



# FCC RF Test Report

**APPLICANT** : HMD Global Oy  
**EQUIPMENT** : Smart Phone  
**BRAND NAME** : Nokia  
**MODEL NAME** : TA-1046  
**FCC ID** : 2AJOTTA-1046  
**STANDARD** : FCC Part 15 Subpart C §15.247  
**CLASSIFICATION** : (DTS) Digital Transmission System

The product was received on Dec. 07, 2017 and testing was completed on Mar. 05, 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.

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Reviewed by: Joseph Lin / Supervisor

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Approved by: Jones Tsai / Manager

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FCC ID: 2AJOTTA-1046

Page Number : 1 of 36

Report Issued Date : Mar. 13, 2018

Report Version : Rev. 01

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## REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR7D0706C	Rev. 01	Initial issue of report	Mar. 13, 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 5.07 dB at 2483.920 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 13.09 dB at 0.190 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-



# **1 General Description**

## **1.1 Applicant**

**HMD Global Oy**

Karaportti 2, 02610 Espoo, Finland

## **1.2 Manufacturer**

**HMD Global Oy**

Karaportti 2, 02610 Espoo, Finland

## **1.3 Product Feature of Equipment Under Test**

GSM/WCDMA/LTE, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac, NFC, and GNSS

<b>Product specification subjective to this standard</b>	
<b>Antenna Type</b>	WWAN: PIFA Antenna WLAN: PIFA Antenna Bluetooth: PIFA Antenna NFC: Single Loop Antenna GPS/GLONASS/BDS: 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 and TW0007 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

<b>Test Site</b>	SPORTON INTERNATIONAL INC.	
<b>Test Site Location</b>	No. 52, Hwa Ya 1 <sup>st</sup> 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	
<b>Test Site No.</b>	<b>Sporton Site No.</b>	
	TH05-HY	CO05-HY

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

<b>Test Site</b>	SPORTON INTERNATIONAL INC.	
<b>Test Site Location</b>	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	
<b>Test Site No.</b>	<b>Sporton Site No.</b>	
	03CH11-HY	

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

## 1.6 Applicable Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
- ♦ ANSI C63.10-2013

### Remark:

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

## 2 Test Configuration of Equipment Under Test

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

### 2.1 Carrier Frequency and Channel

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

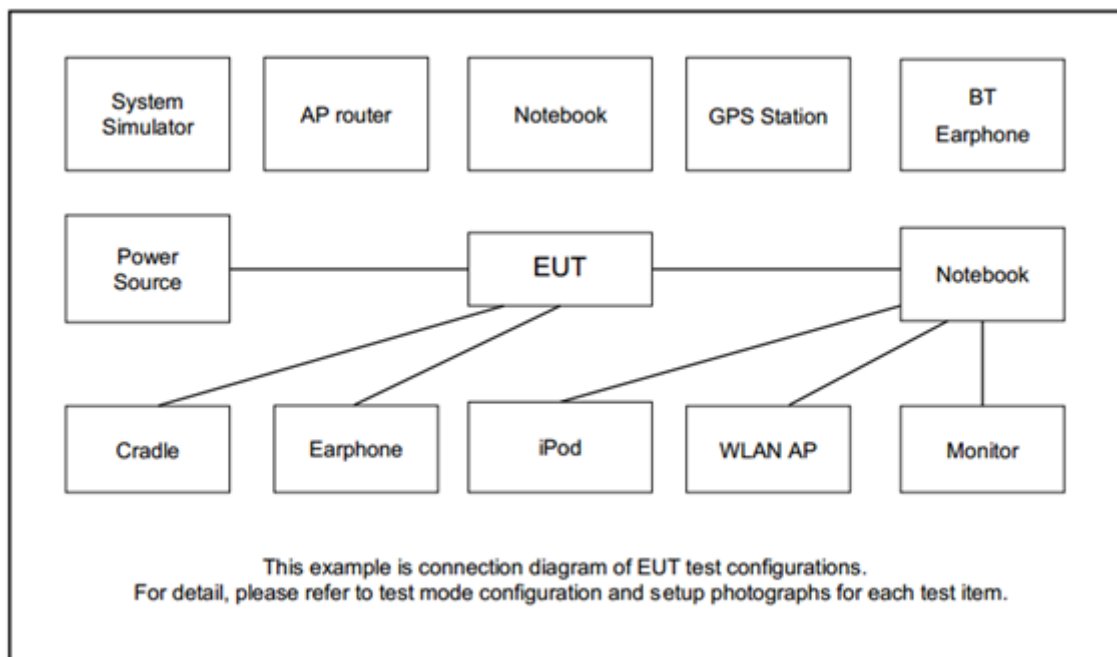
### 2.2 Test Mode

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

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

Test Cases	
AC Conducted Emission	Mode 1: LTE Band 38 Idle + Bluetooth Link + WLAN (2.4GHz) Link + Color Bar + Earphone 2 + USB Cable 1 (Charging from Adapter 3)

## 2.3 Connection Diagram of Test System



## 2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
3.	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
4.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
5.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

## 2.5 EUT Operation Test Setup

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





## 2.6 Measurement Results Explanation Example

**For all conducted test items:**

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

Example:

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

*Offset = RF cable loss + attenuator factor.*

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

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

### 3 Test Result

#### 3.1 6dB and 99% Bandwidth Measurement

##### 3.1.1 Limit of 6dB and 99% Bandwidth

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

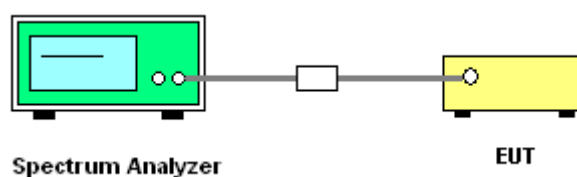
##### 3.1.2 Measuring Instruments

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

##### 3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v04.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 1MHz and set the Video bandwidth (VBW) = 3MHz.
6. Measure and record the results in the test report.

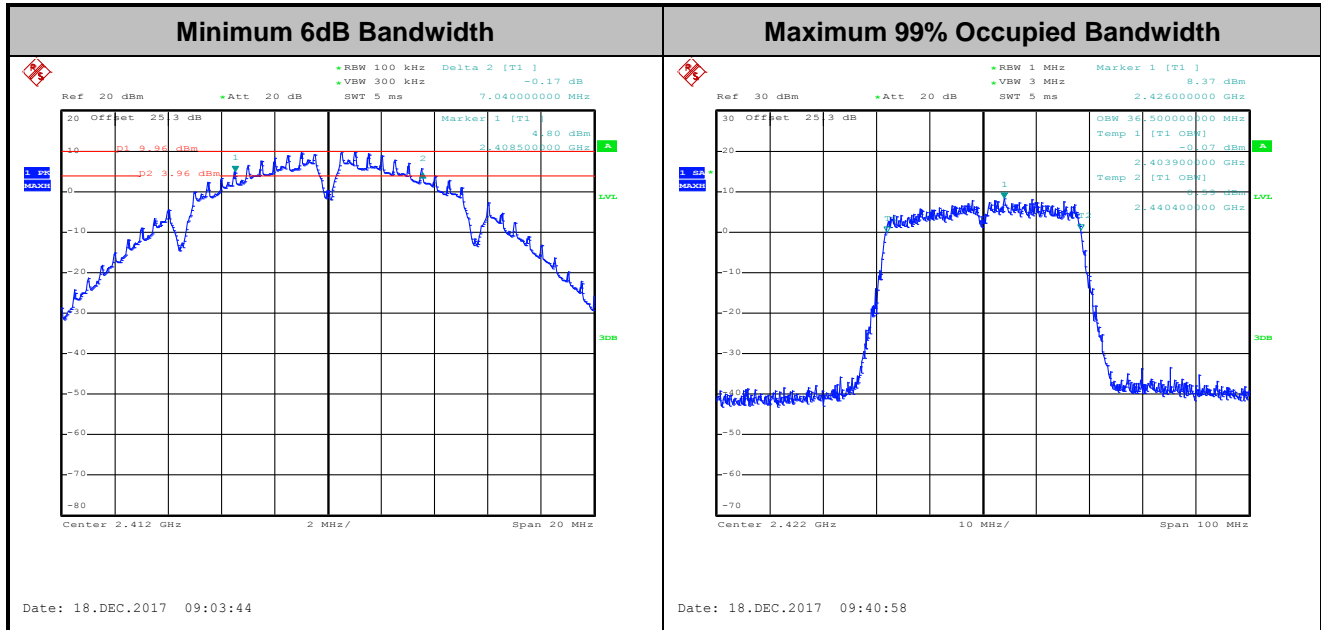
##### 3.1.4 Test Setup





### 3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.



Note : The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

## 3.2 Output Power Measurement

### 3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

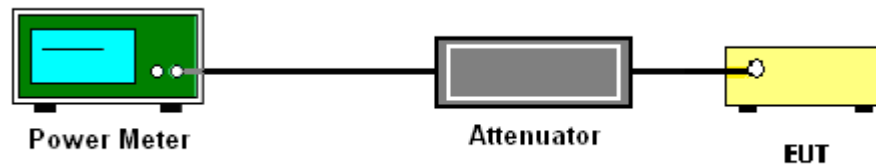
### 3.2.2 Measuring Instruments

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

### 3.2.3 Test Procedures

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

### 3.2.4 Test Setup



### 3.2.5 Test Result of Peak Output Power

Please refer to Appendix A.

### 3.2.6 Test Result of Average output Power (Reporting Only)

Please refer to Appendix A.

### 3.3 Power Spectral Density Measurement

#### 3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

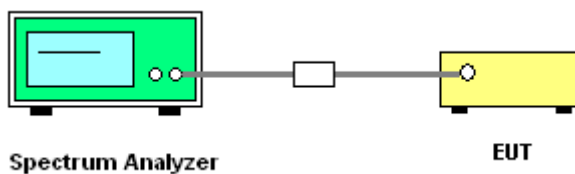
#### 3.3.2 Measuring Instruments

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

#### 3.3.3 Test Procedures

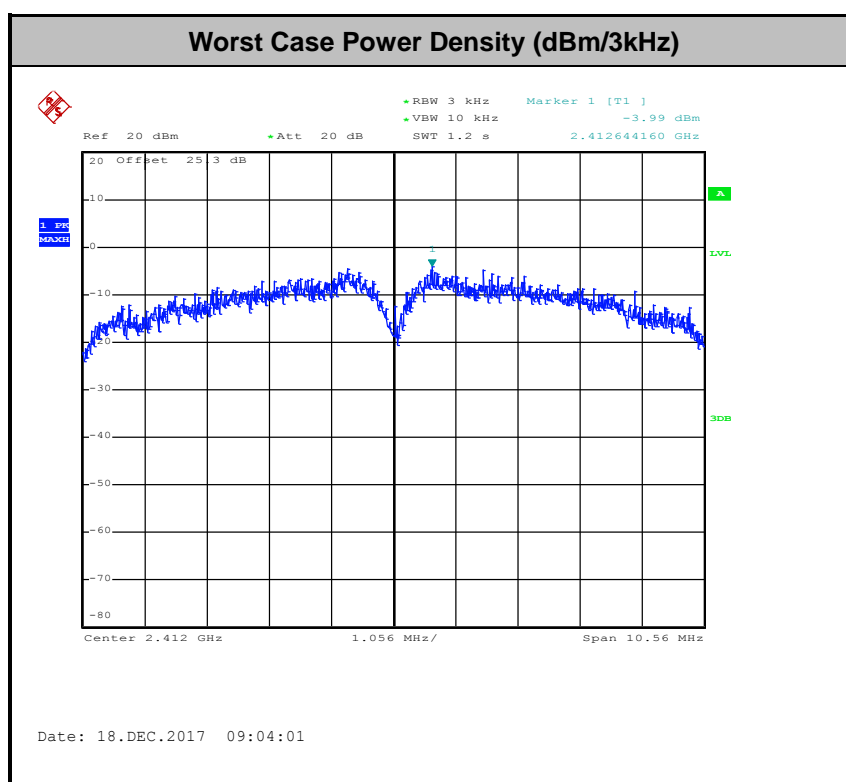
1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.

### 3.3.4 Test Setup



### 3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



## 3.4 Conducted Band Edges and Spurious Emission Measurement

### 3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

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

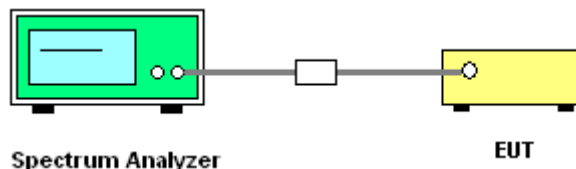
### 3.4.2 Measuring Instruments

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

### 3.4.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

### 3.4.4 Test Setup

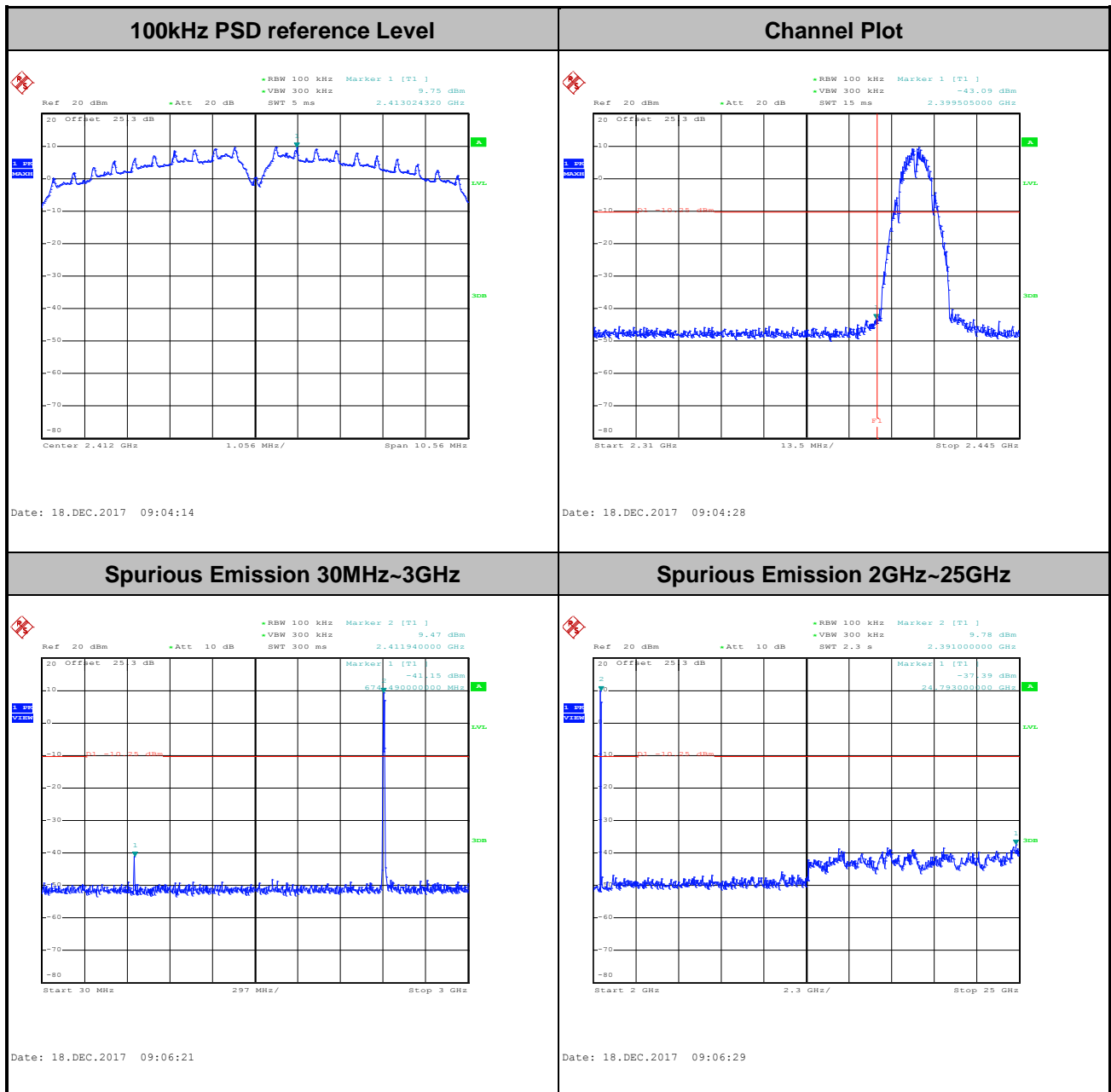




## 3.4.5 Test Result of Conducted Band Edges and Spurious Emission

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

Test Mode :	802.11b	Test Channel :	01
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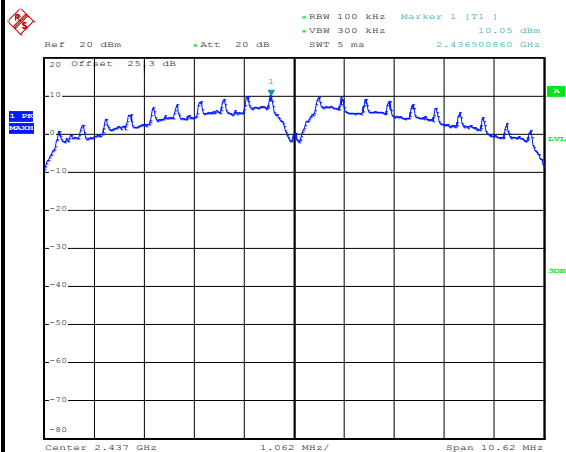






Test Mode :	802.11b	Test Channel :	06
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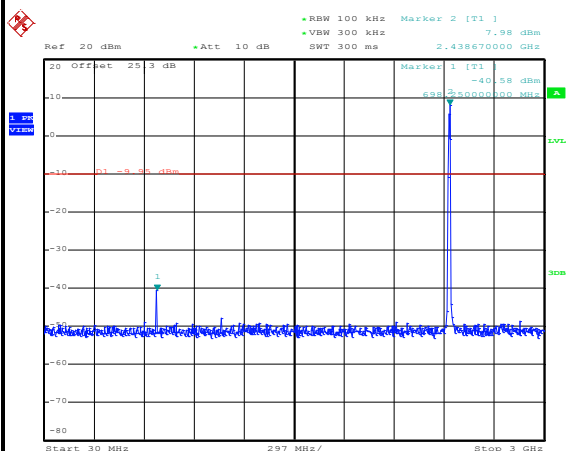
100kHz PSD reference Level



Date: 18.DEC.2017 09:09:48

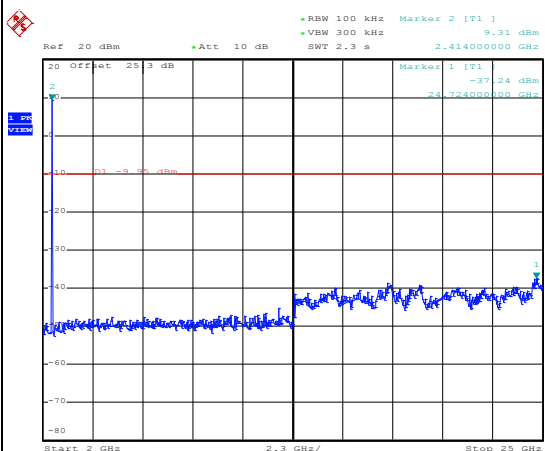
Channel Plot

Spurious Emission 30MHz~3GHz



Date: 18.DEC.2017 09:10:00

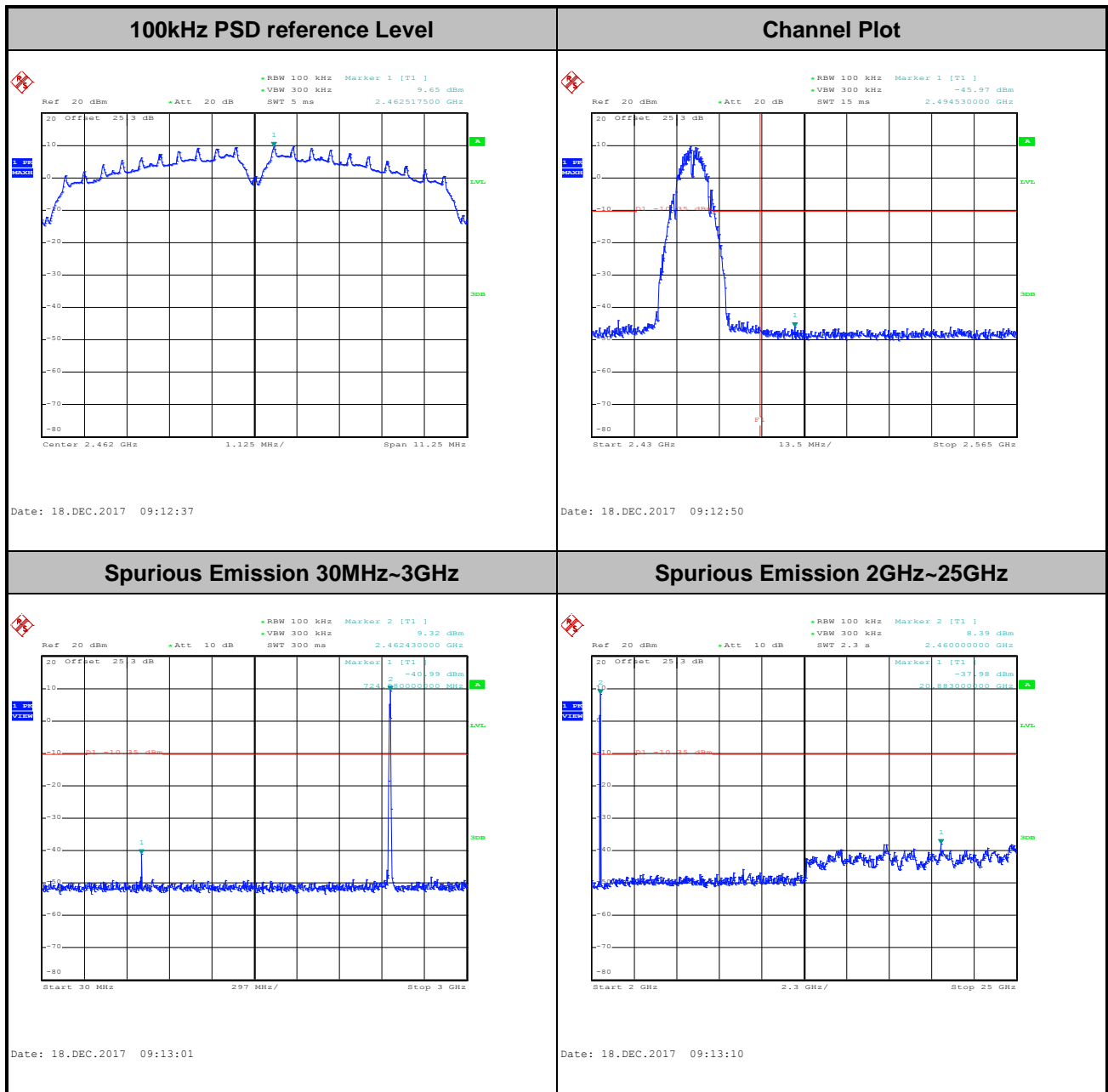
Spurious Emission 2GHz~25GHz



Date: 18.DEC.2017 09:10:08



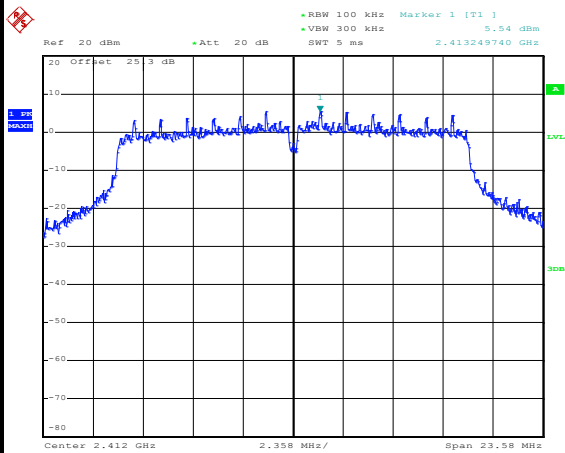
Test Mode :	802.11b	Test Channel :	11
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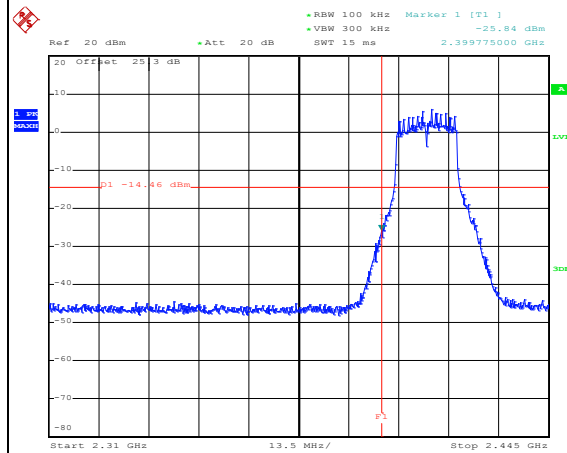
Test Mode :	802.11g	Test Channel :	01
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## 100kHz PSD reference Level



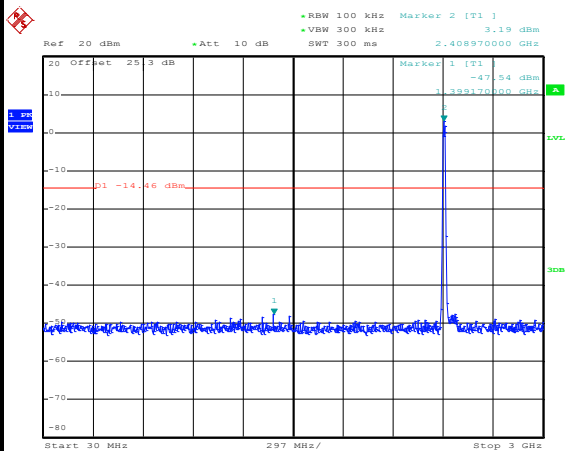
Date: 18.DEC.2017 09:15:48

## Channel Plot



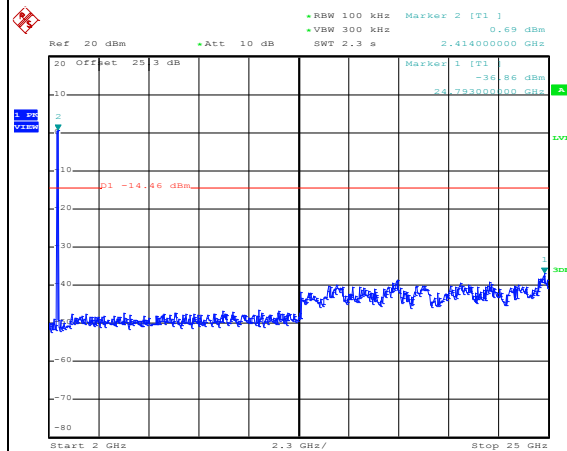
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## Spurious Emission 30MHz~3GHz

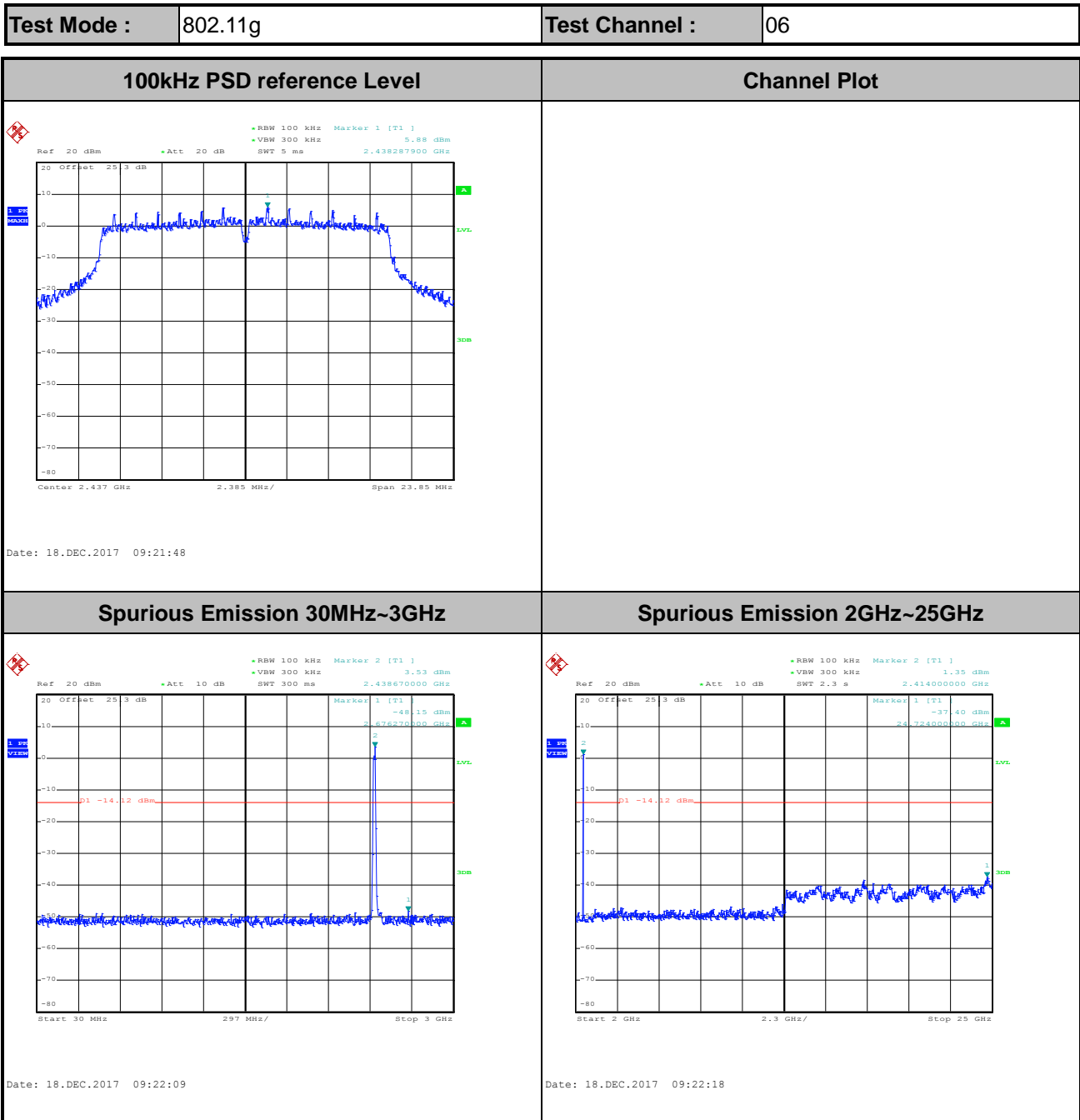


Date: 18.DEC.2017 09:17:08

## Spurious Emission 2GHz~25GHz

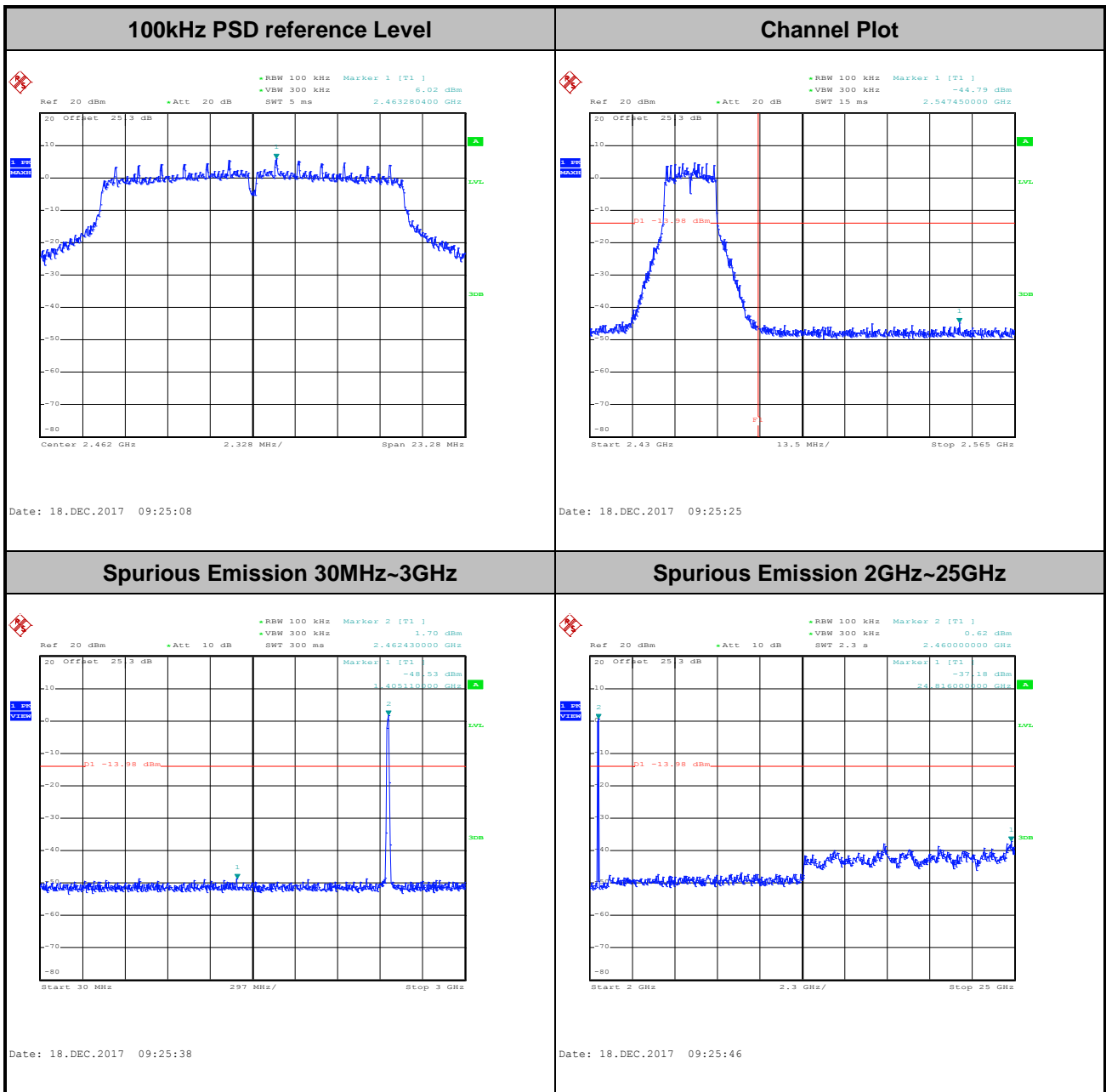


Date: 18.DEC.2017 09:17:16





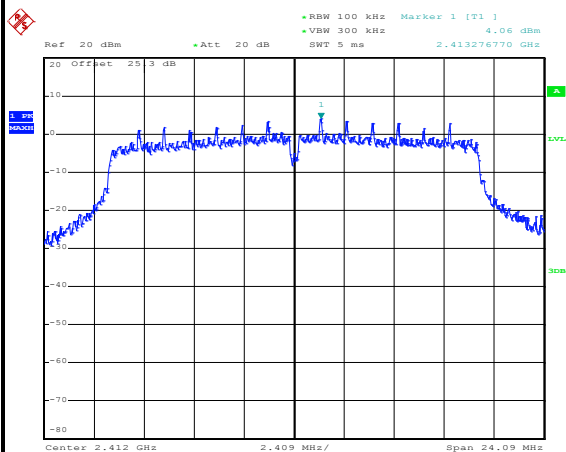
Test Mode :	802.11g	Test Channel :	11
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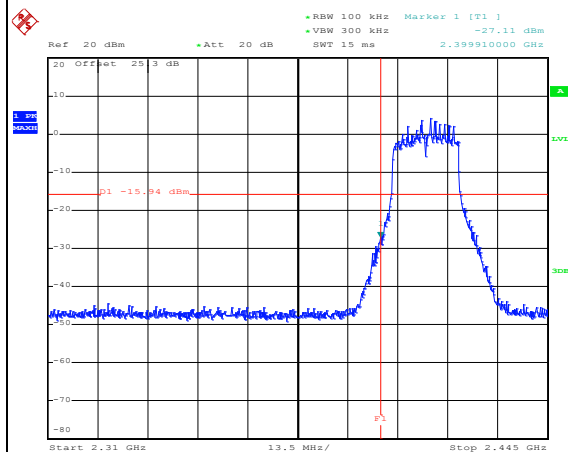
Test Mode :	802.11n HT20	Test Channel :	01
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100kHz PSD reference Level



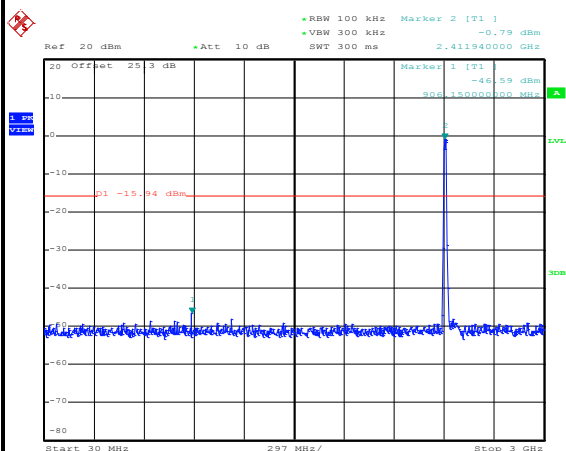
Date: 18.DEC.2017 09:27:50

Channel Plot



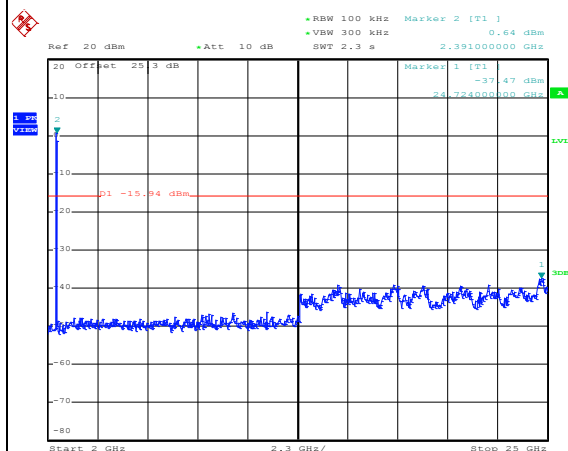
Date: 18.DEC.2017 09:28:11

Spurious Emission 30MHz~3GHz



Date: 18.DEC.2017 09:29:06

Spurious Emission 2GHz~25GHz

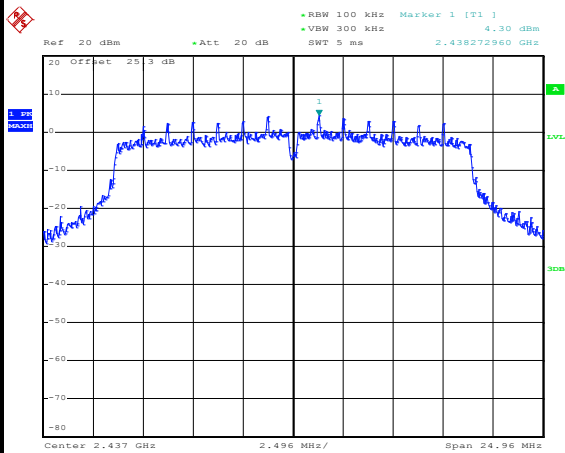


Date: 18.DEC.2017 09:29:14



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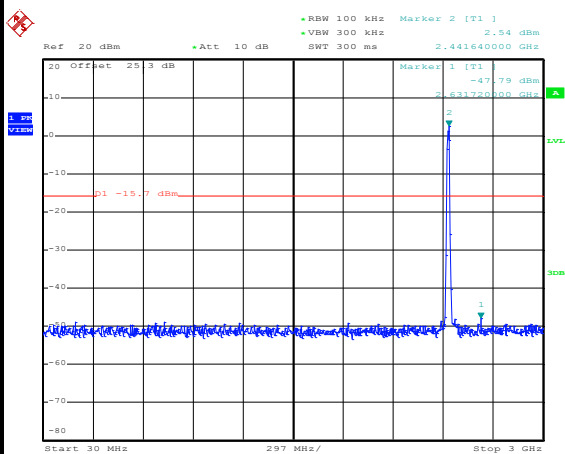
## 100kHz PSD reference Level



Date: 18.DEC.2017 09:31:43

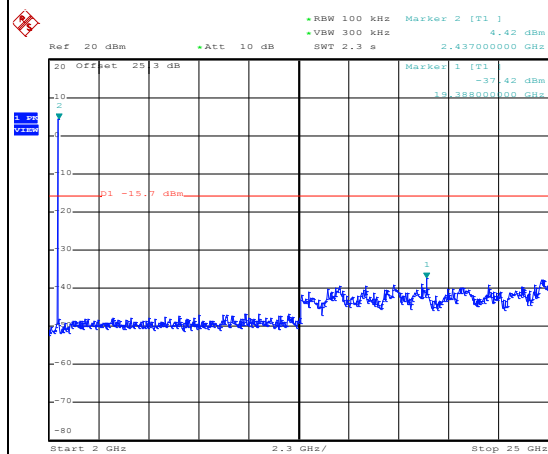
## Channel Plot

## Spurious Emission 30MHz~3GHz



Date: 18.DEC.2017 09:31:57

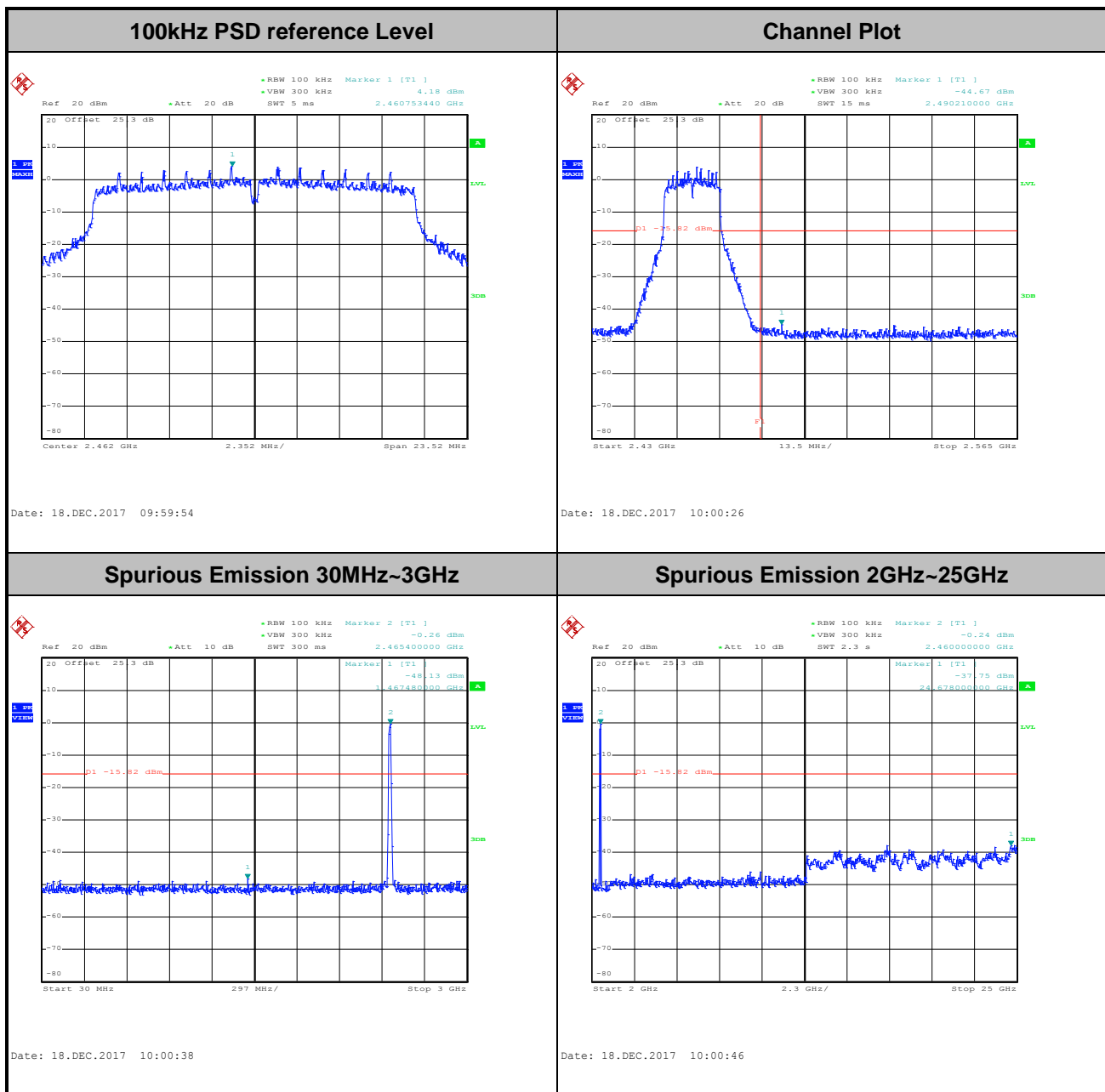
## Spurious Emission 2GHz~25GHz



Date: 18.DEC.2017 09:32:05



Test Mode :	802.11n HT20	Test Channel :	11
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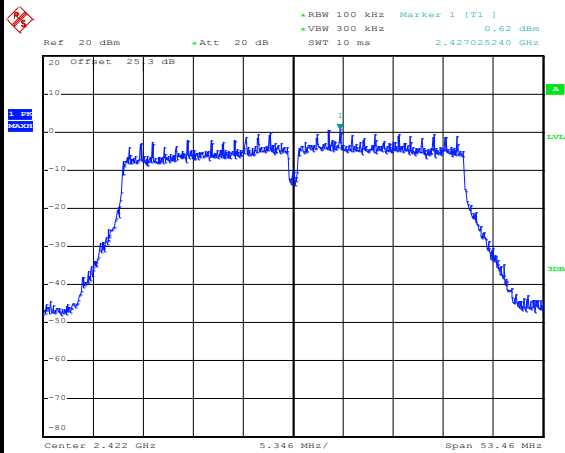




Test Mode : 802.11n HT40

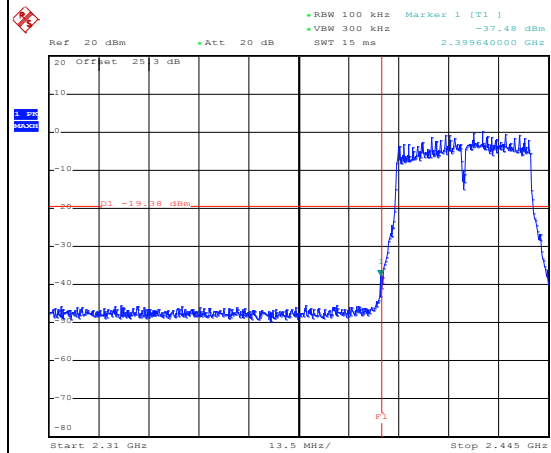
Test Channel : 03

## 100kHz PSD reference Level



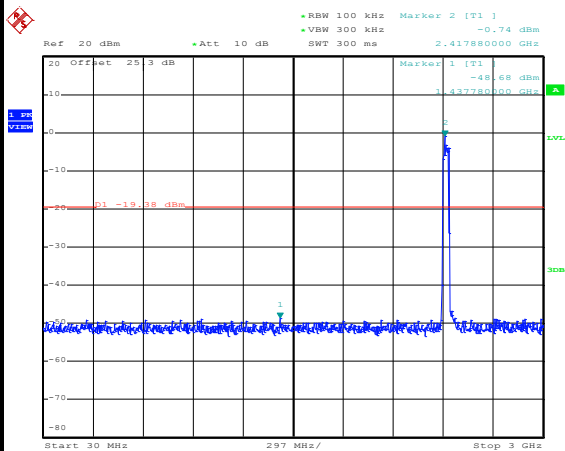
Date: 18.DEC.2017 09:40:11

## Channel Plot



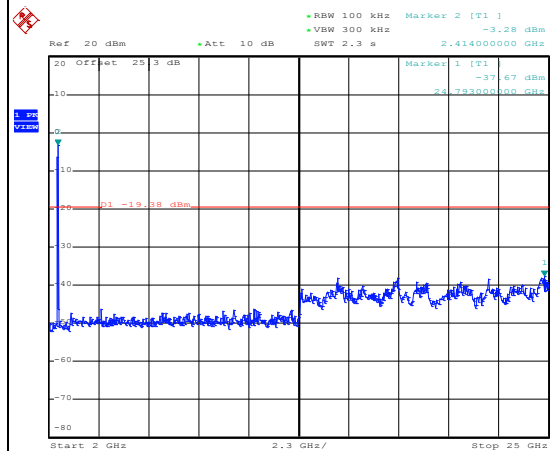
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## Spurious Emission 30MHz~3GHz

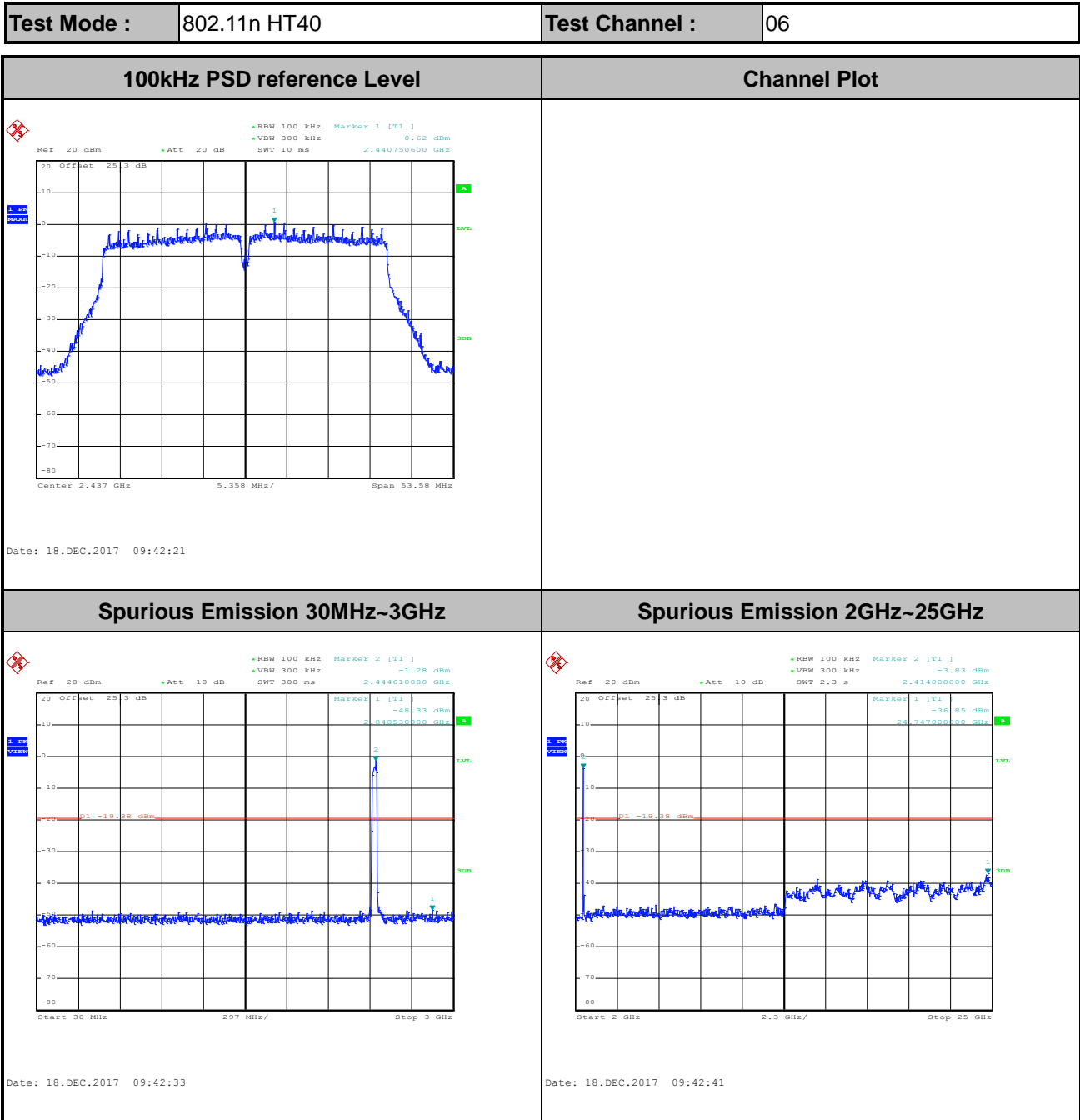


Date: 18.DEC.2017 09:40:38

## Spurious Emission 2GHz~25GHz

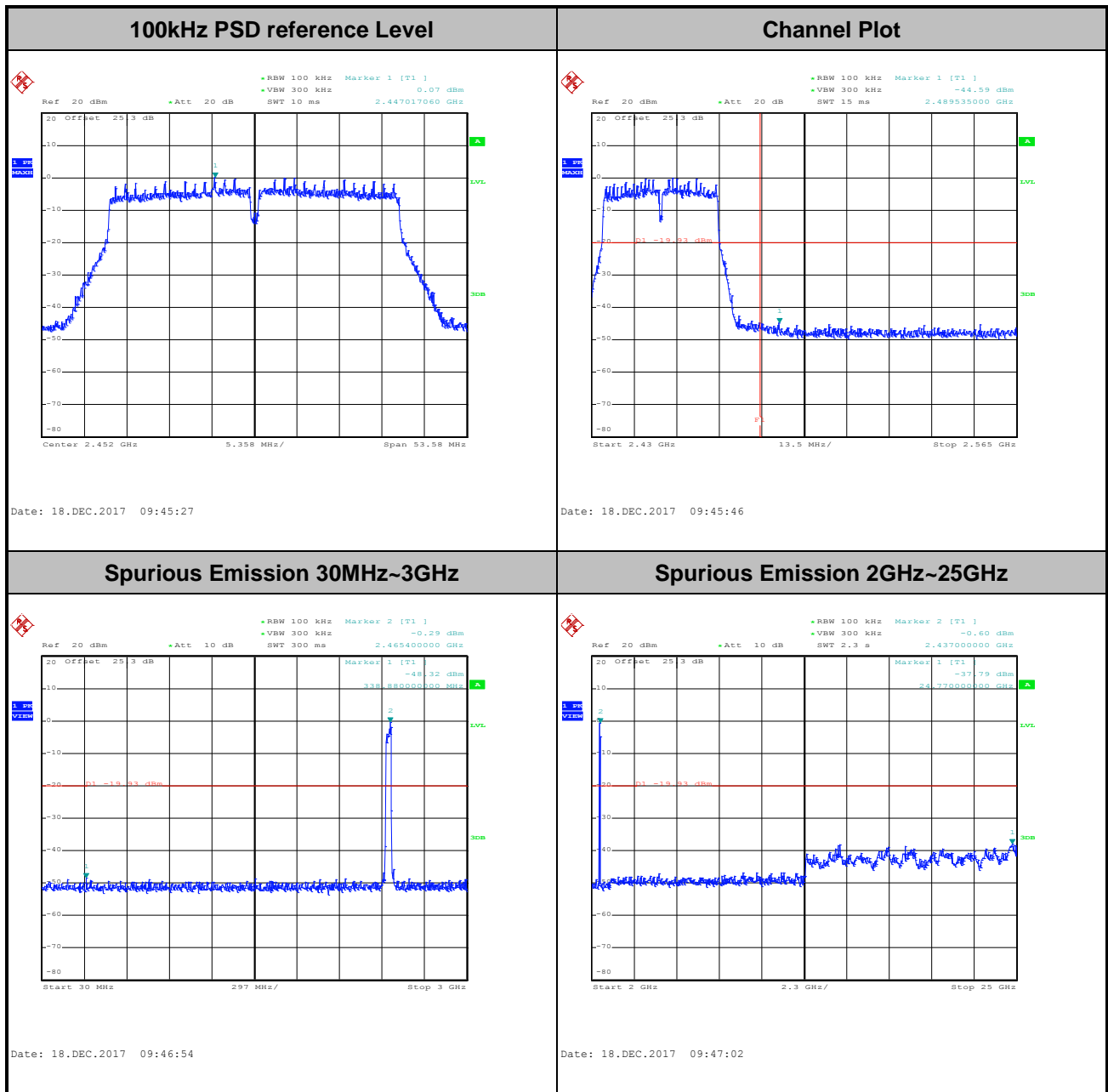


Date: 18.DEC.2017 09:40:47





Test Mode :	802.11n HT40	Test Channel :	09
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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

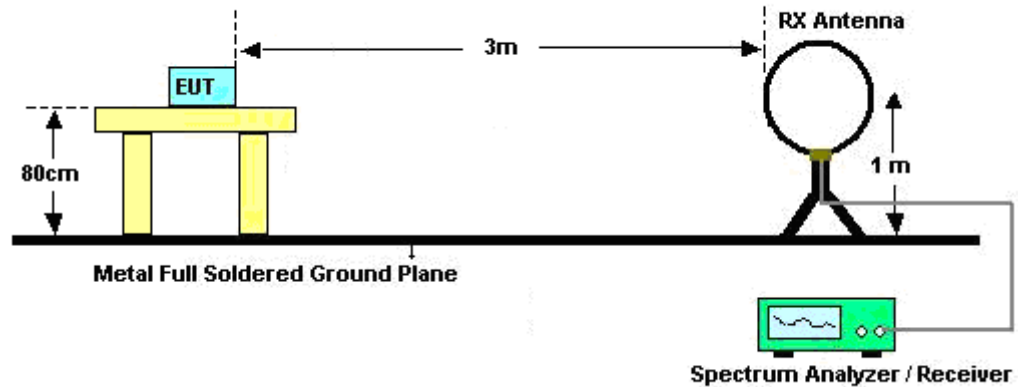
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test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

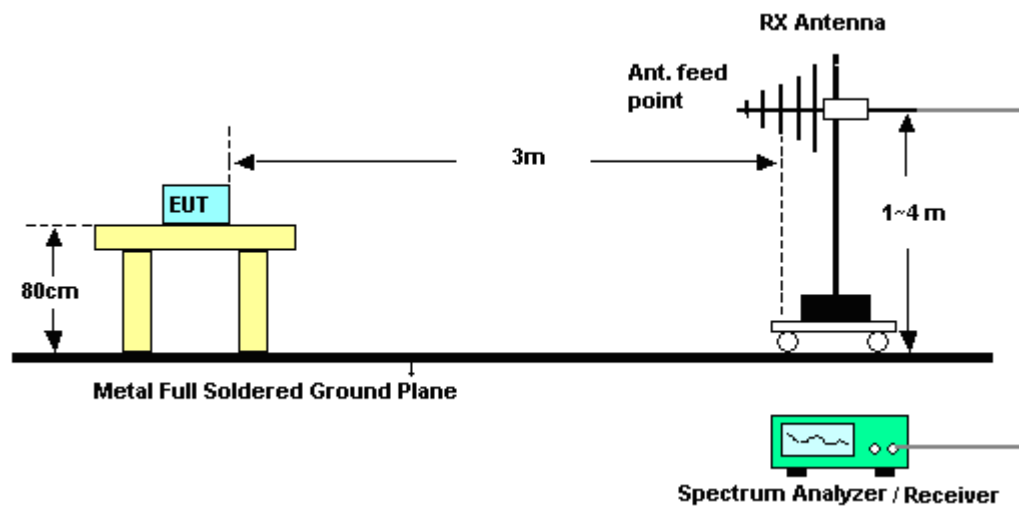
    - VBW = 10 Hz, when duty cycle is no less than 98 percent.
    - VBW  $\geq 1/T$ , when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

### 3.5.4 Test Setup

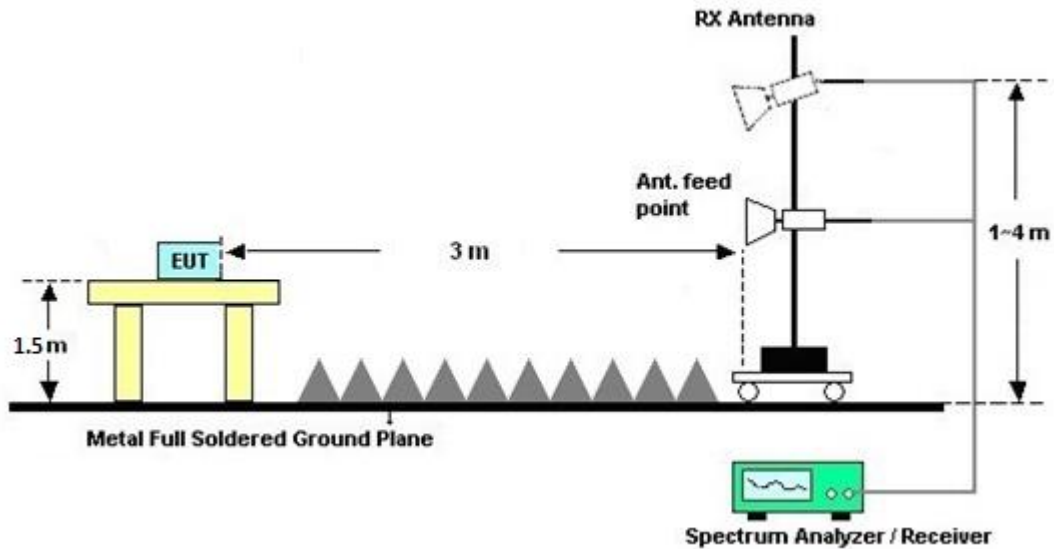
For radiated emissions below 30MHz



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 ~ 10<sup>th</sup> 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 $\mu$ 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

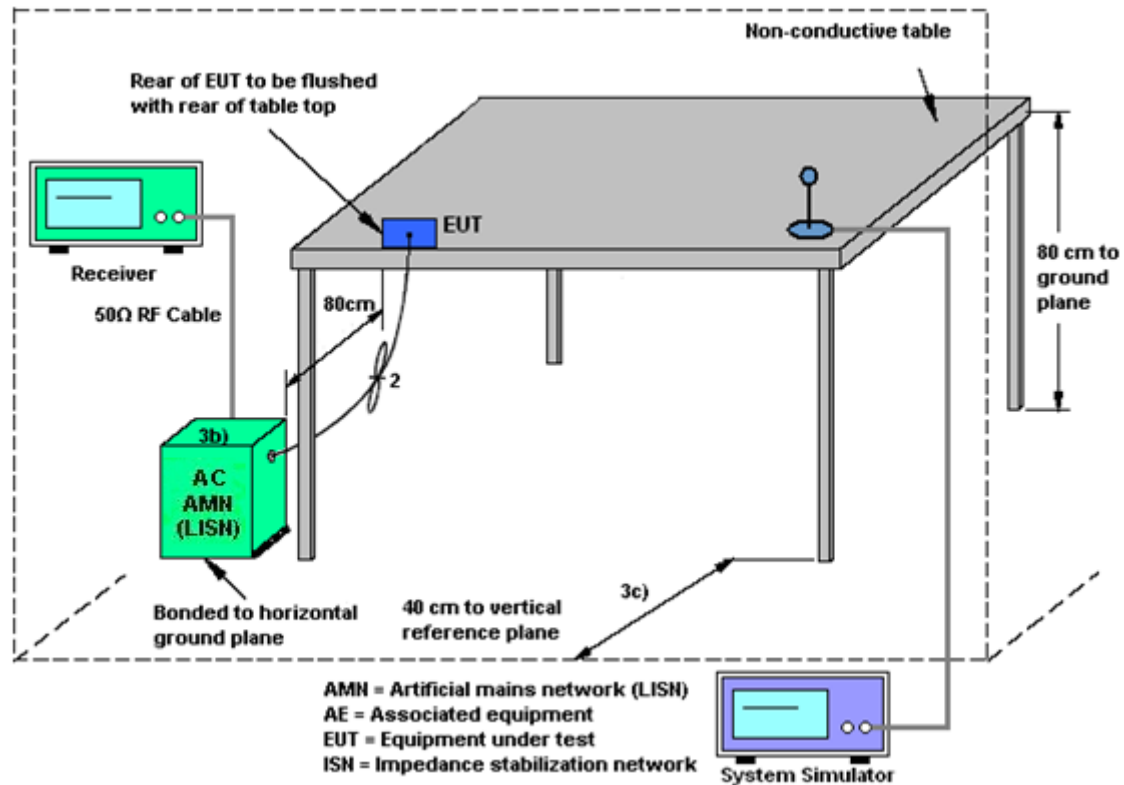
The measuring equipment is listed in the section 4 of this test report.

### 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	1240001	N/A	Sep. 07, 2017	Dec.12, 2017~ Dec.18, 2017	Sep. 06, 2018	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	1207349	300MHz~40GHz z	Sep. 07, 2017	Dec.12, 2017~ Dec.18, 2017	Sep. 06, 2018	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 20, 2017	Dec.12, 2017~ Dec.18, 2017	Jun. 19, 2018	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Mar. 05, 2018	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	3.6GHz	Dec. 08, 2017	Mar. 05, 2018	Dec. 07, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 30, 2017	Mar. 05, 2018	Nov. 29, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Dec. 08, 2017	Mar. 05, 2018	Dec. 07, 2018	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Mar. 05, 2018	N/A	Conduction (CO05-HY)
Amplifier	MITEQ	TTA1840-35- HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 18, 2017	Dec. 18, 2017~ Dec. 19, 2017	Jul. 17, 2018	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Nov. 10, 2016	Dec. 18, 2017~ Dec. 19, 2017	Nov. 09, 2018	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D&N-6-0 6	35414&AT- N0602	30MHz~1GHz	Oct. 14, 2017	Dec. 18, 2017~ Dec. 19, 2017	Oct. 13, 2018	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-132 6	1GHz ~ 18GHz	Oct. 16, 2017	Dec. 18, 2017~ Dec. 19, 2017	Oct. 15, 2018	Radiation (03CH11-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 23, 2017	Dec. 18, 2017~ Dec. 19, 2017	Nov. 22, 2019	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY532700 80	1GHz~26.5GHz	Nov. 10, 2016	Dec. 18, 2017~ Dec. 19, 2017	Nov. 09, 2018	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY542004 86	10Hz ~ 44GHz	Oct. 19, 2017	Dec. 18, 2017~ Dec. 19, 2017	Oct. 18, 2018	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500- B	N/A	1~4m	N/A	Dec. 18, 2017~ Dec. 19, 2017	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	Dec. 18, 2017~ Dec. 19, 2017	N/A	Radiation (03CH11-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800	2025787	1GHZ~18GHZ	Feb. 13, 2017	Dec. 18, 2017~ Dec. 19, 2017	Feb. 12, 2018	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 584	18GHz- 40GHz	Nov. 27, 2017	Dec. 18, 2017~ Dec. 19, 2017	Nov. 26, 2018	Radiation (03CH11-HY)



## 5 Uncertainty of Evaluation

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

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

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

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

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

Test Engineer:	Shiming Liu / Allen Lin	Temperature:	21~25	°C
Test Date:	2017/12/12~2017/12/18	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	12.60	7.04	0.50	Pass
11b	1Mbps	1	6	2437	12.65	7.08	0.50	Pass
11b	1Mbps	1	11	2462	12.60	7.50	0.50	Pass
11g	6Mbps	1	1	2412	17.60	15.72	0.50	Pass
11g	6Mbps	1	6	2437	17.50	15.90	0.50	Pass
11g	6Mbps	1	11	2462	17.55	15.52	0.50	Pass
HT20	MCS0	1	1	2412	18.70	16.06	0.50	Pass
HT20	MCS0	1	6	2437	18.60	16.64	0.50	Pass
HT20	MCS0	1	11	2462	18.55	15.68	0.50	Pass
HT40	MCS0	1	3	2422	36.50	35.64	0.50	Pass
HT40	MCS0	1	6	2437	36.50	35.72	0.50	Pass
HT40	MCS0	1	9	2452	36.50	35.72	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	20.72	30.00	-2.00	18.72	36.00	Pass
11b	1Mbps	1	6	2437	20.85	30.00	-2.00	18.85	36.00	Pass
11b	1Mbps	1	11	2462	20.43	30.00	-2.00	18.43	36.00	Pass
11g	6Mbps	1	1	2412	20.35	30.00	-2.00	18.35	36.00	Pass
11g	6Mbps	1	6	2437	20.52	30.00	-2.00	18.52	36.00	Pass
11g	6Mbps	1	11	2462	20.22	30.00	-2.00	18.22	36.00	Pass
HT20	MCS0	1	1	2412	18.50	30.00	-2.00	16.50	36.00	Pass
HT20	MCS0	1	6	2437	18.64	30.00	-2.00	16.64	36.00	Pass
HT20	MCS0	1	11	2462	18.76	30.00	-2.00	16.76	36.00	Pass
HT40	MCS0	1	3	2422	20.10	30.00	-2.00	18.10	36.00	Pass
HT40	MCS0	1	6	2437	20.20	30.00	-2.00	18.20	36.00	Pass
HT40	MCS0	1	9	2452	20.04	30.00	-2.00	18.04	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	0.00	17.90
11b	1Mbps	1	6	2437	0.00	17.95
11b	1Mbps	1	11	2462	0.00	17.60
11g	6Mbps	1	1	2412	0.23	15.73
11g	6Mbps	1	6	2437	0.23	15.93
11g	6Mbps	1	11	2462	0.23	15.66
HT20	MCS0	1	1	2412	0.25	13.75
HT20	MCS0	1	6	2437	0.25	13.90
HT20	MCS0	1	11	2462	0.25	13.97
HT40	MCS0	1	3	2422	0.46	13.81
HT40	MCS0	1	6	2437	0.46	13.98
HT40	MCS0	1	9	2452	0.46	13.76



**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	-3.99	-2.00	8.00	Pass
11b	1Mbps	1	6	2437	-4.53	-2.00	8.00	Pass
11b	1Mbps	1	11	2462	-4.22	-2.00	8.00	Pass
11g	6Mbps	1	1	2412	-9.57	-2.00	8.00	Pass
11g	6Mbps	1	6	2437	-8.87	-2.00	8.00	Pass
11g	6Mbps	1	11	2462	-10.66	-2.00	8.00	Pass
HT20	MCS0	1	1	2412	-11.67	-2.00	8.00	Pass
HT20	MCS0	1	6	2437	-10.97	-2.00	8.00	Pass
HT20	MCS0	1	11	2462	-11.45	-2.00	8.00	Pass
HT40	MCS0	1	3	2422	-14.91	-2.00	8.00	Pass
HT40	MCS0	1	6	2437	-15.23	-2.00	8.00	Pass
HT40	MCS0	1	9	2452	-14.63	-2.00	8.00	Pass



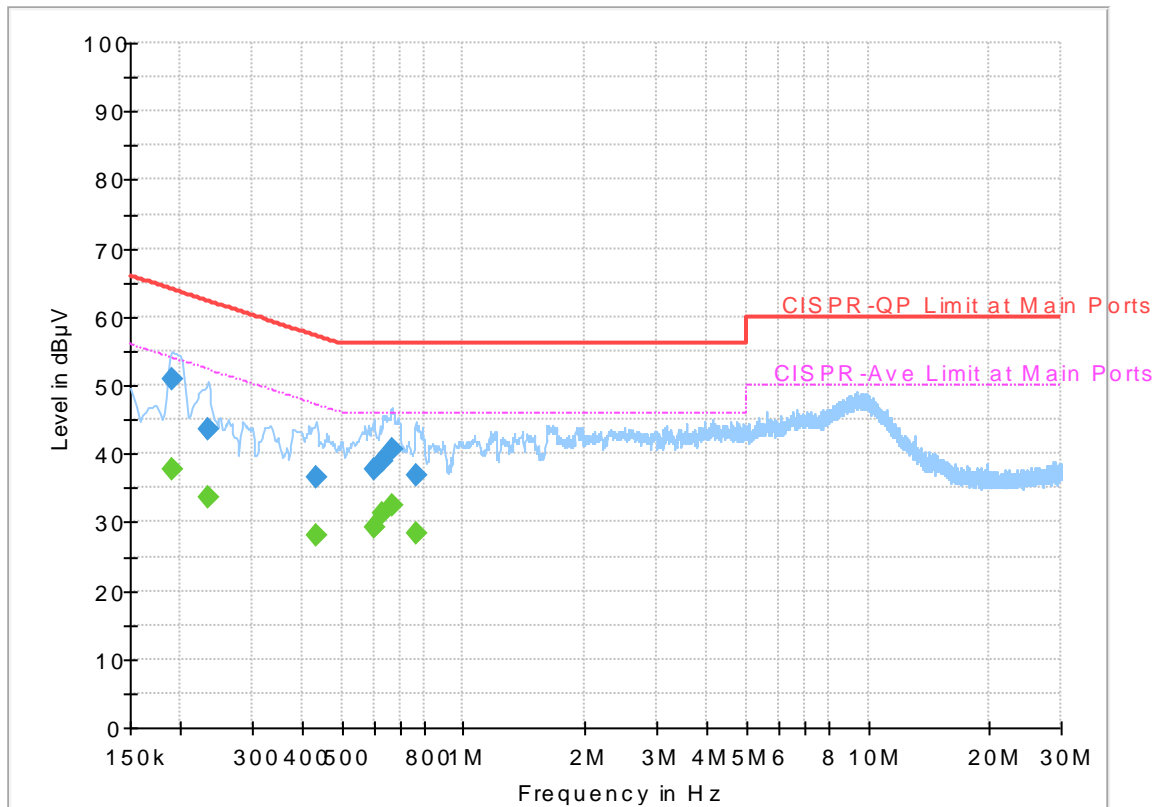
## **Appendix B. AC Conducted Emission Test Results**

<b>Test Engineer :</b>	Shareef Yu	<b>Temperature :</b>	21~23°C
		<b>Relative Humidity :</b>	53~56%

## EUT Information

Report NO : 7D0706  
Test Mode : Mode 1  
Test Voltage : 120Vac/60Hz  
Phase : Line

Full Spectrum



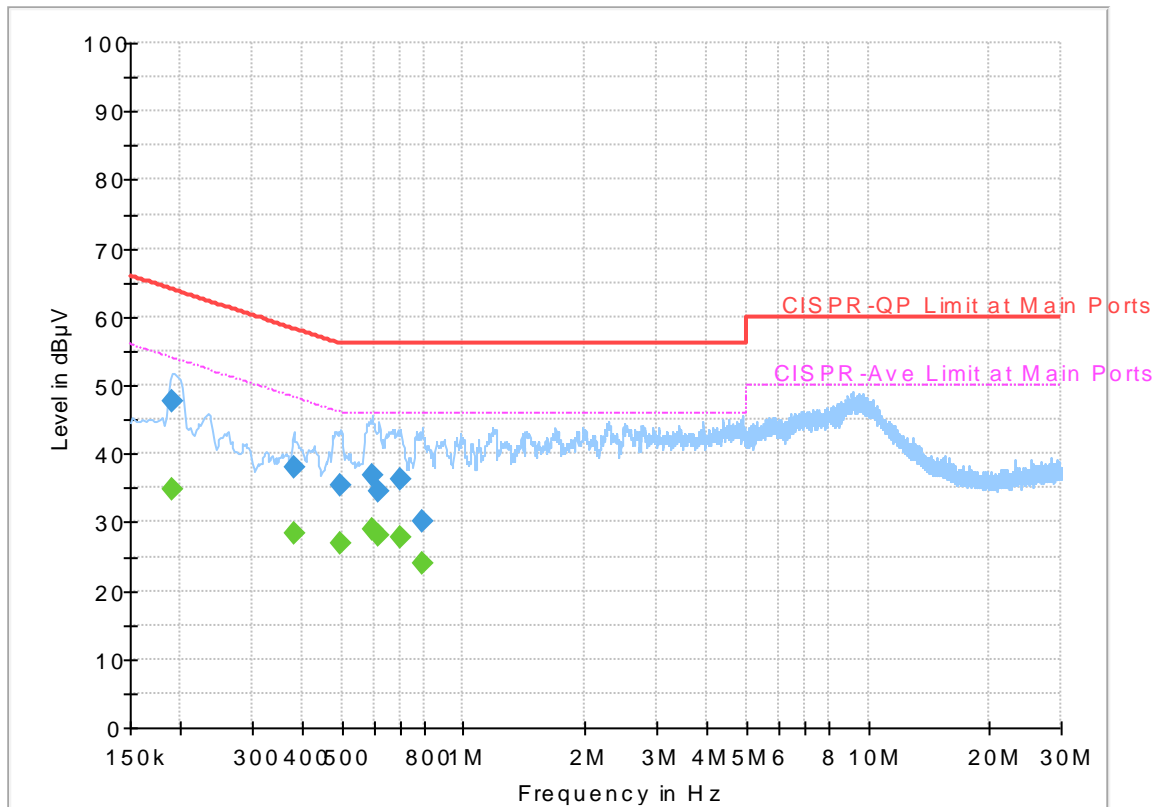
## Final\_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.190500	---	37.82	54.02	16.20	L1	OFF	19.5
0.190500	50.93	---	64.02	13.09	L1	OFF	19.5
0.233250	---	33.50	52.33	18.83	L1	OFF	19.5
0.233250	43.58	---	62.33	18.75	L1	OFF	19.5
0.431250	---	28.16	47.23	19.07	L1	OFF	19.5
0.431250	36.47	---	57.23	20.76	L1	OFF	19.5
0.600000	---	29.21	46.00	16.79	L1	OFF	19.5
0.600000	37.72	---	56.00	18.28	L1	OFF	19.5
0.633750	---	31.24	46.00	14.76	L1	OFF	19.5
0.633750	38.96	---	56.00	17.04	L1	OFF	19.5
0.665250	---	32.50	46.00	13.50	L1	OFF	19.5
0.665250	40.66	---	56.00	15.34	L1	OFF	19.5
0.762000	---	28.48	46.00	17.52	L1	OFF	19.5
0.762000	36.98	---	56.00	19.02	L1	OFF	19.5

## EUT Information

Report NO : 7D0706  
Test Mode : Mode 1  
Test Voltage : 120Vac/60Hz  
Phase : Neutral

Full Spectrum



## Final\_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.190500	---	34.74	54.02	19.28	N	OFF	19.5
0.190500	47.67	---	64.02	16.35	N	OFF	19.5
0.381750	---	28.23	48.24	20.01	N	OFF	19.5
0.381750	37.89	---	58.24	20.35	N	OFF	19.5
0.498750	---	26.89	46.02	19.13	N	OFF	19.5
0.498750	35.28	---	56.02	20.74	N	OFF	19.5
0.595500	---	29.07	46.00	16.93	N	OFF	19.5
0.595500	36.89	---	56.00	19.11	N	OFF	19.5
0.618000	---	27.94	46.00	18.06	N	OFF	19.5
0.618000	34.48	---	56.00	21.52	N	OFF	19.5
0.696750	---	27.71	46.00	18.29	N	OFF	19.5
0.696750	36.31	---	56.00	19.69	N	OFF	19.5
0.791250	---	23.93	46.00	22.07	N	OFF	19.5
0.791250	30.12	---	56.00	25.88	N	OFF	19.5



## Appendix C. Radiated Spurious Emission

Test Engineer :	Hao Hsu, Jacky Hung, and Lance Chiang	Temperature :	26~28℃
		Relative Humidity :	52~57%

### 2.4GHz 2400~2483.5MHz

#### WIFI 802.11b (Band Edge @ 3m)

WIFI	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		2389.905	53.95	-20.05	74	44.12	27.13	6.36	33.59	100	64	P	H
		2390	42.24	-11.76	54	32.41	27.13	6.36	33.59	100	64	A	H
	*	2412	109.62	-	-	99.73	27.18	6.37	33.59	100	64	P	H
	*	2412	106.59	-	-	96.7	27.18	6.37	33.59	100	64	A	H
													H
													H
		2368.695	52.42	-21.58	74	42.71	27.09	6.29	33.6	400	89	P	V
		2390	41.77	-12.23	54	31.94	27.13	6.36	33.59	400	89	A	V
	*	2412	107.96	-	-	98.07	27.18	6.37	33.59	400	89	P	V
	*	2412	104.9	-	-	95.01	27.18	6.37	33.59	400	89	A	V
													V
													V
802.11b CH 06 2437MHz		2360.24	51.7	-22.3	74	42.04	27.04	6.29	33.6	100	64	P	H
		2389.52	41.3	-12.7	54	31.48	27.13	6.36	33.6	100	64	A	H
	*	2437	109.55	-	-	99.56	27.27	6.38	33.59	100	64	P	H
	*	2437	106.39	-	-	96.4	27.27	6.38	33.59	100	64	A	H
		2488.24	52.71	-21.29	74	42.57	27.4	6.39	33.58	100	64	P	H
		2485.04	42.55	-11.45	54	32.45	27.36	6.39	33.58	100	64	A	H
		2354	52.7	-21.3	74	43.11	27.04	6.22	33.6	391	91	P	V
		2389.52	41.15	-12.85	54	31.33	27.13	6.36	33.6	391	91	A	V
	*	2437	108.4	-	-	98.41	27.27	6.38	33.59	391	91	P	V
	*	2437	105.22	-	-	95.23	27.27	6.38	33.59	391	91	A	V
		2483.52	52.91	-21.09	74	42.82	27.36	6.38	33.58	391	91	P	V
		2485.44	42.05	-11.95	54	31.95	27.36	6.39	33.58	391	91	A	V



<b>802.11b</b> <b>CH 11</b> <b>2462MHz</b>	*	2462	109.61	-	-	99.57	27.31	6.38	33.58	100	64	P	H
	*	2462	106.42	-	-	96.38	27.31	6.38	33.58	100	64	A	H
		2488.96	56.25	-17.75	74	46.11	27.4	6.39	33.58	100	64	P	H
		2483.52	45.02	-8.98	54	34.93	27.36	6.38	33.58	100	64	A	H
													H
													H
	*	2462	107.58	-	-	97.54	27.31	6.38	33.58	386	89	P	V
	*	2462	104.46	-	-	94.42	27.31	6.38	33.58	386	89	A	V
		2488.64	54.26	-19.74	74	44.12	27.4	6.39	33.58	386	89	P	V
		2483.52	43.92	-10.08	54	33.83	27.36	6.38	33.58	386	89	A	V
													V
													V
<b>Remark</b>	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	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	42.39	-31.61	74	65.82	31.29	9.59	64.74	100	0	P	H
													H
													H
													H
		4824	43.41	-30.59	74	66.84	31.29	9.59	64.74	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4874	43.35	-30.65	74	66.68	31.38	9.56	64.7	100	0	P	H
		7311	42.04	-31.96	74	58.81	36.28	11.31	64.82	100	0	P	H
													H
													H
		4874	45.97	-28.03	74	69.3	31.38	9.56	64.7	100	0	P	V
		7311	42.58	-31.42	74	59.35	36.28	11.31	64.82	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4924	41.75	-32.25	74	64.94	31.48	9.55	64.66	100	0	P	H
		7386	41.66	-32.34	74	58.37	36.47	11.3	64.86	100	0	P	H
													H
													H
		4924	44.08	-29.92	74	67.27	31.48	9.55	64.66	100	0	P	V
		7386	41.88	-32.12	74	58.59	36.47	11.3	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	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 )
<b>802.11g CH 01 2412MHz</b>		2389.59	54.66	-19.34	74	44.84	27.13	6.36	33.6	100	61	P	H
		2390	44.34	-9.66	54	34.51	27.13	6.36	33.59	100	61	A	H
	*	2412	109.17	-	-	99.28	27.18	6.37	33.59	100	61	P	H
	*	2412	100.87	-	-	90.98	27.18	6.37	33.59	100	61	A	H
													H
													H
		2386.86	52.6	-21.4	74	42.78	27.13	6.36	33.6	400	87	P	V
		2390	43.28	-10.72	54	33.45	27.13	6.36	33.59	400	87	A	V
	*	2412	107.55	-	-	97.66	27.18	6.37	33.59	400	87	P	V
	*	2412	99.16	-	-	89.27	27.18	6.37	33.59	400	87	A	V
													V
													V
<b>802.11g CH 06 2437MHz</b>		2390	53.53	-20.47	74	43.7	27.13	6.36	33.59	123	62	P	H
		2389.04	42.69	-11.31	54	32.87	27.13	6.36	33.6	123	62	A	H
	*	2437	108.84	-	-	98.85	27.27	6.38	33.59	123	62	P	H
	*	2437	100.91	-	-	90.92	27.27	6.38	33.59	123	62	A	H
		2486.08	61.77	-12.23	74	51.67	27.36	6.39	33.58	123	62	P	H
		2484.72	45.58	-8.42	54	35.48	27.36	6.39	33.58	123	62	A	H
		2356.24	52.36	-21.64	74	42.7	27.04	6.29	33.6	393	86	P	V
		2389.84	42.1	-11.9	54	32.27	27.13	6.36	33.59	393	86	A	V
	*	2437	108.27	-	-	98.28	27.27	6.38	33.59	393	86	P	V
	*	2437	99.87	-	-	89.88	27.27	6.38	33.59	393	86	A	V
		2486.16	59.23	-14.77	74	49.13	27.36	6.39	33.58	393	86	P	V
		2485.36	44.62	-9.38	54	34.52	27.36	6.39	33.58	393	86	A	V





<b>802.11g CH 11 2462MHz</b>	*	2462	109.22	-	-	99.18	27.31	6.38	33.58	100	65	P	H
	*	2462	101.29	-	-	91.25	27.31	6.38	33.58	100	65	A	H
		2485.48	63.22	-10.78	74	53.12	27.36	6.39	33.58	100	65	P	H
		2483.6	47.45	-6.55	54	37.36	27.36	6.38	33.58	100	65	A	H
													H
													H
	*	2462	106.77	-	-	96.73	27.31	6.38	33.58	382	83	P	V
	*	2462	99.29	-	-	89.25	27.31	6.38	33.58	382	83	A	V
		2485.12	61.14	-12.86	74	51.04	27.36	6.39	33.58	382	83	P	V
		2483.8	46.22	-7.78	54	36.13	27.36	6.38	33.58	382	83	A	V
													V
													V
<b>Remark</b>	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	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	38.85	-35.15	74	62.28	31.29	9.59	64.74	100	0	P	H
													H
													H
													H
		4824	39.82	-34.18	74	63.25	31.29	9.59	64.74	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4874	39.46	-34.54	74	62.79	31.38	9.56	64.7	100	0	P	H
		7311	41.66	-32.34	74	58.43	36.28	11.31	64.82	100	0	P	H
													H
													H
		4874	40.1	-33.9	74	63.43	31.38	9.56	64.7	100	0	P	V
		7311	42.16	-31.84	74	58.93	36.28	11.31	64.82	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4924	40.12	-33.88	74	63.31	31.48	9.55	64.66	100	0	P	H
		7386	42.05	-31.95	74	58.76	36.47	11.3	64.86	100	0	P	H
													H
													H
		4924	40.55	-33.45	74	63.74	31.48	9.55	64.66	100	0	P	V
		7386	42.31	-31.69	74	59.02	36.47	11.3	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	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		2388.96	53.88	-20.12	74	44.06	27.13	6.36	33.6	100	61	P	H
		2389.905	44.66	-9.34	54	34.83	27.13	6.36	33.59	100	61	A	H
	*	2412	107.89	-	-	98	27.18	6.37	33.59	100	61	P	H
	*	2412	99.39	-	-	89.5	27.18	6.37	33.59	100	61	A	H
													H
													H
		2389.695	52.39	-21.61	74	42.57	27.13	6.36	33.6	400	89	P	V
		2389.8	43.72	-10.28	54	33.89	27.13	6.36	33.59	400	89	A	V
	*	2412	105.68	-	-	95.79	27.18	6.37	33.59	400	89	P	V
	*	2412	97.39	-	-	87.5	27.18	6.37	33.59	400	89	A	V
													V
													V
802.11n HT20 CH 06 2437MHz		2375.76	52.76	-21.24	74	43.05	27.09	6.29	33.6	116	63	P	H
		2387.6	42.34	-11.66	54	32.52	27.13	6.36	33.6	116	63	A	H
	*	2437	108.15	-	-	98.16	27.27	6.38	33.59	116	63	P	H
	*	2437	99.43	-	-	89.44	27.27	6.38	33.59	116	63	A	H
		2483.76	57.08	-16.92	74	46.99	27.36	6.38	33.58	116	63	P	H
		2483.92	44.43	-9.57	54	34.34	27.36	6.38	33.58	116	63	A	H
		2386.32	52.77	-21.23	74	42.95	27.13	6.36	33.6	392	89	P	V
		2387.44	42.12	-11.88	54	32.3	27.13	6.36	33.6	392	89	A	V
	*	2437	105.69	-	-	95.7	27.27	6.38	33.59	392	89	P	V
	*	2437	97.91	-	-	87.92	27.27	6.38	33.59	392	89	A	V
		2487.52	54.98	-19.02	74	44.84	27.4	6.39	33.58	392	89	P	V
		2484.32	43.31	-10.69	54	33.21	27.36	6.39	33.58	392	89	A	V



<b>802.11n</b> <b>HT20</b> <b>CH 11</b> <b>2462MHz</b>	*	2462	106.38	-	-	96.34	27.31	6.38	33.58	100	68	P	H
	*	2462	98.93	-	-	88.89	27.31	6.38	33.58	100	68	A	H
		2489.48	62.58	-11.42	74	52.44	27.4	6.39	33.58	100	68	P	H
		2484	46.43	-7.57	54	36.34	27.36	6.38	33.58	100	68	A	H
													H
													H
	*	2462	104.93	-	-	94.89	27.31	6.38	33.58	385	84	P	V
	*	2462	97.11	-	-	87.07	27.31	6.38	33.58	385	84	A	V
		2486.4	59.1	-14.9	74	49	27.36	6.39	33.58	385	84	P	V
		2483.52	45.42	-8.58	54	35.33	27.36	6.38	33.58	385	84	A	V
													V
													V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



## 2.4GHz 2400~2483.5MHz

## WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	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 HT40 CH 03 2422MHz		2389.8	53.59	-20.41	74	43.76	27.13	6.36	33.59	115	65	P	H
		2389.95	44.11	-9.89	54	34.28	27.13	6.36	33.59	115	65	A	H
	*	2422	103.98	-	-	94.05	27.22	6.37	33.59	115	65	P	H
	*	2422	95.56	-	-	85.63	27.22	6.37	33.59	115	65	A	H
		2483.76	59.88	-14.12	74	49.79	27.36	6.38	33.58	115	65	P	H
		2485.92	45.78	-8.22	54	35.68	27.36	6.39	33.58	115	65	A	H
		2389.95	52.17	-21.83	74	42.34	27.13	6.36	33.59	391	86	P	V
		2389.5	43.37	-10.63	54	33.55	27.13	6.36	33.6	391	86	A	V
	*	2422	102.39	-	-	92.46	27.22	6.37	33.59	391	86	P	V
	*	2422	94.21	-	-	84.28	27.22	6.37	33.59	391	86	A	V
		2483.52	57.52	-16.48	74	47.43	27.36	6.38	33.58	391	86	P	V
		2485.2	44.45	-9.55	54	34.35	27.36	6.39	33.58	391	86	A	V
802.11n HT40 CH 06 2437MHz		2383.8	52.58	-21.42	74	42.8	27.09	6.36	33.6	119	67	P	H
		2389.65	42.88	-11.12	54	33.06	27.13	6.36	33.6	119	67	A	H
	*	2437	104.78	-	-	94.79	27.27	6.38	33.59	119	67	P	H
	*	2437	96.52	-	-	86.53	27.27	6.38	33.59	119	67	A	H
		2483.6	58.59	-15.41	74	48.5	27.36	6.38	33.58	119	67	P	H
		2483.52	45.24	-8.76	54	35.15	27.36	6.38	33.58	119	67	A	H
		2376	51.53	-22.47	74	41.82	27.09	6.29	33.6	394	86	P	V
		2388.45	42.66	-11.34	54	32.84	27.13	6.36	33.6	394	86	A	V
	*	2437	102.44	-	-	92.45	27.27	6.38	33.59	394	86	P	V
	*	2437	94.87	-	-	84.88	27.27	6.38	33.59	394	86	A	V
		2487.44	55.45	-18.55	74	45.35	27.36	6.39	33.58	394	86	P	V
		2485.92	43.83	-10.17	54	33.73	27.36	6.39	33.58	394	86	A	V



<b>802.11n</b> <b>HT40</b> <b>CH 09</b> <b>2452MHz</b>		2347.35	52.78	-21.22	74	43.23	27	6.22	33.6	100	64	P	H
		2388.6	42.79	-11.21	54	32.97	27.13	6.36	33.6	100	64	A	H
	*	2452	103.75	-	-	93.75	27.27	6.38	33.58	100	64	P	H
	*	2452	96.15	-	-	86.15	27.27	6.38	33.58	100	64	A	H
		2484.72	59.82	-14.18	74	49.72	27.36	6.39	33.58	100	64	P	H
		2483.92	48.93	-5.07	54	38.84	27.36	6.38	33.58	100	64	A	H
		2385.15	51.75	-22.25	74	41.97	27.09	6.36	33.6	393	88	P	V
		2389.5	43.1	-10.9	54	33.28	27.13	6.36	33.6	393	88	A	V
	*	2452	101.27	-	-	91.27	27.27	6.38	33.58	393	88	P	V
	*	2452	93.75	-	-	83.75	27.27	6.38	33.58	393	88	A	V
		2485.92	57.56	-16.44	74	47.46	27.36	6.39	33.58	393	88	P	V
		2483.92	46.63	-7.37	54	36.54	27.36	6.38	33.58	393	88	A	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**Emission below 1GHz**  
**2.4GHz WIFI 802.11n HT40 (LF)**

WIFI	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 )
<b>2.4GHz 802.11n HT40 LF</b>		31.62	21.61	-18.39	40	29.93	23.33	0.82	32.49	-	-	P	H
		147.45	17.33	-26.17	43.5	30.93	17.15	1.61	32.44	-	-	P	H
		264.09	20.17	-25.83	46	30.79	19.59	2.09	32.38	-	-	P	H
		505.8	24.67	-21.33	46	30.12	24.04	2.84	32.38	-	-	P	H
		729.1	30.43	-15.57	46	31.7	27.59	3.4	32.39	-	-	P	H
		941.2	32.88	-13.12	46	29.76	30.41	3.82	31.28	100	0	P	H
													H
													H
													H
													H
													H
													H
		48.9	25.97	-14.03	40	42.47	14.96	1.02	32.49	-	-	P	V
		122.88	20.82	-22.68	43.5	34.22	17.51	1.51	32.46	-	-	P	V
		261.93	19.11	-26.89	46	29.62	19.7	2.09	32.38	-	-	P	V
		486.2	23.96	-22.04	46	29.61	23.83	2.84	32.37	-	-	P	V
		647.2	27.95	-18.05	46	30.58	26.52	3.2	32.46	-	-	P	V
		861.4	32.01	-13.99	46	30.64	29.41	3.67	31.86	100	0	P	V
													V
													V
													V
													V
													V
													V
													V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against limit line.												



**Note symbol**

*	<b>Fundamental Frequency</b> which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is <b>over limit</b> line.
P/A	<b>P</b> eak or <b>A</b> verage
H/V	<b>H</b> orizontal or <b>V</b> 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

<b>Test Engineer :</b>	Hao Hsu, Jacky Hung, and Lance Chiang	<b>Temperature :</b>	26~28℃
		<b>Relative Humidity :</b>	52~57%

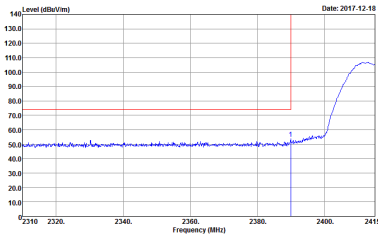
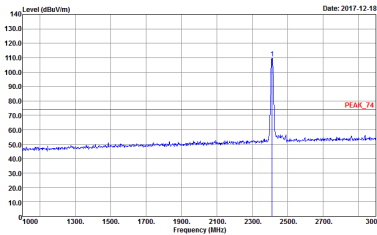
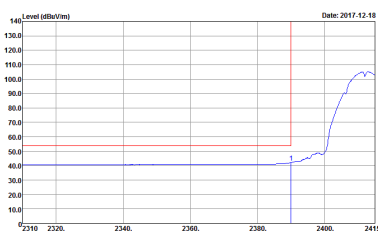
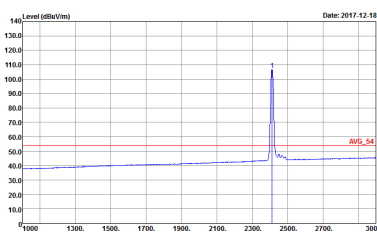
### Note symbol

-L	Low channel location
-R	High channel location

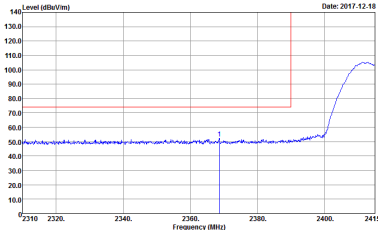
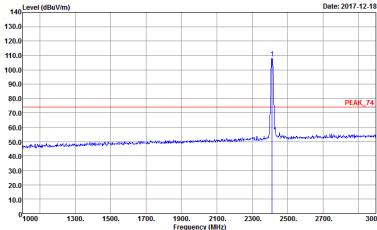
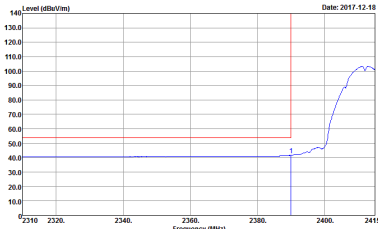
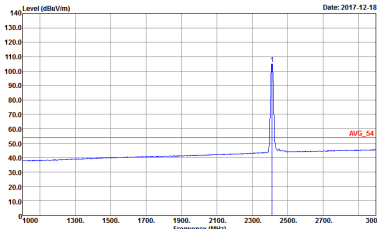


2.4GHz 2400~2483.5MHz

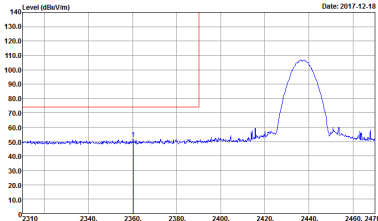
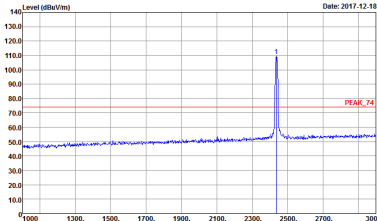
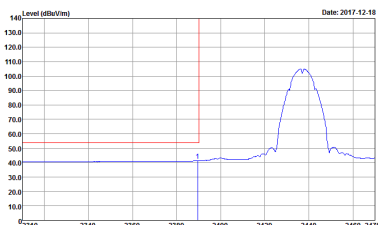
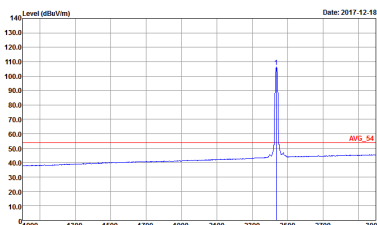
WIFI 802.11b (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11b CH01 2412MHz	
	Horizontal	Fundamental
Peak	 <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	 <p>Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>

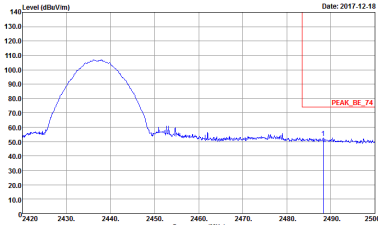
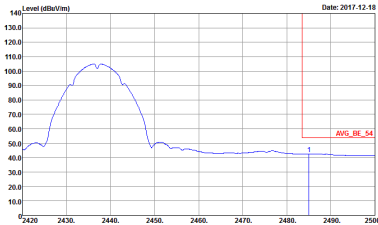


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11b CH01 2412MHz	
	Vertical	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p></div>

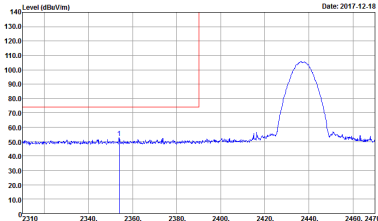
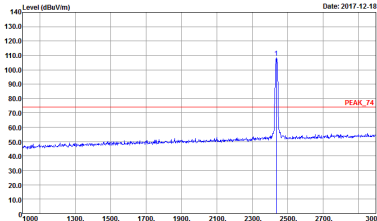
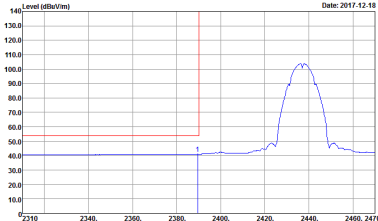
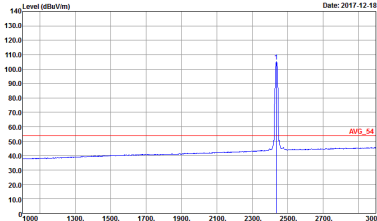


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11b CH06 2437MHz - L	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p></div>

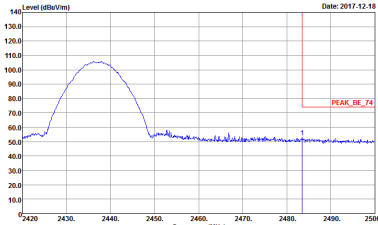
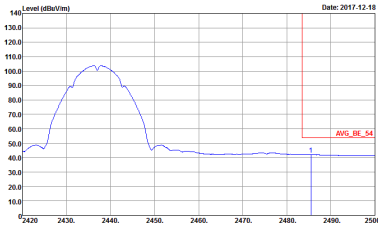


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11b CH06 2437MHz - R	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	Left blank
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	Left blank



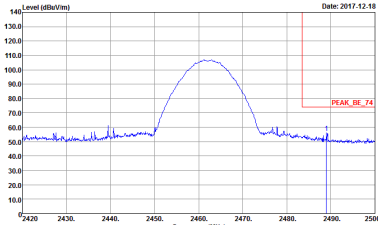
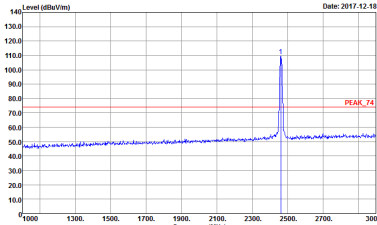
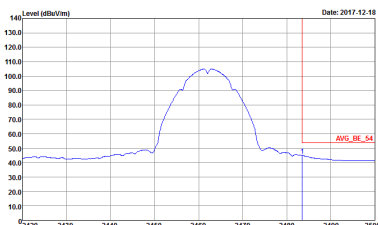
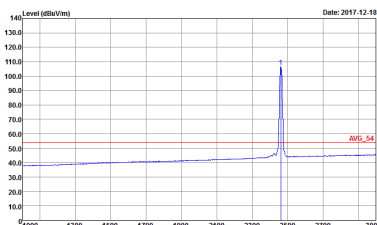
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11b CH06 2437MHz - L	
	Vertical	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p></div>



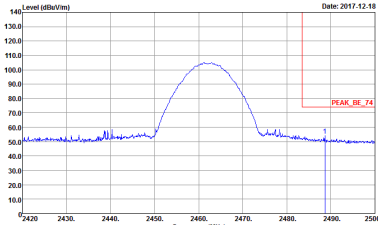
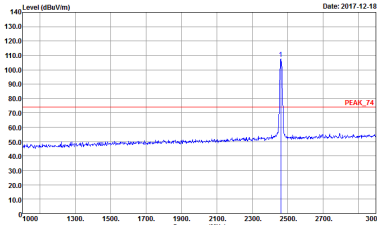
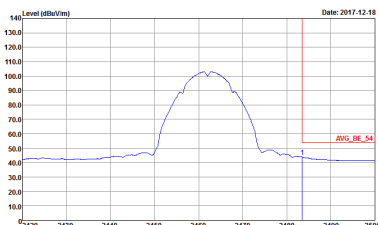
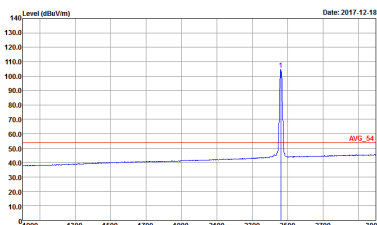
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11b CH06 2437MHz - R	
	Vertical	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	Left blank
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	Left blank





WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11b CH11 2462MHz	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site : 03CH11-HY Condition : AV6_BE_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : AV6_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p></div>

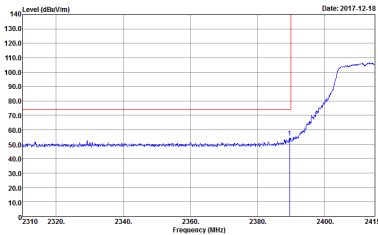
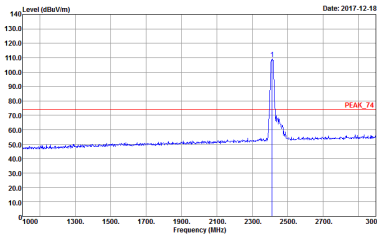
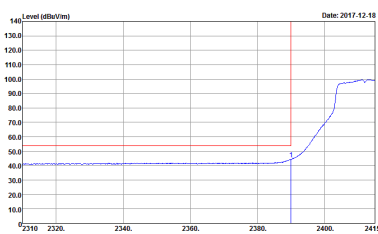
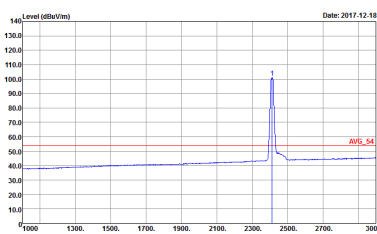


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11b CH11 2462MHz	
	Vertical	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p></div>



2.4GHz 2400~2483.5MHz

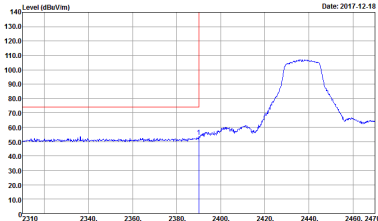
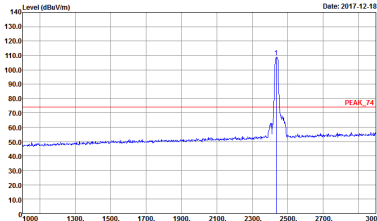
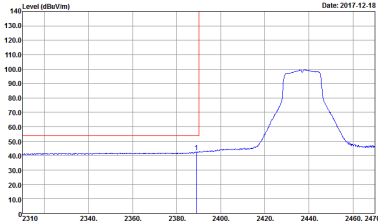
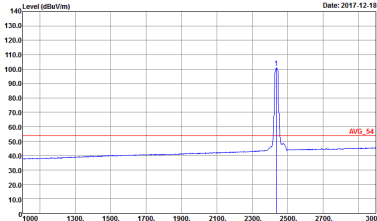
WIFI 802.11g (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11g CH01 2412MHz	
	Horizontal	Fundamental
Peak	 <p>Site Condition : 03CH11-HY : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site Condition : 03CH11-HY : PEAK_74 3m HORN 91200-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Site Condition : 03CH11-HY : AVG_BE_54 3m HORN 91200-HF HORIZONTAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto</p>	 <p>Site Condition : 03CH11-HY : AVG_54 3m HORN 91200-HF HORIZONTAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto</p>

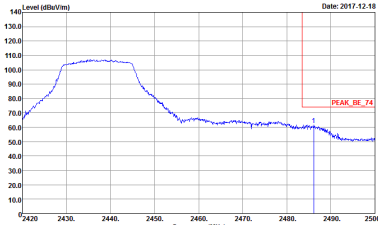
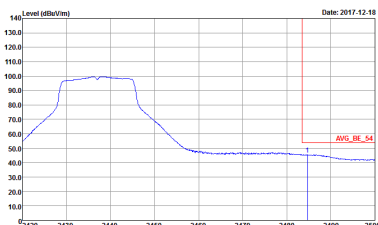


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11g CH01 2412MHz	
	Vertical	Fundamental
Peak	<p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	<p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p>	<p>Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p>

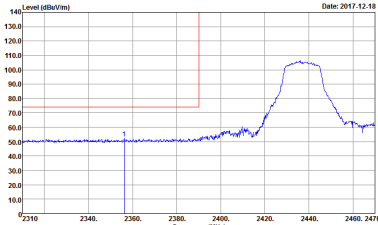
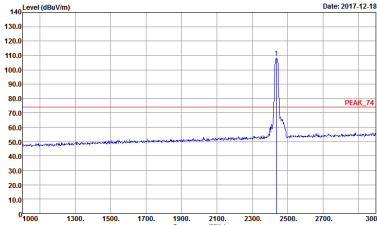
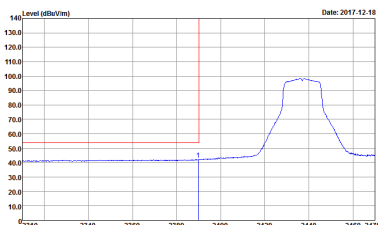
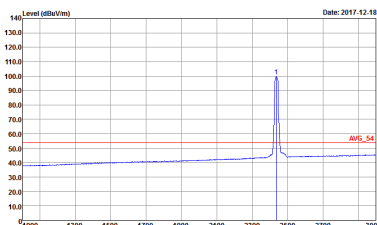


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11g CH06 2437MHz - L	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CHI1-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site : 03CHI1-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site : 03CHI1-HY Condition : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>	<div><p>Site : 03CHI1-HY Condition : AVG_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>

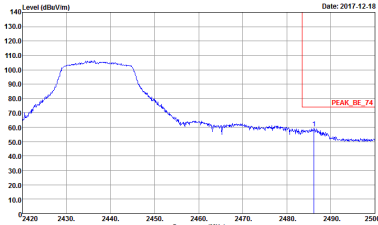
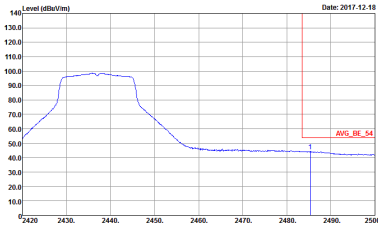


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11g CH06 2437MHz - R	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	Left blank
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>	Left blank



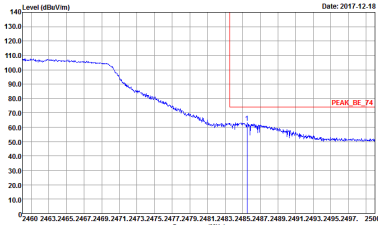
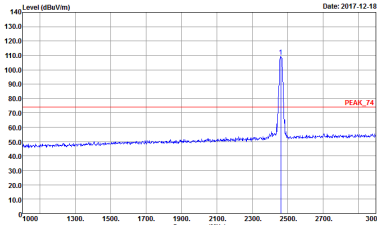
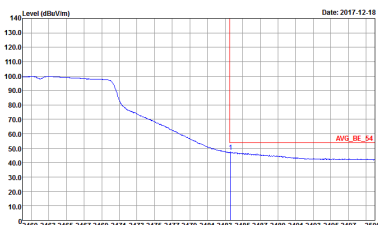
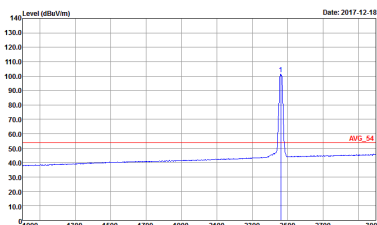
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11g CH06 2437MHz - L	
	Vertical	Fundamental
Peak	 <p>Site : 03CHI1-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CHI1-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Site : 03CHI1-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p>	 <p>Site : 03CHI1-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p>



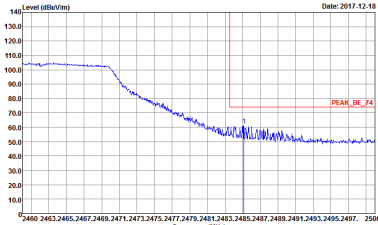
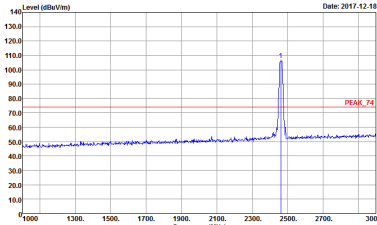
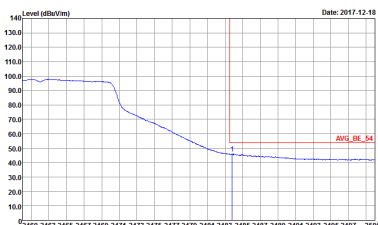
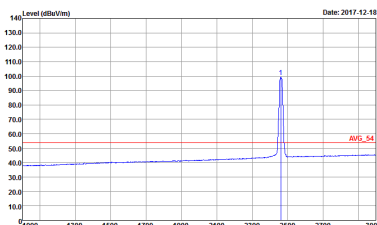
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11g CH06 2437MHz - R	
	Vertical	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	Left Blank
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>	Left Blank





WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11g CH11 2462MHz	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>

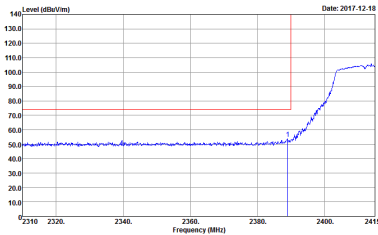
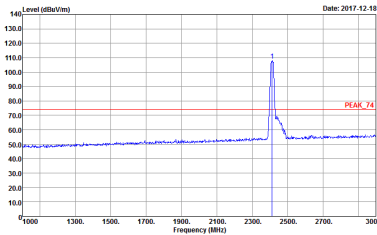
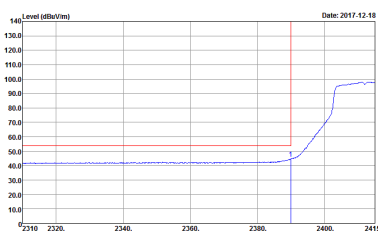
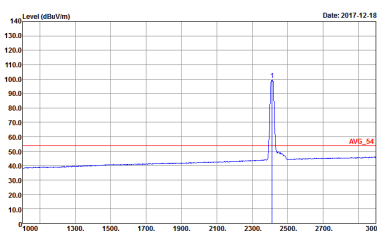


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11g CH11 2462MHz	
	Vertical	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>

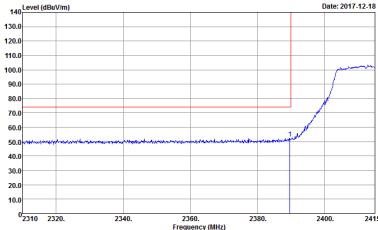
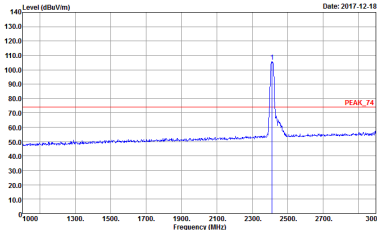
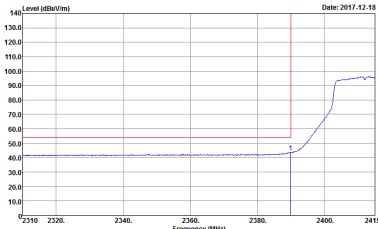
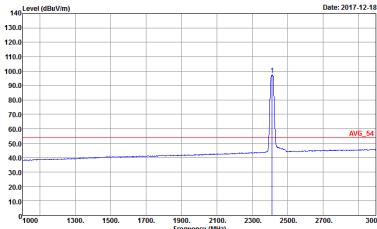


2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT20 CH01 2412MHz	
	Horizontal	Fundamental
Peak	 <p>Site Condition : 03CH11-HY : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site Condition : 03CH11-HY : PEAK_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Site Condition : 03CH11-HY : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto</p>	 <p>Site Condition : 03CH11-HY : AVG_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto</p>

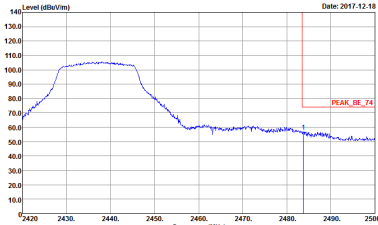
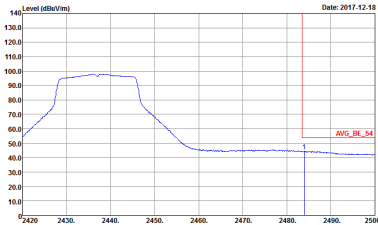


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT20 CH01 2412MHz	
	Vertical	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>

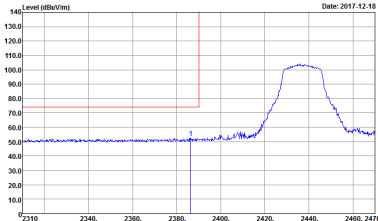
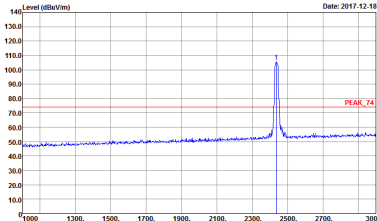
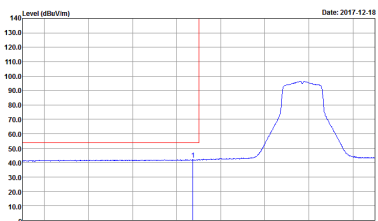
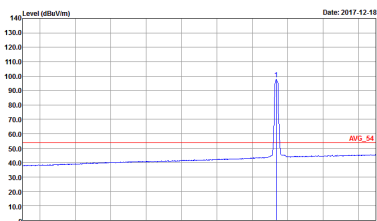


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT20 CH06 2437MHz - L	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CHI1-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site : 03CHI1-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site : 03CHI1-HY Condition : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>	<div><p>Site : 03CHI1-HY Condition : AVG_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>

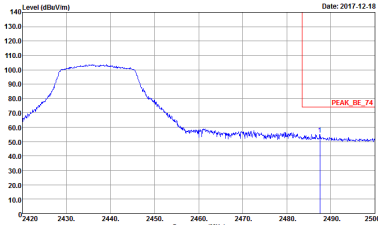
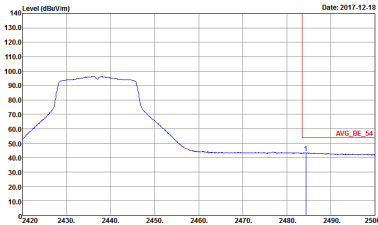


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT20 CH06 2437MHz - R	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	Left blank
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>	Left blank



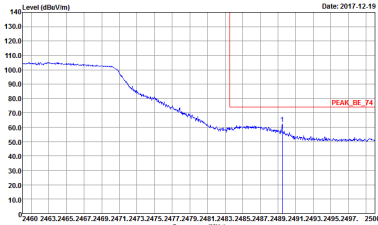
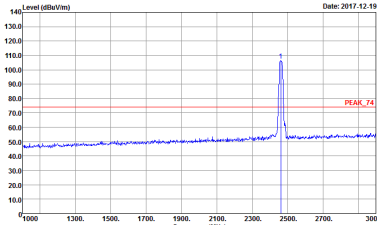
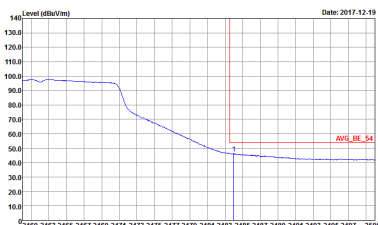
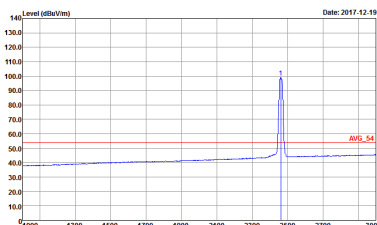
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT20 CH06 2437MHz - L	
	Vertical	Fundamental
Peak	<div><p>Site : 03CHI1-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site : 03CHI1-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site : 03CHI1-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>	<div><p>Site : 03CHI1-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>



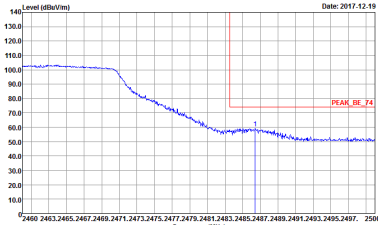
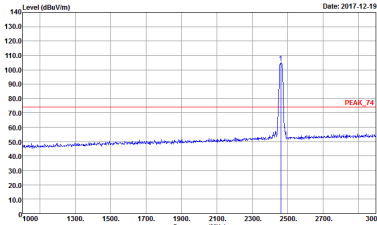
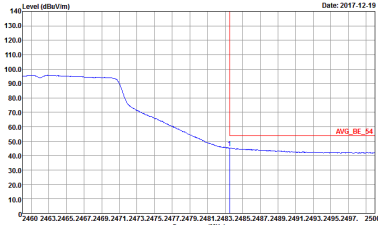
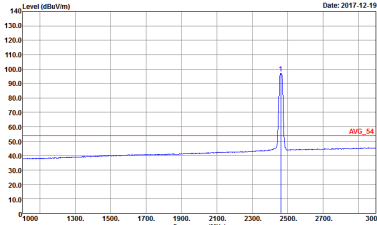
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT20 CH06 2437MHz - R	
	Vertical	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	Left Blank
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>	Left Blank





WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT20 CH11 2462MHz	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>



WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
	802.11n HT20 CH11 2462MHz	
	Vertical	Fundamental
Peak	<div><p>Site : 03CHI1-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site : 03CHI1-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site : 03CHI1-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>	<div><p>Site : 03CHI1-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p></div>

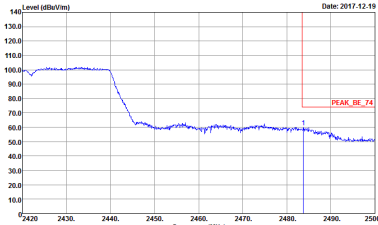
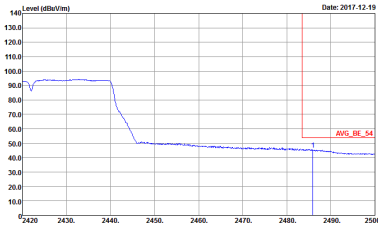


2.4GHz 2400~2483.5MHz

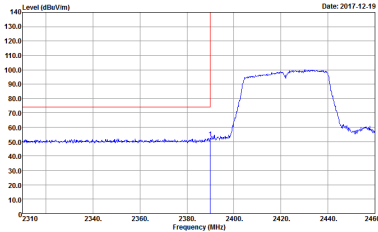
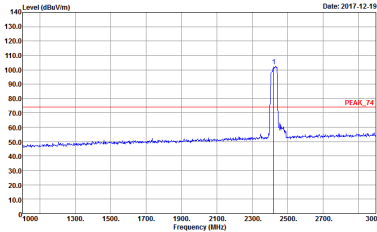
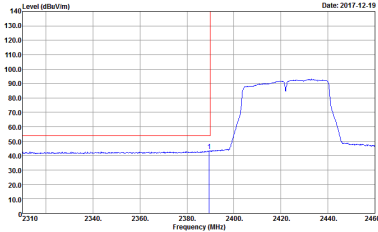
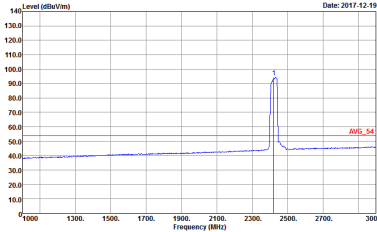
WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT40 CH03 2422MHz - L	
	Horizontal	Fundamental
Peak	<p>Site Condition : 03CH11-HY : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Site Condition : 03CH11-HY : PEAK_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	<p>Site Condition : 03CH11-HY : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto</p>	<p>Site Condition : 03CH11-HY : AVG_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto</p>

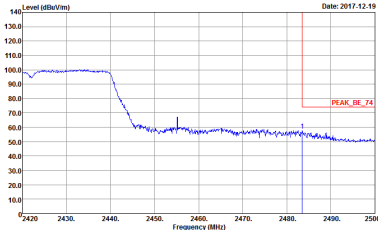
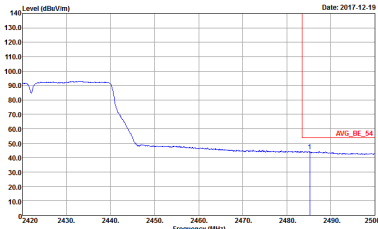


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT40 CH03 2422MHz - R	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	Left Blank
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto</p></div>	Left Blank

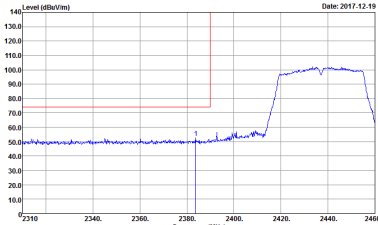
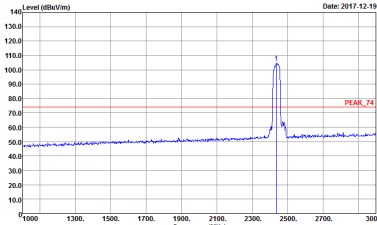
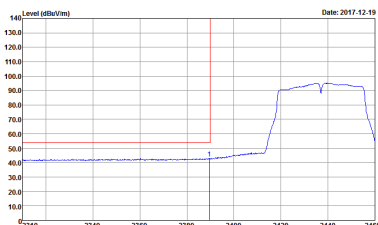
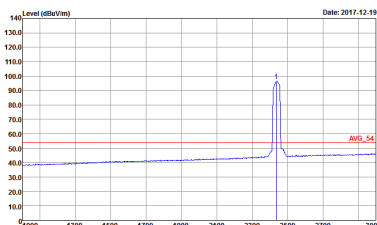


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT40 CH03 2422MHz - L	
	Vertical	Fundamental
Peak	<div><p>Site Condition : 03CH11-HY : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site Condition : 03CH11-HY : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site Condition : 03CH11-HY : AV6_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto</p></div>	<div><p>Site Condition : 03CH11-HY : AV6_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto</p></div>

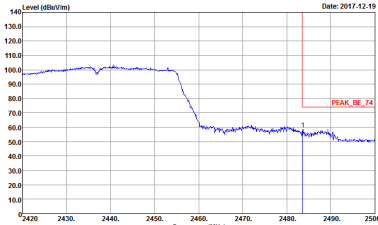
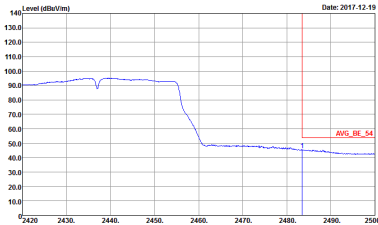


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT40 CH03 2422MHz - R	
	Vertical	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	Left blank
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF VERTICAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto</p></div>	Left blank



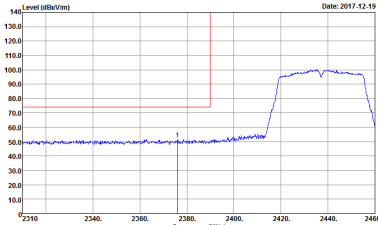
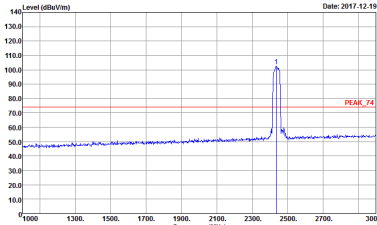
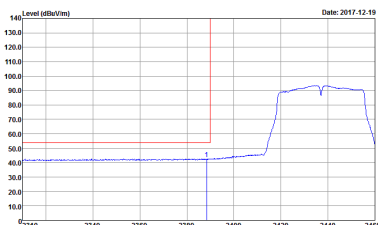
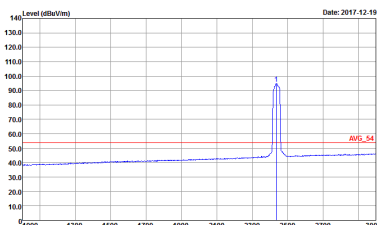
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT40 CH06 2437MHz - L	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CHI1-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site : 03CHI1-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site : 03CHI1-HY Condition : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto</p></div>	<div><p>Site : 03CHI1-HY Condition : AVG_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto</p></div>



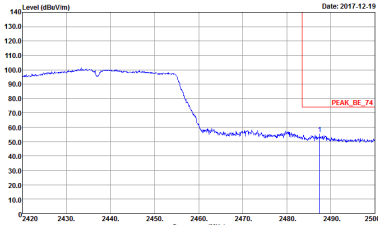
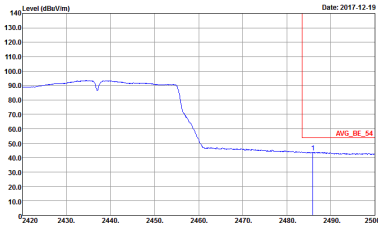
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT40 CH06 2437MHz - R	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	Left blank
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto</p></div>	Left blank



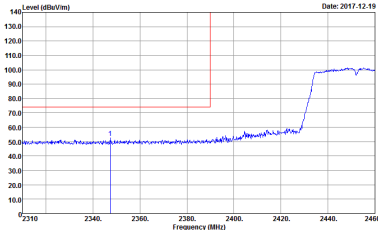
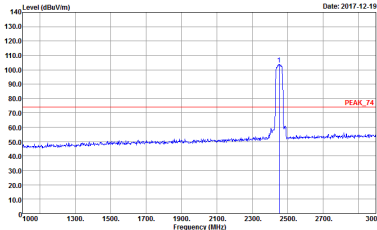
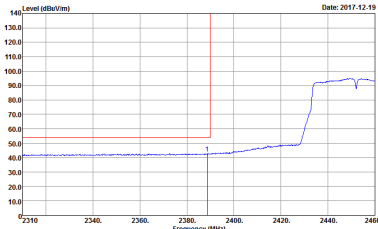
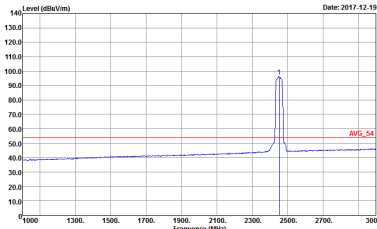


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT40 CH06 2437MHz - L	
	Vertical	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto</p></div>

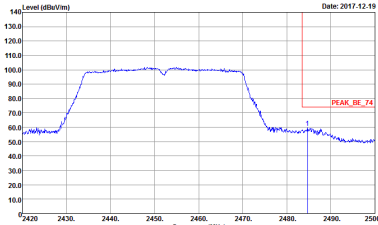
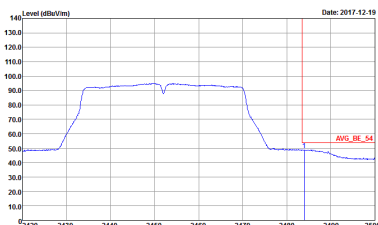


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT40 CH06 2437MHz - R	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	Left blank
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	Left blank

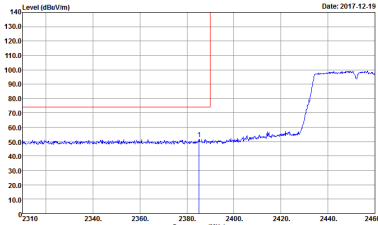
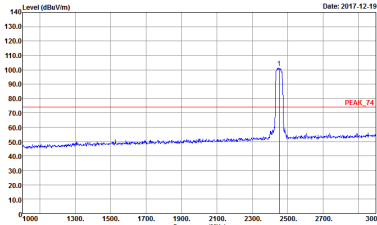
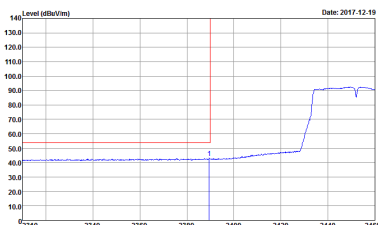
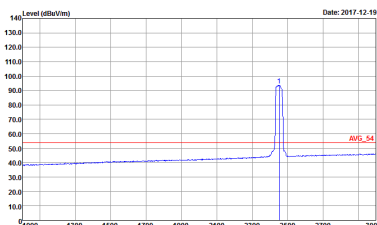


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT40 CH09 2452MHz - L	
	Horizontal	Fundamental
Peak	<div><p>Site Condition : 03CH11-HY : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site Condition : 03CH11-HY : PEAK_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site Condition : 03CH11-HY : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto</p></div>	<div><p>Site Condition : 03CH11-HY : AVG_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto</p></div>

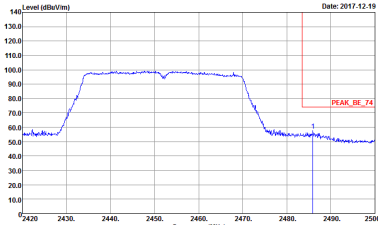
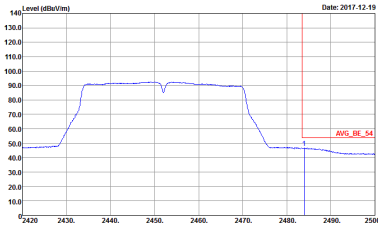


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT40 CH09 2452MHz - R	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	Left blank
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto</p></div>	Left blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT40 CH09 2452MHz - L	
	Vertical	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto</p></div>

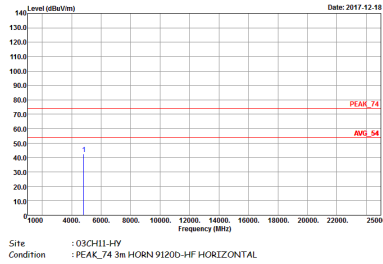
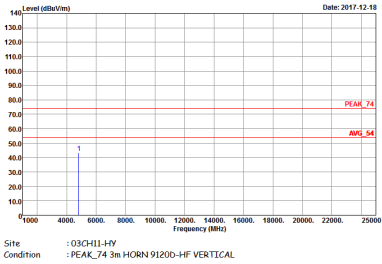


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT40 CH09 2452MHz - R	
	Vertical	Fundamental
Peak	<div><p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	Left blank
Avg.	<div><p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	Left blank



2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

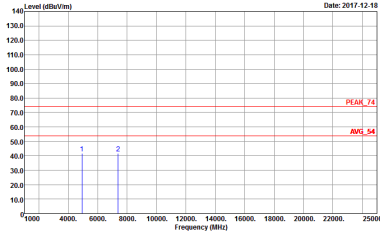
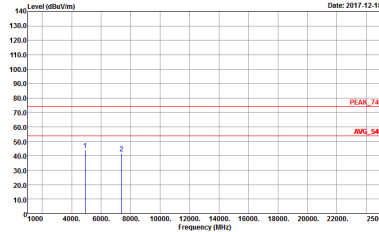
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	802.11b CH01 2412MHz	
	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL</p>	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	802.11b CH06 2437MHz	
	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL</p>	<p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL</p>



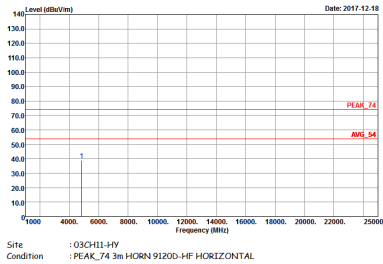
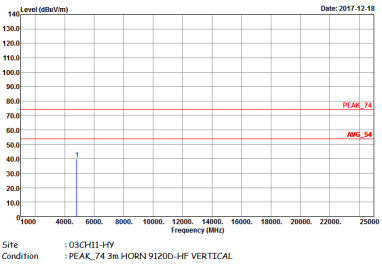


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	802.11b CH11 2462MHz	
	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL</p>	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL</p>

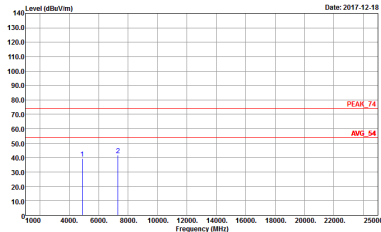
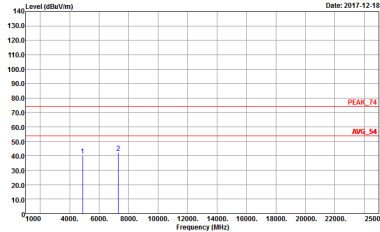


## 2.4GHz 2400~2483.5MHz

## WIFI 802.11g (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	802.11g CH01 2412MHz	
	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL</p>	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL</p>

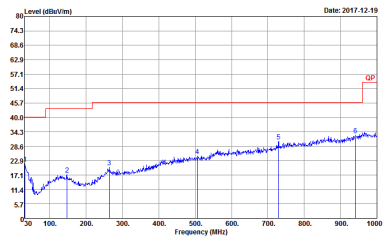
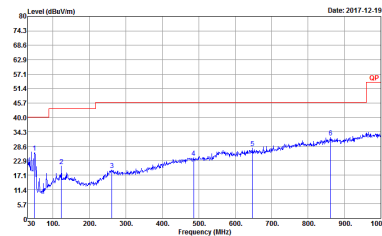


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	802.11g CH06 2437MHz	
	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL</p>	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	802.11g CH11 2462MHz	
	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL</p>	<p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL</p>

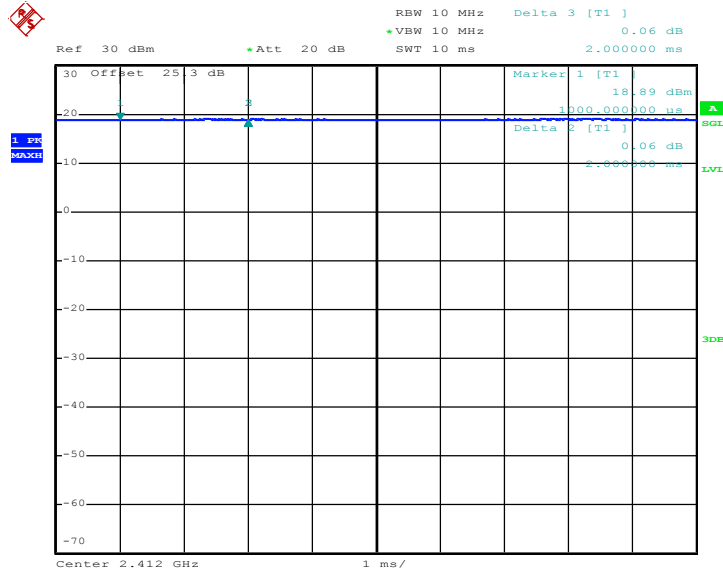
**Emission below 1GHz**  
**2.4GHz WIFI 802.11n HT40 (LF)**

WIFI	2.4GHz 2400~2483.5MHz	
	802.11n HT40 LF	
	Horizontal	Vertical
QP / Peak	 <p>Site : 03CH11-HY  Condition : QP 3m BE-LOG 6111D-LF_ETC HORIZONTAL  Detector : Peak</p>	 <p>Site : 03CH11-HY  Condition : QP 3m BE-LOG 6111D-LF_ETC VERTICAL  Detector : Peak</p>

## Appendix E. Duty Cycle Plots

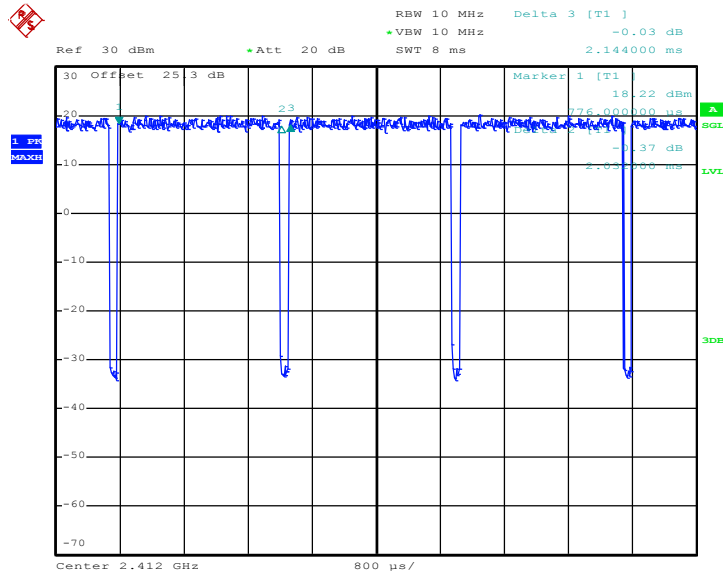
Band	Duty Cycle (%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor (dB)
802.11b	100.00	-	-	10Hz	0.00
802.11g	94.78	2032.00	0.49	1kHz	0.23
2.4GHz 802.11n HT20	94.40	1888.00	0.53	1kHz	0.25
2.4GHz 802.11n HT40	89.92	928.00	1.08	3kHz	0.46

## 802.11b



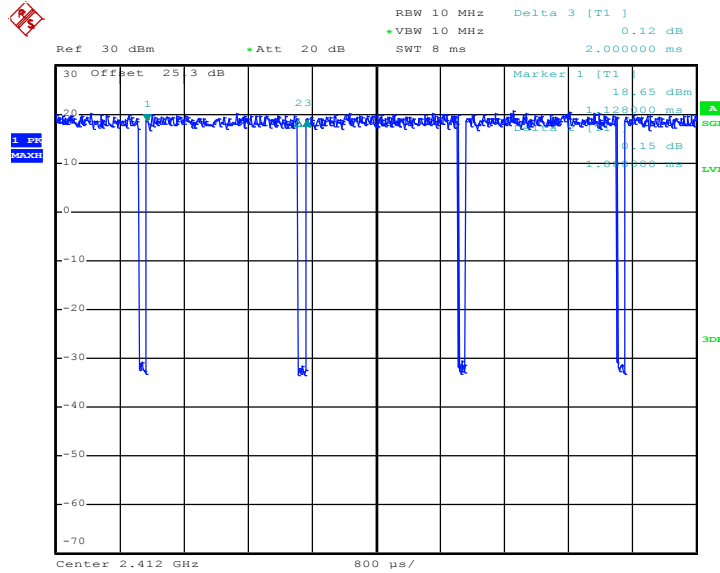
Date: 12.DEC.2017 20:29:27

## 802.11g



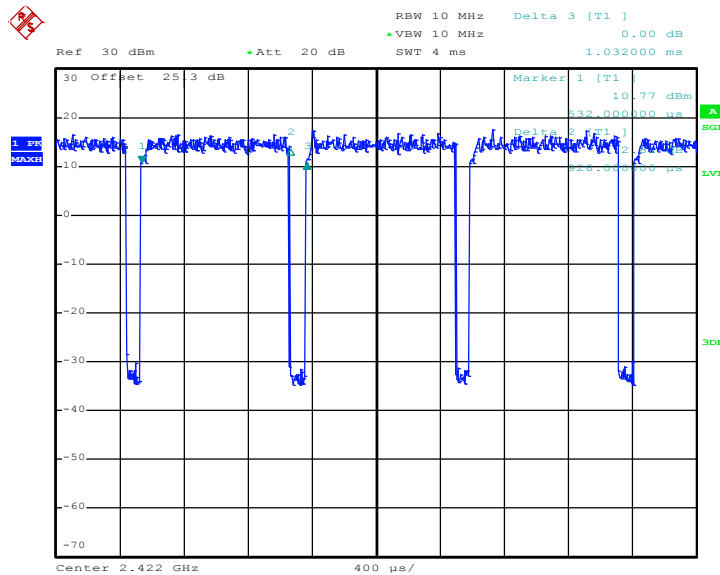
Date: 12.DEC.2017 20:36:52

## 802.11n HT20



Date: 12.DEC.2017 20:47:28

## 802.11n HT40



Date: 12.DEC.2017 20:52:22