



FCC RF Test Report

APPLICANT : Compal Electronics, INC.
EQUIPMENT : VOICE HUB GATEWAY
BRAND NAME : Compal
MODEL NAME : DBX81
MARKETING NAME : VOICE HUB GATEWAY
FCC ID : GKR-DBX81WBZ
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Nov. 21, 2017 and testing was completed on Mar. 28, 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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FCC ID : GKR-DBX81WBZ

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR7N2101C	Rev. 01	Initial issue of report	Jan. 19, 2018
FR7N2101C	Rev. 02	Updating FCC ID	Apr. 03, 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 0.55 dB at 2389.905 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 13.30 dB at 0.150 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

Compal Electronics, INC.

No. 581 ruiguang rd., Neihu District, Taipei City 11492, Taiwan (R.O.C.)

1.2 Manufacturer

Compal Electronics, Inc. Pingzhen plant

3-4F., No. 8-1 & No. 8, Nandong Rd., Pingzhen Dist., Taoyuan City, 32455, Taiwan (R.O.C.)

1.3 Product Feature of Equipment Under Test

Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac, and Zigbee

Product Specification subjective to this standard	
Sample 1	Sample with 1st antenna (SN:DC33002250U/ T-543-9231116-1)
Sample 2	Sample with 2nd antenna (SN:DC33002600U/ ANTA0ZC12651WLAN1)
Antenna Type	WLAN: PIFA Antenna Bluetooth: PIFA Antenna Zigbee: PIFA 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 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	03CH07-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
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ ANSI C63.10-2013

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

2 Test Configuration of Equipment Under Test

- 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		

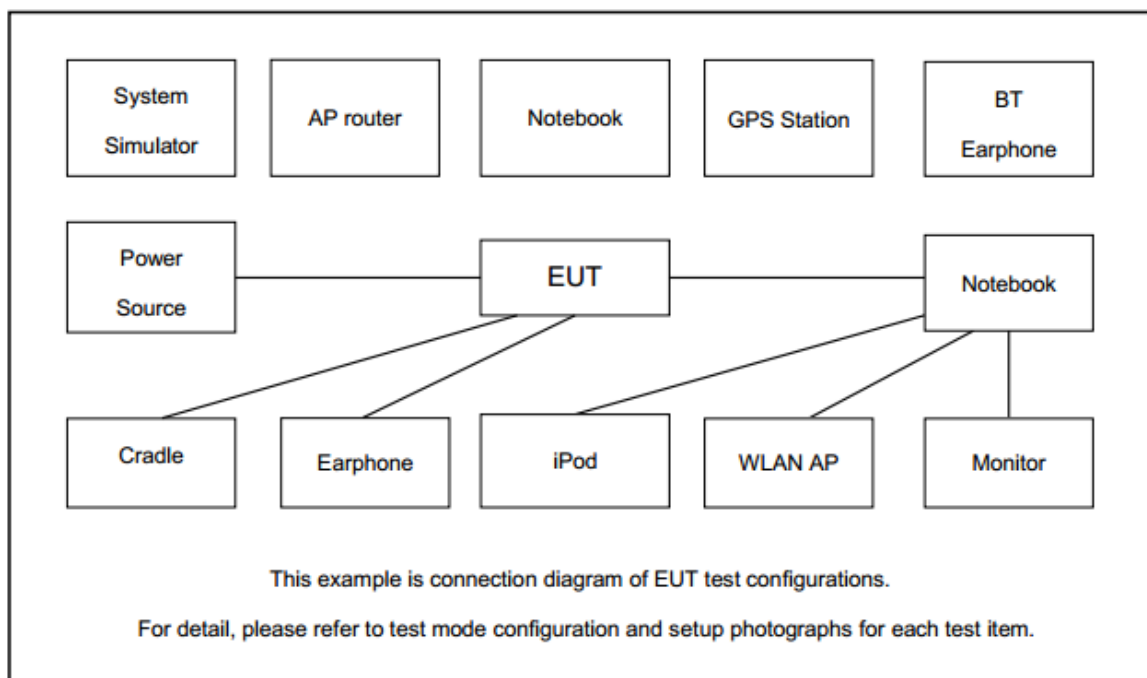
2.2 Test Mode

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

Modulation	Data Rate
802.11b	5.5Mbps
802.11g	6 Mbps
802.11n HT20	MCS0

Test Cases	
AC Conducted Emission	Mode 1 :WLAN (2.4GHz) Tx + Cable (Charging from Adapter) for Sample 1
	Mode 2 :Bluetooth Tx + Cable (Charging from Adapter) for Sample 1
	Mode 3 :Zigbee Tx + Cable (Charging from Adapter) for Sample 1
Remark: The worst case of conducted emission is mode 1; only the test data of it was reported.	

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.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

2.5 EUT Operation Test Setup

The RF test items, utility “Vysor” 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.

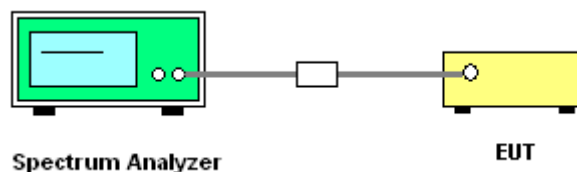
3.1.2 Measuring Instruments

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.

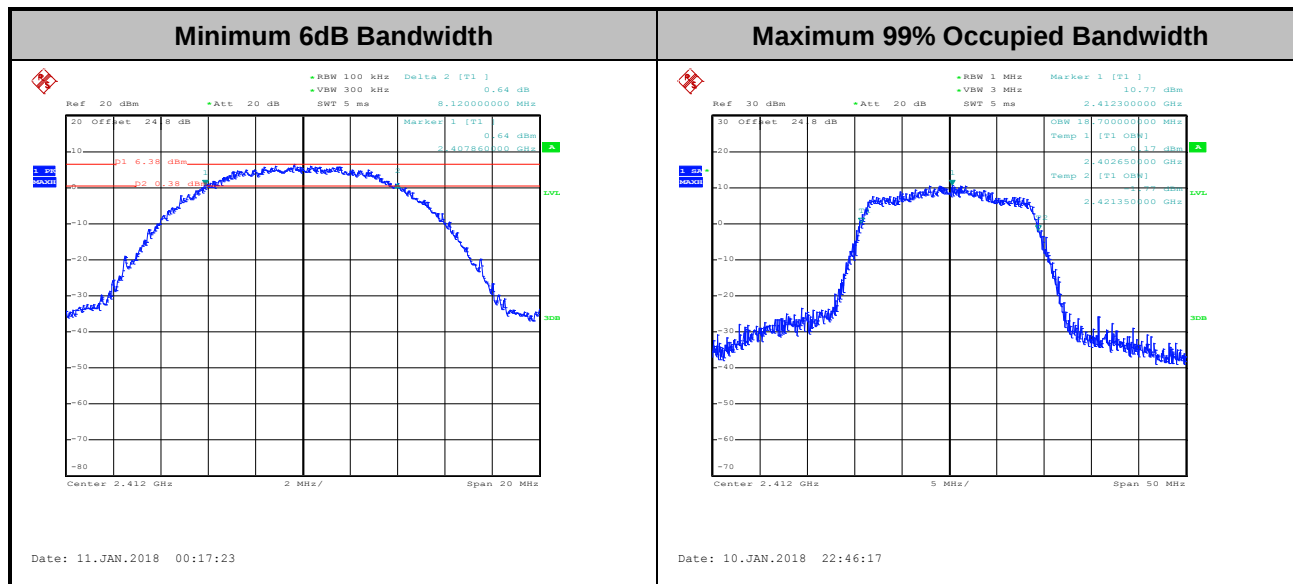
3.1.4 Test Setup





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.

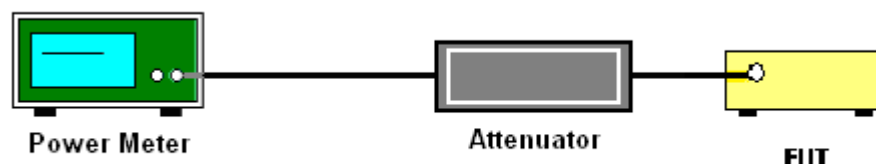
3.2.2 Measuring Instruments

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.

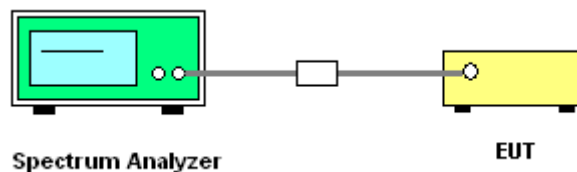
3.3.2 Measuring Instruments

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.
- 7.

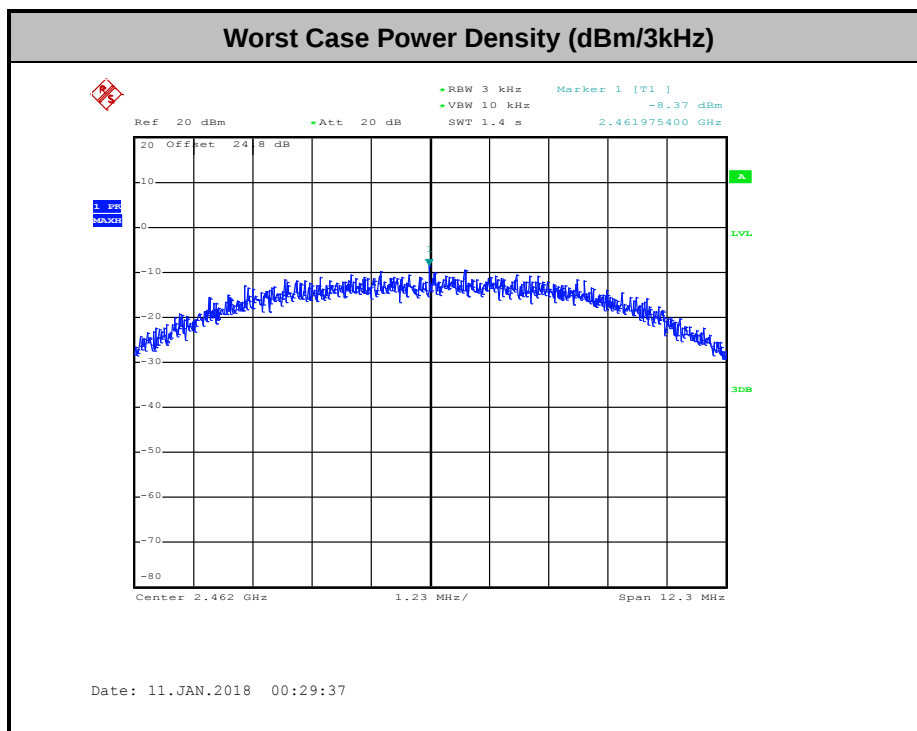
3.3.4 Test Setup





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.

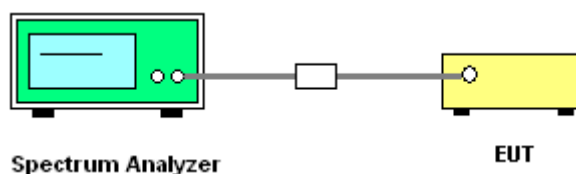
3.4.2 Measuring Instruments

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



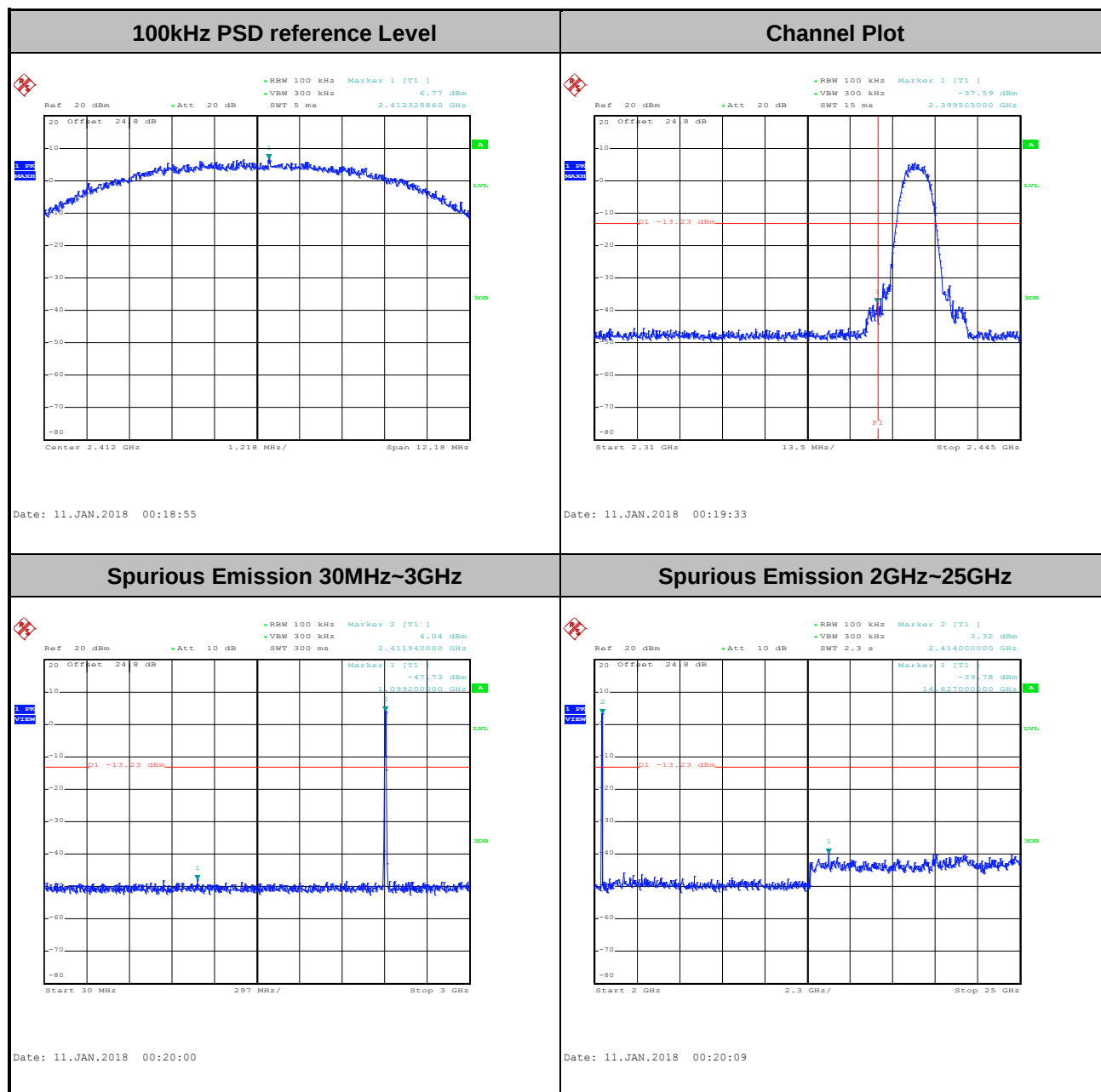


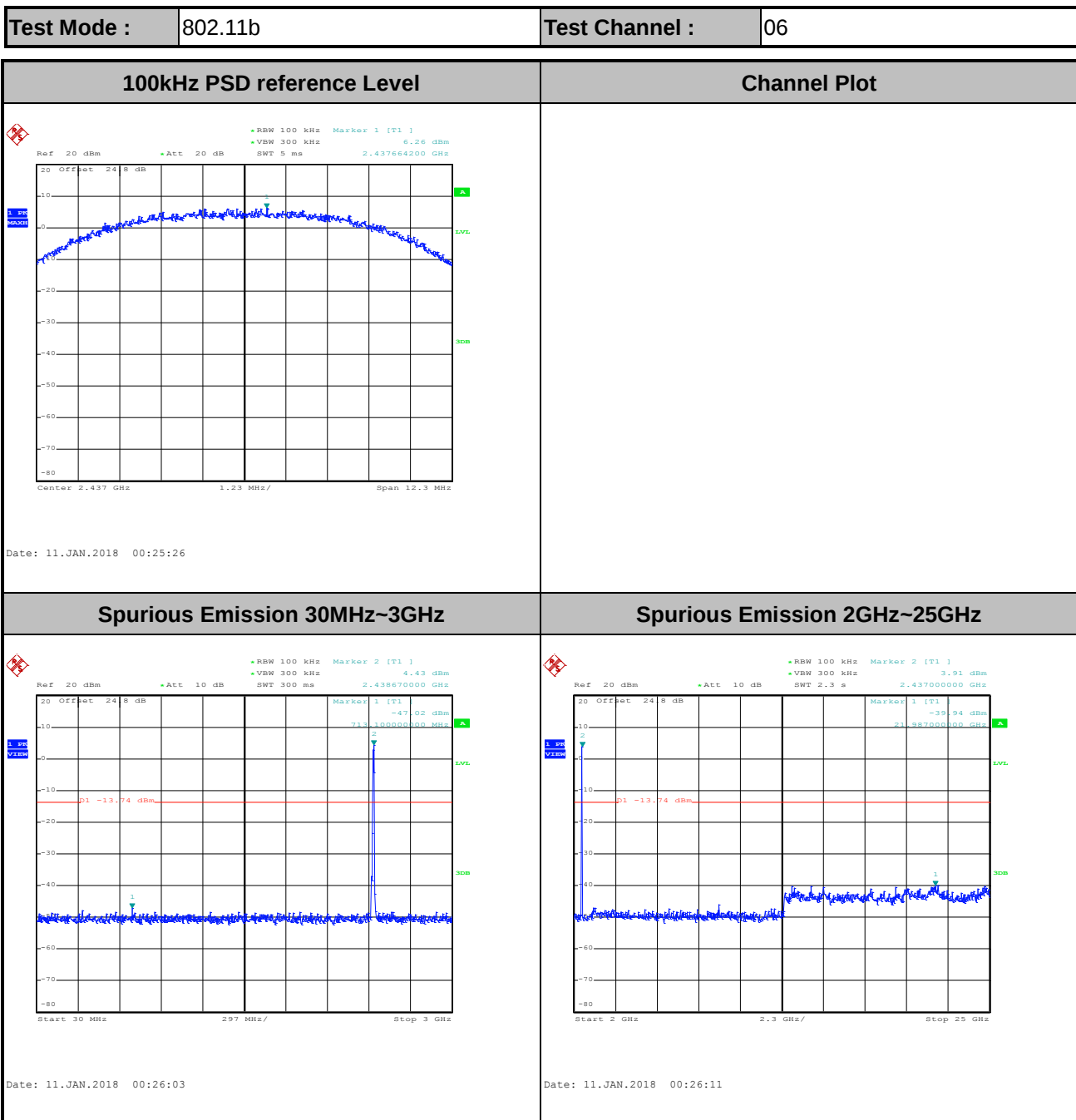
3.4.5 Test Result of Conducted Band Edges and Spurious Emission

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

Number of TX = 1, Ant. 1 (Measured)

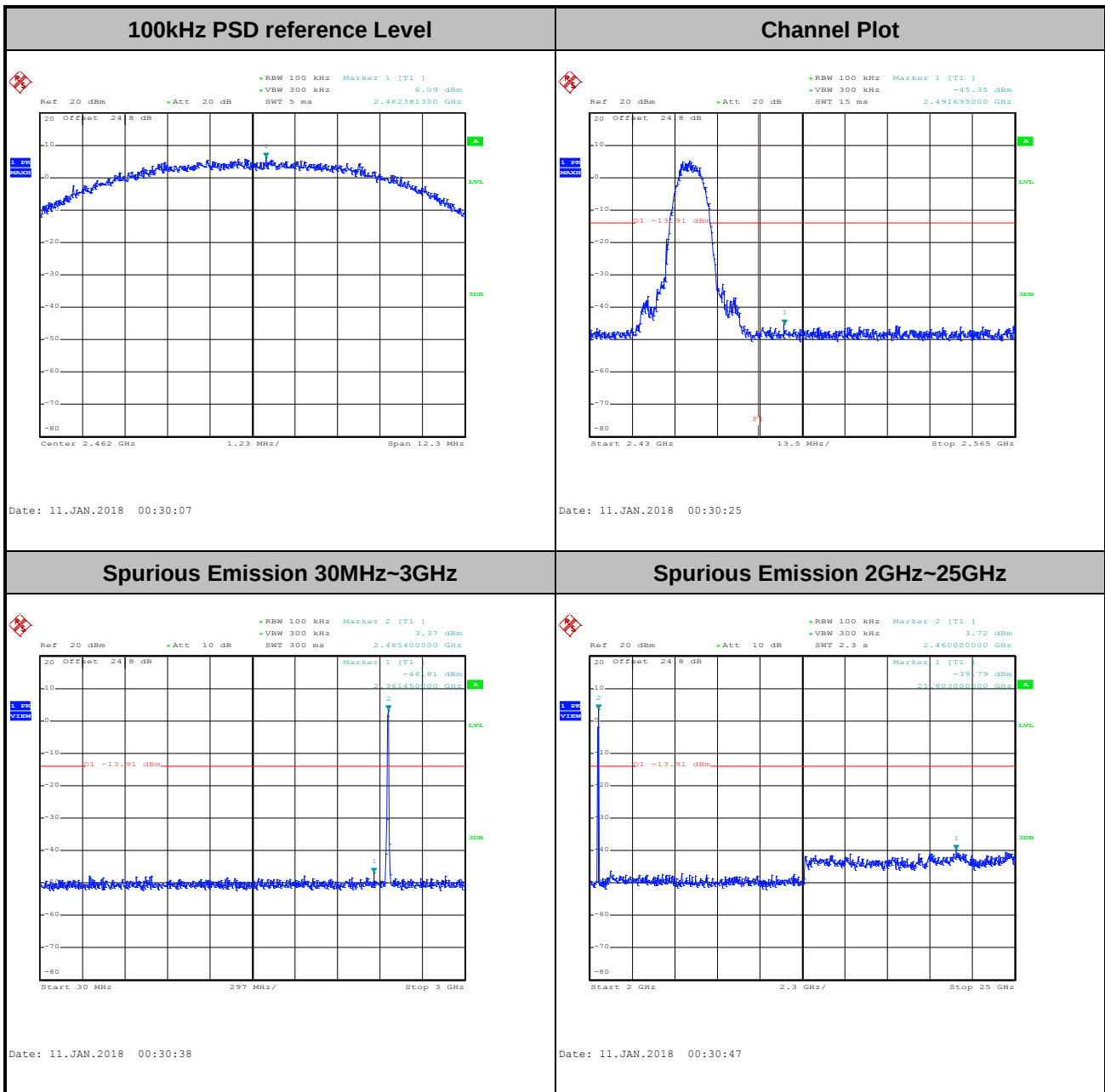
Test Mode :	802.11b	Test Channel :	01
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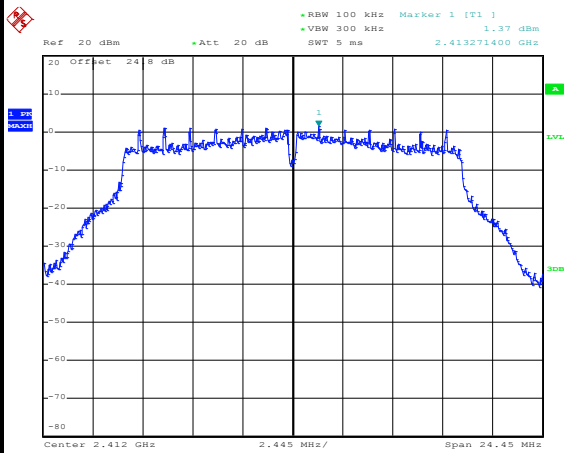
Test Mode :	802.11b	Test Channel :	11
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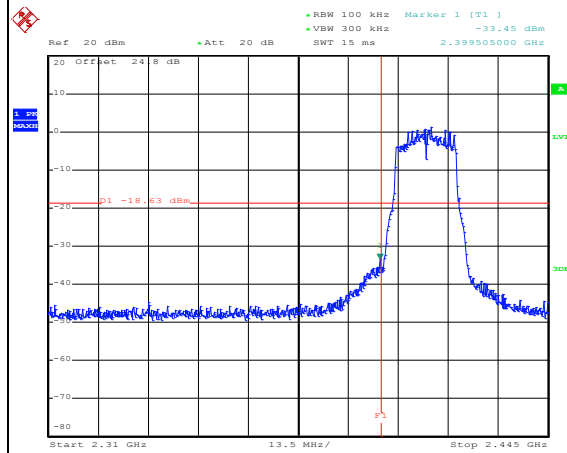
Test Mode :	802.11g	Test Channel :	01
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100kHz PSD reference Level



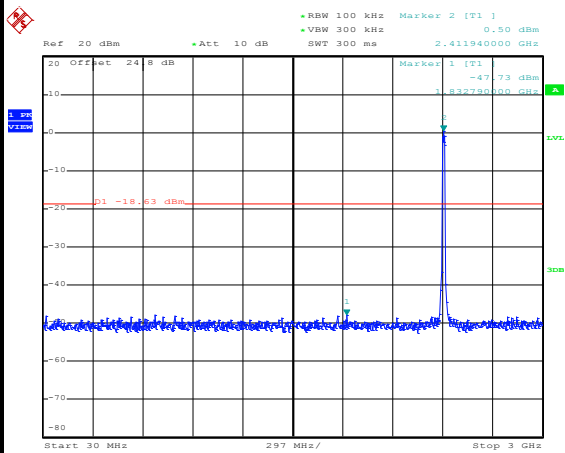
Date: 11.JAN.2018 00:35:22

Channel Plot



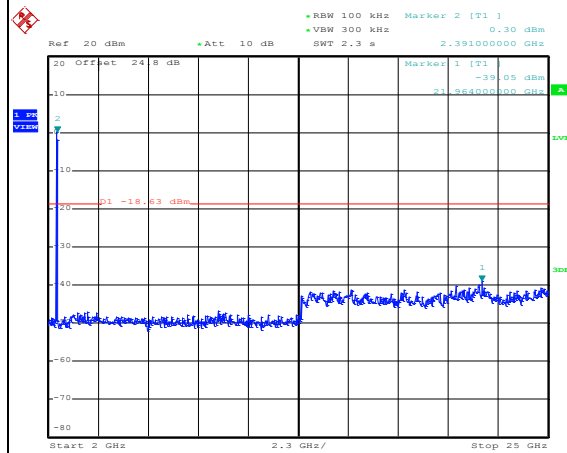
Date: 11.JAN.2018 00:35:37

Spurious Emission 30MHz~3GHz

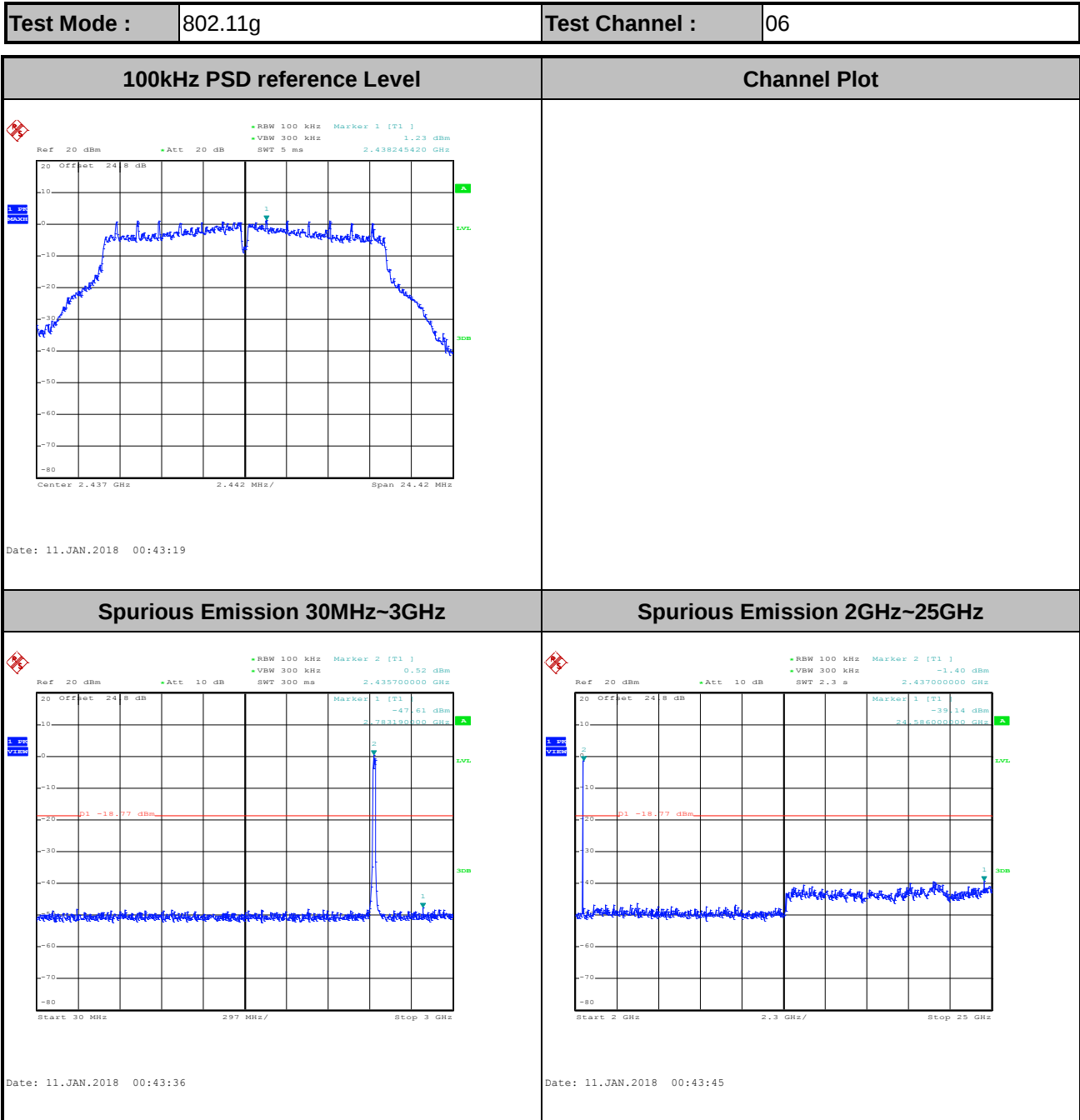


Date: 11.JAN.2018 00:35:58

Spurious Emission 2GHz~25GHz

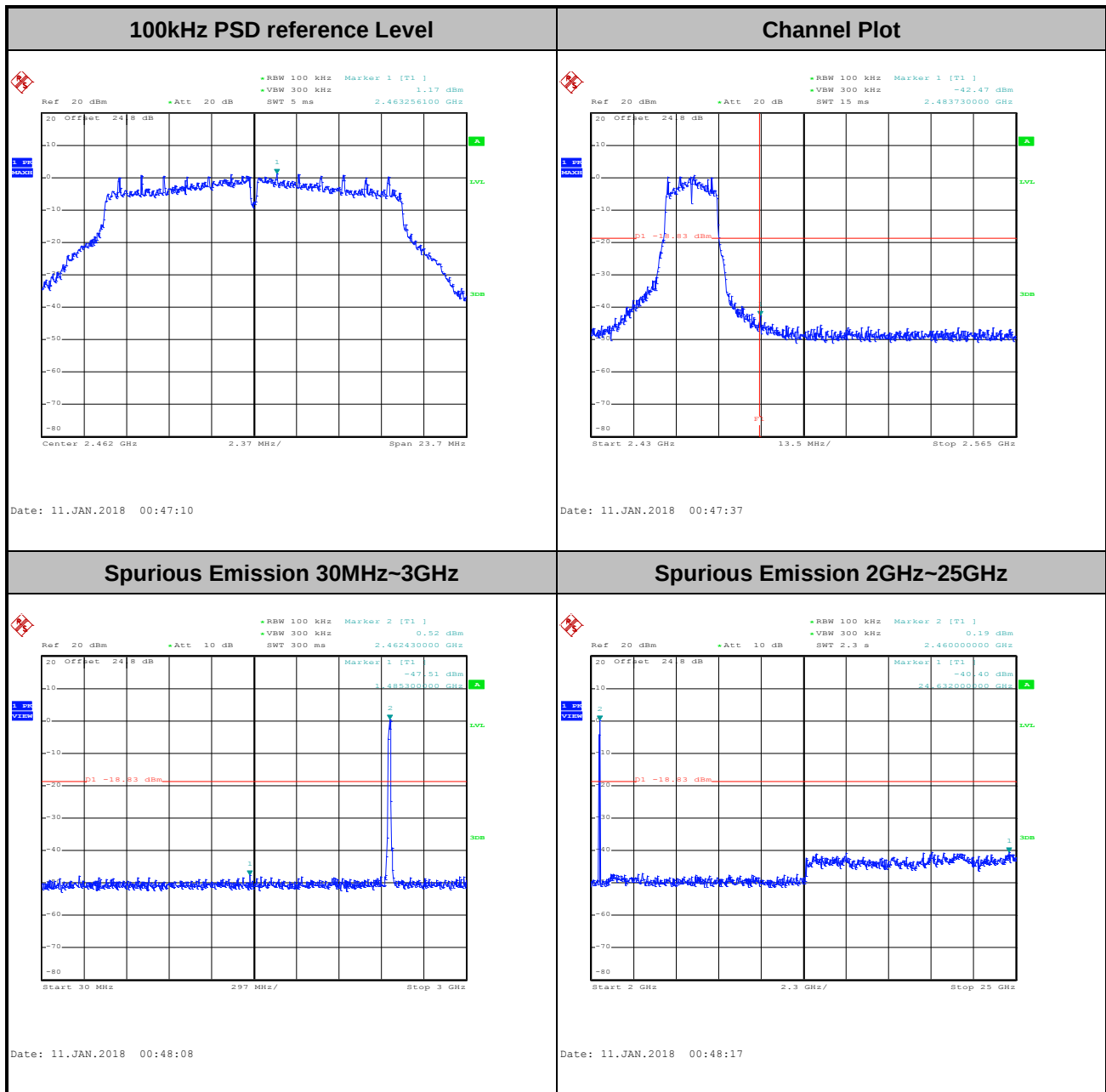


Date: 11.JAN.2018 00:36:06





Test Mode :	802.11g	Test Channel :	11
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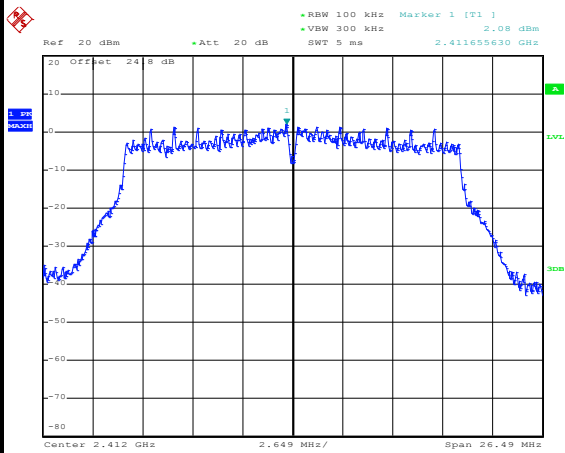




Test Mode : 802.11n HT20

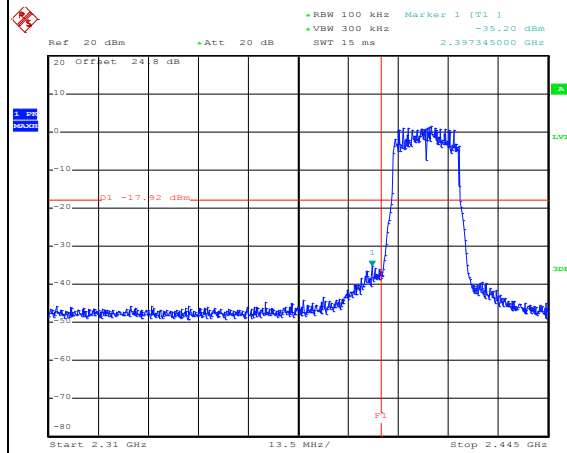
Test Channel : 01

100kHz PSD reference Level



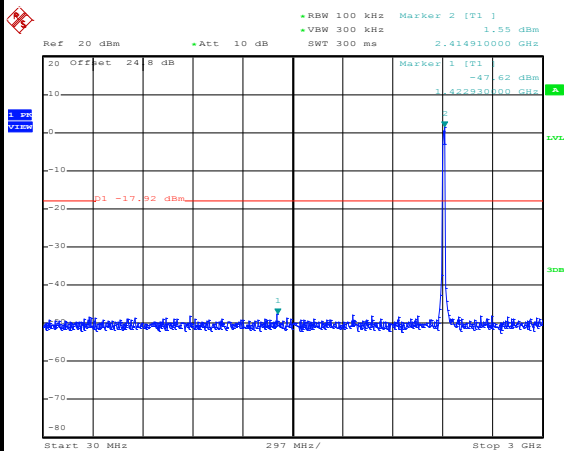
Date: 10.JAN.2018 22:45:07

Channel Plot



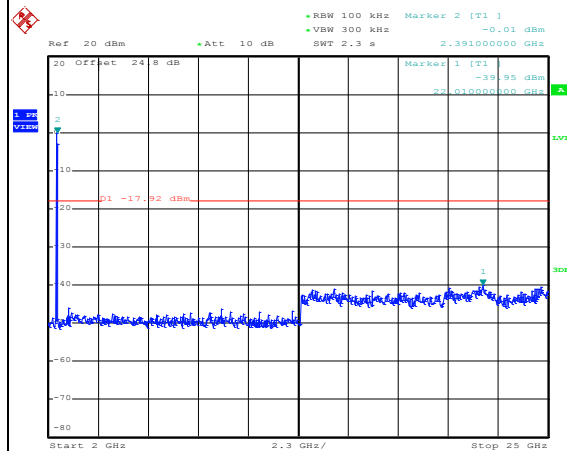
Date: 10.JAN.2018 22:45:23

Spurious Emission 30MHz~3GHz



Date: 10.JAN.2018 22:45:37

Spurious Emission 2GHz~25GHz

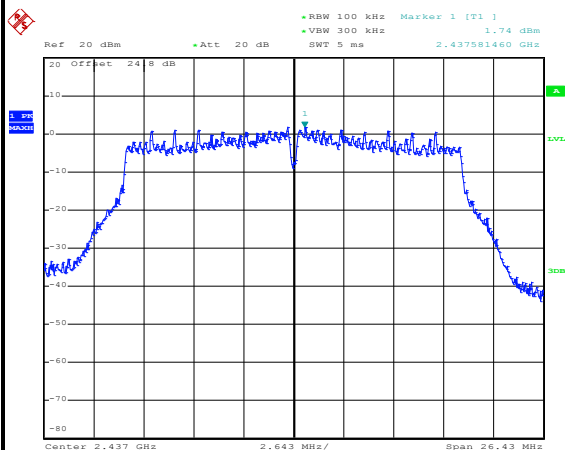


Date: 10.JAN.2018 22:45:46



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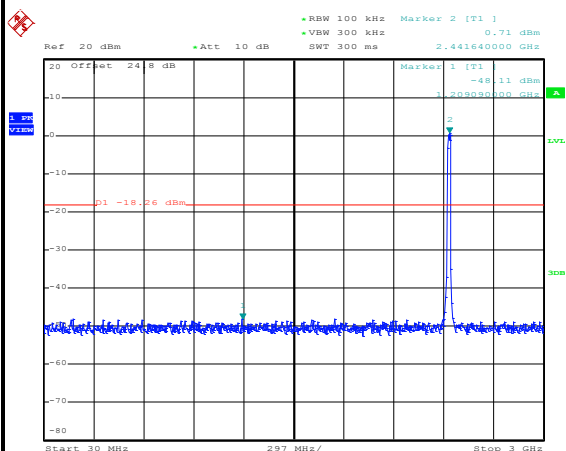
100kHz PSD reference Level



Date: 10.JAN.2018 22:51:38

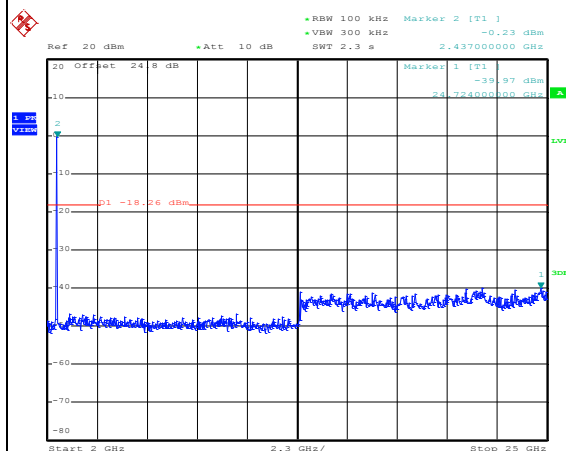
Channel Plot

Spurious Emission 30MHz~3GHz



Date: 10.JAN.2018 22:52:13

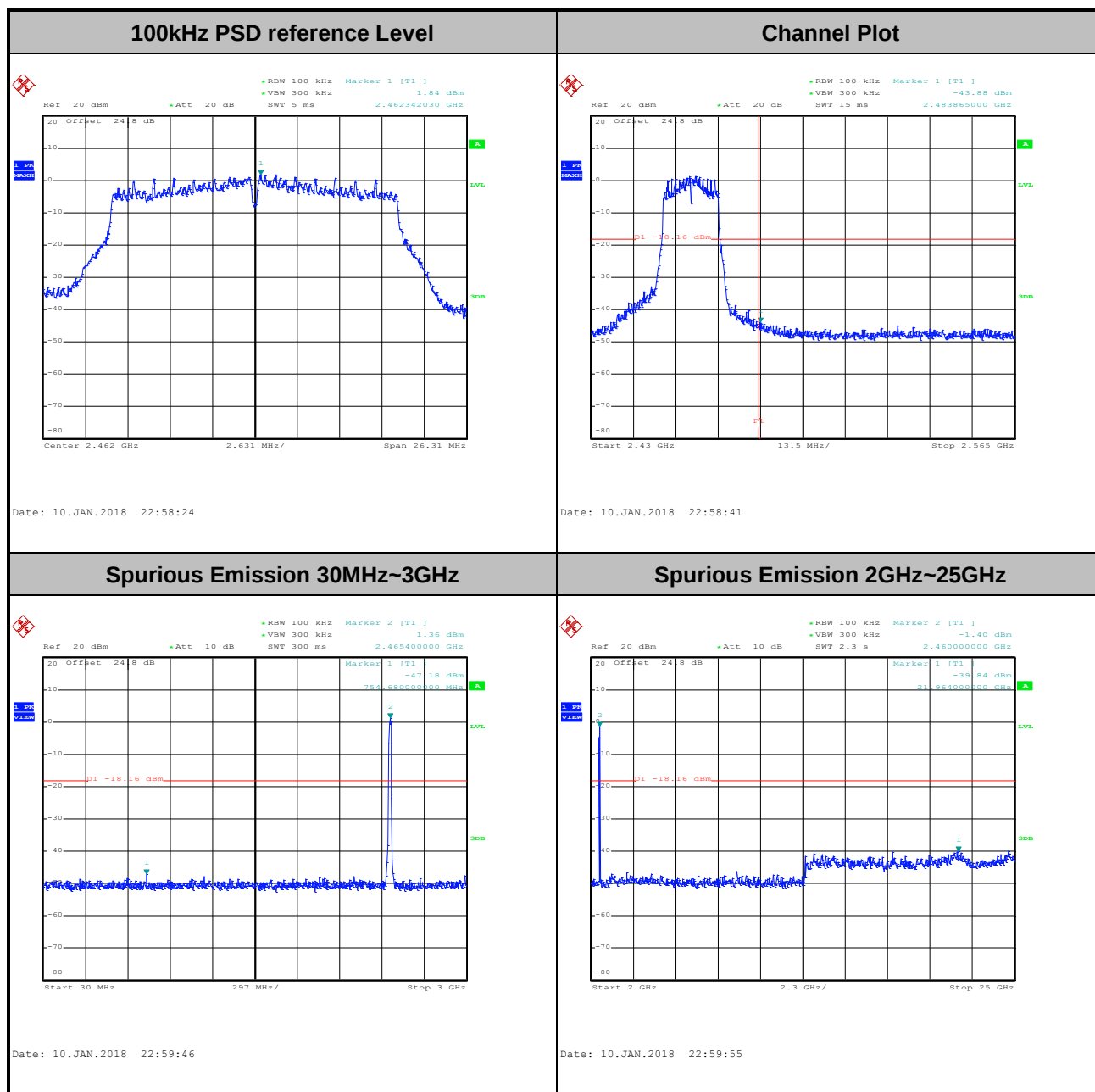
Spurious Emission 2GHz~25GHz



Date: 10.JAN.2018 22:52:21



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

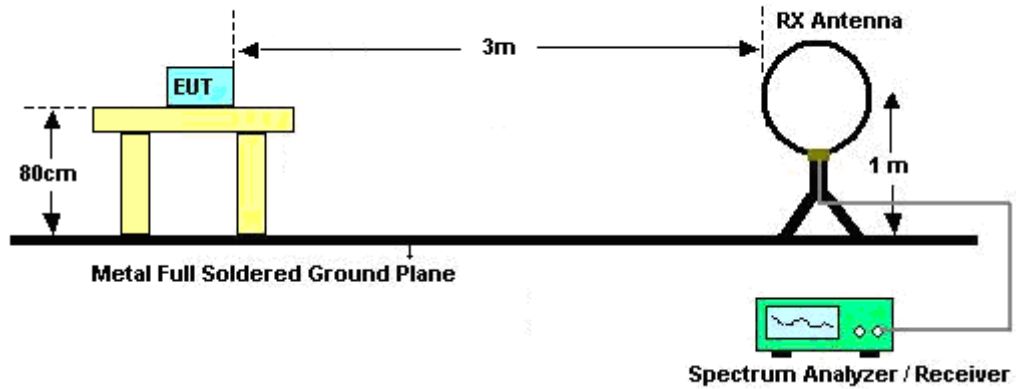
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test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

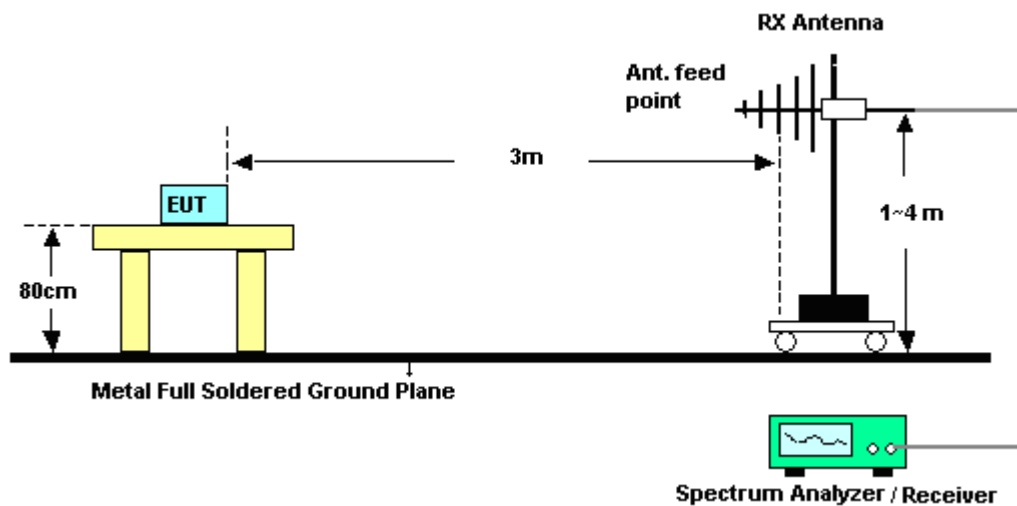
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

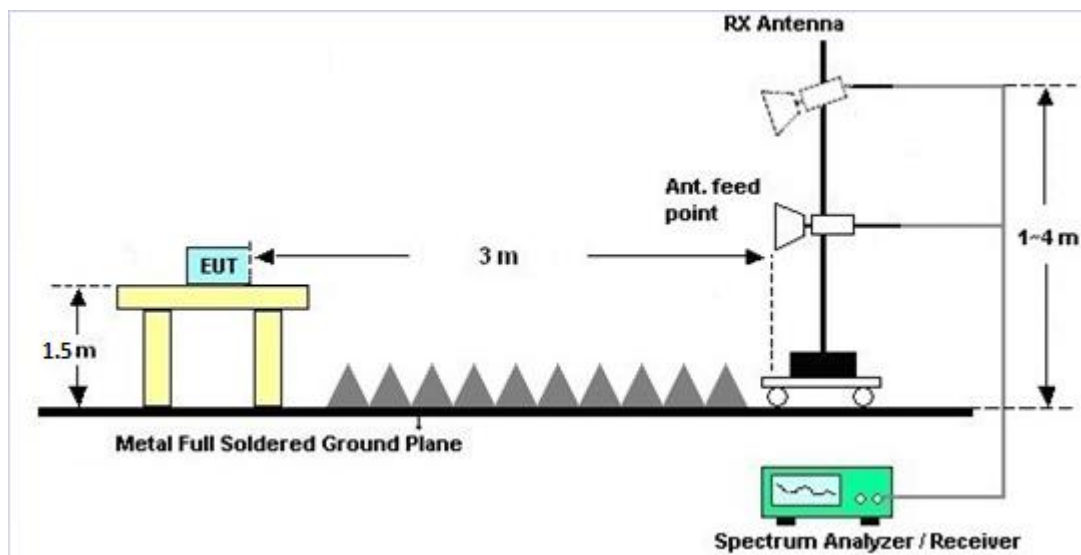
For radiated emissions below 30MHz



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 (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.

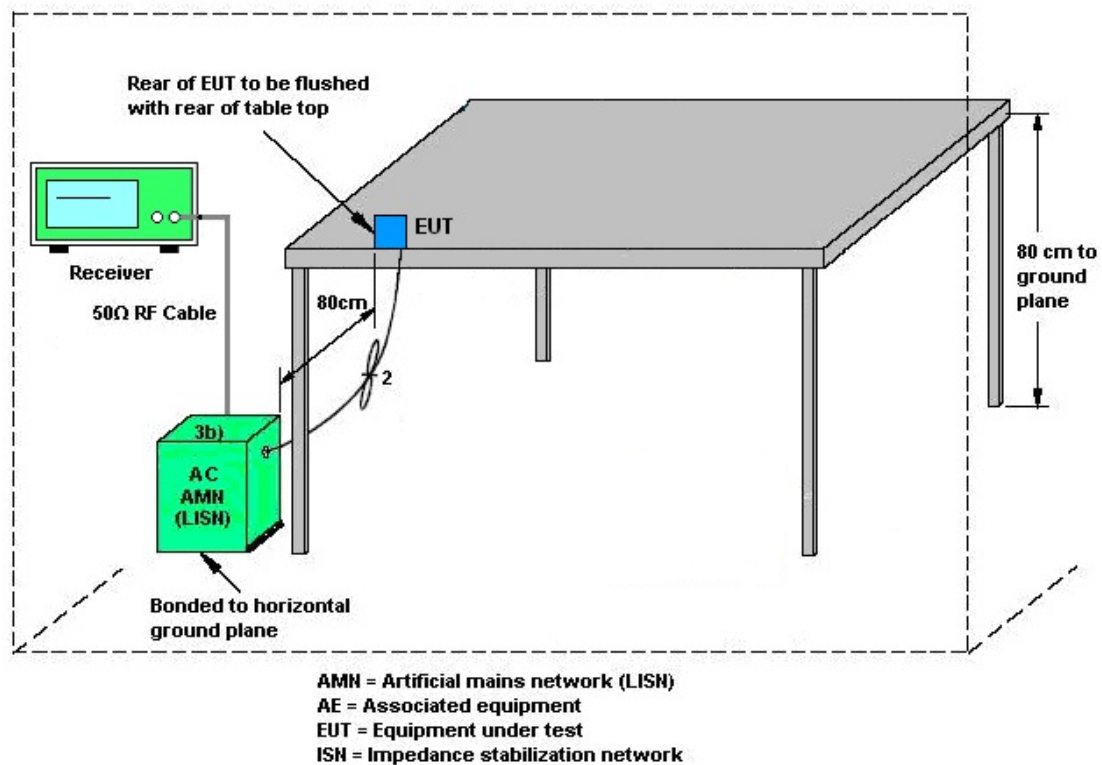
3.6.2 Measuring Instruments

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	Dec. 14, 2017~ Jan. 11, 2018	Sep. 25, 2018	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	0846202	300MHz~40GHz	Sep. 26, 2017	Dec. 14, 2017~ Jan. 11, 2018	Sep. 25, 2018	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9kHz ~ 30GHz	Nov. 13, 2017	Dec. 14, 2017~ Jan. 11, 2018	Nov. 12, 2018	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Dec. 18, 2017~ Dec. 19, 2017	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Sep. 20, 2017	Dec. 18, 2017~ Dec. 19, 2017	Sep. 19, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 30, 2017	Dec. 18, 2017~ Dec. 19, 2017	Nov. 29, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Dec. 08, 2017	Dec. 18, 2017~ Dec. 19, 2017	Dec. 07, 2018	Conduction (CO05-HY)
<Radiated Band Edges and Spurious Emission Measurement for sample 1>								
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	35419&03	30MHz to 1GHz	Jan. 07, 2017	Dec. 14, 2017~ Dec. 28, 2017	Jan. 06, 2018	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 23, 2017	Dec. 14, 2017~ Dec. 28, 2017	Aug. 22, 2018	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Nov. 10, 2017	Dec. 14, 2017~ Dec. 28, 2017	Nov. 09, 2019	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590075	1GHz ~ 18GHz	Apr. 25, 2017	Dec. 14, 2017~ Dec. 28, 2017	Apr. 24, 2018	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz-1GHz	Mar. 14, 2017	Dec. 14, 2017~ Dec. 28, 2017	Mar. 13, 2018	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A023 62	1GHz~ 26.5GHz	Oct. 30, 2017	Dec. 14, 2017~ Dec. 28, 2017	Oct. 29, 2018	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9010A	MY534701 18	10Hz~44GHz	Apr. 17, 2017	Dec. 14, 2017~ Dec. 28, 2017	Apr. 16, 2018	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Dec. 14, 2017~ Dec. 28, 2017	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Dec. 14, 2017~ Dec. 28, 2017	N/A	Radiation (03CH07-HY)
Amplifier	MITEQ	TTA1840-35- HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 18, 2017	Dec. 14, 2017~ Dec. 28, 2017	Jul. 17, 2018	Radiation (03CH07-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY532900 53	20Hz to 26.5GHz	Jan. 12, 2017	Dec. 14, 2017~ Dec. 28, 2017	Jan. 11, 2018	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170 584	18GHz- 40GHz	Nov. 27, 2017	Dec. 14, 2017~ Dec. 28, 2017	Nov. 26, 2018	Radiation (03CH07-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
<Radiated Band Edges and Spurious Emission Measurement for sample 2>								
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	35419&03	30MHz to 1GHz	Dec. 18, 2017	Mar. 22, 2018~ Mar. 28, 2018	Dec. 17, 2018	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 23, 2017	Mar. 22, 2018~ Mar. 28, 2018	Aug. 22, 2018	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Nov. 10, 2017	Mar. 22, 2018~ Mar. 28, 2018	Nov. 09, 2018	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A023 62	1GHz~ 26.5GHz	Oct. 30, 2017	Mar. 22, 2018~ Mar. 28, 2018	Oct. 29, 2018	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9010A	MY534701 18	10Hz~44GHz	Apr. 17, 2017	Mar. 22, 2018~ Mar. 28, 2018	Apr. 16, 2018	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Mar. 22, 2018~ Mar. 28, 2018	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Mar. 22, 2018~ Mar. 28, 2018	N/A	Radiation (03CH07-HY)
Amplifier	MITEQ	TTA1840-35- HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 18, 2017	Mar. 22, 2018~ Mar. 28, 2018	Jul. 17, 2018	Radiation (03CH07-HY)
Test Software	Audix	E3 6.2009-8- 24	N/A	N/A	N/A	Mar. 22, 2018~ Mar. 28, 2018	N/A	Radiation (03CH07-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY532900 53	20Hz to 26.5GHz	Jan. 16, 2018	Mar. 22, 2018~ Mar. 28, 2018	Jan. 15, 2019	Radiation (03CH07-HY)
Amplifier	SONOMA	310N	187231	9kHz~1GHz	Jan. 08, 2018	Mar. 22, 2018~ Mar. 28, 2018	Jan. 07, 2019	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 584	18GHz- 40GHz	Nov. 27, 2017	Mar. 22, 2018~ Mar. 28, 2018	Nov. 26, 2018	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.70
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.70
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.50
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.20
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Ethan Lin/Shiming Liu	Temperature:	21~25	°C
Test Date:	2017/12/14~2018/1/11	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
11b	5.5Mbps	1	1	2412	11.65	8.12	0.50	Pass
11b	5.5Mbps	1	6	2437	11.65	8.20	0.50	Pass
11b	5.5Mbps	1	11	2462	11.80	8.20	0.50	Pass
11g	6Mbps	1	1	2412	17.80	16.30	0.50	Pass
11g	6Mbps	1	6	2437	17.90	16.28	0.50	Pass
11g	6Mbps	1	11	2462	17.50	15.80	0.50	Pass
HT20	MCS7	1	1	2412	18.70	17.66	0.50	Pass
HT20	MCS7	1	6	2437	18.70	17.62	0.50	Pass
HT20	MCS7	1	11	2462	18.50	17.54	0.50	Pass

TEST RESULTS DATA
Peak Power Table

2.4GHz Band										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
11b	5.5Mbps	1	1	2412	17.21	30.00	1.42	18.63	36.00	Pass
11b	5.5Mbps	1	6	2437	17.12	30.00	1.42	18.54	36.00	Pass
11b	5.5Mbps	1	11	2462	16.87	30.00	1.42	18.29	36.00	Pass
11g	6Mbps	1	1	2412	23.08	30.00	1.42	24.50	36.00	Pass
11g	6Mbps	1	6	2437	22.91	30.00	1.42	24.33	36.00	Pass
11g	6Mbps	1	11	2462	22.84	30.00	1.42	24.26	36.00	Pass
HT20	MCS7	1	1	2412	22.77	30.00	1.42	24.19	36.00	Pass
HT20	MCS7	1	6	2437	22.78	30.00	1.42	24.20	36.00	Pass
HT20	MCS7	1	11	2462	22.60	30.00	1.42	24.02	36.00	Pass

TEST RESULTS DATA
Average Power Table
(Reporting Only)

2.4GHz Band						
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
11b	5.5Mbps	1	1	2412	0.09	14.40
11b	5.5Mbps	1	6	2437	0.09	14.29
11b	5.5Mbps	1	11	2462	0.09	14.20
11g	6Mbps	1	1	2412	0.12	12.96
11g	6Mbps	1	6	2437	0.12	13.10
11g	6Mbps	1	11	2462	0.12	13.16
HT20	MCS7	1	1	2412	0.98	12.84
HT20	MCS7	1	6	2437	0.98	12.71
HT20	MCS7	1	11	2462	0.98	12.65

TEST RESULTS DATA
Peak Power Density

2.4GHz Band								
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
11b	5.5Mbps	1	1	2412	-8.44	1.42	8.00	Pass
11b	5.5Mbps	1	6	2437	-9.20	1.42	8.00	Pass
11b	5.5Mbps	1	11	2462	-8.37	1.42	8.00	Pass
11g	6Mbps	1	1	2412	-10.97	1.42	8.00	Pass
11g	6Mbps	1	6	2437	-10.55	1.42	8.00	Pass
11g	6Mbps	1	11	2462	-11.40	1.42	8.00	Pass
HT20	MCS7	1	1	2412	-12.92	1.42	8.00	Pass
HT20	MCS7	1	6	2437	-12.65	1.42	8.00	Pass
HT20	MCS7	1	11	2462	-12.30	1.42	8.00	Pass



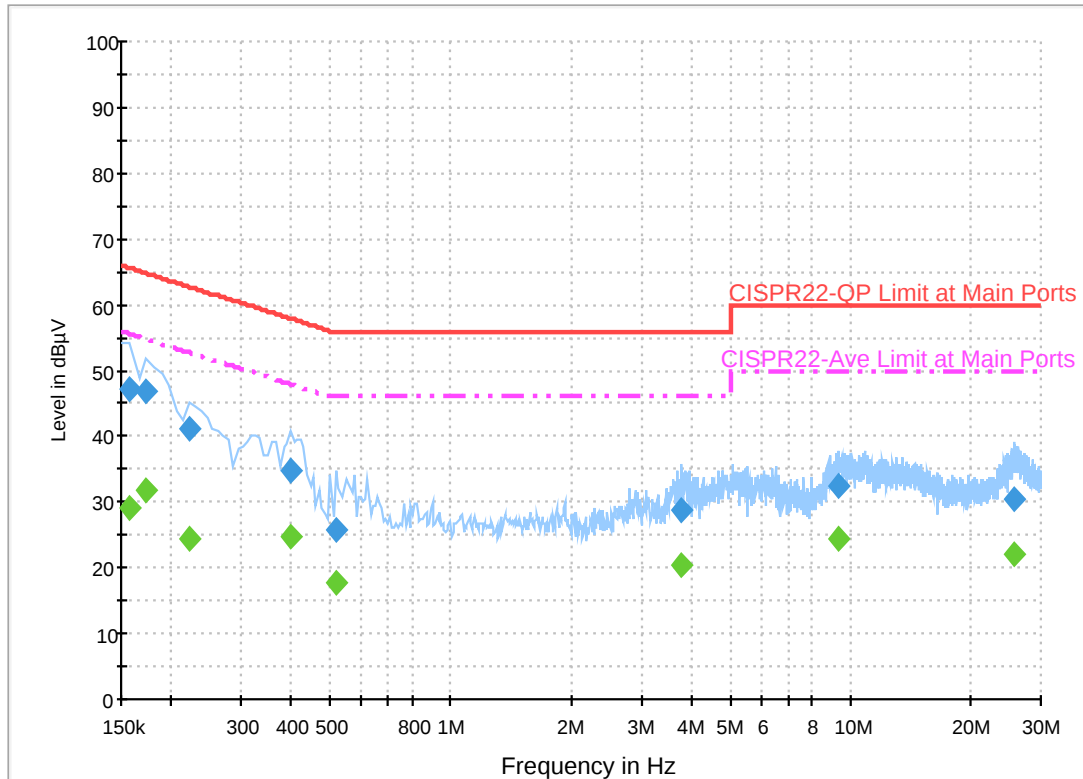
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Shareef Yu	Temperature :	23~25°C
		Relative Humidity :	50~51%

EUT Information

Report NO : 7N2101
Test Mode : Mode 1
Test Voltage : 120Vac/60Hz
Phase : Line

ENV216 Auto Test FCC Power Bar - L



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	47.1	Off	L1	19.5	18.5	65.6
0.174000	46.9	Off	L1	19.5	17.9	64.8
0.222000	41.1	Off	L1	19.5	21.6	62.7
0.398000	34.7	Off	L1	19.5	23.2	57.9
0.518000	25.8	Off	L1	19.5	30.2	56.0
3.798000	28.8	Off	L1	19.5	27.2	56.0
9.366000	32.6	Off	L1	19.7	27.4	60.0
25.726000	30.4	Off	L1	19.8	29.6	60.0

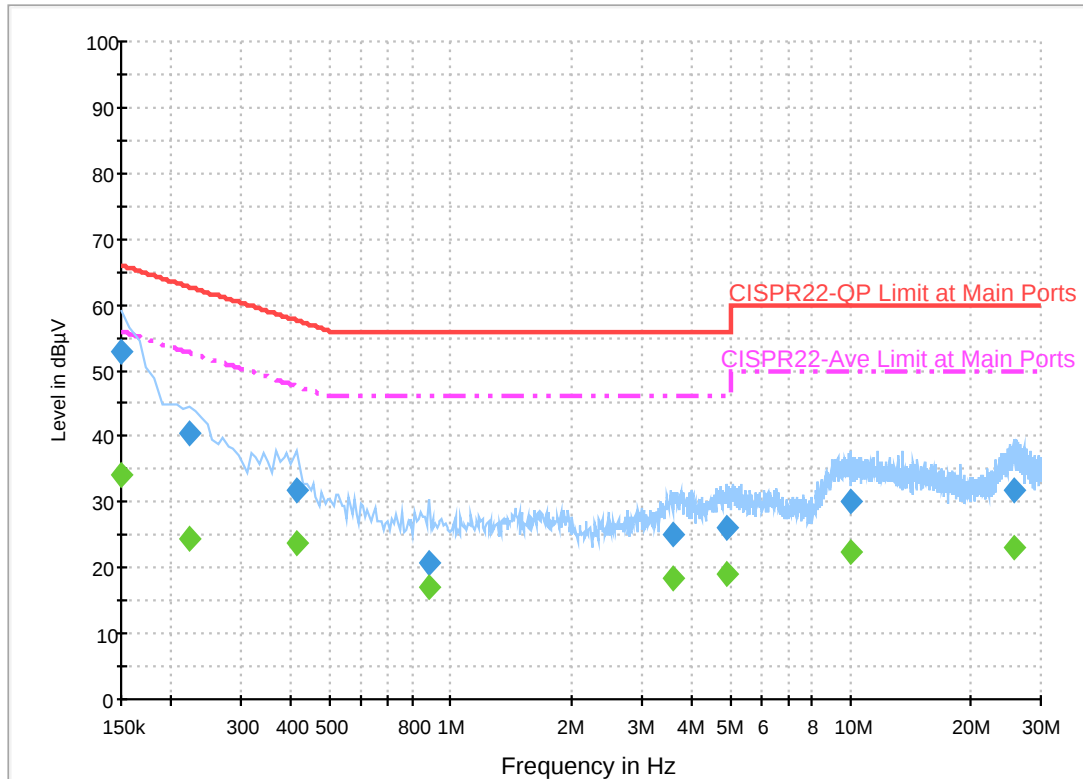
Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	29.0	Off	L1	19.5	26.6	55.6
0.174000	31.7	Off	L1	19.5	23.1	54.8
0.222000	24.5	Off	L1	19.5	28.2	52.7
0.398000	24.8	Off	L1	19.5	23.1	47.9
0.518000	17.7	Off	L1	19.5	28.3	46.0
3.798000	20.4	Off	L1	19.5	25.6	46.0
9.366000	24.3	Off	L1	19.7	25.7	50.0
25.726000	22.1	Off	L1	19.8	27.9	50.0

EUT Information

Report NO : 7N2101
Test Mode : Mode 1
Test Voltage : 120Vac/60Hz
Phase : Neutral

ENV216 Auto Test FCC Power Bar - N



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	52.7	Off	N	19.5	13.3	66.0
0.222000	40.5	Off	N	19.5	22.2	62.7
0.414000	31.8	Off	N	19.5	25.8	57.6
0.886000	20.7	Off	N	19.5	35.3	56.0
3.606000	25.0	Off	N	19.5	31.0	56.0
4.894000	26.0	Off	N	19.6	30.0	56.0
10.046000	30.0	Off	N	19.7	30.0	60.0
25.702000	31.7	Off	N	20.0	28.3	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	33.9	Off	N	19.5	22.1	56.0
0.222000	24.4	Off	N	19.5	28.3	52.7
0.414000	23.8	Off	N	19.5	23.8	47.6
0.886000	17.1	Off	N	19.5	28.9	46.0
3.606000	18.4	Off	N	19.5	27.6	46.0
4.894000	19.0	Off	N	19.6	27.0	46.0
10.046000	22.3	Off	N	19.7	27.7	50.0
25.702000	23.0	Off	N	20.0	27.0	50.0



Appendix C. Radiated Spurious Emission

Test Engineer :	Jesse Wang, Stan Hsieh, and James Chiu	Temperature :	22~24°C
		Relative Humidity :	51~53%

<For Sample 1>

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2388.54	55.89	-18.11	74	40.75	31.95	8.24	35.04	253	268	P	H
		2388.855	44.76	-9.24	54	29.62	31.95	8.24	35.04	253	268	A	H
	*	2412	106.68	-	-	91.51	31.99	8.24	35.05	253	268	P	H
	*	2412	102.11	-	-	86.94	31.99	8.24	35.05	253	268	A	H
													H
													H
		2388.015	56.34	-17.66	74	41.2	31.95	8.24	35.04	289	14	P	V
		2389.905	44.87	-9.13	54	29.74	31.95	8.24	35.05	289	14	A	V
	*	2412	109.83	-	-	94.66	31.99	8.24	35.05	289	14	P	V
	*	2412	105.45	-	-	90.28	31.99	8.24	35.05	289	14	A	V
													V
													V
802.11b CH 06 2437MHz		2387.14	55.56	-18.44	74	40.42	31.95	8.24	35.04	239	268	P	H
		2389.66	44.68	-9.32	54	29.54	31.95	8.24	35.04	239	268	A	H
	*	2437	107.23	-	-	91.95	32.08	8.27	35.06	239	268	P	H
	*	2437	102.89	-	-	87.61	32.08	8.27	35.06	239	268	A	H
		2494.96	55.46	-18.54	74	40.05	32.2	8.3	35.08	239	268	P	H
		2489.08	44.87	-9.13	54	29.45	32.2	8.3	35.07	239	268	A	H
		2344.02	55.2	-18.8	74	40.15	31.83	8.26	35.03	352	14	P	V
		2389.52	44.74	-9.26	54	29.6	31.95	8.24	35.04	352	14	A	V
	*	2437	110.1	-	-	94.82	32.08	8.27	35.06	352	14	P	V
	*	2437	105.49	-	-	90.21	32.08	8.27	35.06	352	14	A	V
		2496.08	55.17	-18.83	74	39.76	32.2	8.3	35.08	352	14	P	V
		2492.02	44.93	-9.07	54	29.52	32.2	8.3	35.08	352	14	A	V



802.11b CH 11 2462MHz	*	2462	106.45	-	-	91.1	32.12	8.3	35.06	260	267	P	H
	*	2462	101.99	-	-	86.64	32.12	8.3	35.06	260	267	A	H
		2491.48	55.96	-18.04	74	40.54	32.2	8.3	35.07	260	267	P	H
		2488.24	44.94	-9.06	54	29.52	32.2	8.3	35.07	260	267	A	H
													H
													H
	*	2462	109.33	-	-	93.98	32.12	8.3	35.06	312	22	P	V
	*	2462	104.97	-	-	89.62	32.12	8.3	35.06	312	22	A	V
		2497.04	55.57	-18.43	74	40.16	32.2	8.3	35.08	312	22	P	V
		2483.68	45.02	-8.98	54	29.64	32.16	8.3	35.07	312	22	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)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	40.28	-33.72	74	52.93	34.23	11.93	59.38	100	0	P	H
													H
													H
													H
		4824	40.49	-33.51	74	53.14	34.23	11.93	59.38	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4874	42.77	-31.23	74	55.38	34.22	11.9	59.29	100	0	P	H
		7311	45.44	-28.56	74	52.42	35.71	14.94	58.05	100	0	P	H
													H
													H
		4874	43.49	-30.51	74	56.1	34.22	11.9	59.29	100	0	P	V
		7311	45.56	-28.44	74	52.54	35.71	14.94	58.05	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4924	44.14	-29.86	74	56.71	34.21	11.87	59.21	100	0	P	H
		7386	49.19	-24.81	74	56.17	35.66	15.08	58.12	100	0	P	H
													H
													H
		4924	44.2	-29.8	74	56.77	34.21	11.87	59.21	100	0	P	V
		7386	49.05	-24.95	74	56.03	35.66	15.08	58.12	100	0	P	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 (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)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		2387.07	61.68	-12.32	74	46.54	31.95	8.24	35.04	126	281	P	H
		2390	49.33	-4.67	54	34.2	31.95	8.24	35.05	126	281	A	H
	*	2412	104.41	-	-	89.24	31.99	8.24	35.05	126	281	P	H
	*	2412	96.98	-	-	81.81	31.99	8.24	35.05	126	281	A	H
													H
													H
		2390	64.95	-9.05	74	49.82	31.95	8.24	35.05	342	21	P	V
		2389.905	50.61	-3.39	54	35.48	31.95	8.24	35.05	342	21	A	V
	*	2412	108.42	-	-	93.25	31.99	8.24	35.05	342	21	P	V
	*	2412	100.01	-	-	84.84	31.99	8.24	35.05	342	21	A	V
													V
													V
802.11g CH 06 2437MHz		2354.8	55.13	-18.87	74	40.04	31.87	8.26	35.03	119	278	P	H
		2389.94	45.2	-8.8	54	30.07	31.95	8.24	35.05	119	278	A	H
	*	2437	105.06	-	-	89.78	32.08	8.27	35.06	119	278	P	H
	*	2437	97.5	-	-	82.22	32.08	8.27	35.06	119	278	A	H
		2489.92	54.97	-19.03	74	39.55	32.2	8.3	35.07	119	278	P	H
		2489.99	45.24	-8.76	54	29.82	32.2	8.3	35.07	119	278	A	H
		2354.1	55.08	-18.92	74	39.99	31.87	8.26	35.03	350	26	P	V
		2388.68	45.22	-8.78	54	30.08	31.95	8.24	35.04	350	26	A	V
	*	2437	108.04	-	-	92.76	32.08	8.27	35.06	350	26	P	V
	*	2437	100.56	-	-	85.28	32.08	8.27	35.06	350	26	A	V
		2491.53	54.83	-19.17	74	39.41	32.2	8.3	35.07	350	26	P	V
		2489.22	45.48	-8.52	54	30.06	32.2	8.3	35.07	350	26	A	V



802.11g CH 11 2462MHz	*	2462	105.37	-	-	90.02	32.12	8.3	35.06	132	268	P	H
	*	2462	97.86	-	-	82.51	32.12	8.3	35.06	132	268	A	H
		2483.64	64.13	-9.87	74	48.75	32.16	8.3	35.07	132	268	P	H
		2483.64	50.42	-3.58	54	35.04	32.16	8.3	35.07	132	268	A	H
													H
													H
	*	2462	108.3	-	-	92.95	32.12	8.3	35.06	300	31	P	V
	*	2462	100.83	-	-	85.48	32.12	8.3	35.06	300	31	A	V
		2483.52	65.11	-8.89	74	49.73	32.16	8.3	35.07	300	31	P	V
		2483.64	51.19	-2.81	54	35.81	32.16	8.3	35.07	300	31	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)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	40.28	-33.72	74	52.93	34.23	11.93	59.38	100	0	P	H
													H
													H
													H
		4824	41.1	-32.9	74	53.75	34.23	11.93	59.38	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4874	41.37	-32.63	74	53.98	34.22	11.9	59.29	100	0	P	H
		7311	49.43	-24.57	74	56.41	35.71	14.94	58.05	100	0	P	H
													H
													H
		4874	40.55	-33.45	74	53.16	34.22	11.9	59.29	100	0	P	V
		7311	49.55	-24.45	74	56.53	35.71	14.94	58.05	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4924	43.45	-30.55	74	56.02	34.21	11.87	59.21	100	0	P	H
		7386	49.06	-24.94	74	56.04	35.66	15.08	58.12	100	0	P	H
													H
													H
		4924	42.49	-31.51	74	55.06	34.21	11.87	59.21	100	0	P	V
		7386	49.29	-24.71	74	56.27	35.66	15.08	58.12	100	0	P	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 (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)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		2389.485	62.56	-11.44	74	47.42	31.95	8.24	35.04	100	291	P	H
		2390	50.93	-3.07	54	35.8	31.95	8.24	35.05	100	291	A	H
	*	2412	105.33	31.33	74	90.16	31.99	8.24	35.05	100	291	P	H
	*	2412	98.14	44.14	54	82.97	31.99	8.24	35.05	100	291	A	H
													H
													H
		2388.96	66.85	-7.15	74	51.71	31.95	8.24	35.04	280	22	P	V
		2389.905	53.45	-0.55	54	38.32	31.95	8.24	35.05	280	22	A	V
	*	2412	108.86	34.86	74	93.69	31.99	8.24	35.05	280	22	P	V
	*	2412	101.6	47.6	54	86.43	31.99	8.24	35.05	280	22	A	V
													V
													V
802.11n HT20 CH 06 2437MHz		2338.84	55.1	-18.9	74	40.03	31.83	8.28	35.03	173	263	P	H
		2389.52	45.54	-8.46	54	30.4	31.95	8.24	35.04	173	263	A	H
	*	2437	104.96	-	-	89.68	32.08	8.27	35.06	173	263	P	H
	*	2437	96.33	-	-	81.05	32.08	8.27	35.06	173	263	A	H
		2490.34	55.82	-18.18	74	40.4	32.2	8.3	35.07	173	263	P	H
		2497.97	45.79	-8.21	54	30.38	32.2	8.3	35.08	173	263	A	H
		2332.12	55.48	-18.52	74	40.44	31.79	8.28	35.02	352	13	P	V
		2384.76	45.6	-8.4	54	30.5	31.91	8.24	35.04	352	13	A	V
	*	2437	109.28	-	-	94	32.08	8.27	35.06	352	13	P	V
	*	2437	100.58	-	-	85.3	32.08	8.27	35.06	352	13	A	V
		2489.85	55.76	-18.24	74	40.34	32.2	8.3	35.07	352	13	P	V
		2484.6	46.02	-7.98	54	30.64	32.16	8.3	35.07	352	13	A	V



802.11n HT20 CH 11 2462MHz	*	2462	104.91	-	-	89.56	32.12	8.3	35.06	259	268	P	H
	*	2462	97.36	-	-	82.01	32.12	8.3	35.06	259	268	A	H
		2483.52	62.86	-11.14	74	47.48	32.16	8.3	35.07	259	268	P	H
		2483.64	48.83	-5.17	54	33.45	32.16	8.3	35.07	259	268	A	H
													H
													H
	*	2462	107.6	-	-	92.25	32.12	8.3	35.06	300	32	P	V
	*	2462	99.61	-	-	84.26	32.12	8.3	35.06	300	32	A	V
		2483.52	62.61	-11.39	74	47.23	32.16	8.3	35.07	300	32	P	V
		2483.72	49.46	-4.54	54	34.08	32.16	8.3	35.07	300	32	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)	Cable 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	42.89	-31.11	74	55.54	34.23	11.93	59.38	100	0	P	H
													H
													H
													H
		4824	42.26	-31.74	74	54.91	34.23	11.93	59.38	100	0	P	V
													V
													V
													V
802.11n HT20 CH 06 2437MHz		4874	40.37	-33.63	74	52.98	34.22	11.9	59.29	100	0	P	H
		7311	46.27	-27.73	74	53.25	35.71	14.94	58.05	100	0	P	H
													H
													H
		4874	41.04	-32.96	74	53.65	34.22	11.9	59.29	100	0	P	V
		7311	47.59	-26.41	74	54.57	35.71	14.94	58.05	100	0	P	V
													V
													V
802.11n HT20 CH 11 2462MHz		4924	41.7	-32.3	74	54.27	34.21	11.87	59.21	100	0	P	H
		7386	49.92	-24.08	74	56.9	35.66	15.08	58.12	100	0	P	H
													H
													H
		4924	42.59	-31.41	74	55.16	34.21	11.87	59.21	100	0	P	V
		7386	49.05	-24.95	74	56.03	35.66	15.08	58.12	100	0	P	V
													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 802.11n HT20 (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	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 802.11n HT20 LF		38.91	26.57	-13.43	40	36.36	19.94	1.71	31.47	-	-	P	H
		209.01	36.2	-7.3	43.5	49.78	15.07	2.72	31.44	-	-	P	H
		299.73	31.97	-14.03	46	40.66	19.22	3.28	31.3	-	-	P	H
		322.4	42.12	-3.88	46	50.39	19.43	3.43	31.26	100	0	P	H
		362.3	37.24	-8.76	46	44	20.71	3.57	31.19	-	-	P	H
		797.7	38.73	-7.27	46	36.19	27.94	4.98	30.59	-	-	P	H
													H
													H
													H
													H
													H
													H
		39.72	38.43	-1.57	40	48.77	19.4	1.71	31.48	100	124	QP	V
		209.01	39.86	-3.64	43.5	53.44	15.07	2.72	31.44	-	-	P	V
		299.73	31.69	-14.31	46	40.38	19.22	3.28	31.3	-	-	P	V
		321.7	39.54	-6.46	46	47.81	19.43	3.43	31.26	-	-	P	V
		626.9	33.8	-12.2	46	33.86	25.98	4.59	30.79	-	-	P	V
		797.7	36.31	-9.69	46	33.77	27.94	4.98	30.59	-	-	P	V
													V
													V
												V	
												V	
												V	
												V	
												V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



<For Sample 2>

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		2389.485	61.88	-12.12	74	47.54	31.95	17.43	35.04	220	278	P	H
		2389.38	48.81	-5.19	54	34.47	31.95	17.43	35.04	220	278	A	H
	*	2412	105.11	-	-	90.74	31.99	17.43	35.05	220	278	P	H
	*	2412	97.85	-	-	83.48	31.99	17.43	35.05	220	278	A	H
													H
													H
		2389.905	65.09	-8.91	74	50.76	31.95	17.43	35.05	287	6	P	V
		2390	52.17	-1.83	54	37.84	31.95	17.43	35.05	287	6	A	V
	*	2412	108.68	-	-	94.31	31.99	17.43	35.05	287	6	P	V
	*	2412	100.74	-	-	86.37	31.99	17.43	35.05	287	6	A	V
													V
													V
Remark	3. No other spurious found.												
	4. 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	41.78	-32.22	74	55.81	34.23	11.12	59.38	100	0	P	H
													H
													H
													H
		4824	41.77	-32.23	74	55.8	34.23	11.12	59.38	100	0	P	V
													V
													V
													V
Remark	3. No other spurious found.												
	4. 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	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 802.11n HT20 LF		30	29.11	-10.89	40	35.14	24.6	1.2	31.83	-	-	P	H
		115.32	31.09	-12.41	43.5	43.73	17.27	1.83	31.74	-	-	P	H
		209.01	36.47	-7.03	43.5	50.85	15.11	2.18	31.67	-	-	P	H
		321	40.84	-5.16	46	50.26	19.44	2.76	31.62	100	0	P	H
		400.8	33.9	-12.1	46	40.78	21.71	3.05	31.64	-	-	P	H
		797.7	36.84	-9.16	46	36.35	27.96	4.32	31.79	-	-	P	H
													H
													H
													H
													H
													H
													H
		35.4	39.14	-0.86	40	48.25	21.51	1.2	31.82	100	245	QP	V
		49.44	29.86	-10.14	40	45.8	14.66	1.2	31.8	-	-	P	V
		143.94	35.09	-8.41	43.5	47.45	17.3	2.06	31.72	-	-	P	V
		322.4	41.32	-4.68	46	50.71	19.47	2.76	31.62	-	-	P	V
		394.5	39.26	-6.74	46	46.36	21.49	3.05	31.64	-	-	P	V
		797.7	35.54	-10.46	46	35.05	27.96	4.32	31.79	-	-	P	V
													V
													V
												V	
												V	
												V	
												V	
												V	
Remark	3. No other spurious found. 4. 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	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 D. Radiated Spurious Emission Plots

Test Engineer :	Jesse Wang, Stan Hsieh, and James Chiu	Temperature :	22~24°C
		Relative Humidity :	51~53%

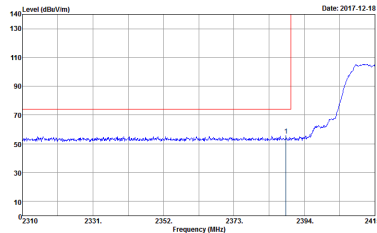
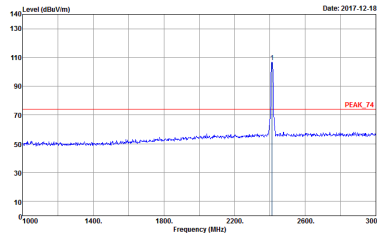
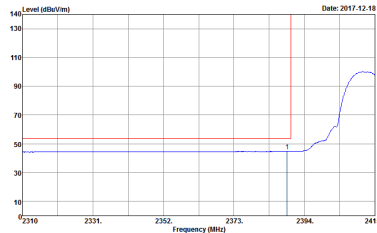
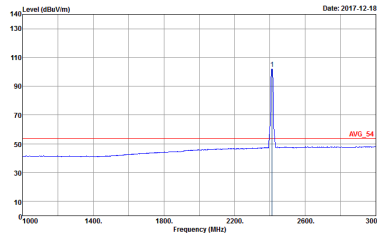
Note symbol

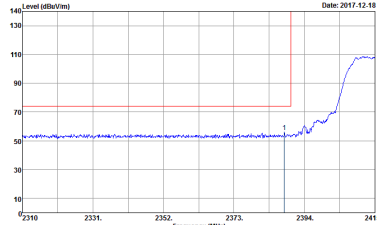
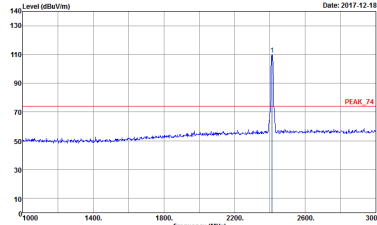
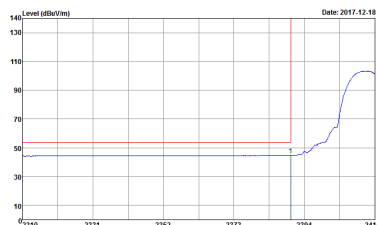
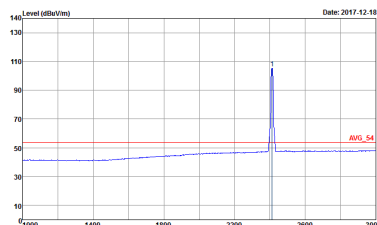
-L	Low channel location
-R	High channel location

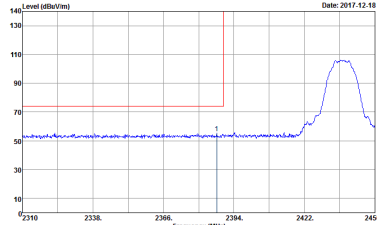
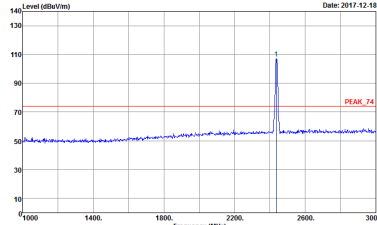
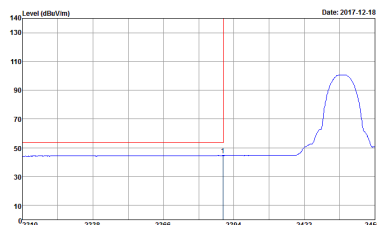
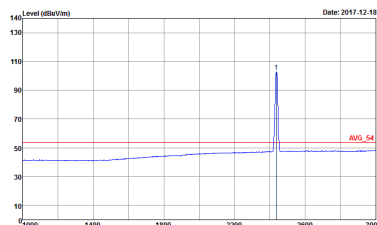
<For Sample 1>

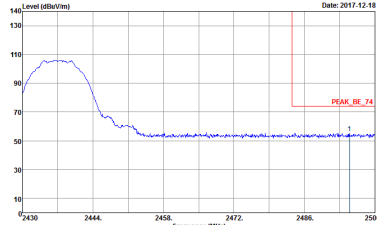
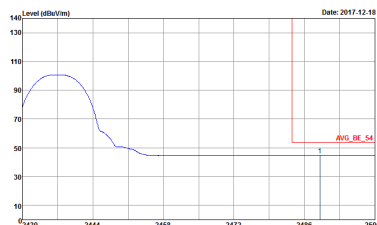
2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

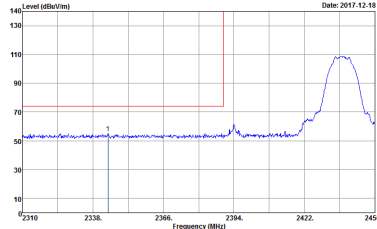
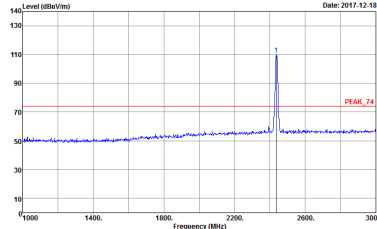
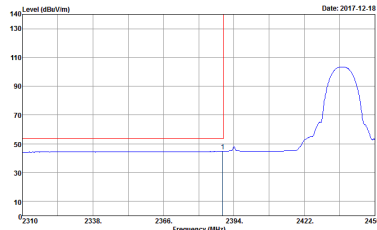
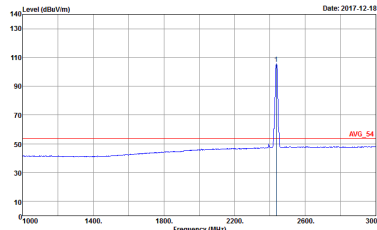
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 14	 Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 14
Avg.	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000KHz VBW:1000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 14	 Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000KHz VBW:1000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 14

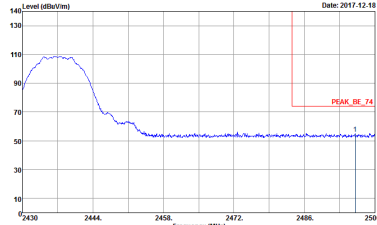
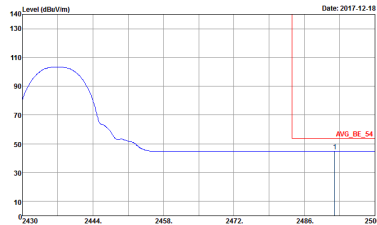
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 14	 Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 14
Avg.	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 14	 Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 14

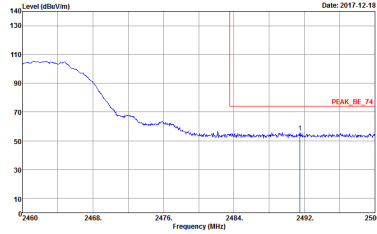
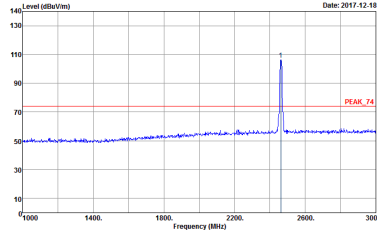
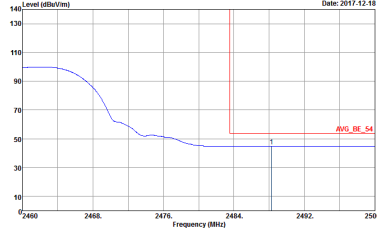
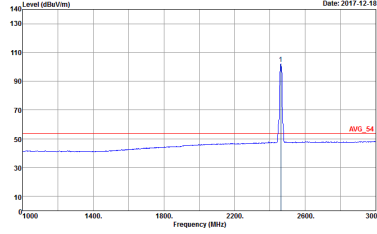
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 15	 Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 15
Avg.	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 15	 Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 15

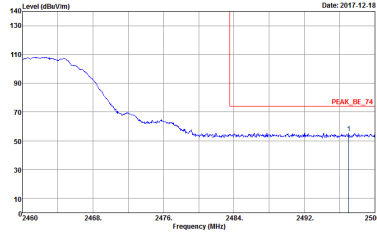
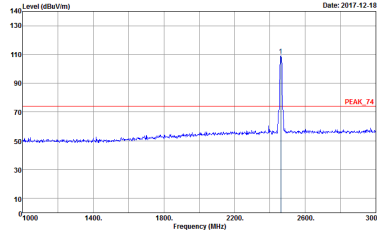
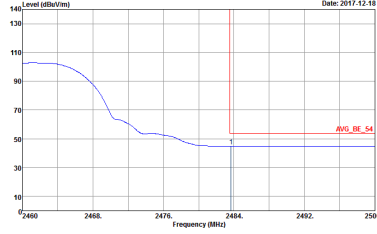
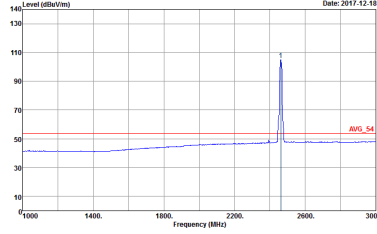
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-4HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 15	Left blank
Avg.	 Site : 03CH07-4HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 15	Left blank



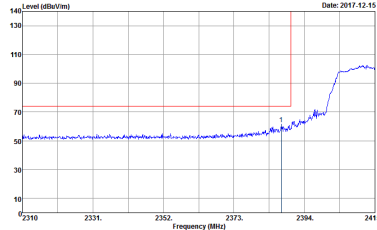
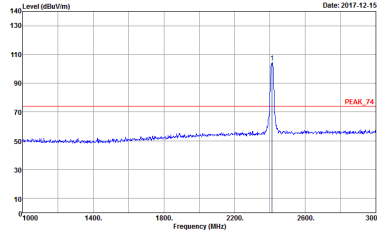
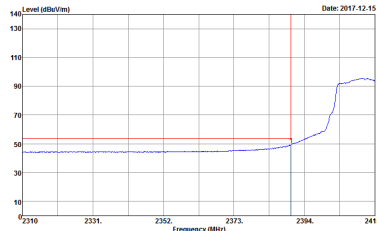
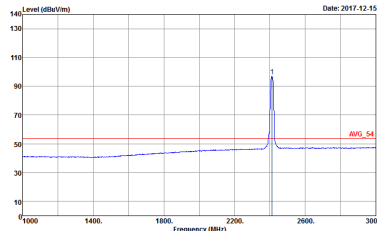
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 15	 Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 15
Avg.	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL RBW:1000.000KHz VBW:1000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 15	 Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 VERTICAL RBW:1000.000KHz VBW:1000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 15

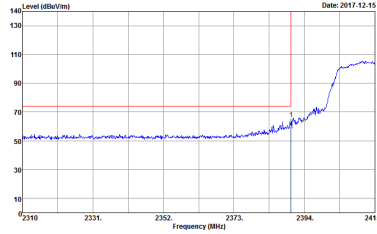
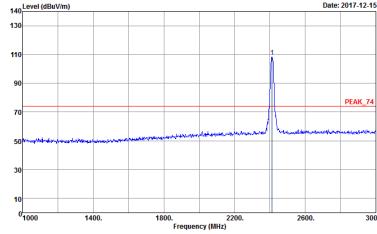
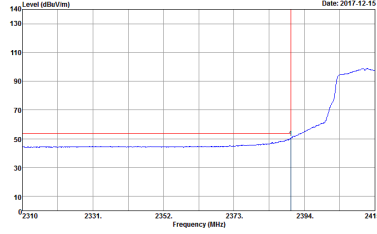
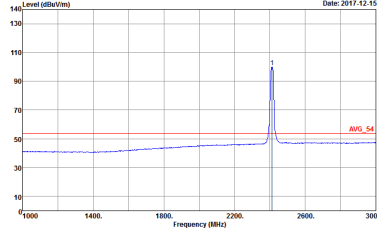
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 15	Left blank
Avg.	 Site : 03CH07-4HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 15	Left blank

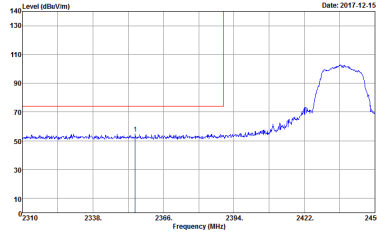
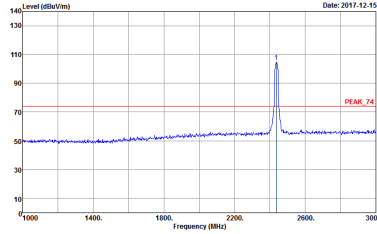
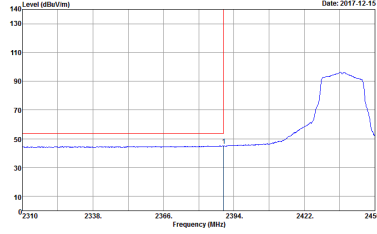
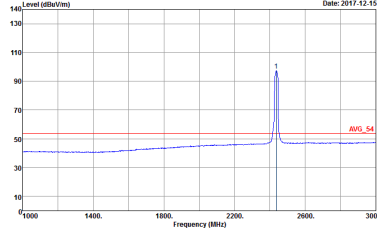
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 16	 Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 16
	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 16	 Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 16

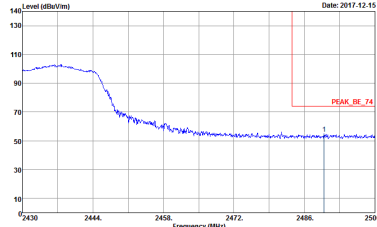
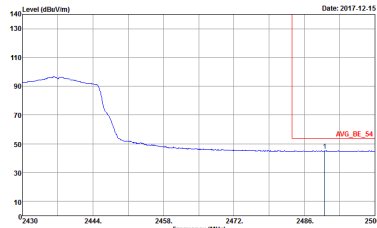
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 16	 Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 16
	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 16	 Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 16

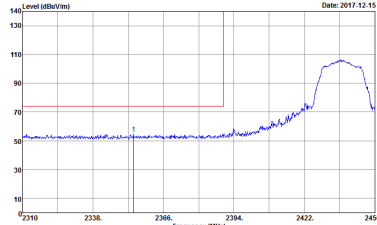
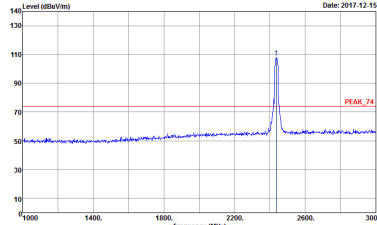
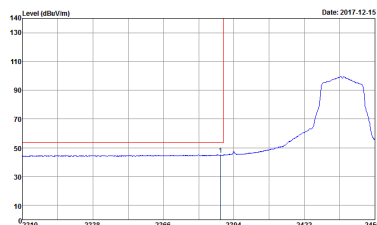
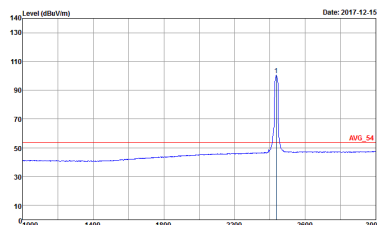
2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge @ 3m)

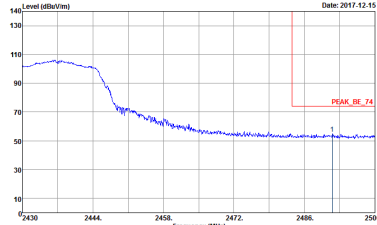
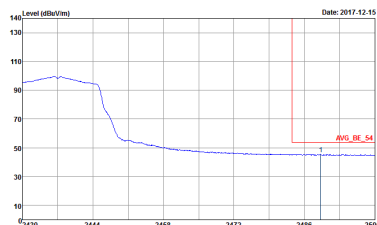
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-4HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 17	 Site : 03CH07-4HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 17
Avg.	 Site : 03CH07-4HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 17	 Site : 03CH07-4HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 17

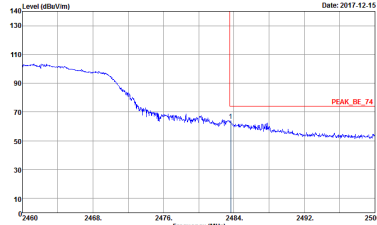
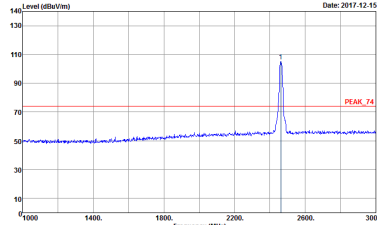
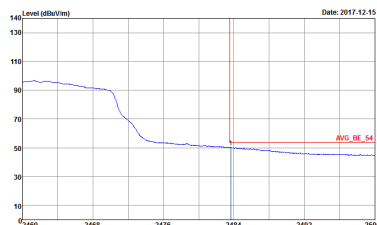
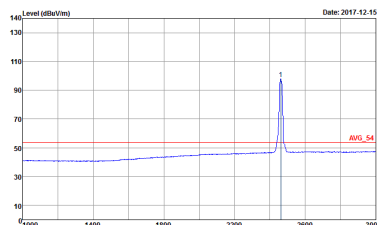
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 17	 Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 17
	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 17	 Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 17

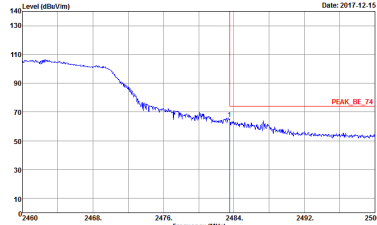
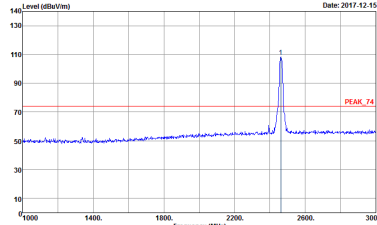
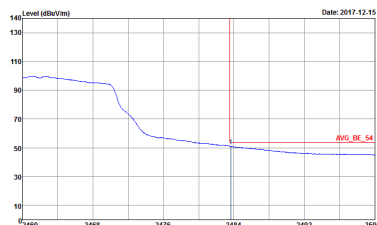
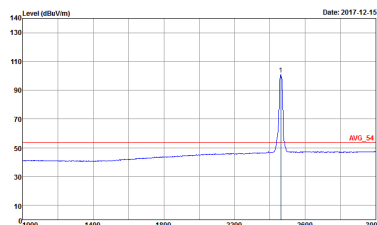
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 18	 Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 18
	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000KHz VBW:1000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 18	 Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000KHz VBW:1000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 18

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-4V Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 18	Left blank
Avg.	 Site : 03CH07-4V Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000KHz VBW:1000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 18	Left blank

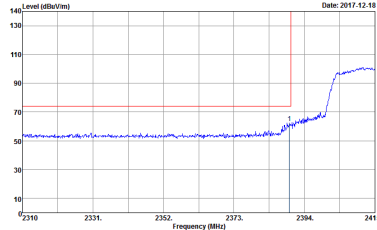
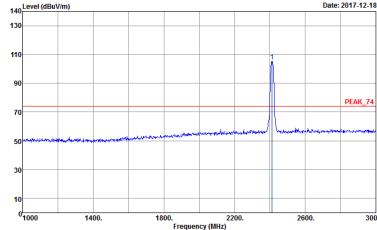
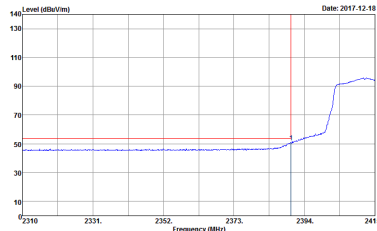
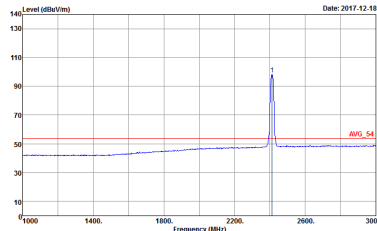
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 18	 Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 18
	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 18	 Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 18

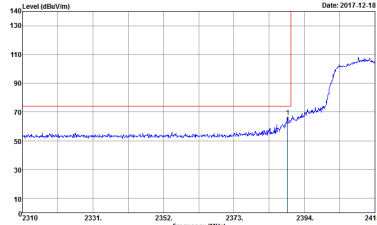
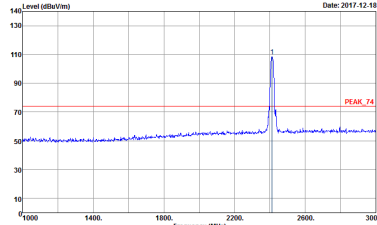
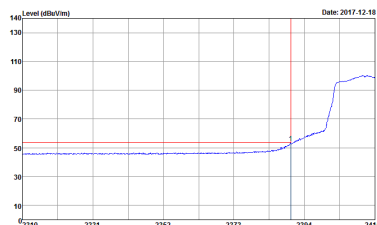
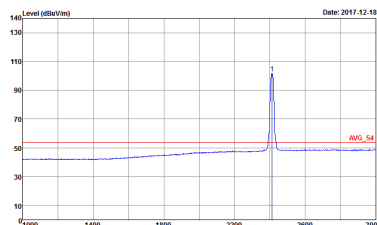
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Date: 2017-12-15 Site : 03CH07-4HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 18	Left Blank
Avg.	 Date: 2017-12-15 Site : 03CH07-4HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 18	Left Blank

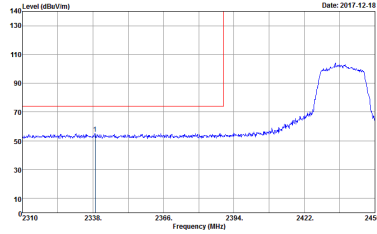
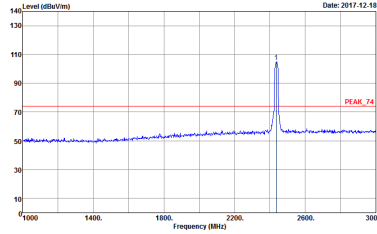
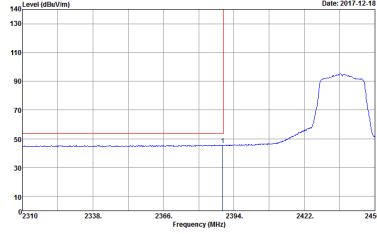
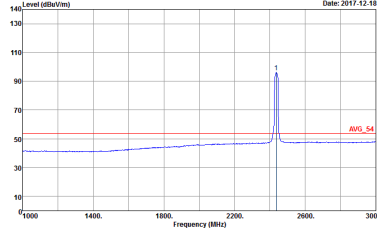
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 19	 Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 19
	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000KHz VBW:1000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 19	 Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000KHz VBW:1000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 19

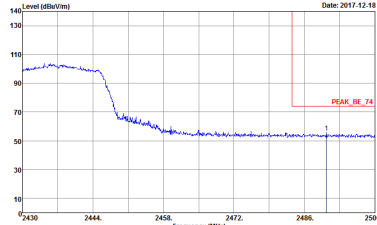
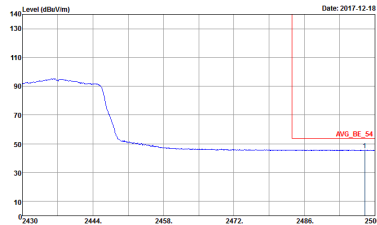
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 19	 Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 19
	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 19	 Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 19

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

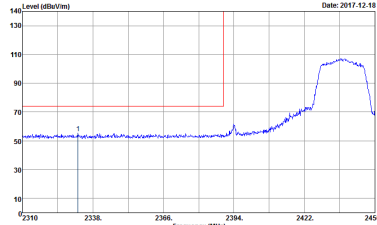
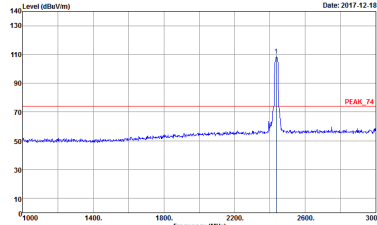
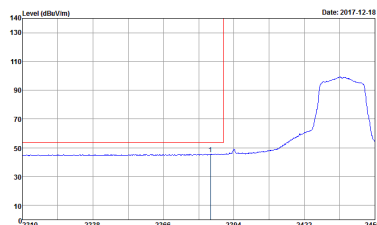
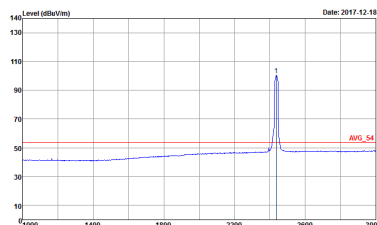
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-4HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 20	 Site : 03CH07-4HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 20
Avg.	 Site : 03CH07-4HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 20	 Site : 03CH07-4HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 20

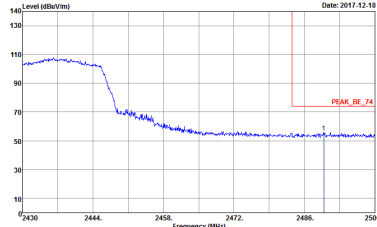
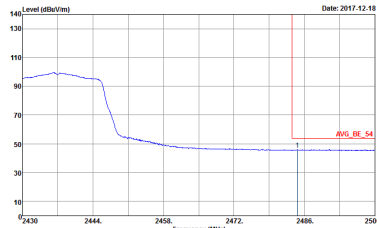
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 20	 Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 20
	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 20	 Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 20

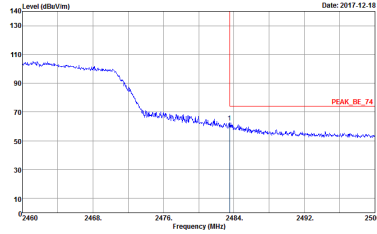
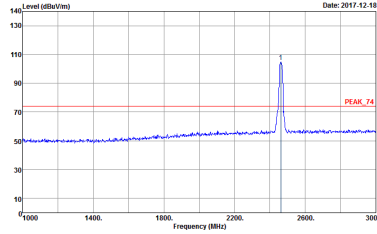
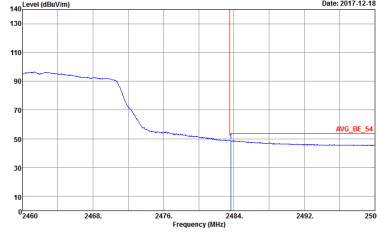
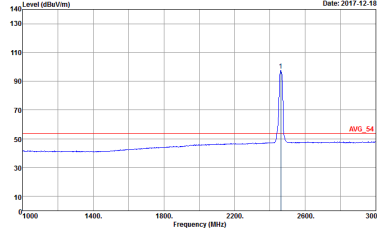
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : Z1	 Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : Z1
Avg.	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : Z1	 Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : Z1

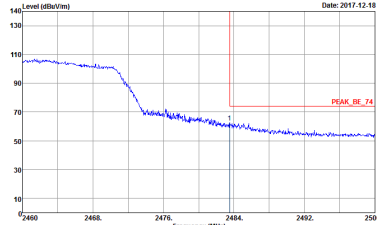
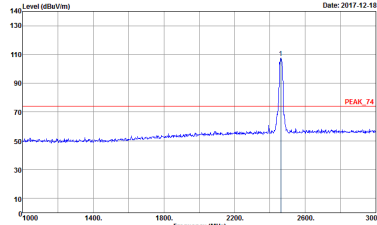
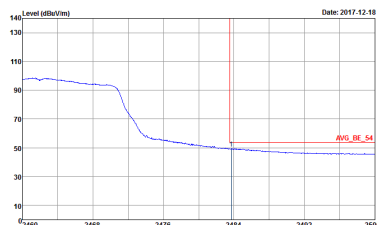
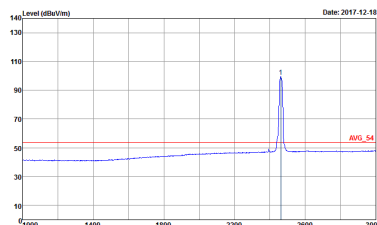
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : Z1	Left blank
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : Z1	Left blank



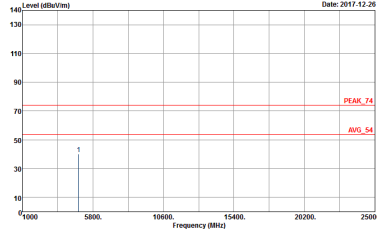
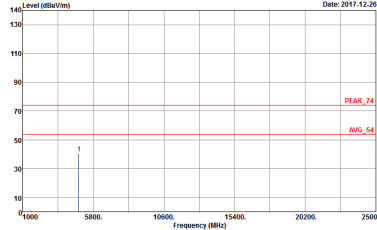
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : Z1	 Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : Z1
Avg.	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : Z1	 Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : Z1

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : Z1	Left Blank
Avg.	 Site : 03CH07-4HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : Z1	Left Blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : ZZ	 Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : ZZ
	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : ZZ	 Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : ZZ

WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : ZZ	 Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : ZZ
	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : ZZ	 Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : ZZ

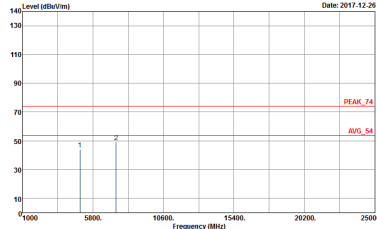
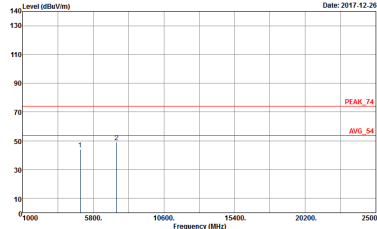
2.4GHz 2400~2483.5MHz
WIFI 802.11b (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 14	 Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 7N2101 Mode : 14

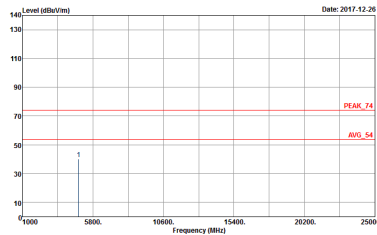
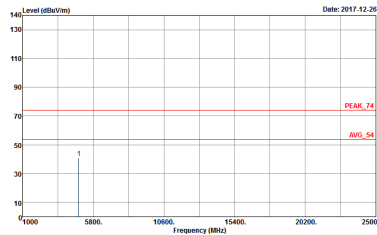


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.	Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 15	Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 7N2101 Mode : 15

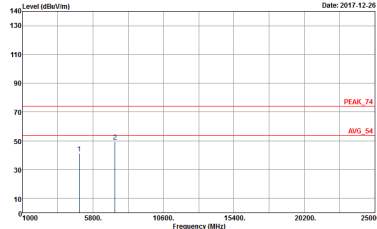
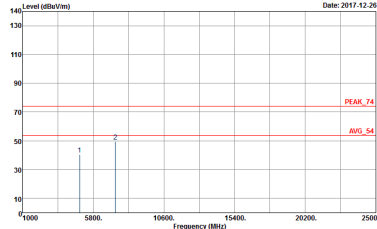


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 16	 Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 7N2101 Mode : 16

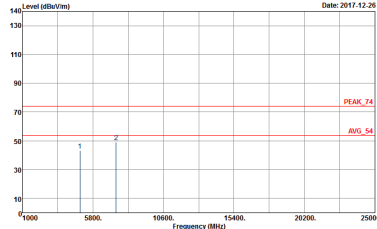
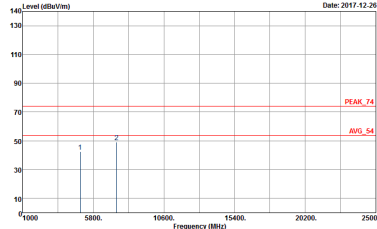
2.4GHz 2400~2483.5MHz
WIFI 802.11g (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 17	 Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 7N2101 Mode : 17

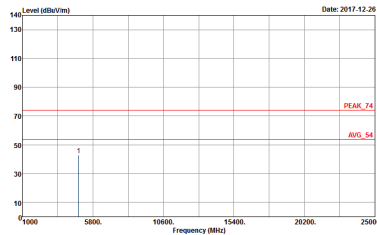
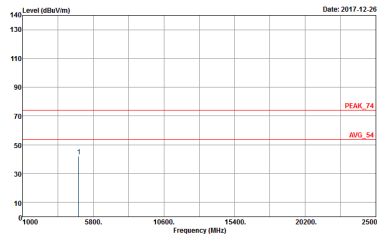


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 18	 Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 7N2101 Mode : 18

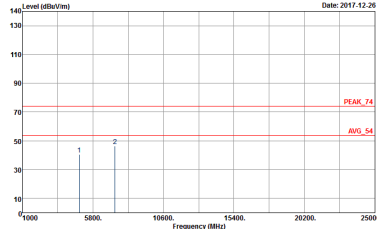
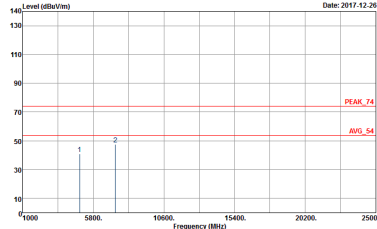


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 19	 Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 7N2101 Mode : 19

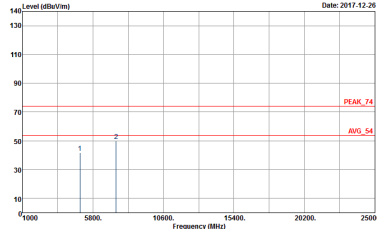
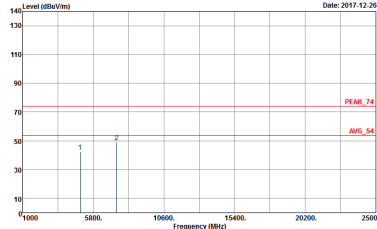
2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 20	 Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 7N2101 Mode : 20

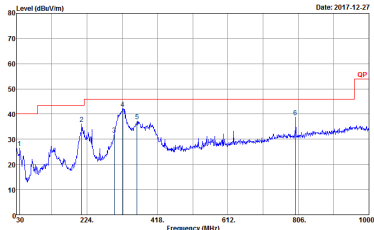
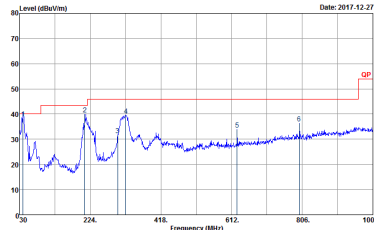


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 7N2101 Mode : Z1	 Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 7N2101 Mode : Z1



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 7N2101 Mode : ZZ	 Site : 03CH07-4HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 7N2101 Mode : ZZ

2.4GHz 2400~2483.5MHz
Emission below 1GHz
2.4GHz WIFI 802.11n HT20 (LF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11n HT20 LF	
1	Horizontal	Vertical
QP / Peak	 Site : 03CH07-1Y Condition : QP 3m LF-ANT-35419(s) HORIZONTAL Detector : Peak Project : 7N2101 Mode : 23	 Site : 03CH07-1Y Condition : QP 3m LF-ANT-35419(s) VERTICAL Detector : Peak Project : 7N2101 Mode : 23

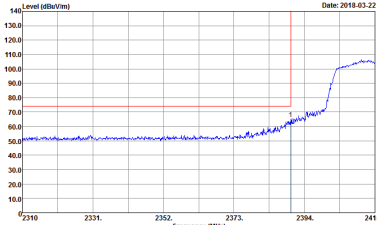
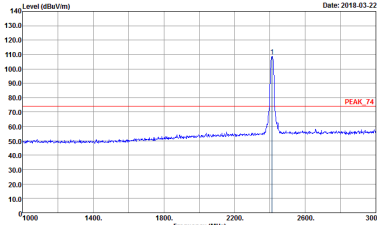
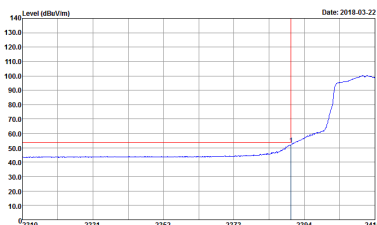
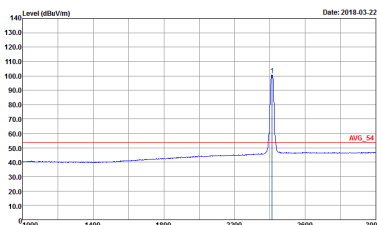


<For Sample 2>

2.4GHz 2400~2483.5MHz

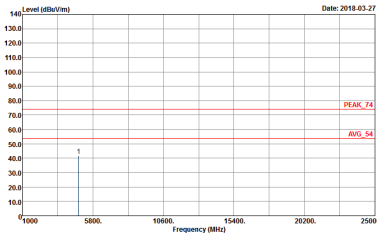
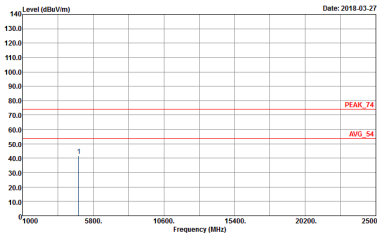
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Fundamental
Peak	Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 20	Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 20
Avg.	Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 20	Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 20

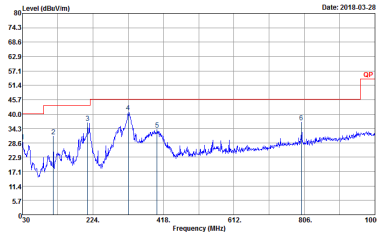
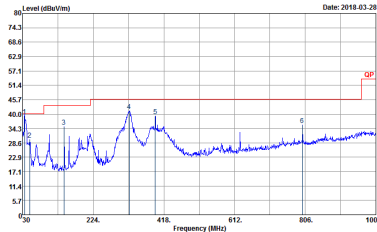
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-4Y Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 20	 Site : 03CH07-4Y Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 20
	 Site : 03CH07-4Y Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 20	 Site : 03CH07-4Y Condition : AVG_54 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 7N2101 Mode : 20



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.	 Site : 03CH07-1FY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 7	 Site : 03CH07-1FY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 7N2101 Mode : 7

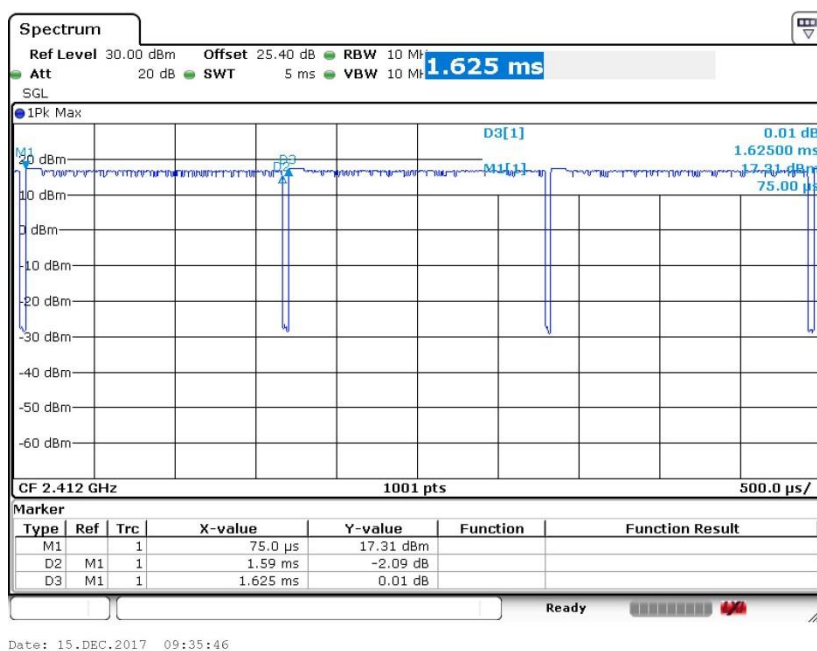
2.4GHz 2400~2483.5MHz
Emission below 1GHz
2.4GHz WIFI 802.11n HT20 (LF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11n HT20 LF	
1	Horizontal	Vertical
QP / Peak	 Site : 03CH07-1Y Condition : QP 3m LF-ANT-35419(s) HORIZONTAL Detector : Peak Project : 7N2101 Mode : 8	 Site : 03CH07-1Y Condition : QP 3m LF-ANT-35419(s) VERTICAL Detector : Peak Project : 7N2101 Mode : 8

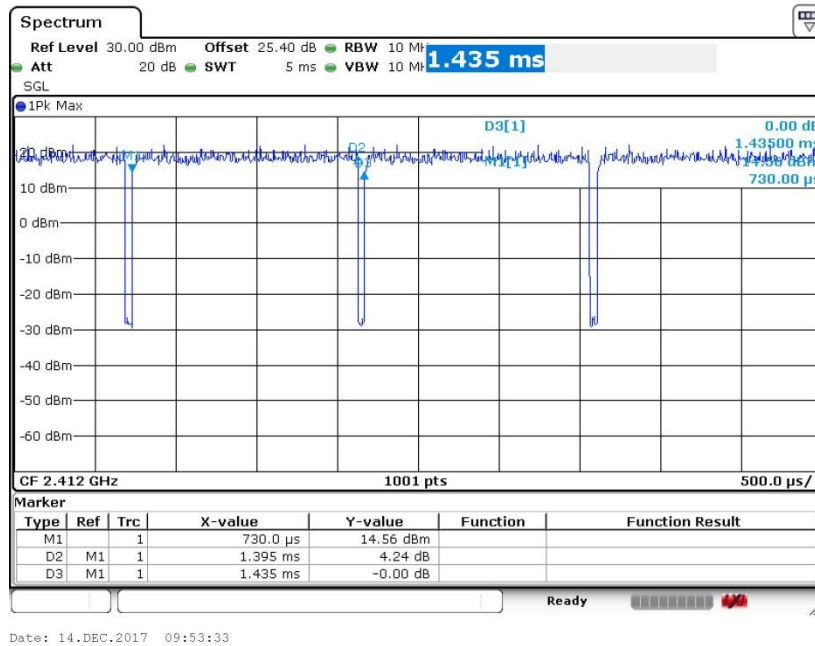
Appendix E. Duty Cycle Plots

Band	Duty Cycle (%)	T(us)	1/T(kHz)	VBW Setting
802.11b	97.85	1590.00	0.63	1kHz
802.11g	97.21	1395.00	0.72	1kHz
2.4GHz 802.11n HT20	96.79	672.00	1.49	3kHz

802.11b



802.11g



802.11n HT20

