



FCC RF Test Report

APPLICANT : SHARP CORPORATION
EQUIPMENT : Smart phone
FCC ID : APYHRO00262
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Mar. 24, 2018 and testing was completed on Apr. 21, 2018. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

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

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR832404C	Rev. 01	Initial issue of report	Apr. 27, 2018



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	99% Bandwidth	-	Pass	-
3.2	15.247(b)	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.88 dB at 2390.000 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 3.42 dB at 0.177 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

SHARP CORPORATION

2-13-1, HACHIHONMATSU-IIDA, HIGASHI-HIROSHIMA-SHI, HIROSHIMA PREFECTURE 739-0192, Japan

1.2 Manufacturer

SHARP CORPORATION

2-13-1, HACHIHONMATSU-IIDA, HIGASHI-HIROSHIMA-SHI, HIROSHIMA PREFECTURE 739-0192, Japan

1.3 Product Feature of Equipment Under Test

GSM/WCDMA/LTE, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, and GNSS.

Product Specification subjective to this standard	
Antenna Type	WWAN: Monopole Antenna WLAN: Monopole Antenna Bluetooth: Monopole Antenna GPS / Glonass : Monopole Antenna

1.4 Modification of EUT

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



1.5 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1190 and TW0007 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan 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

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

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd Rd. Guishan Dist, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855	
Test Site No.	Sporton Site No.	
	03CH12-HY	

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

1.6 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
- ♦ 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 (Y 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		



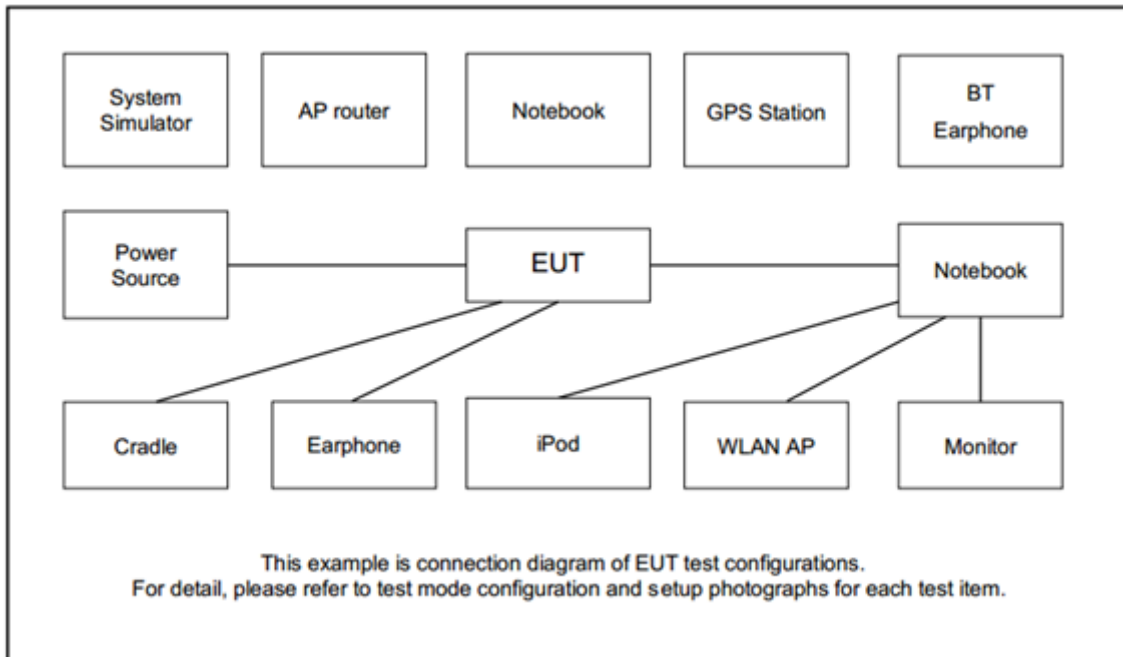
2.2 Test Mode

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 : GSM1900 Idle + Bluetooth Link + WLAN (2.4GHz) Link + GPS Rx + Alarm Function + Earphone + USB Cable (Charging from Adapter)

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.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
3.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
4.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
5.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
6.	NoteBook	Lenovo	E335	N/A	N/A	N/A
7.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A
8.	US Adapter	Salcomp	AD-18WU	N/A	N/A	N/A
9.	USB Cable	FIT	CUDU01B-FA 204-DH	N/A	Shielded 1.0m	N/A



2.5 EUT Operation Test Setup

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

2.6 Measurement Results Explanation Example

For all conducted test items:

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

Example:

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

Offset = RF cable loss + attenuator factor.

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

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

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

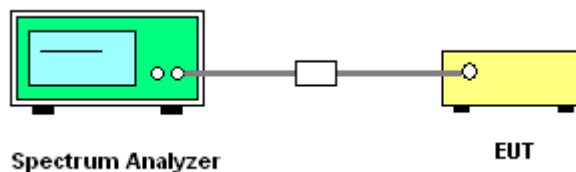
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v04.
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) = 1MHz and set the Video bandwidth (VBW) = 3MHz.
6. Measure and record the results in the test report.

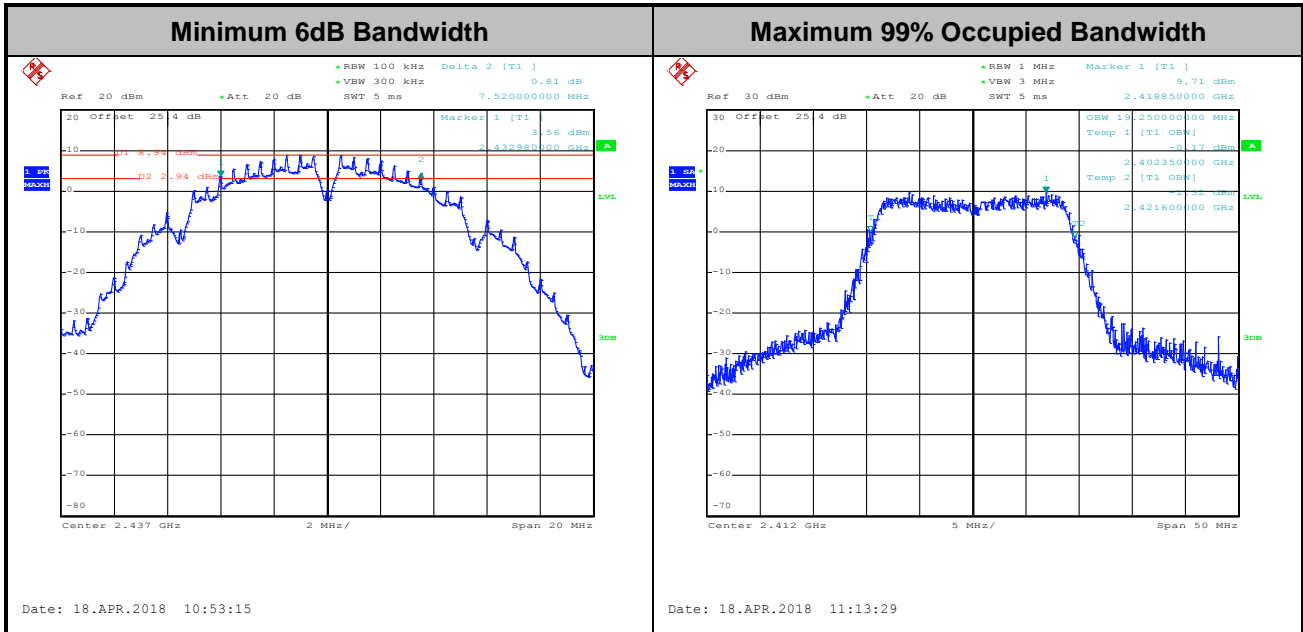
3.1.4 Test Setup





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.

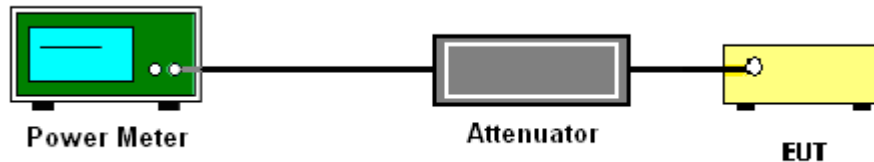
3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v04 section 9.1.3 PKPM1 Peak power meter method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 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.

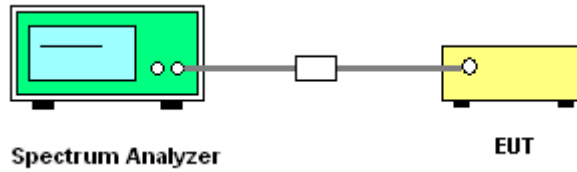
3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

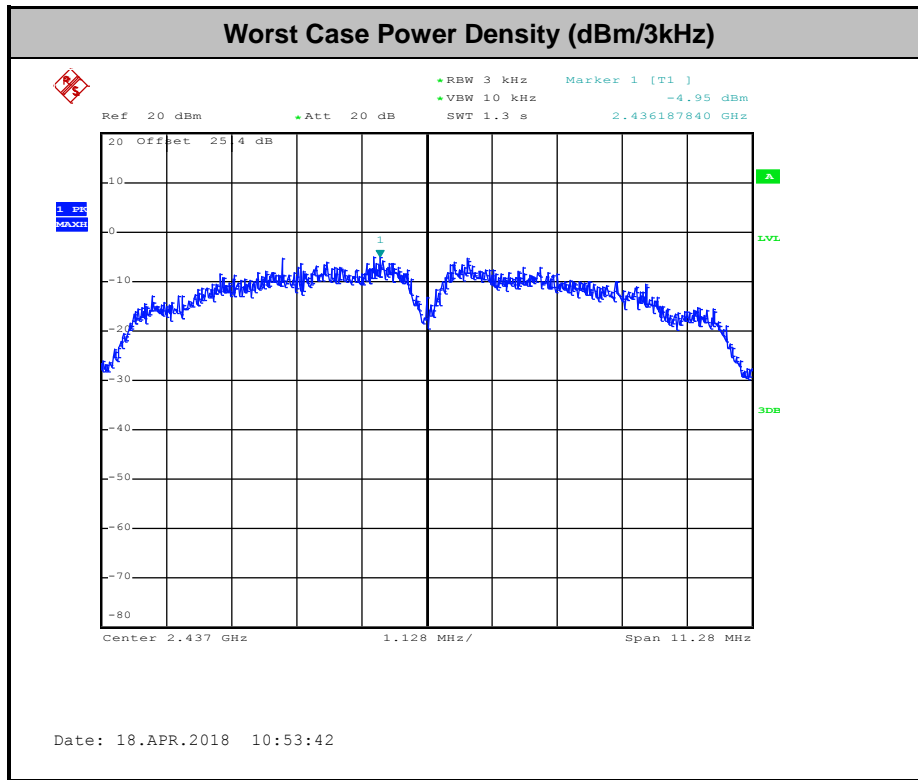
1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum 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.

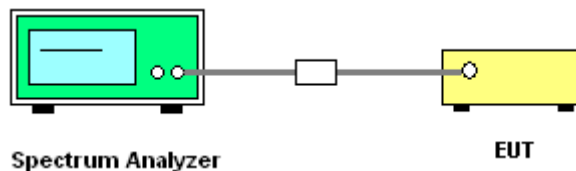
3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
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

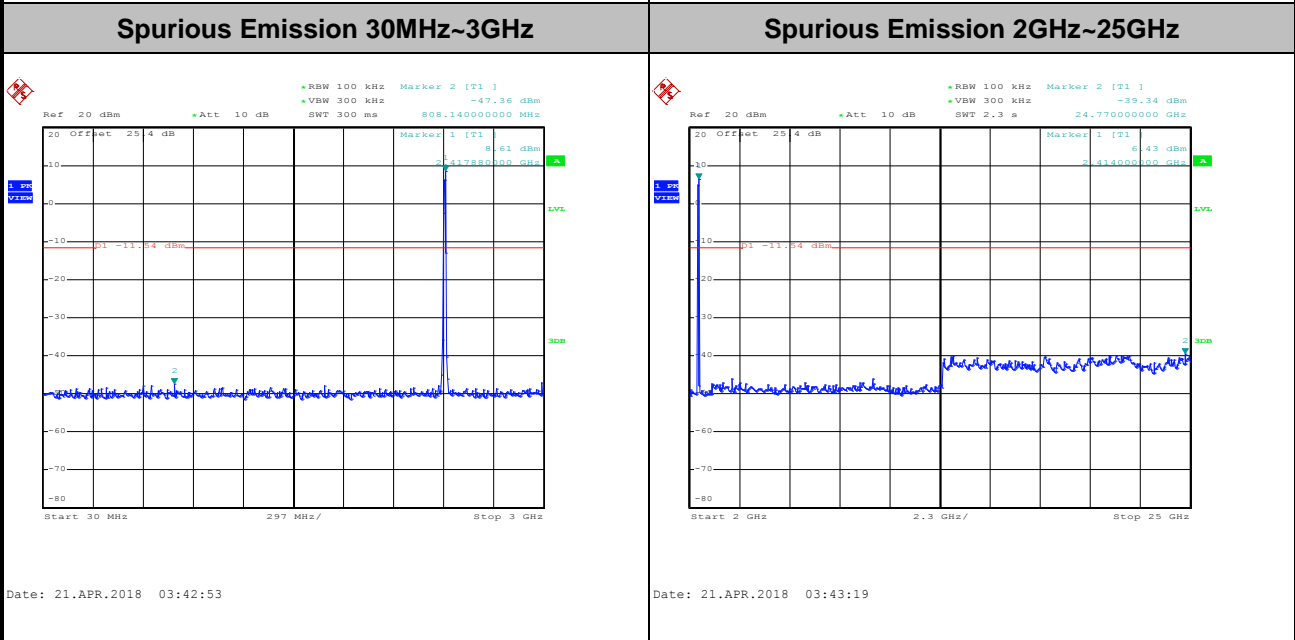
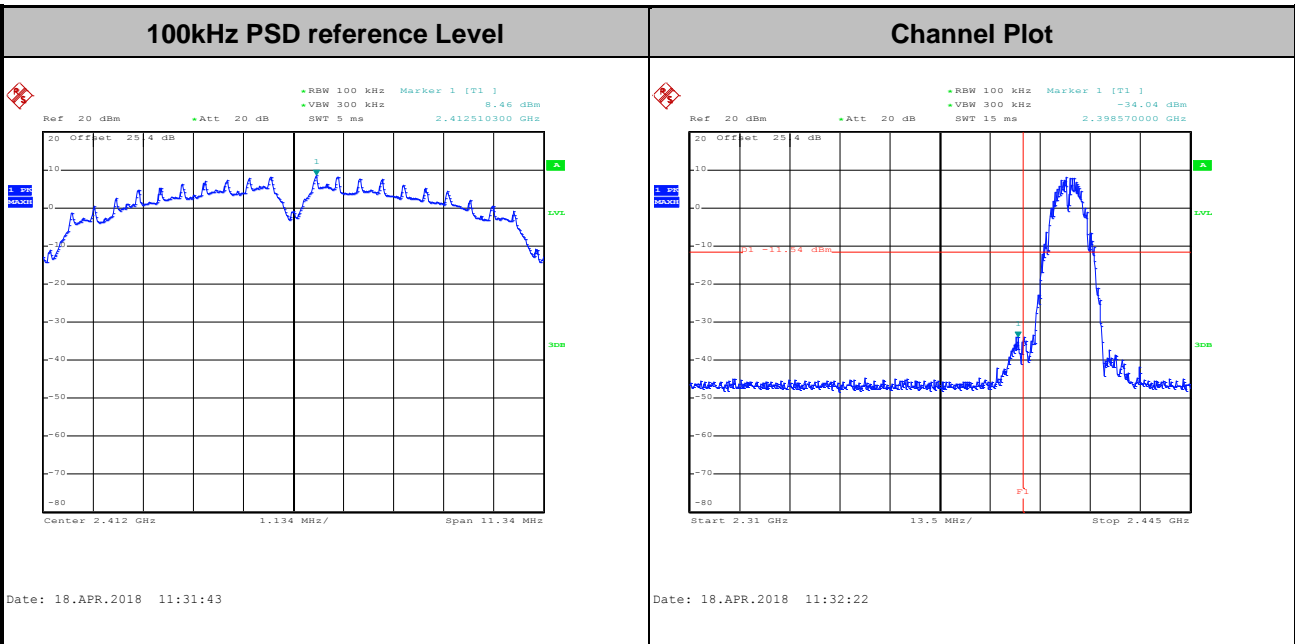




3.4.5 Test Result of Conducted Band Edges and Spurious Emission

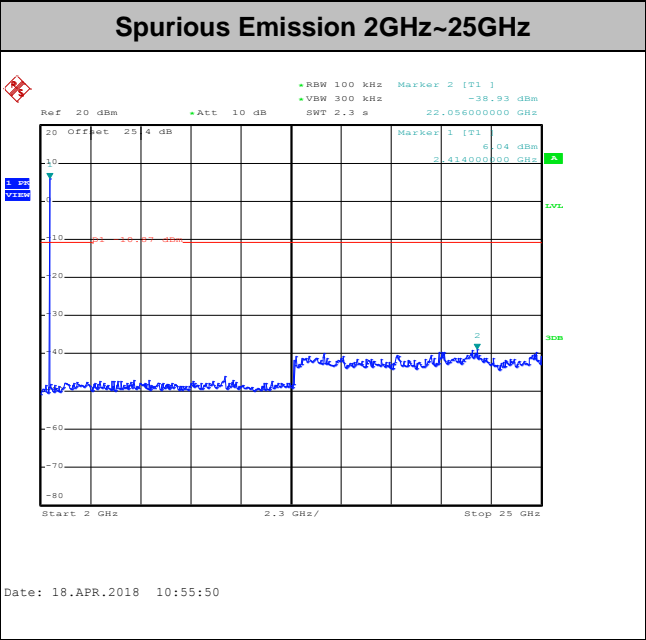
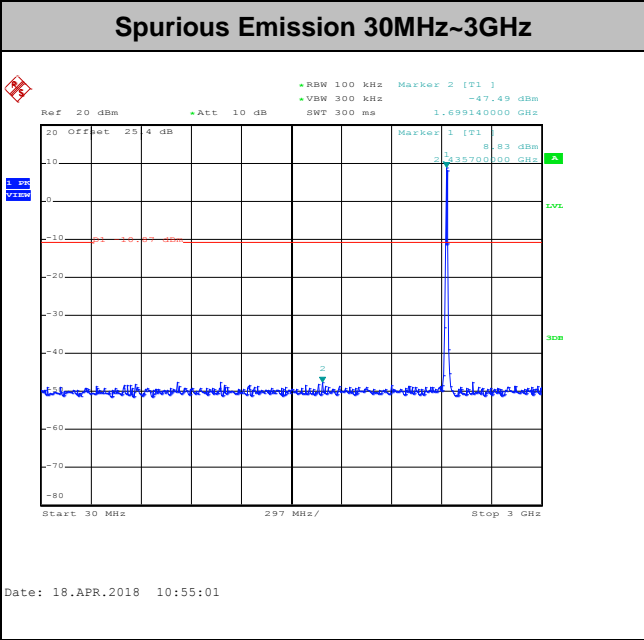
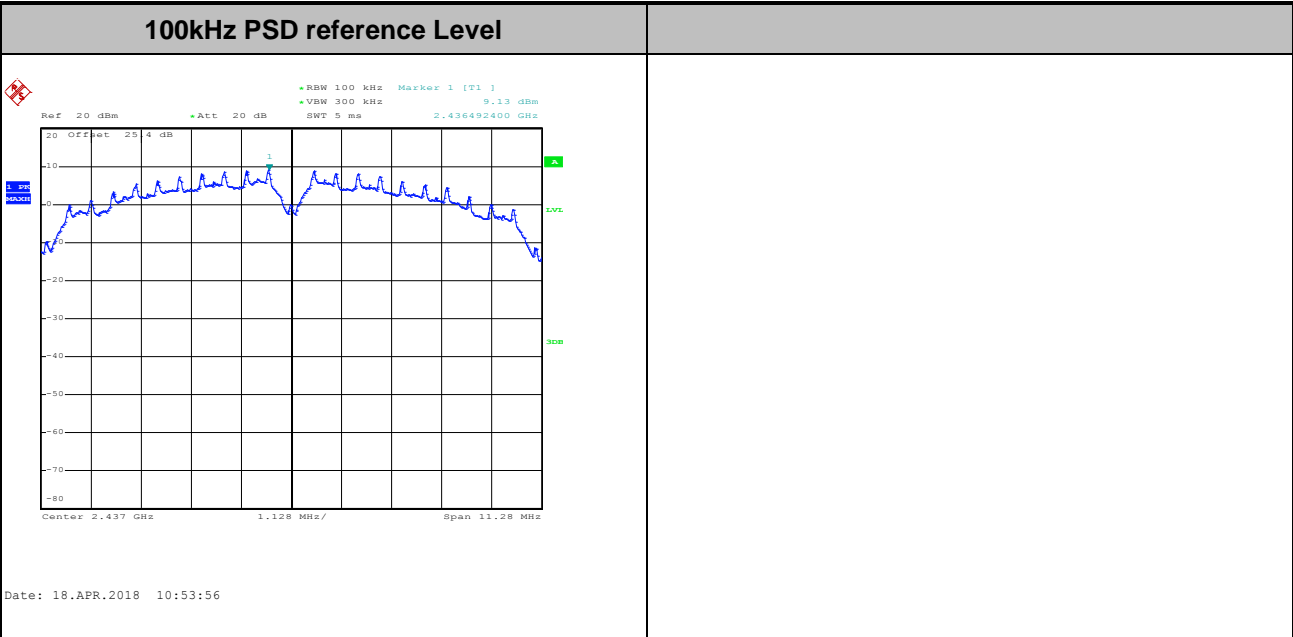
Test Engineer :	Shiming Liu and Allen Lin	Temperature :	21~25°C
		Relative Humidity :	51~54%

Test Mode :	802.11b	Test Channel :	01
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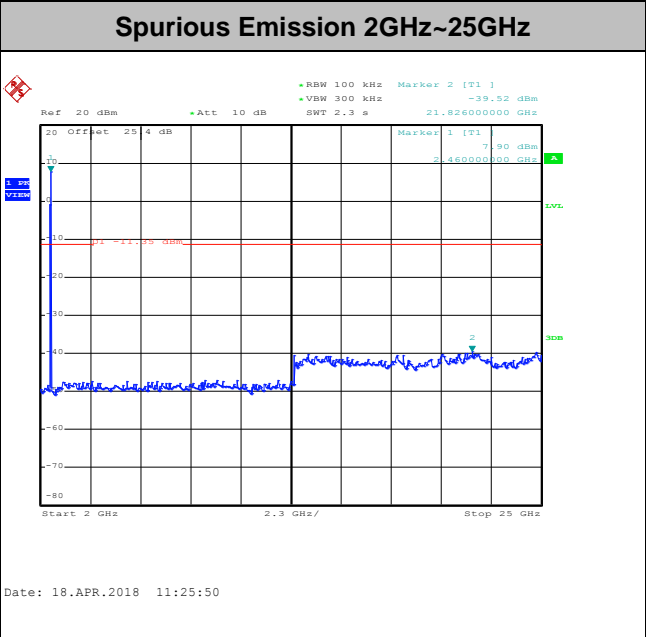
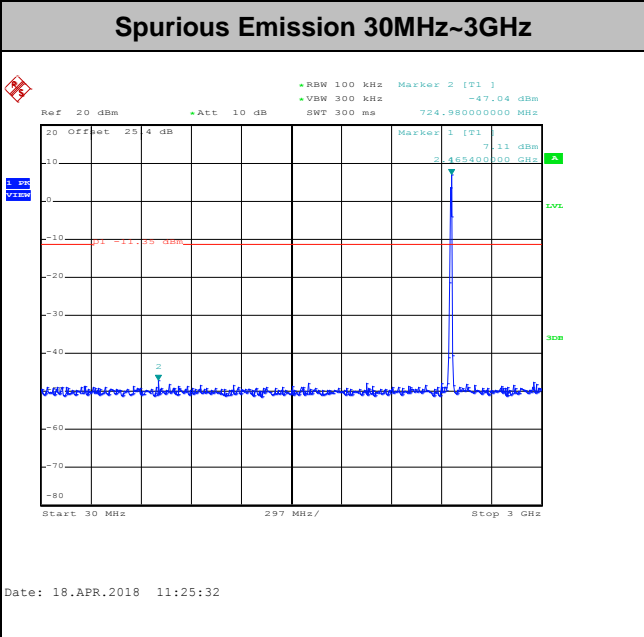
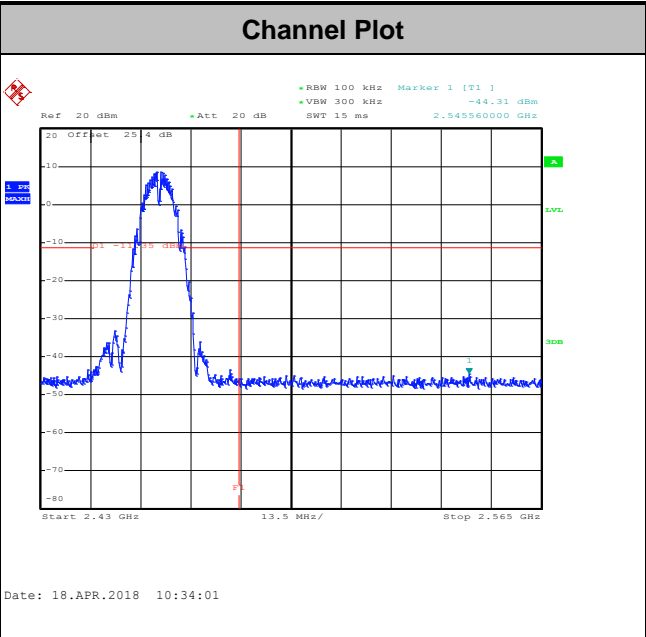
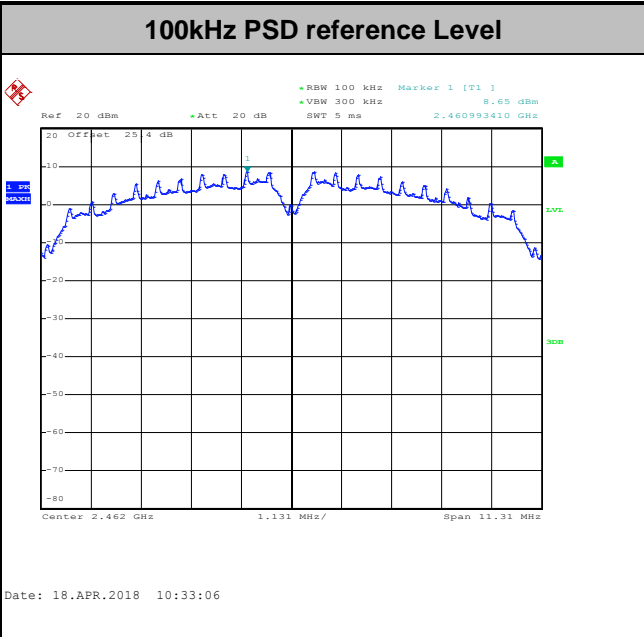


Test Mode :	802.11b	Test Channel :	06
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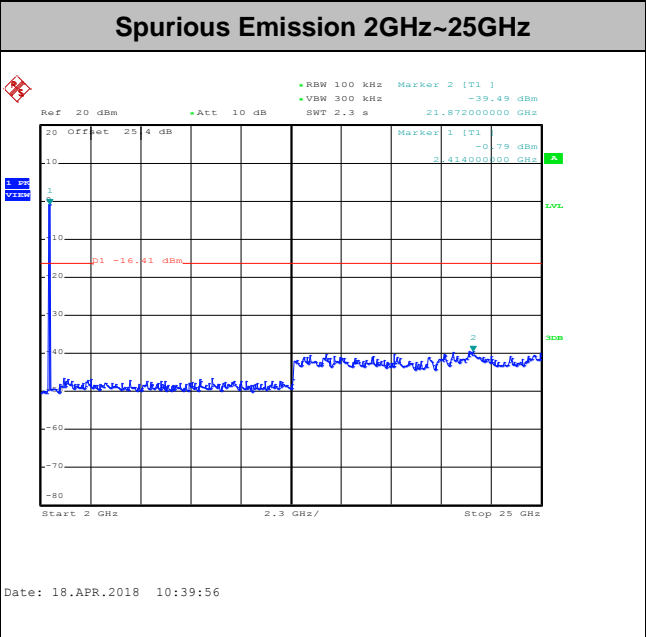
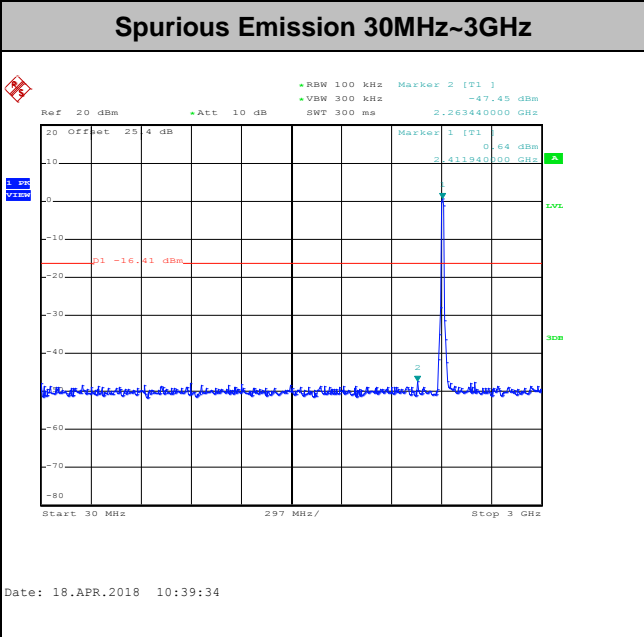
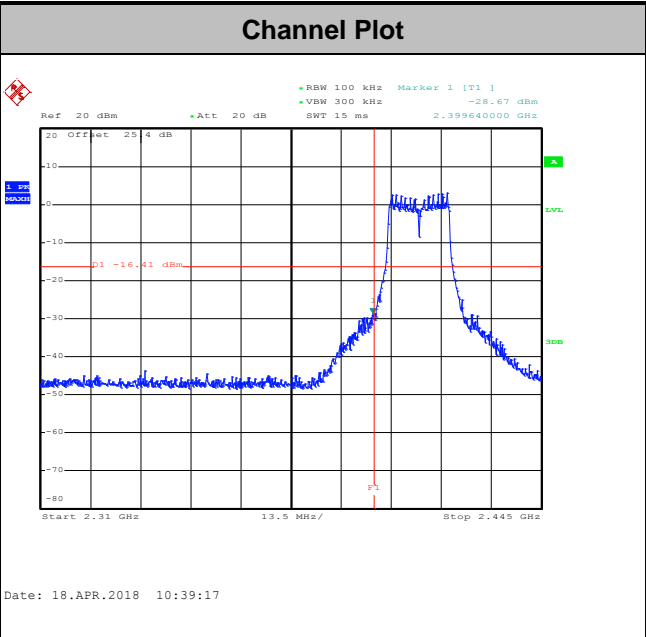
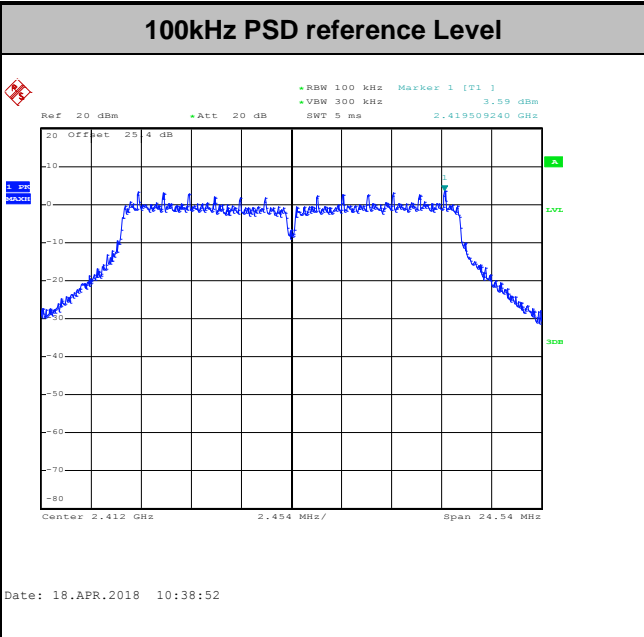


Test Mode :	802.11b	Test Channel :	11
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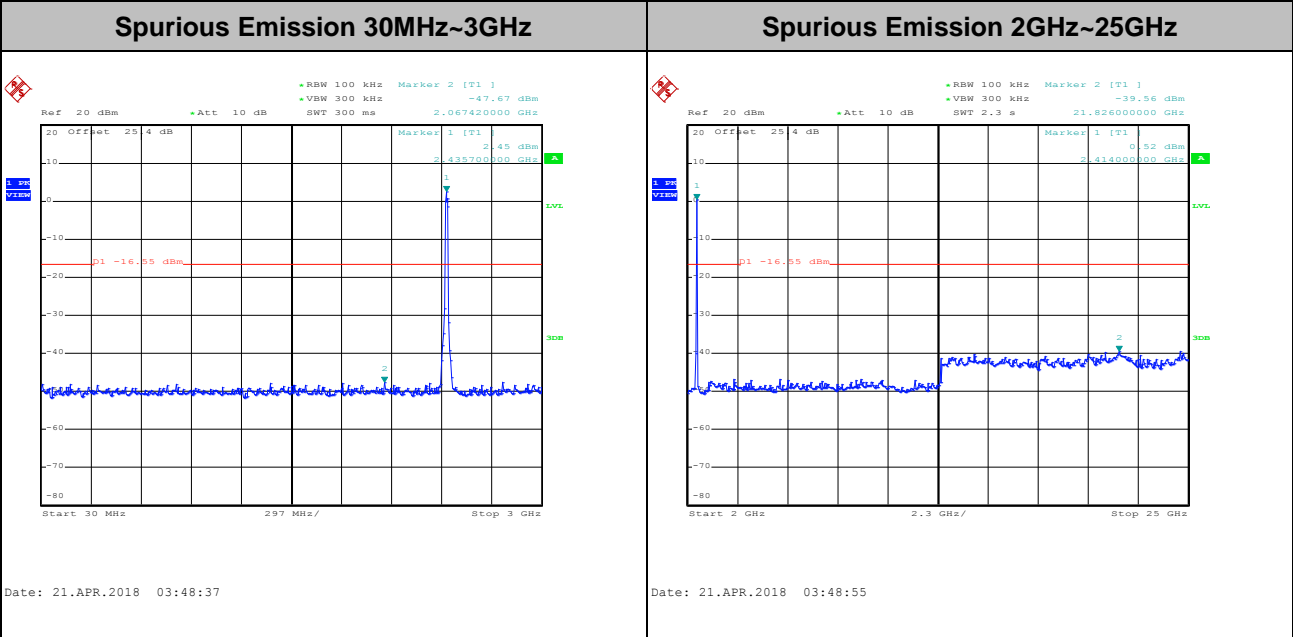
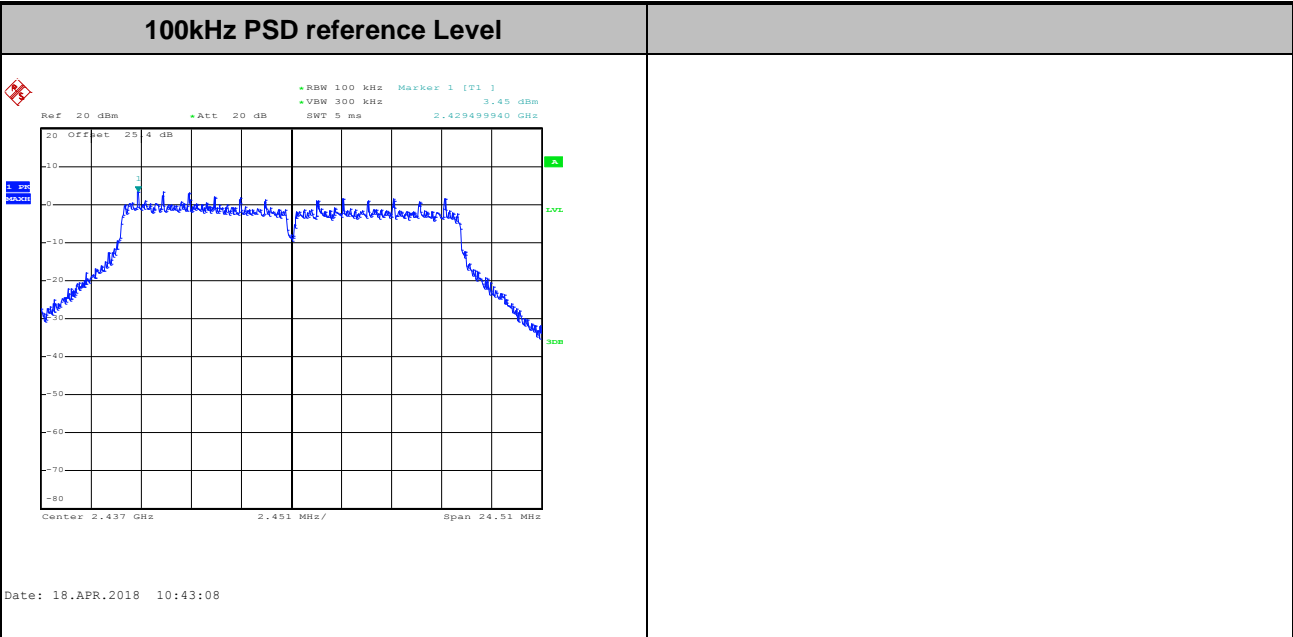


Test Mode :	802.11g	Test Channel :	01
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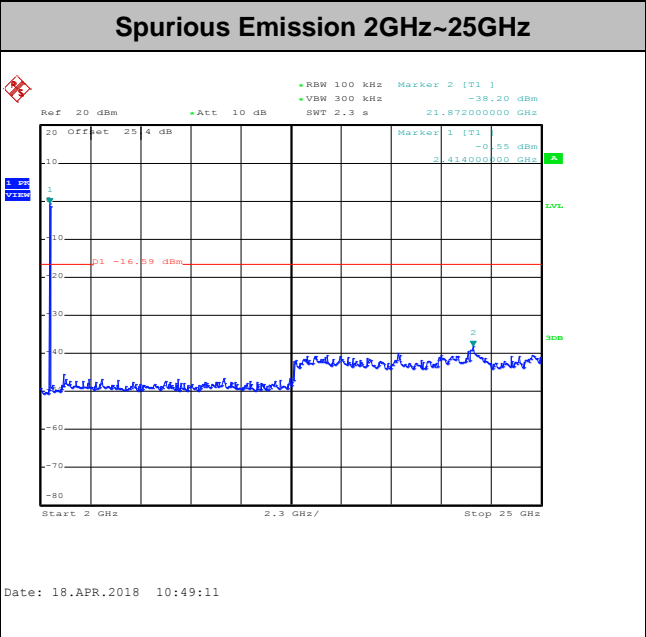
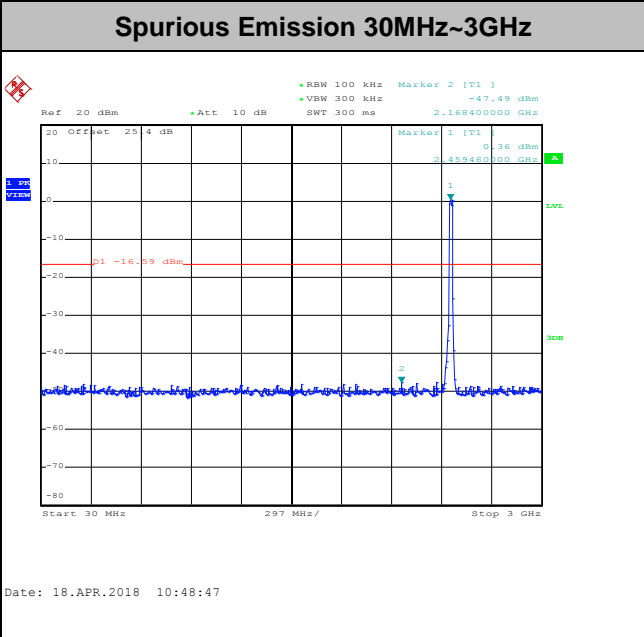
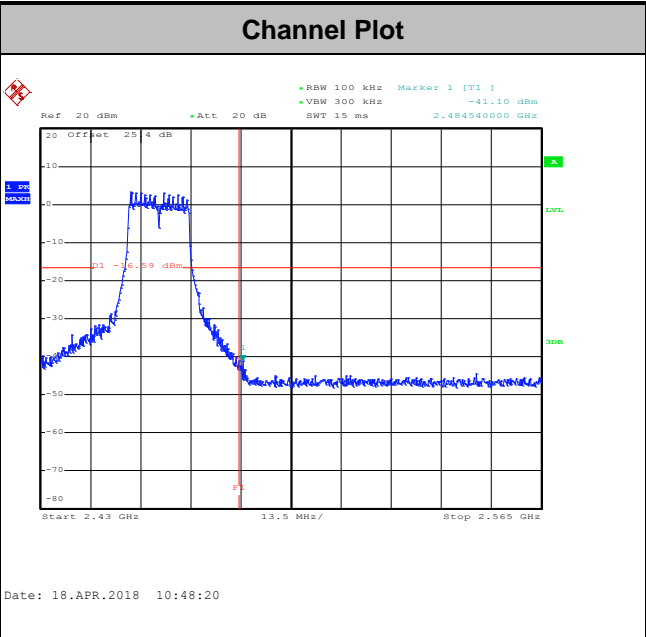
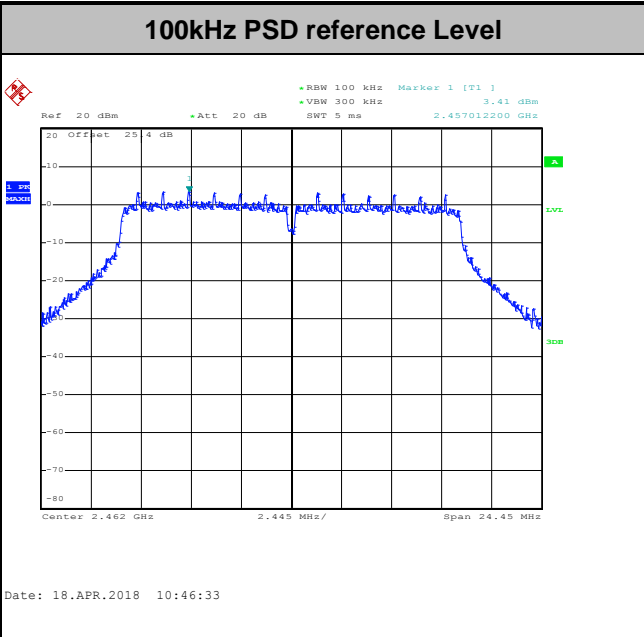


Test Mode :	802.11g	Test Channel :	06
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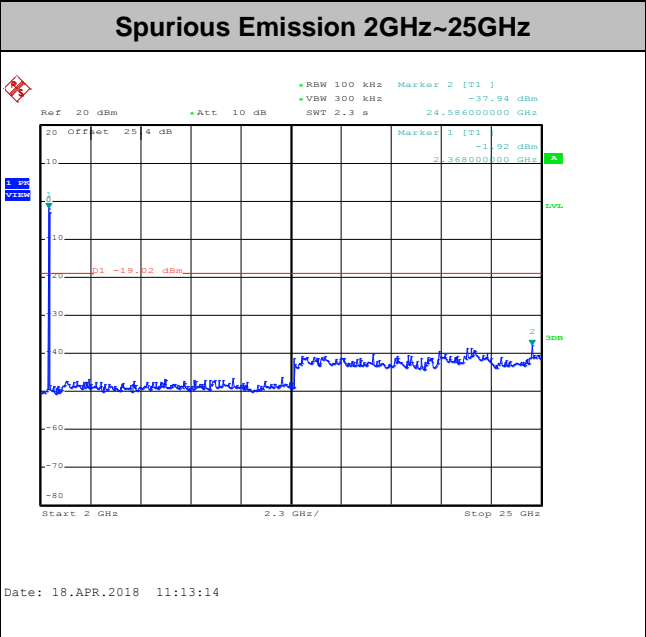
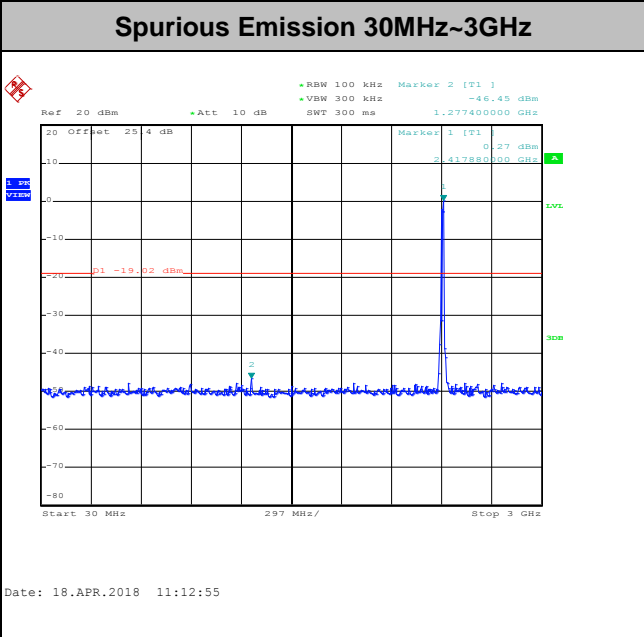
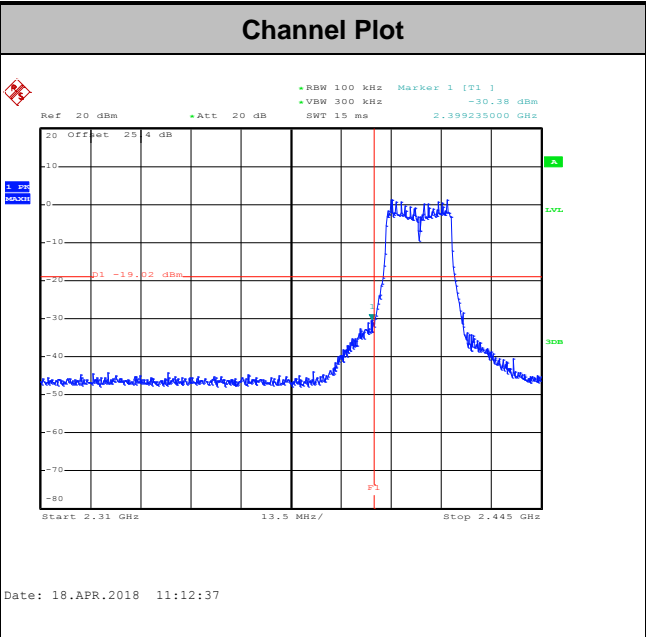
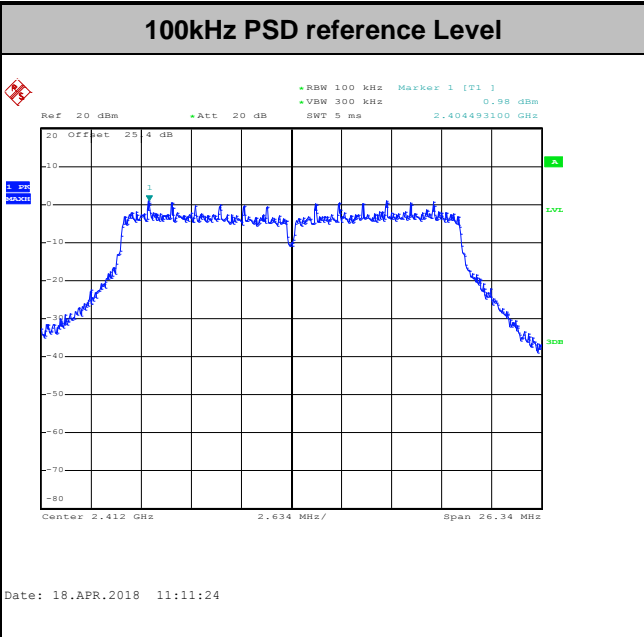


Test Mode :	802.11g	Test Channel :	11
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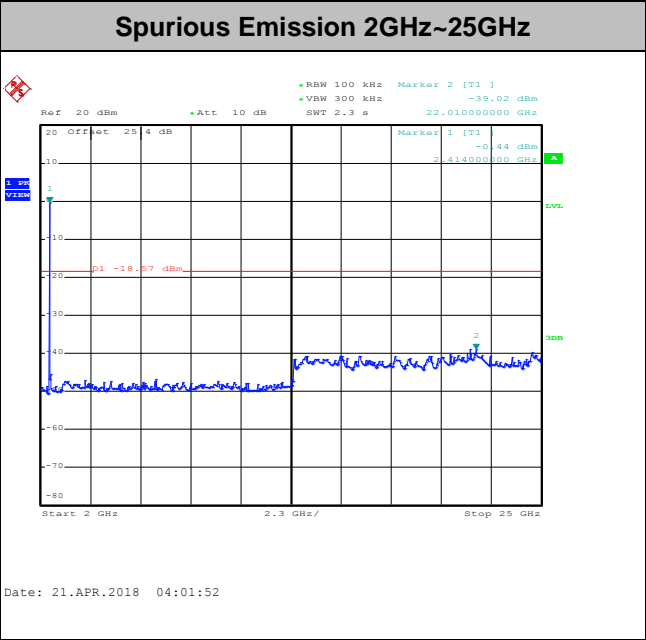
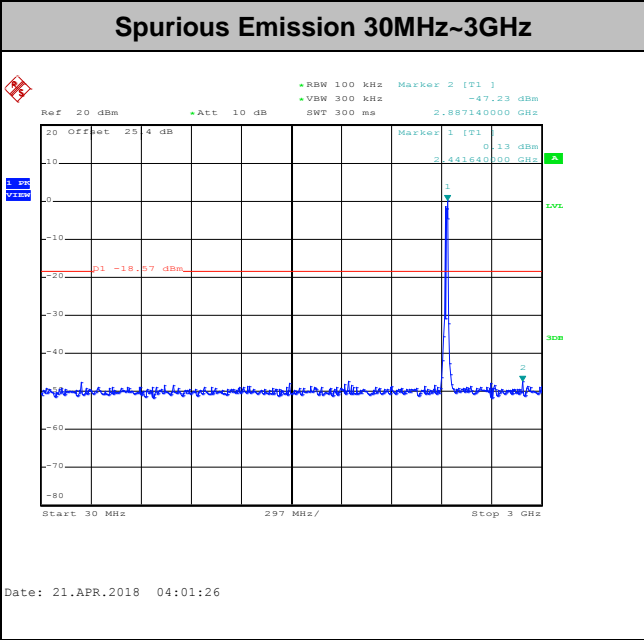
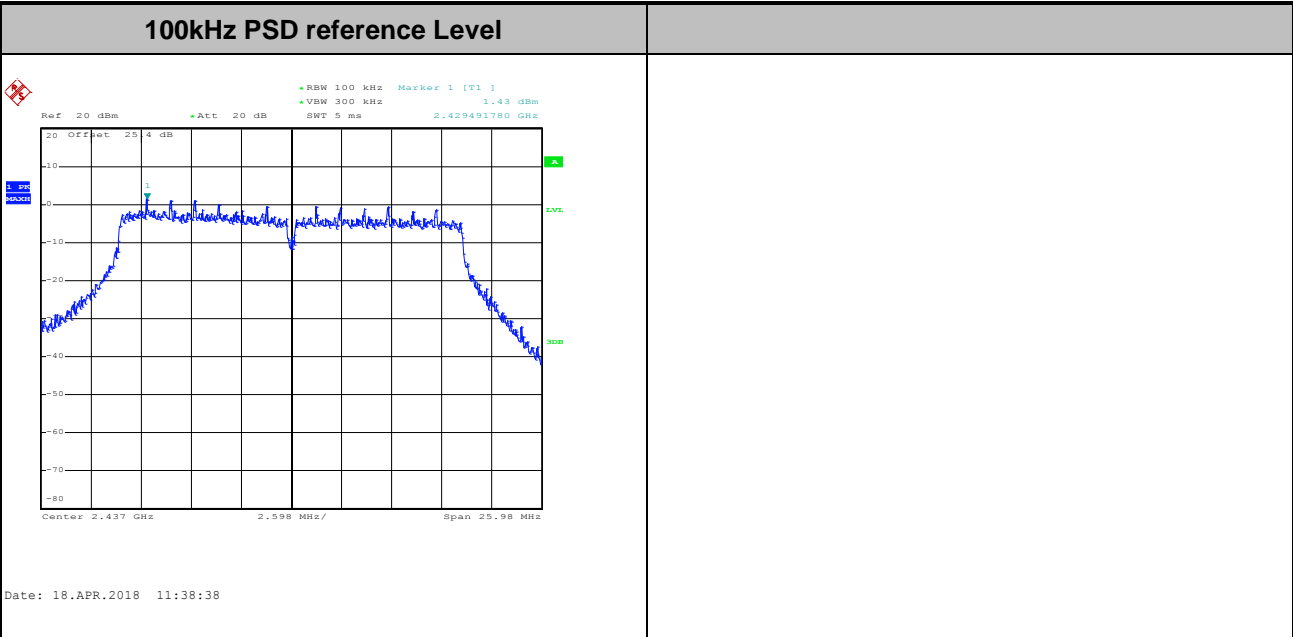


Test Mode :	802.11n HT20	Test Channel :	01
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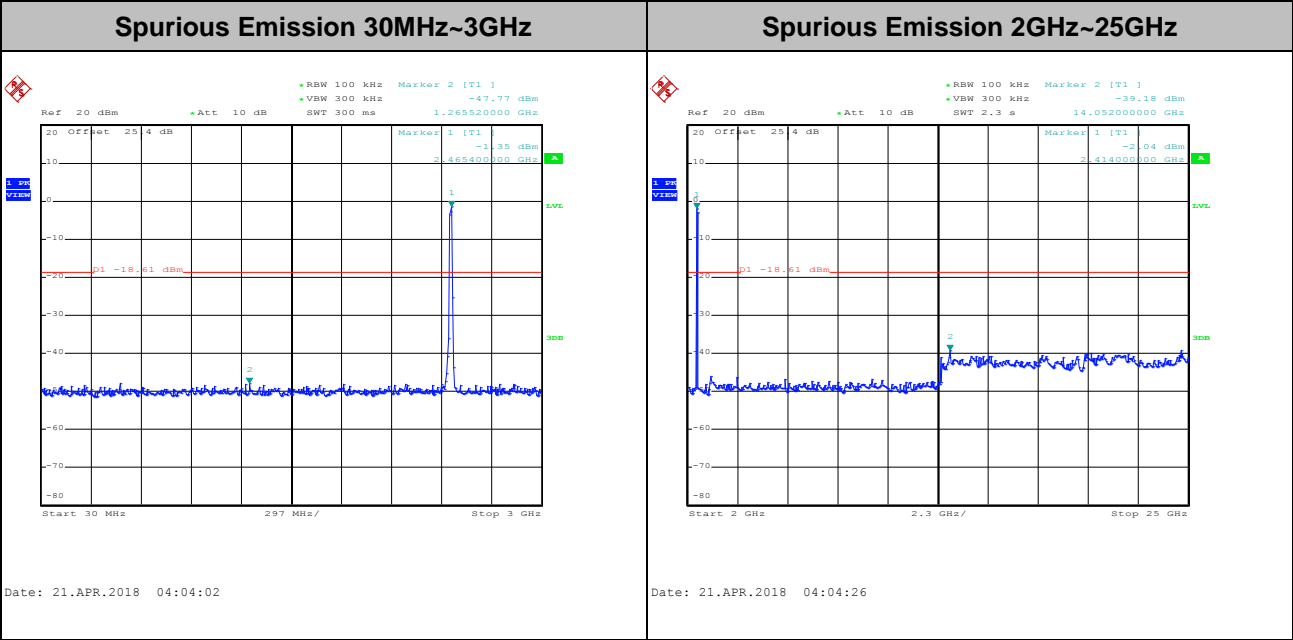
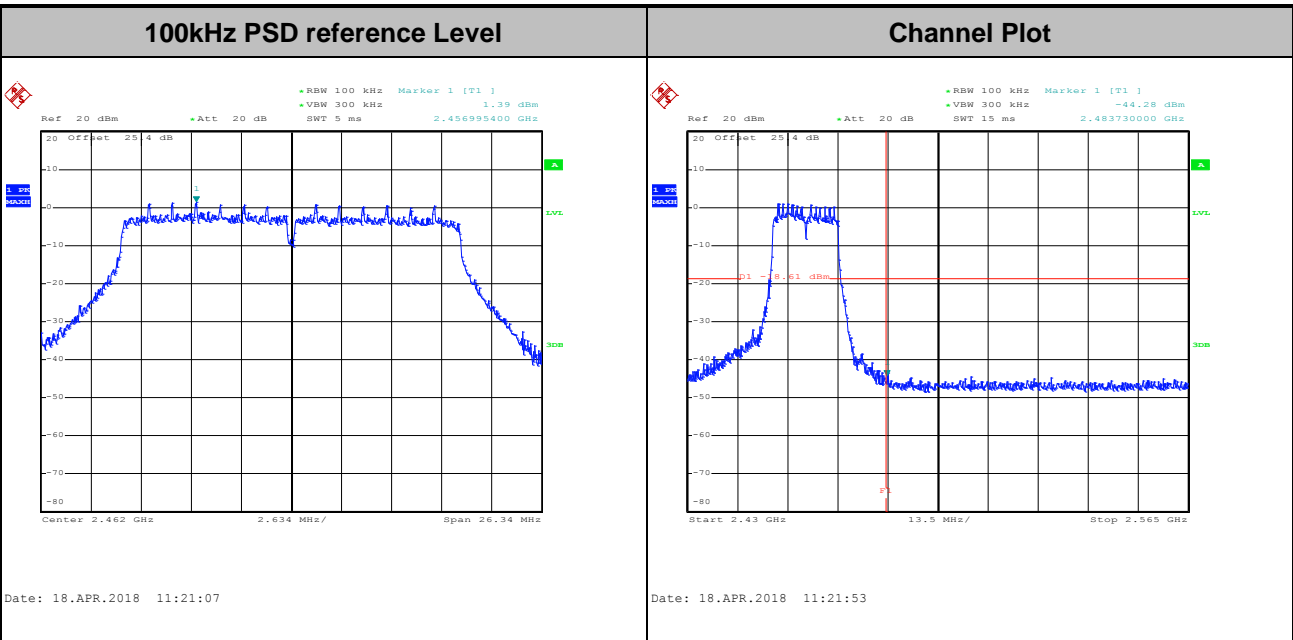


Test Mode :	802.11n HT20	Test Channel :	06
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Test Mode :	802.11n HT20	Test Channel :	11
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3.5 Radiated Band Edges and Spurious Emission Measurement

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

The measuring equipment is listed in the section 4 of this test report.

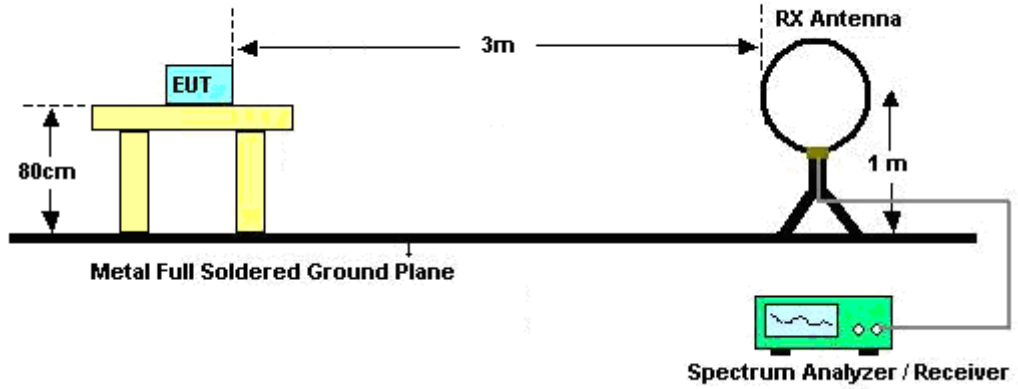


3.5.3 Test Procedures

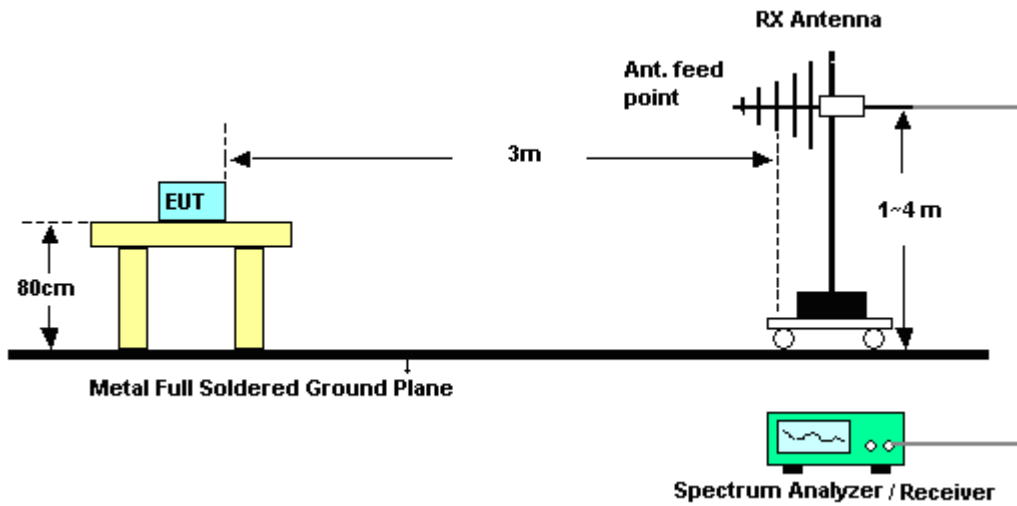
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test 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

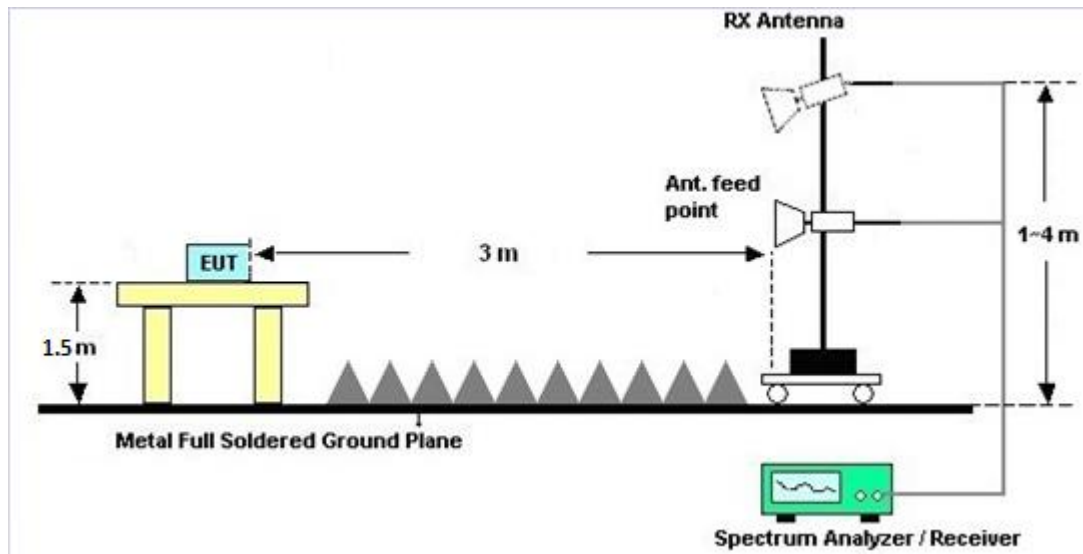
For radiated emissions below 30MHz



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 semi-Anechoic chamber, and the result came out very similar.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C and D.

3.5.7 Duty Cycle

Please refer to Appendix E.

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

Please refer to Appendix C and D.



3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

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

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	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.

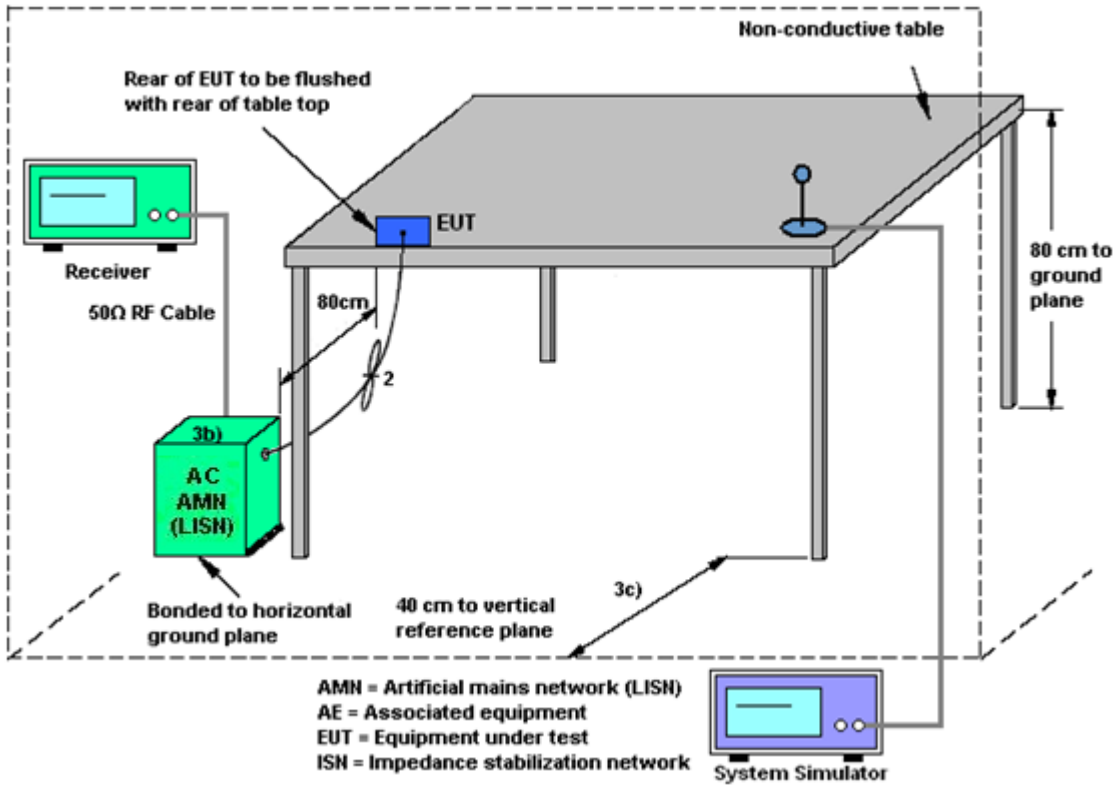
3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 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 Meter	Anritsu	ML2495A	0932001	N/A	Sep. 26, 2017	Mar. 30, 2018 ~ Apr. 21, 2018	Sep. 25, 2018	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	0846202	300MHz~40GHz z	Sep. 26, 2017	Mar. 30, 2018 ~ Apr. 21, 2018	Sep. 25, 2018	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9kHz ~ 30GHz	Nov. 13, 2017	Mar. 30, 2018 ~ Apr. 21, 2018	Nov. 12, 2018	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Apr. 02, 2018 ~ Apr. 03, 2018	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	3.6GHz	Dec. 08, 2017	Apr. 02, 2018 ~ Apr. 03, 2018	Dec. 07, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 30, 2017	Apr. 02, 2018 ~ Apr. 03, 2018	Nov. 29, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Dec. 08, 2017	Apr. 02, 2018 ~ Apr. 03, 2018	Dec. 07, 2018	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Apr. 02, 2018 ~ Apr. 03, 2018	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 03, 2018	Apr. 02, 2018 ~ Apr. 03, 2018	Jan. 02, 2019	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 03, 2018	Apr. 02, 2018 ~ Apr. 03, 2018	Jan. 02, 2019	Conduction (CO05-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 18, 2017	Apr. 06, 2018 ~ Apr. 12, 2018	Jul. 17, 2018	Radiation (03CH12-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200485	10Hz ~ 44GHz	Oct. 31, 2017	Apr. 06, 2018 ~ Apr. 12, 2018	Oct. 30, 2018	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D&N-6-06	35414&AT-N0602	30MHz~1GHz	Oct. 14, 2017	Apr. 06, 2018 ~ Apr. 12, 2018	Oct. 13, 2018	Radiation (03CH12-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 23, 2017	Apr. 06, 2018 ~ Apr. 12, 2018	Nov. 22, 2018	Radiation (03CH12-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100390	20Hz~26.5GHz	Dec. 25, 2017	Apr. 06, 2018 ~ Apr. 12, 2018	Dec. 24, 2018	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1328	1GHz ~ 18GHz	Oct. 20, 2017	Apr. 06, 2018 ~ Apr. 12, 2018	Oct. 19, 2018	Radiation (03CH12-HY)
Amplifier	Sonoma-Instrument	310 N	187282	9KHz~1GHz	Jan. 19, 2018	Apr. 06, 2018 ~ Apr. 12, 2018	Jan. 18, 2020	Radiation (03CH12-HY)
Preamplifier	Keysight	83017A	MY53270148	1GHz~26.5GHz	Jan. 15, 2018	Apr. 06, 2018 ~ Apr. 12, 2018	Jan. 14, 2019	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN2	3 GHz Highpass	Jul. 17, 2017	Apr. 06, 2018 ~ Apr. 12, 2018	Jul. 16, 2018	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-12SS	SN2	1.2G Low Pass	Jul. 17, 2017	Apr. 06, 2018 ~ Apr. 12, 2018	Jul. 16, 2018	Radiation (03CH12-HY)
Attenuator	Fairview Microwave	SA18S5W-10	n/a	10db	Jul. 17, 2017	Apr. 06, 2018 ~ Apr. 12, 2018	Jul. 16, 2018	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Apr. 06, 2018 ~ Apr. 12, 2018	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Apr. 06, 2018 ~ Apr. 12, 2018	N/A	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170576	18GHz ~ 40GHz	Apr. 27, 2017	Apr. 06, 2018 ~ Apr. 12, 2018	Apr. 26, 2018	Radiation (03CH12-HY)
Preamplifier	Jet-Power	JPA00101800-30-10P	1601180002	1GHz~18GHz	Jul. 31, 2017	Apr. 06, 2018 ~ Apr. 12, 2018	Jul. 30, 2018	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Apr. 06, 2018 ~ Apr. 12, 2018	N/A	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30M-18G	Mar. 14, 2018	Apr. 06, 2018 ~ Apr. 12, 2018	Mar. 13, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY15539/4	30M-18G	Mar. 14, 2018	Apr. 06, 2018 ~ Apr. 12, 2018	Mar. 13, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY36979/4	30M-18G	Mar. 14, 2018	Apr. 06, 2018 ~ Apr. 12, 2018	Mar. 13, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30M~40GHz	Oct. 17, 2017	Apr. 06, 2018 ~ Apr. 12, 2018	Oct. 16, 2018	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30M~40GHz	Oct. 17, 2017	Apr. 06, 2018 ~ Apr. 12, 2018	Oct. 16, 2018	Radiation (03CH12-HY)



5 Uncertainty of Evaluation

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

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.2
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.7
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Shiming Liu / Allen Lin	Temperature:	21~25	°C
Test Date:	2018/3/30~2018/4/21	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 1		
11b	1Mbps	1	1	2412	11.95	7.56	0.50	Pass
11b	1Mbps	1	6	2437	11.85	7.52	0.50	Pass
11b	1Mbps	1	11	2462	11.80	7.54	0.50	Pass
11g	6Mbps	1	1	2412	18.60	16.36	0.50	Pass
11g	6Mbps	1	6	2437	18.25	16.34	0.50	Pass
11g	6Mbps	1	11	2462	18.20	16.30	0.50	Pass
HT20	MCS0	1	1	2412	19.25	17.56	0.50	Pass
HT20	MCS0	1	6	2437	19.20	17.32	0.50	Pass
HT20	MCS0	1	11	2462	18.90	17.56	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 1	Ant 1	Ant 1	Ant 1	
11b	1Mbps	1	1	2412	19.90	30.00	-0.52	19.38	36.00	Pass
11b	1Mbps	1	6	2437	20.05	30.00	-0.52	19.53	36.00	Pass
11b	1Mbps	1	11	2462	20.00	30.00	-0.52	19.48	36.00	Pass
11g	6Mbps	1	1	2412	22.42	30.00	-0.52	21.90	36.00	Pass
11g	6Mbps	1	6	2437	22.67	30.00	-0.52	22.15	36.00	Pass
11g	6Mbps	1	11	2462	22.70	30.00	-0.52	22.18	36.00	Pass
HT20	MCS0	1	1	2412	21.65	30.00	-0.52	21.13	36.00	Pass
HT20	MCS0	1	6	2437	21.92	30.00	-0.52	21.40	36.00	Pass
HT20	MCS0	1	11	2462	22.00	30.00	-0.52	21.48	36.00	Pass

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

TEST RESULTS DATA
Average Output Power

2.4GHz Band						
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
					Ant 1	Ant 1
11b	1Mbps	1	1	2412	0.00	16.65
11b	1Mbps	1	6	2437	0.00	16.72
11b	1Mbps	1	11	2462	0.00	16.68
11g	6Mbps	1	1	2412	0.63	14.60
11g	6Mbps	1	6	2437	0.63	14.62
11g	6Mbps	1	11	2462	0.63	14.78
HT20	MCS0	1	1	2412	0.65	12.64
HT20	MCS0	1	6	2437	0.65	12.65
HT20	MCS0	1	11	2462	0.65	12.77

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 1	Ant 1	
11b	1Mbps	1	1	2412	-5.56	-0.52	8.00	Pass
11b	1Mbps	1	6	2437	-4.95	-0.52	8.00	Pass
11b	1Mbps	1	11	2462	-4.95	-0.52	8.00	Pass
11g	6Mbps	1	1	2412	-11.15	-0.52	8.00	Pass
11g	6Mbps	1	6	2437	-10.79	-0.52	8.00	Pass
11g	6Mbps	1	11	2462	-10.78	-0.52	8.00	Pass
HT20	MCS0	1	1	2412	-13.00	-0.52	8.00	Pass
HT20	MCS0	1	6	2437	-13.53	-0.52	8.00	Pass
HT20	MCS0	1	11	2462	-12.99	-0.52	8.00	Pass

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



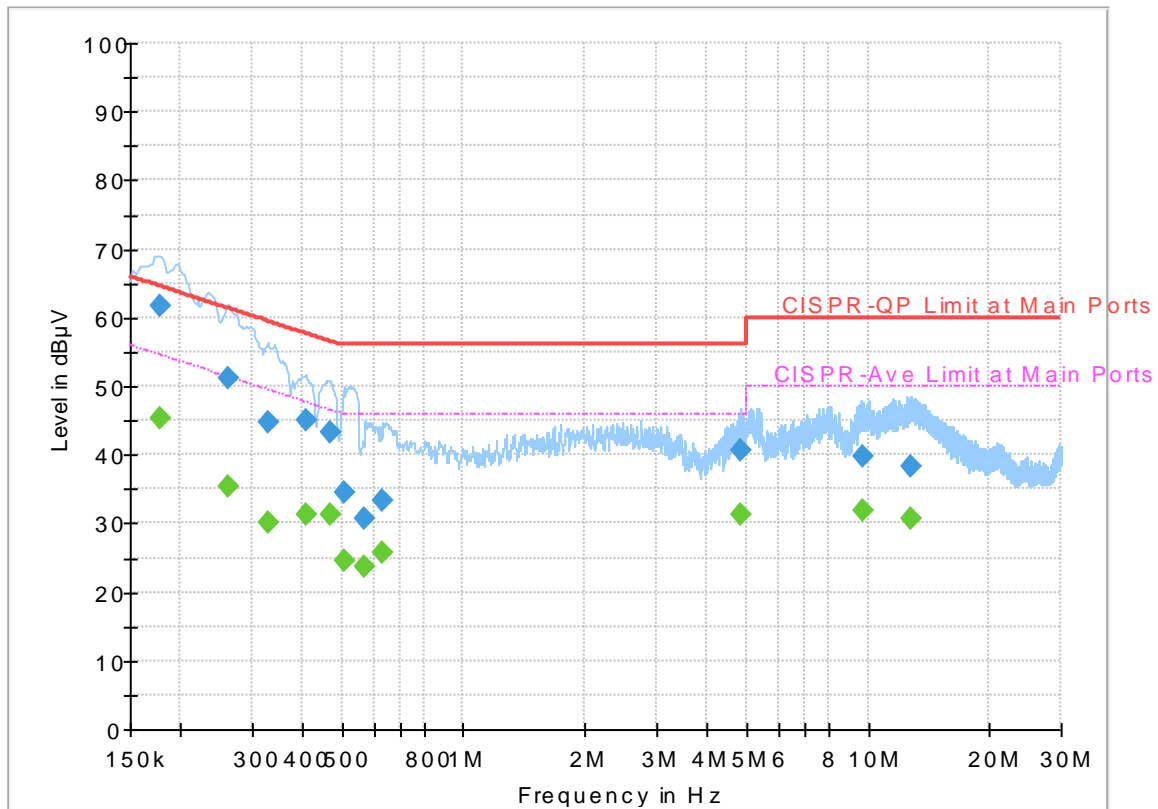
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Shareef Yu	Temperature :	23~24°C
		Relative Humidity :	56~58%

EUT Information

Report NO : 832404
 Test Mode : Mode 1
 Test Voltage : 120Vac/60Hz
 Phase : Line

Full Spectrum



Final_Result

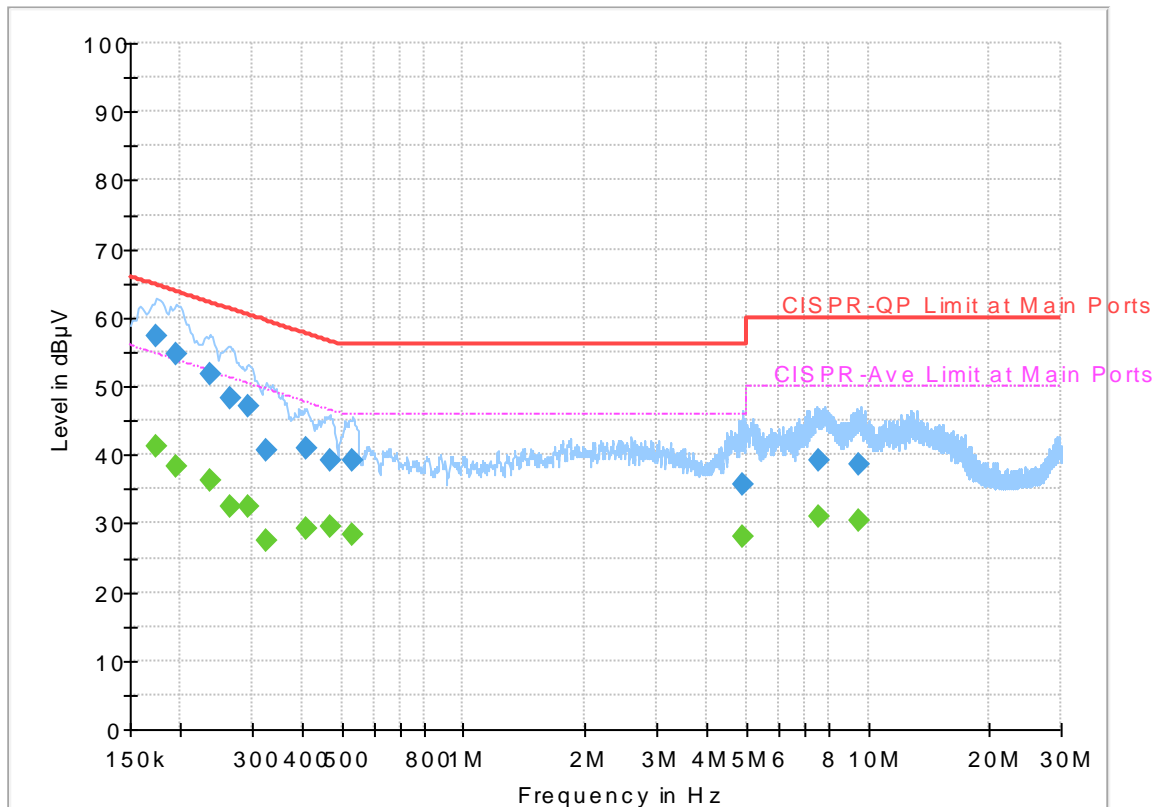
Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.177	61.21	---	64.63	3.42	L1	OFF	19.5
0.177	---	45.62	54.63	9.01	L1	OFF	19.5
0.2625	51.37	---	61.35	9.98	L1	OFF	19.5
0.2625	---	35.26	51.35	16.09	L1	OFF	19.5
0.32775	44.86	---	59.51	14.65	L1	OFF	19.5
0.32775	---	30.2	49.51	19.31	L1	OFF	19.5
0.40875	45.13	---	57.67	12.54	L1	OFF	19.5
0.40875	---	31.28	47.67	16.39	L1	OFF	19.5
0.4695	43.21	---	56.52	13.31	L1	OFF	19.5
0.4695	---	31.35	46.52	15.17	L1	OFF	19.5
0.50775	34.36	---	56	21.64	L1	OFF	19.5
0.50775	---	24.52	46	21.48	L1	OFF	19.5
0.57075	30.58	---	56	25.42	L1	OFF	19.5
0.57075	---	23.67	46	22.33	L1	OFF	19.5
0.63375	33.26	---	56	22.74	L1	OFF	19.5
0.63375	---	25.68	46	20.32	L1	OFF	19.5
4.84125	40.53	---	56	15.47	L1	OFF	19.6
4.84125	---	31.24	46	14.76	L1	OFF	19.6
9.67875	39.77	---	60	20.23	L1	OFF	19.7
9.67875	---	31.83	50	18.17	L1	OFF	19.7
12.768	38.44	---	60	21.56	L1	OFF	19.7

12.768	--	30.72	50	19.28	L1	OFF	19.7
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EUT Information

Report NO : 832404
 Test Mode : Mode 1
 Test Voltage : 120Vac/60Hz
 Phase : Neutral

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.174750	---	41.25	54.73	13.48	N	OFF	19.5
0.174750	57.12	---	64.73	7.61	N	OFF	19.5
0.195000	---	38.34	53.82	15.48	N	OFF	19.5
0.195000	54.60	---	63.82	9.22	N	OFF	19.5
0.237750	---	36.36	52.17	15.81	N	OFF	19.5
0.237750	51.85	---	62.17	10.32	N	OFF	19.5
0.264750	---	32.39	51.28	18.89	N	OFF	19.5
0.264750	48.17	---	61.28	13.11	N	OFF	19.5
0.294000	---	32.53	50.41	17.88	N	OFF	19.5
0.294000	47.09	---	60.41	13.32	N	OFF	19.5
0.325500	---	27.63	49.57	21.94	N	OFF	19.5
0.325500	40.59	---	59.57	18.98	N	OFF	19.5
0.411000	---	29.12	47.63	18.51	N	OFF	19.5
0.411000	40.97	---	57.63	16.66	N	OFF	19.5
0.467250	---	29.60	46.56	16.96	N	OFF	19.5
0.467250	39.26	---	56.56	17.30	N	OFF	19.5
0.532500	---	28.48	46.00	17.52	N	OFF	19.5
0.532500	39.09	---	56.00	16.91	N	OFF	19.5
4.915500	---	28.13	46.00	17.87	N	OFF	19.6
4.915500	35.53	---	56.00	20.47	N	OFF	19.6
7.527750	---	31.12	50.00	18.88	N	OFF	19.7

7.527750	39.17	---	60.00	20.83	N	OFF	19.7
9.447000	---	30.47	50.00	19.53	N	OFF	19.7
9.447000	38.73	---	60.00	21.27	N	OFF	19.7



Appendix C. Radiated Spurious Emission

Test Engineer :	Watt Tseng, Karl Hou, and Nick Yu	Temperature :	21~23°C
		Relative Humidity :	57~60%

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		2381.19	52.75	-21.25	74	43.16	27.11	14.06	31.58	303	360	P	H	
		2390	41.47	-12.53	54	31.83	27.15	14.06	31.57	303	360	A	H	
	*	2412	101.12	-	-	91.42	27.19	14.08	31.57	303	360	P	H	
	*	2412	96.83	-	-	87.13	27.19	14.08	31.57	303	360	A	H	
													H	
														H
			2389.695	53.9	-20.1	74	44.27	27.15	14.06	31.58	333	45	P	V
			2390	42.83	-11.17	54	33.19	27.15	14.06	31.57	333	45	A	V
	*		2412	108.62	-	-	98.92	27.19	14.08	31.57	333	45	P	V
	*		2412	104.25	-	-	94.55	27.19	14.08	31.57	333	45	A	V
														V
														V
802.11b CH 06 2437MHz		2361.94	53.46	-20.54	74	43.93	27.07	14.04	31.58	300	1	P	H	
		2389.94	41.12	-12.88	54	31.48	27.15	14.06	31.57	300	1	A	H	
	*	2437	100.63	-	-	90.82	27.28	14.1	31.57	300	1	P	H	
	*	2437	96.16	-	-	86.35	27.28	14.1	31.57	300	1	A	H	
			2488.52	53.87	-20.13	74	43.89	27.4	14.14	31.56	300	1	P	H
			2496.71	41.35	-12.65	54	31.36	27.4	14.14	31.55	300	1	A	H
			2380.56	52.98	-21.02	74	43.39	27.11	14.06	31.58	326	66	P	V
			2389.8	41.26	-12.74	54	31.62	27.15	14.06	31.57	326	66	A	V
	*		2437	108.51	-	-	98.7	27.28	14.1	31.57	326	66	P	V
	*		2437	104.09	-	-	94.28	27.28	14.1	31.57	326	66	A	V
			2496.22	53.24	-20.76	74	43.25	27.4	14.14	31.55	326	66	P	V
			2484.39	41.41	-12.59	54	31.47	27.36	14.14	31.56	326	66	A	V



802.11b CH 11 2462MHz	*	2462	100.39	-	-	90.52	27.32	14.11	31.56	399	355	P	H
	*	2462	96.3	-	-	86.43	27.32	14.11	31.56	399	355	A	H
		2498.04	53.75	-20.25	74	43.76	27.4	14.14	31.55	399	355	P	H
		2483.8	41.4	-12.6	54	31.46	27.36	14.14	31.56	399	355	A	H
													H
													H
	*	2462	108.29	-	-	98.42	27.32	14.11	31.56	287	74	P	V
	*	2462	103.9	-	-	94.03	27.32	14.11	31.56	287	74	A	V
		2491.84	53.5	-20.5	74	43.51	27.4	14.14	31.55	287	74	P	V
		2483.84	41.75	-12.25	54	31.81	27.36	14.14	31.56	287	74	A	V
													V
													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		4824	42.78	-31.22	74	66.08	31.36	6.7	61.36	100	0	P	H	
													H	
													H	
													H	
			4824	41.3	-32.7	74	64.6	31.36	6.7	61.36	100	0	P	V
														V
														V
802.11b CH 06 2437MHz		4874	42.03	-31.97	74	65.21	31.46	6.73	61.37	100	0	P	H	
		7311	43.61	-30.39	74	61.03	36.11	8.07	61.6	100	0	P	H	
													H	
													H	
			4874	39.12	-34.88	74	62.3	31.46	6.73	61.37	100	0	P	V
			7311	43.89	-30.11	74	61.31	36.11	8.07	61.6	100	0	P	V
														V
802.11b CH 11 2462MHz		4924	42.37	-31.63	74	65.46	31.56	6.73	61.38	100	0	P	H	
		7386	44.59	-29.41	74	61.85	36.33	8.01	61.6	100	0	P	H	
													H	
													H	
			4924	42.1	-31.9	74	65.19	31.56	6.73	61.38	100	0	P	V
			7386	44.42	-29.58	74	61.68	36.33	8.01	61.6	100	0	P	V
														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		2389.8	57.43	-16.57	74	47.79	27.15	14.06	31.57	296	12	P	H	
		2390	45.57	-8.43	54	35.93	27.15	14.06	31.57	296	12	A	H	
	*	2412	100.18	-	-	90.48	27.19	14.08	31.57	296	12	P	H	
	*	2412	90.14	-	-	80.44	27.19	14.08	31.57	296	12	A	H	
													H	
													H	
			2389.8	62.44	-11.56	74	52.8	27.15	14.06	31.57	295	80	P	V
			2390	50.12	-3.88	54	40.48	27.15	14.06	31.57	295	80	A	V
	*		2412	106.32	-	-	96.62	27.19	14.08	31.57	295	80	P	V
	*		2412	95.94	-	-	86.24	27.19	14.08	31.57	295	80	A	V
													V	
													V	
802.11g CH 06 2437MHz		2340.94	53.22	-20.78	74	43.74	27.03	14.03	31.58	299	344	P	H	
		2371.32	41.99	-12.01	54	32.42	27.11	14.04	31.58	299	344	A	H	
	*	2437	100.5	-	-	90.69	27.28	14.1	31.57	299	344	P	H	
	*	2437	90.2	-	-	80.39	27.28	14.1	31.57	299	344	A	H	
			2487.26	53.48	-20.52	74	43.54	27.36	14.14	31.56	299	344	P	H
			2487.75	42.29	-11.71	54	32.31	27.4	14.14	31.56	299	344	A	H
			2384.48	54.61	-19.39	74	45.02	27.11	14.06	31.58	296	78	P	V
			2385.32	42.19	-11.81	54	32.6	27.11	14.06	31.58	296	78	A	V
	*		2437	107.94	-	-	98.13	27.28	14.1	31.57	296	78	P	V
	*		2437	97.41	-	-	87.6	27.28	14.1	31.57	296	78	A	V
			2483.55	54.09	-19.91	74	44.15	27.36	14.14	31.56	296	78	P	V
			2483.5	42.32	-11.68	54	32.38	27.36	14.14	31.56	296	78	A	V



802.11g CH 11 2462MHz	*	2462	98.34	-	-	88.47	27.32	14.11	31.56	399	35	P	H
	*	2462	87.95	-	-	78.08	27.32	14.11	31.56	399	35	A	H
		2484	55.45	-18.55	74	45.51	27.36	14.14	31.56	399	35	P	H
		2483.64	42.62	-11.38	54	32.68	27.36	14.14	31.56	399	35	A	H
													H
													H
	*	2462	107.17	-	-	97.3	27.32	14.11	31.56	362	89	P	V
	*	2462	96.82	-	-	86.95	27.32	14.11	31.56	362	89	A	V
		2483.76	66.39	-7.61	74	56.45	27.36	14.14	31.56	362	89	P	V
		2483.56	49.31	-4.69	54	39.37	27.36	14.14	31.56	362	89	A	V
													V
													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		4824	39.75	-34.25	74	63.05	31.36	6.7	61.36	100	0	P	H	
													H	
													H	
													H	
			4824	39.94	-34.06	74	63.24	31.36	6.7	61.36	100	0	P	V
														V
														V
802.11g CH 06 2437MHz		4874	39.88	-34.12	74	63.06	31.46	6.73	61.37	100	0	P	H	
		7311	44.25	-29.75	74	61.67	36.11	8.07	61.6	100	0	P	H	
													H	
													H	
			4874	38.86	-35.14	74	62.04	31.46	6.73	61.37	100	0	P	V
			7311	44.13	-29.87	74	61.55	36.11	8.07	61.6	100	0	P	V
														V
802.11g CH 11 2462MHz		4924	40.13	-33.87	74	63.22	31.56	6.73	61.38	100	0	P	H	
		7386	43.82	-30.18	74	61.08	36.33	8.01	61.6	100	0	P	H	
													H	
													H	
			4924	39.86	-34.14	74	62.95	31.56	6.73	61.38	100	0	P	V
			7386	43.46	-30.54	74	60.72	36.33	8.01	61.6	100	0	P	V
														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		2390	57.45	-16.55	74	47.81	27.15	14.06	31.57	301	0	P	H	
		2390	45.3	-8.7	54	35.66	27.15	14.06	31.57	301	0	A	H	
	*	2412	99.26	-	-	89.56	27.19	14.08	31.57	301	0	P	H	
	*	2412	88.38	-	-	78.68	27.19	14.08	31.57	301	0	A	H	
													H	
													H	
			2389.8	63.59	-10.41	74	53.95	27.15	14.06	31.57	295	72	P	V
			2390	49.22	-4.78	54	39.58	27.15	14.06	31.57	295	72	A	V
		*	2412	105.43	-	-	95.73	27.19	14.08	31.57	295	72	P	V
		*	2412	94.83	-	-	85.13	27.19	14.08	31.57	295	72	A	V
													V	
													V	
802.11n HT20 CH 06 2437MHz		2353.68	53.76	-20.24	74	44.24	27.07	14.03	31.58	300	0	P	H	
		2388.68	42	-12	54	32.37	27.15	14.06	31.58	300	0	A	H	
		* 2437	98.52	-	-	88.71	27.28	14.1	31.57	300	0	P	H	
		* 2437	87.93	-	-	78.12	27.28	14.1	31.57	300	0	A	H	
			2489.78	53.51	-20.49	74	43.53	27.4	14.14	31.56	300	0	P	H
			2497.13	42.12	-11.88	54	32.13	27.4	14.14	31.55	300	0	A	H
			2345.84	52.91	-21.09	74	43.43	27.03	14.03	31.58	297	72	P	V
			2385.88	42.05	-11.95	54	32.42	27.15	14.06	31.58	297	72	A	V
		*	2437	105.56	-	-	95.75	27.28	14.1	31.57	297	72	P	V
		*	2437	95.59	-	-	85.78	27.28	14.1	31.57	297	72	A	V
		2487.61	54.43	-19.57	74	44.45	27.4	14.14	31.56	297	72	P	V	
		2483.69	42.5	-11.5	54	32.56	27.36	14.14	31.56	297	72	A	V	



802.11n HT20 CH 11 2462MHz	*	2462	96.92	-	-	87.05	27.32	14.11	31.56	399	354	P	H
	*	2462	86.72	-	-	76.85	27.32	14.11	31.56	399	354	A	H
		2483.96	54.51	-19.49	74	44.57	27.36	14.14	31.56	399	354	P	H
		2483.84	42.58	-11.42	54	32.64	27.36	14.14	31.56	399	354	A	H
													H
													H
	*	2462	105.58	-	-	95.71	27.32	14.11	31.56	281	79	P	V
	*	2462	94.94	-	-	85.07	27.32	14.11	31.56	281	79	A	V
		2483.56	63.67	-10.33	74	53.73	27.36	14.14	31.56	281	79	P	V
		2483.52	45.61	-8.39	54	35.67	27.36	14.14	31.56	281	79	A	V
													V
												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		4824	39	-35	74	62.3	31.36	6.7	61.36	100	0	P	H	
													H	
													H	
													H	
			4824	39.37	-34.63	74	62.67	31.36	6.7	61.36	100	0	P	V
														V
														V
802.11n HT20 CH 06 2437MHz		4874	38.98	-35.02	74	62.16	31.46	6.73	61.37	100	0	P	H	
		7311	43.2	-30.8	74	60.62	36.11	8.07	61.6	100	0	P	H	
													H	
													H	
			4874	39.09	-34.91	74	62.27	31.46	6.73	61.37	100	0	P	V
			7311	43.37	-30.63	74	60.79	36.11	8.07	61.6	100	0	P	V
														V
802.11n HT20 CH 11 2462MHz		4924	39.92	-34.08	74	63.01	31.56	6.73	61.38	100	0	P	H	
		7386	43.61	-30.39	74	60.87	36.33	8.01	61.6	100	0	P	H	
													H	
													H	
			4924	39.82	-34.18	74	62.91	31.56	6.73	61.38	100	0	P	V
			7386	44	-30	74	61.26	36.33	8.01	61.6	100	0	P	V
														V
Remark	1. No other spurious found.													
	2. All results are PASS against Peak and Average limit line.													



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

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)	
2.4GHz 802.11g LF		106.95	33.6	-9.9	43.5	48.63	16.42	0.84	32.29	100	0	P	H	
		159.06	30.31	-13.19	43.5	45.09	16.32	1.18	32.28	-	-	P	H	
		207.66	32.19	-11.31	43.5	48.18	14.95	1.32	32.26	-	-	P	H	
		564.6	26.24	-19.76	46	30.5	25.92	2.03	32.21	-	-	P	H	
		636	26.54	-19.46	46	30.42	26.19	2.13	32.2	-	-	P	H	
		992.3	33.9	-20.1	54	31.15	30.65	2.77	30.67	-	-	P	H	
														H
														H
														H
														H
														H
														H
			76.44	30.6	-9.4	40	49.4	12.69	0.81	32.3	100	0	P	V
			157.44	31.86	-11.64	43.5	46.57	16.4	1.17	32.28	-	-	P	V
			206.04	31.7	-11.8	43.5	47.71	14.93	1.32	32.26	-	-	P	V
			640.2	26.33	-19.67	46	30.05	26.34	2.13	32.19	-	-	P	V
			741	30.06	-15.94	46	32.12	27.73	2.31	32.1	-	-	P	V
			968.5	33.19	-20.81	54	30.23	31.11	2.74	30.89	-	-	P	V
														V
														V
													V	
													V	
													V	
													V	
													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	Peak or Average
H/V	Horizontal or Vertical



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 D. Radiated Spurious Emission Plots

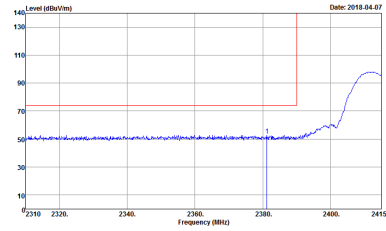
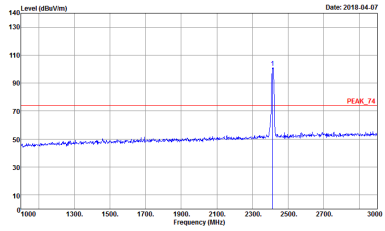
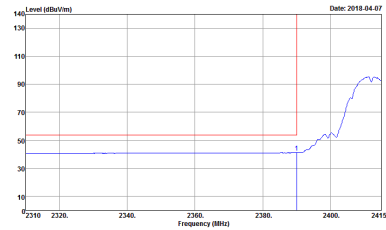
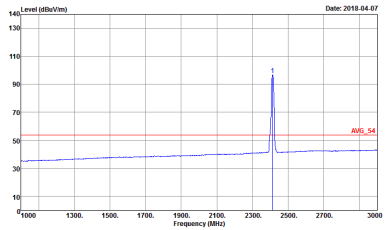
Test Engineer :	Watt Tseng, Karl Hou, and Nick Yu	Temperature :	21~23°C
		Relative Humidity :	57~60%

Note symbol

-L	Low channel location
-R	High channel location



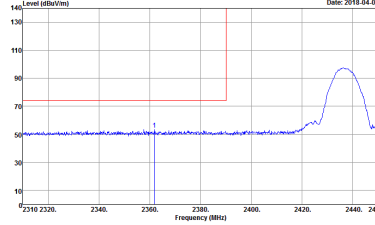
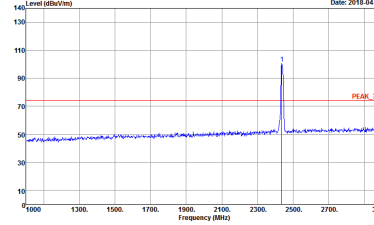
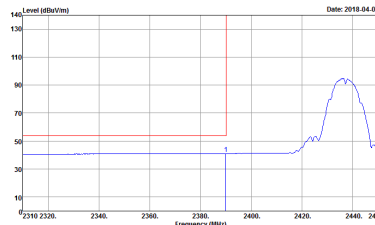
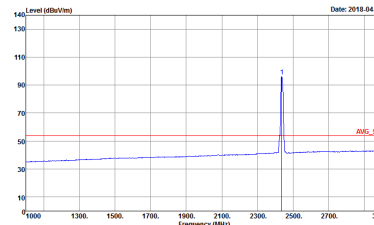
2.4GHz 2400~2483.5MHz
WIFI 802.11b (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 7</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 7</p>
Avg.	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832404 Mode : 7</p>	 <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832404 Mode : 7</p>

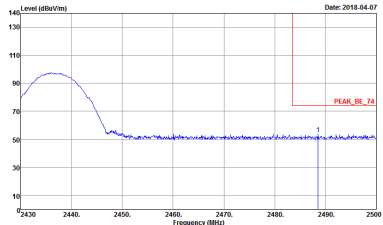
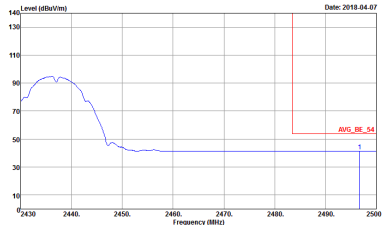


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Vertical	Fundamental
Peak	<p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 7</p>	<p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 7</p>
Avg.	<p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832404 Mode : 7</p>	<p>Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832404 Mode : 7</p>

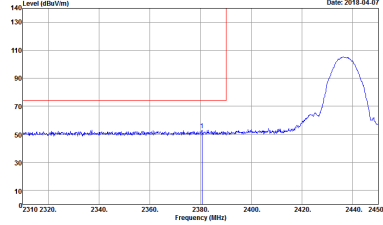
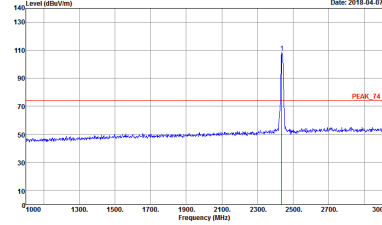
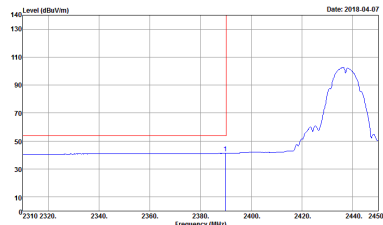
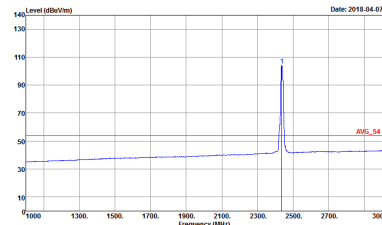


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 <p>Date: 2018.04.07</p> <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 8</p>	 <p>Date: 2018.04.07</p> <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 8</p>
Avg.	 <p>Date: 2018.04.07</p> <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832404 Mode : 8</p>	 <p>Date: 2018.04.07</p> <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832404 Mode : 8</p>

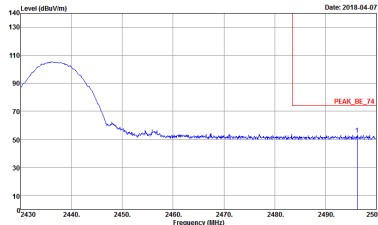
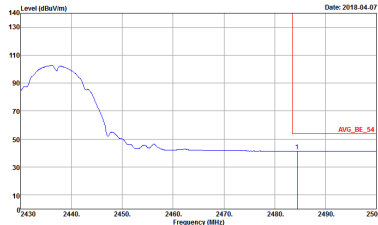


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Horizontal	Fundamental
<p>Peak</p>	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 8</p>	<p>Left blank</p>
<p>Avg.</p>	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 8</p>	<p>Left blank</p>

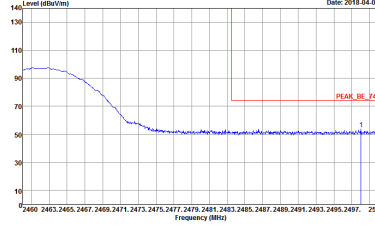
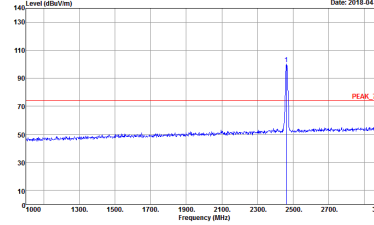
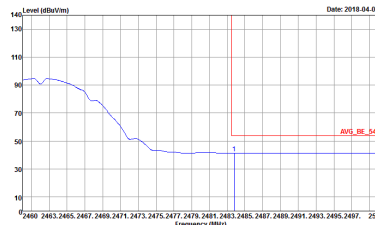
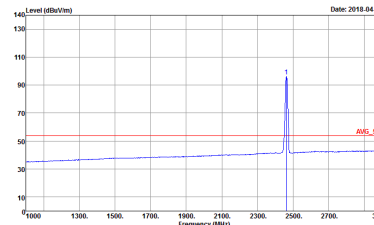


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 8</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 8</p>
Avg.	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832404 Mode : 8</p>	 <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832404 Mode : 8</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
<p>Peak</p>	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 832404 Mode : 8</p>	<p>Left blank</p>
<p>Avg.</p>	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 832404 Mode : 8</p>	<p>Left blank</p>



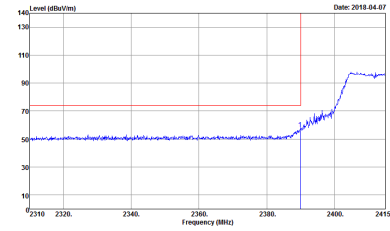
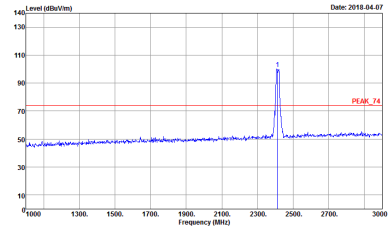
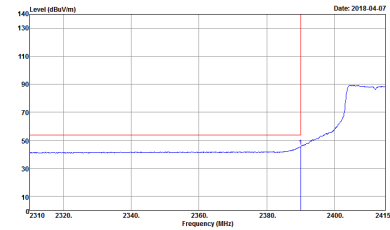
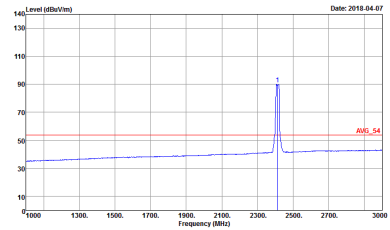
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Fundamental
<p>Peak</p>	 <p>Date: 2018.04.07</p> <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 9</p>	 <p>Date: 2018.04.07</p> <p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 9</p>
<p>Avg.</p>	 <p>Date: 2018.04.07</p> <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832404 Mode : 9</p>	 <p>Date: 2018.04.07</p> <p>Site : 03CH12-HY Condition : AVG_F4 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832404 Mode : 9</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Vertical	Fundamental
Peak	<p>Site : 03CH2-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 9</p>	<p>Site : 03CH2-HY Condition : PEAK_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 9</p>
	<p>Site : 03CH2-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832404 Mode : 9</p>	<p>Site : 03CH2-HY Condition : AVG_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832404 Mode : 9</p>



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	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL RBW:1000.0000kHz VBW:3000.0000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 10 Setting : 14</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL RBW:1000.0000kHz VBW:3000.0000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 10 Setting : 14</p>
Avg.	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL RBW:1000.0000kHz VBW:1.0000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 10 Setting : 14</p>	 <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL RBW:1000.0000kHz VBW:1.0000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 10 Setting : 14</p>

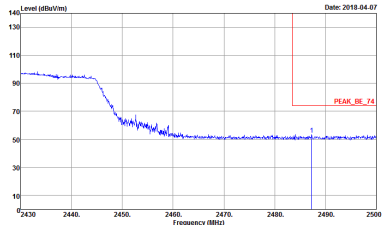
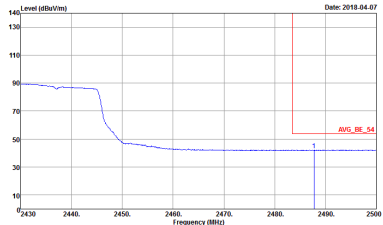


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Vertical	Fundamental
Peak	<p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 10 Setting : 14</p>	<p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 10 Setting : 14</p>
	<p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 10 Setting : 14</p>	<p>Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 10 Setting : 14</p>

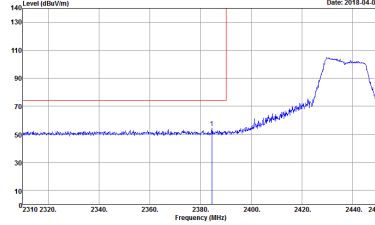
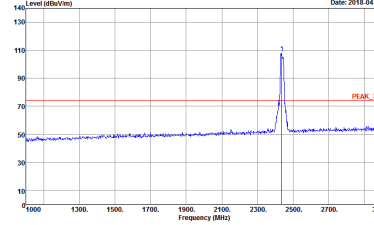
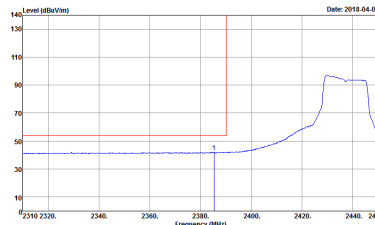
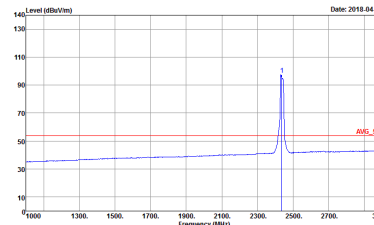


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	<p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : II</p>	<p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : II</p>
Avg.	<p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : II</p>	<p>Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : II</p>

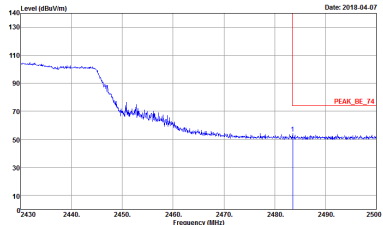
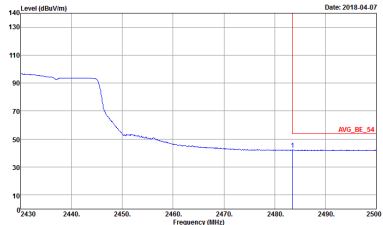


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Horizontal	Fundamental
<p>Peak</p>	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 11</p>	<p>Left blank</p>
<p>Avg.</p>	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 11</p>	<p>Left blank</p>

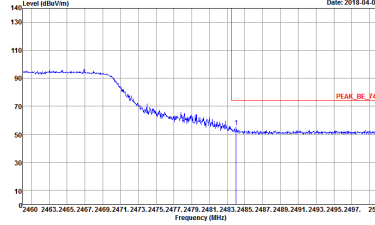
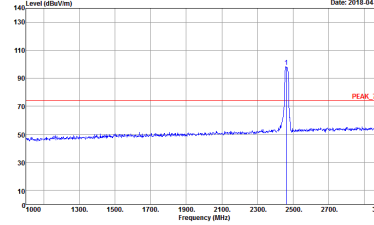
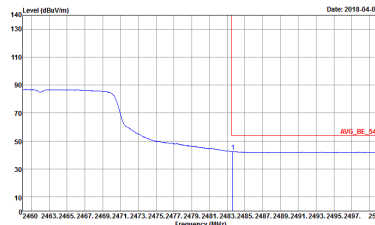
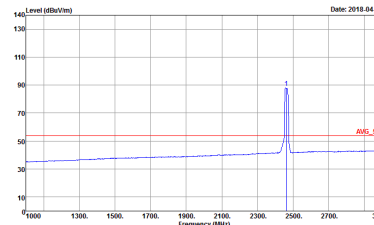


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 <p>Date: 2018.04.07</p> <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : II</p>	 <p>Date: 2018.04.07</p> <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : II</p>
Avg.	 <p>Date: 2018.04.07</p> <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : II</p>	 <p>Date: 2018.04.07</p> <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : II</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Vertical	Fundamental
<p>Peak</p>	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 832404 Mode : 11</p>	<p>Left Blank</p>
<p>Avg.</p>	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 832404 Mode : 11</p>	<p>Left Blank</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Fundamental
<p>Peak</p>	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 12</p>	 <p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 12</p>
<p>Avg.</p>	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 12</p>	 <p>Site : 03CH12-HY Condition : AVG_F4 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 12</p>

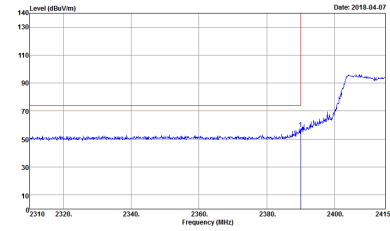
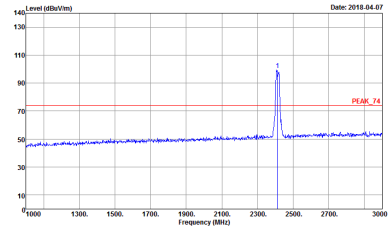
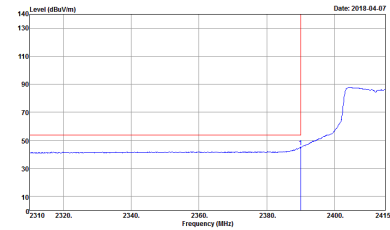
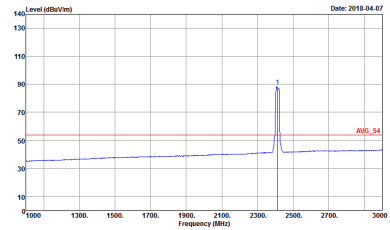


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Vertical	Fundamental
<p>Peak</p>	<p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 1Z</p>	<p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 1Z</p>
<p>Avg.</p>	<p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 1Z</p>	<p>Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 1Z</p>

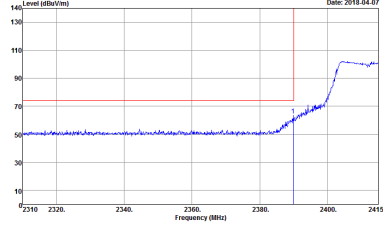
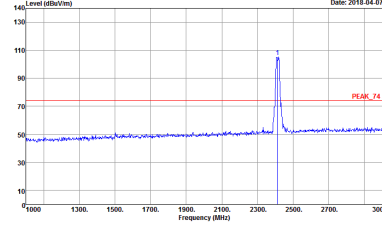
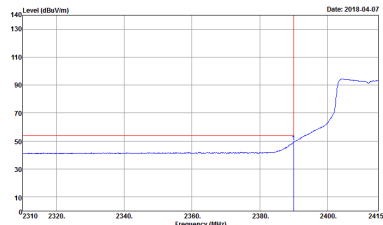
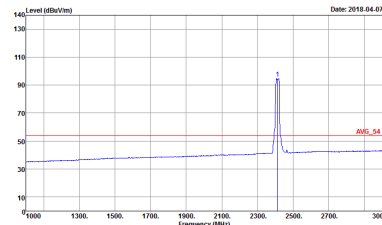


2.4GHz 2400~2483.5MHz

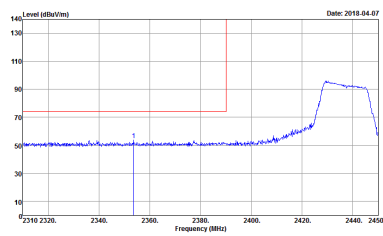
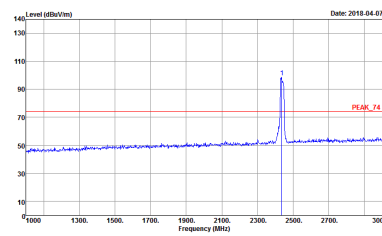
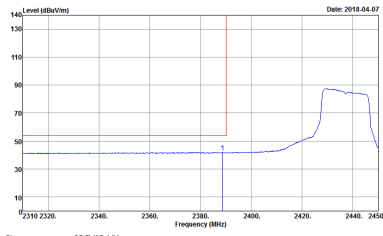
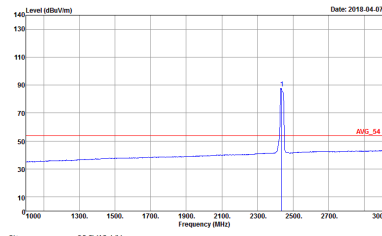
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 13</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 13</p>
Avg.	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 13</p>	 <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 13</p>

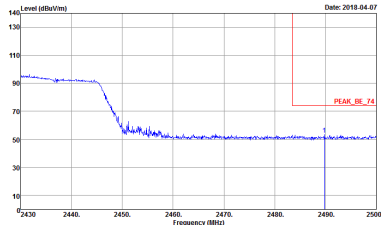
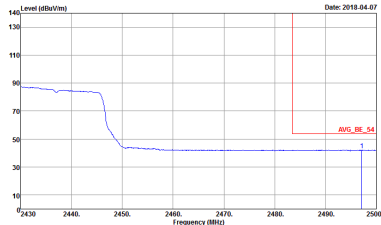


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 13</p>	 <p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 13</p>
Avg.	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 13</p>	 <p>Site : 03CH12-HY Condition : AVG_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 13</p>

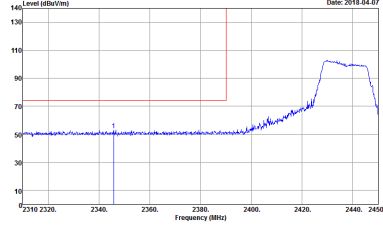
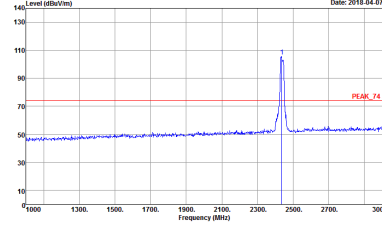
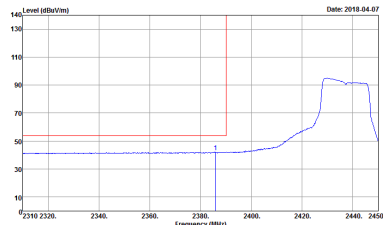
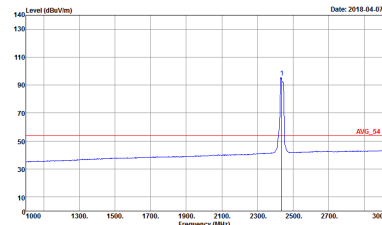


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 14</p>	 <p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_91200_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 14</p>
	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL RBW:1000.000kHz VBW:1000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 14</p>	 <p>Site : 03CH12-HY Condition : AVG_F4 3m HORN_91200_1328 HORIZONTAL RBW:1000.000kHz VBW:1000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 14</p>

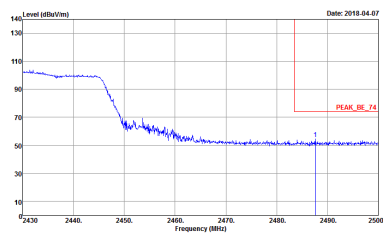
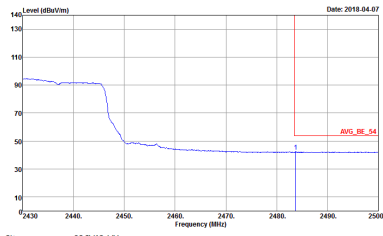


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Horizontal	Fundamental
<p>Peak</p>	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 14</p>	<p>Left blank</p>
<p>Avg.</p>	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 14</p>	<p>Left blank</p>

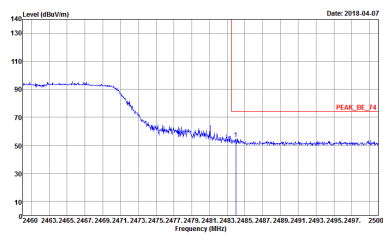
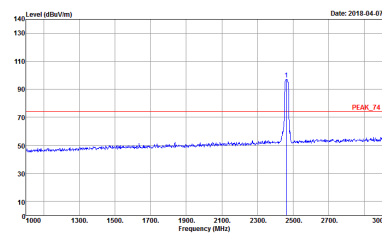
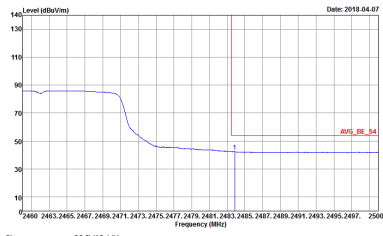
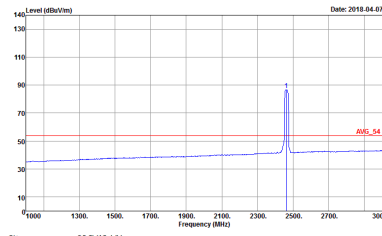


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 <p>Date: 2018.04.07</p> <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 14</p>	 <p>Date: 2018.04.07</p> <p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 14</p>
Avg.	 <p>Date: 2018.04.07</p> <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 14</p>	 <p>Date: 2018.04.07</p> <p>Site : 03CH12-HY Condition : AVG_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 14</p>

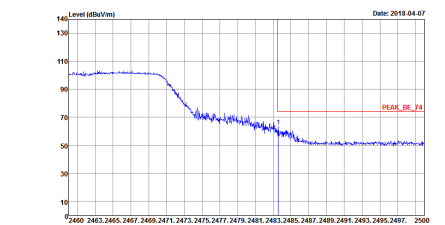
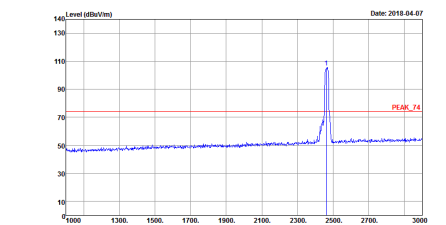
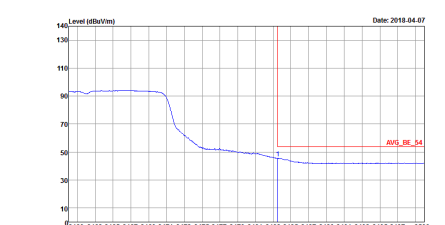
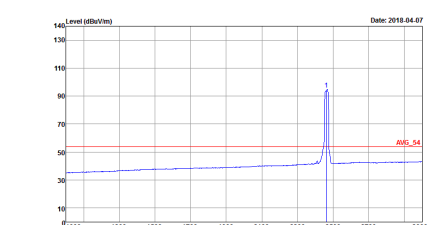


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 832404 Mode : 14</p>	Left Blank
Avg.	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 832404 Mode : 14</p>	Left Blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Fundamental
<p>Peak</p>	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 15</p>	 <p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 15</p>
<p>Avg.</p>	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:1000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 15</p>	 <p>Site : 03CH12-HY Condition : AVG_F4 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:1000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 15</p>



WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Vertical	Fundamental
<p>Peak</p>	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 15</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 15</p>
<p>Avg.</p>	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 15</p>	 <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832404 Mode : 15</p>



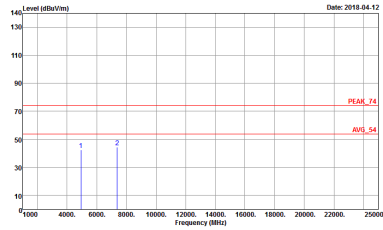
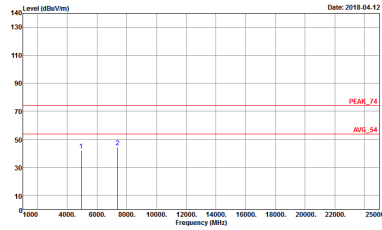
**2.4GHz 2400~2483.5MHz
WIFI 802.11b (Harmonic @ 3m)**

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.	<p> <small>Date: 2018-04-12</small> <small>Site : 03CH12-HY</small> <small>Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL</small> <small>Detector : Peak</small> <small>Project : 832404</small> <small>Mode : 7</small> </p>	<p> <small>Date: 2018-04-12</small> <small>Site : 03CH12-HY</small> <small>Condition : PEAK_74 3m HORN_91200_1328 VERTICAL</small> <small>Detector : Peak</small> <small>Project : 832404</small> <small>Mode : 7</small> </p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 8</p>	<p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 832404 Mode : 8</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 9</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 832404 Mode : 9</p>



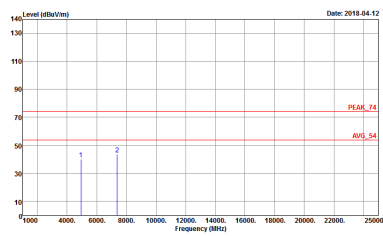
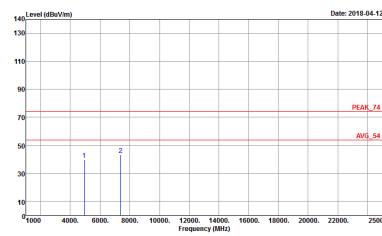
**2.4GHz 2400~2483.5MHz
WIFI 802.11g (Harmonic @ 3m)**

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 10</p>	<p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 832404 Mode : 10</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.		



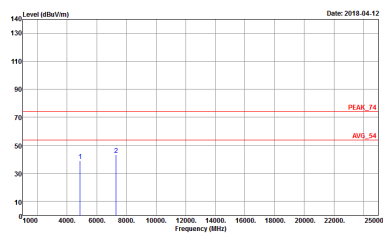
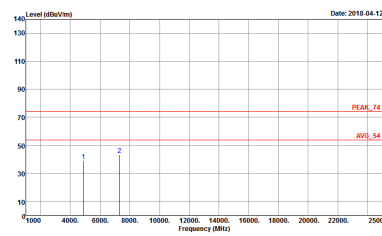
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 12</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 832404 Mode : 12</p>



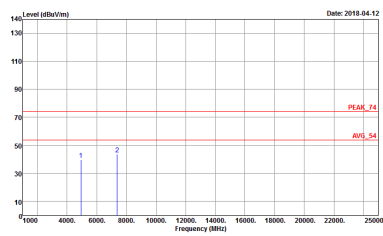
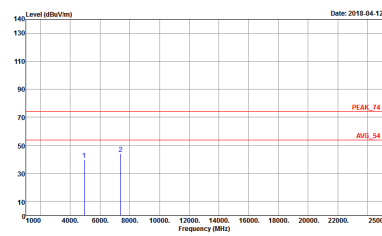
2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 13</p>	<p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 832404 Mode : 13</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 14</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 832404 Mode : 14</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832404 Mode : 15</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 832404 Mode : 15</p>



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

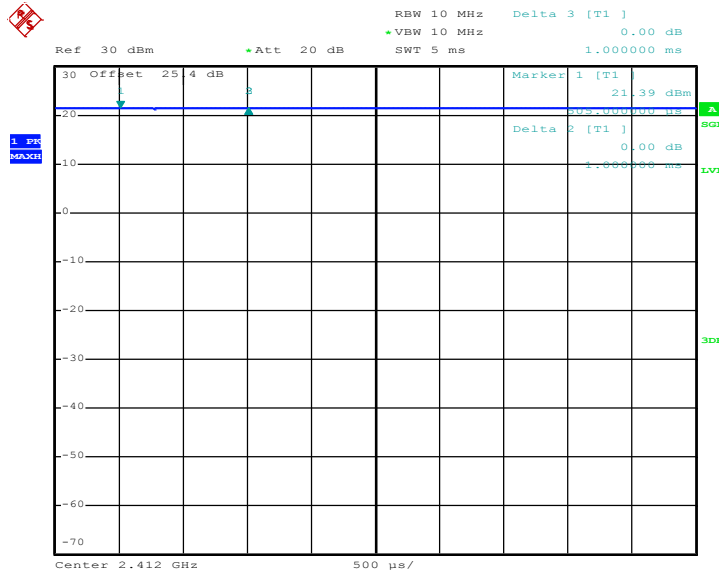
Table with 2 columns: Horizontal and Vertical. It contains two spectral plots showing Level (dBV/m) vs Frequency (MHz) for a QP / Peak. The plots show a blue signal line with peaks and a red step function. Metadata includes Site: 03CH12-HY, Condition: QP 3m BIL06_6111D_35414 HORIZONTAL, Detector: Peak, Project: 832404, Mode: 18.



Appendix E. Duty Cycle Plots

Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
802.11b	100	-	-	10Hz	0.00
802.11g	86.59	1356	0.74	1kHz	0.63
2.4GHz 802.11n HT20	86.18	1272	0.79	1kHz	0.65

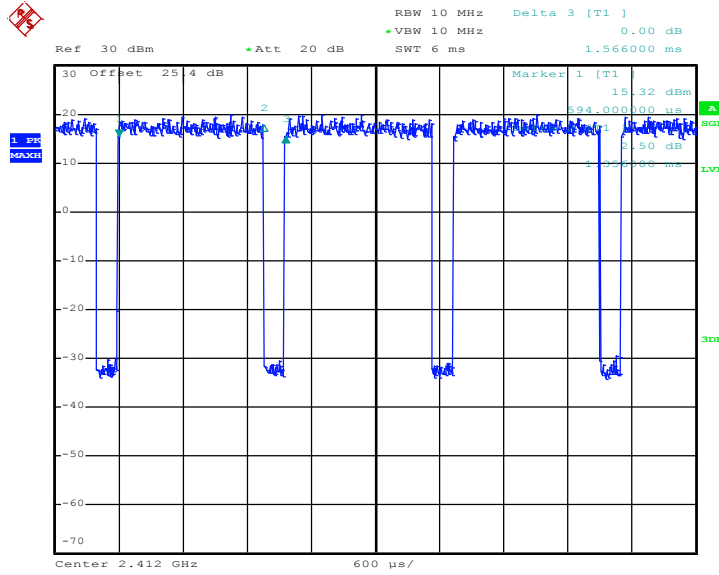
802.11b



Date: 31.MAR.2018 00:20:38

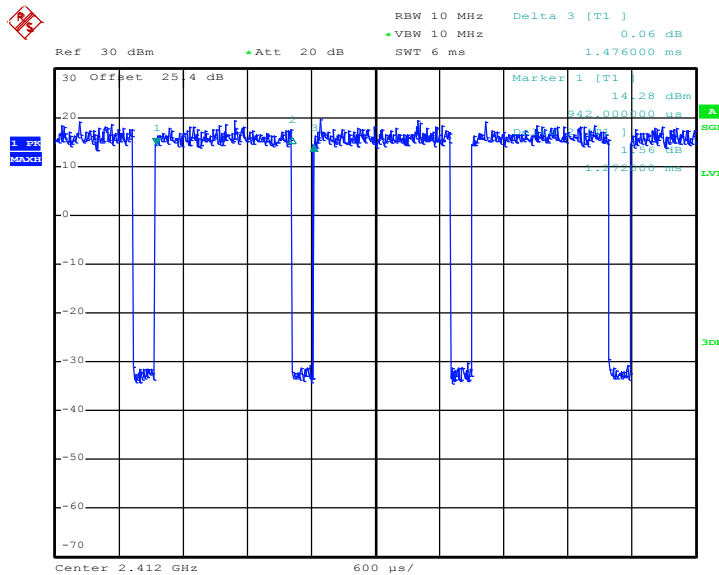


802.11g



Date: 31.MAR.2018 00:36:35

802.11n HT20



Date: 31.MAR.2018 00:44:48