



FCC RADIO TEST REPORT

FCC ID : Z64-CC3235MOD
Equipment : Dual-Band Wi-Fi® Module
Brand Name : Texas Instruments
Model Name : CC3235MODSM2MOB, CC3235MODSF12MOB
Marketing : SimpleLink™ Wi-Fi® CC3235MOD Dual-Band
Name : Wireless Microcontroller Module
Applicant : Texas Instruments Incorporated
12500 TI BLVD., Dallas Texas, 75243
Manufacturer : Texas Instruments Incorporated
12500 TI BLVD., Dallas Texas, 75243
Standard : FCC Part 15 Subpart C §15.247

The product was received on Dec. 19, 2018 and testing was started from May 16, 2019 and completed on Aug. 06, 2019. We, SPORTON INTERNATIONAL INC., EMC & Wireless Communications Laboratory, 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: Jones Tsai

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
FR8D1930A	01	Initial issue of report	Jul. 19, 2019
FR8D1930A	02	Add the test result of peak power	Aug. 06, 2019

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.247(a)(2)	6dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.247(b)	Power Output Measurement	Pass	-
3.3	15.247(e)	Power Spectral Density	Pass	-
3.4	15.247(d)	Conducted Band Edges	Pass	-
		Conducted Spurious Emission	Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	Pass	Under limit 1.45 dB at 4924 MHz for Average
3.6	15.207	AC Conducted Emission	Pass	Under limit 15.59 dB at 0.15225 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass	-

Remark: Not required means after assessing, test items are not necessary to carry out.

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.

Reviewed by: Wii Chang

Report Producer: Shirley Xu

1 General Description

1.1 Product Feature of Equipment Under Test

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

Antenna Information					
	Antenna Type	Brand Name	Model	2.4GHz Gain(dBi)	5GHz Gain(dBi)
1.	Chip	Pulse	W3078	1.7	4.3
2.		Yageo	ANT5320LL04R2455A	2.17	3.51
3.		Ethertronics	M830520	1	2.6
4.	1000423		-0.6	4.5	
5.	PCB	Laird	CAF94504	2	4
6.			CAF94505	2	4
7.	Dipole	LSR	001-0012	2	2
8.			080-0013	2	2
9.			080-0014	2	2
10.	PIFA		001-0016	2.5	3
11.			001-0021	2.5	3
Note: The EUT used a dual-band chip antenna (Antenna 3 from Ethertronics)					

1.2 Modification of EUT

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



1.3 Testing Location

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory	
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	Sporton Site No.	
	TH05-HY	CO05-HY

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory	
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.

FCC designation No.: TW1190 and TW0007

1.4 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:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

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

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		

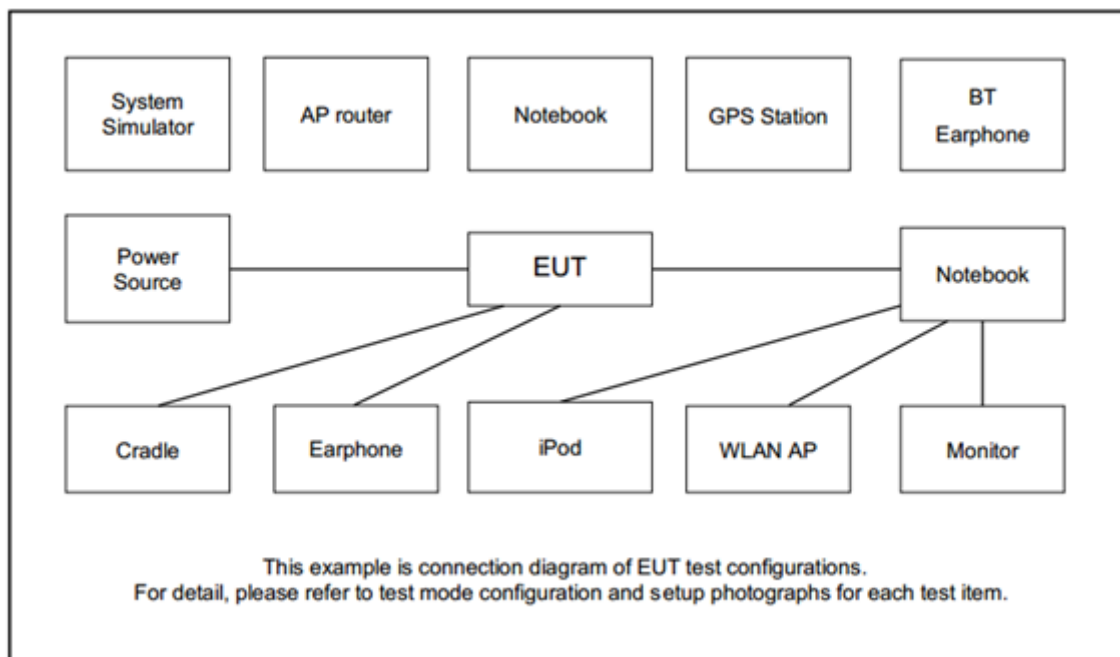
2.2 Test Mode

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

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0

Test Cases	
AC Conducted Emission	Mode 1 :WLAN 2.4G Link + USB Cable(Charging from Notebook)

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded,1.8m
2.	Notebook	Dell	Latitude E3340	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	Notebook	Lenovo	L570	FCC DoC	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
4.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0m	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “CC31XX/CC32XX Radio Tool v1.0.3.10” 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 1.1 dB and 10dB attenuator.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 1.1 + 10 = 11.1 \text{ (dB)}\end{aligned}$$

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.

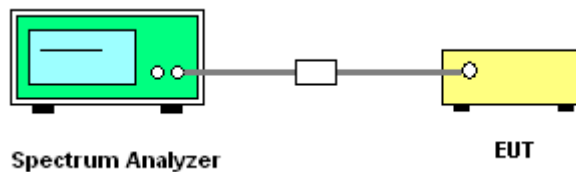
3.1.2 Measuring Instruments

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.

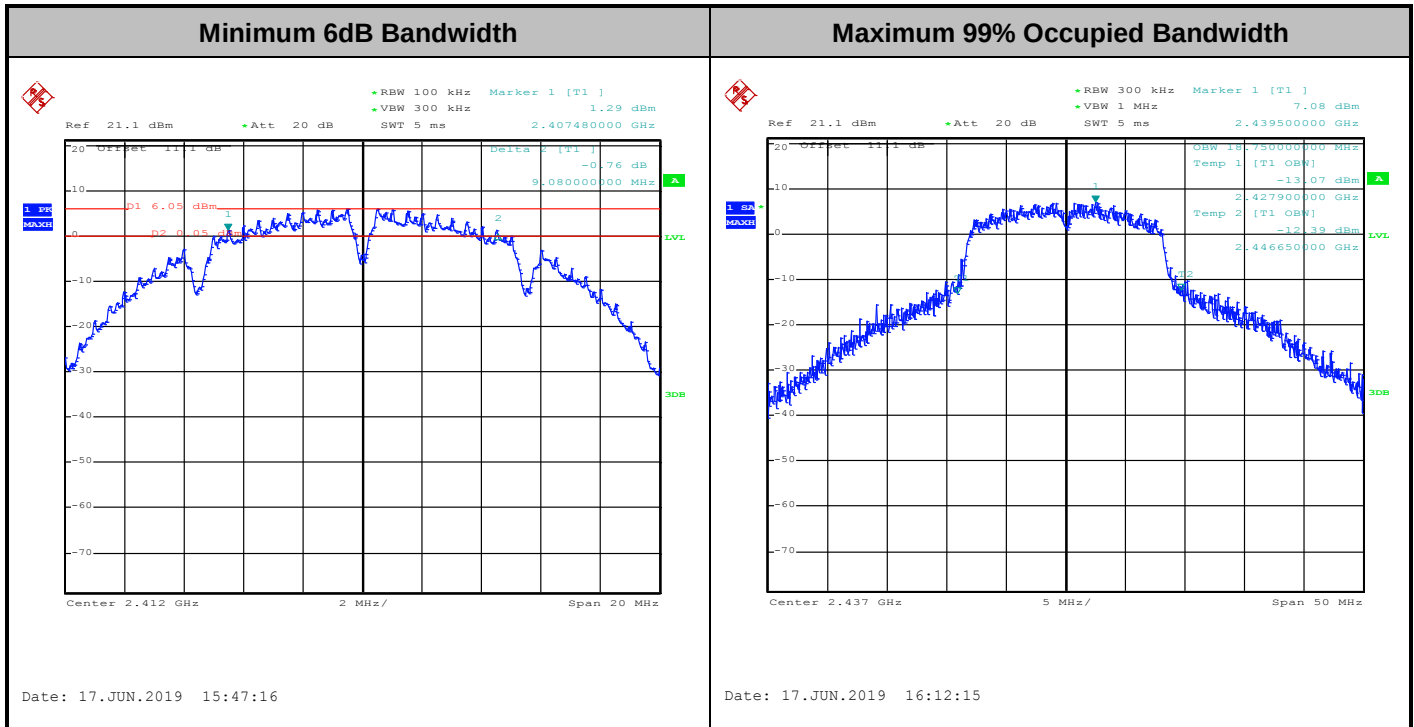
3.1.4 Test Setup





3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.



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 with 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.

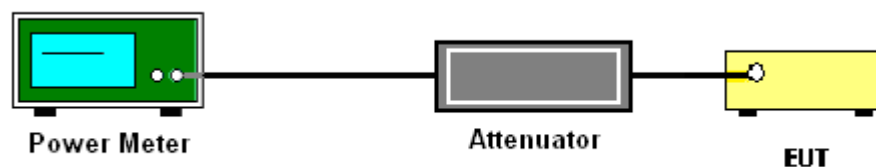
3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

3.2.3 Test Procedures

1. For Peak Power, the testing follows ANSI C63.10 Section 11.9.1.3 PKPM1
2. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
3. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
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.

3.2.6 Test Result of Average Output Power (Reporting Only)

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.

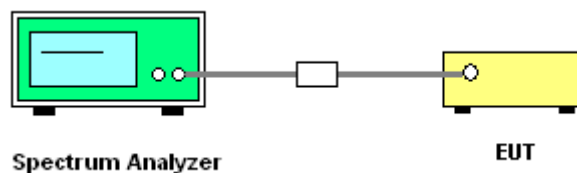
3.3.2 Measuring Instruments

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.

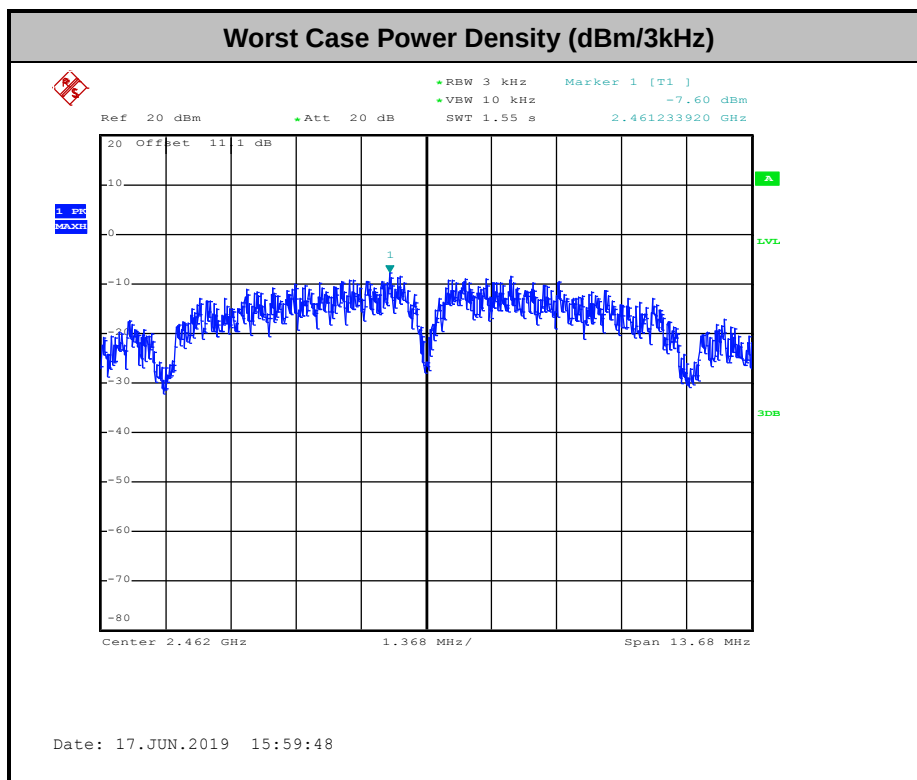
3.3.4 Test Setup





3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement.

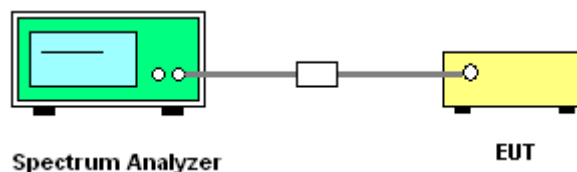
3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

3.4.3 Test Procedures

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 per 15.247(d).
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

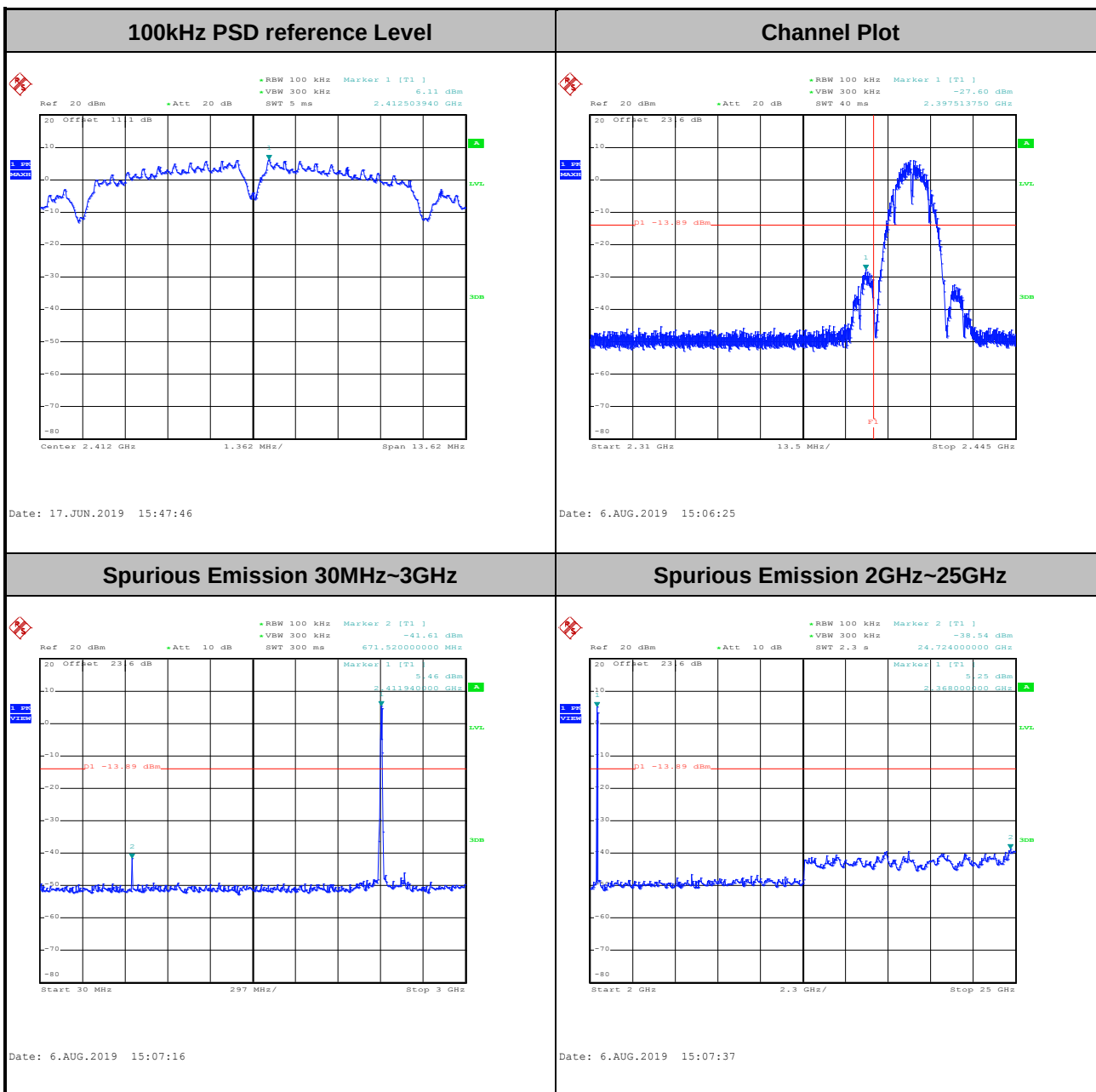




3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Engineer :	Leo Lee	Temperature :	21~25°C
		Relative Humidity :	51~54%

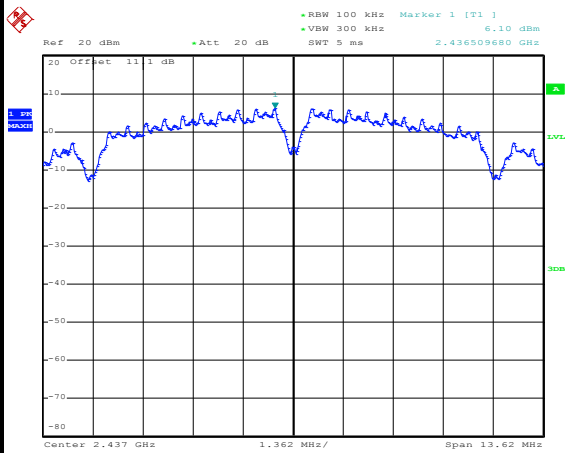
Test Mode :	802.11b	Test Channel :	01
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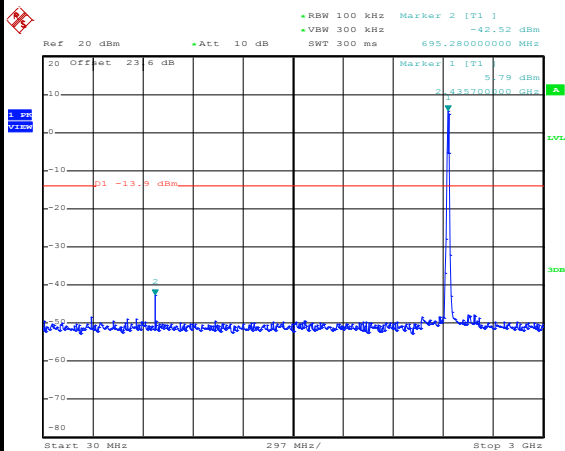
Test Mode :	802.11b	Test Channel :	06
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100kHz PSD reference Level



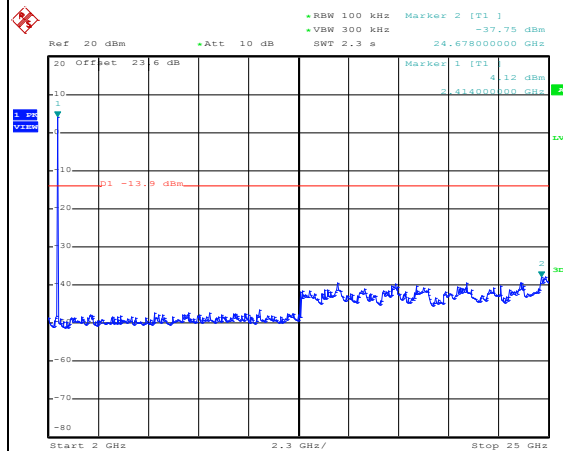
Date: 17.JUN.2019 15:55:07

Spurious Emission 30MHz~3GHz



Date: 6.AUG.2019 15:08:55

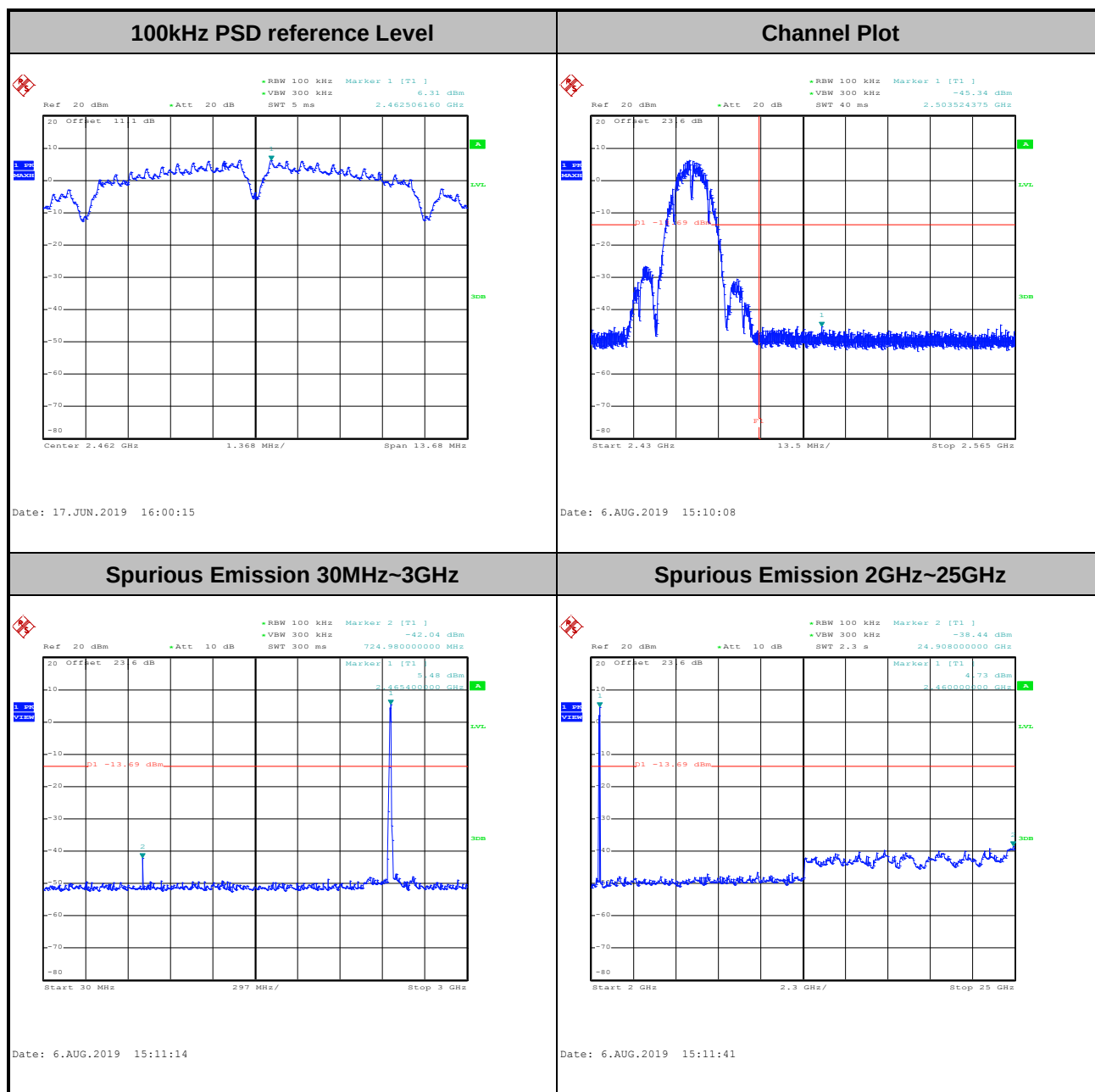
Spurious Emission 2GHz~25GHz



Date: 6.AUG.2019 15:09:25



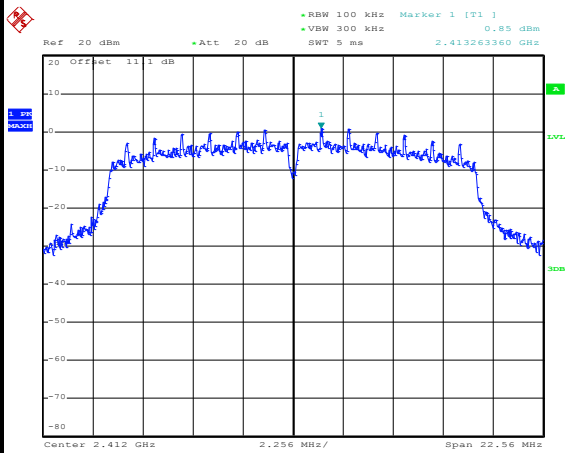
Test Mode :	802.11b	Test Channel :	11
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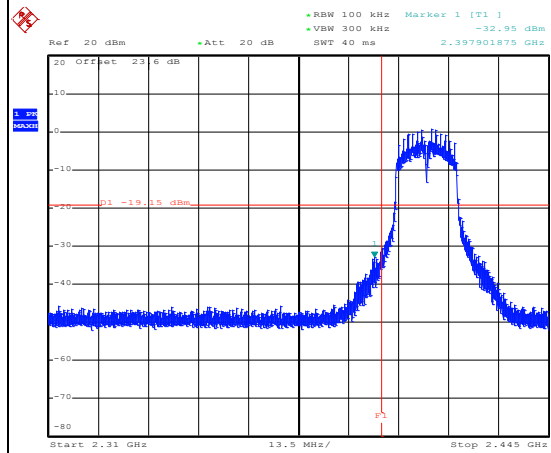
Test Mode :	802.11g	Test Channel :	01
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100kHz PSD reference Level



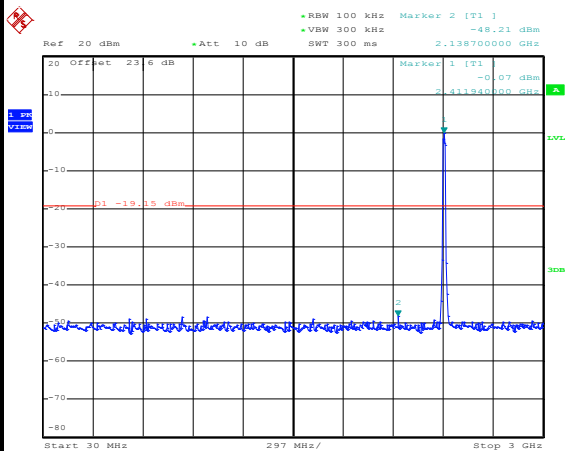
Date: 17.JUN.2019 16:03:43

Channel Plot



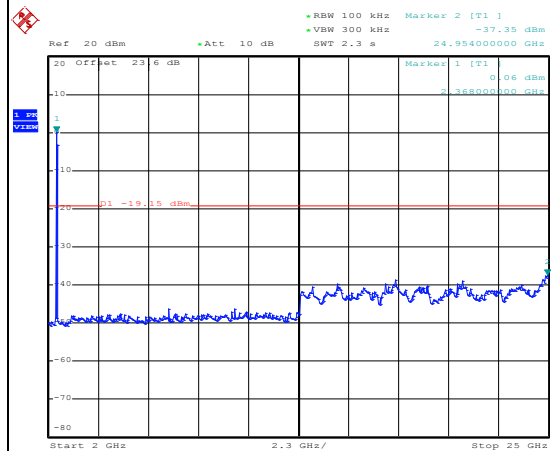
Date: 6.AUG.2019 15:13:49

Spurious Emission 30MHz~3GHz



Date: 6.AUG.2019 15:14:40

Spurious Emission 2GHz~25GHz

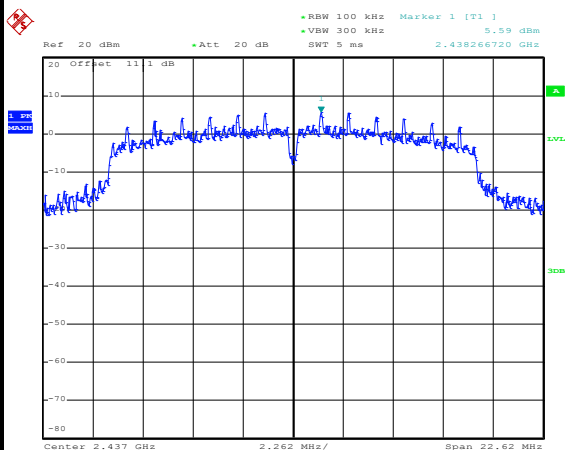


Date: 6.AUG.2019 15:15:35



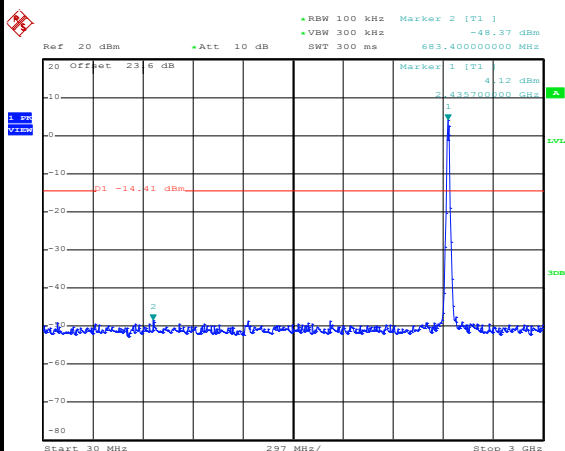
Test Mode :	802.11g	Test Channel :	06
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100kHz PSD reference Level



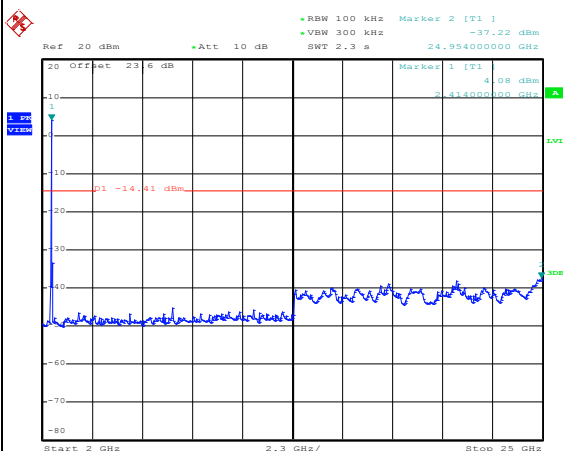
Date: 17.JUN.2019 16:11:11

Spurious Emission 30MHz~3GHz



Date: 6.AUG.2019 15:16:39

Spurious Emission 2GHz~25GHz

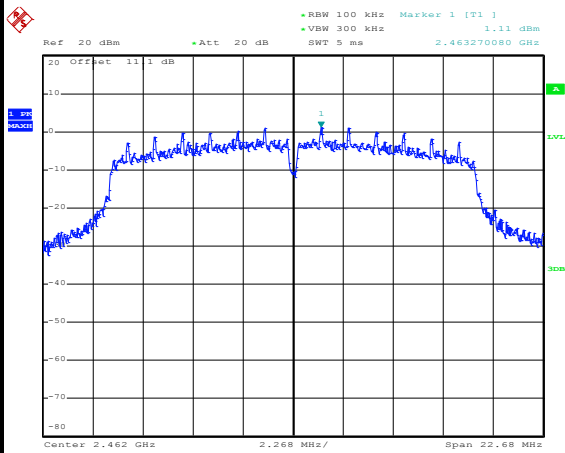


Date: 6.AUG.2019 15:18:06



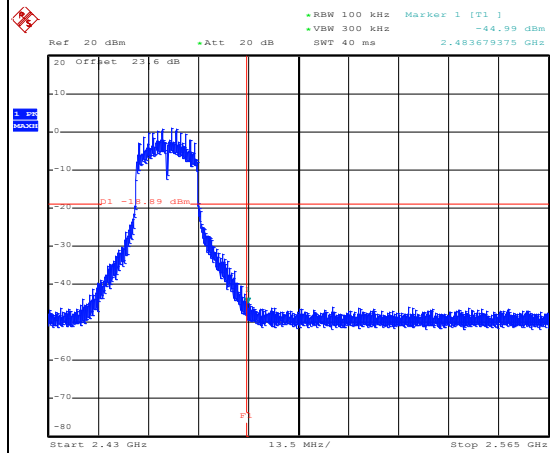
Test Mode :	802.11g	Test Channel :	11
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100kHz PSD reference Level



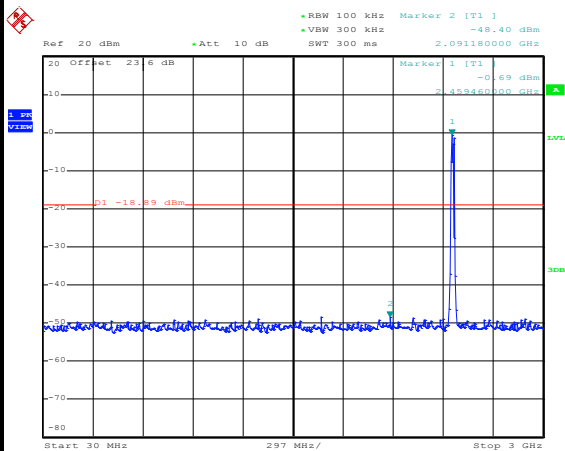
Date: 17.JUN.2019 16:15:16

Channel Plot



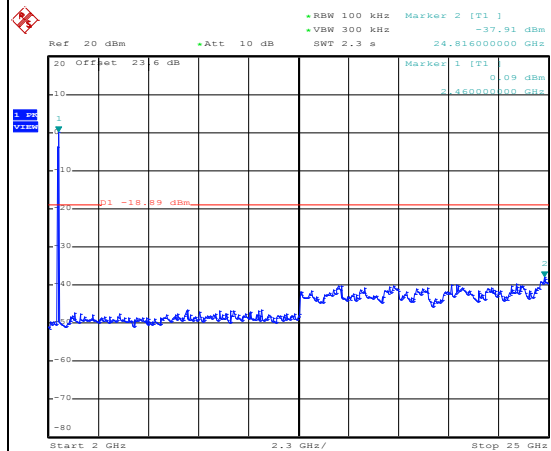
Date: 6.AUG.2019 15:19:07

Spurious Emission 30MHz~3GHz



Date: 6.AUG.2019 15:19:57

Spurious Emission 2GHz~25GHz

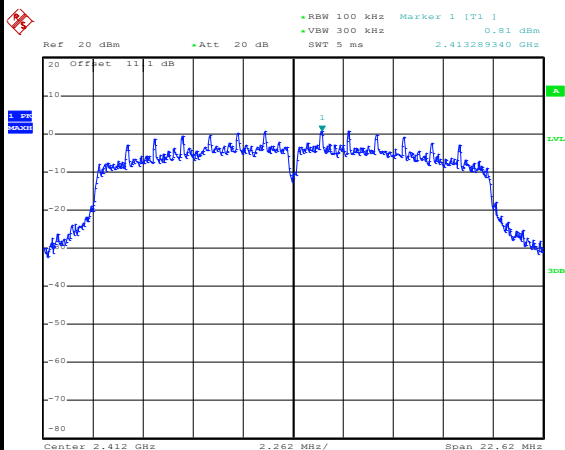


Date: 6.AUG.2019 15:20:40



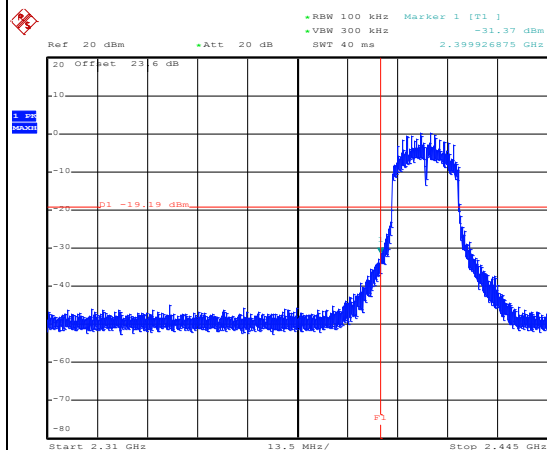
Test Mode :	802.11n HT20	Test Channel :	01
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100kHz PSD reference Level



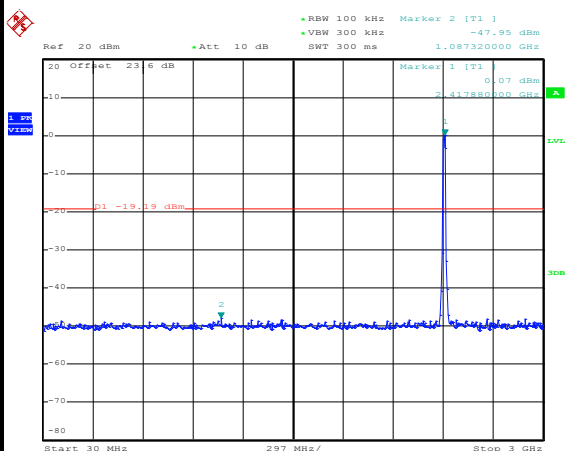
Date: 17.JUN.2019 16:20:44

Channel Plot



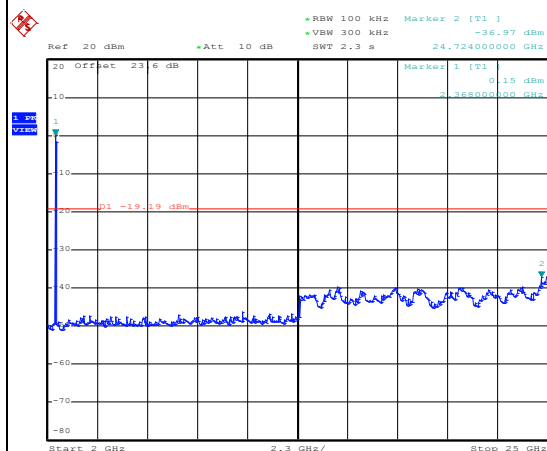
Date: 6.AUG.2019 15:23:12

Spurious Emission 30MHz~3GHz



Date: 6.AUG.2019 15:25:20

Spurious Emission 2GHz~25GHz

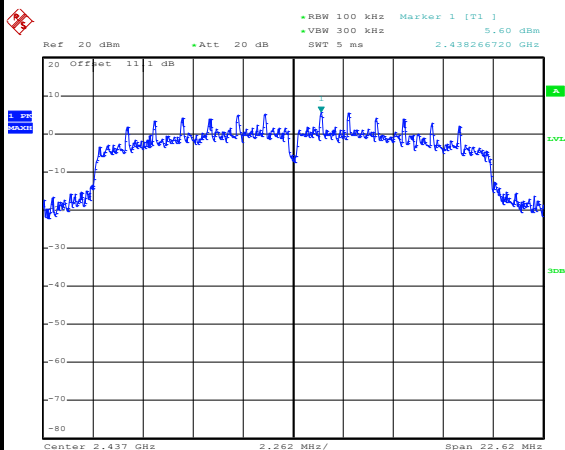


Date: 6.AUG.2019 15:26:06



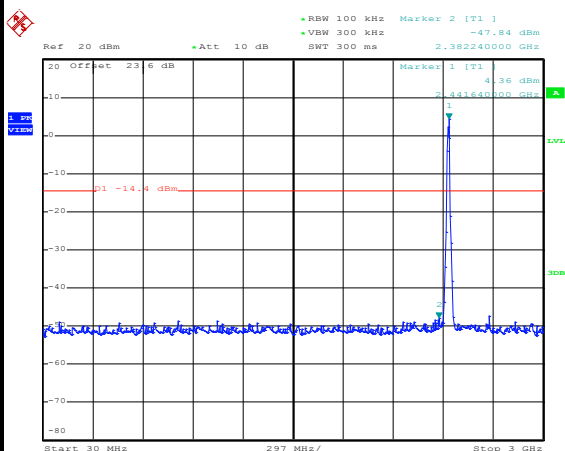
Test Mode :	802.11n HT20	Test Channel :	06
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100kHz PSD reference Level



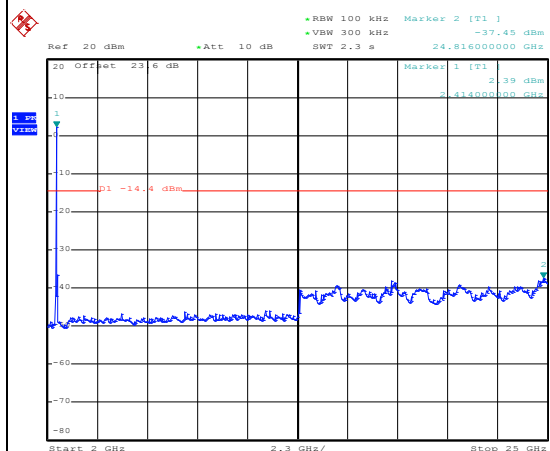
Date: 27.JUN.2019 16:02:40

Spurious Emission 30MHz~3GHz



Date: 6.AUG.2019 15:26:59

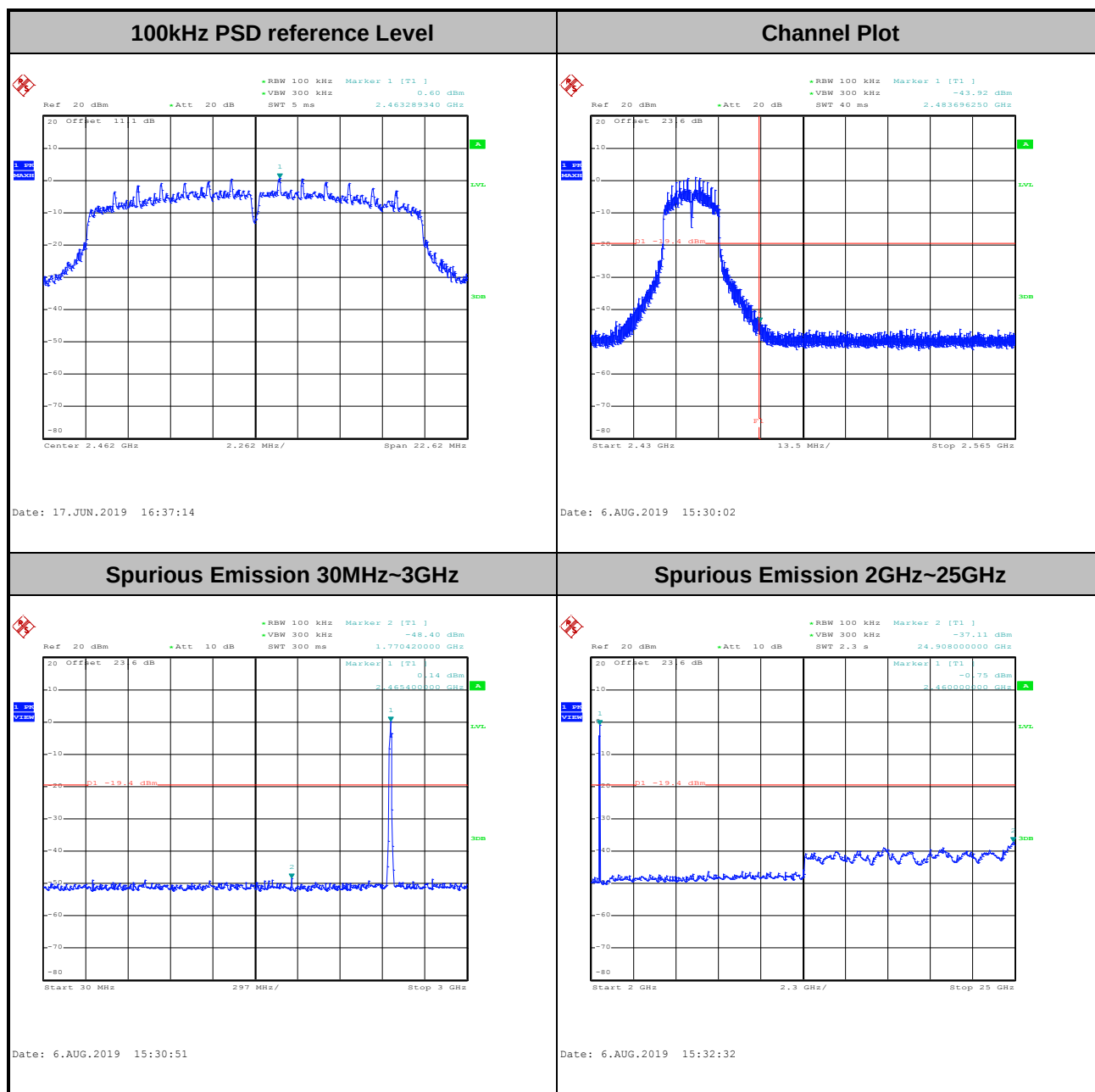
Spurious Emission 2GHz~25GHz



Date: 6.AUG.2019 15:28:41



Test Mode :	802.11n HT20	Test Channel :	11
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3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

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

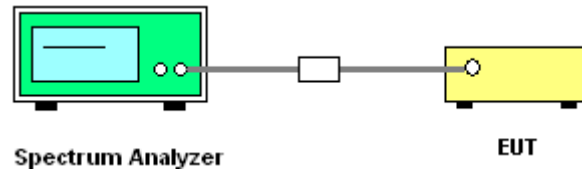
See list of measuring equipment of this test report.

3.5.3 Test Procedures

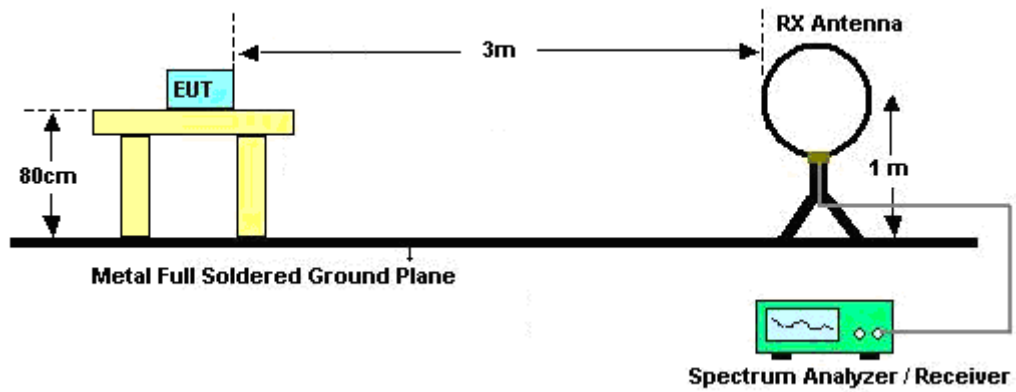
1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the 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 $f < 1$ GHz; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
 - $VBW = 10$ Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

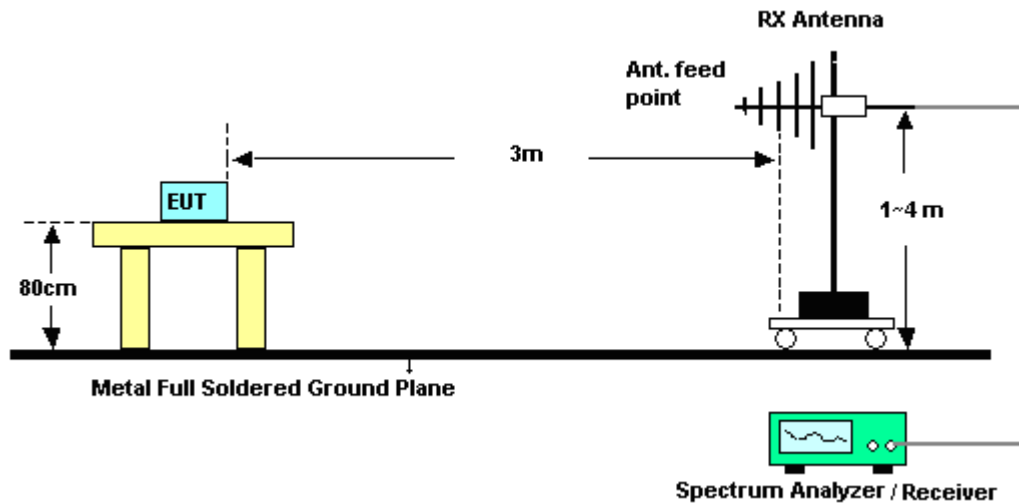
For Conducted Measurement Setup:



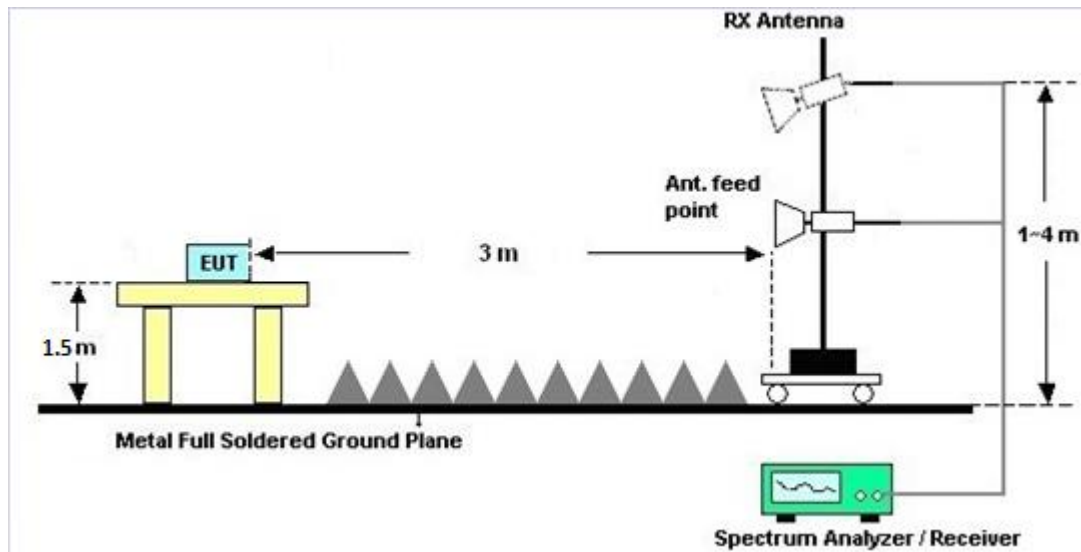
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated Spurious Emissions (9kHz ~ 30MHz)

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 Conduced Spurious at Band Edges in the Restricted Band

Please refer to Appendix C and D.

3.5.7 Test Result of Conduced Spurious Emission in the Restricted Band

Please refer to Appendix C and D.

3.5.8 Test Result of Cabinet Radiated Spurious at Band Edges

Please refer to Appendix E and F.

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

Please refer to Appendix E and F.

3.5.10 Duty Cycle

Please refer to Appendix G.

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.

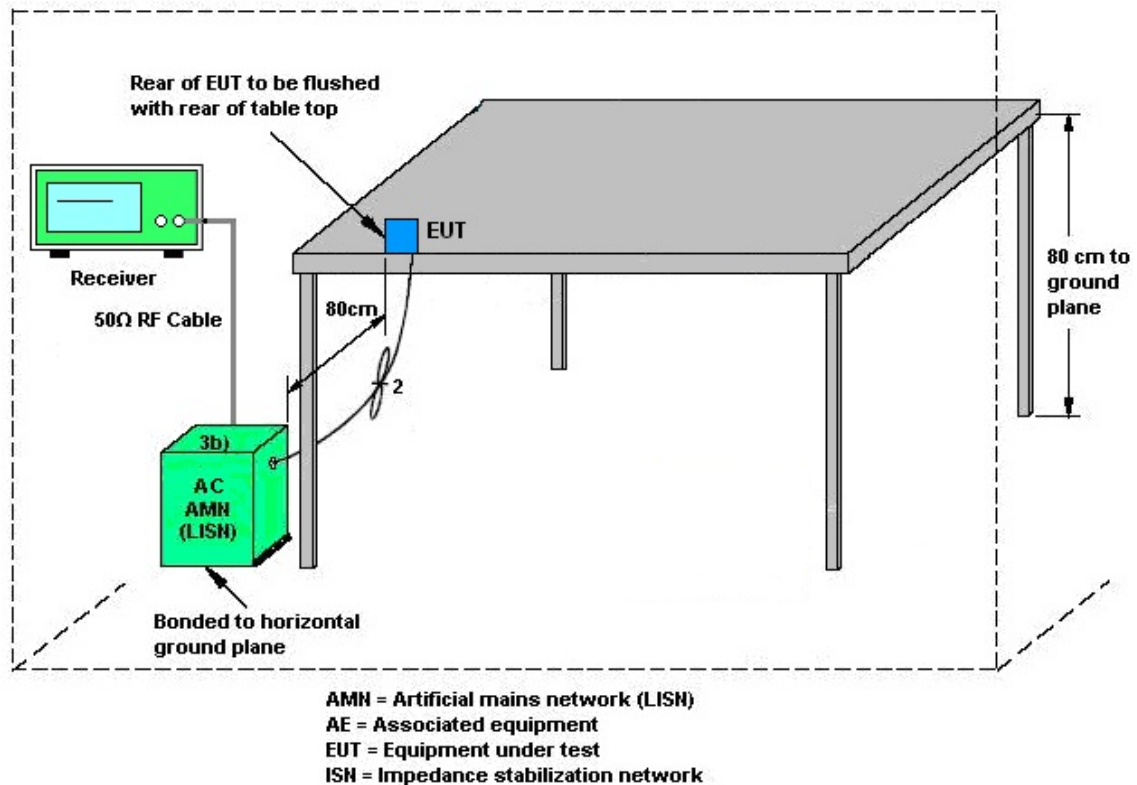
3.6.2 Measuring Instruments

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, and it 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.

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	13I00030S NO32	9kHz~6GHz	Dec. 03, 2018	May 22, 2019~ Aug. 06, 2019	Dec. 02, 2019	Conducted (TH05-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 28, 2019	May 22, 2019~ Aug. 06, 2019	Sep. 27, 2019	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	1207349	300MHz~40GHz	Sep. 28, 2019	May 22, 2019~ Aug. 06, 2019	Sep. 27, 2019	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz~40GHz	Nov. 21, 2018	May 22, 2019~ Aug. 06, 2019	Nov. 20, 2019	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC120838 2	N/A	Mar. 27, 2019	May 22, 2019~ Aug. 06, 2019	Mar. 26, 2020	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	May 16, 2019	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9KHz~3.6GHz	Nov. 12, 2018	May 16, 2019	Nov. 11, 2019	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 14, 2018	May 16, 2019	Nov. 13, 2019	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 09, 2018	May 16, 2019	Nov. 08, 2019	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	May 16, 2019	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Dec. 31, 2018	May 16, 2019	Dec. 30, 2019	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Dec. 31, 2018	May 16, 2019	Dec. 30, 2019	Conduction (CO05-HY)



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	Jan. 07, 2019	Jun. 09, 2019~ Jun. 25, 2019	Jan. 06, 2020	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL6111D&0 0800N1D01N- 06	41912&05	30MHz to 1GHz	Feb. 12, 2019	Jun. 09, 2019~ Jun. 25, 2019	Feb. 11, 2020	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120D	9120D-162 0	1G~18GHz	Oct. 17, 2018	Jun. 09, 2019~ Jun. 25, 2019	Oct. 16, 2019	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 584	18GHz- 40GHz	Dec. 05, 2018	Jun. 09, 2019~ Jun. 25, 2019	Dec. 04, 2019	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 28, 2018	Jun. 09, 2019~ Jun. 25, 2019	Dec. 27, 2019	Radiation (03CH15-HY)
Preamplifier	Jet-Power	JPA0118-55-3 03	171000180 00550006	1GHz~18GHz	Jul. 10, 2018	Jun. 20, 2019~ Jun. 28, 2019	Jul. 09, 2019	Radiation (03CH15-HY)
Preamplifier	Keysight	83017A	MY532701 95	1GHz~26.5GHz	Aug. 23, 2018	Jun. 09, 2019~ Jun. 25, 2019	Aug. 22, 2019	Radiation (03CH15-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 06, 2018	Jun. 09, 2019~ Jun. 25, 2019	Dec. 05, 2019	Radiation (03CH15-HY)
EMI Test Receiver	Keysight	N9038A (MXE)	MY541300 85	20Hz ~ 8.4GHz	Nov. 01, 2018	Jun. 09, 2019~ Jun. 25, 2019	Oct. 31, 2019	Radiation (03CH15-HY)
Spectrum Analyzer	Agilent	E4446A	MY501801 36	3Hz~44GHz	Apr. 29, 2019	Jun. 09, 2019~ Jun. 25, 2019	Apr. 28, 2020	Radiation (03CH15-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Jun. 09, 2019~ Jun. 25, 2019	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Jun. 09, 2019~ Jun. 25, 2019	N/A	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24(k 5)	RK-00045 1	N/A	N/A	Jun. 09, 2019~ Jun. 25, 2019	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY36980/ 4	30M-18G	Apr. 15, 2019	Jun. 09, 2019~ Jun. 25, 2019	Apr. 14, 2020	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9838/4	30M-18G	Apr. 15, 2019	Jun. 09, 2019~ Jun. 25, 2019	Apr. 14, 2020	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY802430 /4	30M~18GHz	May. 13, 2019	Jun. 09, 2019~ Jun. 25, 2019	May. 12, 2020	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30MHz-40GHz	Mar. 13, 2019	Jun. 09, 2019~ Jun. 25, 2019	Mar. 12, 2020	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY4274/2	30MHz-40GHz	Mar. 13, 2019	Jun. 09, 2019~ Jun. 25, 2019	Mar. 12, 2020	Radiation (03CH15-HY)
Filter	Wainwright	WLK4-1000-1 530-8000-40S S	SN11	1G Low Pass	Sep. 16, 2018	Jun. 09, 2019~ Jun. 25, 2019	Sep. 15, 2019	Radiation (03CH15-HY)
Filter	Wainwright	WHKX12-270 0-3000-18000 -60ST	SN1	3 GHz Highpass	Sep. 16, 2018	Jun. 09, 2019~ Jun. 25, 2019	Sep. 15, 2019	Radiation (03CH15-HY)



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.7dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.2dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.5dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.2dB
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Leo Lee	Temperature:	21~25	°C
Test Date:	2019/5/22~2019/8/6	Relative Humidity:	51~54	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band										
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	99% Occupied BW (MHz)		6dB BW (MHz)		6dB BW Limit (MHz)	Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2		
11b	1Mbps	1	1	2412	14.30	-	9.08	-	0.50	Pass
11b	1Mbps	1	6	2437	14.40	-	9.08	-	0.50	Pass
11b	1Mbps	1	11	2462	14.40	-	9.12	-	0.50	Pass
11g	6Mbps	1	1	2412	16.55	-	15.04	-	0.50	Pass
11g	6Mbps	1	6	2437	18.75	-	15.08	-	0.50	Pass
11g	6Mbps	1	11	2462	16.60	-	15.12	-	0.50	Pass
HT20	MCS0	1	1	2412	17.60	-	15.08	-	0.50	Pass
HT20	MCS0	1	6	2437	18.75	-	15.08	-	0.50	Pass
HT20	MCS0	1	11	2462	17.55	-	15.08	-	0.50	Pass

TEST RESULTS DATA
Peak Output Power

2.4GHz Band																
Mod.	Data Rate	N _{Tx}	CH.	Freq. (MHz)	Peak Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11b	1Mbps	1	1	2412	18.23	-	-	30.00	-	2.50	-	20.73	-	36.00	-	Pass
11b	1Mbps	1	6	2437	18.48	-	-	30.00	-	2.50	-	20.98	-	36.00	-	Pass
11b	1Mbps	1	11	2462	18.33	-	-	30.00	-	2.50	-	20.83	-	36.00	-	Pass
11g	6Mbps	1	1	2412	19.08	-	-	30.00	-	2.50	-	21.58	-	36.00	-	Pass
11g	6Mbps	1	6	2437	19.69	-	-	30.00	-	2.50	-	22.19	-	36.00	-	Pass
11g	6Mbps	1	11	2462	19.14	-	-	30.00	-	2.50	-	21.64	-	36.00	-	Pass
HT20	MCS0	1	1	2412	19.07	-	-	30.00	-	2.50	-	21.57	-	36.00	-	Pass
HT20	MCS0	1	6	2437	19.53	-	-	30.00	-	2.50	-	22.03	-	36.00	-	Pass
HT20	MCS0	1	11	2462	19.16	-	-	30.00	-	2.50	-	21.66	-	36.00	-	Pass

Note: Measured power (dBm) has offset with cable loss.

TEST RESULTS DATA
Average Output Power
(Reporting Only)

2.4GHz Band							
Mod.	Data Rate	Ntx	CH.	Freq. (MHz)	Average Conducted Power (dBm)		
					Ant 1	Ant 2	SUM
11b	1Mbps	1	1	2412	16.10	-	-
11b	1Mbps	1	6	2437	16.40	-	
11b	1Mbps	1	11	2462	16.50	-	
11g	6Mbps	1	1	2412	11.50	-	
11g	6Mbps	1	6	2437	16.00	-	
11g	6Mbps	1	11	2462	11.60	-	
HT20	MCS0	1	1	2412	11.30	-	
HT20	MCS0	1	6	2437	15.90	-	
HT20	MCS0	1	11	2462	11.40	-	

Note: Measured power (dBm) has offset with cable loss.

TEST RESULTS DATA
Peak Power Spectral Density

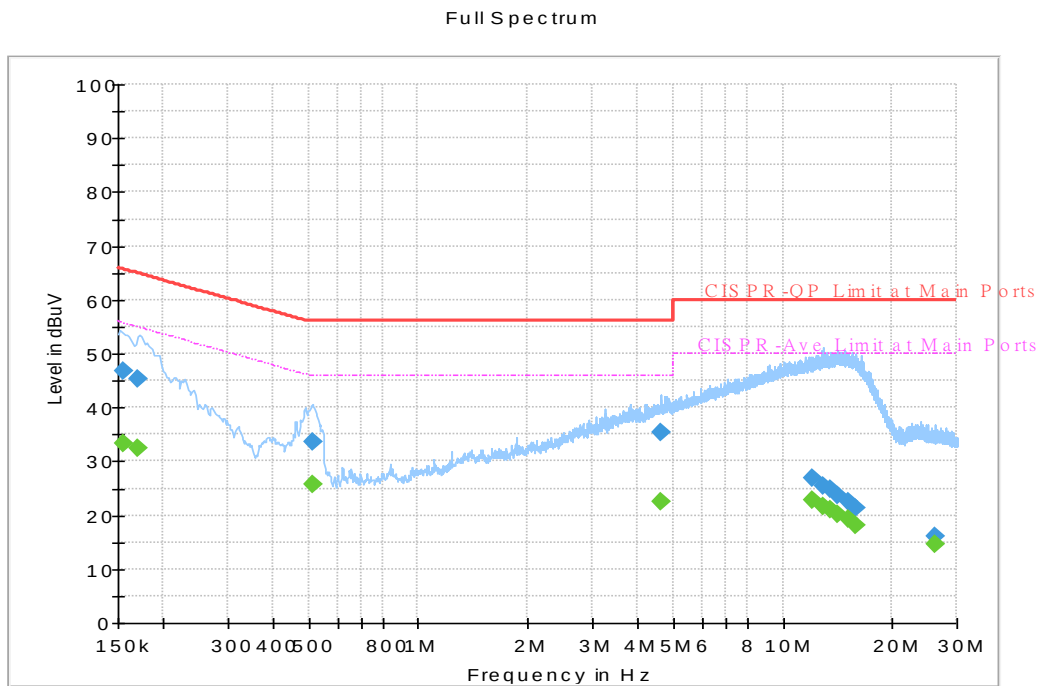
2.4GHz Band												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)			DG (dBi)		Peak PSD Limit (dBm/3kHz)		Pass/Fail
					Ant 1	Ant 2	Worse + 3.01	Ant 1	Ant 2	Ant 1	Ant 2	
11b	1Mbps	1	1	2412	-8.07	-	-	2.50	-	8.00	-	Pass
11b	1Mbps	1	6	2437	-8.03	-	-	2.50	-	8.00	-	Pass
11b	1Mbps	1	11	2462	-7.60	-	-	2.50	-	8.00	-	Pass
11g	6Mbps	1	1	2412	-17.07	-	-	2.50	-	8.00	-	Pass
11g	6Mbps	1	6	2437	-12.26	-	-	2.50	-	8.00	-	Pass
11g	6Mbps	1	11	2462	-14.19	-	-	2.50	-	8.00	-	Pass
HT20	MCS0	1	1	2412	-15.25	-	-	2.50	-	8.00	-	Pass
HT20	MCS0	1	6	2437	-11.77	-	-	2.50	-	8.00	-	Pass
HT20	MCS0	1	11	2462	-15.86	-	-	2.50	-	8.00	-	Pass

Measured power density (dBm) has offset with cable loss.



Appendix B. AC Conducted Emission Test Results

Test Engineer :	Jimmy Chang	Temperature :	24~26°C
		Relative Humidity :	51~53%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



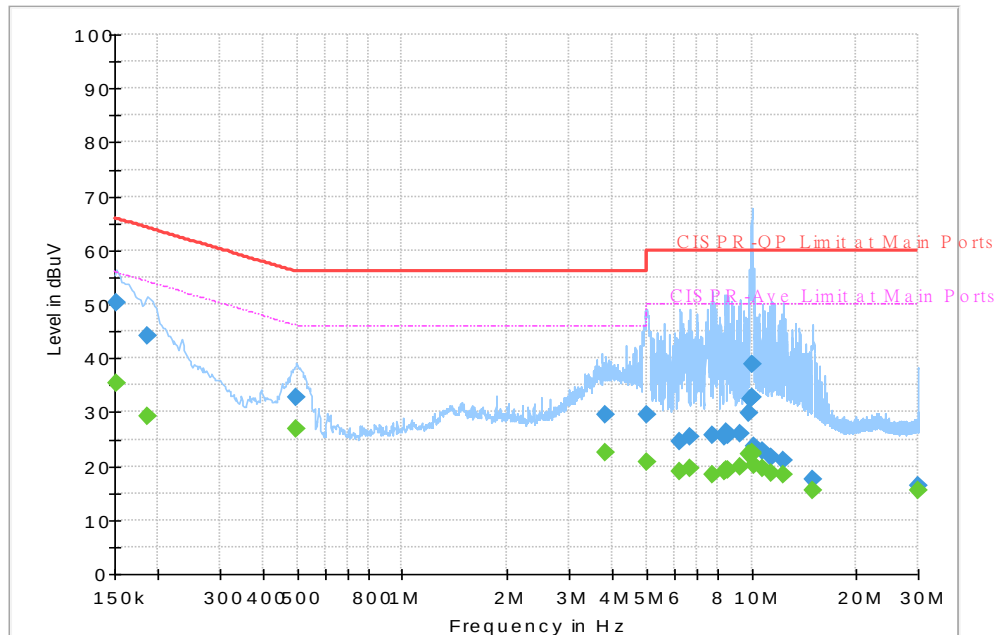
Final Result

Frequency	QuasiPeak	CAverage	Limit	Margin	Line	Filter	Corr.
0.154500	46.72	---	65.75	19.03	L1	OFF	19.5
0.154500	---	33.24	55.75	22.51	L1	OFF	19.5
0.170250	45.44	---	64.95	19.51	L1	OFF	19.5
0.170250	---	32.59	54.95	22.36	L1	OFF	19.5
0.512250	33.50	---	56.00	22.50	L1	OFF	19.5
0.512250	---	25.78	46.00	20.22	L1	OFF	19.5
4.641000	35.51	---	56.00	20.49	L1	OFF	19.6
4.641000	---	22.64	46.00	23.36	L1	OFF	19.6
12.018750	26.84	---	60.00	33.16	L1	OFF	19.7
12.018750	---	22.75	50.00	27.25	L1	OFF	19.7
12.862500	25.39	---	60.00	34.61	L1	OFF	19.7
12.862500	---	21.53	50.00	28.47	L1	OFF	19.7
13.566750	24.76	---	60.00	35.24	L1	OFF	19.7
13.566750	---	20.91	50.00	29.09	L1	OFF	19.7
14.149500	23.64	---	60.00	36.36	L1	OFF	19.7
14.149500	---	20.10	50.00	29.90	L1	OFF	19.7
15.148500	22.50	---	60.00	37.50	L1	OFF	19.8
15.148500	---	19.16	50.00	30.84	L1	OFF	19.8
15.823500	21.46	---	60.00	38.54	L1	OFF	19.8
15.823500	---	18.24	50.00	31.76	L1	OFF	19.8
26.133000	16.07	---	60.00	43.93	L1	OFF	19.8
26.133000	---	14.76	50.00	35.24	L1	OFF	19.8



Test Engineer :	Jimmy Chang	Temperature :	24~26°C
		Relative Humidity :	51~53%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

Full Spectrum

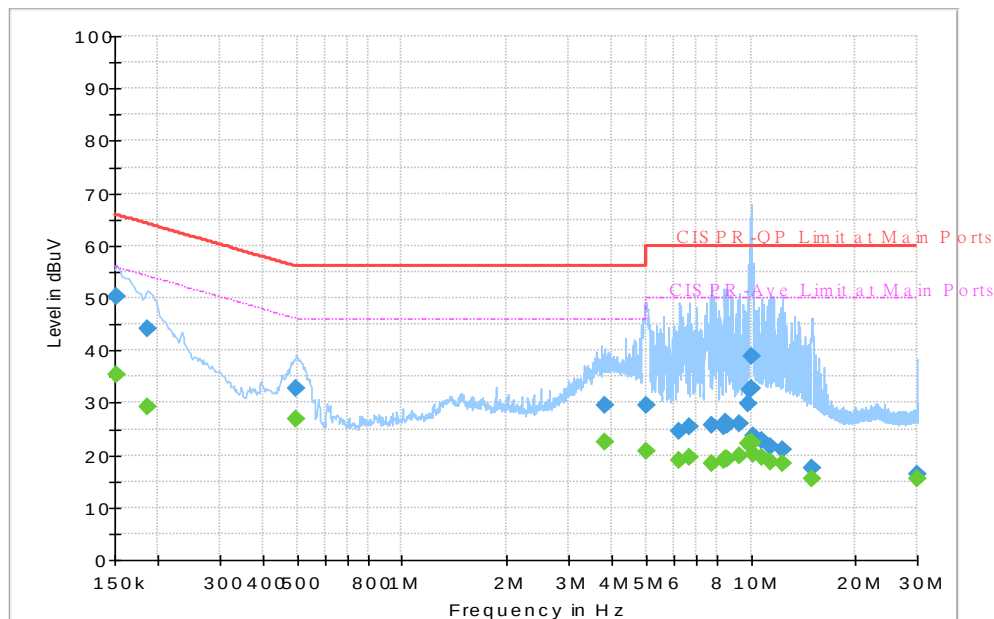
**Final Result**

Frequency	QuasiPeak	CAverage	Limit	Margin	Line	Filter	Corr.
0.152250	50.29	---	65.88	15.59	N	OFF	19.5
0.152250	---	35.42	55.88	20.46	N	OFF	19.5
0.186000	44.18	---	64.21	20.03	N	OFF	19.5
0.186000	---	29.19	54.21	25.02	N	OFF	19.5
0.498750	32.77	---	56.02	23.25	N	OFF	19.5
0.498750	---	26.78	46.02	19.24	N	OFF	19.5
3.815250	29.56	---	56.00	26.44	N	OFF	19.6
3.815250	---	22.45	46.00	23.55	N	OFF	19.6
4.998750	29.39	---	56.00	26.61	N	OFF	19.6
4.998750	---	20.75	46.00	25.25	N	OFF	19.6
6.261000	24.53	---	60.00	35.47	N	OFF	19.6
6.261000	---	18.99	50.00	31.01	N	OFF	19.6
6.668250	25.32	---	60.00	34.68	N	OFF	19.6
6.668250	---	19.60	50.00	30.40	N	OFF	19.6
7.705500	25.83	---	60.00	34.17	N	OFF	19.7
7.705500	---	18.52	50.00	31.48	N	OFF	19.7
8.412000	25.32	---	60.00	34.68	N	OFF	19.7
8.412000	---	19.14	50.00	30.86	N	OFF	19.7
8.457000	26.28	---	60.00	33.72	N	OFF	19.7
8.457000	---	19.18	50.00	30.82	N	OFF	19.7
8.551500	25.60	---	60.00	34.40	N	OFF	19.7
8.551500	---	19.18	50.00	30.82	N	OFF	19.7



Test Engineer :	Jimmy Chang	Temperature :	24~26°C
		Relative Humidity :	51~53%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

Full Spectrum

**Final Result**

Frequency	QuasiPeak	CAverage	Limit	Margin	Line	Filter	Corr.
9.249000	26.09	---	60.00	33.91	N	OFF	19.7
9.249000	---	19.95	50.00	30.05	N	OFF	19.7
9.789000	29.68	---	60.00	30.32	N	OFF	19.7
9.789000	---	22.32	50.00	27.68	N	OFF	19.7
9.924000	32.51	---	60.00	27.49	N	OFF	19.7
9.924000	---	22.24	50.00	27.76	N	OFF	19.7
10.000500	38.76	---	60.00	21.24	N	OFF	19.7
10.000500	---	22.62	50.00	27.38	N	OFF	19.7
10.077000	32.68	---	60.00	27.32	N	OFF	19.7
10.077000	---	22.16	50.00	27.84	N	OFF	19.7
10.207500	23.67	---	60.00	36.33	N	OFF	19.7
10.207500	---	20.18	50.00	29.82	N	OFF	19.7
10.745250	22.76	---	60.00	37.24	N	OFF	19.7
10.745250	---	19.54	50.00	30.46	N	OFF	19.7
11.445000	21.68	---	60.00	38.32	N	OFF	19.7
11.445000	---	18.80	50.00	31.20	N	OFF	19.7
12.288750	20.97	---	60.00	39.03	N	OFF	19.7
12.288750	---	18.33	50.00	31.67	N	OFF	19.7
15.024750	17.66	---	60.00	42.34	N	OFF	19.8
15.024750	---	15.63	50.00	34.37	N	OFF	19.8
29.998500	16.30	---	60.00	43.70	N	OFF	20.1
29.998500	---	15.46	50.00	34.54	N	OFF	20.1



Appendix C. Conducted Spurious Emission

Test Engineer :	Karl Hou	Temperature :	23~25°C
		Relative Humidity :	52~58%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBm)	Over Limit (dB)	Limit Line (dBm)	Read Level (dBm)	Antenna Gain (dBi)	Path Loss (dB)	MIMO Factor (dB)	Groun ding Factor (dB)	Peak Avg. (P/A)
802.11b CH 01 2412MHz		2375.835	-38.45	-17.25	-21.2	-43.01	2.5	2.06	0	0	P
		2389.695	-46.74	-5.54	-41.2	-51.3	2.5	2.06	0	0	A
	*	2412	13.03	-	-	8.45	2.5	2.08	0	0	P
	*	2412	10.56	-	-	5.98	2.5	2.08	0	0	A
802.11b CH 06 2437MHz		2383.64	-40.98	-19.78	-21.2	-45.54	2.5	2.06	0	0	P
		2357.74	-48.17	-6.97	-41.2	-52.71	2.5	2.04	0	0	A
	*	2437	13.13	-	-	8.55	2.5	2.08	0	0	P
	*	2437	10.66	-	-	6.08	2.5	2.08	0	0	A
		2490.48	-40.94	-19.74	-21.2	-45.55	2.5	2.11	0	0	P
		2483.5	-48.73	-7.53	-41.2	-53.33	2.5	2.1	0	0	A
802.11b CH 11 2462MHz	*	2462	12.62	-	-	8.02	2.5	2.1	0	0	P
	*	2462	10.19	-	-	5.59	2.5	2.1	0	0	A
		2486.56	-38.21	-17.01	-21.2	-42.81	2.5	2.1	0	0	P
		2484.56	-46.32	-5.12	-41.2	-50.92	2.5	2.1	0	0	A
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										



2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBm)	Over Limit (dB)	Limit Line (dBm)	Read Level (dBm)	Antenna Gain (dBi)	Path Loss (dB)	MIMO Factor (dB)	Groun ding Factor (dB)	Peak Avg. (P/A)
802.11b CH 01 2412MHz		4018.7	-45.97	-24.77	-21.2	-51.88	2.5	3.41	0	0	P
		4824	-58.74	-37.54	-21.2	-64.82	2.5	3.58	0	0	P
802.11b CH 06 2437MHz		4061.4	-46.19	-24.99	-21.2	-52.14	2.5	3.45	0	0	P
		4874	-46.47	-25.27	-21.2	-52.56	2.5	3.59	0	0	P
		7311	-63.62	-42.42	-21.2	-70.57	2.5	4.45	0	0	P
802.11b CH 11 2462MHz		4104.1	-51.7	-30.5	-21.2	-57.67	2.5	3.47	0	0	P
		4924	-41.42	-20.22	-21.2	-47.51	2.5	3.59	0	0	P
		4924	-42.29	-1.09	-41.2	-48.38	2.5	3.59	0	0	A
		7386	-71.18	-49.98	-21.2	-78.21	2.5	4.53	0	0	P
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										

2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	MIMO	Groun ding	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Factor	Avg.
1		(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dBi)	(dB)	(dB)	(dB)	(P/A)
802.11g CH 01 2412MHz		2389.59	-35.39	-14.19	-21.2	-39.95	2.5	2.06	0	0	P
		2389.905	-43.49	-2.29	-41.2	-48.05	2.5	2.06	0	0	A
	*	2412	11.01	-	-	6.43	2.5	2.08	0	0	P
	*	2412	4.37	-	-	-0.21	2.5	2.08	0	0	A
802.11g CH 06 2437MHz		2323.02	-41.59	-20.39	-21.2	-46.11	2.5	2.02	0	0	P
		2383.5	-48.13	-6.93	-41.2	-52.69	2.5	2.06	0	0	A
	*	2437	14.93	-	-	10.35	2.5	2.08	0	0	P
	*	2437	8.86	-	-	4.28	2.5	2.08	0	0	A
		2494.82	-41.2	-20	-21.2	-45.81	2.5	2.11	0	0	P
		2486.28	-47.67	-6.47	-41.2	-52.27	2.5	2.1	0	0	A
802.11g CH 11 2462MHz	*	2462	10.4	-	-	5.8	2.5	2.1	0	0	P
	*	2462	3.98	-	-	-0.62	2.5	2.1	0	0	A
		2483.92	-35.21	-14.01	-21.2	-39.81	2.5	2.1	0	0	P
		2483.64	-42.46	-1.26	-41.2	-47.06	2.5	2.1	0	0	A
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										

**2.4GHz 2400~2483.5MHz****WIFI 802.11g (Harmonic)**

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBm)	Over Limit (dB)	Limit Line (dBm)	Read Level (dBm)	Antenna Gain (dBi)	Path Loss (dB)	MIMO Factor (dB)	Groun ding Factor (dB)	Peak Avg. (P/A)
802.11g CH 01 2412MHz		4018.7	-47.67	-26.47	-21.2	-53.58	2.5	3.41	0	0	P
		4824	-63.77	-42.57	-21.2	-69.85	2.5	3.58	0	0	P
802.11g CH 06 2437MHz		4061	-42.96	-21.76	-21.2	-48.91	2.5	3.45	0	0	P
		4061	-49.99	-8.79	-41.2	-55.94	2.5	3.45	0	0	A
		4874	-47.86	-26.66	-21.2	-53.95	2.5	3.59	0	0	P
		7311	-61.58	-40.38	-21.2	-68.53	2.5	4.45	0	0	P
802.11g CH 11 2462MHz		4104.1	-50.91	-29.71	-21.2	-56.88	2.5	3.47	0	0	P
		4924	-52.86	-31.66	-21.2	-58.95	2.5	3.59	0	0	P
		7386	-73.3	-52.1	-21.2	-80.33	2.5	4.53	0	0	P
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										



2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	MIMO	Groun ding	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Factor	Avg.
1		(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dBi)	(dB)	(dB)	(dB)	(P/A)
802.11n		2388.75	-31.54	-10.34	-21.2	-36.1	2.5	2.06	0	0	P
HT20		2389.905	-42.22	-1.02	-41.2	-46.78	2.5	2.06	0	0	A
CH 01	*	2412	9.78	-	-	5.2	2.5	2.08	0	0	P
2412MHz	*	2412	3.17	-	-	-1.41	2.5	2.08	0	0	A
802.11n		2389.94	-38.82	-17.62	-21.2	-43.38	2.5	2.06	0	0	P
		2387.7	-48.26	-7.06	-41.2	-52.82	2.5	2.06	0	0	A
HT20	*	2437	14.5	-	-	9.92	2.5	2.08	0	0	P
CH 06	*	2437	8.02	-	-	3.44	2.5	2.08	0	0	A
2437MHz		2485.02	-40.36	-19.16	-21.2	-44.96	2.5	2.1	0	0	P
		2485.37	-47.61	-6.41	-41.2	-52.21	2.5	2.1	0	0	A
802.11n	*	2462	10.1	-	-	5.5	2.5	2.1	0	0	P
HT20	*	2462	3.41	-	-	-1.19	2.5	2.1	0	0	A
CH 11		2483.84	-32.93	-11.73	-21.2	-37.53	2.5	2.1	0	0	P
2462MHz		2483.76	-41.68	-0.48	-41.2	-46.28	2.5	2.1	0	0	A
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										



2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBm)	Over Limit (dB)	Limit Line (dBm)	Read Level (dBm)	Antenna Gain (dBi)	Path Loss (dB)	MIMO Factor (dB)	Groun ding Factor (dB)	Peak Avg. (P/A)
802.11n HT20 CH 01 2412MHz		4018.7	-46.63	-25.43	-21.2	-52.54	2.5	3.41	0	0	P
		4824	-63.1	-41.9	-21.2	-69.18	2.5	3.58	0	0	P
802.11n HT20 CH 06 2437MHz		4061	-43.92	-22.72	-21.2	-49.87	2.5	3.45	0	0	P
		4061	-50.86	-9.66	-41.2	-56.81	2.5	3.45	0	0	A
		4874	-49.69	-28.49	-21.2	-55.78	2.5	3.59	0	0	P
		7311	-59.84	-38.64	-21.2	-66.79	2.5	4.45	0	0	P
802.11n HT20 CH 11 2462MHz		4104.1	-50.64	-29.44	-21.2	-56.61	2.5	3.47	0	0	P
		4924	-50.83	-29.63	-21.2	-56.92	2.5	3.59	0	0	P
		7386	-71.89	-50.69	-21.2	-78.92	2.5	4.53	0	0	P
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										



Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	MIMO	Grounding	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Factor	Avg.
1		(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dBi)	(dB)	(dB)	(dB)	(P/A)
2.4GHz 802.11n HT20 LF		45.12	-77.09	-21.89	-55.2	-84.55	2.5	0.26	0	4.7	P
		185.25	-75.24	-23.54	-51.7	-83.15	2.5	0.71	0	4.7	P
		232.5	-75.3	-26.1	-49.2	-83.19	2.5	0.69	0	4.7	P
		437.2	-75.59	-26.39	-49.2	-83.67	2.5	0.88	0	4.7	P
		640.9	-73.12	-23.92	-49.2	-81.41	2.5	1.09	0	4.7	P
		822.9	-69.89	-20.69	-49.2	-78.39	2.5	1.3	0	4.7	P
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										



Note symbol

*	Fundamental Frequency which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is over limit line.
P/A	Peak or Average



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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	MIMO	Grounding	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Factor	Avg.
1		(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dBi)	(dB)	(dB)	(dB)	(P/A)
802.11b		2386.545	-39.03	-17.83	-21.2	-44.06	2	3.03	0	0	P
CH 01											
2412MHz		2386.125	-48.1	-6.9	-41.2	-53.13	2	3.03	0	0	A

1. Level(dBm) =

Antenna Gain(dBi) + Path Loss(dB) + Read Level(dBm) + MIMO Factor(dB) + Grounding Factor(dB)

2. Over Limit(dB) = Level(dBm) – Limit Line(dBm)

For Peak Limit @ 2386.545MHz:

1. Level(dBm)

= Antenna Gain(dBi) + Path Loss(dB) + Read Level(dBm) + MIMO Factor(dB) + Grounding Factor(dB)

= 2(dB) + 3.03(dB) – 44.06(dBm)

= -39.03(dBm)

2. Over Limit(dB)

= Level(dBm) – Limit Line(dBm)

= -39.03(dBm) + 21.2(dBm)

= -17.83(dB)

For Average Limit @ 2386.125MHz:

1. Level(dBm)

= Antenna Gain(dBi) + Path Loss(dB) + Read Level(dBm) + MIMO Factor(dB) + Grounding Factor(dB)

= 2(dBi) + 3.03(dB) – 53.13(dBm)

= -48.1(dBm)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -6.9(dB)

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



Appendix D. Conducted Spurious Emission Plots

Test Engineer :	Karl Hou	Temperature :	23~25°C
		Relative Humidity :	52~58%

Note symbol

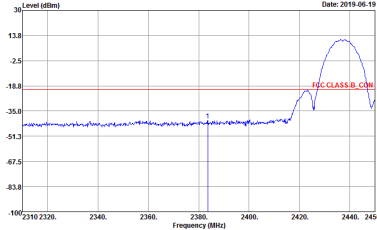
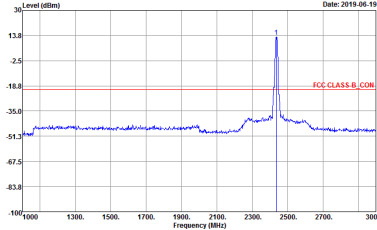
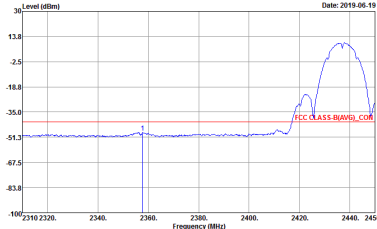
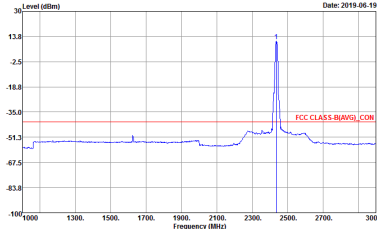
-L	Low channel location
-R	High channel location



2.4GHz 2400~2483.5MHz
WIFI 802.11b (Band Edge)

WIFI	2.4GHz 2400~2483.5MHz Band Edge	
ANT	802.11b CH01 2412MHz	
1	CSE	Fundamental
Peak	Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 8D1930 Mode : 1 Setting : 0	Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 8D1930 Mode : 1 Setting : 0
Avg.	Site : 03CH15-HY Condition : FCC CLASS-B(AVG)_CON ANT_GAIN+2.5 HORIZONTAL RBW:1000.000kHz VBW:3.000kHz SWT:Auto Detector : Peak Project : 8D1930 Mode : 1 Setting : 0	Site : 03CH15-HY Condition : FCC CLASS-B(AVG)_CON ANT_GAIN+2.5 HORIZONTAL RBW:1000.000kHz VBW:3.000kHz SWT:Auto Detector : Peak Project : 8D1930 Mode : 1 Setting : 0

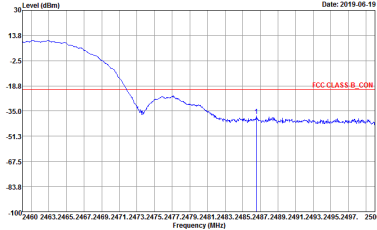
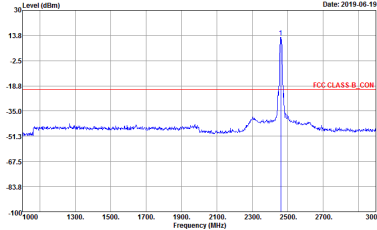
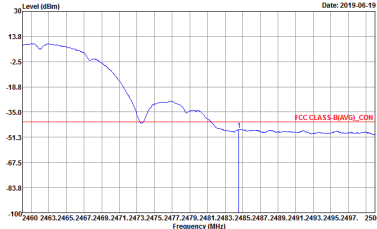
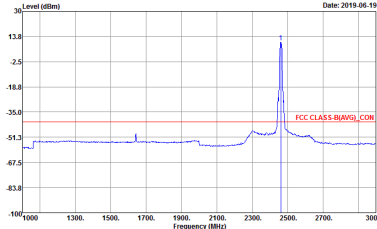


WIFI	2.4GHz 2400~2483.5MHz Band Edge	
ANT	802.11b CH06 2437MHz - L	
1	CSE	Fundamental
Peak	 Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 2 Setting : 0	 Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 2 Setting : 0
Avg.	 Site : 03CH15-HY Condition : FCC CLASS-B_AVG_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 2 Setting : 0	 Site : 03CH15-HY Condition : FCC CLASS-B_AVG_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 2 Setting : 0



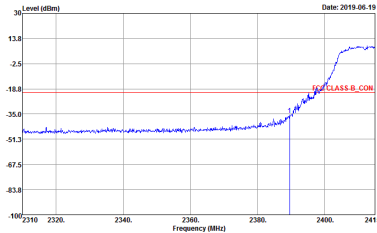
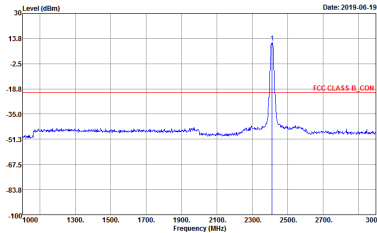
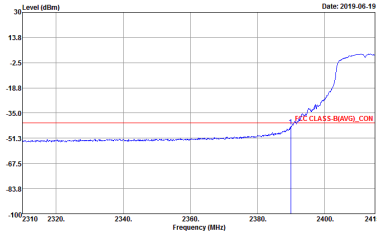
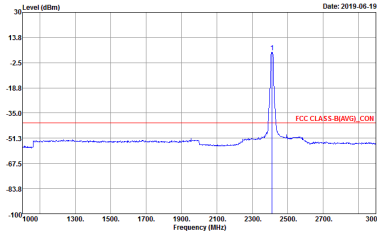
WIFI	2.4GHz 2400~2483.5MHz Band Edge	
ANT	802.11b CH06 2437MHz - R	
1	CSE	Fundamental
Peak	Site : 63CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : Peak Mode : 2 Setting : 0	Left blank
Avg.	Site : 63CH15-HY Condition : FCC CLASS-B(AVG)_CON ANT_GAIN+2.5 HORIZONTAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : Peak Mode : 2 Setting : 0	Left blank



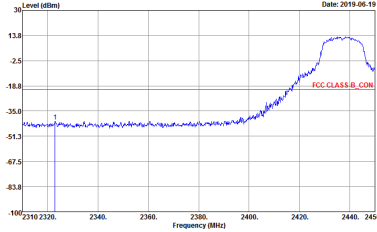
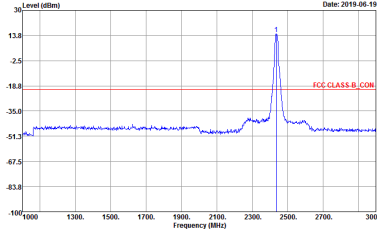
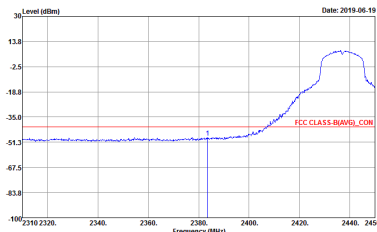
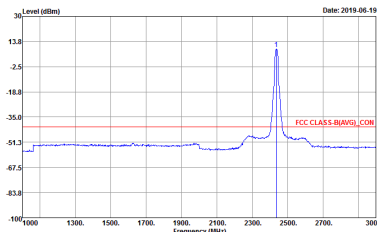
WIFI	2.4GHz 2400~2483.5MHz Band Edge	
ANT	802.11b CH11 2462MHz	
1	CSE	Fundamental
Peak	 Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 3 Setting : 0	 Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 3 Setting : 0
Avg.	 Site : 03CH15-HY Condition : FCC CLASS-B(AVG)_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 3 Setting : 0	 Site : 03CH15-HY Condition : FCC CLASS-B(AVG)_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 3 Setting : 0



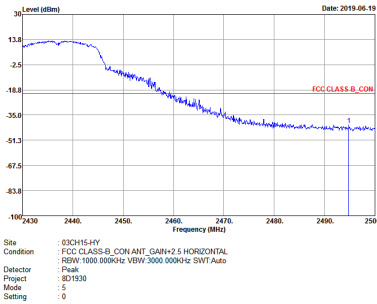
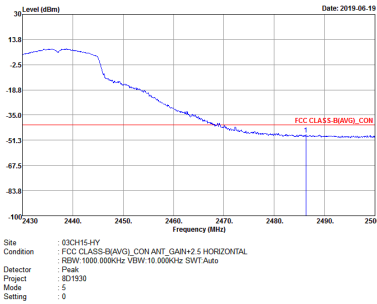
2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge)

WIFI	2.4GHz 2400~2483.5MHz Band Edge	
ANT	802.11g CH01 2412MHz	
1	CSE	Fundamental
Peak	 Site : 03CH15-HY Condition : FCC CLASS-B, CON ANT_GAIN+2.5 HORIZONTAL REBW: 1000.000kHz VBW: 3000.000kHz SWT: Auto Detector : Peak Project : 8D1930 Mode : 4 Setting : 0	 Site : 03CH15-HY Condition : FCC CLASS-B, CON ANT_GAIN+2.5 HORIZONTAL REBW: 1000.000kHz VBW: 3000.000kHz SWT: Auto Detector : Peak Project : 8D1930 Mode : 4 Setting : 0
Avg.	 Site : 03CH15-HY Condition : FCC CLASS-B(AVG), CON ANT_GAIN+2.5 HORIZONTAL REBW: 1000.000kHz VBW: 10.000kHz SWT: Auto Detector : Peak Project : 8D1930 Mode : 4 Setting : 0	 Site : 03CH15-HY Condition : FCC CLASS-B(AVG), CON ANT_GAIN+2.5 HORIZONTAL REBW: 1000.000kHz VBW: 10.000kHz SWT: Auto Detector : Peak Project : 8D1930 Mode : 4 Setting : 0



WIFI	2.4GHz 2400~2483.5MHz Band Edge	
ANT	802.11g CH06 2437MHz - L	
1	CSE	Fundamental
Peak	 Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 5 Setting : 0	 Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 5 Setting : 0
Avg.	 Site : 03CH15-HY Condition : FCC CLASS-B(AVG)_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 5 Setting : 0	 Site : 03CH15-HY Condition : FCC CLASS-B(AVG)_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 5 Setting : 0



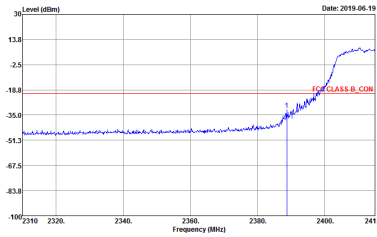
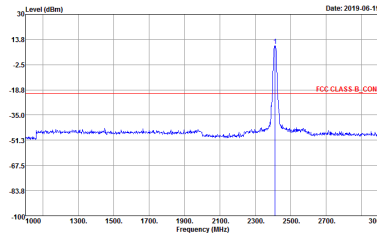
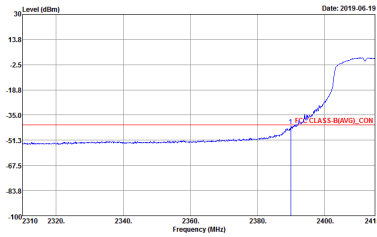
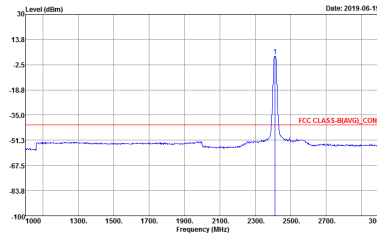
WIFI	2.4GHz 2400~2483.5MHz Band Edge	
ANT	802.11g CH06 2437MHz - R	
1	CSE	Fundamental
Peak	 Site : 63CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : BD1530 Mode : S Setting : 0	Left blank
Avg.	 Site : 63CH15-HY Condition : FCC CLASS-B(AVG)_CON ANT_GAIN+2.5 HORIZONTAL RBW:1000.000kHz VBW:10.000kHz SWT:Auto Detector : Peak Project : BD1530 Mode : S Setting : 0	Left blank



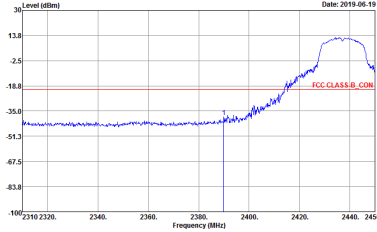
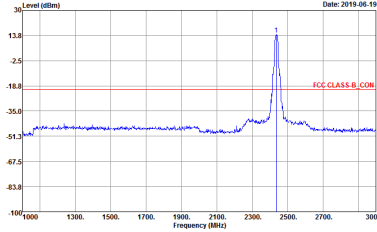
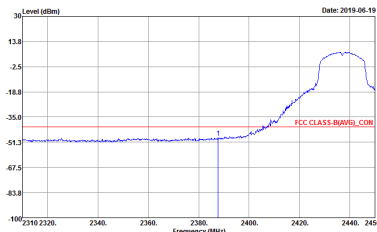
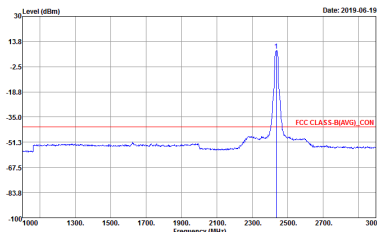
WIFI	2.4GHz 2400~2483.5MHz Band Edge	
ANT	802.11g CH11 2462MHz	
1	CSE	Fundamental
Peak	Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 6 Setting : 0	Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 6 Setting : 0
Avg.	Site : 03CH15-HY Condition : FCC CLASS-B(AVG) CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 6 Setting : 0	Site : 03CH15-HY Condition : FCC CLASS-B(AVG) CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 6 Setting : 0



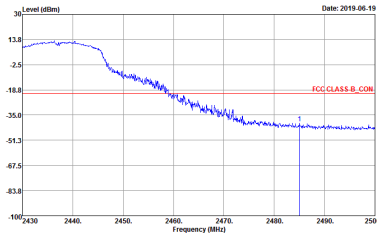
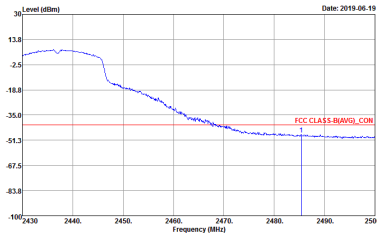
2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Band Edge)

WIFI	2.4GHz 2400~2483.5MHz Band Edge	
ANT	802.11n HT20 CH01 2412MHz	
1	CSE	Fundamental
Peak	 Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : REW 1000 0000Hz VBW 3000 0000Hz SWT Auto Project : Peak Mode : 7 Setting : 0	 Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : REW 1000 0000Hz VBW 3000 0000Hz SWT Auto Project : Peak Mode : 7 Setting : 0
Avg.	 Site : 03CH15-HY Condition : FCC CLASS-B_AVG_CON ANT_GAIN+2.5 HORIZONTAL Detector : REW 1000 0000Hz VBW 10 0000Hz SWT Auto Project : Peak Mode : 7 Setting : 0	 Site : 03CH15-HY Condition : FCC CLASS-B_AVG_CON ANT_GAIN+2.5 HORIZONTAL Detector : REW 1000 0000Hz VBW 10 0000Hz SWT Auto Project : Peak Mode : 7 Setting : 0

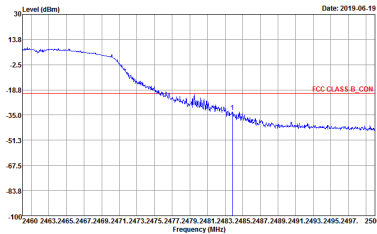
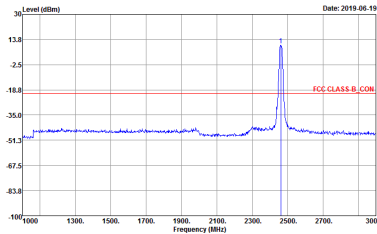
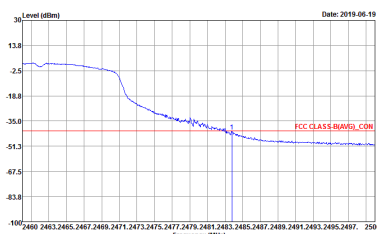
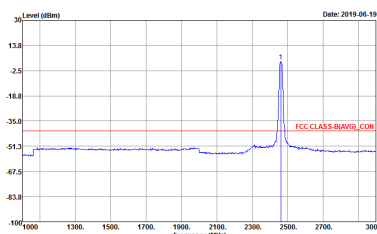


WIFI	2.4GHz 2400~2483.5MHz Band Edge	
ANT	802.11n HT20 CH06 2437MHz - L	
1	CSE	Fundamental
Peak	 Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 801930 Mode : 8 Setting : 0	 Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 801930 Mode : 8 Setting : 0
Avg.	 Site : 03CH15-HY Condition : FCC CLASS-B_AVG_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 801930 Mode : 8 Setting : 0	 Site : 03CH15-HY Condition : FCC CLASS-B_AVG_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 801930 Mode : 8 Setting : 0



WIFI	2.4GHz 2400~2483.5MHz Band Edge	
ANT	802.11n HT20 CH06 2437MHz - R	
1	CSE	Fundamental
Peak	 Site : 63CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : BD1530 Mode : S Setting : 0	Left blank
Avg.	 Site : 63CH15-HY Condition : FCC CLASS-B(AVG)_CON ANT_GAIN+2.5 HORIZONTAL RBW:1000.000kHz VBW:10.000kHz SWT:Auto Detector : Peak Project : BD1530 Mode : S Setting : 0	Left blank

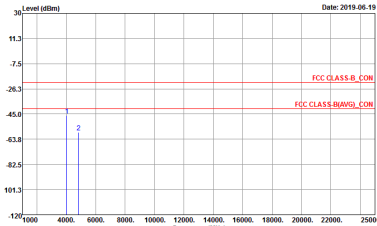
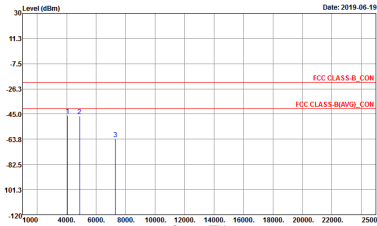


WIFI	2.4GHz 2400~2483.5MHz Band Edge	
ANT	802.11n HT20 CH11 2462MHz	
1	CSE	Fundamental
Peak	 Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 9 Setting : 0	 Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 9 Setting : 0
Avg.	 Site : 03CH15-HY Condition : FCC CLASS-B(AVG)_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 9 Setting : 0	 Site : 03CH15-HY Condition : FCC CLASS-B(AVG)_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 9 Setting : 0

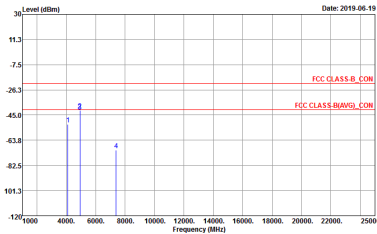


2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic)

WIFI	2.4GHz 2400~2483.5MHz Harmonic	
ANT	802.11b	
1	CH01 2412MHz	CH06 2437MHz
Peak Avg.	 Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GARH+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 1 Setting : 0	 Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GARH+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 2 Setting : 0



WIFI	2.4GHz 2400~2483.5MHz Harmonic	
ANT	802.11b	
1	CH11 2462MHz	-
Peak Avg.	 Site : 02CH1544Y Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 0219130 Mode : 3 Setting : 0	Left blank

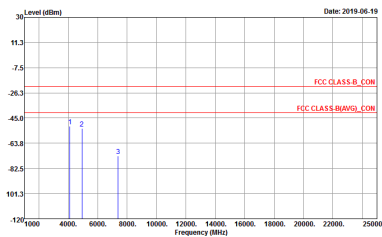


2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic)

WIFI	2.4GHz 2400~2483.5MHz Harmonic	
ANT	802.11g	
1	CH01 2412MHz	CH06 2437MHz
Peak Avg.	Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAR+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 4 Setting : 0	Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GAR+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 5 Setting : 0



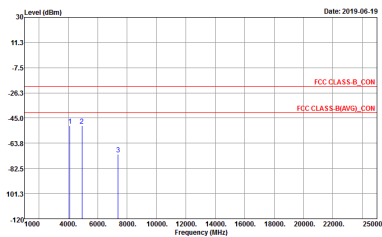
WIFI	2.4GHz 2400~2483.5MHz Harmonic	
ANT	802.11g	
1	CH11 2462MHz	-
Peak Avg.	 Site : 02CH154NY Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 0313130 Mode : 6 Setting : 0	Left blank



2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Harmonic)

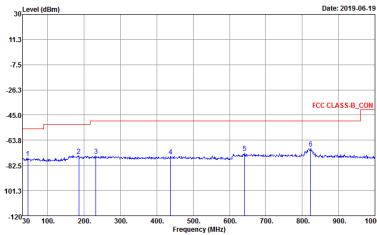
WIFI	2.4GHz 2400~2483.5MHz Harmonic	
ANT	802.11n HT20	
1	CH01 2412MHz	CH06 2437MHz
Peak Avg.	Level (dBm) Date: 2019-06-19 Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GARH+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 7 Setting : 0	Level (dBm) Date: 2019-06-19 Site : 03CH15-HY Condition : FCC CLASS-B_CON ANT_GARH+2.5 HORIZONTAL Detector : Peak Project : 8D1930 Mode : 8 Setting : 0



WIFI	2.4GHz 2400~2483.5MHz Harmonic	
ANT	802.11n HT20	
1	CH11 2462MHz	-
Peak Avg.	 Site : 02CH1544Y Condition : FCC CLASS-B_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 0219130 Mode : 0 Setting : 0	Left blank



Emission below 1GHz
2.4GHz WIFI 802.11n HT20 (LF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11n HT20	
1	LF	-
QP / Peak	 Site : 02CH544Y Condition : FCC CLASS B_CON ANT_GAIN+2.5 HORIZONTAL Detector : Peak Project : 821930 Mode : 10 Setting : 0	Left blank



Appendix E. Cabinet Radiated Spurious Emission

Test Engineer :	Karl Hou, Big Show Wang	Temperature :	23~26°C
		Relative Humidity :	50~65%

**2.4GHz 2400~2483.5MHz****WIFI 802.11b (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.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2350.32	53.86	-20.14	74	41.06	27.7	16.11	31.01	100	305	P	H
		2352.105	44.58	-9.42	54	31.81	27.67	16.11	31.01	100	305	A	H
	*	2412	76.19	-	-	63.39	27.6	16.18	30.98	100	305	P	H
	*	2412	72.65	-	-	59.85	27.6	16.18	30.98	100	305	A	H
		2332.995	53.81	-20.19	74	40.98	27.77	16.08	31.02	333	261	P	V
		2314.305	44.63	-9.37	54	31.77	27.83	16.06	31.03	333	261	A	V
	*	2412	77.2	-	-	64.4	27.6	16.18	30.98	333	261	P	V
	*	2412	73.71	-	-	60.91	27.6	16.18	30.98	333	261	A	V
802.11b CH 06 2437MHz		2347.38	53.93	-20.07	74	41.14	27.7	16.1	31.01	100	302	P	H
		2341.92	44.58	-9.42	54	31.8	27.7	16.09	31.01	100	302	A	H
	*	2437	77.1	-	-	64.26	27.6	16.21	30.97	100	302	P	H
	*	2437	73.84	-	-	61	27.6	16.21	30.97	100	302	A	H
		2490.55	52.57	-21.43	74	39.85	27.4	16.26	30.94	100	302	P	H
		2500	44.29	-9.71	54	31.56	27.4	16.27	30.94	100	302	A	H
		2314.62	54.52	-19.48	74	41.66	27.83	16.06	31.03	369	262	P	V
		2336.74	44.89	-9.11	54	32.12	27.7	16.09	31.02	369	262	A	V
	*	2437	76.68	-	-	63.84	27.6	16.21	30.97	369	262	P	V
	*	2437	73.25	-	-	60.41	27.6	16.21	30.97	369	262	A	V
		2492.37	52.97	-21.03	74	40.25	27.4	16.26	30.94	369	262	P	V
		2493.14	44.16	-9.84	54	31.44	27.4	16.26	30.94	369	262	A	V



802.11b CH 11 2462MHz	*	2462	76.59	-	-	63.79	27.53	16.23	30.96	100	299	P	H
	*	2462	73.18	-	-	60.38	27.53	16.23	30.96	100	299	A	H
		2493	53.23	-20.77	74	40.51	27.4	16.26	30.94	100	299	P	H
		2485.04	44.6	-9.4	54	31.82	27.47	16.26	30.95	100	299	A	H
	*	2462	75.72	-	-	62.92	27.53	16.23	30.96	362	260	P	V
	*	2462	72.1	-	-	59.3	27.53	16.23	30.96	362	260	A	V
		2487.28	53.58	-20.42	74	40.8	27.47	16.26	30.95	362	260	P	V
		2494.88	44.68	-9.32	54	31.96	27.4	16.26	30.94	362	260	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI Ant. 1	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)
802.11b CH 01 2412MHz		4020	46	-28	74	67.43	29.73	8.9	60.06	100	0	P	H
		4824	45.16	-28.84	74	63.43	31.3	9.59	59.16	100	0	P	H
		4020	54.4	-19.6	74	75.83	29.73	8.9	60.06	348	194	P	V
		4020	49.67	-4.33	54	71.1	29.73	8.9	60.06	348	194	A	V
		4824	54.75	-19.25	74	73.02	31.3	9.59	59.16	364	138	P	V
		4824	51.42	-2.58	54	69.69	31.3	9.59	59.16	364	138	A	V
802.11b CH 06 2437MHz		4061	47.85	-26.15	74	69.12	29.8	8.91	59.98	100	0	P	H
		4874	48.29	-25.71	74	66.58	31.3	9.58	59.17	100	0	P	H
		7311	44.94	-29.06	74	56.26	36.2	11.66	59.18	100	0	P	H
		4061	54.18	-19.82	74	75.45	29.8	8.91	59.98	303	203	P	V
		4061	49.35	-4.65	54	70.62	29.8	8.91	59.98	303	203	A	V
		4874	55.68	-18.32	74	73.97	31.3	9.58	59.17	357	149	P	V
		4874	51.71	-2.29	54	70	31.3	9.58	59.17	357	149	A	V
		7311	47.6	-26.4	74	58.92	36.2	11.66	59.18	100	0	P	V
802.11b CH 11 2462MHz		4103	48.44	-25.56	74	69.6	29.8	8.93	59.89	100	0	P	H
		4924	49.33	-24.67	74	67.57	31.37	9.57	59.18	100	0	P	H
		7386	45.37	-28.63	74	56.35	36.5	11.67	59.15	100	0	P	H
		4103	53.81	-20.19	74	74.97	29.8	8.93	59.89	314	207	P	V
		4103	48.92	-5.08	54	70.08	29.8	8.93	59.89	314	207	A	V
		4924	55.58	-18.42	74	73.82	31.37	9.57	59.18	394	149	P	V
		4924	52.55	-1.45	54	70.79	31.37	9.57	59.18	394	149	A	V
		7386	47.77	-26.23	74	58.75	36.5	11.67	59.15	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
WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 1	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)
802.11g CH 01 2412MHz		2383.92	54.19	-19.81	74	41.4	27.63	16.15	30.99	100	304	P	H
		2315.775	46.09	-7.91	54	33.22	27.83	16.06	31.02	100	304	A	H
	*	2412	73.82	-	-	61.02	27.6	16.18	30.98	100	304	P	H
	*	2412	66.53	-	-	53.73	27.6	16.18	30.98	100	304	A	H
		2324.28	53.99	-20.01	74	41.17	27.77	16.07	31.02	343	260	P	V
		2380.245	46.21	-7.79	54	33.44	27.63	16.14	31	343	260	A	V
	*	2412	74.19	-	-	61.39	27.6	16.18	30.98	343	260	P	V
	*	2412	67.68	-	-	54.88	27.6	16.18	30.98	343	260	A	V
802.11g CH 06 2437MHz		2338.42	53.4	-20.6	74	40.62	27.7	16.09	31.01	100	300	P	H
		2341.36	46.11	-7.89	54	33.33	27.7	16.09	31.01	100	300	A	H
	*	2437	78.85	-	-	66.01	27.6	16.21	30.97	100	300	P	H
	*	2437	72.3	-	-	59.46	27.6	16.21	30.97	100	300	A	H
		2488.52	53.63	-20.37	74	40.92	27.4	16.26	30.95	100	300	P	H
		2485.58	45.73	-8.27	54	32.95	27.47	16.26	30.95	100	300	A	H
		2371.74	53.88	-20.12	74	41.12	27.63	16.13	31	327	263	P	V
		2364.88	46.27	-7.73	54	33.48	27.67	16.12	31	327	263	A	V
	*	2437	78.16	-	-	65.32	27.6	16.21	30.97	327	263	P	V
	*	2437	72.02	-	-	59.18	27.6	16.21	30.97	327	263	A	V
		2485.37	54.45	-19.55	74	41.67	27.47	16.26	30.95	327	263	P	V
		2496.01	45.93	-8.07	54	33.2	27.4	16.27	30.94	327	263	A	V



802.11g CH 11 2462MHz	*	2462	74.52	-	-	61.72	27.53	16.23	30.96	100	297	P	H
	*	2462	66.92	-	-	54.12	27.53	16.23	30.96	100	297	A	H
		2495.16	53.45	-20.55	74	40.72	27.4	16.27	30.94	100	297	P	H
		2491.84	46.04	-7.96	54	33.32	27.4	16.26	30.94	100	297	A	H
	*	2462	72.95	-	-	60.15	27.53	16.23	30.96	352	262	P	V
	*	2462	66.09	-	-	53.29	27.53	16.23	30.96	352	262	A	V
		2493.36	53.33	-20.67	74	40.61	27.4	16.26	30.94	352	262	P	V
		2497	46.06	-7.94	54	33.33	27.4	16.27	30.94	352	262	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI Ant. 1	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)
802.11g CH 01 2412MHz		4020	45.51	-28.49	74	66.94	29.73	8.9	60.06	100	0	P	H
		4824	38.5	-35.5	74	56.77	31.3	9.59	59.16	100	0	P	H
		4020	54.11	-19.89	74	75.54	29.73	8.9	60.06	302	195	P	V
		4020	46.71	-7.29	54	68.14	29.73	8.9	60.06	302	195	A	V
		4824	43.18	-30.82	74	61.45	31.3	9.59	59.16	100	0	P	V
802.11g CH 06 2437MHz		4061	46.49	-27.51	74	67.76	29.8	8.91	59.98	100	0	P	H
		4874	44.48	-29.52	74	62.77	31.3	9.58	59.17	100	0	P	H
		7311	46.15	-27.85	74	57.47	36.2	11.66	59.18	100	0	P	H
		4061	54.8	-19.2	74	76.07	29.8	8.91	59.98	321	213	P	V
		4061	47.84	-6.16	54	69.11	29.8	8.91	59.98	321	213	A	V
		4874	48.96	-25.04	74	67.25	31.3	9.58	59.17	100	0	P	V
		7311	48.28	-25.72	74	59.6	36.2	11.66	59.18	100	0	P	V
802.11g CH 11 2462MHz		4095	45.51	-28.49	74	66.69	29.8	8.93	59.91	100	0	P	H
		4924	38.29	-35.71	74	56.53	31.37	9.57	59.18	100	0	P	H
		7386	42.64	-31.36	74	53.62	36.5	11.67	59.15	100	0	P	H
		4095	48.15	-25.85	74	69.33	29.8	8.93	59.91	100	0	P	V
		4924	42.16	-31.84	74	60.4	31.37	9.57	59.18	100	0	P	V
		7386	43.28	-30.72	74	54.26	36.5	11.67	59.15	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

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	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)
802.11n HT20 CH 01 2412MHz		2378.46	53.48	-20.52	74	40.71	27.63	16.14	31	328	300	P	H
		2344.65	46.16	-7.84	54	33.37	27.7	16.1	31.01	328	300	A	H
	*	2412	74.16	-	-	61.36	27.6	16.18	30.98	328	300	P	H
	*	2412	67.35	-	-	54.55	27.6	16.18	30.98	328	300	A	H
		2373.525	53.93	-20.07	74	41.16	27.63	16.14	31	348	261	P	V
		2343.915	46.23	-7.77	54	33.44	27.7	16.1	31.01	348	261	A	V
	*	2412	73.7	-	-	60.9	27.6	16.18	30.98	348	261	P	V
	*	2412	66.43	-	-	53.63	27.6	16.18	30.98	348	261	A	V
802.11n HT20 CH 06 2437MHz		2344.3	53.59	-20.41	74	40.8	27.7	16.1	31.01	324	298	P	H
		2326.24	46.2	-7.8	54	33.38	27.77	16.07	31.02	324	298	A	H
	*	2437	78.72	-	-	65.88	27.6	16.21	30.97	324	298	P	H
	*	2437	71.59	-	-	58.75	27.6	16.21	30.97	324	298	A	H
		2495.87	53.03	-20.97	74	40.3	27.4	16.27	30.94	324	298	P	H
		2499.37	45.69	-8.31	54	32.96	27.4	16.27	30.94	324	298	A	H
		2376.5	53.65	-20.35	74	40.88	27.63	16.14	31	367	263	P	V
		2364.46	46.05	-7.95	54	33.26	27.67	16.12	31	367	263	A	V
	*	2437	76.87	-	-	64.03	27.6	16.21	30.97	367	263	P	V
	*	2437	69.77	-	-	56.93	27.6	16.21	30.97	367	263	A	V
		2491.32	53.61	-20.39	74	40.89	27.4	16.26	30.94	367	263	P	V
		2486.21	45.9	-8.1	54	33.12	27.47	16.26	30.95	367	263	A	V



802.11n HT20 CH 11 2462MHz	*	2462	73.93	-	-	61.13	27.53	16.23	30.96	280	297	P	H
	*	2462	66.79	-	-	53.99	27.53	16.23	30.96	280	297	A	H
		2496.64	53.38	-20.62	74	40.65	27.4	16.27	30.94	280	297	P	H
		2498	45.93	-8.07	54	33.2	27.4	16.27	30.94	280	297	A	H
	*	2462	72.72	-	-	59.92	27.53	16.23	30.96	360	262	P	V
	*	2462	65.59	-	-	52.79	27.53	16.23	30.96	360	262	A	V
		2496.24	53.48	-20.52	74	40.75	27.4	16.27	30.94	360	262	P	V
		2488.44	46.11	-7.89	54	33.4	27.4	16.26	30.95	360	262	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1	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)
802.11n HT20 CH 01 2412MHz		4020	43.2	-30.8	74	64.63	29.73	8.9	60.06	100	0	P	H
		4824	37.62	-36.38	74	55.89	31.3	9.59	59.16	100	0	P	H
		4020	49.07	-24.93	74	70.5	29.73	8.9	60.06	100	0	P	V
		4824	43.2	-30.8	74	61.47	31.3	9.59	59.16	100	0	P	V
802.11n HT20 CH 06 2437MHz		4061	45.57	-28.43	74	66.84	29.8	8.91	59.98	100	0	P	H
		4874	41.76	-32.24	74	60.05	31.3	9.58	59.17	100	0	P	H
		7311	43.74	-30.26	74	55.06	36.2	11.66	59.18	100	0	P	H
		4061	53.91	-20.09	74	75.18	29.8	8.91	59.98	300	214	P	V
		4061	47.14	-6.86	54	68.41	29.8	8.91	59.98	300	214	A	V
		4874	46.9	-27.1	74	65.19	31.3	9.58	59.17	100	0	P	V
		7311	47.35	-26.65	74	58.67	36.2	11.66	59.18	100	0	P	V
802.11n HT20 CH 11 2462MHz		4095	43.38	-30.62	74	64.56	29.8	8.93	59.91	100	0	P	H
		4924	38.54	-35.46	74	56.78	31.37	9.57	59.18	100	0	P	H
		7386	43.21	-30.79	74	54.19	36.5	11.67	59.15	100	0	P	H
		4095	47.3	-26.7	74	68.48	29.8	8.93	59.91	100	0	P	V
		4924	41.78	-32.22	74	60.02	31.37	9.57	59.18	100	0	P	V
		7386	43.1	-30.9	74	54.08	36.5	11.67	59.15	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 WIFI 802.11b (LF)**

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	QP	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/Q)	(H/V)
2.4GHz 802.11b LF		95.96	41.99	-1.51	43.5	57.78	15.4	1.33	32.52	204	30	Q	H
		296.75	41.69	-4.31	46	52.69	19.24	2.3	32.54	100	320	Q	H
		526.64	36.87	-9.13	46	42.35	24.1	3	32.58	169	41	Q	H
		719.67	33.13	-12.87	46	34.85	27.18	3.46	32.36	-	-	P	H
		824.43	32.04	-13.96	46	32.16	28.19	3.76	32.07	-	-	P	H
		943.74	33.03	-12.97	46	29.73	30.52	4.05	31.27	-	-	P	H
		95.96	37.33	-6.17	43.5	53.12	15.4	1.33	32.52	100	0	P	V
		263.77	27.58	-18.42	46	37.89	20	2.21	32.52	-	-	P	V
		385.99	35.51	-10.49	46	44.18	21.34	2.54	32.55	-	-	P	V
		519.85	32.48	-13.52	46	37.99	24.1	2.97	32.58	-	-	P	V
		785.63	30.66	-15.34	46	30.85	28.39	3.65	32.23	-	-	P	V
		872.93	32.26	-13.74	46	31.15	29	3.91	31.8	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Note symbol

*	Fundamental Frequency which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is over limit line.
P/A/Q	P eak or A verage or Q uasi-Peak
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		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		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 F. Cabinet Radiated Spurious Emission Plots

Test Engineer :	Karl Hou, Big Show Wang	Temperature :	23~26°C
		Relative Humidity :	50~65%

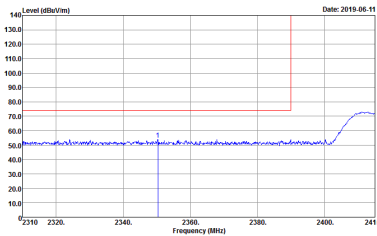
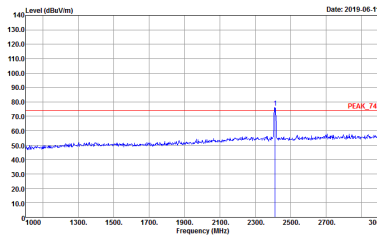
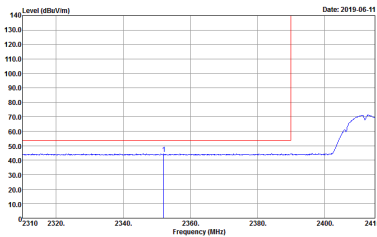
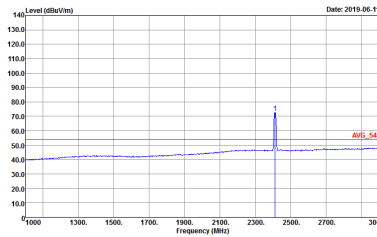
Note symbol

-L	Low channel location
-R	High channel location



2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Vertical	Fundamental
Peak	Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak

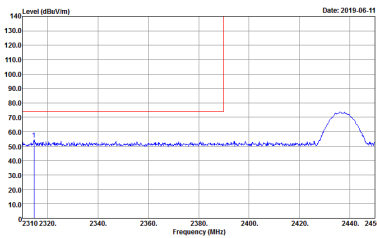
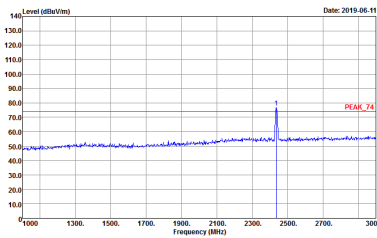
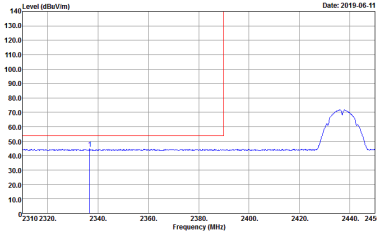
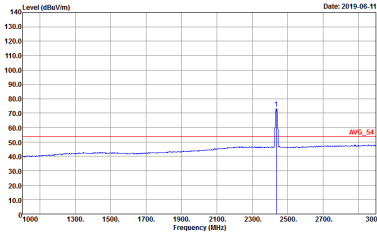


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak

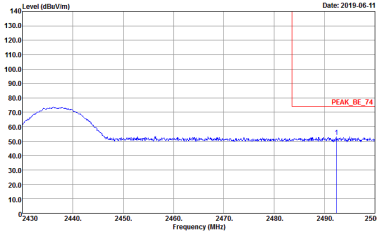
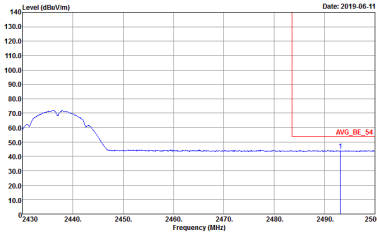


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak	Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left blank
Avg.	Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	Left blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left blank
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Fundamental
Peak	Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak

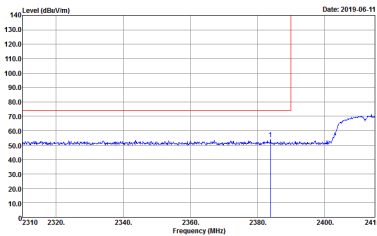
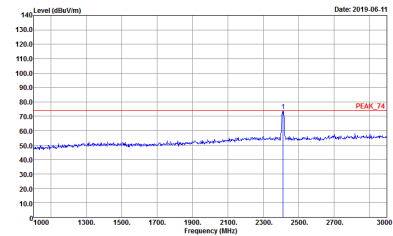
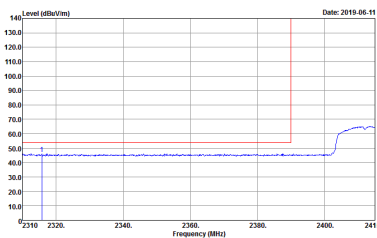
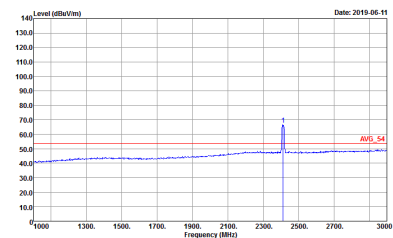


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Vertical	Fundamental
Peak	Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak

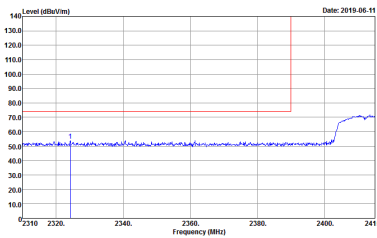
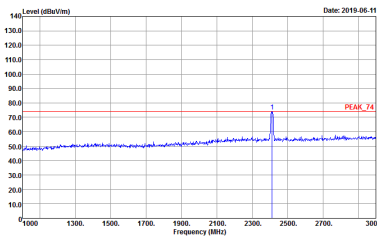
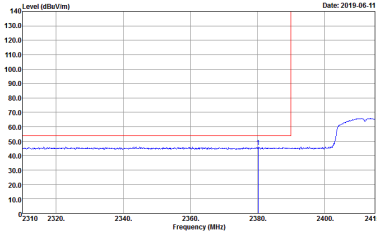
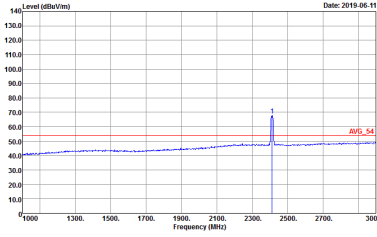


2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

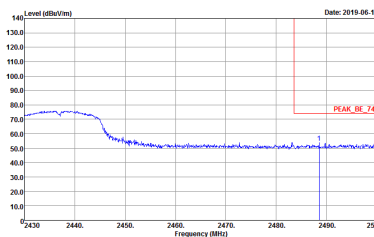
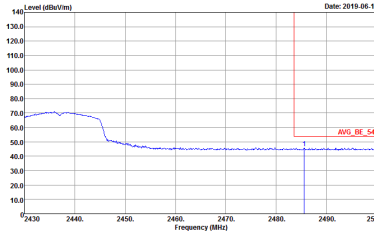
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:30.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:30.000KHz SWT:Auto Detector : Peak



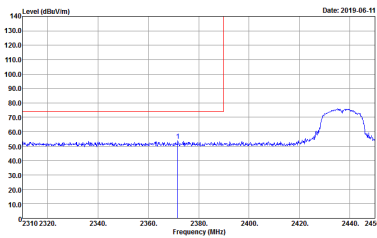
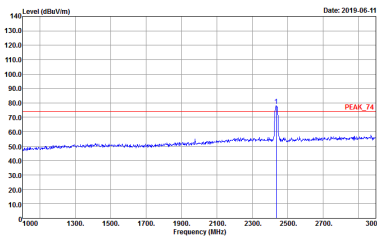
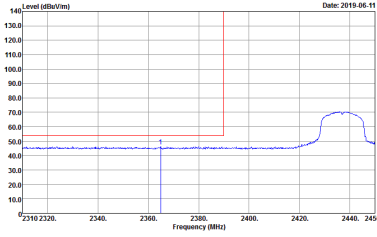
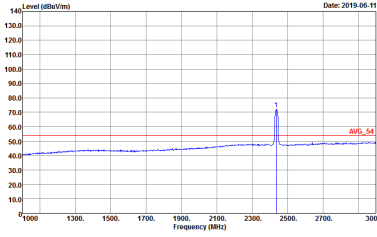
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL Detector : RBW:1000.000KHz VBW:30.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 VERTICAL Detector : RBW:1000.000KHz VBW:30.000KHz SWT:Auto Detector : Peak



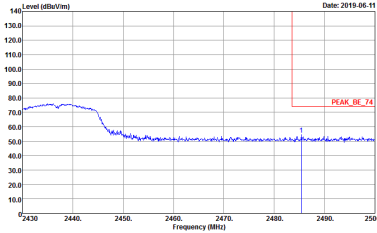
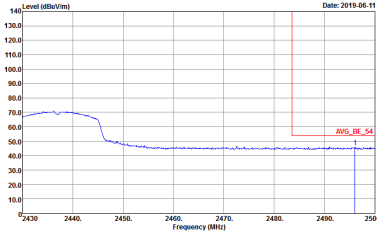
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:30.000KHz SWT:Auto Detector : Peak	Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:30.000KHz SWT:Auto Detector : Peak

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left blank
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL Detector : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Project : 8D1930 Mode : 5	Left blank

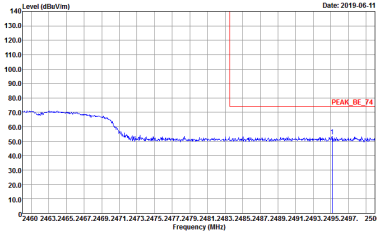
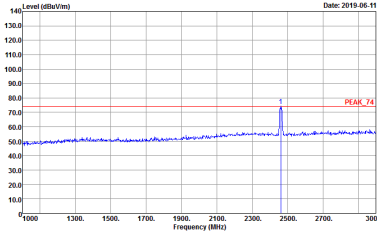
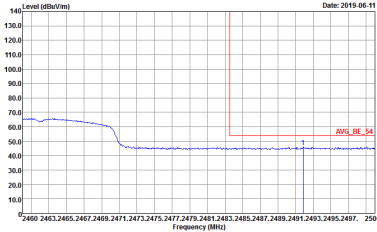
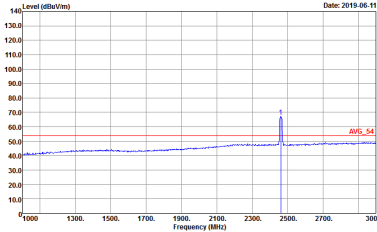


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:30.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:30.000KHz SWT:Auto Detector : Peak



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left Blank
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left Blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:30.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:30.000KHz SWT:Auto Detector : Peak

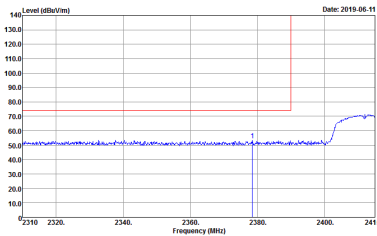
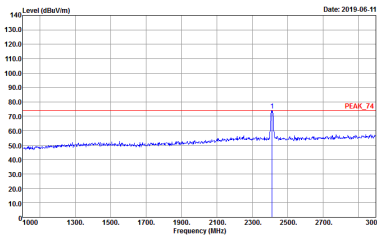
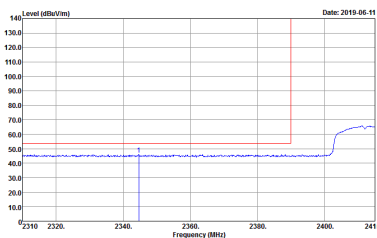
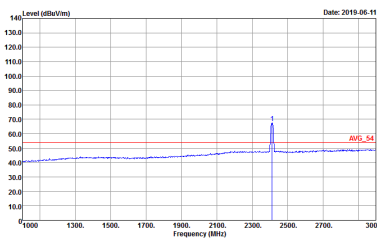


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Vertical	Fundamental
Peak	Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak

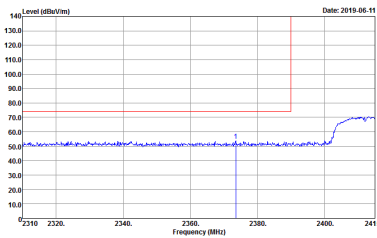
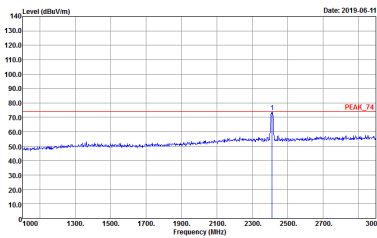
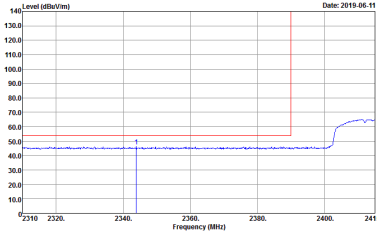
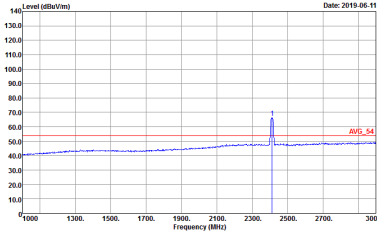


2.4GHz 2400~2483.5MHz

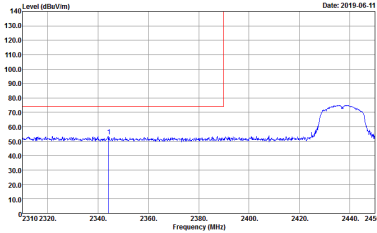
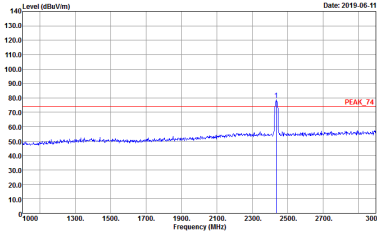
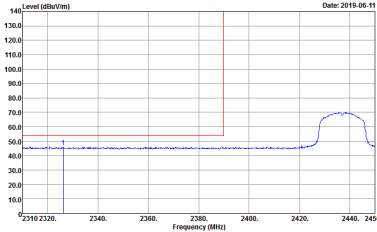
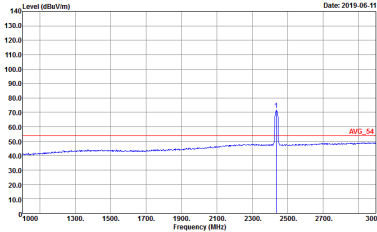
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak

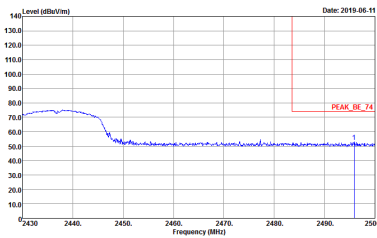
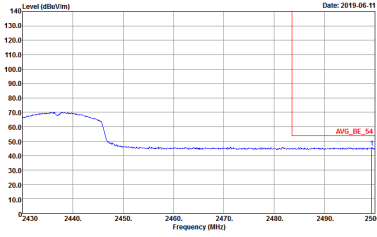


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak

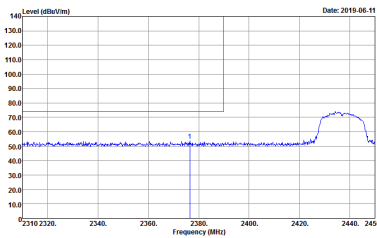
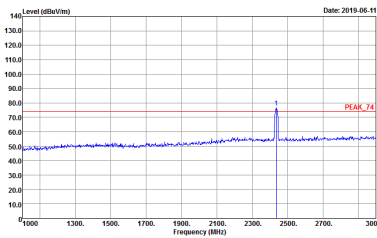
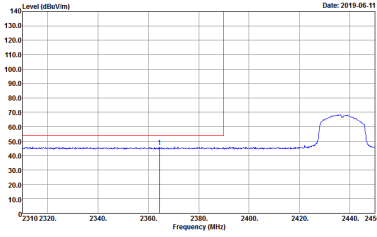
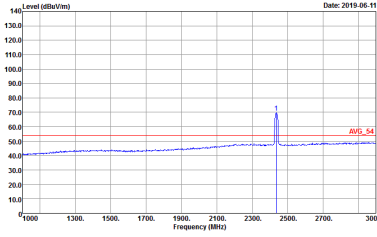


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:30.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:30.000KHz SWT:Auto Detector : Peak

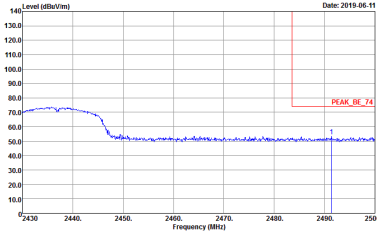
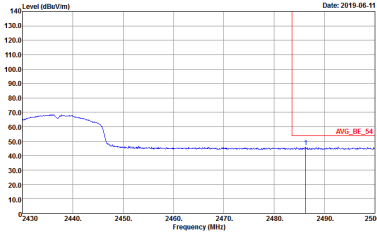


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto : Peak	Left blank
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto : Peak	Left blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak

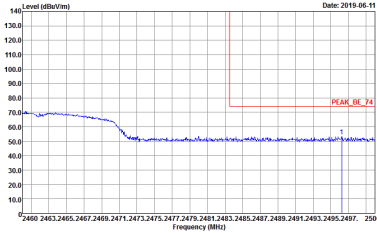
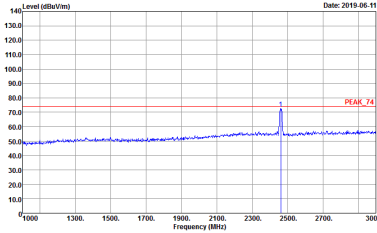
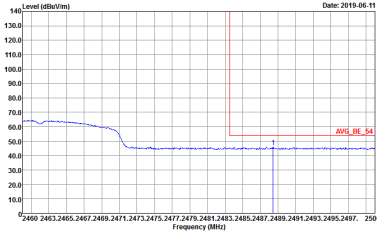
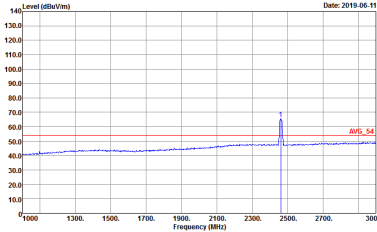


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left Blank
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left Blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Fundamental
Peak	Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:30.000KHz SWT:Auto Detector : Peak	Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:30.000KHz SWT:Auto Detector : Peak

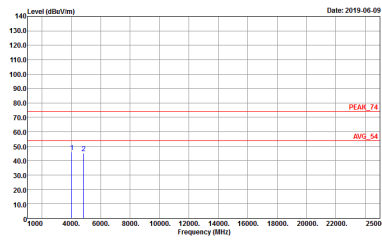
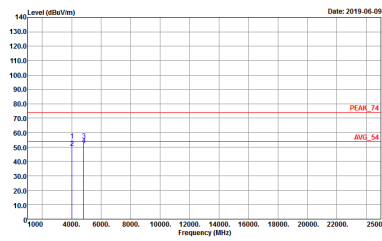


WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:30.000KHz SWT:Auto Detector : Peak	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:30.000KHz SWT:Auto Detector : Peak



2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 HORIZONTAL Detector : Peak	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL Detector : Peak



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2019-06-09 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 HORIZONTAL Detector : Peak	Level (dBuV/m) Date: 2019-06-09 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL Detector : Peak

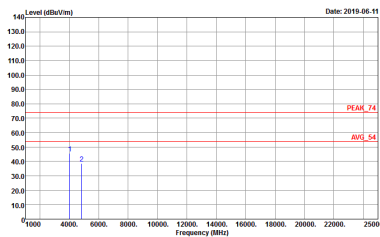
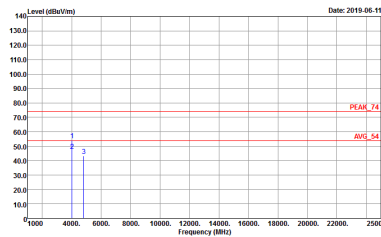


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 HORIZONTAL Detector : Peak	Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL Detector : Peak



2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL Detector : Peak	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL Detector : Peak



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.	Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 HORIZONTAL Detector : Peak	Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL Detector : Peak

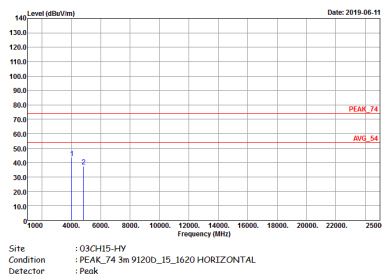
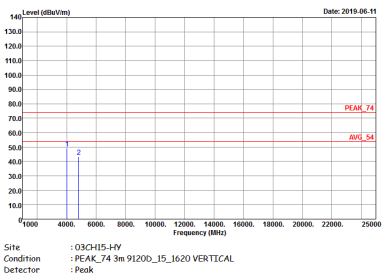


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	Horizontal spectrum plot showing Level (dBuV/m) vs Frequency (MHz). The plot displays three distinct peaks labeled 1, 2, and 3. A red line indicates the Peak level at approximately 74 dBuV/m, and another red line indicates the Average level at approximately 54 dBuV/m. The x-axis ranges from 4000 to 25000 MHz, and the y-axis ranges from 10.0 to 140.0 dBuV/m. Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL Detector : Peak	Vertical spectrum plot showing Level (dBuV/m) vs Frequency (MHz). The plot displays three distinct peaks labeled 1, 2, and 3. A red line indicates the Peak level at approximately 74 dBuV/m, and another red line indicates the Average level at approximately 54 dBuV/m. The x-axis ranges from 4000 to 25000 MHz, and the y-axis ranges from 10.0 to 140.0 dBuV/m. Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL Detector : Peak



2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

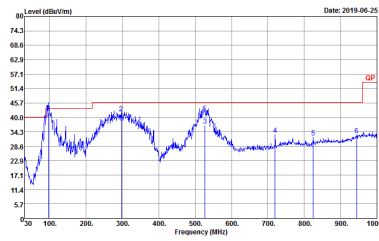
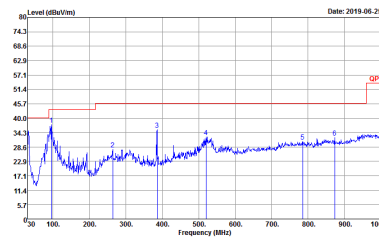


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.	Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 HORIZONTAL Detector : Peak	Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL Detector : Peak



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 HORIZONTAL Detector : Peak	Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL Detector : Peak

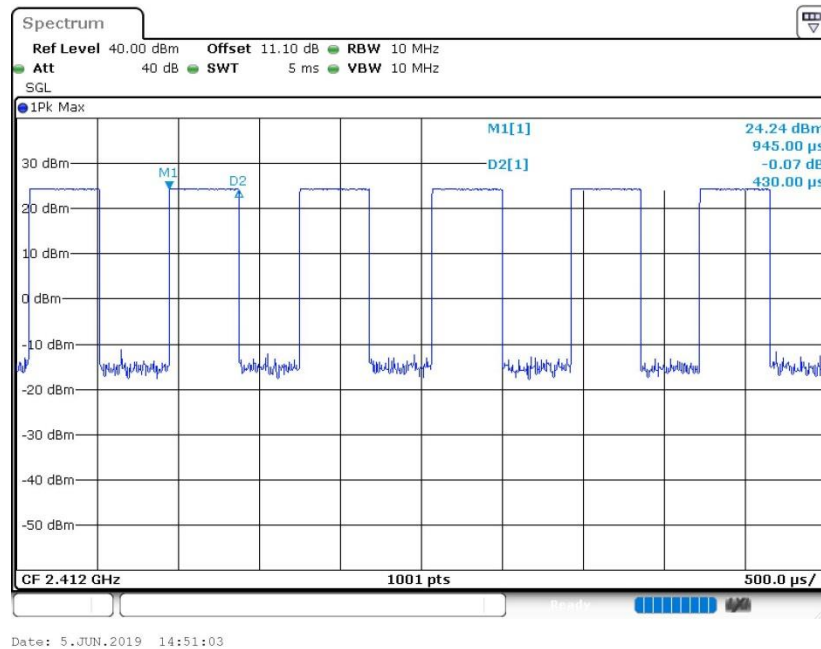
Emission below 1GHz
2.4GHz WIFI 802.11b (LF)

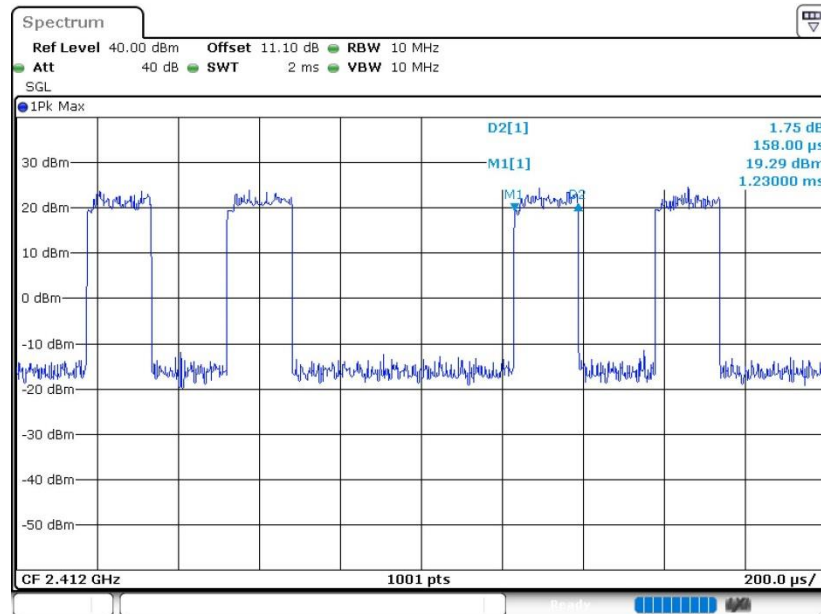
WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11b LF	
1	Horizontal	Vertical
QP / Peak	 Site : 03CH15-HY Condition : QP 3m 81LOG_15_41912 HORIZONTAL Detector : Peak	 Site : 03CH15-HY Condition : QP 3m 81LOG_15_41912 VERTICAL Detector : Peak

Appendix G. Duty Cycle Plots

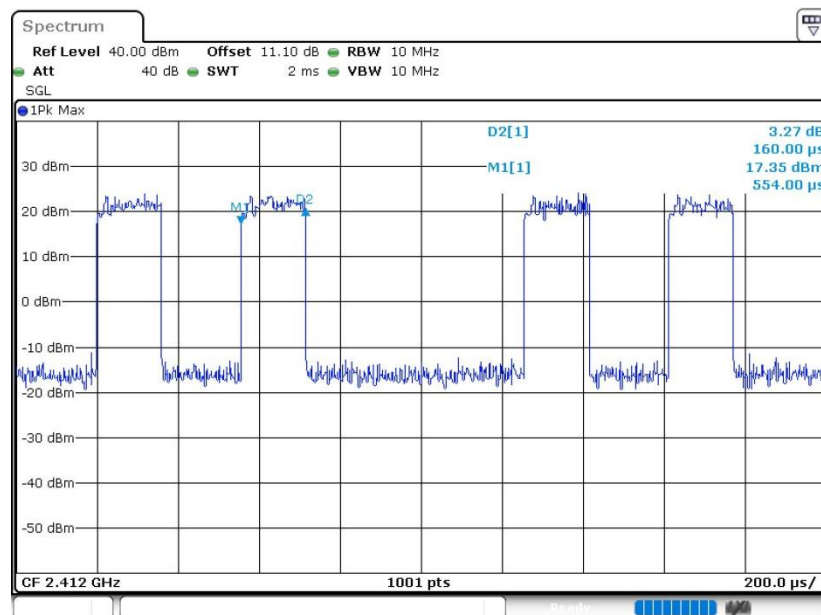
Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
802.11b	51.00	430	2.33	3kHz
802.11g	30.60	158	6.33	10kHz
802.11n HT20	30.60	160	6.25	10kHz

802.11b



802.11g


Date: 5.JUN.2019 14:55:02

802.11n HT20


Date: 5.JUN.2019 14:58:36