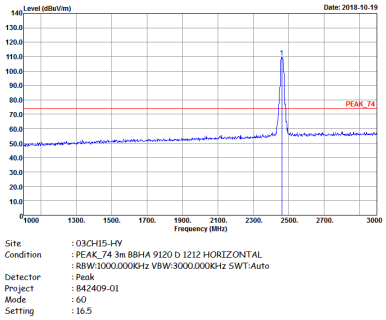
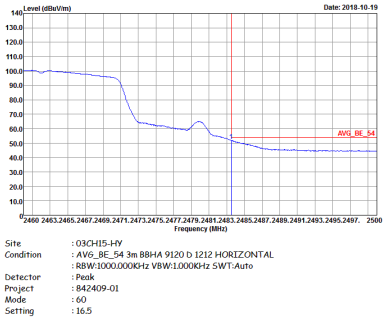
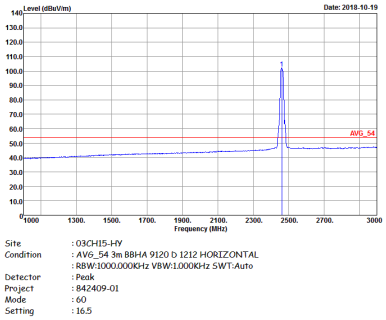
Both peak and average measured complies with the limit line, so test result is "PASS".

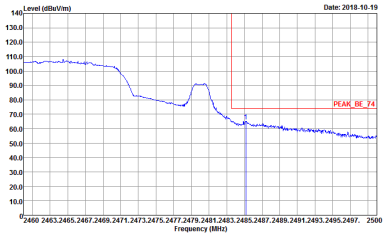
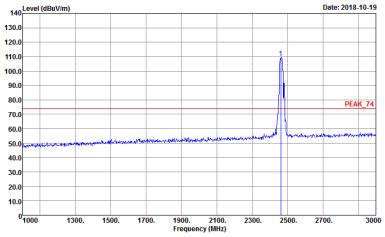
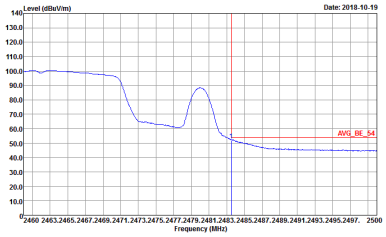
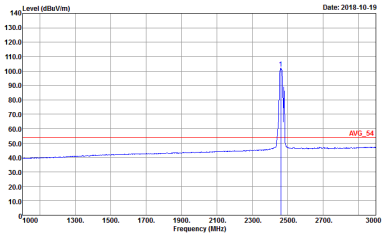
Appendix B. Radiated Spurious Emission Plots

Test Engineer :	Watt Tseng, Karl Hou and Big-show Wang	Temperature :	22~25°C
		Relative Humidity :	51~58%

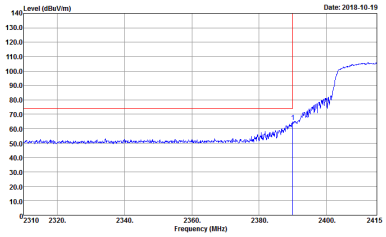
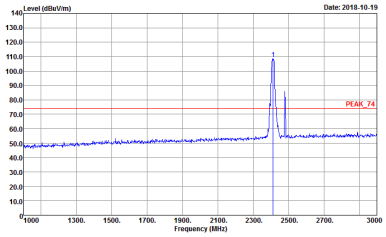
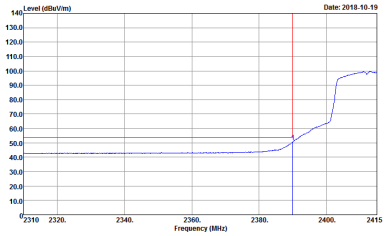
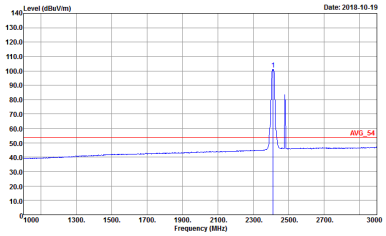
Co-location Mode

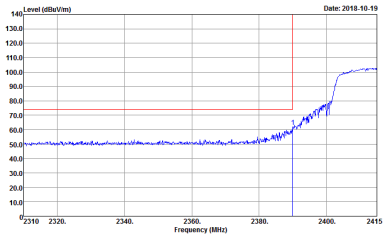
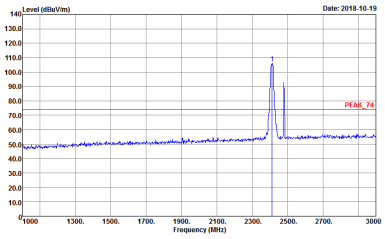
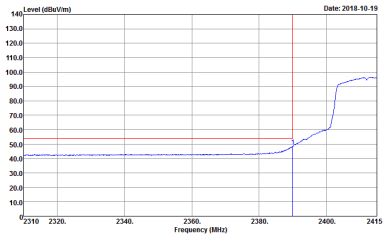
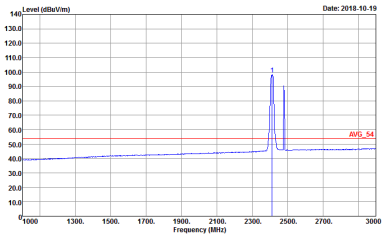
2.4GHz 2400~2483.5MHz (Band Edge @ 3m)

ANT	BLE(2M) CH39 2480MHz + 11n_HT20_Tx_Ch11 2462MHz(Ant1)	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		

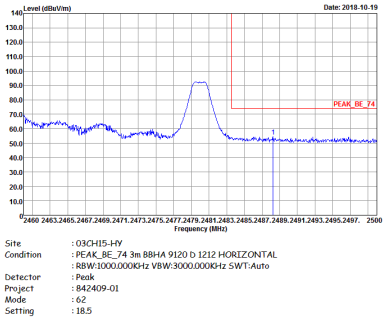
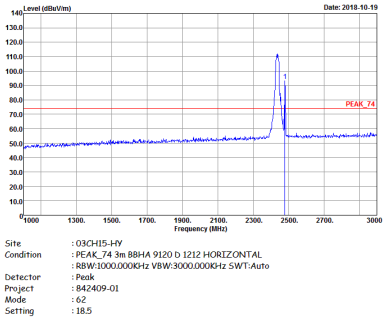
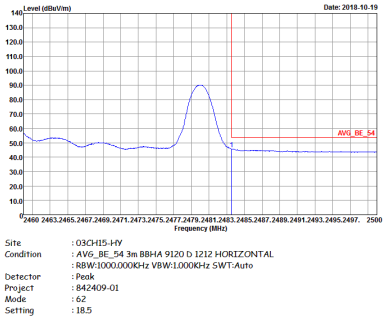
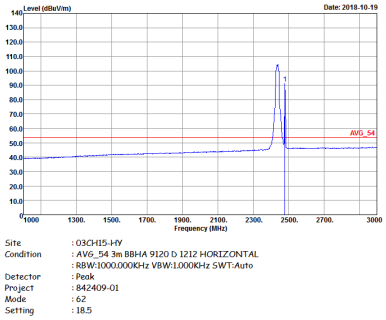
ANT	BLE(2M) CH39 2480MHz + 11n_HT20_Tx_Ch11 2462MHz(Ant1)	
Simultaneously	**Vertical**	**Fundamental**
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 60 Setting : 16.5	 Site : 03CH15-HY Condition : PEAK_74 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 60 Setting : 16.5
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 60 Setting : 16.5	 Site : 03CH15-HY Condition : AVG_54 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 60 Setting : 16.5

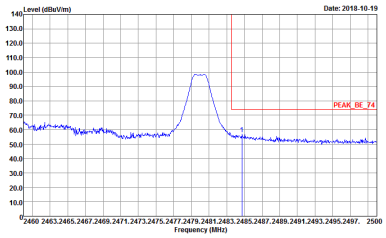
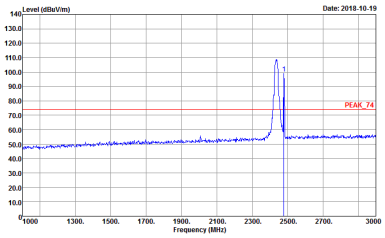
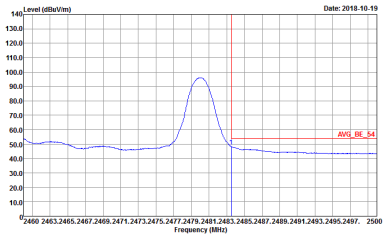
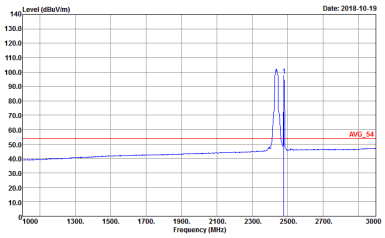
2.4GHz 2400~2483.5MHz (Band Edge @ 3m)

ANT	BLE(2M) CH39 2480MHz + 11n_HT20_Tx_Ch01 2412MHz(Ant2)	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		

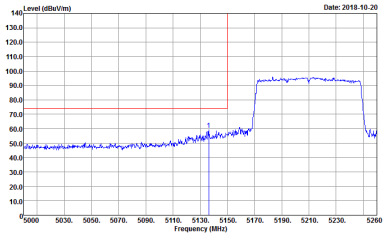
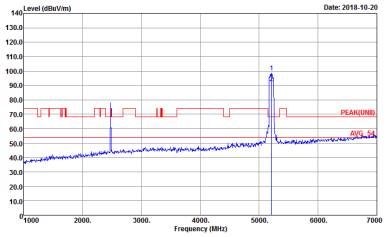
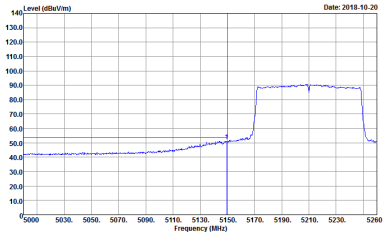
ANT	BLE(2M) CH39 2480MHz + 11n_HT20_Tx_Ch01 2412MHz(Ant2)	
Simultaneously	**Vertical**	**Fundamental**
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 61 Setting : 16	 Site : 03CH15-HY Condition : PEAK_74 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 61 Setting : 16
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 61 Setting : 16	 Site : 03CH15-HY Condition : AVG_54 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 61 Setting : 16

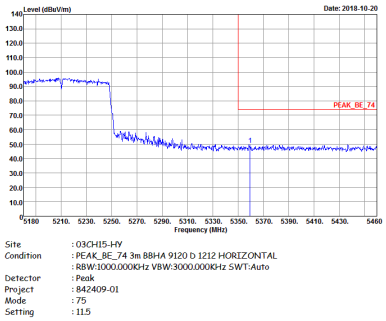
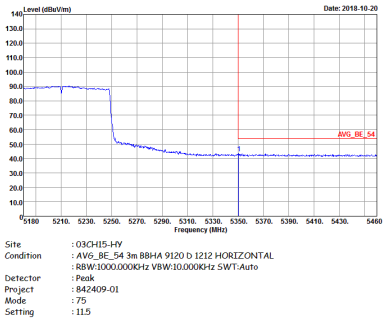
2.4GHz 2400~2483.5MHz (Band Edge @ 3m)

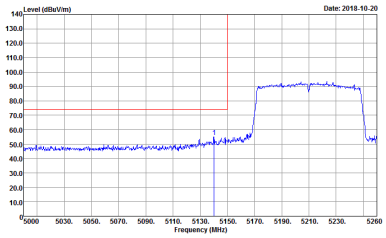
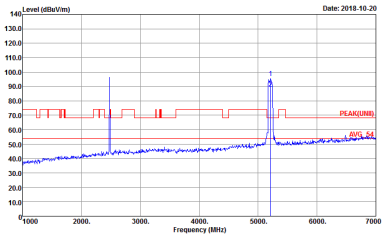
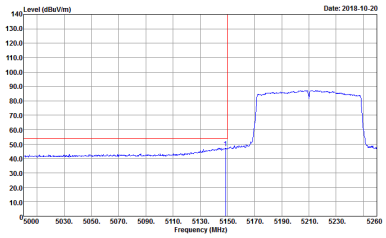
ANT	BLE(2M) CH39 2480MHz + 11g_Tx_Ch06 2437MHz(Ant1+2)	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		

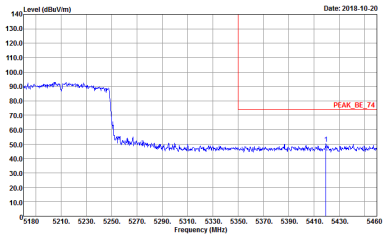
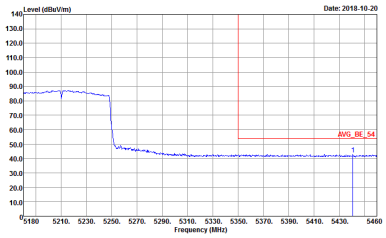
ANT	BLE(2M) CH39 2480MHz + 11g_Tx_Ch06 2437MHz(Ant1+2)	
Simultaneously	**Vertical**	**Fundamental**
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 62 Setting : 18.5	 Site : 03CH15-HY Condition : PEAK_74 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 62 Setting : 18.5
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 62 Setting : 18.5	 Site : 03CH15-HY Condition : AVG_54 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 62 Setting : 18.5

2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (Band Edge @ 3m)

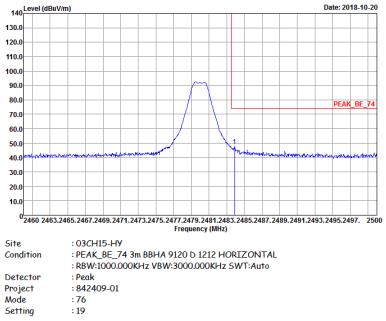
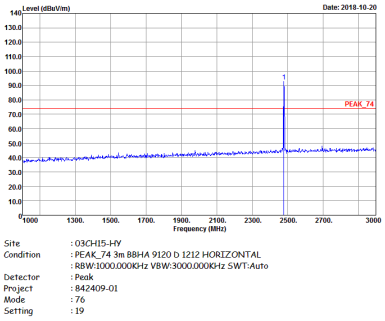
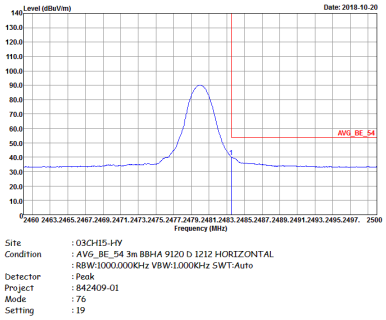
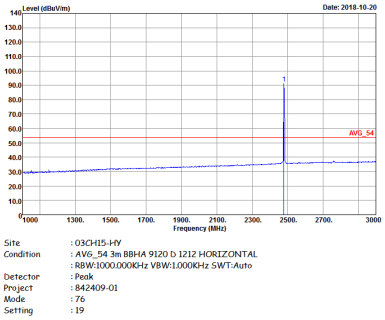
ANT	BLE(2M) CH39 2480MHz + 11ac_VHT80_Tx_Ch42 5210MHz(Ant1)	
Simultaneously	**Horizontal**	**Fundamental**
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 88HA 9120 D 1212 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 75 Setting : 11.5	 Site : 03CH15-HY Condition : PEAK(UNII) 3m 88HA 9120 D 1212 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 75 Setting : 11.5
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 88HA 9120 D 1212 HORIZONTAL : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 75 Setting : 11.5	Left blank

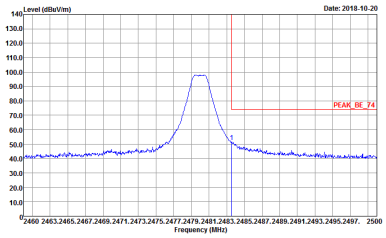
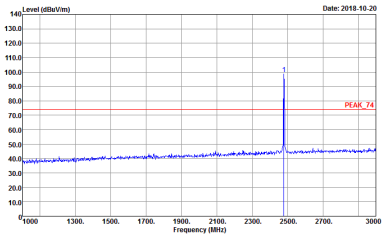
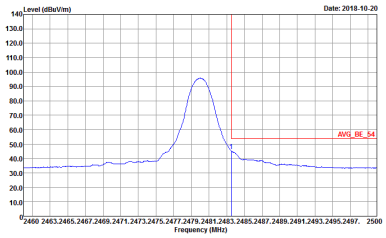
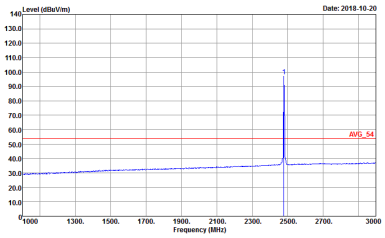
ANT	BLE(2M) CH39 2480MHz + 11ac_VHT80_Tx_Ch42 5210MHz(Ant1)	
Simultaneously	**Horizontal**	**Fundamental**
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 88HA 9120 D 1212 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 75 Setting : 11.5	Left blank
Avg.	 Site : 03CH15-HY Condition : AV6_BE_54 3m 88HA 9120 D 1212 HORIZONTAL : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 75 Setting : 11.5	Left blank

ANT	BLE(2M) CH39 2480MHz + 11ac_VHT80_Tx_Ch42 5210MHz(Ant1)	
Simultaneously	**Vertical**	**Fundamental**
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 75 Setting : 11.5	 Site : 03CH15-HY Condition : PEAK(UNII) 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 75 Setting : 11.5
Avg.	 Site : 03CH15-HY Condition : AV6_BE_54 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 75 Setting : 11.5	Left blank

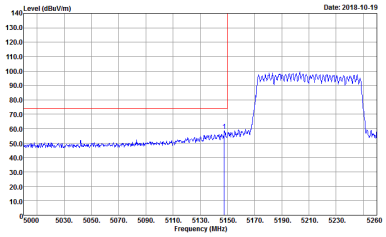
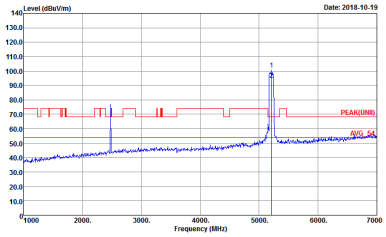
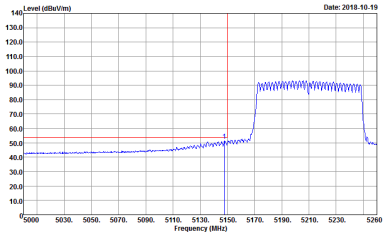
ANT	BLE(2M) CH39 2480MHz + 11ac_VHT80_Tx_Ch42 5210MHz(Ant1)	
Simultaneously	**Vertical**	**Fundamental**
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 75 Setting : 11.5	Left blank
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 75 Setting : 11.5	Left blank

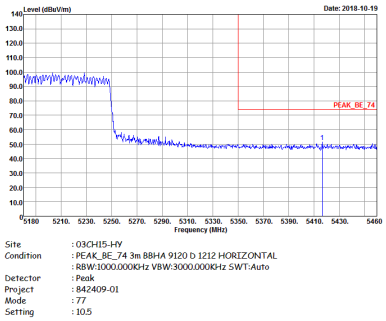
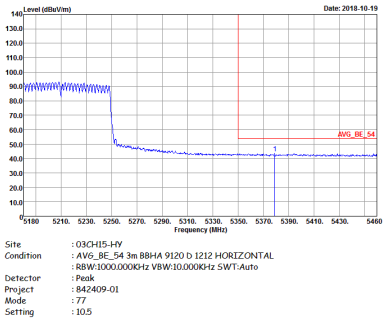
2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (Band Edge @ 3m)

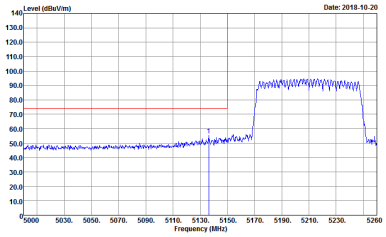
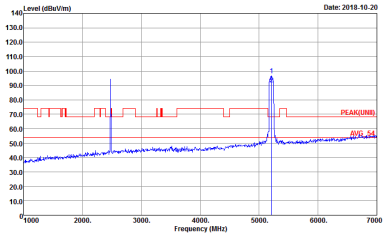
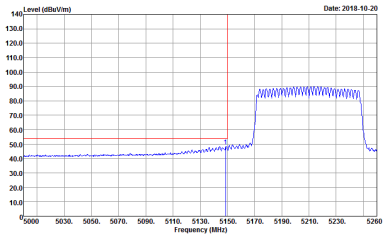
ANT	BLE(2M) CH39 2480MHz + 11a_Tx_Ch48 5240MHz(Ant2)	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		

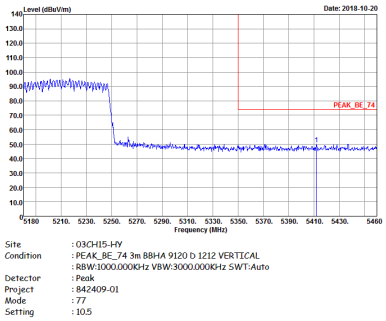
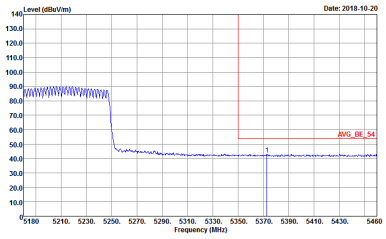
ANT	BLE(2M) CH39 2480MHz + 11a_Tx_Ch48 5240MHz(Ant2)	
Simultaneously	**Vertical**	**Fundamental**
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 76 Setting : 19	 Site : 03CH15-HY Condition : PEAK_74 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 76 Setting : 19
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 76 Setting : 19	 Site : 03CH15-HY Condition : AVG_54 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 76 Setting : 19

2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (Band Edge @ 3m)

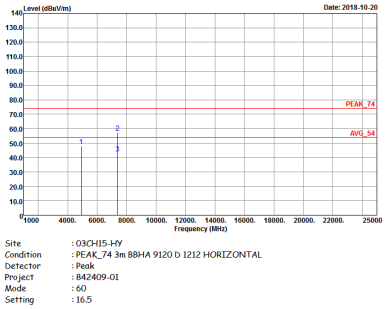
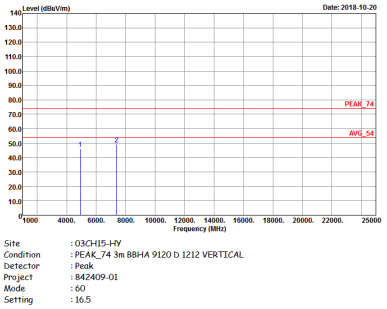
ANT	BLE(2M) CH39 2480MHz + 11ac_VHT80_Tx_Ch42 5210MHz(Ant1+2)	
Simultaneously	**Horizontal**	**Fundamental**
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 88HA 9120 D 1212 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 77 Setting : 10.5	 Site : 03CH15-HY Condition : PEAK(UNII) 3m 88HA 9120 D 1212 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 77 Setting : 10.5
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 88HA 9120 D 1212 HORIZONTAL : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 77 Setting : 10.5	Left blank

ANT	BLE(2M) CH39 2480MHz + 11ac_VHT80_Tx_Ch42 5210MHz(Ant1+2)	
Simultaneously	**Horizontal**	**Fundamental**
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 88HA 9120 D 1212 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 77 Setting : 10.5	Left blank
Avg.	 Site : 03CH15-HY Condition : AV6_BE_54 3m 88HA 9120 D 1212 HORIZONTAL : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 77 Setting : 10.5	Left blank

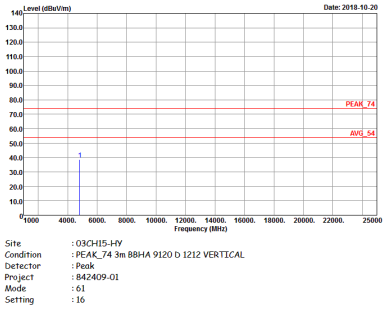
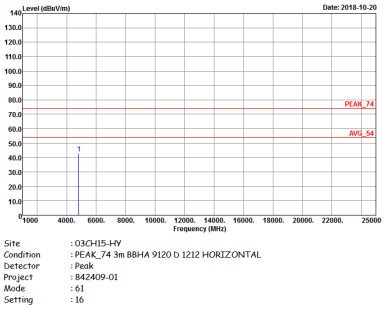
ANT	BLE(2M) CH39 2480MHz + 11ac_VHT80_Tx_Ch42 5210MHz(Ant1+2)	
Simultaneously	**Vertical**	**Fundamental**
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 77 Setting : 10.5	 Site : 03CH15-HY Condition : PEAK(UNII) 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 77 Setting : 10.5
Avg.	 Site : 03CH15-HY Condition : AV6_BE_54 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 77 Setting : 10.5	Left blank

ANT	BLE(2M) CH39 2480MHz + 11ac_VHT80_Tx_Ch42 5210MHz(Ant1+2)	
Simultaneously	**Vertical**	**Fundamental**
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 77 Setting : 10.5	Left blank
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 88HA 9120 D 1212 VERTICAL : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak Project : 842409-01 Mode : 77 Setting : 10.5	Left blank

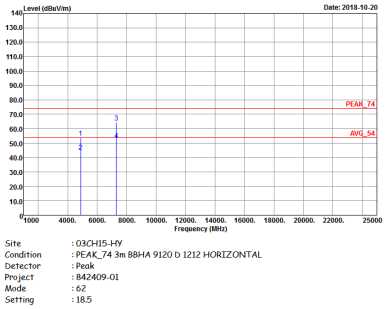
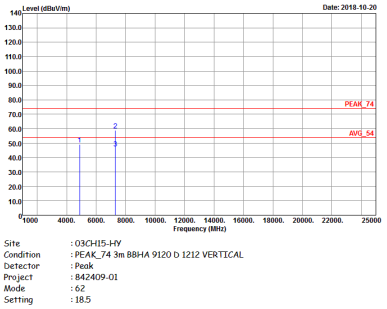
2.4GHz 2400~2483.5MHz (Harmonic @ 3m)

ANT	BLE(2M) CH39 2480MHz + 11n_HT20_Tx_Ch11 2462MHz(Ant1)	
Simultaneously	Horizontal	Vertical
Peak Avg.		

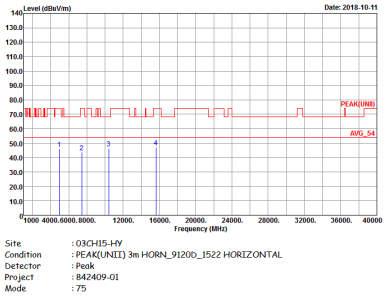
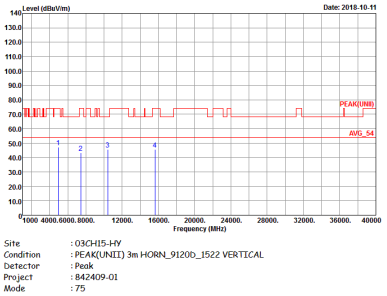
2.4GHz 2400~2483.5MHz (Harmonic @ 3m)

ANT	BLE(2M) CH39 2480MHz + 11n_HT20_Tx_Ch01 2412MHz(Ant2)	
Simultaneously	**Horizontal**	**Vertical**
Peak **Avg.**		

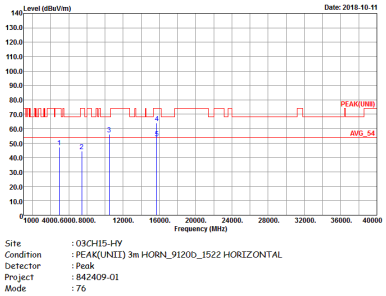
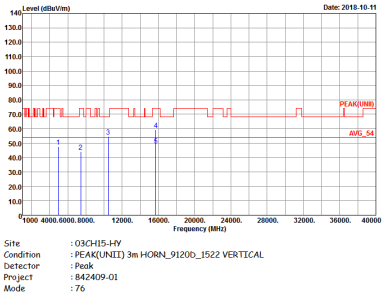
2.4GHz 2400~2483.5MHz (Harmonic @ 3m)

ANT	BLE(2M) CH39 2480MHz + 11g_Tx_Ch06 2437MHz(Ant1+2)	
Simultaneously	Horizontal	Vertical
Peak Avg.		

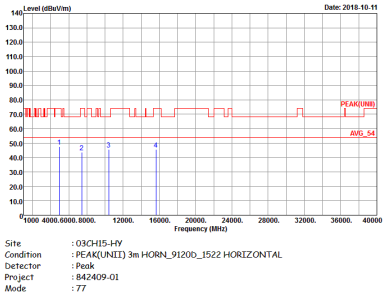
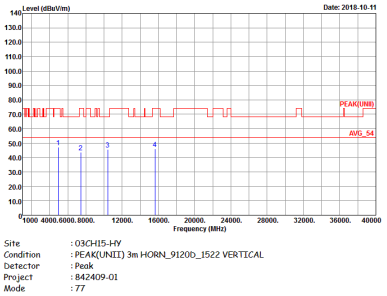
2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (Harmonic @ 3m)

ANT	BLE(2M) CH39 2480MHz + 11ac_VHT80_Tx_Ch42 5210MHz(Ant1)	
Simultaneously	**Horizontal**	**Vertical**
Peak **Avg.**		

2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (Harmonic @ 3m)

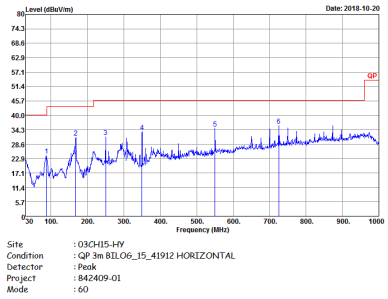
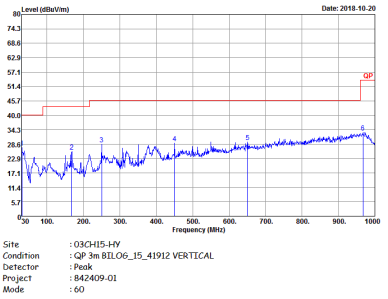
ANT	BLE(2M) CH39 2480MHz + 11a_Tx_Ch48 5240MHz(Ant2)	
Simultaneously	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (Harmonic @ 3m)

ANT	BLE(2M) CH39 2480MHz + 11ac_VHT80_Tx_Ch42 5210MHz(Ant1+2)	
Simultaneously	**Horizontal**	**Vertical**
Peak **Avg.**		

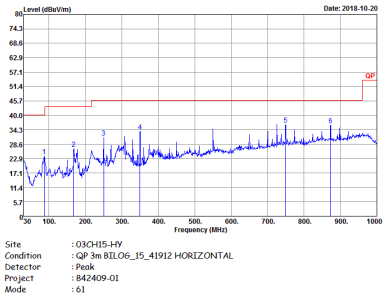
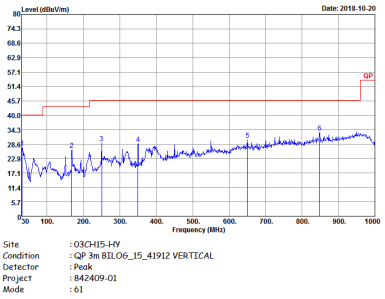
Emission below 1GHz

2.4GHz 2400~2483.5MHz (LF)

ANT	BLE(2M) CH39 2480MHz + 11n_HT20_Tx_Ch11 2462MHz(Ant1)	
Simultaneously	Horizontal	Vertical
QP / Peak		

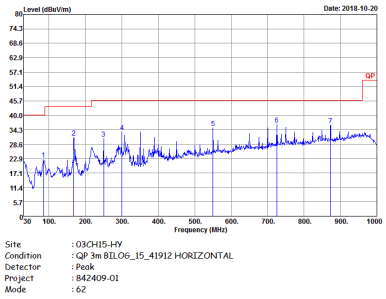
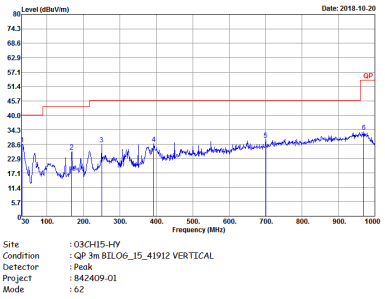
Emission below 1GHz

2.4GHz 2400~2483.5MHz (LF)

ANT	BLE(2M) CH39 2480MHz + 11n_HT20_Tx_Ch01 2412MHz(Ant2)	
Simultaneously	Horizontal	Vertical
QP / Peak		

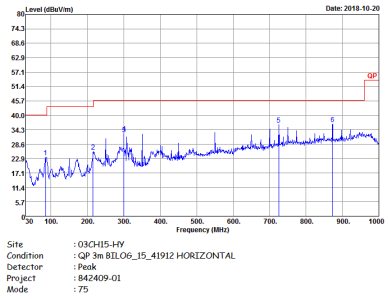
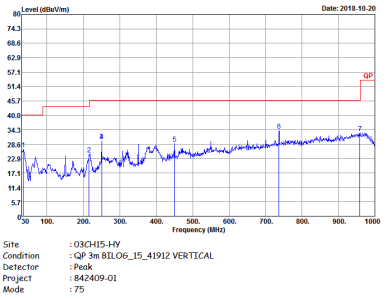
Emission below 1GHz

2.4GHz 2400~2483.5MHz (LF)

ANT	BLE(2M) CH39 2480MHz + 11g_Tx_Ch06 2437MHz(Ant1+2)	
Simultaneously	Horizontal	Vertical
QP / Peak		

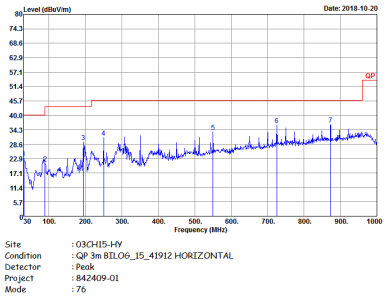
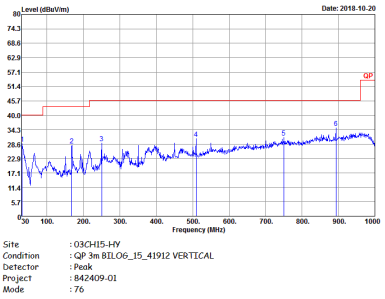
Emission below 1GHz

2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (LF)

ANT	BLE(2M) CH39 2480MHz + 11ac_VHT80_Tx_Ch42 5210MHz(Ant1)	
Simultaneously	Horizontal	Vertical
QP / Peak		

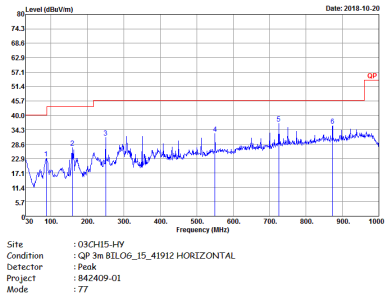
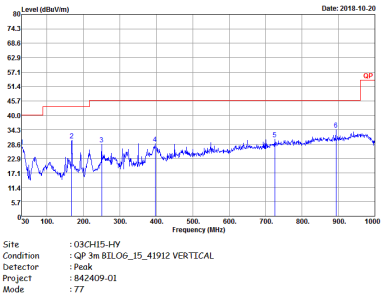
Emission below 1GHz

2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (LF)

ANT	BLE(2M) CH39 2480MHz + 11a_Tx_Ch48 5240MHz(Ant2)	
Simultaneously	Horizontal	Vertical
QP / Peak		

Emission below 1GHz

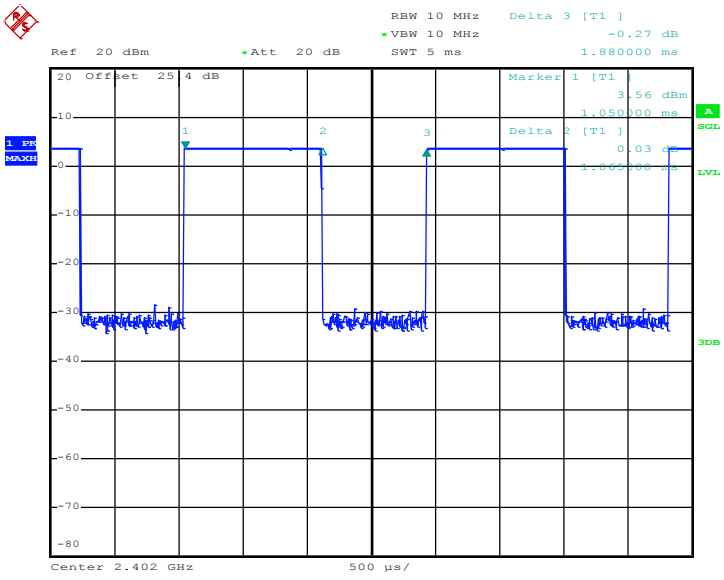
2.4GHz 2400~2483.5MHz and Band 1 5150~5250MHz (LF)

ANT	BLE(2M) CH39 2480MHz + 11ac_VHT80_Tx_Ch42 5210MHz(Ant1+2)	
Simultaneously	Horizontal	Vertical
QP / Peak		

Appendix C. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
-	Bluetooth - LE for 2 Mbps	56.65	1065	0.94	1kHz	2.47
1+2	802.11g for Ant. 1	92.23	1305	0.77	1kHz	0.35
1+2	802.11g for Ant. 2	92.23	1305	0.77	1kHz	0.35
1	2.4GHz 802.11n HT20	92.88	1305	0.77	1kHz	0.32
2	2.4GHz 802.11n HT20	92.91	1310	0.76	1kHz	0.32
2	5GHz 802.11a	92.91	1310	0.76	1kHz	0.32
1	5GHz 802.11ac VHT80	76.43	321	3.12	10kHz	1.17
1+2	5GHz 802.11ac VHT80 for Ant. 1	76.60	324	3.09	10kHz	1.16
1+2	5GHz 802.11ac VHT80 for Ant. 2	75.89	321	3.12	10kHz	1.20

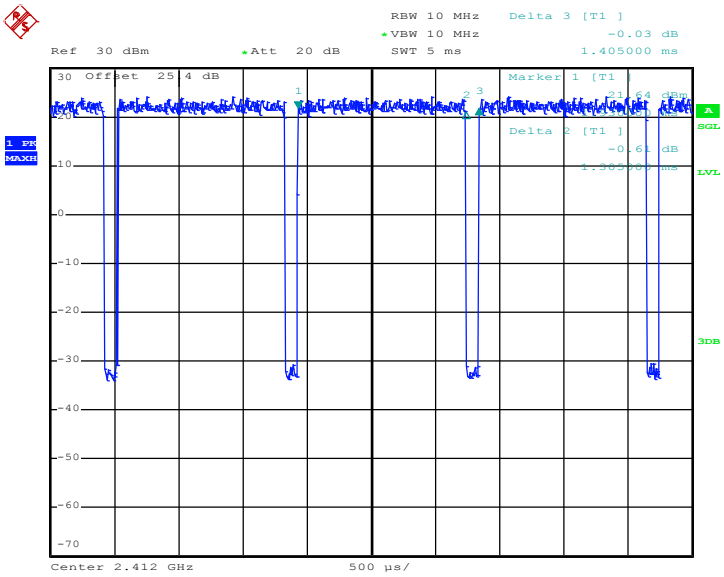
Bluetooth – LE for 2Mbps



Date: 1.OCT.2018 15:23:59

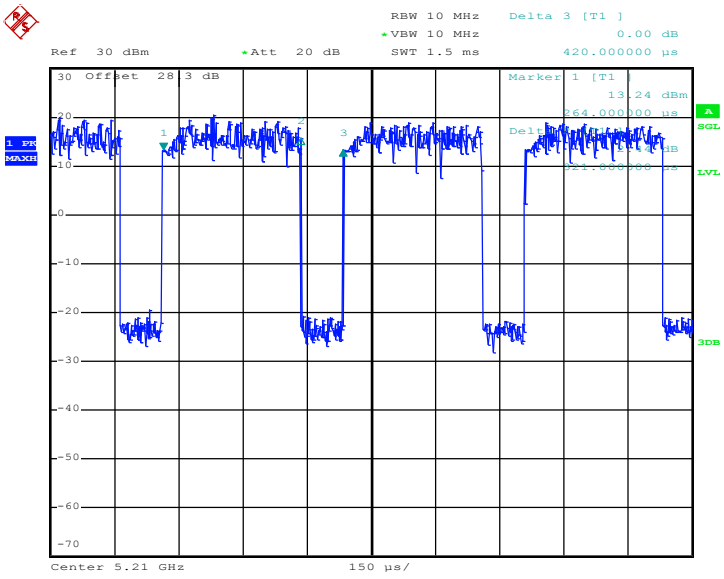
<Ant. 1>

2.4GHz 802.11n HT20



Date: 29.SEP.2018 05:27:00

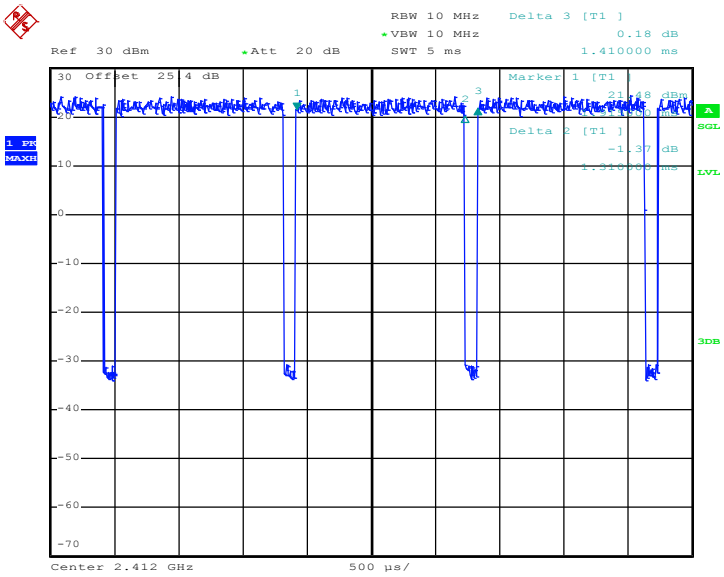
5GHz 802.11ac VHT80



Date: 29.SEP.2018 07:13:03

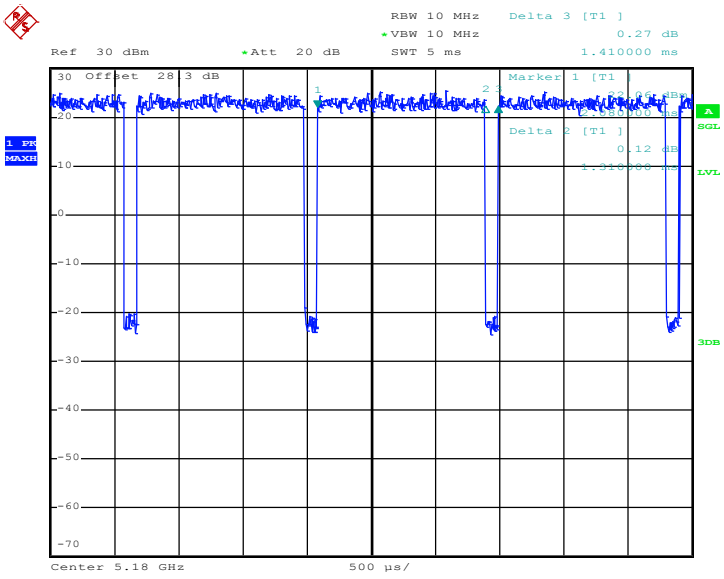
<Ant. 2>

2.4GHz 802.11n HT20



Date: 29.SEP.2018 05:27:40

5GHz 802.11a



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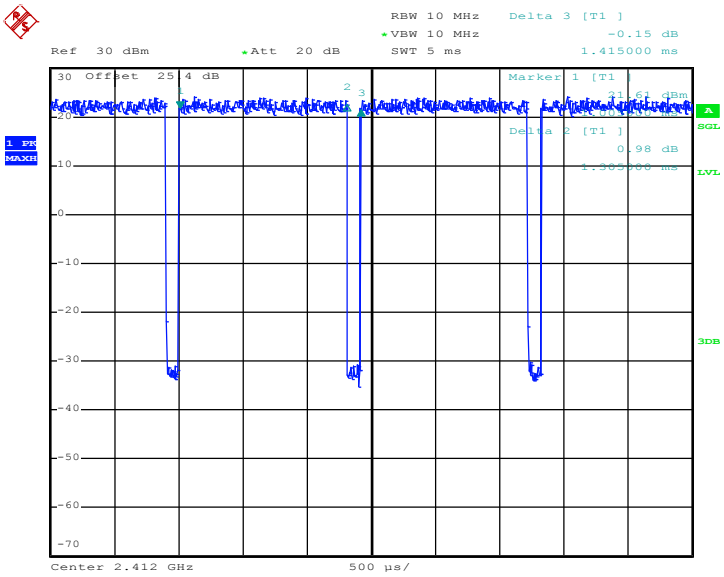

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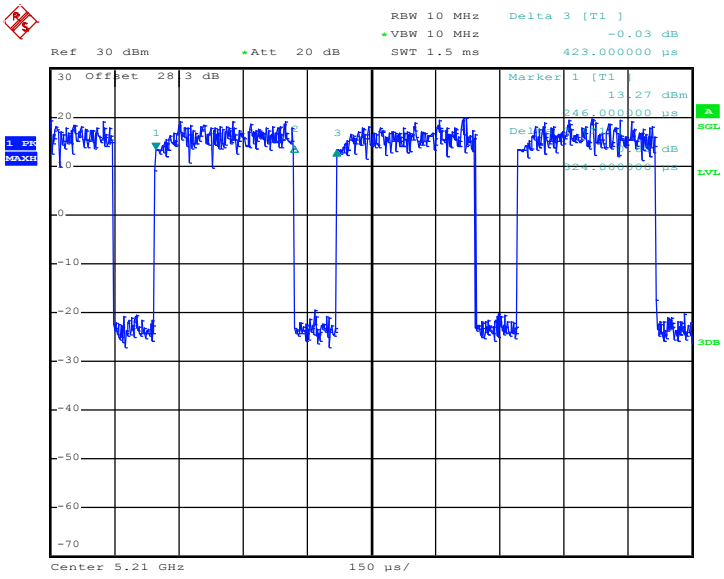

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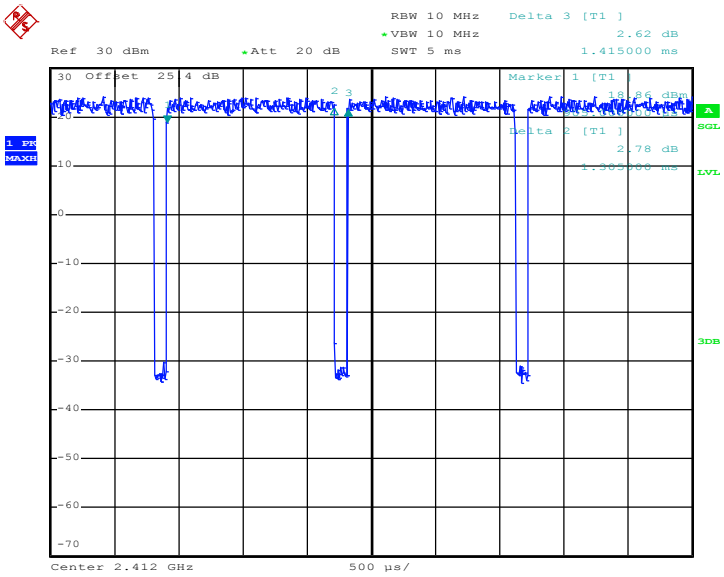

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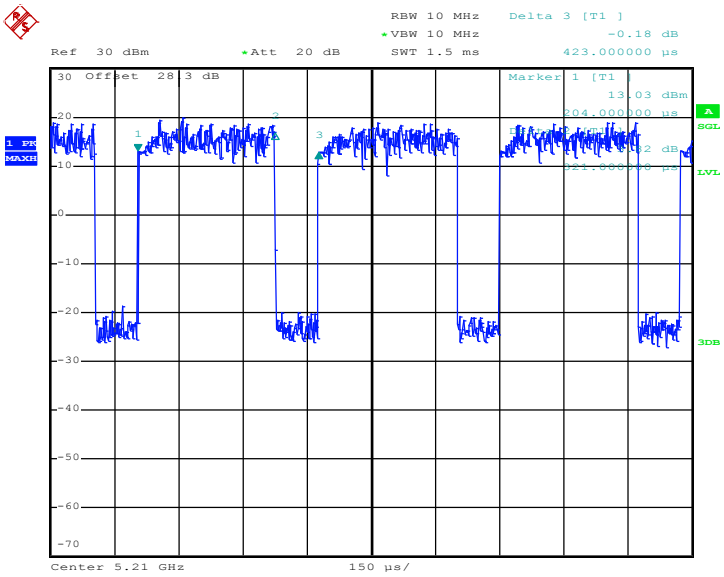

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