

FCC RF Test Report

APPLICANT : MITAC International Corp
EQUIPMENT : Tablet
BRAND NAME : Mitac, Magellan
MODEL NAME : N536
FCC ID : P4Q-N536
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Feb. 06, 2017 and testing was completed on Mar. 21, 2017. 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.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.



TABLE OF CONTENTS

REVISION HISTORY.....	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant.....	5
1.2 Manufacturer.....	5
1.3 Product Feature of Equipment Under Test.....	5
1.4 Modification of EUT	5
1.5 Testing Location	6
1.6 Applicable Standards.....	6
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	7
2.1 Carrier Frequency and Channel	7
2.2 Test Mode.....	8
2.3 Connection Diagram of Test System.....	9
2.4 Support Unit used in test configuration and system	10
2.5 EUT Operation Test Setup	10
2.6 Measurement Results Explanation Example.....	10
3 TEST RESULT	11
3.1 6dB and 99% Bandwidth Measurement	11
3.2 Output Power Measurement.....	13
3.3 Power Spectral Density Measurement	14
3.4 Conducted Band Edges and Spurious Emission Measurement	16
3.5 Radiated Band Edges and Spurious Emission Measurement	26
3.6 AC Conducted Emission Measurement.....	30
3.7 Antenna Requirements.....	32
4 LIST OF MEASURING EQUIPMENT	33
5 UNCERTAINTY OF EVALUATION.....	34
APPENDIX A. CONDUCTED TEST RESULTS	
APPENDIX B. AC CONDUCTED EMISSION TEST RESULT	
APPENDIX C. RADIATED SPURIOUS EMISSION	
APPENDIX D. RADIATED SPURIOUS EMISSION PLOTS	
APPENDIX E. DUTY CYCLE PLOTS	
APPENDIX F. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR72010C	Rev. 01	Initial issue of report	Apr. 12, 2017

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 3.15 dB at 2389.905 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 11.60 dB at 0.558 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

MITAC International Corp

No. 200, Wenhua 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)

1.2 Manufacturer

MITAC Computer (Kunshan) Co., Ltd.

No. 269, 2nd Avenue, District A, Comprehensive Free Trade Zone, 300 Kunshan, China

1.3 Product Feature of Equipment Under Test

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

Product Specification subjective to this standard	
Sample 1	EUT with SKU 1
Sample 2	EUT with SKU 2
Antenna Type	WLAN: Holder with FPC Antenna Bluetooth: Holder with FPC Antenna NFC: Loop Antenna

Sample List		
SKU	SKU 1	SKU 2
WLAN	Support	Support
WWAN	Not Support	Not Support
RFID(13.56MHz)	Support	Support
Barcode	Support	Not Support

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. 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 v03r05
- ♦ 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	-	-

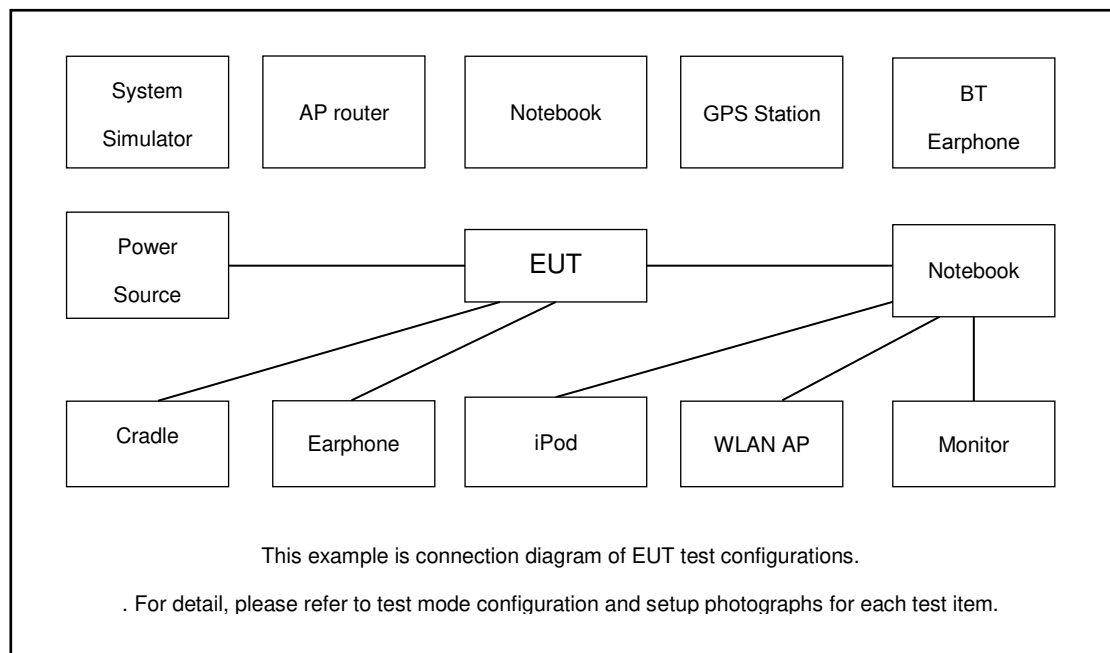
2.2 Test Mode

Final test mode of conducted test items and radiated spurious emissions 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 : Bluetooth Link + WLAN (2.4GHz) Link + Earphone + USB Cable (Charging from Adapter) + Camera (Rear) for Sample 1
Remark: For Radiated Test Cases, The tests were performance with Sample 1.	

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
2.	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
3.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
4.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
5.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, programmed RF utility, "QRCT" installed in the notebook make the EUT provide functions like channel selection and power level for continuous transmitting and receiving 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.

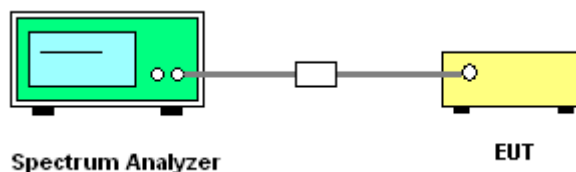
3.1.2 Measuring Instruments

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 v03r05.
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.

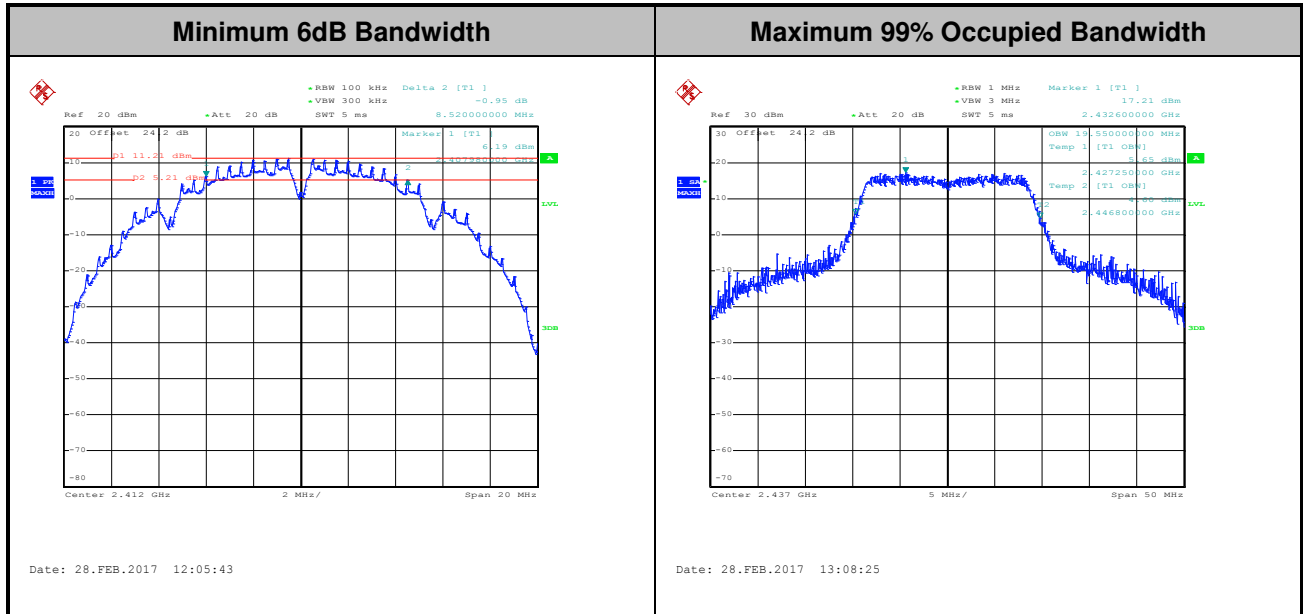
3.1.4 Test Setup





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 of directional gain greater than 6dBi are 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.

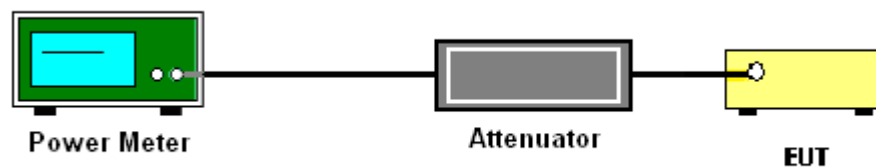
3.2.2 Measuring Instruments

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 v03r05 section 9.1.2 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.

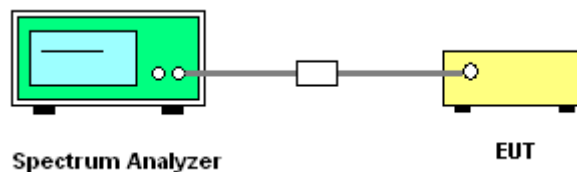
3.3.2 Measuring Instruments

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 v03r05
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.

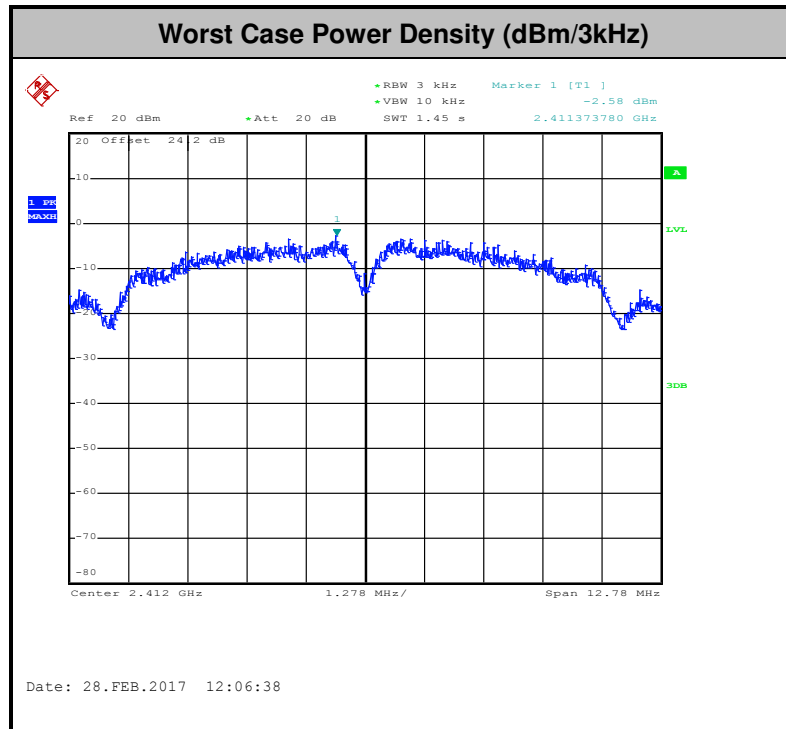
3.3.4 Test Setup





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 and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

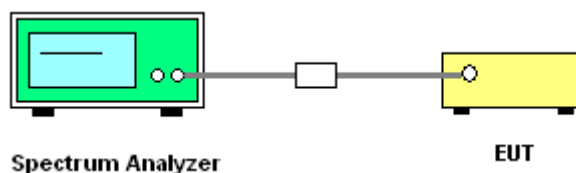
3.4.2 Measuring Instruments

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 v03r05.
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



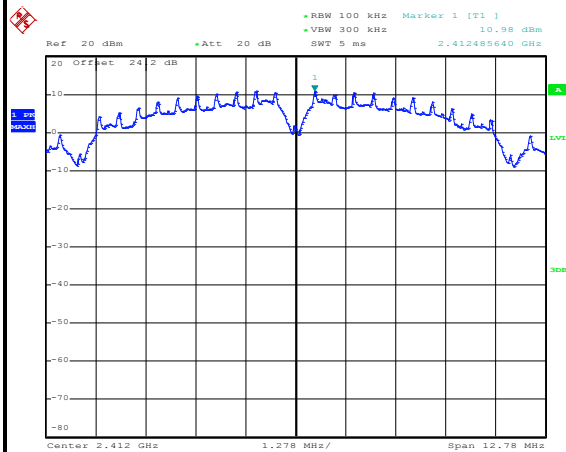


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Aking Chang

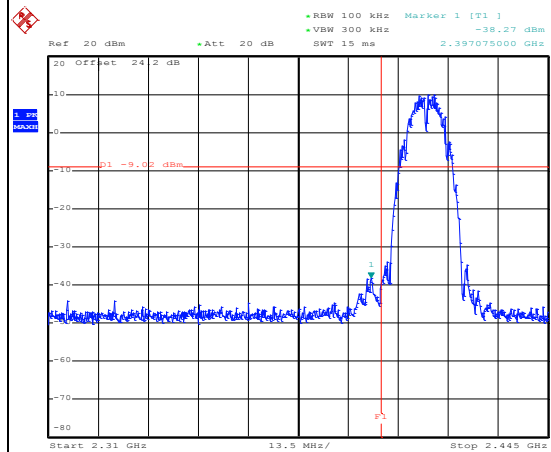
WLAN 802.11b Channel 01

100kHz PSD reference Level



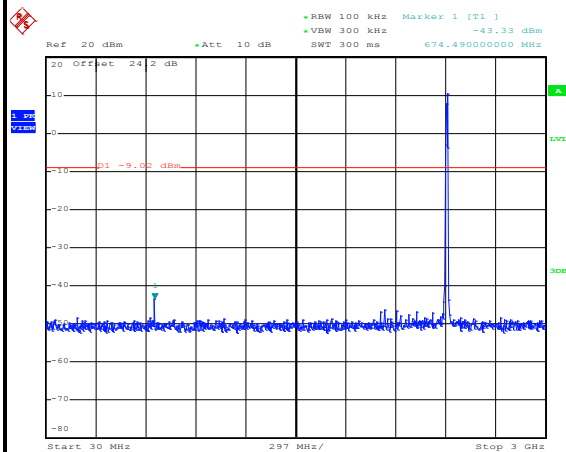
Date: 28.FEB.2017 12:07:29

Low Channel Plot



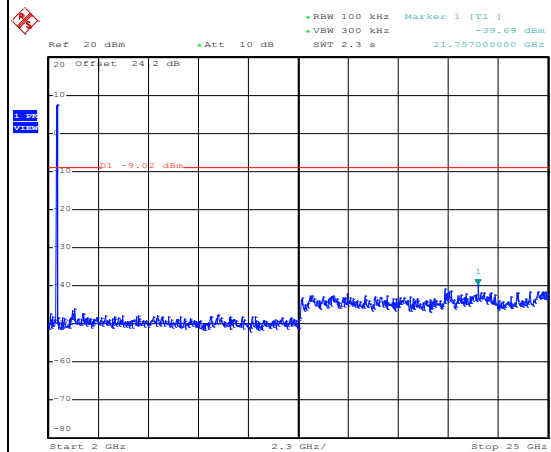
Date: 28.FEB.2017 12:08:03

Spurious Emission 30MHz~3GHz



Date: 28.FEB.2017 12:08:16

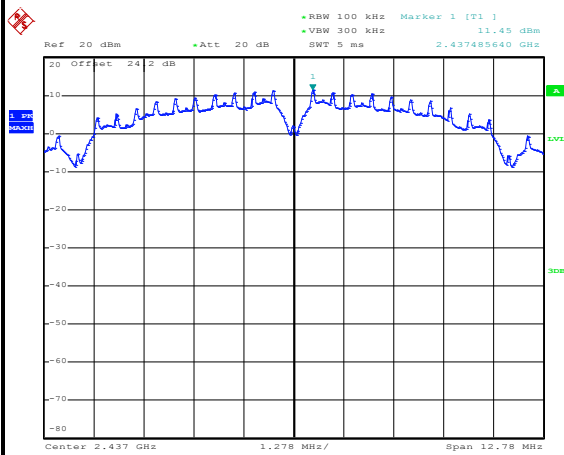
Spurious Emission 2GHz~25GHz



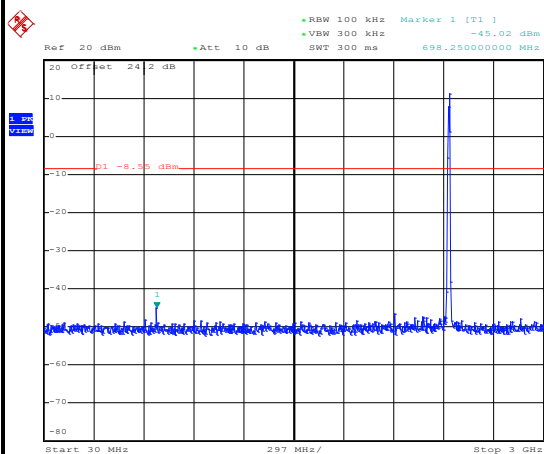
Date: 28.FEB.2017 12:08:25



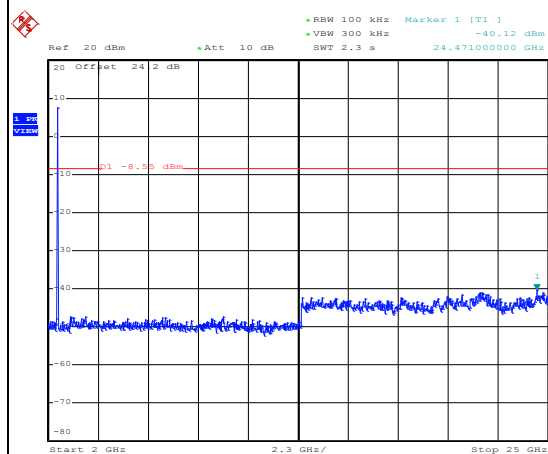
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Aking Chang

WLAN 802.11b Channel 06**100kHz PSD reference Level**

Date: 28.FEB.2017 12:13:54

Mid Channel Plot**Spurious Emission 30MHz~3GHz**

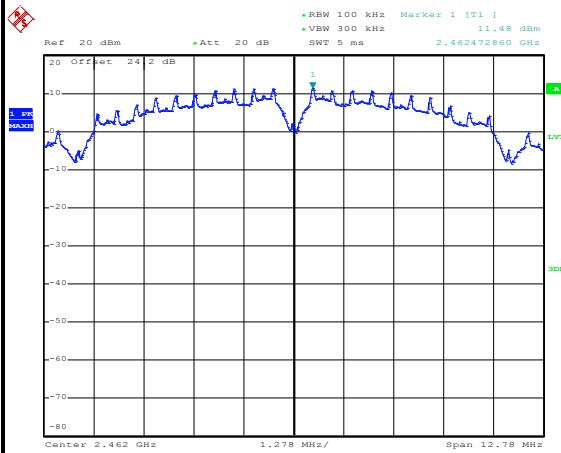
Date: 28.FEB.2017 12:14:29

Spurious Emission 2GHz~25GHz

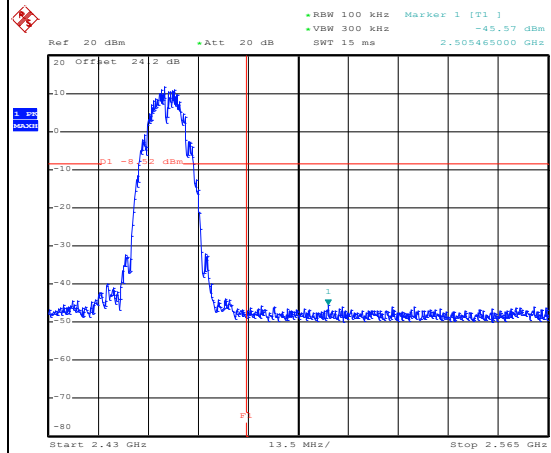
Date: 28.FEB.2017 12:14:38



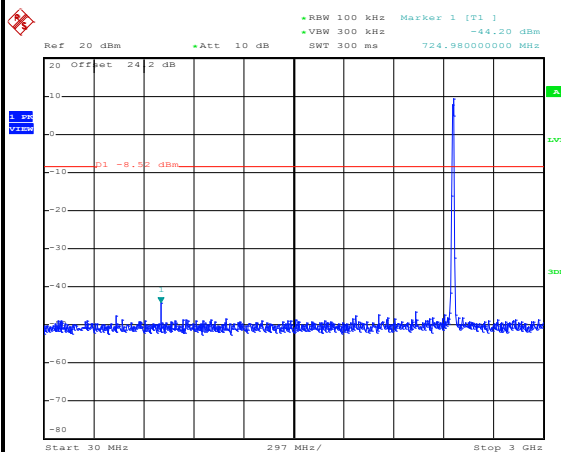
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Aking Chang

WLAN 802.11b Channel 11**100kHz PSD reference Level**

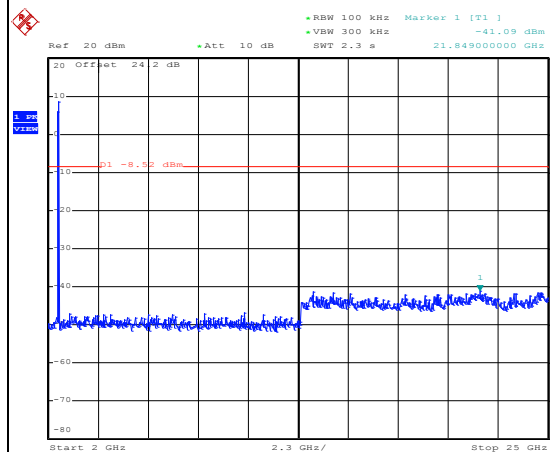
Date: 28.FEB.2017 12:20:10

High Channel Plot

Date: 28.FEB.2017 12:20:24

Spurious Emission 30MHz~3GHz

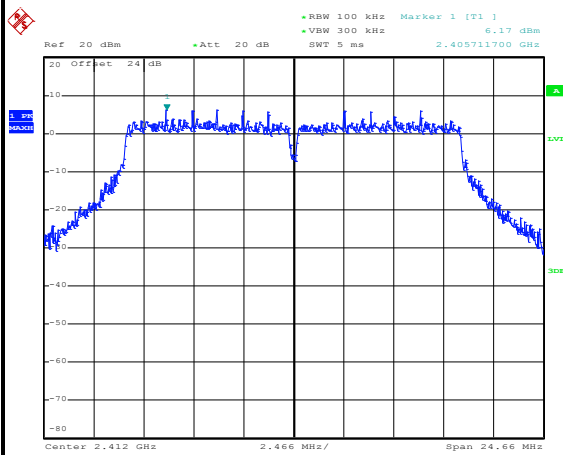
Date: 28.FEB.2017 12:20:36

Spurious Emission 2GHz~25GHz

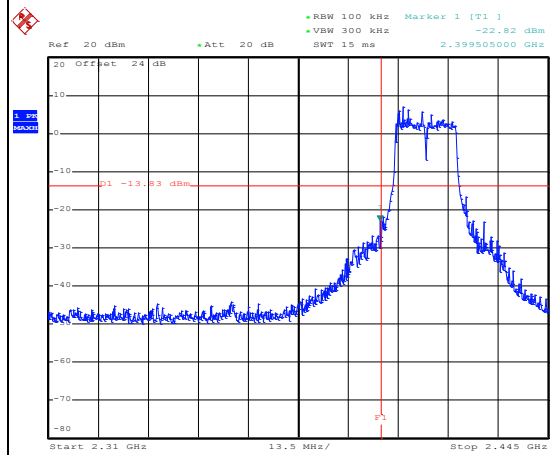
Date: 28.FEB.2017 12:20:45



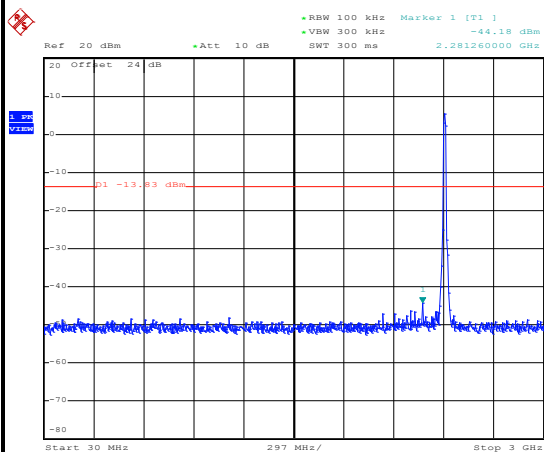
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Aking Chang

WLAN 802.11g Channel 01**100kHz PSD reference Level**

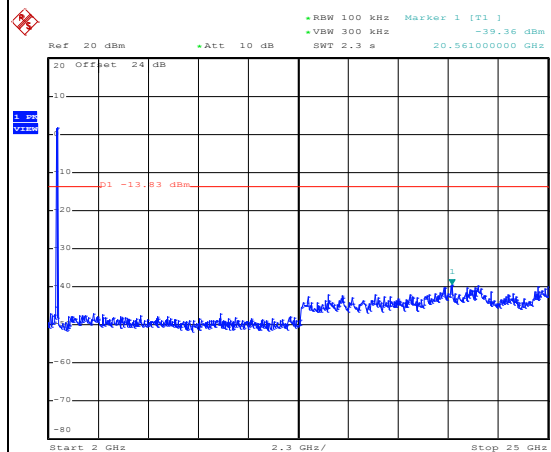
Date: 15.MAR.2017 10:54:01

Low Channel Plot

Date: 15.MAR.2017 10:54:10

Spurious Emission 30MHz~3GHz

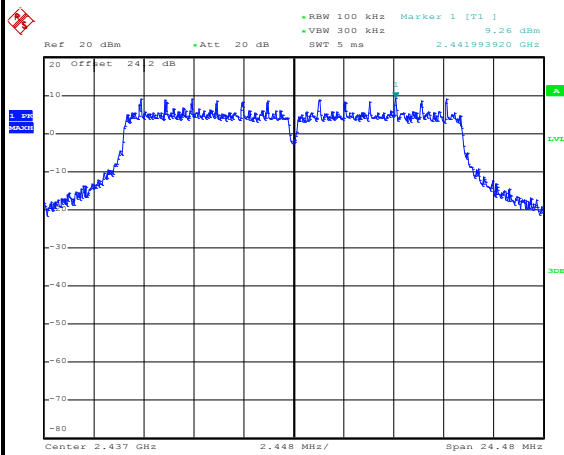
Date: 15.MAR.2017 10:54:44

Spurious Emission 2GHz~25GHz

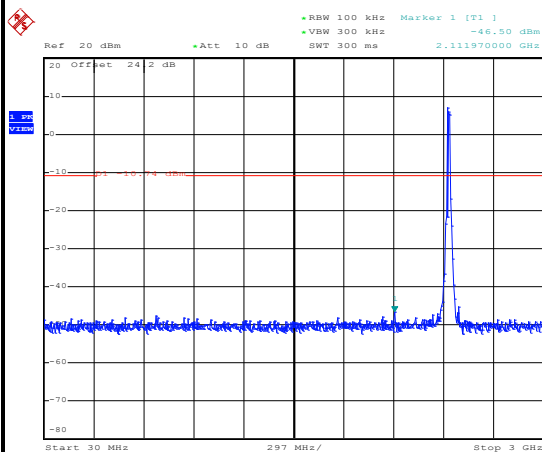
Date: 15.MAR.2017 10:54:52



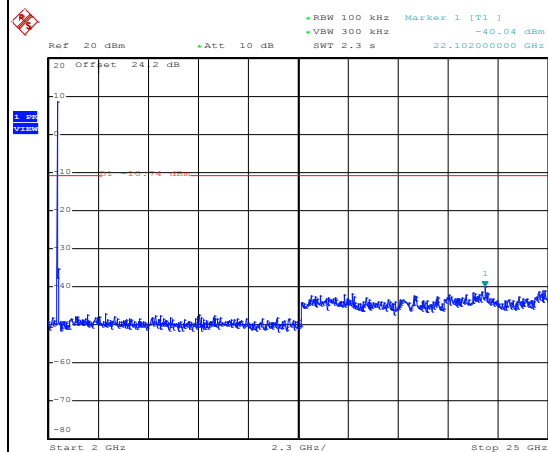
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Aking Chang

WLAN 802.11g Channel 06**100kHz PSD reference Level**

Date: 28.FEB.2017 12:37:07

Mid Channel Plot**Spurious Emission 30MHz~3GHz**

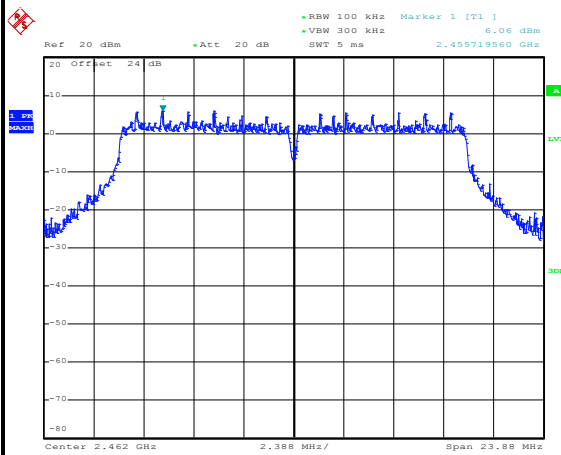
Date: 28.FEB.2017 12:42:54

Spurious Emission 2GHz~25GHz

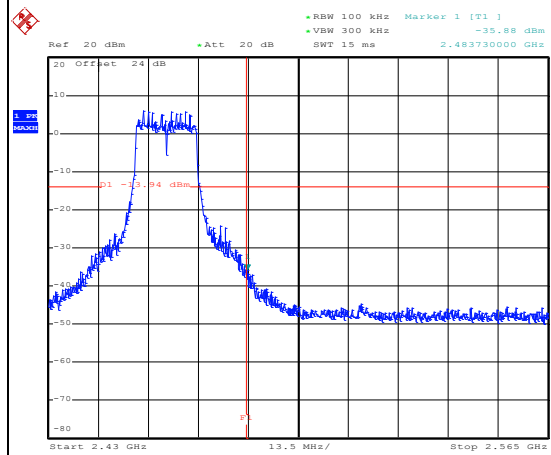
Date: 28.FEB.2017 12:40:45



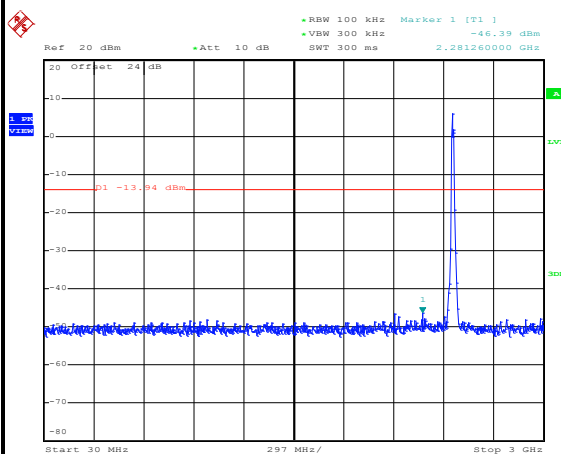
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Aking Chang

WLAN 802.11g Channel 11**100kHz PSD reference Level**

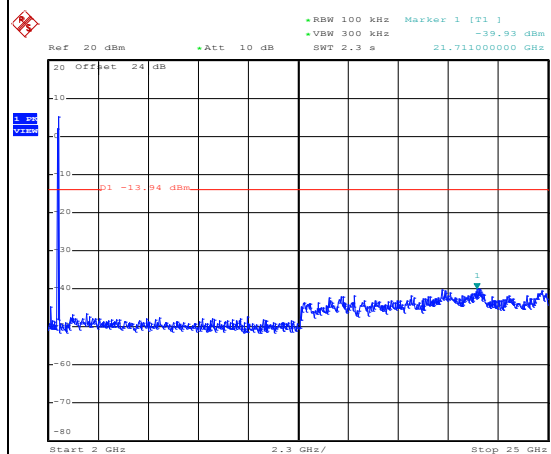
Date: 15.MAR.2017 11:01:08

High Channel Plot

Date: 15.MAR.2017 11:01:22

Spurious Emission 30MHz~3GHz

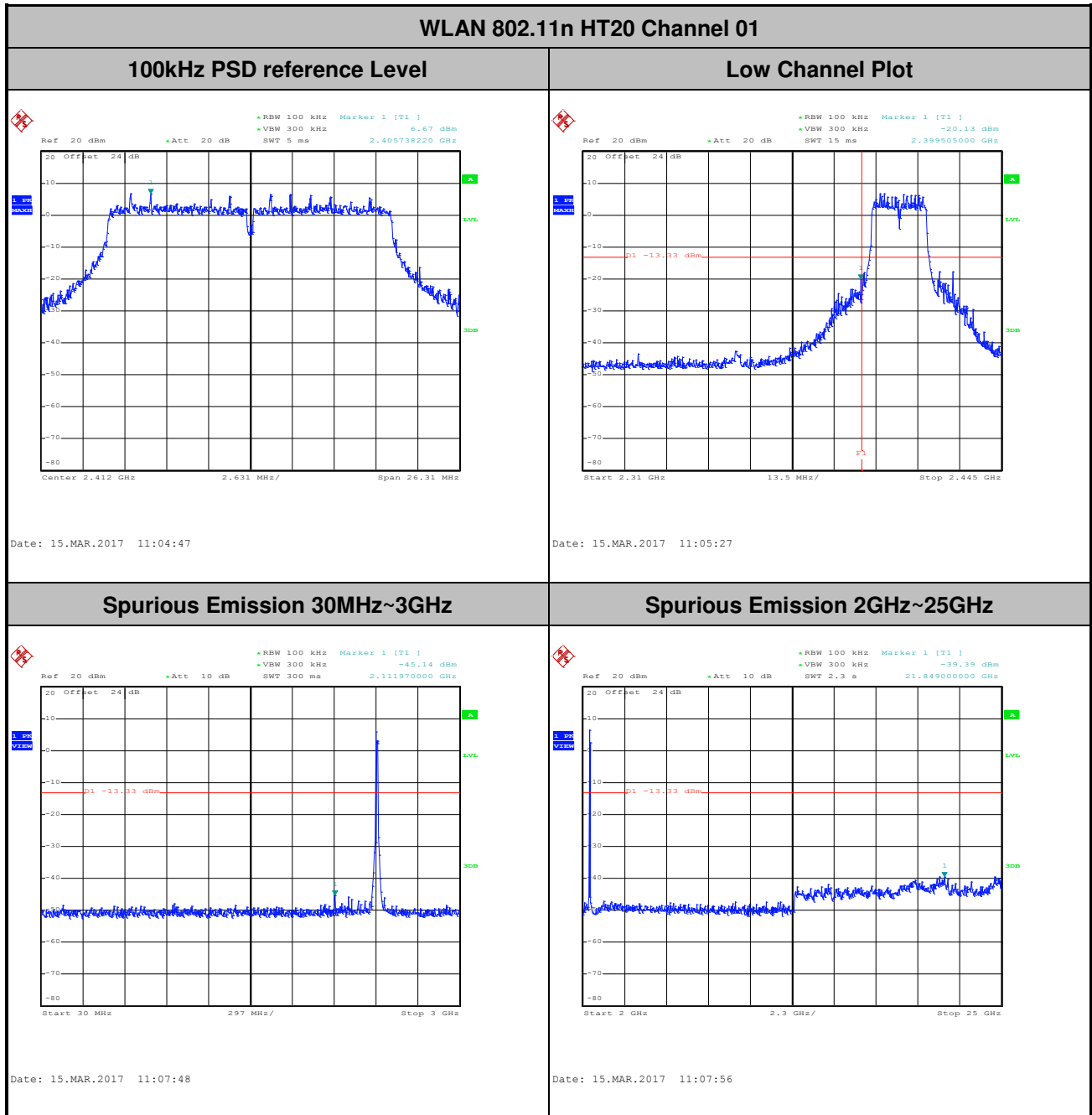
Date: 15.MAR.2017 11:01:58

Spurious Emission 2GHz~25GHz

Date: 15.MAR.2017 11:02:07

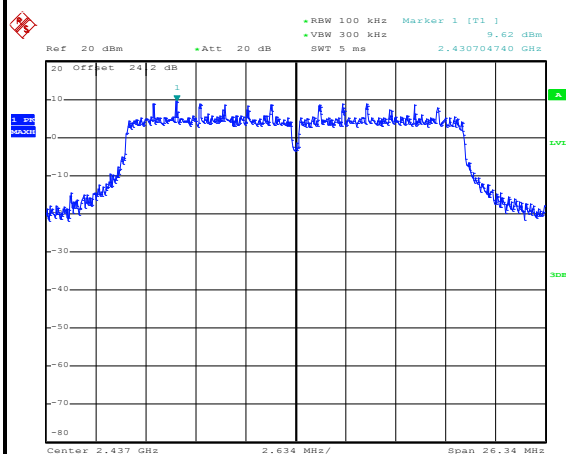


Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Aking Chang

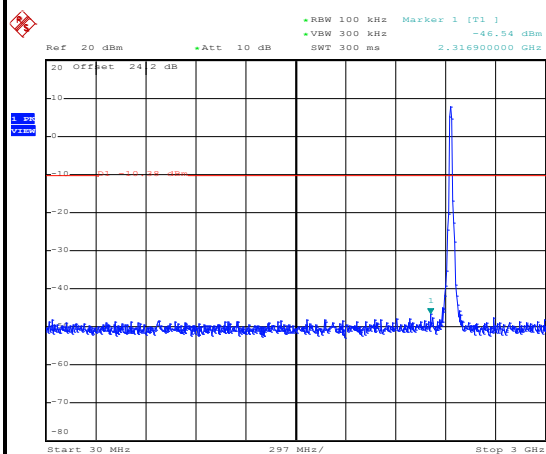




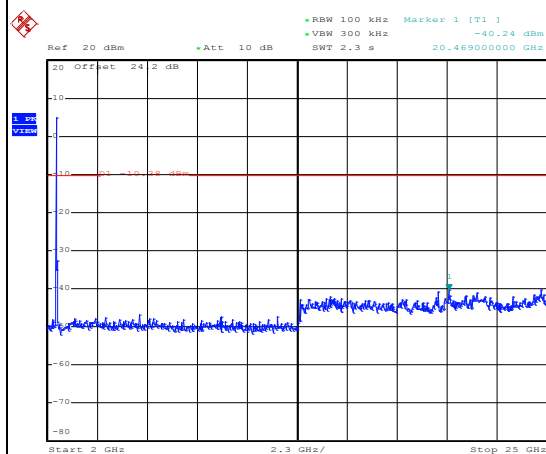
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Aking Chang

WLAN 802.11n HT20 Channel 06**100kHz PSD reference Level**

Date: 28.FEB.2017 13:05:49

Mid Channel Plot**Spurious Emission 30MHz~3GHz**

Date: 28.FEB.2017 13:06:32

Spurious Emission 2GHz~25GHz

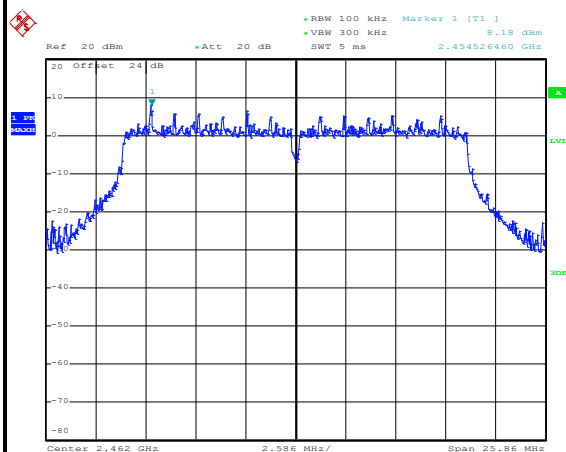
Date: 28.FEB.2017 13:06:40



Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Aking Chang

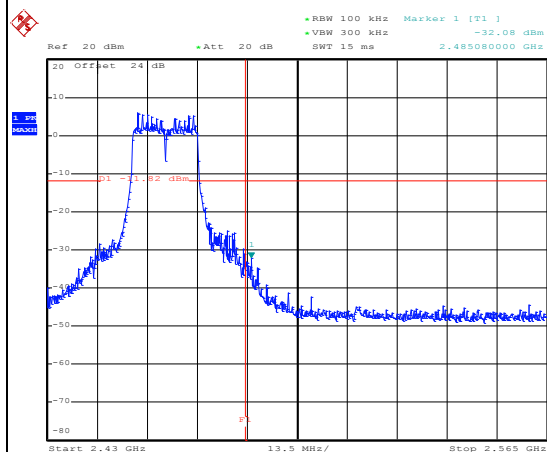
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



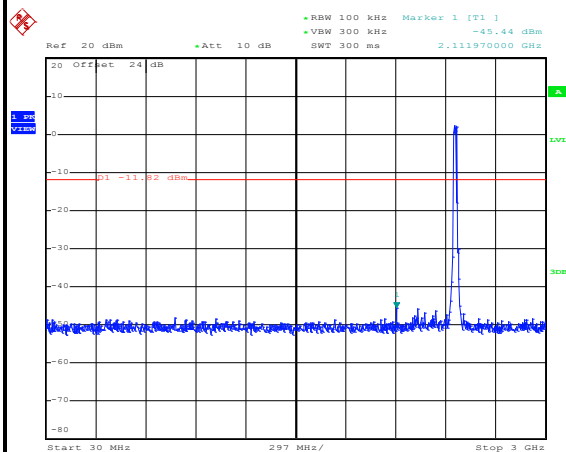
Date: 15.MAR.2017 11:13:09

High Channel Plot



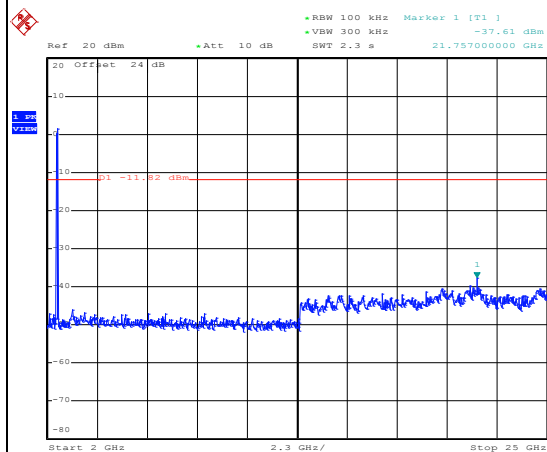
Date: 15.MAR.2017 11:13:34

Spurious Emission 30MHz~3GHz



Date: 15.MAR.2017 11:14:39

Spurious Emission 2GHz~25GHz



Date: 15.MAR.2017 11:14:48

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 FCC section 15.209 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

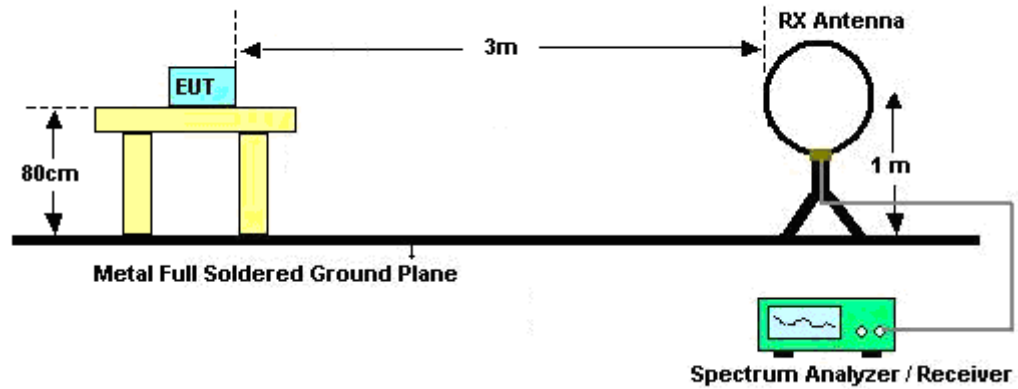
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the 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 measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. 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:

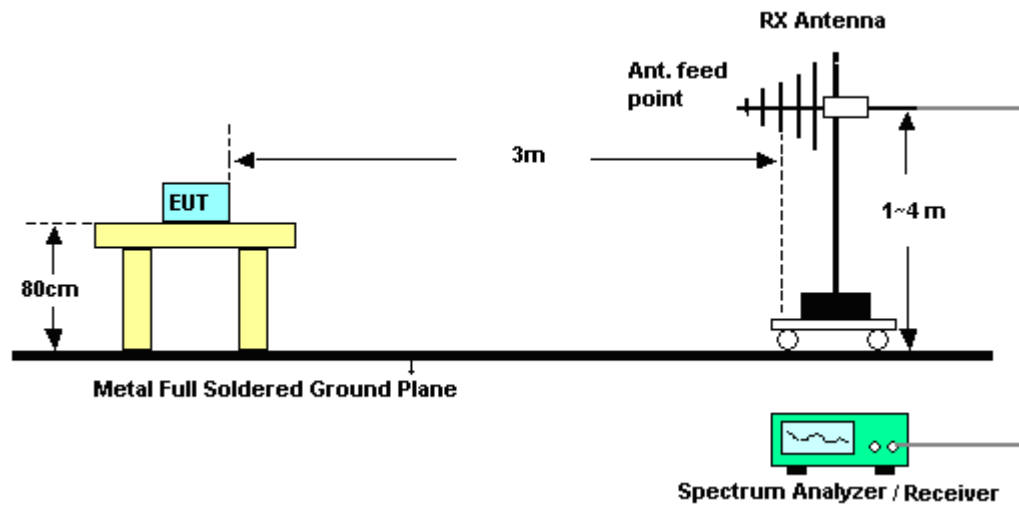
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

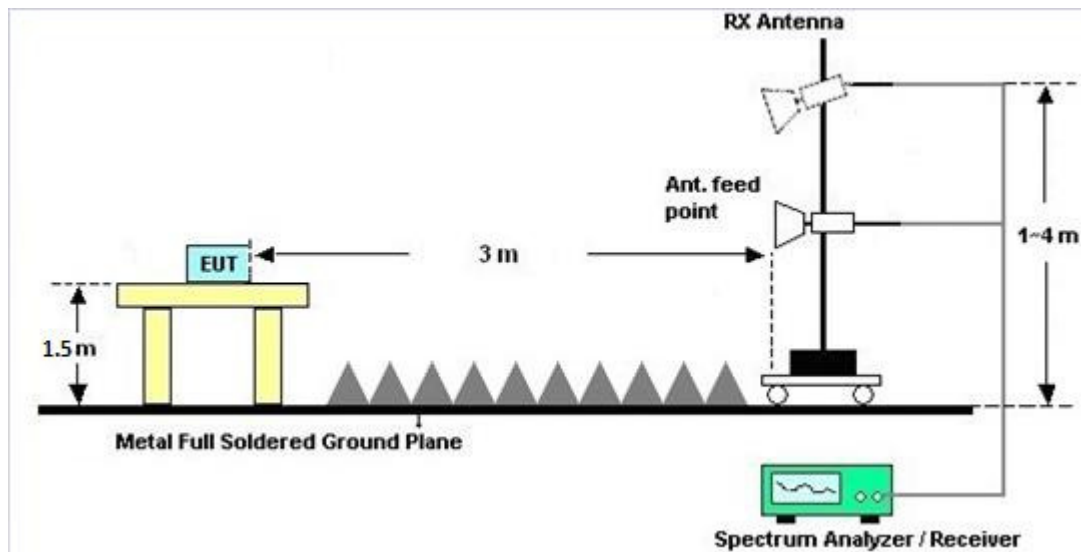
For radiated emissions below 30MHz



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 per 15.31(o) was not reported.

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.

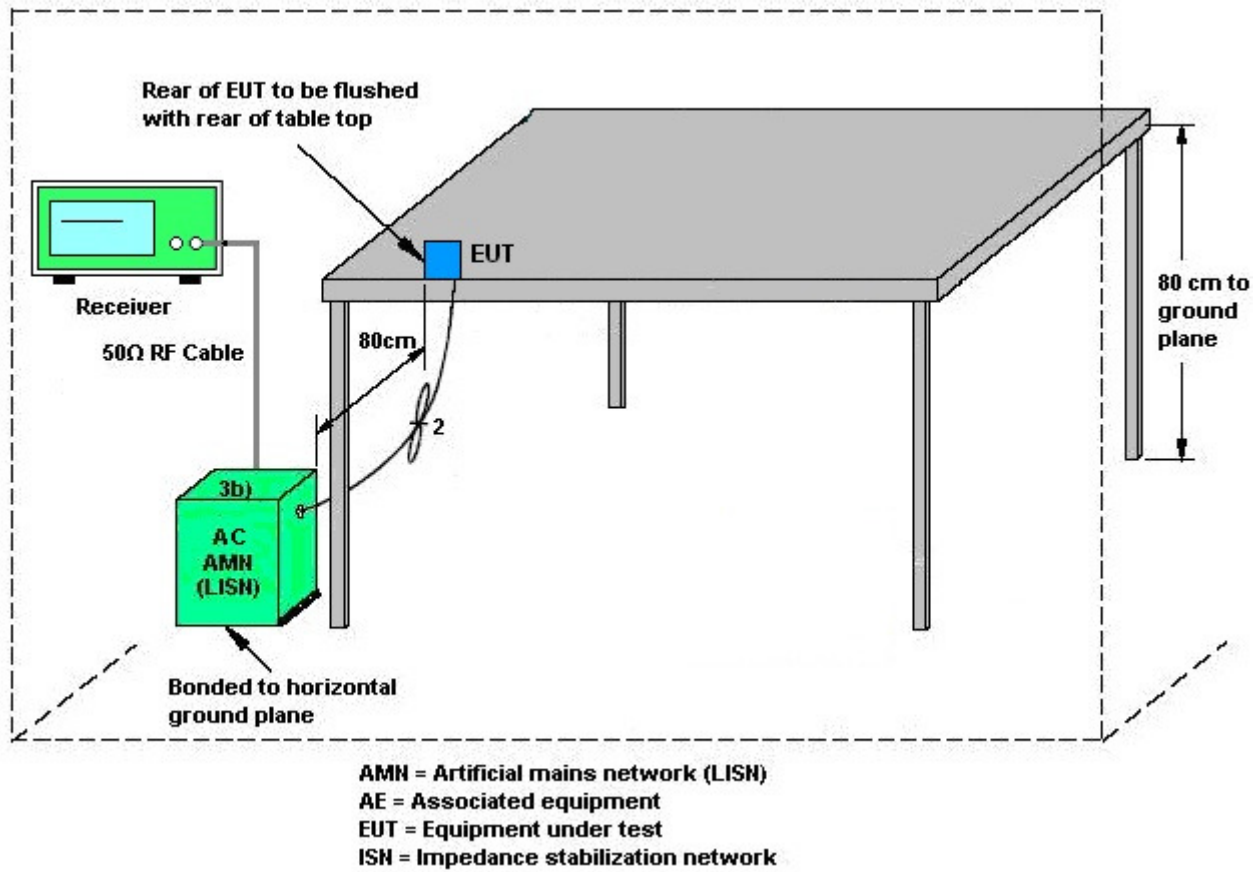
3.6.2 Measuring Instruments

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. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. 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 FCC 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	300MHz~40GHz z	Sep. 29, 2016	Feb. 28, 2017 ~ Mar. 15, 2017	Sep. 28, 2017	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	0846202	300MHz~40GHz z	Sep. 29, 2016	Feb. 28, 2017 ~ Mar. 15, 2017	Sep. 28, 2017	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz-40GHz	Jul. 17, 2016	Feb. 28, 2017 ~ Mar. 15, 2017	Jul. 16, 2017	Conducted (TH05-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Nov. 10, 2016	Mar. 10, 2017 ~ Mar. 15, 2017	Nov. 09, 2017	Radiation (03CH12-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Oct. 20, 2016	Mar. 10, 2017 ~ Mar. 15, 2017	Oct. 19, 2018	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	37059&01	30MHz~1GHz	Oct. 15, 2016	Mar. 10, 2017 ~ Mar. 15, 2017	Oct. 14, 2017	Radiation (03CH12-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100390	20Hz~26.5GHz	Dec. 23, 2016	Mar. 10, 2017 ~ Mar. 15, 2017	Dec. 22, 2017	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-132 8	1GHz ~ 18GHz	Oct. 25, 2016	Mar. 10, 2017 ~ Mar. 15, 2017	Oct. 24, 2017	Radiation (03CH12-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800	2025787	1GHZ~18GHZ	Feb. 13, 2017	Mar. 10, 2017 ~ Mar. 15, 2017	Feb. 12, 2018	Radiation (03CH12-HY)
Preamplifier	Keysight	83017A	MY532701 48	1GHz~26.5GHz	Jan. 12, 2017	Mar. 10, 2017 ~ Mar. 15, 2017	Jan. 11, 2018	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500- B	N/A	1m~4m	N/A	Mar. 10, 2017 ~ Mar. 15, 2017	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Mar. 10, 2017 ~ Mar. 15, 2017	N/A	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170 576	18GHz ~ 40GHz	Apr. 15, 2016	Mar. 10, 2017 ~ Mar. 15, 2017	Apr. 14, 2017	Radiation (03CH12-HY)
Preamplifier	MITEQ	JS44-180040 00-33-8P	1840917	18GHz ~ 40GHz	Jun. 14, 2016	Mar. 10, 2017 ~ Mar. 15, 2017	Jun. 13, 2017	Radiation (03CH12-HY)
BT Base Station(Measure)	Rohde & Schwarz	CBT32	100519	N/A	Jun. 03, 2016	Mar. 10, 2017 ~ Mar. 15, 2017	Jun. 02, 2017	Radiation (03CH12-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Mar. 11, 2017	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Aug. 30, 2016	Mar. 11, 2017	Aug. 29, 2017	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 29, 2016	Mar. 11, 2017	Nov. 28, 2017	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 05, 2017	Mar. 11, 2017	Jan. 04, 2018	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 05, 2017	Mar. 11, 2017	Jan. 04, 2018	Conduction (CO05-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
--	-----

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1
--	-----

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.2
--	-----

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.7
--	-----



Appendix A. Conducted Test Results

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Aking Chang	Temperature:	21~25	°C
Test Date:	2017/02/28 ~ 2017/03/15	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	1Mbps	1	1	2412	13.35	8.52	0.50	Pass
11b	1Mbps	1	6	2437	13.30	8.52	0.50	Pass
11b	1Mbps	1	11	2462	13.45	8.52	0.50	Pass
11g	6Mbps	1	1	2412	18.40	16.44	0.50	Pass
11g	6Mbps	1	6	2437	18.80	16.32	0.50	Pass
11g	6Mbps	1	11	2462	18.25	15.92	0.50	Pass
HT20	MCS0	1	1	2412	19.10	17.54	0.50	Pass
HT20	MCS0	1	6	2437	19.55	17.56	0.50	Pass
HT20	MCS0	1	11	2462	19.20	17.24	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	1Mbps	1	1	2412	22.62	30.00	0.58	23.20	36.00	Pass
11b	1Mbps	1	6	2437	22.52	30.00	0.58	23.10	36.00	Pass
11b	1Mbps	1	11	2462	22.83	30.00	0.58	23.41	36.00	Pass
11g	6Mbps	1	1	2412	25.05	30.00	0.58	25.63	36.00	Pass
11g	6Mbps	1	6	2437	26.18	30.00	0.58	26.76	36.00	Pass
11g	6Mbps	1	11	2462	24.70	30.00	0.58	25.28	36.00	Pass
HT20	MCS0	1	1	2412	25.14	30.00	0.58	25.72	36.00	Pass
HT20	MCS0	1	6	2437	26.36	30.00	0.58	26.94	36.00	Pass
HT20	MCS0	1	11	2462	24.45	30.00	0.58	25.03	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	1Mbps	1	1	2412	0.12	19.83
11b	1Mbps	1	6	2437	0.12	19.77
11b	1Mbps	1	11	2462	0.12	20.27
11g	6Mbps	1	1	2412	0.59	17.89
11g	6Mbps	1	6	2437	0.59	20.50
11g	6Mbps	1	11	2462	0.59	17.29
HT20	MCS0	1	1	2412	0.66	18.06
HT20	MCS0	1	6	2437	0.66	20.66
HT20	MCS0	1	11	2462	0.66	16.81

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	1Mbps	1	1	2412	-2.58	0.58	8.00	Pass
11b	1Mbps	1	6	2437	-4.21	0.58	8.00	Pass
11b	1Mbps	1	11	2462	-2.58	0.58	8.00	Pass
11g	6Mbps	1	1	2412	-8.00	0.58	8.00	Pass
11g	6Mbps	1	6	2437	-4.98	0.58	8.00	Pass
11g	6Mbps	1	11	2462	-8.84	0.58	8.00	Pass
HT20	MCS0	1	1	2412	-8.16	0.58	8.00	Pass
HT20	MCS0	1	6	2437	-4.90	0.58	8.00	Pass
HT20	MCS0	1	11	2462	-8.46	0.58	8.00	Pass



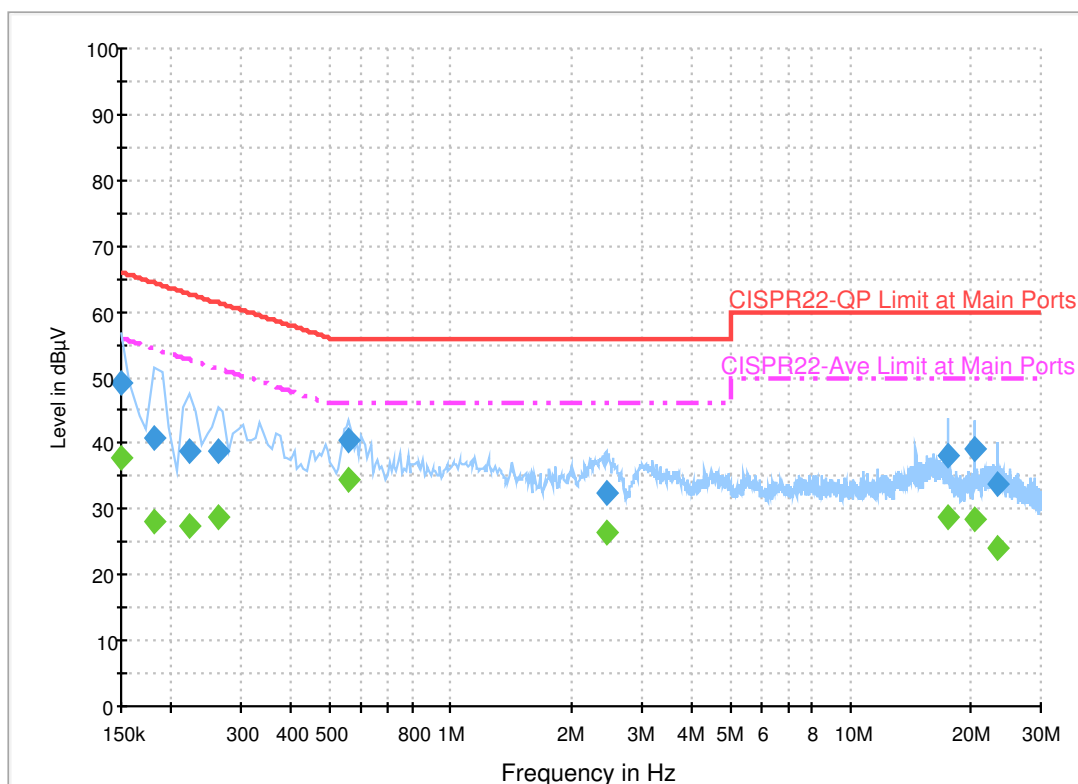
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Arthur Hsieh	Temperature :	23~25°C
		Relative Humidity :	50~52%

EUT Information

Report NO : 720610
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)
0.150000	49.1	Off	L1	19.6	16.9	66.0
0.182000	40.7	Off	L1	19.6	23.7	64.4
0.222000	38.9	Off	L1	19.6	23.8	62.7
0.262000	38.9	Off	L1	19.6	22.5	61.4
0.558000	40.6	Off	L1	19.6	15.4	56.0
2.454000	32.4	Off	L1	19.2	23.6	56.0
17.510000	38.2	Off	L1	20.5	21.8	60.0
20.422000	39.1	Off	L1	20.6	20.9	60.0
23.358000	33.7	Off	L1	20.7	26.3	60.0

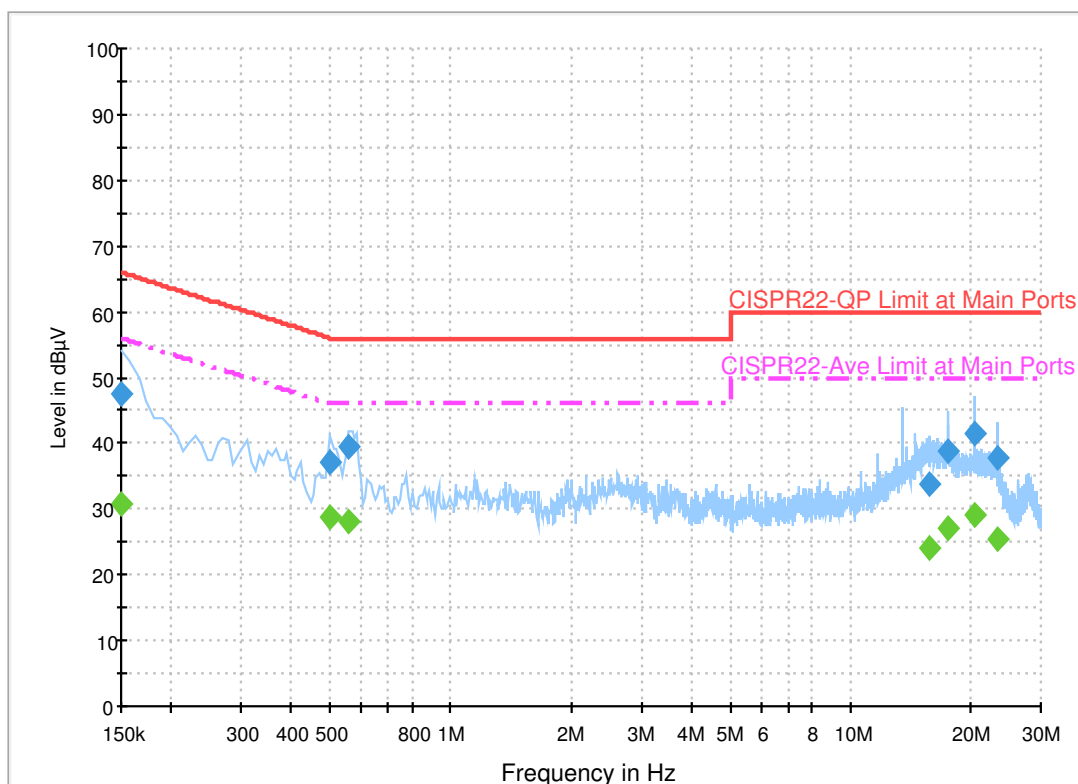
Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	37.9	Off	L1	19.6	18.1	56.0
0.182000	28.1	Off	L1	19.6	26.3	54.4
0.222000	27.3	Off	L1	19.6	25.4	52.7
0.262000	28.8	Off	L1	19.6	22.6	51.4
0.558000	34.4	Off	L1	19.6	11.6	46.0
2.454000	26.3	Off	L1	19.2	19.7	46.0
17.510000	28.9	Off	L1	20.5	21.1	50.0
20.422000	28.5	Off	L1	20.6	21.5	50.0
23.358000	24.2	Off	L1	20.7	25.8	50.0

EUT Information

Report NO : 720610
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	47.6	Off	N	19.5	18.4	66.0
0.502000	37.3	Off	N	19.5	18.7	56.0
0.558000	39.3	Off	N	19.5	16.7	56.0
15.822000	33.9	Off	N	20.4	26.1	60.0
17.526000	38.9	Off	N	20.5	21.1	60.0
20.438000	41.4	Off	N	20.7	18.6	60.0
23.350000	37.7	Off	N	20.9	22.3	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	30.7	Off	N	19.5	25.3	56.0
0.502000	28.6	Off	N	19.5	17.4	46.0
0.558000	28.0	Off	N	19.5	18.0	46.0
15.822000	24.0	Off	N	20.4	26.0	50.0
17.526000	27.2	Off	N	20.5	22.8	50.0
20.438000	29.0	Off	N	20.7	21.0	50.0
23.350000	25.3	Off	N	20.9	24.7	50.0



Appendix C. Radiated Spurious Emission

Test Engineer :	Peter Chiu, Karl Hou, and Nick Yu	Temperature :	21~23°C
		Relative Humidity :	53~55%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (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)
802.11b CH 01 2412MHz		2365.86	56.9	-17.1	74	54.02	27	7.37	31.49	100	350	P	H
		2386.44	44.66	-9.34	54	41.64	27.06	7.45	31.49	100	350	A	H
	*	2412	105.26	-	-	102.16	27.14	7.45	31.49	100	350	P	H
	*	2412	101.04	-	-	97.94	27.14	7.45	31.49	100	350	A	H
													H
													H
		2377.095	56.2	-17.8	74	53.29	27.03	7.37	31.49	361	357	P	V
		2386.335	44.47	-9.53	54	41.45	27.06	7.45	31.49	361	357	A	V
	*	2412	104.39	-	-	101.29	27.14	7.45	31.49	361	357	P	V
	*	2412	99.84	-	-	96.74	27.14	7.45	31.49	361	357	A	V
													V
													V
802.11b CH 06 2437MHz		2383.08	56.15	-17.85	74	53.14	27.05	7.45	31.49	115	350	P	H
		2389.1	44.82	-9.18	54	41.79	27.07	7.45	31.49	115	350	A	H
	*	2437	106.93	-	-	103.71	27.21	7.49	31.48	115	350	P	H
	*	2437	102.42	-	-	99.2	27.21	7.49	31.48	115	350	A	H
		2492.51	56.39	-17.61	74	52.94	27.38	7.53	31.46	115	350	P	H
		2485.02	45.3	-8.7	54	41.88	27.36	7.53	31.47	115	350	A	H
		2375.66	55.59	-18.41	74	52.68	27.03	7.37	31.49	400	360	P	V
		2389.24	44.39	-9.61	54	41.36	27.07	7.45	31.49	400	360	A	V
	*	2437	105.54	-	-	102.32	27.21	7.49	31.48	400	360	P	V
	*	2438	101.34	-	-	98.12	27.21	7.49	31.48	400	360	A	V
		2494.61	56.02	-17.98	74	52.57	27.38	7.53	31.46	400	360	P	V
		2493.49	44.88	-9.12	54	41.43	27.38	7.53	31.46	400	360	A	V



802.11b CH 11 2462MHz	*	2462	108.28	-	-	104.93	27.29	7.53	31.47	108	353	P	H
	*	2462	104.18	-	-	100.83	27.29	7.53	31.47	108	353	A	H
		2489.8	58.66	-15.34	74	55.23	27.37	7.53	31.47	108	353	P	H
		2483.96	45.04	-8.96	54	41.63	27.35	7.53	31.47	108	353	A	H
													H
													H
	*	2462	106.59	-	-	103.24	27.29	7.53	31.47	393	360	P	V
	*	2462	102.29	-	-	98.94	27.29	7.53	31.47	393	360	A	V
		2488.28	57.28	-16.72	74	53.86	27.36	7.53	31.47	393	360	P	V
		2484.8	44.81	-9.19	54	41.4	27.35	7.53	31.47	393	360	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	39.35	-34.65	74	61.17	32.18	10.74	64.74	100	0	P	H
													H
													H
													H
		4824	41.25	-32.75	74	63.07	32.18	10.74	64.74	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4874	39.65	-34.35	74	61.19	32.27	10.89	64.7	100	0	P	H
		7311	46.87	-27.13	74	60.54	36.97	14.18	64.82	100	0	P	H
													H
													H
		4874	40.87	-33.13	74	62.41	32.27	10.89	64.7	100	0	P	V
		7311	45.95	-28.05	74	59.62	36.97	14.18	64.82	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4924	40	-34	74	61.26	32.36	11.04	64.66	100	0	P	H
		7386	49.19	-24.81	74	62.6	37.18	14.27	64.86	100	0	P	H
													H
													H
		4924	41.1	-32.9	74	62.36	32.36	11.04	64.66	100	0	P	V
		7386	49	-25	74	62.41	37.18	14.27	64.86	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		2389.59	65.53	-8.47	74	62.5	27.07	7.45	31.49	100	350	P	H
		2390	49.59	-4.41	54	46.56	27.07	7.45	31.49	100	350	A	H
	*	2418	105.54	-	-	102.42	27.15	7.45	31.48	100	350	P	H
	*	2416	95.38	-	-	92.26	27.15	7.45	31.48	100	350	A	H
													H
													H
		2389.905	63.21	-10.79	74	60.18	27.07	7.45	31.49	363	356	P	V
		2389.485	48.42	-5.58	54	45.39	27.07	7.45	31.49	363	356	A	V
	*	2412	104.03	-	-	100.93	27.14	7.45	31.49	363	356	P	V
	*	2412	94.58	-	-	91.48	27.14	7.45	31.49	363	356	A	V
													V
													V
802.11g CH 06 2437MHz		2340.52	57.88	-16.12	74	55.09	26.92	7.37	31.5	229	65	P	H
		2385.04	46.74	-7.26	54	43.72	27.06	7.45	31.49	229	65	A	H
	*	2437	108.92	-	-	105.7	27.21	7.49	31.48	229	65	P	H
	*	2437	99.59	-	-	96.37	27.21	7.49	31.48	229	65	A	H
		2488.03	60.02	-13.98	74	56.6	27.36	7.53	31.47	229	65	P	H
		2488.94	48.63	-5.37	54	45.2	27.37	7.53	31.47	229	65	A	H
		2351.58	55.98	-18.02	74	53.16	26.95	7.37	31.5	400	0	P	V
		2385.04	45.58	-8.42	54	42.56	27.06	7.45	31.49	400	0	A	V
	*	2437	108.04	-	-	104.82	27.21	7.49	31.48	400	0	P	V
	*	2437	98.11	-	-	94.89	27.21	7.49	31.48	400	0	A	V
		2483.62	57.64	-16.36	74	54.23	27.35	7.53	31.47	400	0	P	V
		2489.43	46.45	-7.55	54	43.02	27.37	7.53	31.47	400	0	A	V



802.11g CH 11 2462MHz	*	2462	107.31	-	-	103.96	27.29	7.53	31.47	106	357	P	H
	*	2462	97	-	-	93.65	27.29	7.53	31.47	106	357	A	H
		2484.32	69.02	-4.98	74	65.61	27.35	7.53	31.47	106	357	P	H
		2483.64	50.61	-3.39	54	47.2	27.35	7.53	31.47	106	357	A	H
													H
													H
	*	2462	105.42	-	-	102.07	27.29	7.53	31.47	393	360	P	V
	*	2462	95.51	-	-	92.16	27.29	7.53	31.47	393	360	A	V
		2484.6	67.26	-6.74	74	63.85	27.35	7.53	31.47	393	360	P	V
		2483.6	49.32	-4.68	54	45.91	27.35	7.53	31.47	393	360	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	38.55	-35.45	74	60.37	32.18	10.74	64.74	100	0	P	H
													H
													H
													H
		4824	38.79	-35.21	74	60.61	32.18	10.74	64.74	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4874	39.45	-34.55	74	60.99	32.27	10.89	64.7	100	0	P	H
		7311	56.37	-17.63	74	70.04	36.97	14.18	64.82	330	345	P	H
		7311	40.78	-13.22	54	54.45	36.97	14.18	64.82	330	345	A	H
													H
		4874	39.47	-34.53	74	61.01	32.27	10.89	64.7	100	0	P	V
		7311	49.9	-24.1	74	63.57	36.97	14.18	64.82	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4924	38.91	-35.09	74	60.17	32.36	11.04	64.66	100	0	P	H
		7386	46.53	-27.47	74	59.94	37.18	14.27	64.86	100	0	P	H
													H
													H
		4924	38.55	-35.45	74	59.81	32.36	11.04	64.66	100	0	P	V
		7386	47.8	-26.2	74	61.21	37.18	14.27	64.86	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		2388.015	64.26	-9.74	74	61.24	27.06	7.45	31.49	100	351	P	H
		2389.905	50.85	-3.15	54	47.82	27.07	7.45	31.49	100	351	A	H
	*	2412	105.18	-	-	102.08	27.14	7.45	31.49	100	351	P	H
	*	2412	95.08	-	-	91.98	27.14	7.45	31.49	100	351	A	H
													H
													H
		2390	65.33	-8.67	74	62.3	27.07	7.45	31.49	362	357	P	V
		2390	48.72	-5.28	54	45.69	27.07	7.45	31.49	362	357	A	V
	*	2412	104.1	-	-	101	27.14	7.45	31.49	362	357	P	V
	*	2412	94.28	-	-	91.18	27.14	7.45	31.49	362	357	A	V
													V
													V
802.11n HT20 CH 06 2437MHz		2387.56	59.39	-14.61	74	56.37	27.06	7.45	31.49	116	351	P	H
		2384.76	47.38	-6.62	54	44.37	27.05	7.45	31.49	116	351	A	H
	*	2437	108.65	-	-	105.43	27.21	7.49	31.48	116	351	P	H
	*	2437	98.83	-	-	95.61	27.21	7.49	31.48	116	351	A	H
		2484.11	61	-13	74	57.59	27.35	7.53	31.47	116	351	P	H
		2488.66	48.53	-5.47	54	45.1	27.37	7.53	31.47	116	351	A	H
		2382.94	56.28	-17.72	74	53.27	27.05	7.45	31.49	400	360	P	V
		2385.04	46.04	-7.96	54	43.02	27.06	7.45	31.49	400	360	A	V
	*	2437	108.04	-	-	104.82	27.21	7.49	31.48	400	360	P	V
	*	2437	97.74	-	-	94.52	27.21	7.49	31.48	400	360	A	V
		2484.88	57.5	-16.5	74	54.09	27.35	7.53	31.47	400	360	P	V
		2489.15	46.72	-7.28	54	43.29	27.37	7.53	31.47	400	360	A	V



802.11n HT20 CH 11 2462MHz	*	2462	106.57	-	-	103.22	27.29	7.53	31.47	106	354	P	H
	*	2462	96.43	-	-	93.08	27.29	7.53	31.47	106	354	A	H
		2483.52	69.94	-4.06	74	66.53	27.35	7.53	31.47	106	354	P	H
		2483.68	50.35	-3.65	54	46.94	27.35	7.53	31.47	106	354	A	H
													H
													H
	*	2462	104.85	-	-	101.5	27.29	7.53	31.47	398	360	P	V
	*	2462	94.61	-	-	91.26	27.29	7.53	31.47	398	360	A	V
		2483.6	67.52	-6.48	74	64.11	27.35	7.53	31.47	398	360	P	V
		2484.24	48.19	-5.81	54	44.78	27.35	7.53	31.47	398	360	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	38.07	-35.93	74	59.89	32.18	10.74	64.74	100	0	P	H
													H
													H
													H
		4824	38.17	-35.83	74	59.99	32.18	10.74	64.74	100	0	P	V
													V
													V
													V
802.11n HT20 CH 06 2437MHz		4874	39.79	-34.21	74	61.33	32.27	10.89	64.7	100	0	P	H
		7311	50.54	-23.46	74	64.21	36.97	14.18	64.82	100	0	P	H
													H
													H
		4874	39.26	-34.74	74	60.8	32.27	10.89	64.7	100	0	P	V
		7311	54.23	-19.77	74	67.9	36.97	14.18	64.82	199	137	P	V
		7311	38.79	-15.21	54	52.46	36.97	14.18	64.82	199	137	A	V
													V
802.11n HT20 CH 11 2462MHz		4924	39.09	-34.91	74	60.35	32.36	11.04	64.66	100	0	P	H
		7386	46.95	-27.05	74	60.36	37.18	14.27	64.86	100	0	P	H
													H
													H
		4924	38.67	-35.33	74	59.93	32.36	11.04	64.66	100	0	P	V
		7386	47.58	-26.42	74	60.99	37.18	14.27	64.86	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

Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (LF)

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)
2.4GHz 802.11n HT20 LF		95.88	25.78	-17.72	43.5	41.63	15.52	1.06	32.43			P	H
		136.38	27.06	-16.44	43.5	40.19	17.86	1.43	32.42			P	H
		199.56	33.67	-9.83	43.5	48.58	15.8	1.7	32.41	100	0	P	H
		451.2	29.13	-16.87	46	35.51	23.12	2.89	32.39			P	H
		537.3	28.99	-17.01	46	33.83	24.37	3.19	32.4			P	H
		798.4	35.25	-10.75	46	35.52	27.79	4.14	32.2			P	H
													H
													H
													H
													H
													H
		61.86	33.58	-6.42	40	53.07	11.9	1.06	32.45			P	V
		65.64	35.13	-4.87	40	54.42	12.1	1.06	32.45	100	0	P	V
		251.94	31.75	-14.25	46	43.54	18.7	1.83	32.32			P	V
		592.6	31.91	-14.09	46	35.55	25.26	3.5	32.4			P	V
		766.2	37.38	-8.62	46	38.01	27.67	3.97	32.27			P	V
		798.4	36.5	-9.5	46	36.77	27.79	4.14	32.2			P	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	P eak or A verage
H/V	H orizontal or V ertical

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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	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)
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. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable 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) + Cable 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 :	Peter Chiu, Karl Hou, and Nick Yu	Temperature :	21~23°C
		Relative Humidity :	53~55%

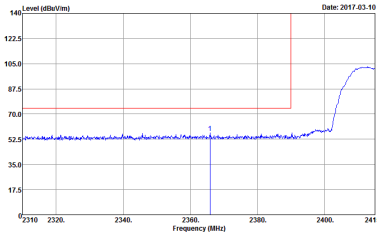
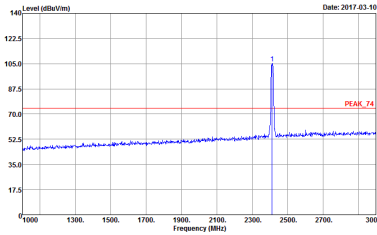
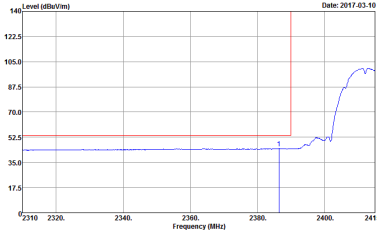
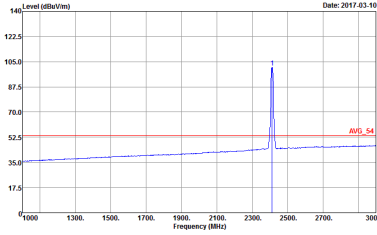
Note symbol

-L	Low channel location
-R	High channel location

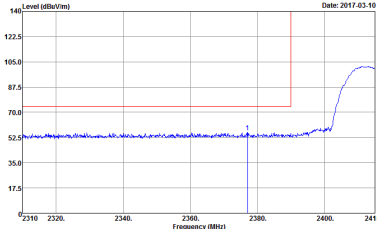
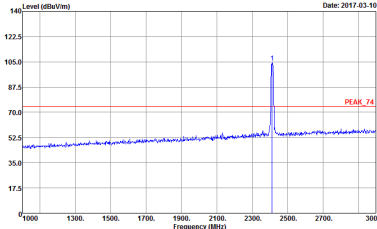
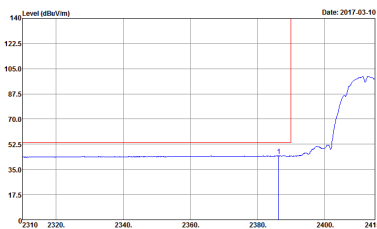
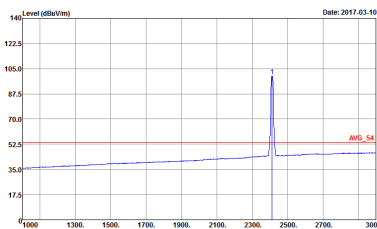


2.4GHz 2400~2483.5MHz

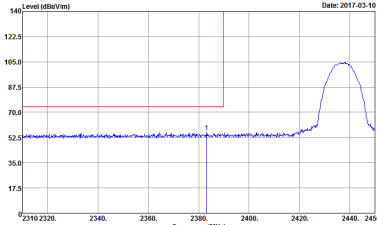
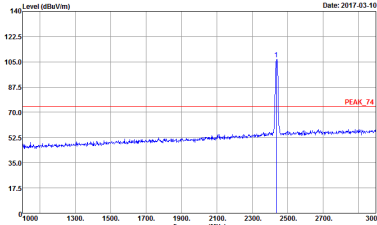
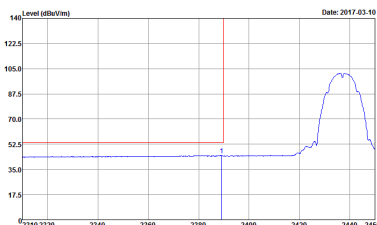
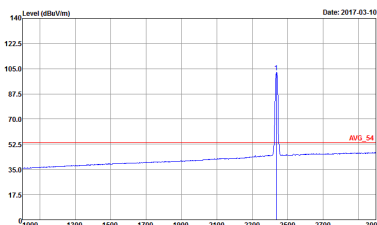
WIFI 802.11b (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 Site Condition : 03CH12-HY : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 7 Setting : 21	 Site Condition : 03CH12-HY : PEAK_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 7 Setting : 21
Avg.	 Site Condition : 03CH12-HY : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Detector : Peak Project : 720610 Mode : 7 Setting : 21	 Site Condition : 03CH12-HY : AVG_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Detector : Peak Project : 720610 Mode : 7 Setting : 21

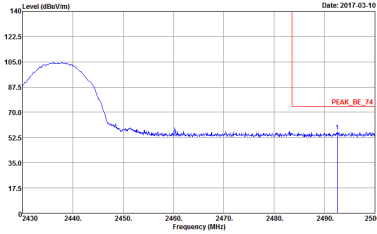
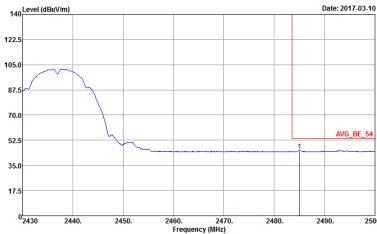


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Vertical	Fundamental
Peak	 Site Condition : 03CH12-HY : PEAK, RE_74 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VSW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 7 Setting : 21	 Site Condition : 03CH12-HY : PEAK, RE_74 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VSW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 7 Setting : 21
Avg.	 Site Condition : 03CH12-HY : AVG, RE_54 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VSW:0.300KHz SWT:Auto Detector : Peak Project : 720610 Mode : 7 Setting : 21	 Site Condition : 03CH12-HY : AVG, RE_54 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VSW:0.300KHz SWT:Auto Detector : Peak Project : 720610 Mode : 7 Setting : 21

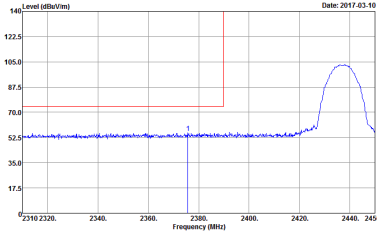
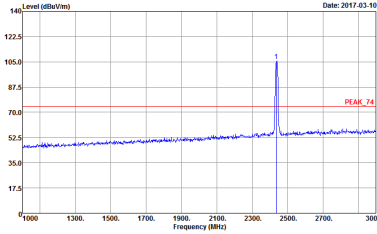
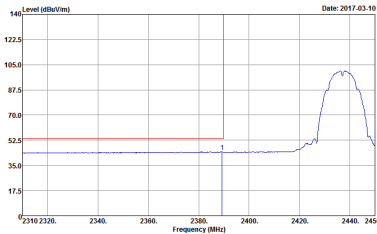
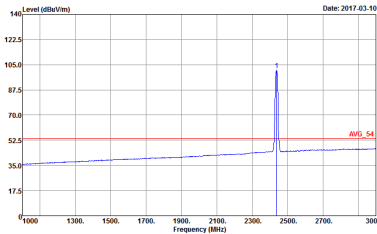


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK, RE_74 3m HORN_9120D_1328 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Mode : 720610 Setting : 8 : 21	 Site : 03CH12-HY Condition : PEAK, 74 3m HORN_9120D_1328 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Mode : 720610 Setting : 8 : 21
Avg.	 Site : 03CH12-HY Condition : AVG, RE_54 3m HORN_9120D_1328 HORIZONTAL Detector : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Project : Peak Mode : 720610 Setting : 8 : 21	 Site : 03CH12-HY Condition : AVG, 54 3m HORN_9120D_1328 HORIZONTAL Detector : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Project : Peak Mode : 720610 Setting : 8 : 21

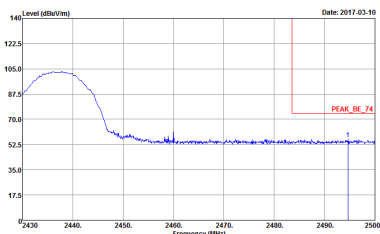
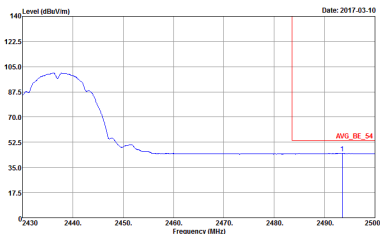


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1338 HORIZONTAL Detector : RBW:1000.000KHz VSW:3.000KHz SWT:Auto Project : Peak Mode : 720610 Setting : 8 : 21	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1338 HORIZONTAL Detector : RBW:1000.000KHz VSW:3.000KHz SWT:Auto Project : Peak Mode : 720610 Setting : 8 : 21	Left blank

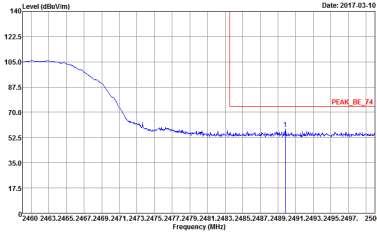
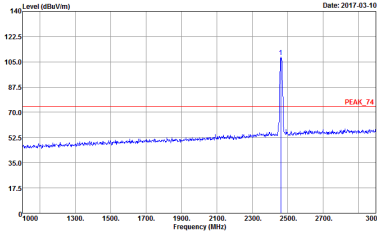
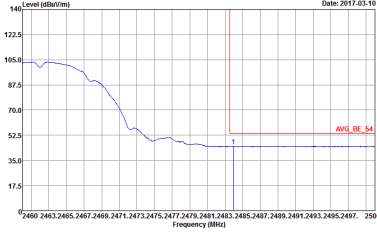
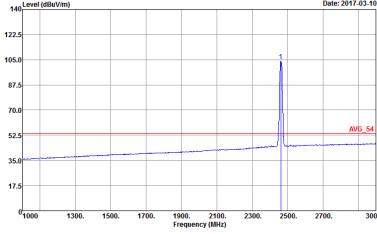


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK, RE_74 3m HORN_9120D_1338 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Mode : 720610 Setting : 8 : 21	 Site : 03CH12-HY Condition : PEAK, 74 3m HORN_9120D_1338 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Mode : 720610 Setting : 8 : 21
Avg.	 Site : 03CH12-HY Condition : AVG, RE_54 3m HORN_9120D_1338 VERTICAL Detector : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Project : Peak Mode : 720610 Setting : 8 : 21	 Site : 03CH12-HY Condition : AVG, 54 3m HORN_9120D_1338 VERTICAL Detector : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Project : Peak Mode : 720610 Setting : 8 : 21

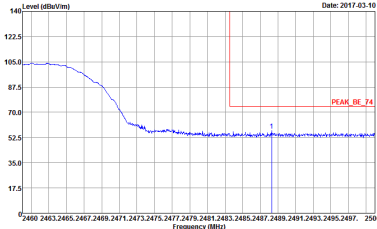
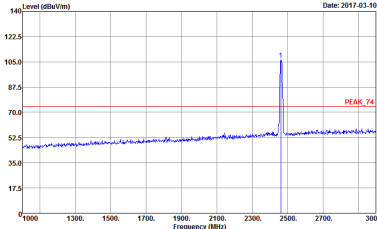
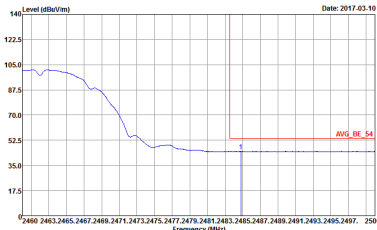
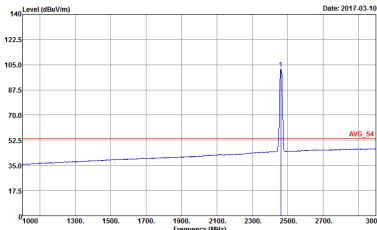


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1378 VERTICAL Detector : RBW:1000.000KHz VSW:3000.000KHz SWT:Auto Project : Peak Mode : 720610 Setting : 8 : 21	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1378 VERTICAL Detector : RBW:1000.000KHz VSW:0.300KHz SWT:Auto Project : Peak Mode : 720610 Setting : 8 : 21	Left blank

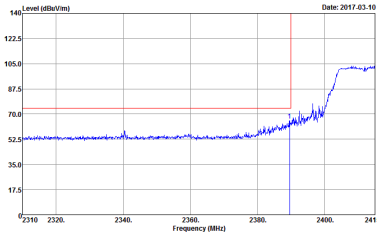
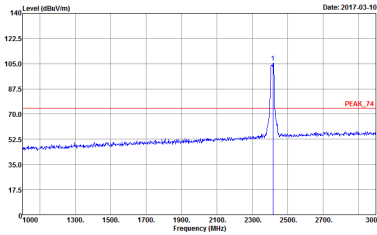
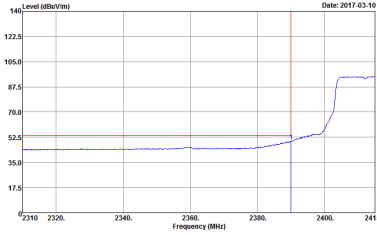
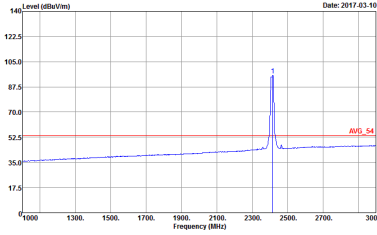


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site Condition : 03CH12-HY : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 9 Setting : 21	 Site Condition : 03CH12-HY : PEAK_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 9 Setting : 21
Avg.	 Site Condition : 03CH12-HY : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Detector : Peak Project : 720610 Mode : 9 Setting : 21	 Site Condition : 03CH12-HY : AVG_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Detector : Peak Project : 720610 Mode : 9 Setting : 21



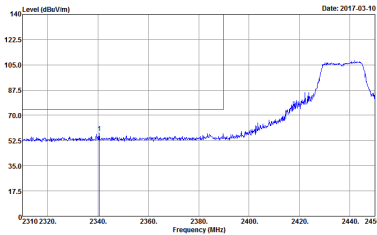
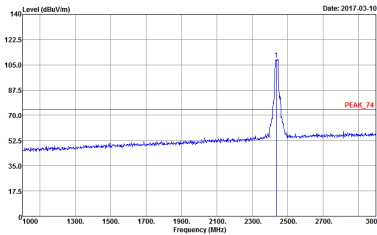
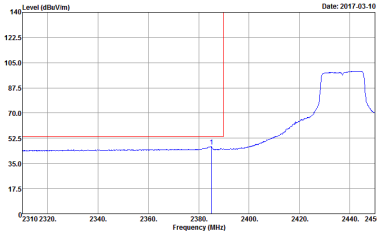
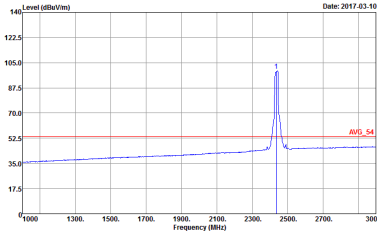
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Level (dBuV/m) Frequency (MHz) Site Condition : 03CH12-HY : PEAK_BE_74 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto : Peak : 720610 : 9 : 21	 Level (dBuV/m) Frequency (MHz) Site Condition : 03CH12-HY : PEAK_74 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto : Peak : 720610 : 9 : 21
Avg.	 Level (dBuV/m) Frequency (MHz) Site Condition : 03CH12-HY : AVG_BE_54 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VBW:0.300KHz SWT:Auto : Peak : 720610 : 9 : 21	 Level (dBuV/m) Frequency (MHz) Site Condition : 03CH12-HY : AVG_54 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VBW:0.300KHz SWT:Auto : Peak : 720610 : 9 : 21

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

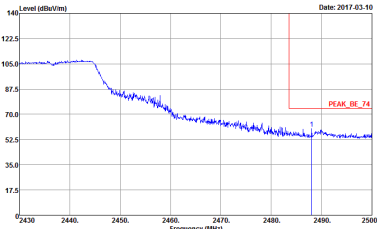
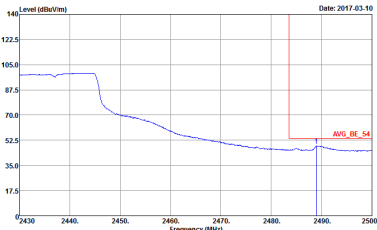
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 Site Condition : 03CH12-HY : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz YBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 10 Setting : 18.5	 Site Condition : 03CH12-HY : PEAK_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz YBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 10 Setting : 18.5
	 Site Condition : 03CH12-HY : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz YBW:1.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 10 Setting : 18.5	 Site Condition : 03CH12-HY : AVG_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz YBW:1.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 10 Setting : 18.5
Avg.		



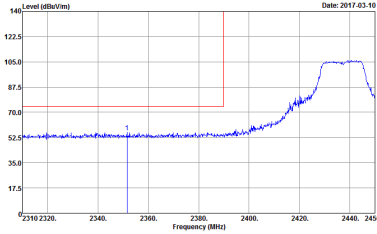
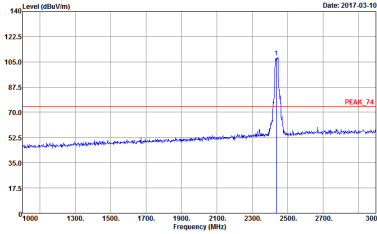
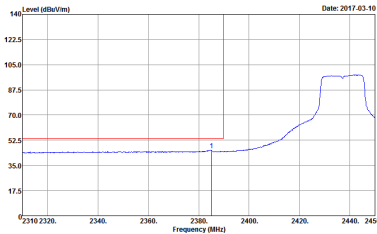
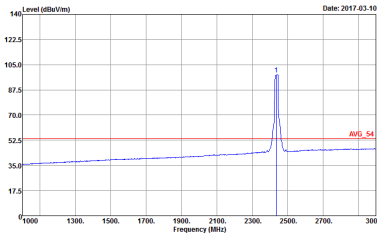
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Vertical	Fundamental
Peak	Site Condition : 03CH12-HY : PEAK, RE_74 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 10 Setting : 18.5	Site Condition : 03CH12-HY : PEAK, 74 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 10 Setting : 18.5
Avg.	Site Condition : 03CH12-HY : AVG, RE_54 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 10 Setting : 18.5	Site Condition : 03CH12-HY : AVG, 54 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 10 Setting : 18.5

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site: 03CH12-HY Condition: PEAK, RE, 74 3m HORN, 9120D_1328 HORIZONTAL Detector: RBW:1000.000KHz VSW:3000.000KHz SWT:Auto Project: Peak Mode: 720610 Setting: 11	 Site: 03CH12-HY Condition: PEAK, 74 3m HORN, 9120D_1328 HORIZONTAL Detector: RBW:1000.000KHz VSW:3000.000KHz SWT:Auto Project: Peak Mode: 720610 Setting: 11
Avg.	 Site: 03CH12-HY Condition: AVG, RE, 54 3m HORN, 9120D_1328 HORIZONTAL Detector: RBW:1000.000KHz VSW:1.000KHz SWT:Auto Project: Peak Mode: 720610 Setting: 11	 Site: 03CH12-HY Condition: AVG, 54 3m HORN, 9120D_1328 HORIZONTAL Detector: RBW:1000.000KHz VSW:1.000KHz SWT:Auto Project: Peak Mode: 720610 Setting: 11

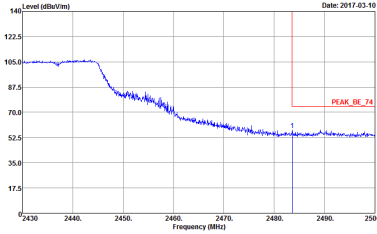
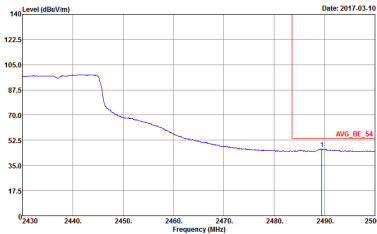


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL Detector : RBW:1000.000KHz VSW:3000.000KHz SWT:Auto Project : Peak Mode : 720610 Setting : 11 Setting : 21	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL Detector : RBW:1000.000KHz VSW:1.000KHz SWT:Auto Project : Peak Mode : 720610 Setting : 11 Setting : 21	Left blank

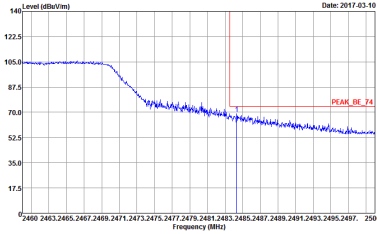
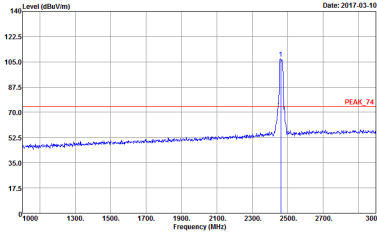
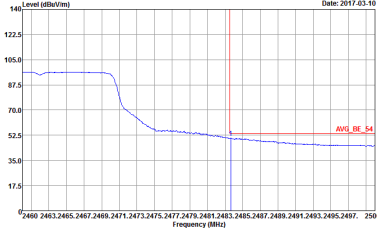
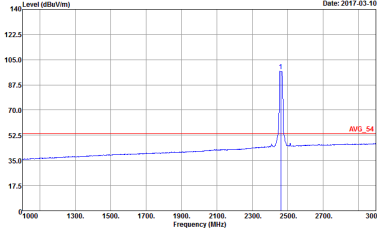


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK, RE_74 3m HORN_9120D_1338 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Mode : 720610 Setting : 11 Date: 2017-03-10	 Site : 03CH12-HY Condition : PEAK, 74 3m HORN_9120D_1338 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Mode : 720610 Setting : 11 Date: 2017-03-10
Avg.	 Site : 03CH12-HY Condition : AVG, RE_54 3m HORN_9120D_1338 VERTICAL Detector : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Project : Peak Mode : 720610 Setting : 11 Date: 2017-03-10	 Site : 03CH12-HY Condition : AVG, 54 3m HORN_9120D_1338 VERTICAL Detector : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Project : Peak Mode : 720610 Setting : 11 Date: 2017-03-10

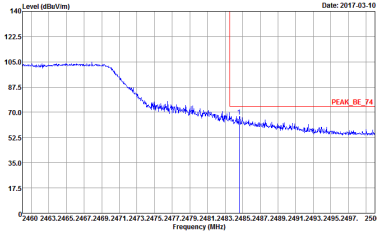
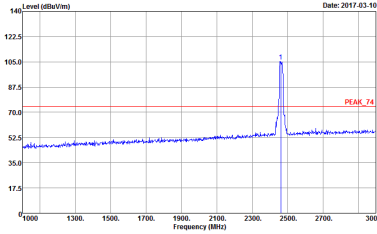
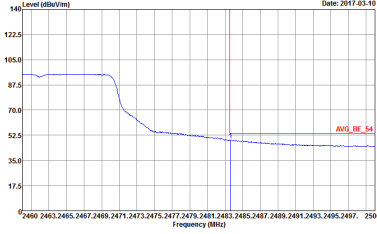
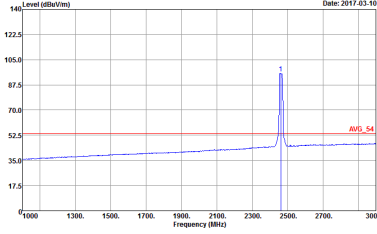


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Site: 03CH12-HY Condition: PEAK, BE_74 3m HORN_9120D_1378 VERTICAL Detector: RBW:1000.000KHz VBW:3000.000KHz SWT:auto Project: Peak Mode: 720610 Setting: 11 21	Left Blank
Avg.	 Site: 03CH12-HY Condition: AVG, BE_54 3m HORN_9120D_1378 VERTICAL Detector: RBW:1000.000KHz VBW:1.000KHz SWT:auto Project: Peak Mode: 720610 Setting: 11 21	Left Blank

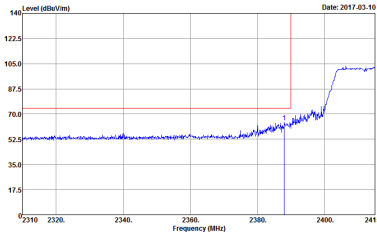
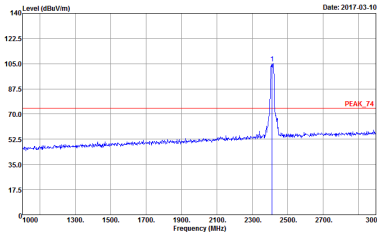
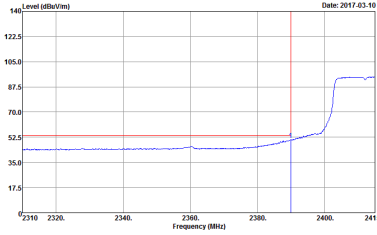
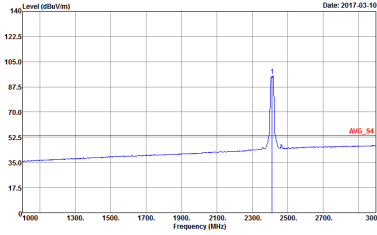


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site Condition : 03CH12-HY : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 12 Setting : 17.5	 Site Condition : 03CH12-HY : PEAK_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 12 Setting : 17.5
Avg.	 Site Condition : 03CH12-HY : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 12 Setting : 17.5	 Site Condition : 03CH12-HY : AVG_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 12 Setting : 17.5

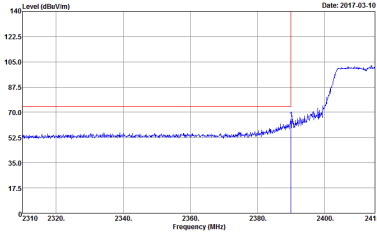
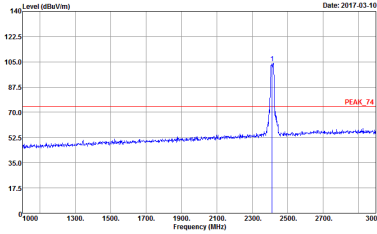
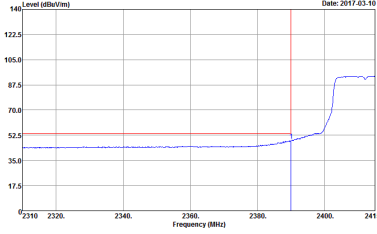
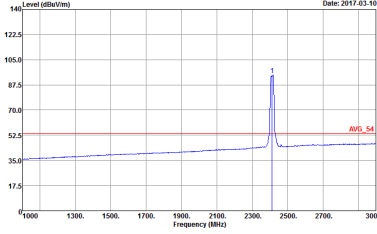


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site Condition : 03CH12-HY : PEAK_BE_74 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 12 Setting : 17.5	 Site Condition : 03CH12-HY : PEAK_74 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 12 Setting : 17.5
Avg.	 Site Condition : 03CH12-HY : AVG_BE_54 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 12 Setting : 17.5	 Site Condition : 03CH12-HY : AVG_54 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 12 Setting : 17.5

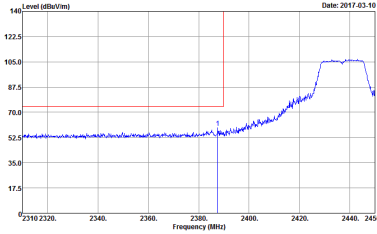
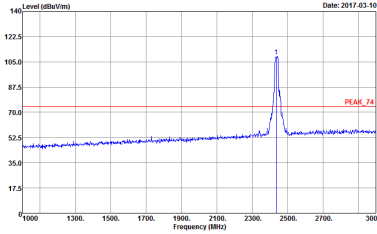
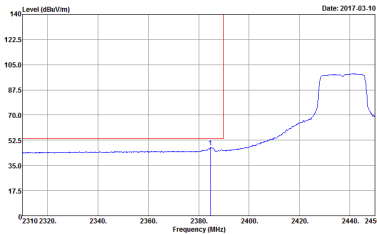
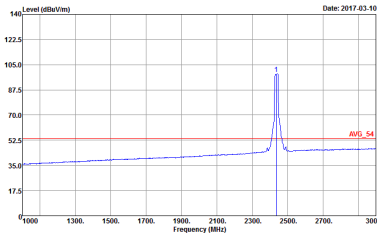
2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 Site Condition : 03CH12-HY : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 13 Setting : 18.5	 Site Condition : 03CH12-HY : PEAK_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 13 Setting : 18.5
	 Site Condition : 03CH12-HY : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 13 Setting : 18.5	 Site Condition : 03CH12-HY : AVG_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 13 Setting : 18.5
Avg.		

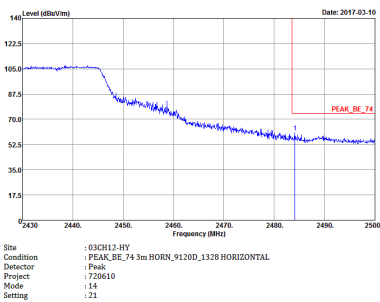
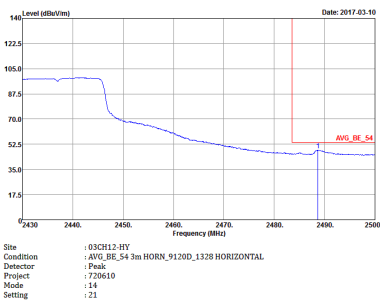


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Vertical	Fundamental
Peak	 Site Condition : 03CH12-HY PEAK, RE_74 3m HORN_9120D_1338 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 13 Setting : 18.5	 Site Condition : 03CH12-HY PEAK, 74 3m HORN_9120D_1338 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 13 Setting : 18.5
Avg.	 Site Condition : 03CH12-HY AVG, RE_54 3m HORN_9120D_1338 VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 13 Setting : 18.5	 Site Condition : 03CH12-HY AVG, 54 3m HORN_9120D_1338 VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 13 Setting : 18.5

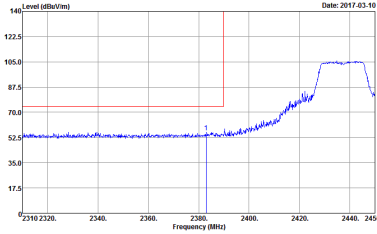
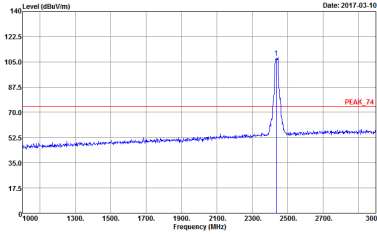
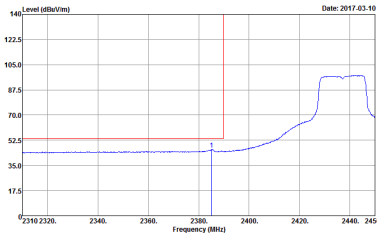
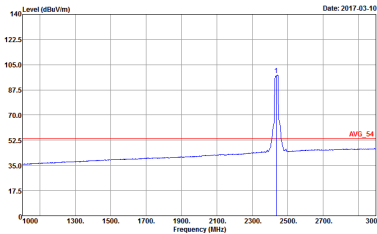


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 720610 Mode : 14 Setting : 21	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 720610 Mode : 14 Setting : 21
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 720610 Mode : 14 Setting : 21	 Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 720610 Mode : 14 Setting : 21

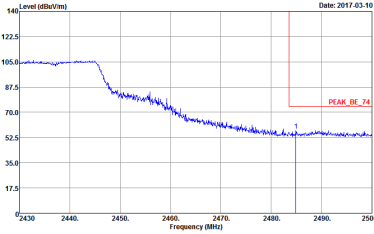
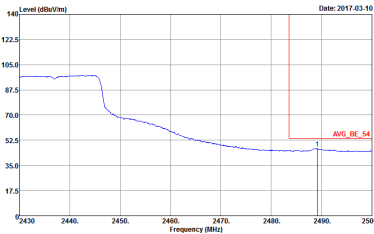


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

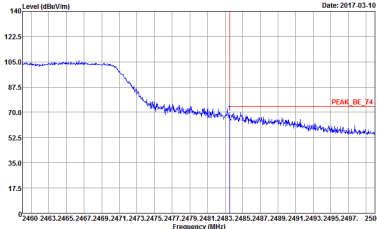
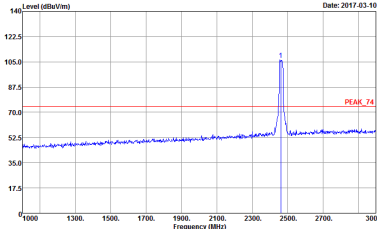
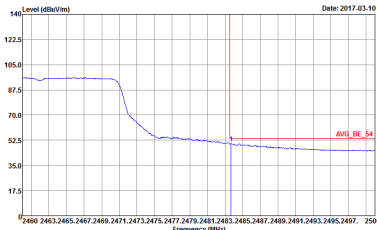
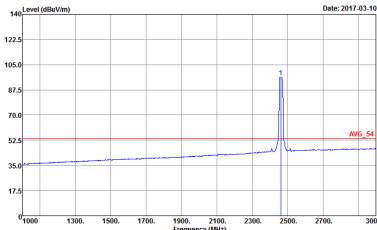


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 720610 Mode : 14 Setting : 21	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 720610 Mode : 14 Setting : 21
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 720610 Mode : 14 Setting : 21	 Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 720610 Mode : 14 Setting : 21

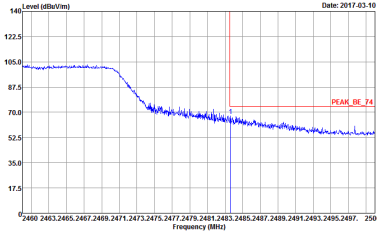
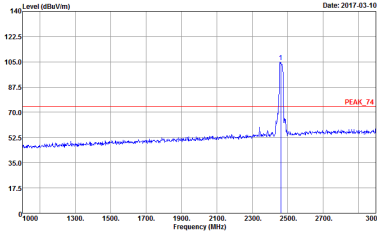
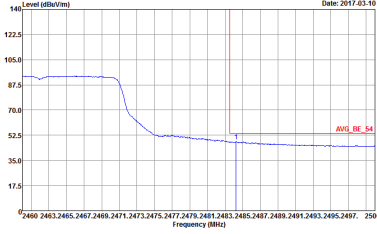
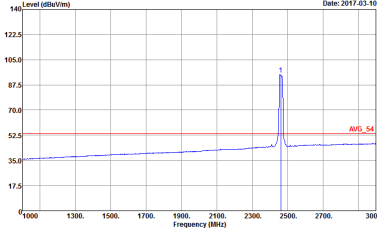


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 720610 Mode : 14 Setting : 21	Left Blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 720610 Mode : 14 Setting : 21	Left Blank



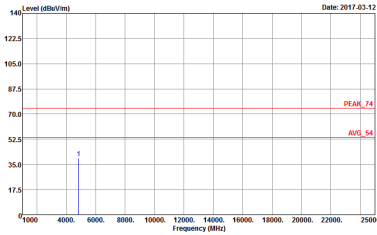
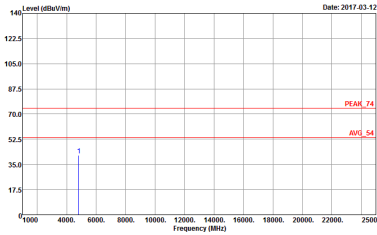
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site Condition : 03CH12-HY : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VSW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 15 Setting : 17	 Site Condition : 03CH12-HY : PEAK_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VSW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 15 Setting : 17
Avg.	 Site Condition : 03CH12-HY : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VSW:1.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 15 Setting : 17	 Site Condition : 03CH12-HY : AVG_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VSW:1.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 15 Setting : 17



WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site Condition : 03CH12-HY : PEAK_BE_74 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 15 Setting : 17	 Site Condition : 03CH12-HY : PEAK_74 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 15 Setting : 17
Avg.	 Site Condition : 03CH12-HY : AVG_BE_54 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 15 Setting : 17	 Site Condition : 03CH12-HY : AVG_54 3m HORN_9120D_1338 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 720610 Mode : 15 Setting : 17



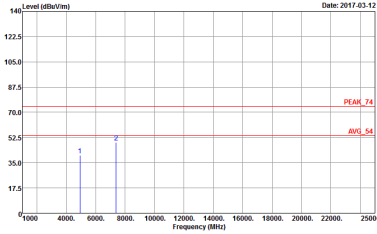
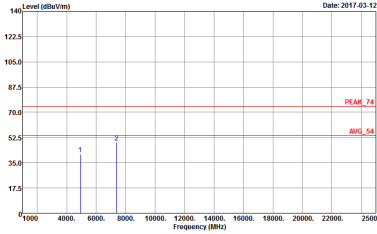
2.4GHz 2400~2483.5MHz
WIFI 802.11b (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 720610 Mode : 7 Setting : 21	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 720610 Mode : 7 Setting : 21



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.	Site Condition : 03CH12-HY Detector : PEAK_74 3m HORN_9120D_1328 HORIZONTAL Project : Peak Mode : 720610 Setting : 8 Setting : 21	Site Condition : 03CH12-HY Detector : PEAK_74 3m HORN_9120D_1328 VERTICAL Project : Peak Mode : 720610 Setting : 8 Setting : 21

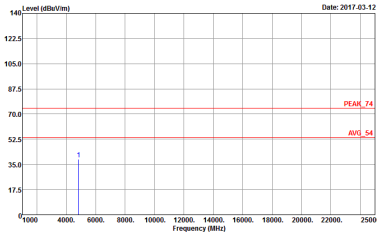
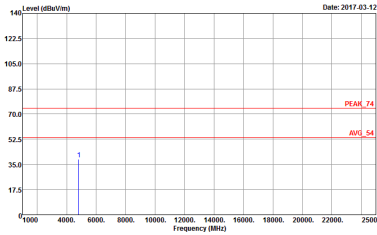


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	 Site Condition : 03CH12-HY Detector : PEAK_74 3m HORN_9120D_1328 HORIZONTAL Project : Peak Mode : 720610 Setting : 9 Setting : 21	 Site Condition : 03CH12-HY Detector : PEAK_74 3m HORN_9120D_1328 VERTICAL Project : Peak Mode : 720610 Setting : 9 Setting : 21

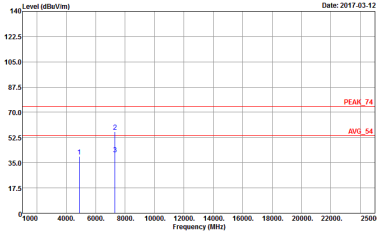
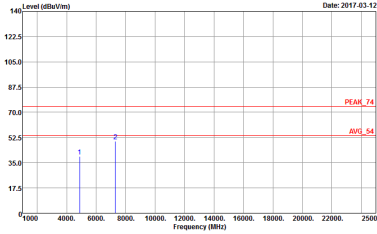


2.4GHz 2400~2483.5MHz

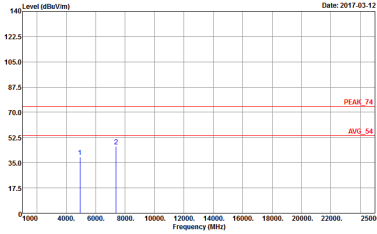
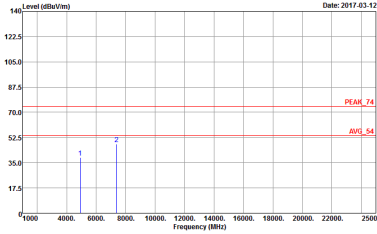
WIFI 802.11g (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 720610 Mode : 10 Setting : 10.5	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 720610 Mode : 10 Setting : 10.5



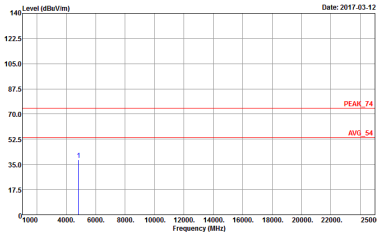
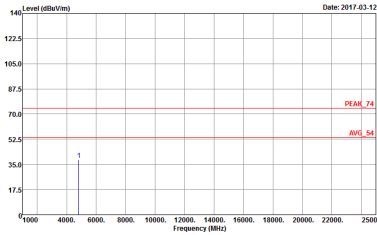
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.	 Site Condition : 03CH12-HY Detector : PEAK_74 3m HORN_9120D_1328 HORIZONTAL Project : Peak Mode : 720610 Setting : 11 Setting : 21	 Site Condition : 03CH12-HY Detector : PEAK_74 3m HORN_9120D_1328 VERTICAL Project : Peak Mode : 720610 Setting : 11 Setting : 21



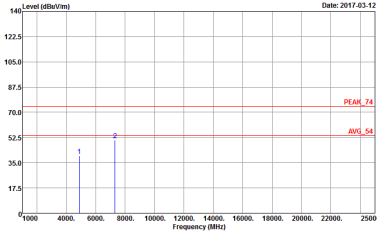
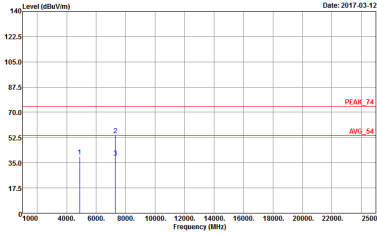
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	 Site Condition : 03CH12-HY Detector : PEAK_74 3m HORN_9120D_1328 HORIZONTAL Project : Peak Mode : 720610 Setting : 12 Setting : 17.5	 Site Condition : 03CH12-HY Detector : PEAK_74 3m HORN_9120D_1328 VERTICAL Project : Peak Mode : 720610 Setting : 12 Setting : 17.5



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 : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 720610 Mode : 13 Setting : 10.5	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 720610 Mode : 13 Setting : 10.5

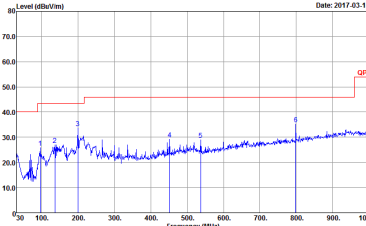
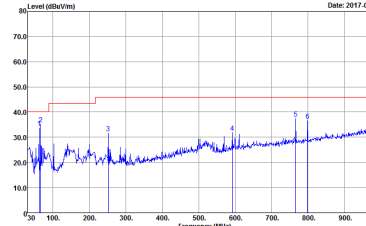


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.	 Site Condition : 03CH12-HY Detector : PEAK_74 3m HORN_9120D_1328 HORIZONTAL Project : Peak Mode : 14 Setting : 21	 Site Condition : 03CH12-HY Detector : PEAK_74 3m HORN_9120D_1328 VERTICAL Project : Peak Mode : 14 Setting : 21



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	Site Condition : 03CH12-HY Detector : PEAK_74 3m HORN_9120D_1328 HORIZONTAL Project : Peak Mode : 15 Setting : 17	Site Condition : 03CH12-HY Detector : PEAK_74 3m HORN_9120D_1328 VERTICAL Project : Peak Mode : 15 Setting : 17

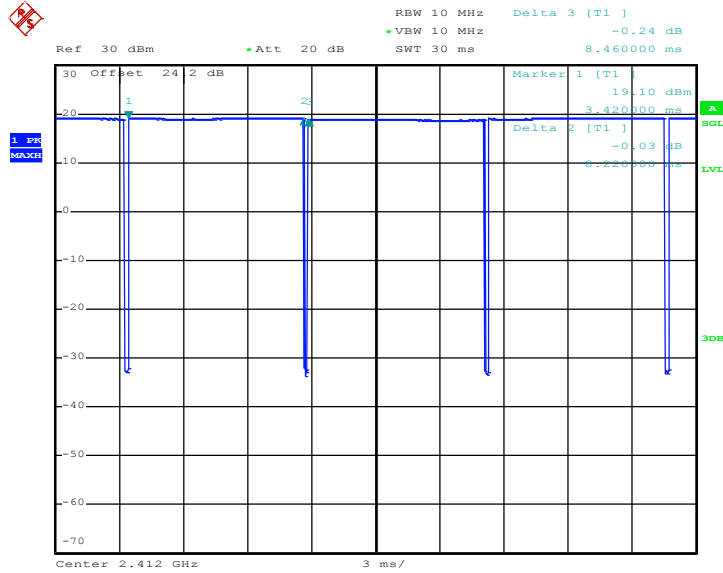
Emission below 1GHz
2.4GHz WIFI 802.11n HT20 (LF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11n HT20 LF	
1	Horizontal	Vertical
QP / Peak	 Site : 03CH12-HY Condition : QP 3m BILOG_6111D_37059 HORIZONTAL Project : 720610 Mode : 18	 Site : 03CH12-HY Condition : QP 3m BILOG_6111D_37059 VERTICAL Project : 720610 Mode : 18

Appendix E. Duty Cycle Plots

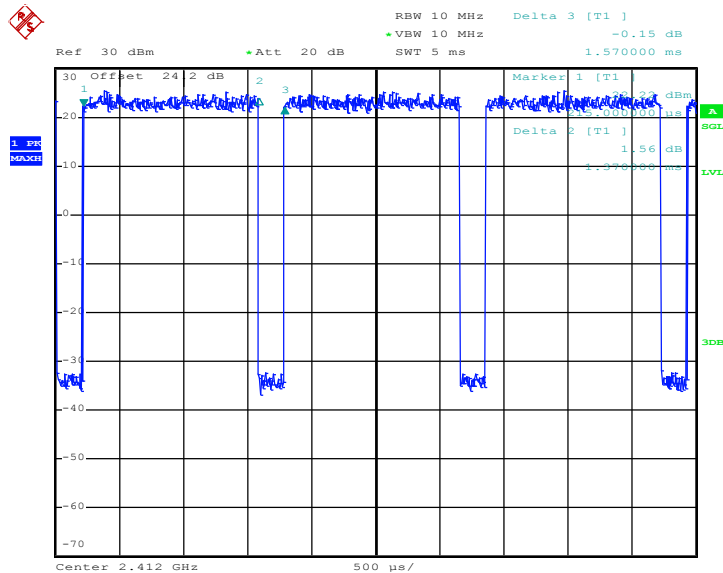
Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
2.4G 802.11b	97.16	8220	0.121654501	300Hz
2.4G 802.11g	87.26	1370	0.729927007	1kHz
2.4GHz 802.11gn HT20	85.91	1280	0.78125	1kHz

802.11b



Date: 28.FEB.2017 11:58:19

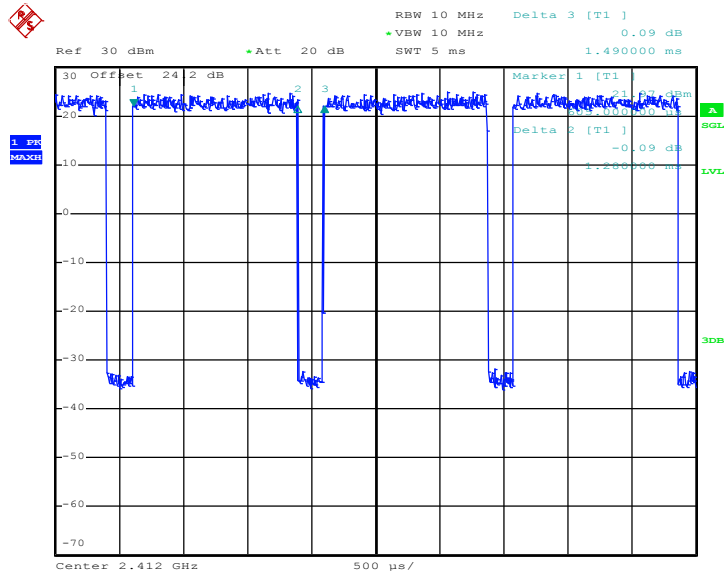
802.11g



Date: 28.FEB.2017 12:25:40



802.11n HT20



Date: 28.FEB.2017 12:50:45