



# FCC RADIO TEST REPORT

**FCC ID** : B32E280BTWF  
**Equipment** : Point of Sales Terminal  
**Brand Name** : Verifone  
**Model Name** : e280  
**Applicant** : Verifone, Inc.  
1400 West Stanford Ranch Road, Suite  
100, 150 & 200, Rocklin CA 95765 USA  
**Manufacturer** : Inventec Applicanes (Pudong) Corp.  
**Standard** : FCC Part 15 Subpart C §15.247

The product was received on Mar. 28, 2018 and testing was started from Apr. 27, 2018 and completed on May 21, 2018. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

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

Approved by: Jones Tsai

**SPORTON INTERTIONAL INC. EMC & Wireless Communications Laboratory**

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



## Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
<b>1 General Description .....</b>	<b>5</b>
1.1 Product Feature of Equipment Under Test.....	5
1.2 Modification of EUT .....	5
1.3 Testing Location .....	6
1.4 Applicable Standards.....	6
<b>2 Test Configuration of Equipment Under Test .....</b>	<b>7</b>
2.1 Carrier Frequency and Channel .....	7
2.2 Test Mode.....	7
2.3 Support Unit used in test configuration and system .....	8
2.4 EUT Operation Test Setup .....	8
2.5 Measurement Results Explanation Example.....	8
<b>3 Test Result .....</b>	<b>9</b>
3.1 6dB and 99% Bandwidth Measurement .....	9
3.2 Output Power Measurement.....	11
3.3 Power Spectral Density Measurement .....	12
3.4 Conducted Band Edges and Spurious Emission Measurement .....	14
3.5 Radiated Band Edges and Spurious Emission Measurement .....	24
3.6 AC Conducted Emission Measurement.....	28
3.7 Antenna Requirements .....	30
<b>4 List of Measuring Equipment.....</b>	<b>31</b>
<b>5 Uncertainty of Evaluation .....</b>	<b>32</b>
<b>Appendix A. Conducted Test Results</b>	
<b>Appendix B. AC Conducted Emission Test Result</b>	
<b>Appendix C. Radiated Spurious Emission</b>	
<b>Appendix D. Radiated Spurious Emission Plots</b>	
<b>Appendix E. Duty Cycle Plots</b>	
<b>Appendix F. Setup Photographs</b>	



### History of this test report

Report No.	Version	Description	Issued Date
FR832801C	01	Initial issue of report	Jun. 12, 2018



### Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.247(a)(2)	6dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.247(b)	Power Output Measurement	Pass	-
3.3	15.247(e)	Power Spectral Density	Pass	-
3.4	15.247(d)	Conducted Band Edges	Pass	-
		Conducted Spurious Emission	Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	Pass	Under limit 5.01 dB at 2383.710 MHz
3.6	15.207	AC Conducted Emission	Pass	Under limit 4.86 dB at 27.121 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass	-

Reviewed by: Joseph Lin

Report Producer: Nancy Yang



# 1 General Description

## 1.1 Product Feature of Equipment Under Test

Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, and RFID.

Product Specification subjective to this standard	
Antenna Type	WLAN: Stamping Antenna Bluetooth: Stamping Antenna RFID: Loop Antenna

Specification of Accessory		
AC Adapter	Brand Name	Verifone
	Manufacturer	Phihong
	Model Name	PSAA05A-050QL6V
	Power Rating	Input:100-240Vac, 50-60Hz 0.2A Output: 5V/1A
	Power Cord	N/A
Battery	Brand Name	Verifone
	Model Name	BPK087-700
USB Cable	Brand Name	Verifone
	Model Name	NA

## 1.2 Modification of EUT

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



### 1.3 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, Huaya 1st Rd., Guishan Dist., Taoyuan 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>	
	03CH13-HY	

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

### 1.4 Applicable Standards

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

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

**Remark:**

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



## 2 Test Configuration of Equipment Under Test

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

### 2.1 Carrier Frequency and Channel

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

### 2.2 Test Mode

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

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

Test Cases	
AC Conducted Emission	Mode 1 :WLAN (2.4GHz) Link + Bluetooth Link + MSR + Smart Card + LED + Buzzer + RFID On + USB Cable (Charging from Adapter)



### 2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
2.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	iPhone	Apple	A1387	BCG-E2430A	N/A	N/A
4.	MSR Card	N/A	N/A	N/A	N/A	N/A
5.	Smart Card	N/A	N/A	N/A	N/A	N/A

### 2.4 EUT Operation Test Setup

The RF test items, utility “Tera Tern” 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.

### 2.5 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.

$$\text{Offset} = \text{RF cable loss} + \text{attenuator factor}.$$

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.

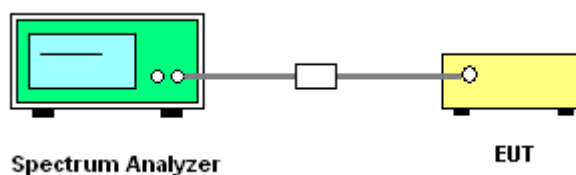
##### 3.1.2 Measuring Instruments

See list of measuring equipment 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.

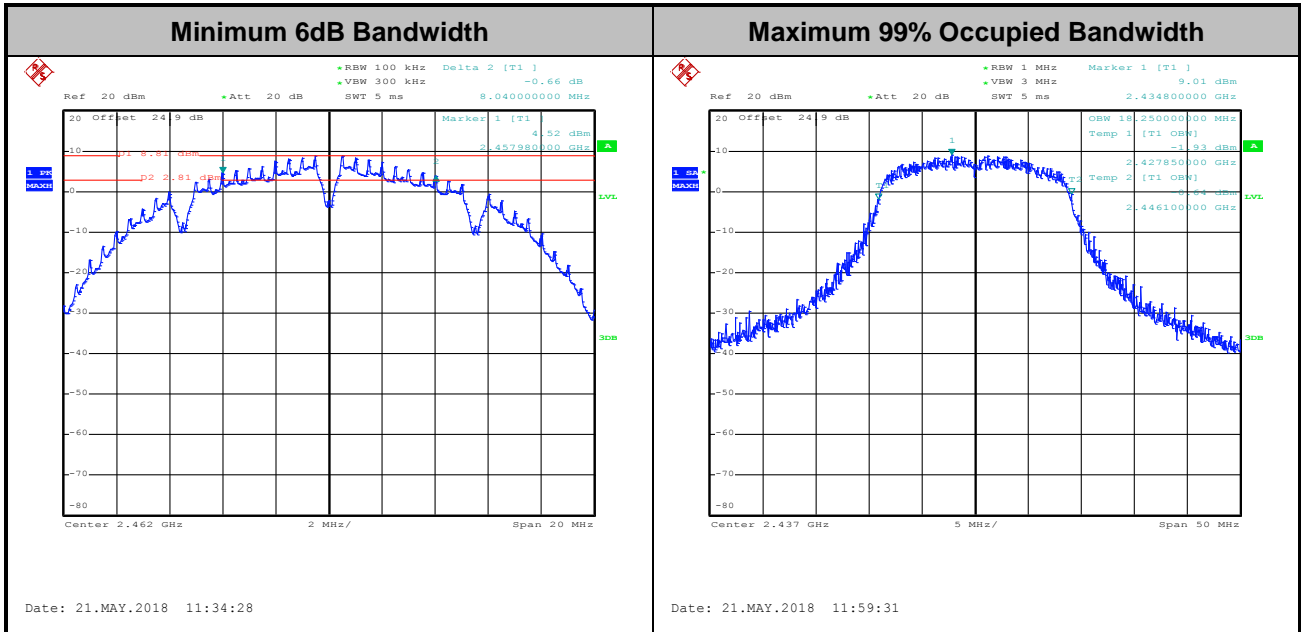
##### 3.1.4 Test Setup





### 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.

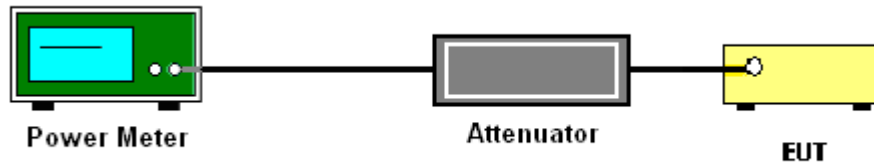
### 3.2.2 Measuring Instruments

See list of measuring equipment 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.

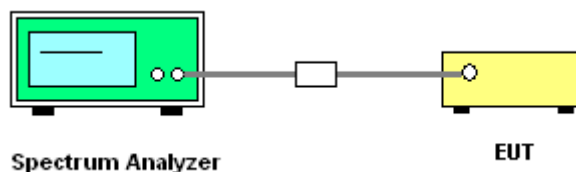
#### 3.3.2 Measuring Instruments

See list of measuring equipment 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.

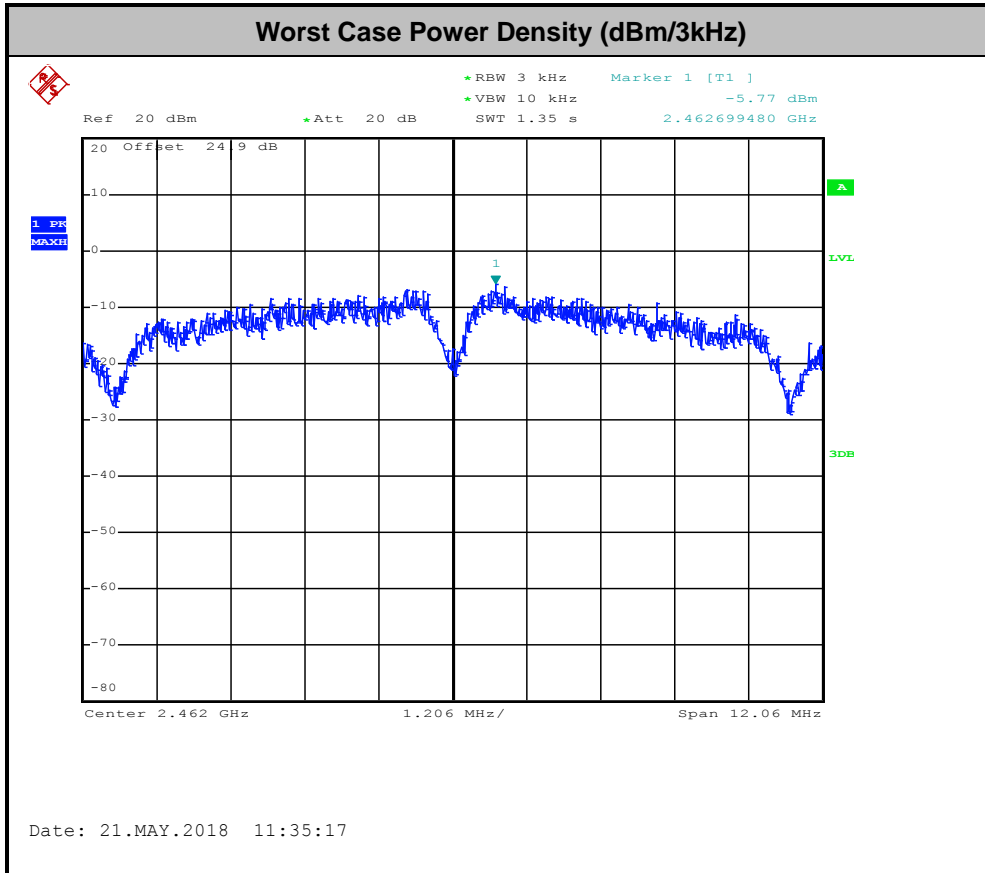
#### 3.3.4 Test Setup





### 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.

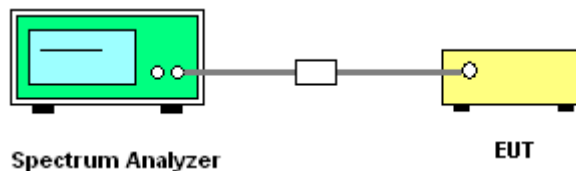
### 3.4.2 Measuring Instruments

See list of measuring equipment 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

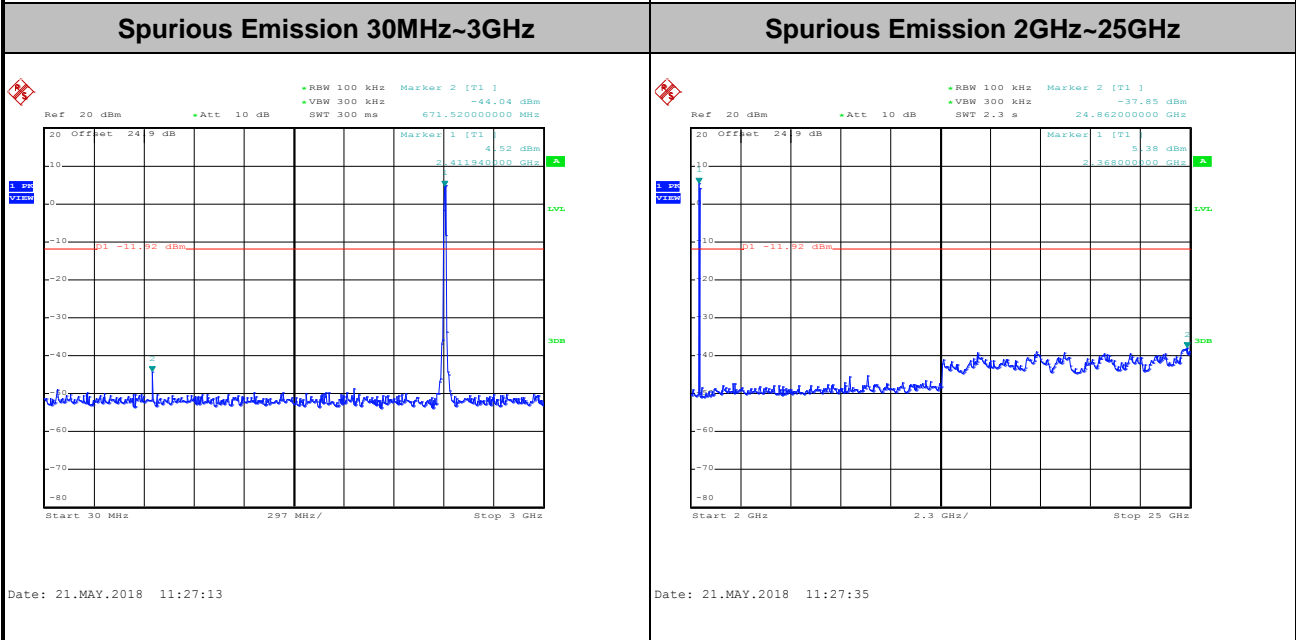
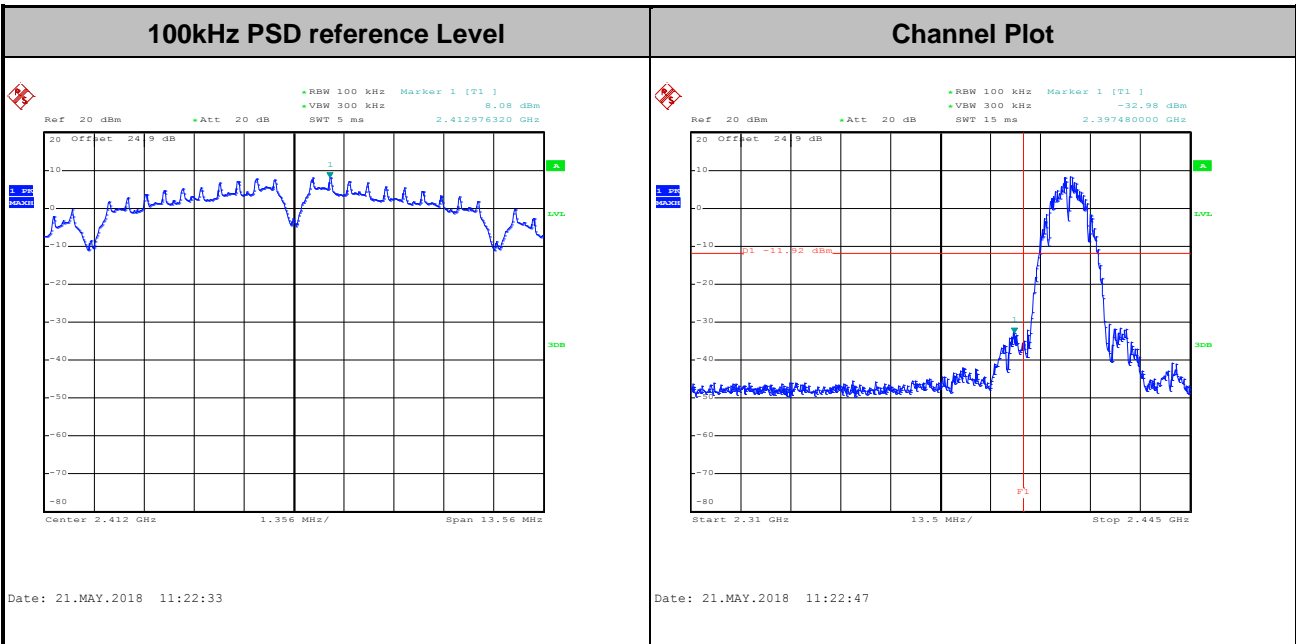




3.4.5 Test Result of Conducted Band Edges and Spurious Emission

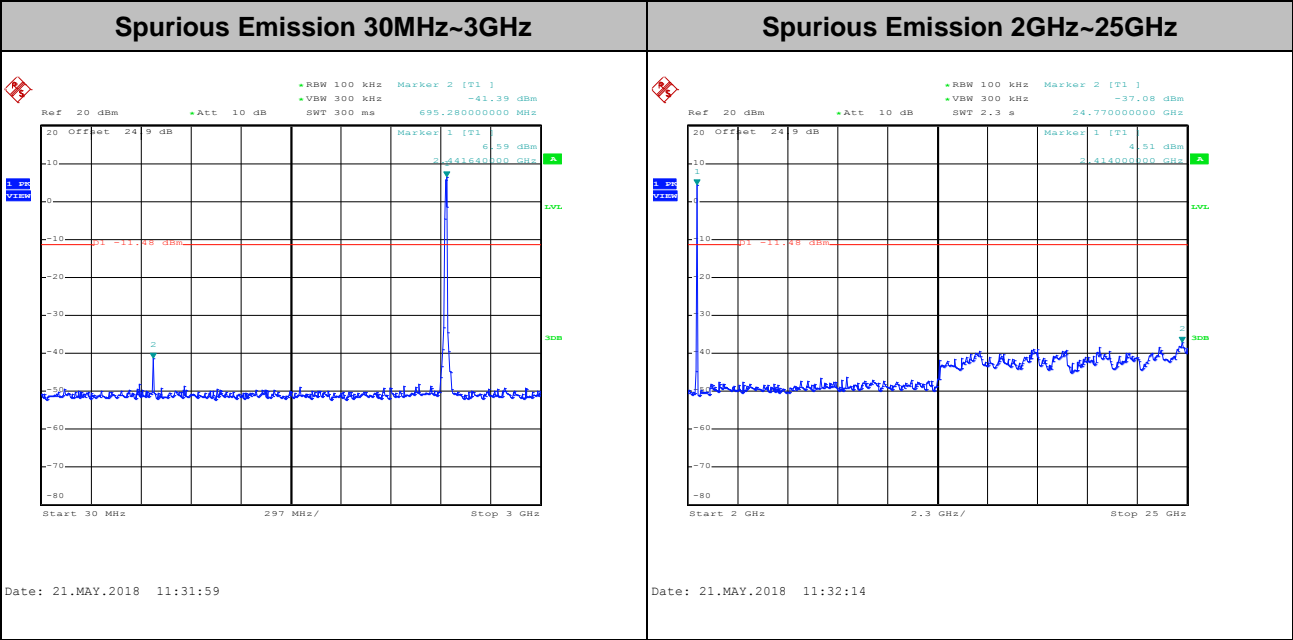
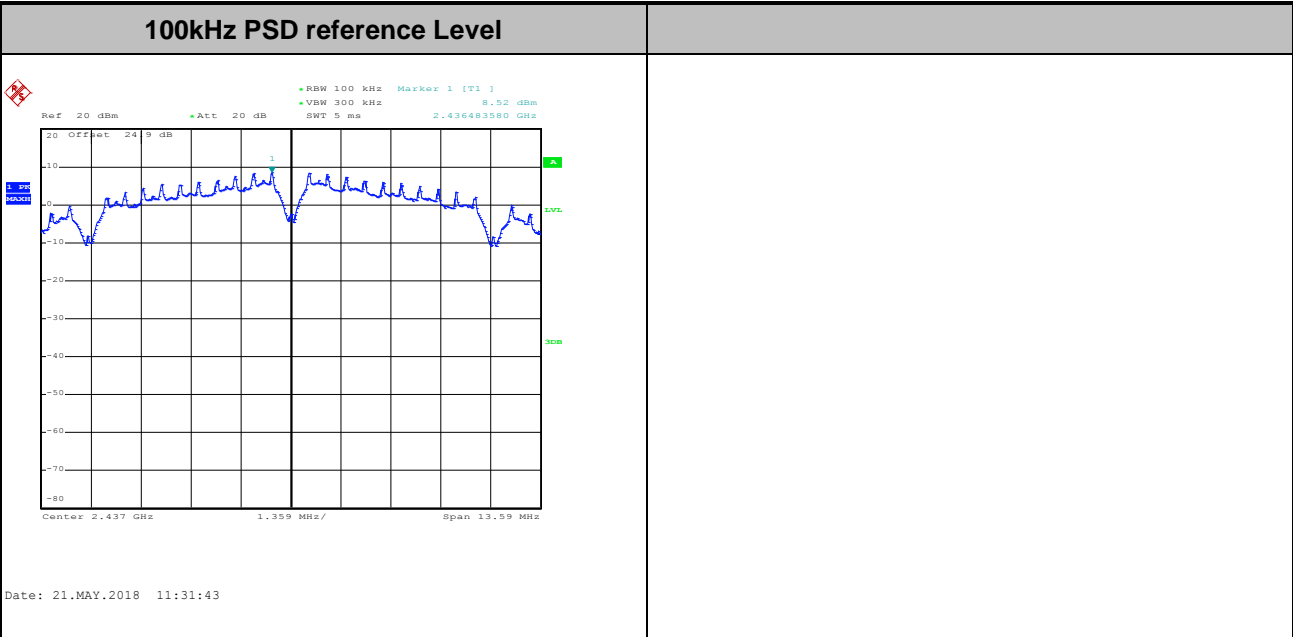
Test Engineer :	Shiang Wang and Allen Lin	Temperature :	21~25°C
		Relative Humidity :	51~54%

Test Mode :	802.11b	Test Channel :	01
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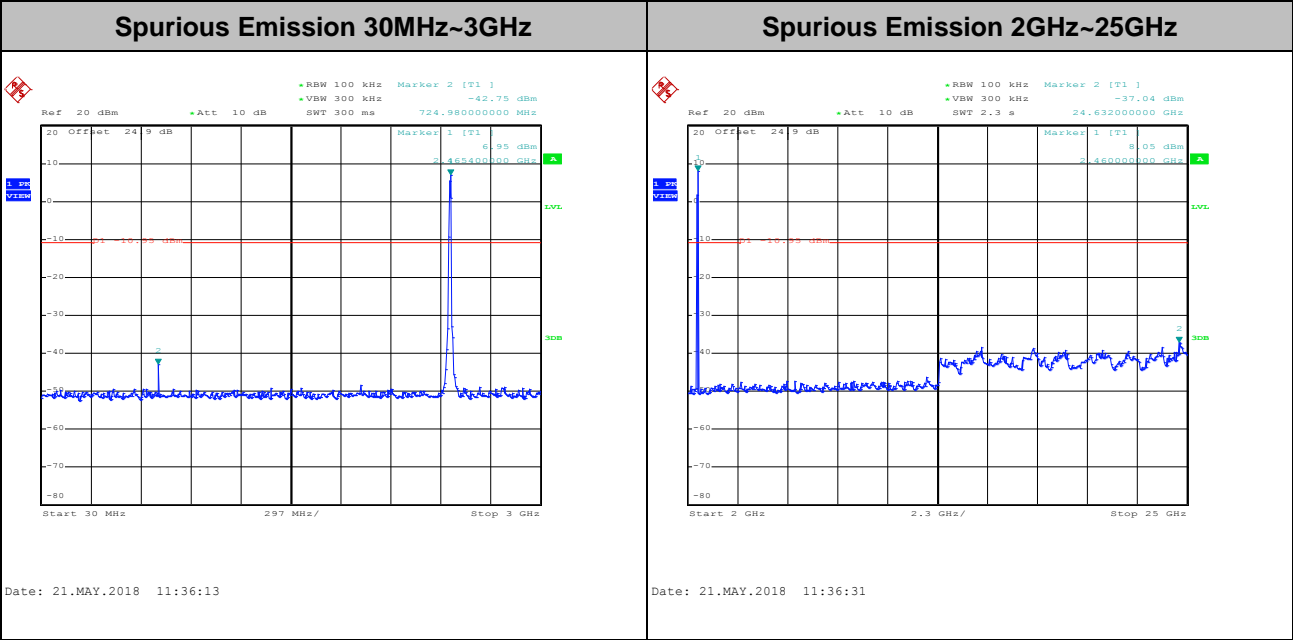
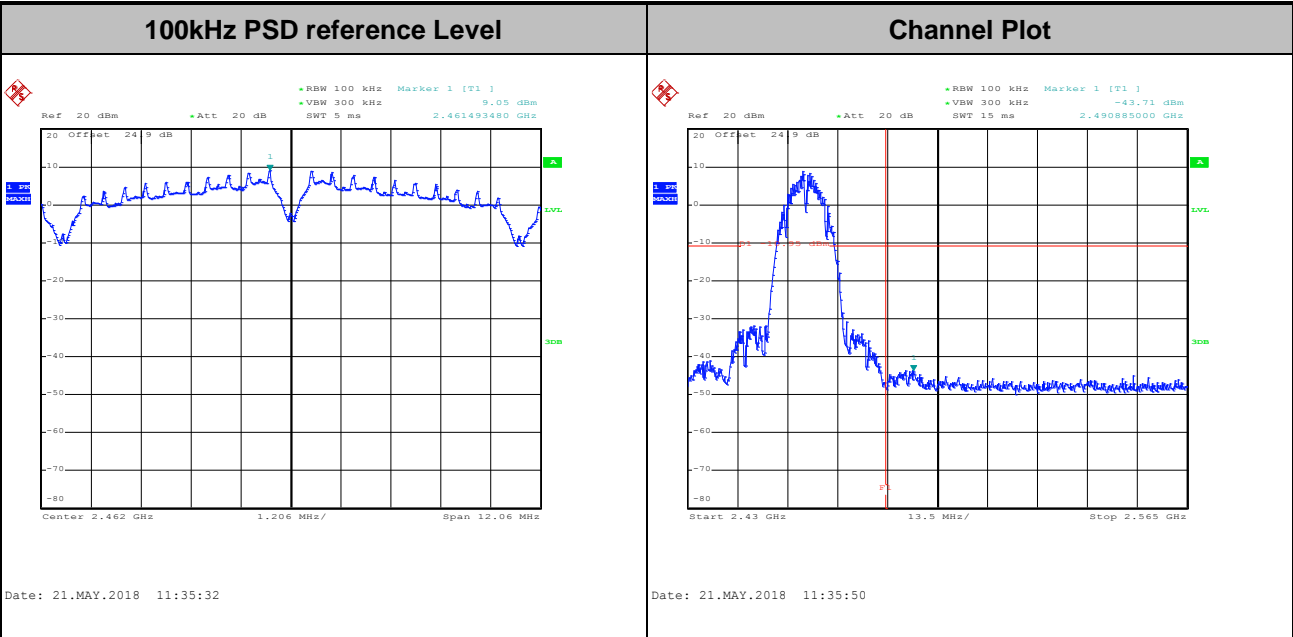
Test Mode :	802.11b	Test Channel :	06
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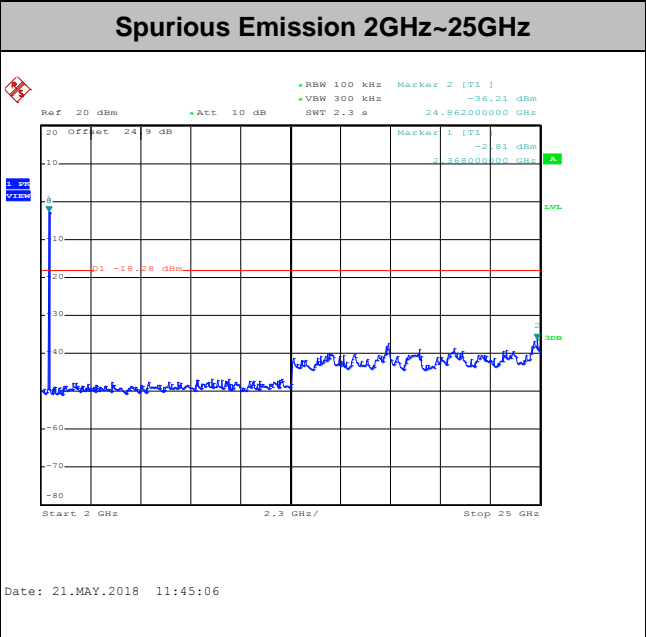
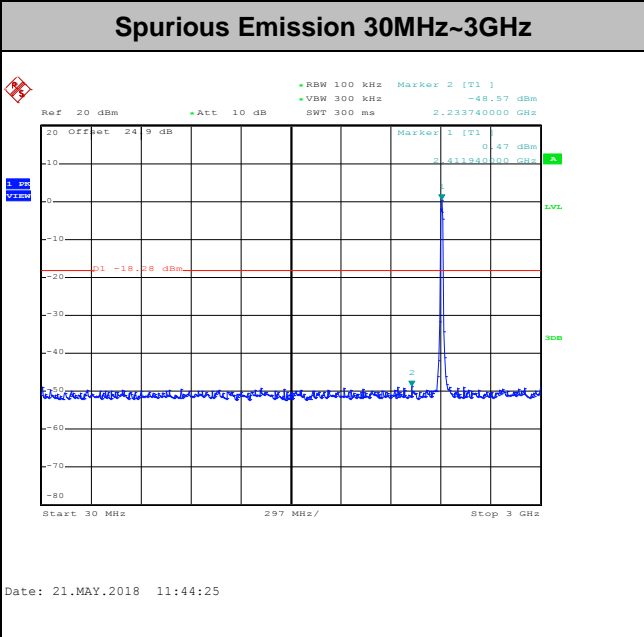
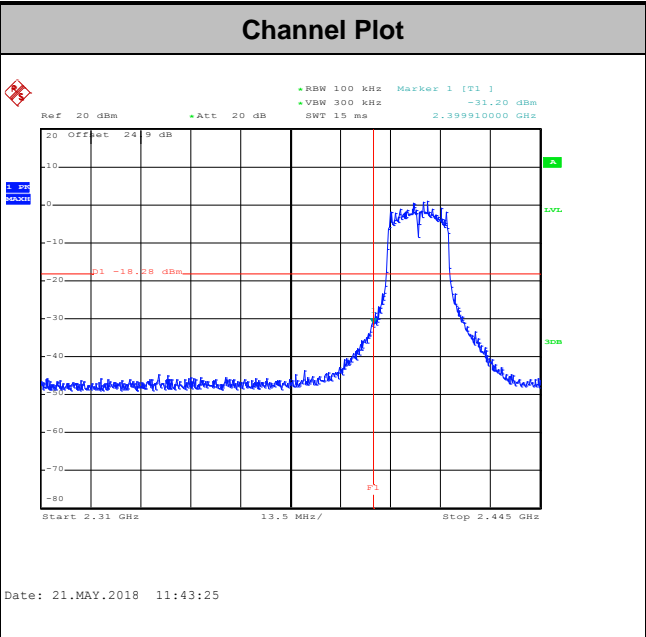
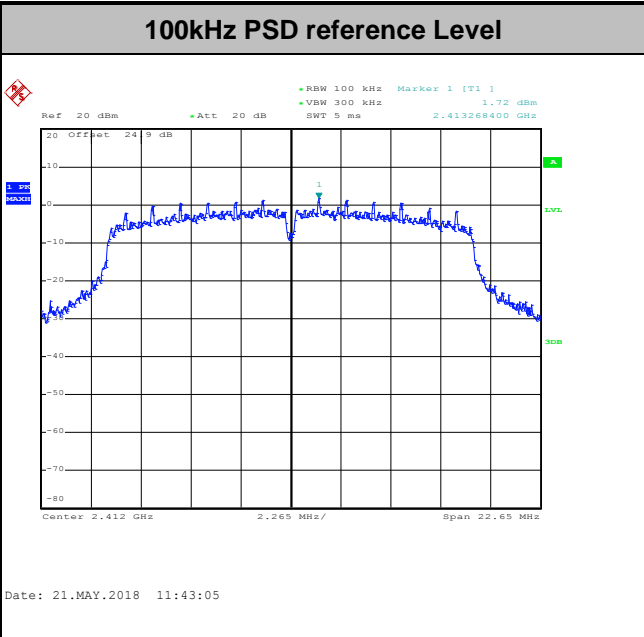


Test Mode :	802.11b	Test Channel :	11
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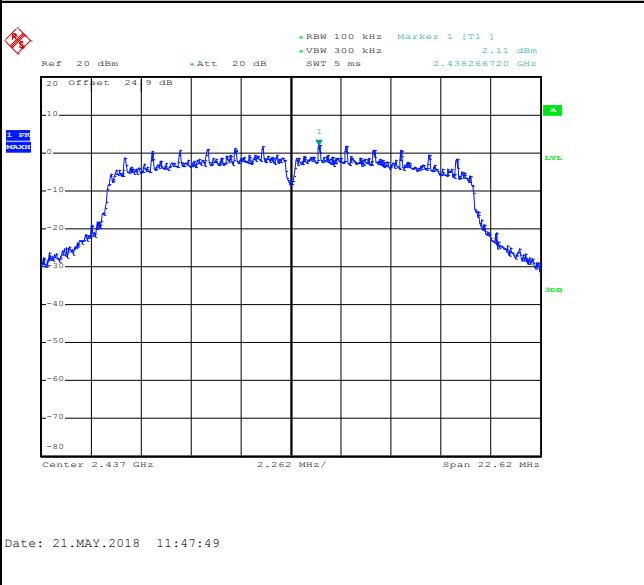
Test Mode : 802.11g Test Channel : 01



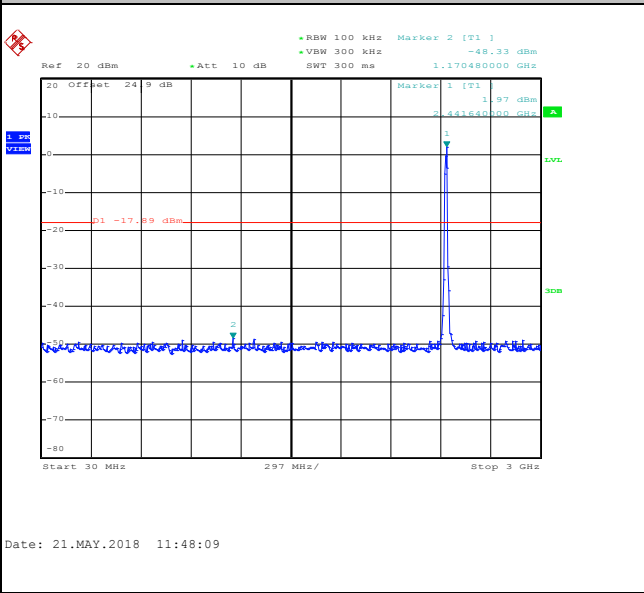


Test Mode :	802.11g	Test Channel :	06
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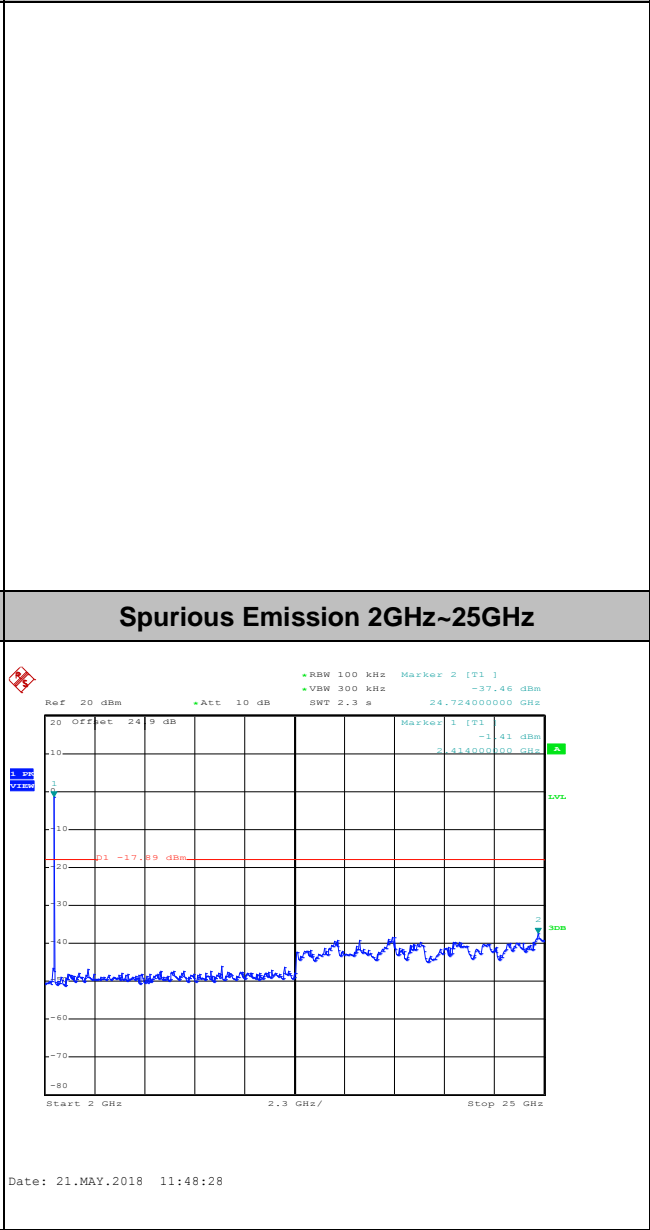
<b>100kHz PSD reference Level</b>
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<b>Spurious Emission 30MHz~3GHz</b>
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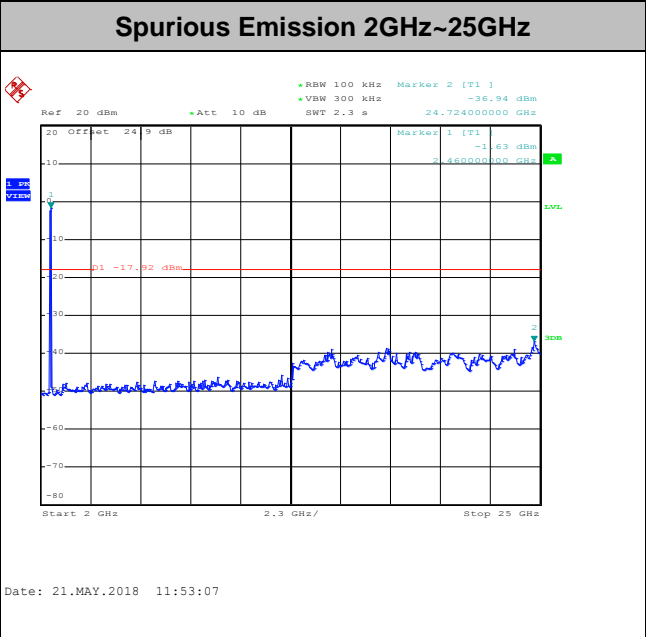
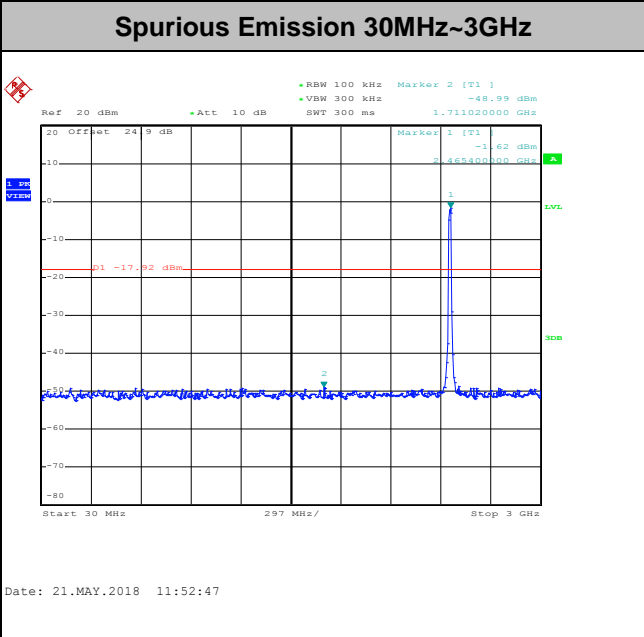
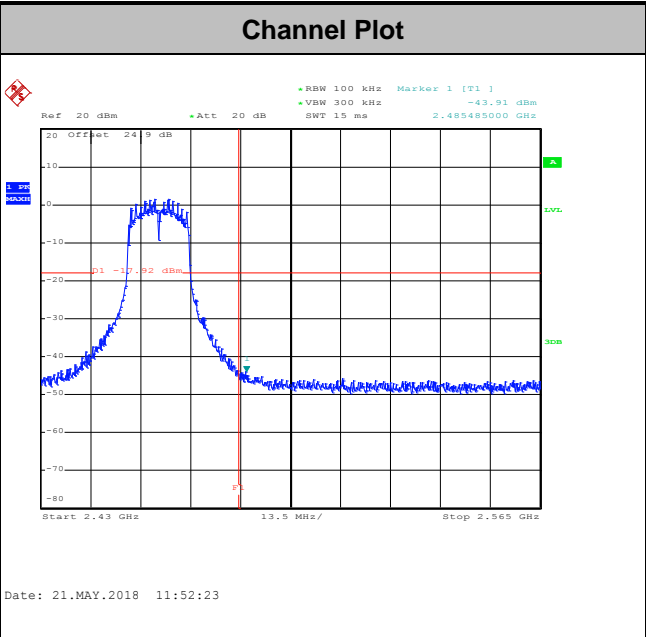
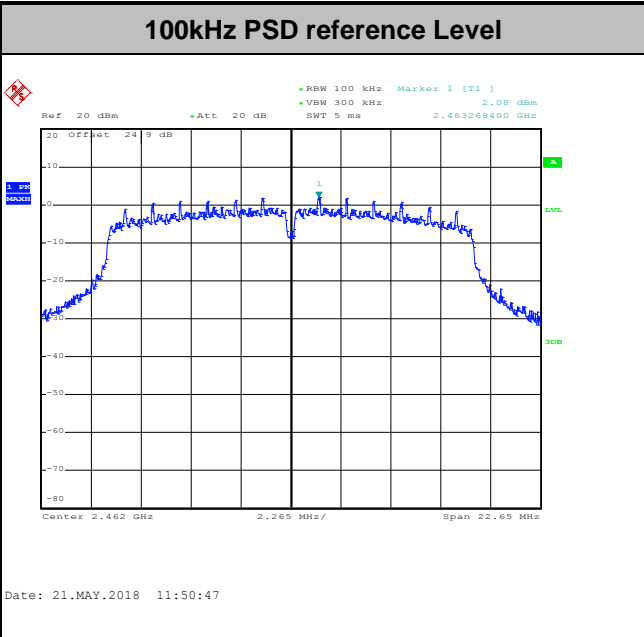


<b>Spurious Emission 2GHz~25GHz</b>
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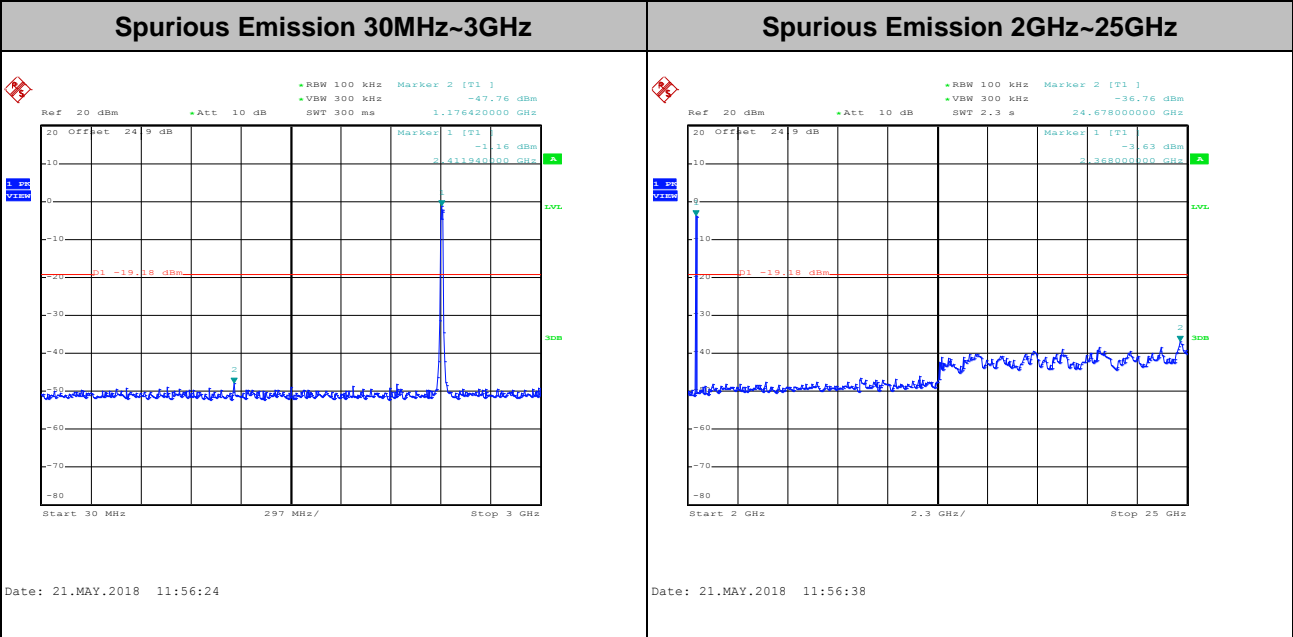
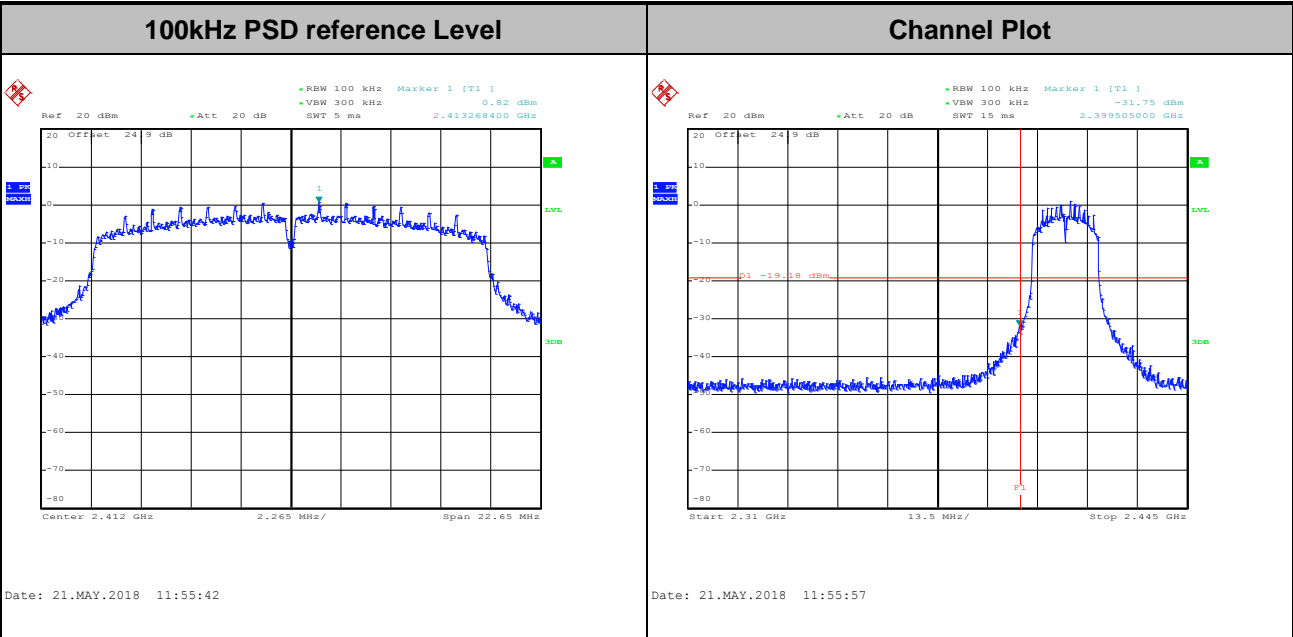


Test Mode :	802.11g	Test Channel :	11
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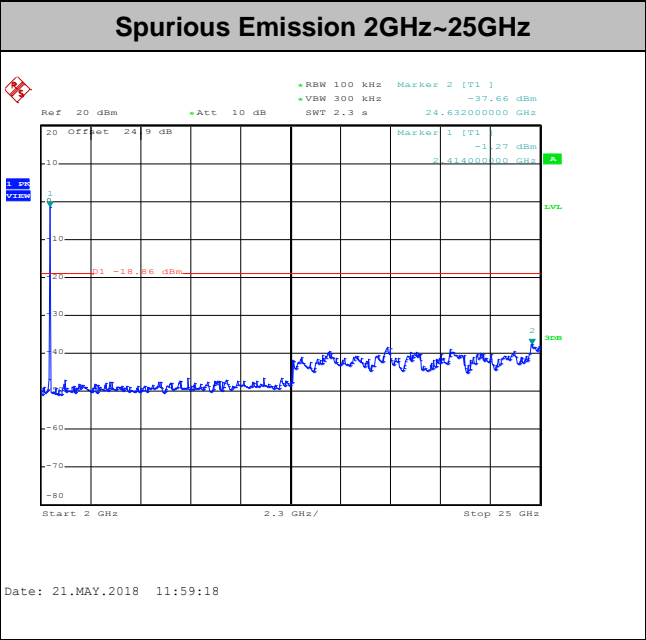
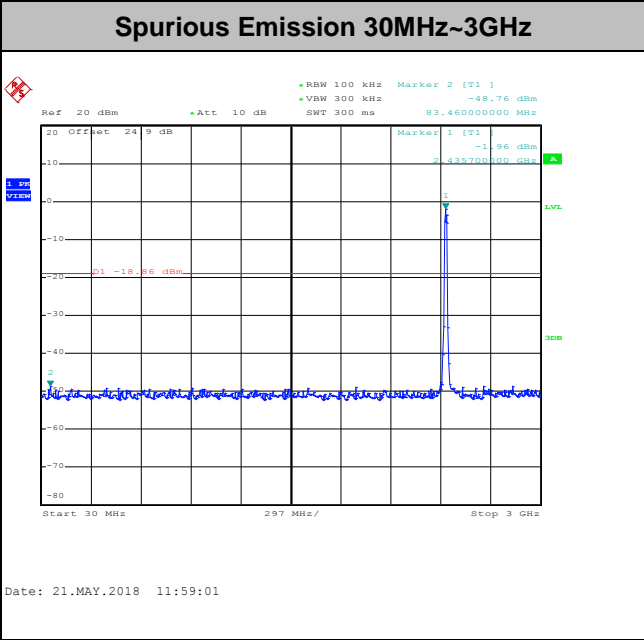
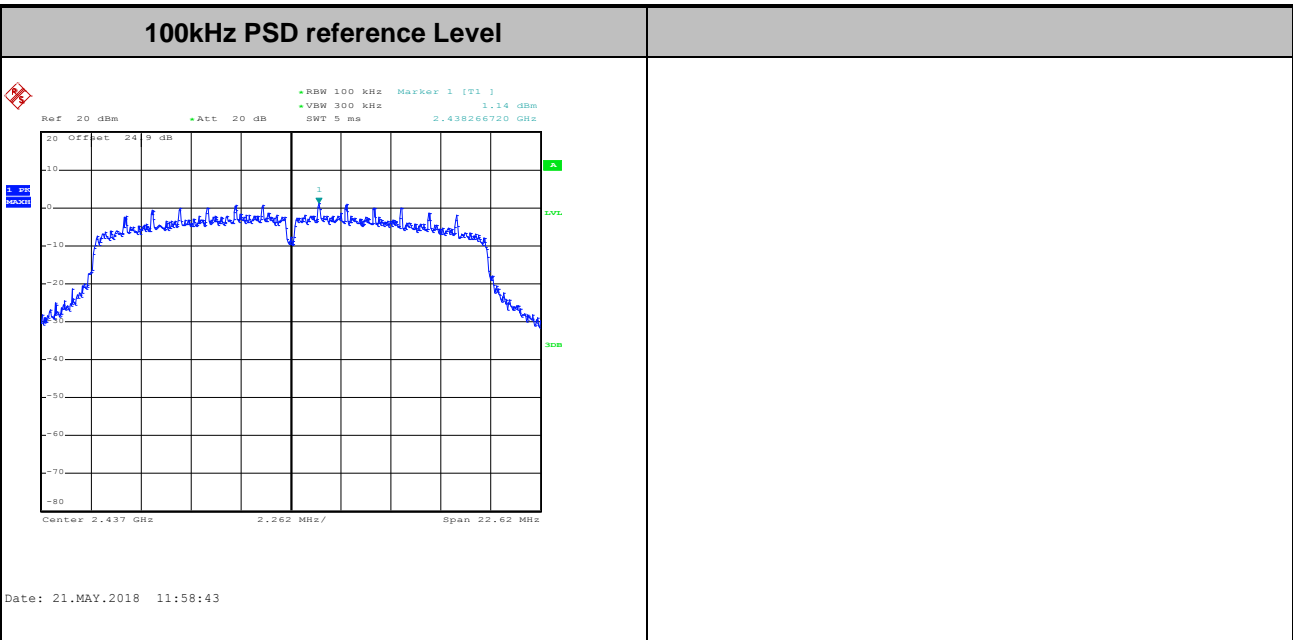


Test Mode :	802.11n HT20	Test Channel :	01
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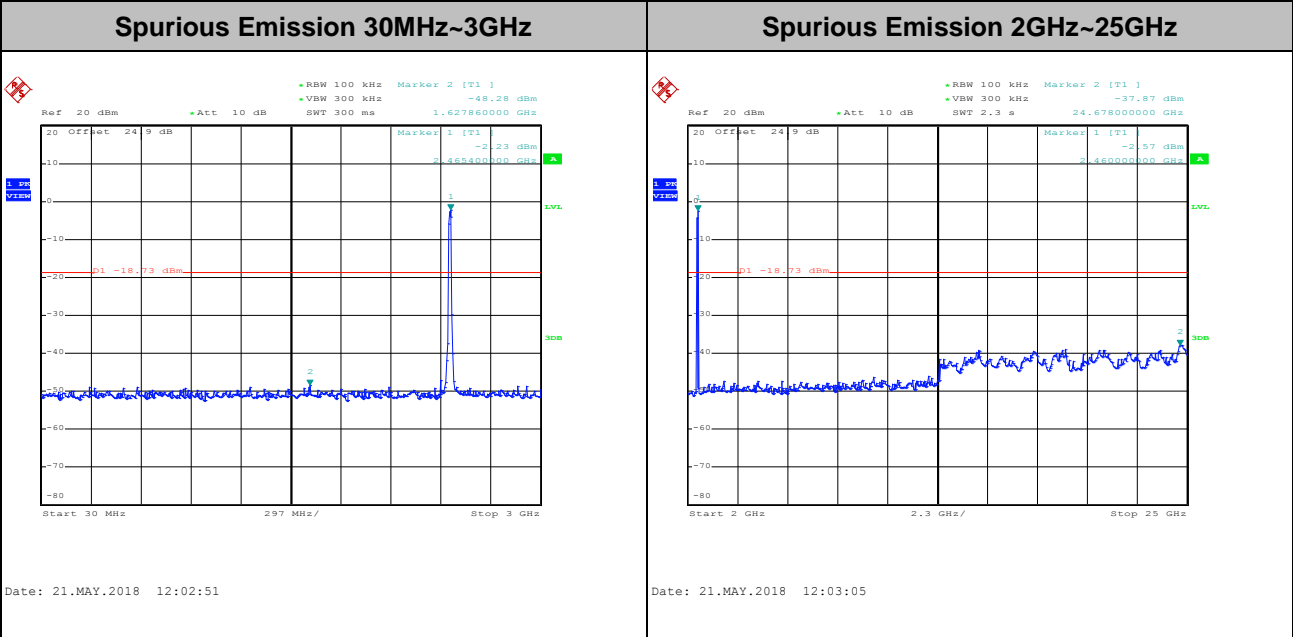
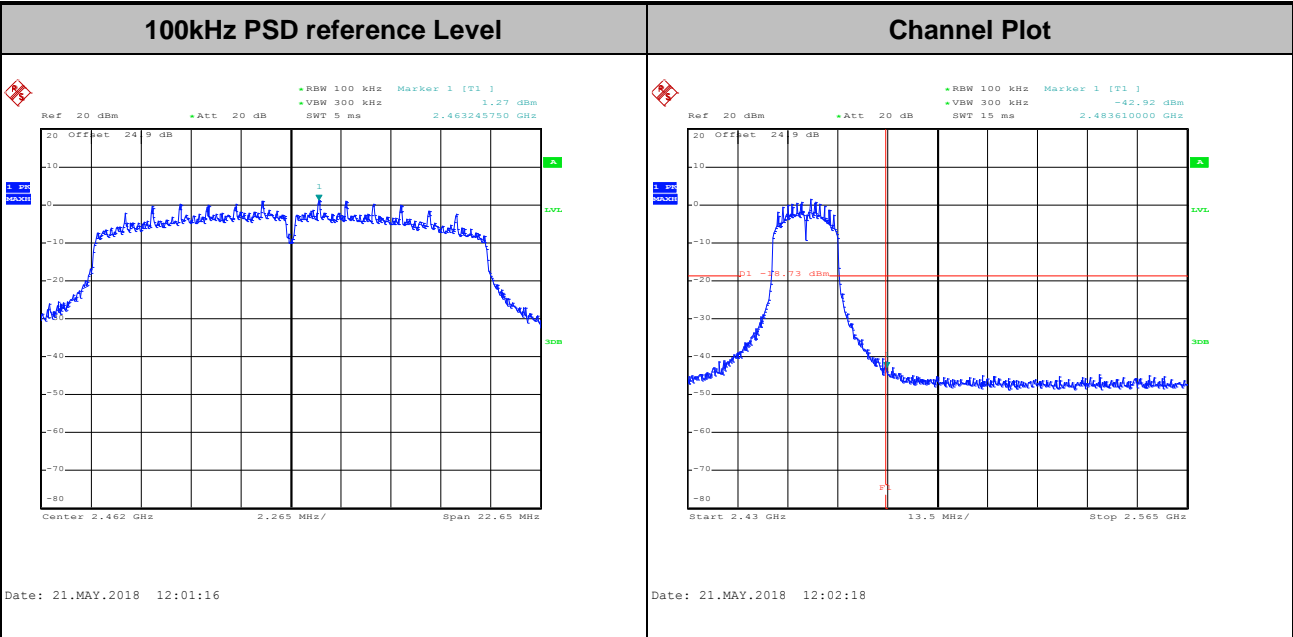


Test Mode :	802.11n HT20	Test Channel :	06
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Test Mode :	802.11n HT20	Test Channel :	11
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### 3.5 Radiated Band Edges and Spurious Emission Measurement

#### 3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

#### 3.5.2 Measuring Instruments

See list of measuring equipment of this test report.



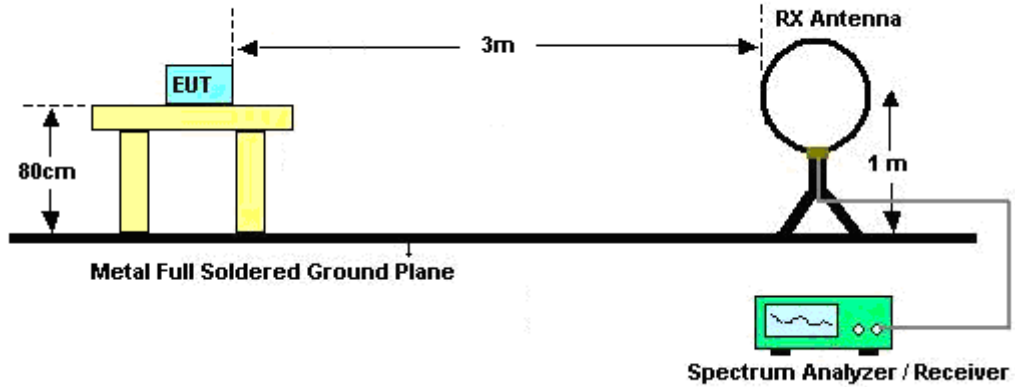


### 3.5.3 Test Procedures

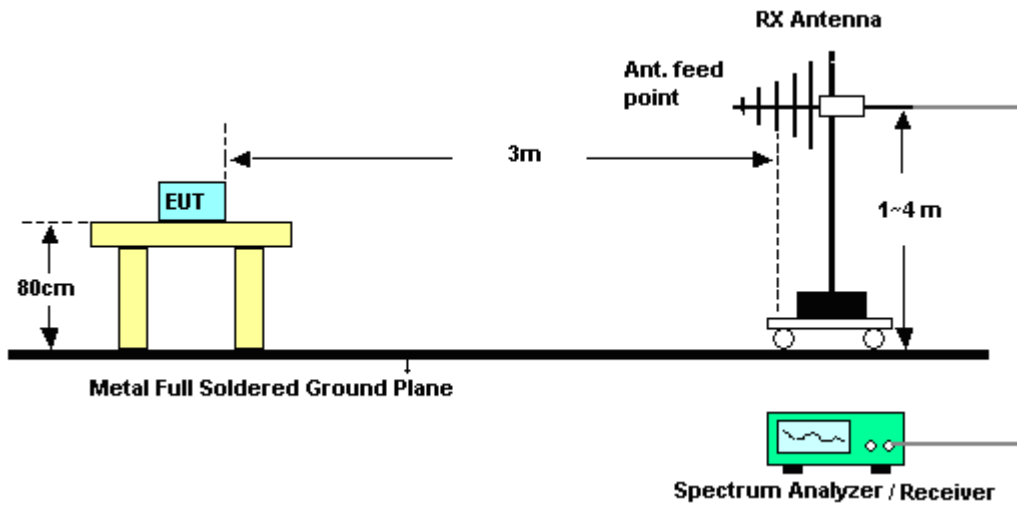
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test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

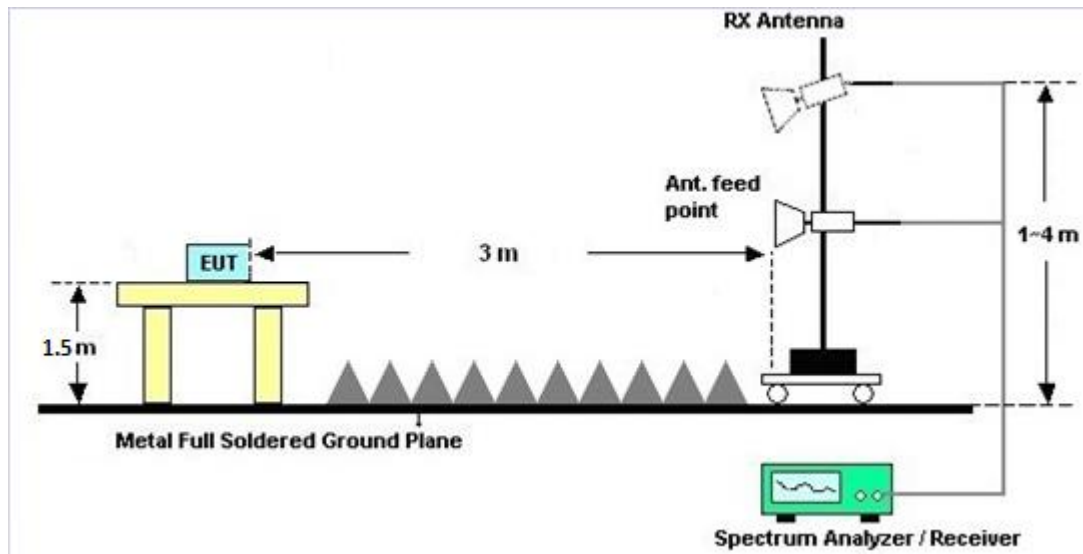
For radiated emissions below 30MHz



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.

For terminal test result, the testing follows FCC KDB 174176.

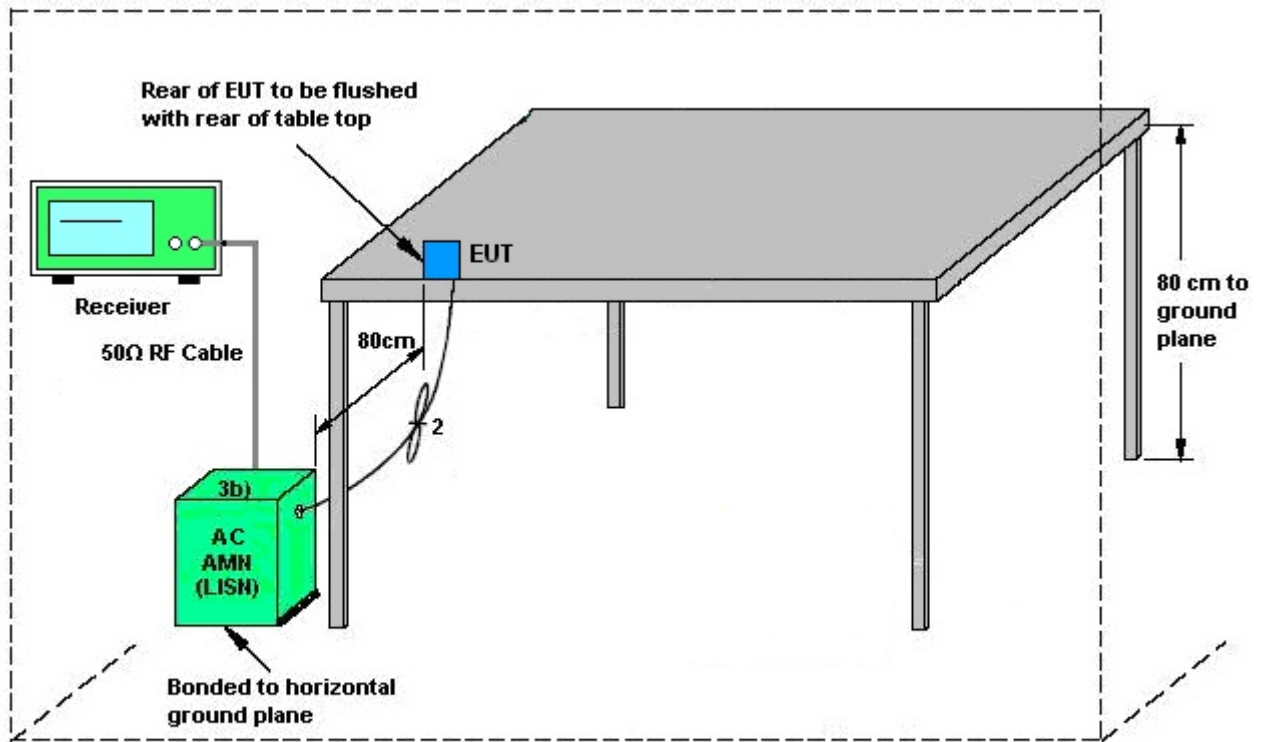
#### 3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

#### 3.6.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF bandwidth = 9kHz) with Maximum Hold Mode.

### 3.6.4 Test Setup



AMN = Artificial mains network (LISH)  
 AE = Associated equipment  
 EUT = Equipment under test  
 ISN = Impedance stabilization network

### 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
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Apr. 27, 2018 ~ May 18, 2018	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	3.6GHz	Dec. 08, 2017	Apr. 27, 2018 ~ May 18, 2018	Dec. 07, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 30, 2017	Apr. 27, 2018 ~ May 18, 2018	Nov. 29, 2018	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Apr. 27, 2018 ~ May 18, 2018	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 03, 2018	Apr. 27, 2018 ~ May 18, 2018	Jan. 02, 2019	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 03, 2018	Apr. 27, 2018 ~ May 18, 2018	Jan. 02, 2019	Conduction (CO05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Nov. 10, 2017	May 12, 2018 ~ May 15, 2018	Nov. 09, 2018	Radiation (03CH13-HY)
Filter	Wainwright	WLKS1200-8 SS	SN3	1.2G Low Pass	Nov. 21, 2017	May 12, 2018 ~ May 15, 2018	Nov. 20, 2018	Radiation (03CH13-HY)
Amplifier	Sonoma-Instrument	310 N	187282	9KHz~1GHz	Jan. 19, 2018	May 12, 2018 ~ May 15, 2018	Jan. 18, 2020	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	40103&07	30MHz to 1GHz	Jan. 10, 2018	May 12, 2018 ~ May 15, 2018	Jan. 09, 2019	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1241	1GHz ~ 18GHz	Jun. 15, 2017	May 12, 2018 ~ May 15, 2018	Jun. 14, 2018	Radiation (03CH13-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590074	1GHz~18GHz	May 22, 2017	May 12, 2018 ~ May 15, 2018	May 21, 2018	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY53270147	1GHz~26.5GHz	Feb. 02, 2018	May 12, 2018 ~ May 15, 2018	Feb. 01, 2019	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY55370526	10Hz~44GHz	Mar. 15, 2018	May 12, 2018 ~ May 15, 2018	Mar. 14, 2019	Radiation (03CH13-HY)
Filter	Wainwright	WHKX12-270 0-3000-18000 -60SS	SN2	3G High Pass	Sep. 18, 2017	May 12, 2018 ~ May 15, 2018	Sep. 17, 2018	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	May 12, 2018 ~ May 15, 2018	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	May 12, 2018 ~ May 15, 2018	N/A	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 27, 2017	May 12, 2018 ~ May 15, 2018	Nov. 26, 2018	Radiation (03CH13-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY53290053	20Hz to 26.5GHz	Jan. 16, 2018	May 12, 2018 ~ May 15, 2018	Jan. 15, 2019	Radiation (03CH13-HY)
Preamplifier	MITEQ	TTA 1840-35-HG	1871923	18GHz ~ 40GHz	Jul. 18, 2017	May 12, 2018 ~ May 15, 2018	Jul. 17, 2018	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0030/126E	30M-18G	Jan. 22, 2018	May 12, 2018 ~ May 15, 2018	Jan. 21, 2019	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	335041/4	30M-18G	Jan. 22, 2018	May 12, 2018 ~ May 15, 2018	Jan. 21, 2019	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24961/4	30M-18GHz	Jan. 22, 2018	May 12, 2018 ~ May 15, 2018	Jan. 21, 2019	Radiation (03CH13-HY)
Software	AUDIX	E3 6.2009-8-24c	RK-001124	N/A	N/A	May 12, 2018 ~ May 15, 2018	N/A	Radiation (03CH13-HY)
Power Meter	Anritsu	ML2495A	1240001	N/A	Sep. 07, 2017	May 18, 2018 ~ May 21, 2018	Sep. 06, 2018	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	1207349	300MHz~40GHz	Sep. 07, 2017	May 18, 2018 ~ May 21, 2018	Sep. 06, 2018	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 20, 2017	May 18, 2018 ~ May 21, 2018	Jun. 19, 2018	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC1300484	N/A	Mar. 01, 2018	May 18, 2018 ~ May 21, 2018	Feb. 28, 2019	Conducted (TH05-HY)



## 5 Uncertainty of Evaluation

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

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.9
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### Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.4
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### Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.3
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**Appendix A. Test Result of Conducted Test Items**

Test Engineer:	Shiang Wang / Allen Lin	Temperature:	21~25	°C
Test Date:	2018/5/18~2018/5/21	Relative Humidity:	51~54	%

**TEST RESULTS DATA**  
**6dB and 99% Occupied Bandwidth**

2.4GHz Band								
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
					Ant 1	Ant 1		
11b	1Mbps	1	1	2412	14.50	9.04	0.50	Pass
11b	1Mbps	1	6	2437	14.50	9.06	0.50	Pass
11b	1Mbps	1	11	2462	14.45	8.04	0.50	Pass
11g	6Mbps	1	1	2412	17.25	15.10	0.50	Pass
11g	6Mbps	1	6	2437	17.40	15.08	0.50	Pass
11g	6Mbps	1	11	2462	17.30	15.10	0.50	Pass
HT20	MCS0	1	1	2412	18.20	15.10	0.50	Pass
HT20	MCS0	1	6	2437	18.25	15.08	0.50	Pass
HT20	MCS0	1	11	2462	18.20	15.10	0.50	Pass

**TEST RESULTS DATA**  
**Peak Output Power**

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
					Ant 1	Ant 1	Ant 1	Ant 1	Ant 1	
11b	1Mbps	1	1	2412	18.91	30.00	0.86	19.77	36.00	Pass
11b	1Mbps	1	6	2437	19.28	30.00	0.86	20.14	36.00	Pass
11b	1Mbps	1	11	2462	19.21	30.00	0.86	20.07	36.00	Pass
11g	6Mbps	1	1	2412	21.51	30.00	0.86	22.37	36.00	Pass
11g	6Mbps	1	6	2437	21.83	30.00	0.86	22.69	36.00	Pass
11g	6Mbps	1	11	2462	21.85	30.00	0.86	22.71	36.00	Pass
HT20	MCS0	1	1	2412	20.81	30.00	0.86	21.67	36.00	Pass
HT20	MCS0	1	6	2437	21.42	30.00	0.86	22.28	36.00	Pass
HT20	MCS0	1	11	2462	21.50	30.00	0.86	22.36	36.00	Pass

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

**TEST RESULTS DATA**  
**Average Output Power**  
**(Reporting Only)**

2.4GHz Band						
Mod.	Data Rate	N <sub>TX</sub>	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
					Ant 1	Ant 1
11b	1Mbps	1	1	2412	0.06	16.76
11b	1Mbps	1	6	2437	0.06	17.17
11b	1Mbps	1	11	2462	0.06	17.14
11g	6Mbps	1	1	2412	0.32	12.37
11g	6Mbps	1	6	2437	0.32	12.76
11g	6Mbps	1	11	2462	0.32	12.80
HT20	MCS0	1	1	2412	0.34	11.32
HT20	MCS0	1	6	2437	0.34	11.93
HT20	MCS0	1	11	2462	0.34	11.79

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

**TEST RESULTS DATA**  
**Peak Power Spectral Density**

2.4GHz Band								
Mod.	Data Rate	N <sub>TX</sub>	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)	DG (dBi)	Peak PSD Limit (dBm/3kHz)	Pass/Fail
					Ant 1	Ant 1	Ant 1	
11b	1Mbps	1	1	2412	-6.91	0.86	8.00	Pass
11b	1Mbps	1	6	2437	-6.45	0.86	8.00	Pass
11b	1Mbps	1	11	2462	-5.77	0.86	8.00	Pass
11g	6Mbps	1	1	2412	-12.95	0.86	8.00	Pass
11g	6Mbps	1	6	2437	-12.25	0.86	8.00	Pass
11g	6Mbps	1	11	2462	-12.37	0.86	8.00	Pass
HT20	MCS0	1	1	2412	-14.36	0.86	8.00	Pass
HT20	MCS0	1	6	2437	-12.43	0.86	8.00	Pass
HT20	MCS0	1	11	2462	-11.87	0.86	8.00	Pass

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



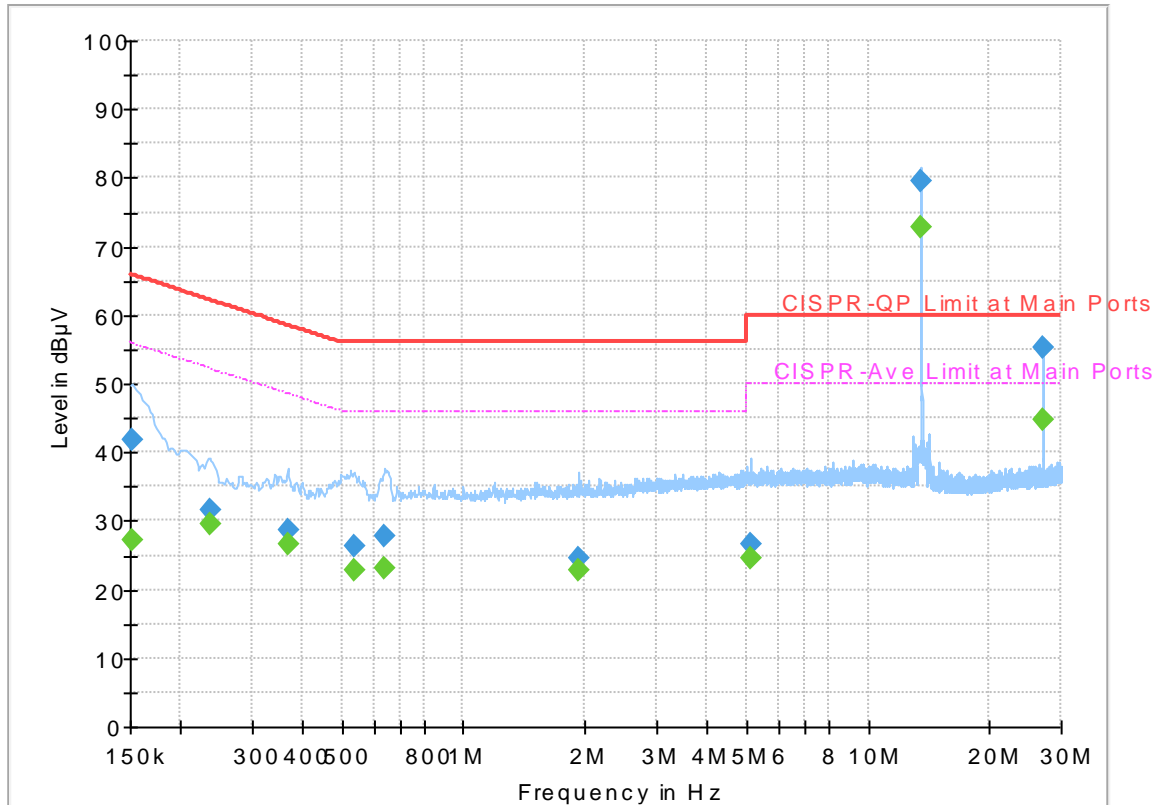
## Appendix B. AC Conducted Emission Test Results

Test Engineer :	Shareef Yu and Kai-Chun Chu	Temperature :	25~27°C
		Relative Humidity :	50~52%

# EUT Information

Report NO : 832801  
 Test Mode : Mode 1  
 Test Voltage : 120Vac/60Hz  
 Phase : Line  
 Original Mode

Full Spectrum



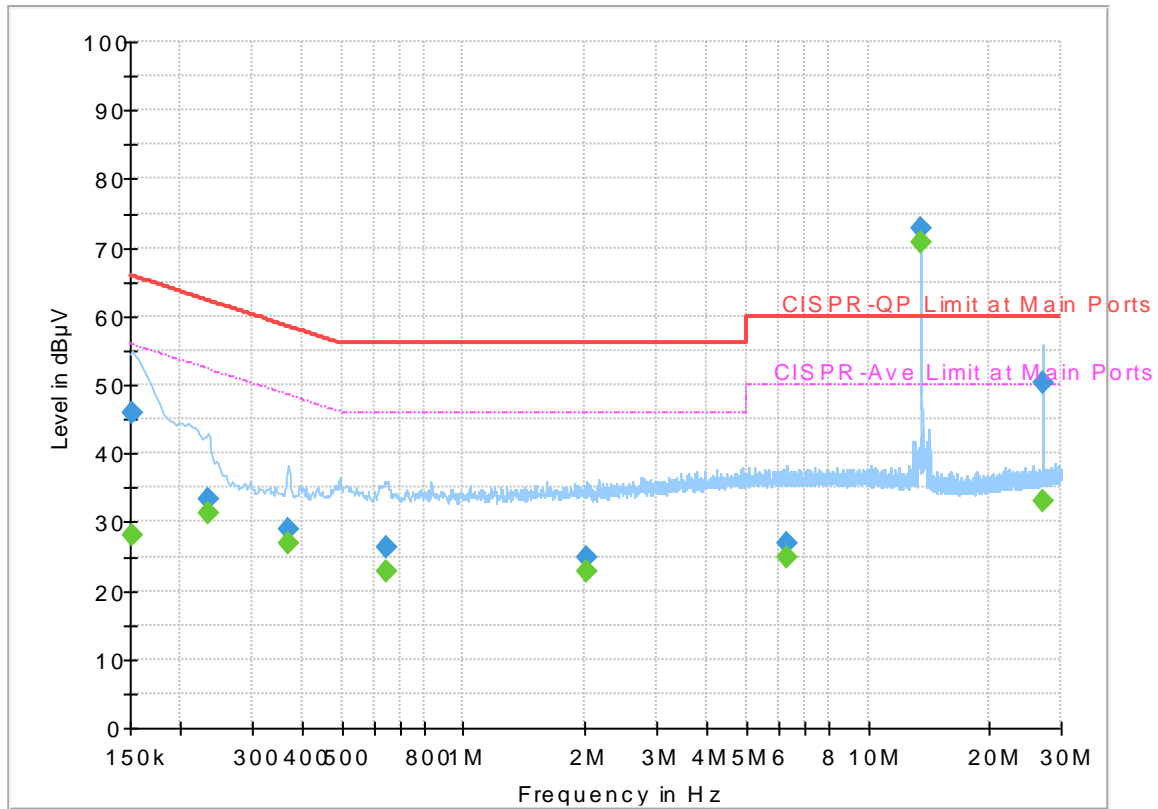
## Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.15225	---	27.28	55.88	28.6	L1	OFF	19.5
0.15225	41.7	---	65.88	24.18	L1	OFF	19.5
0.2355	---	29.5	52.25	22.75	L1	OFF	19.5
0.2355	31.52	---	62.25	30.73	L1	OFF	19.5
0.36825	---	26.74	48.54	21.8	L1	OFF	19.5
0.36825	28.6	---	58.54	29.94	L1	OFF	19.5
0.537	---	22.94	46	23.06	L1	OFF	19.5
0.537	26.37	---	56	29.63	L1	OFF	19.5
0.6405	---	23.03	46	22.97	L1	OFF	19.5
0.6405	27.74	---	56	28.26	L1	OFF	19.5
1.93425	---	22.67	46	23.33	L1	OFF	19.6
1.93425	24.67	---	56	31.33	L1	OFF	19.6
5.13375	---	24.6	50	25.4	L1	OFF	19.6
5.13375	26.6	---	60	33.4	L1	OFF	19.6
13.56	---	72.92	50	-22.92	L1	OFF	19.7
13.56	79.61	---	60	-19.61	L1	OFF	19.7
27.12075	---	44.62	50	5.38	L1	OFF	19.8
27.12075	55.14	---	60	4.86	L1	OFF	19.8

# EUT Information

Report NO : 832801  
 Test Mode : Mode 1  
 Test Voltage : 120Vac/60Hz  
 Phase : Neutral  
 Original Mode

Full Spectrum



## Final Result

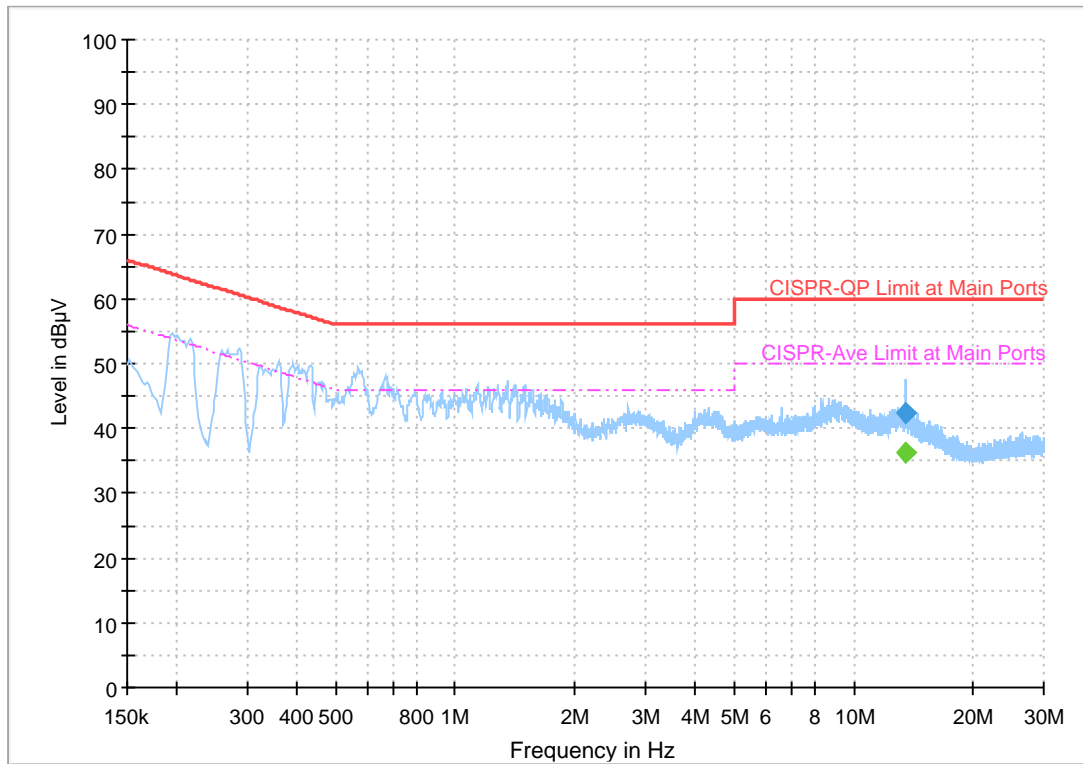
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.15225	---	28.03	55.88	27.85	N	OFF	19.5
0.15225	46	---	65.88	19.88	N	OFF	19.5
0.23325	---	31.25	52.33	21.08	N	OFF	19.5
0.23325	33.43	---	62.33	28.9	N	OFF	19.5
0.3705	---	26.87	48.49	21.62	N	OFF	19.5
0.3705	28.83	---	58.49	29.66	N	OFF	19.5
0.64275	---	22.91	46	23.09	N	OFF	19.5
0.64275	26.36	---	56	29.64	N	OFF	19.5
2.013	---	22.71	46	23.29	N	OFF	19.6
2.013	24.74	---	56	31.26	N	OFF	19.6
6.27675	---	24.75	50	25.25	N	OFF	19.6
6.27675	26.84	---	60	33.16	N	OFF	19.6
13.56	---	70.69	50	-20.69	N	OFF	19.8
13.56	72.8	---	60	-12.8	N	OFF	19.8
27.1185	---	33.11	50	16.89	N	OFF	20
27.1185	50.23	---	60	9.77	N	OFF	20



## EUT Information

Report NO : 832801  
 Test Mode : Mode 1  
 Test Voltage : 120Vac/60Hz  
 Phase : Line  
 Terminal

Full Spectrum



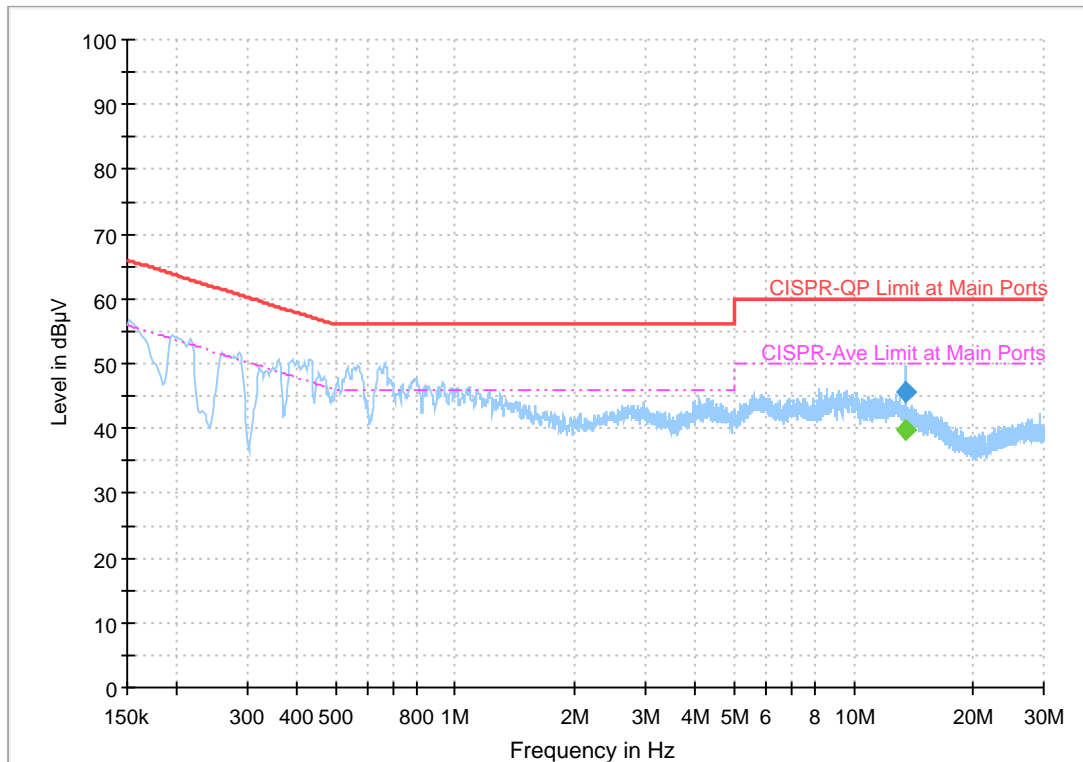
## Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
13.560000	---	36.37	50.00	13.63	L1	OFF	19.7
13.560000	42.48	---	60.00	17.52	L1	OFF	19.7

## EUT Information

Report NO : 832801  
 Test Mode : Mode 1  
 Test Voltage : 120Vac/60Hz  
 Phase : Neutral Terminal

Full Spectrum



## Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
13.560000	---	39.80	50.00	10.20	N	OFF	19.8
13.560000	45.52	---	60.00	14.48	N	OFF	19.8



### Appendix C. Radiated Spurious Emission

Test Engineer :	Alex Jheng, Fu Chen, and Wilson Wu	Temperature :	24~26°C
		Relative Humidity :	48~50%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
1		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )	
802.11b CH 01 2412MHz		2386.965	56.18	-17.82	74	43.7	26.89	15.49	29.9	359	353	P	H	
		2383.71	48.99	-5.01	54	36.56	26.84	15.49	29.9	359	353	A	H	
	*	2412	105.83	-	-	93.25	26.94	15.53	29.89	359	353	P	H	
	*	2412	102.65	-	-	90.07	26.94	15.53	29.89	359	353	A	H	
													H	
														H
			2385.18	55.8	-18.2	74	43.37	26.84	15.49	29.9	297	115	P	V
			2383.71	47.32	-6.68	54	34.89	26.84	15.49	29.9	297	115	A	V
	*		2412	102.8	-	-	90.22	26.94	15.53	29.89	297	115	P	V
	*		2412	99.62	-	-	87.04	26.94	15.53	29.89	297	115	A	V
														V
														V
802.11b CH 06 2437MHz		2348.78	53.6	-20.4	74	41.33	26.73	15.45	29.91	400	352	P	H	
		2388.12	42.45	-11.55	54	29.97	26.89	15.49	29.9	400	352	A	H	
	*	2437	106.6	-	-	93.9	27.04	15.55	29.89	400	352	P	H	
	*	2437	103.5	-	-	90.8	27.04	15.55	29.89	400	352	A	H	
			2485.65	54.13	-19.87	74	41.25	27.15	15.61	29.88	400	352	P	H
			2484.18	42.59	-11.41	54	29.71	27.15	15.61	29.88	400	352	A	H
			2386.02	53.58	-20.42	74	41.1	26.89	15.49	29.9	333	114	P	V
			2388.4	42.36	-11.64	54	29.88	26.89	15.49	29.9	333	114	A	V
	*		2437	103.16	-	-	90.46	27.04	15.55	29.89	333	114	P	V
	*		2437	100.03	-	-	87.33	27.04	15.55	29.89	333	114	A	V
			2495.52	53.67	-20.33	74	40.73	27.2	15.61	29.87	333	114	P	V
			2487.54	42.55	-11.45	54	29.62	27.2	15.61	29.88	333	114	A	V



<b>802.11b</b> <b>CH 11</b> <b>2462MHz</b>	*	2462	106.05	-	-	93.26	27.1	15.57	29.88	386	355	P	H
	*	2462	102.86	-	-	90.07	27.1	15.57	29.88	386	355	A	H
		2484.08	56.21	-17.79	74	43.33	27.15	15.61	29.88	386	355	P	H
		2488.84	46.94	-7.06	54	34.01	27.2	15.61	29.88	386	355	A	H
													H
													H
	*	2462	101.8	-	-	89.01	27.1	15.57	29.88	326	299	P	V
	*	2462	98.59	-	-	85.8	27.1	15.57	29.88	326	299	A	V
		2491.44	54.62	-19.38	74	41.69	27.2	15.61	29.88	326	299	P	V
		2488.84	44.61	-9.39	54	31.68	27.2	15.61	29.88	326	299	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 Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )	
802.11b CH 01 2412MHz		4824	40.01	-33.99	74	57.42	31.56	8.27	57.24	100	0	P	H	
													H	
													H	
													H	
			4824	38.72	-35.28	74	56.13	31.56	8.27	57.24	100	0	P	V
														V
														V
802.11b CH 06 2437MHz		4874	39.68	-34.32	74	56.73	31.63	8.49	57.17	100	0	P	H	
		7311	43.95	-30.05	74	54.38	36.16	10.68	57.27	100	0	P	H	
													H	
													H	
			4874	38.97	-35.03	74	56.02	31.63	8.49	57.17	100	0	P	V
			7311	44.22	-29.78	74	54.65	36.16	10.68	57.27	100	0	P	V
														V
802.11b CH 11 2462MHz		4924	39.21	-34.79	74	55.97	31.7	8.64	57.1	100	0	P	H	
		7386	43.73	-30.27	74	54.13	36.31	10.67	57.38	100	0	P	H	
													H	
													H	
			4924	39.17	-34.83	74	55.93	31.7	8.64	57.1	100	0	P	V
			7386	44	-30	74	54.4	36.31	10.67	57.38	100	0	P	V
														V
Remark	1. No other spurious found.													
	2. All results are PASS against Peak and Average limit line.													



2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )	
802.11g CH 01 2412MHz		2389.8	56.97	-17.03	74	44.48	26.89	15.49	29.89	399	353	P	H	
		2390	46.53	-7.47	54	34.04	26.89	15.49	29.89	399	353	A	H	
	*	2412	103.26	-	-	90.68	26.94	15.53	29.89	399	353	P	H	
	*	2412	95.56	-	-	82.98	26.94	15.53	29.89	399	353	A	H	
													H	
													H	
			2390	56.23	-17.77	74	43.74	26.89	15.49	29.89	266	111	P	V
			2389.905	46.03	-7.97	54	33.54	26.89	15.49	29.89	266	111	A	V
	*		2412	102.24	-	-	89.66	26.94	15.53	29.89	266	111	P	V
	*		2412	93.99	-	-	81.41	26.94	15.53	29.89	266	111	A	V
													V	
													V	
802.11g CH 06 2437MHz		2382.8	53.08	-20.92	74	40.65	26.84	15.49	29.9	400	351	P	H	
		2386.16	43.38	-10.62	54	30.9	26.89	15.49	29.9	400	351	A	H	
	*	2437	105.44	-	-	92.74	27.04	15.55	29.89	400	351	P	H	
	*	2437	96.55	-	-	83.85	27.04	15.55	29.89	400	351	A	H	
			2485.09	53.32	-20.68	74	40.44	27.15	15.61	29.88	400	351	P	H
			2487.75	43.51	-10.49	54	30.58	27.2	15.61	29.88	400	351	A	H
			2378.74	52.71	-21.29	74	40.28	26.84	15.49	29.9	292	108	P	V
			2387.84	43.27	-10.73	54	30.79	26.89	15.49	29.9	292	108	A	V
	*		2437	100.68	-	-	87.98	27.04	15.55	29.89	292	108	P	V
	*		2437	93.26	-	-	80.56	27.04	15.55	29.89	292	108	A	V
			2488.45	53.27	-20.73	74	40.34	27.2	15.61	29.88	292	108	P	V
			2484.67	43.62	-10.38	54	30.74	27.15	15.61	29.88	292	108	A	V



<b>802.11g</b> <b>CH 11</b> <b>2462MHz</b>	*	2462	105.4	-	-	92.61	27.1	15.57	29.88	384	351	P	H
	*	2462	95.88	-	-	83.09	27.1	15.57	29.88	384	351	A	H
		2484	58.05	-15.95	74	45.17	27.15	15.61	29.88	384	351	P	H
		2484.24	47.2	-6.8	54	34.32	27.15	15.61	29.88	384	351	A	H
													H
													H
	*	2462	101.8	-	-	89.01	27.1	15.57	29.88	286	111	P	V
	*	2462	93.72	-	-	80.93	27.1	15.57	29.88	286	111	A	V
		2483.64	55.8	-18.2	74	42.92	27.15	15.61	29.88	286	111	P	V
		2483.72	45.6	-8.4	54	32.72	27.15	15.61	29.88	286	111	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 Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11g CH 01 2412MHz		4824	38.1	-35.9	74	55.51	31.56	8.27	57.24	100	0	P	H
													H
													H
													H
		4824	38.39	-35.61	74	55.8	31.56	8.27	57.24	100	0	P	V
													V
													V
802.11g CH 06 2437MHz		4874	39.18	-34.82	74	56.23	31.63	8.49	57.17	100	0	P	H
		7311	42.96	-31.04	74	53.39	36.16	10.68	57.27	100	0	P	H
													H
													H
		4874	38.69	-35.31	74	55.74	31.63	8.49	57.17	100	0	P	V
		7311	43.51	-30.49	74	53.94	36.16	10.68	57.27	100	0	P	V
													V
802.11g CH 11 2462MHz		4924	39.02	-34.98	74	55.78	31.7	8.64	57.1	100	0	P	H
		7386	44.85	-29.15	74	55.25	36.31	10.67	57.38	100	0	P	H
													H
													H
		4924	38.8	-35.2	74	55.56	31.7	8.64	57.1	100	0	P	V
		7386	43.87	-30.13	74	54.27	36.31	10.67	57.38	100	0	P	V
													V
Remark	1. No other spurious found.												
	2. All results are PASS against Peak and Average limit line.												





2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )	
802.11n HT20 CH 01 2412MHz		2389.485	59.38	-14.62	74	46.9	26.89	15.49	29.9	360	355	P	H	
		2389.8	47.42	-6.58	54	34.93	26.89	15.49	29.89	360	355	A	H	
	*	2412	103.12	-	-	90.54	26.94	15.53	29.89	360	355	P	H	
	*	2412	95.03	-	-	82.45	26.94	15.53	29.89	360	355	A	H	
													H	
														H
			2387.49	56.44	-17.56	74	43.96	26.89	15.49	29.9	266	126	P	V
			2390	44.91	-9.09	54	32.42	26.89	15.49	29.89	266	126	A	V
		*	2412	99.17	-	-	86.59	26.94	15.53	29.89	266	126	P	V
		*	2412	91.4	-	-	78.82	26.94	15.53	29.89	266	126	A	V
													V	
													V	
802.11n HT20 CH 06 2437MHz		2380	54.06	-19.94	74	41.63	26.84	15.49	29.9	400	354	P	H	
		2388.54	43.14	-10.86	54	30.66	26.89	15.49	29.9	400	354	A	H	
	*	2437	102.73	-	-	90.03	27.04	15.55	29.89	400	354	P	H	
	*	2437	95.12	-	-	82.42	27.04	15.55	29.89	400	354	A	H	
			2497.13	53.32	-20.68	74	40.38	27.2	15.61	29.87	400	354	P	H
			2487.19	43.36	-10.64	54	30.48	27.15	15.61	29.88	400	354	A	H
			2384.2	53.44	-20.56	74	41.01	26.84	15.49	29.9	300	112	P	V
			2385.04	43.18	-10.82	54	30.75	26.84	15.49	29.9	300	112	A	V
		*	2437	99.05	-	-	86.35	27.04	15.55	29.89	300	112	P	V
		*	2437	91.47	-	-	78.77	27.04	15.55	29.89	300	112	A	V
		2486.77	53.69	-20.31	74	40.81	27.15	15.61	29.88	300	112	P	V	
		2483.83	43.38	-10.62	54	30.5	27.15	15.61	29.88	300	112	A	V	



<b>802.11n</b> <b>HT20</b> <b>CH 11</b> <b>2462MHz</b>	*	2462	102.46	-	-	89.67	27.1	15.57	29.88	386	354	P	H
	*	2462	94.77	-	-	81.98	27.1	15.57	29.88	386	354	A	H
		2483.96	58.85	-15.15	74	45.97	27.15	15.61	29.88	386	354	P	H
		2483.8	47.56	-6.44	54	34.68	27.15	15.61	29.88	386	354	A	H
													H
													H
	*	2462	99.37	-	-	86.58	27.1	15.57	29.88	286	125	P	V
	*	2462	91.19	-	-	78.4	27.1	15.57	29.88	286	125	A	V
		2484.88	55.07	-18.93	74	42.19	27.15	15.61	29.88	286	125	P	V
		2483.88	45.09	-8.91	54	32.21	27.15	15.61	29.88	286	125	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 HT20 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )	
802.11n HT20 CH 01 2412MHz		4824	38.42	-35.58	74	55.83	31.56	8.27	57.24	100	0	P	H	
													H	
													H	
													H	
			4824	37.99	-36.01	74	55.4	31.56	8.27	57.24	100	0	P	V
														V
														V
802.11n HT20 CH 06 2437MHz		4874	38.47	-35.53	74	55.52	31.63	8.49	57.17	100	0	P	H	
		7311	43.45	-30.55	74	53.88	36.16	10.68	57.27	100	0	P	H	
													H	
													H	
			4874	38.05	-35.95	74	55.1	31.63	8.49	57.17	100	0	P	V
			7311	43.25	-30.75	74	53.68	36.16	10.68	57.27	100	0	P	V
														V
802.11n HT20 CH 11 2462MHz		4924	38.13	-35.87	74	54.89	31.7	8.64	57.1	100	0	P	H	
		7386	43.34	-30.66	74	53.74	36.31	10.67	57.38	100	0	P	H	
													H	
													H	
			4924	37.62	-36.38	74	54.38	31.7	8.64	57.1	100	0	P	V
			7386	44.46	-29.54	74	54.86	36.31	10.67	57.38	100	0	P	V
														V
Remark	1. No other spurious found.													
	2. All results are PASS against Peak and Average limit line.													



Emission below 1GHz

2.4GHz WIFI 802.11b (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
1		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )	
2.4GHz 802.11b LF		103.44	29.17	-14.33	43.5	43.65	16.45	1.36	32.29	-	-	P	H	
		207.12	37.22	-6.28	43.5	52.53	15.15	1.8	32.26	100	0	P	H	
		294.87	35.18	-10.82	46	46.04	19.18	2.1	32.14	-	-	P	H	
		322.4	33.55	-12.45	46	43.97	19.55	2.16	32.13	-	-	P	H	
		556.9	34.53	-11.47	46	38.13	25.74	2.87	32.21	-	-	P	H	
		973.4	33.7	-20.3	54	30.02	30.81	3.72	30.85	-	-	P	H	
														H
														H
														H
														H
														H
														H
			31.89	27.64	-12.36	40	35.65	23.54	0.79	32.34	-	-	P	V
			67.8	29.92	-10.08	40	48.73	12.34	1.16	32.31	-	-	P	V
			207.66	34.11	-9.39	43.5	49.42	15.15	1.8	32.26	100	0	P	V
			338.5	26.88	-19.12	46	36.69	20.1	2.23	32.14	-	-	P	V
			491.1	31.08	-14.92	46	36.8	23.82	2.66	32.2	-	-	P	V
			622	34.03	-11.97	46	37.34	25.91	2.98	32.2	-	-	P	V
														V
														V
													V	
													V	
													V	
													V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.													



**Note symbol**

*	<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>Peak</b> or <b>Average</b>
H/V	<b>Horizontal</b> or <b>Vertical</b>



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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =  
Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

**For Peak Limit @ 2390MHz:**

1. Level(dBμV/m)  
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)  
= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)  
= 55.45 (dBμV/m)
2. Over Limit(dB)  
= Level(dBμV/m) – Limit Line(dBμV/m)  
= 55.45(dBμV/m) – 74(dBμV/m)  
= -18.55(dB)

**For Average Limit @ 2390MHz:**

1. Level(dBμV/m)  
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)  
= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)  
= 43.54 (dBμV/m)
2. Over Limit(dB)  
= Level(dBμV/m) – Limit Line(dBμV/m)  
= 43.54(dBμV/m) – 54(dBμV/m)  
= -10.46(dB)

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



## Appendix D. Radiated Spurious Emission Plots

Test Engineer :	Alex Jheng, Fu Chen, and Wilson Wu	Temperature :	24~26°C
		Relative Humidity :	48~50%

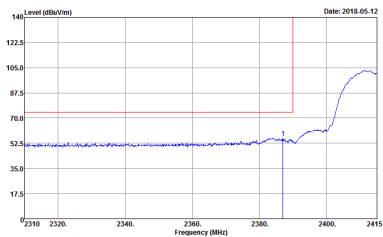
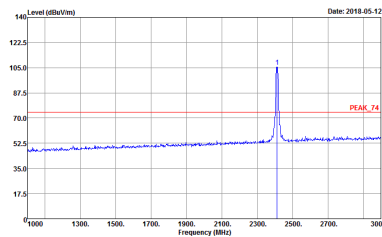
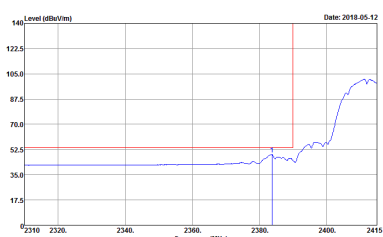
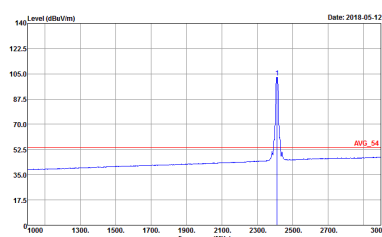
**Note symbol**

-L	Low channel location
-R	High channel location



2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

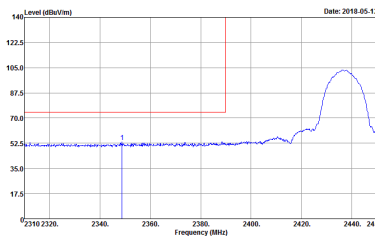
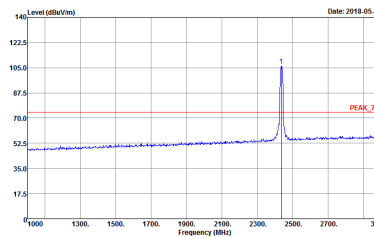
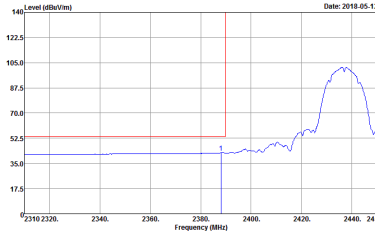
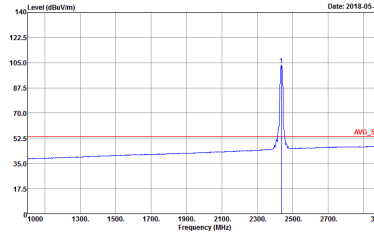
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Fundamental
<b>Peak</b>	 <p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 7</p>	 <p>Site : 03CH13-HY            Condition : PEAK_74 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 7</p>
<b>Avg.</b>	 <p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 7</p>	 <p>Site : 03CH13-HY            Condition : AVG_54 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 7</p>



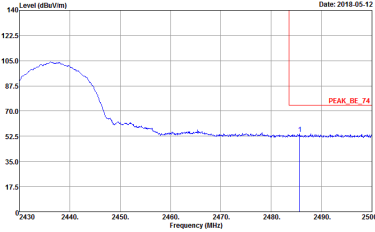
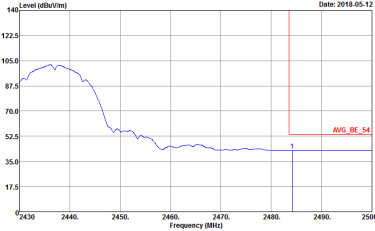


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Vertical	Fundamental
Peak	<p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 7</p>	<p>Site : 03CH13-HY            Condition : PEAK_74 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 7</p>
	<p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 7</p>	<p>Site : 03CH13-HY            Condition : AVG_54 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 7</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 <p>Date: 2018-05-12</p> <p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : B</p>	 <p>Date: 2018-05-12</p> <p>Site : 03CH13-HY            Condition : PEAK_74 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : B</p>
Avg.	 <p>Date: 2018-05-12</p> <p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:0.010KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : B</p>	 <p>Date: 2018-05-12</p> <p>Site : 03CH13-HY            Condition : AVG_54 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:0.010KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : B</p>

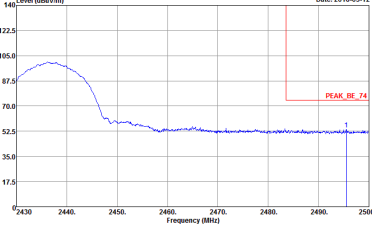
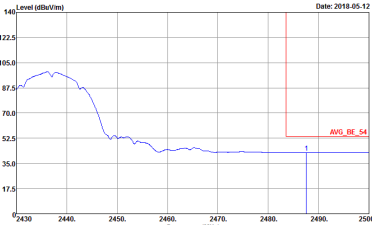


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Horizontal	Fundamental
<p><b>Peak</b></p>	 <p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 HORIZONTAL            : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : B</p>	<p>Left blank</p>
<p><b>Avg.</b></p>	 <p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 HORIZONTAL            : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : B</p>	<p>Left blank</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Vertical	Fundamental
<b>Peak</b>	<p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 VERTICAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : B</p>	<p>Site : 03CH13-HY            Condition : PEAK_74 3m HORN_91200_1241 VERTICAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : B</p>
<b>Avg.</b>	<p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 VERTICAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : B</p>	<p>Site : 03CH13-HY            Condition : AVG_54 3m HORN_91200_1241 VERTICAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : B</p>

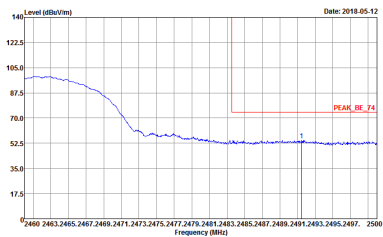
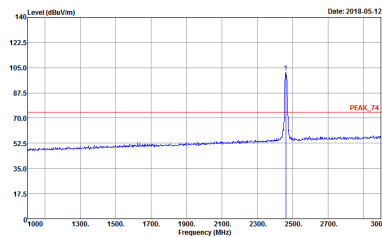
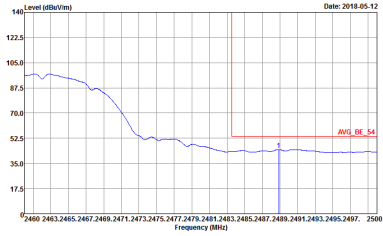
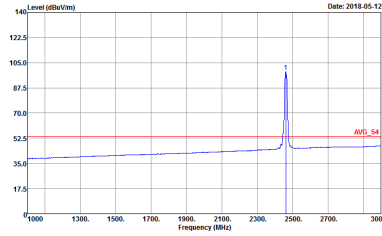


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 VERTICAL            : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : B</p>	Left blank
Avg.	 <p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 VERTICAL            : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : B</p>	Left blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Fundamental
Peak	<p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 9</p>	<p>Site : 03CH13-HY            Condition : PEAK_74 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 9</p>
Avg.	<p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:0.010KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 9</p>	<p>Site : 03CH13-HY            Condition : AVG_54 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:0.010KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 9</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Vertical	Fundamental
Peak	 <p>Date: 2018-05-12</p> <p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 VERTICAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 9</p>	 <p>Date: 2018-05-12</p> <p>Site : 03CH13-HY            Condition : PEAK_74 3m HORN_91200_1241 VERTICAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 9</p>
Avg.	 <p>Date: 2018-05-12</p> <p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 VERTICAL            RBW:1000.000KHz VBW:0.010KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 9</p>	 <p>Date: 2018-05-12</p> <p>Site : 03CH13-HY            Condition : AVG_54 3m HORN_91200_1241 VERTICAL            RBW:1000.000KHz VBW:0.010KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 9</p>



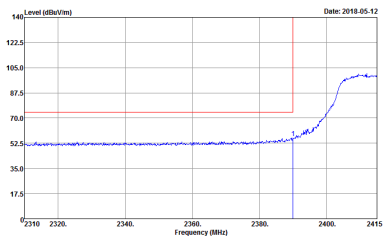
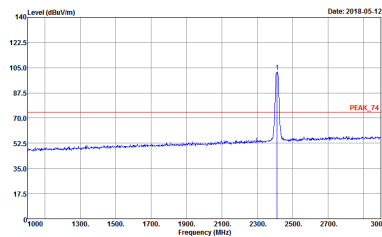
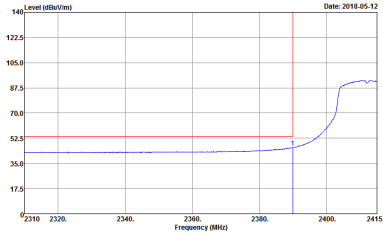
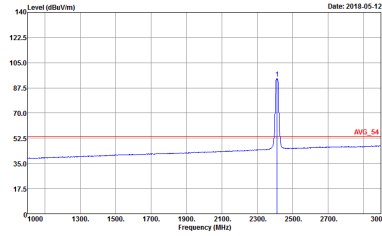
2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

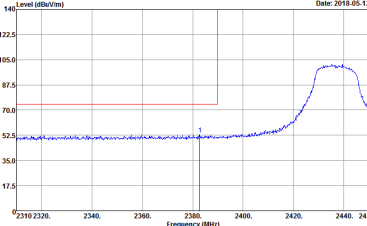
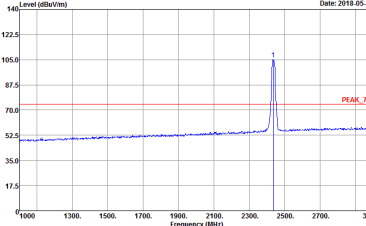
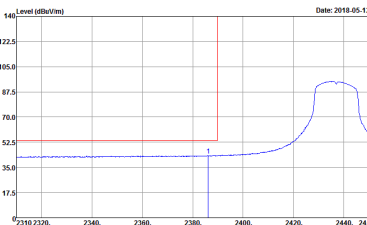
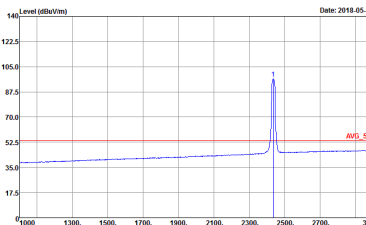
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Fundamental
<b>Peak</b>	<p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 10</p>	<p>Site : 03CH13-HY            Condition : PEAK_74 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 10</p>
<b>Avg.</b>	<p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 10</p>	<p>Site : 03CH13-HY            Condition : AVG_54 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 10</p>



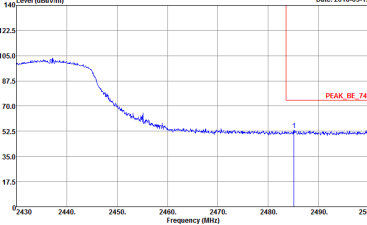
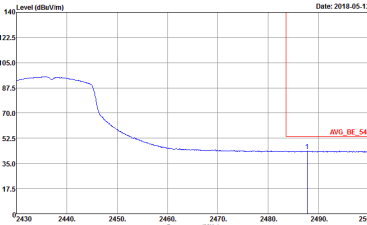


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Vertical	Fundamental
Peak	 <p>Date: 2018-05-12</p> <p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 10</p>	 <p>Date: 2018-05-12</p> <p>Site : 03CH13-HY            Condition : PEAK_74 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 10</p>
Avg.	 <p>Date: 2018-05-12</p> <p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 10</p>	 <p>Date: 2018-05-12</p> <p>Site : 03CH13-HY            Condition : AVG_54 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 10</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 11</p>	 <p>Site : 03CH13-HY            Condition : PEAK_74 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 11</p>
Avg.	 <p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 11</p>	 <p>Site : 03CH13-HY            Condition : AVG_54 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 11</p>

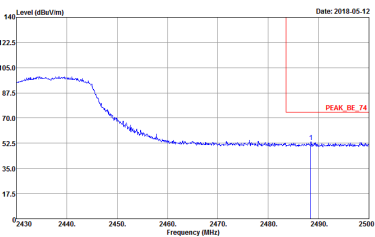
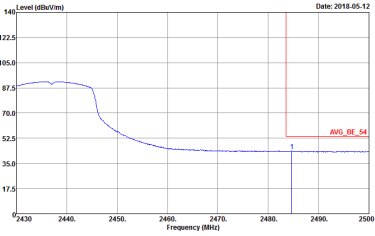


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Horizontal	Fundamental
<p><b>Peak</b></p>	 <p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 11</p>	<p>Left blank</p>
<p><b>Avg.</b></p>	 <p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 11</p>	<p>Left blank</p>

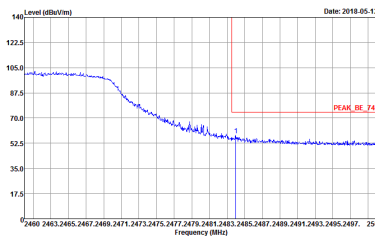
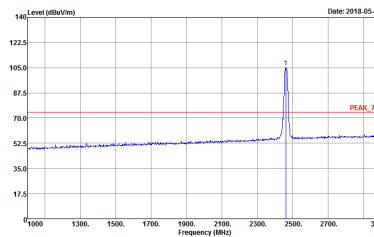
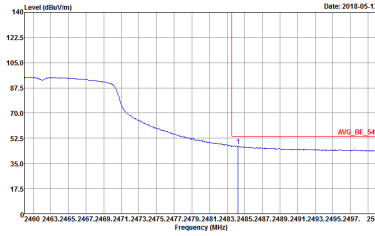
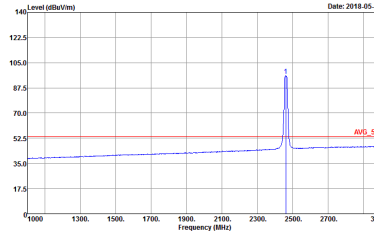


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Vertical	Fundamental
<b>Peak</b>	<p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 11</p>	<p>Site : 03CH13-HY            Condition : PEAK_74 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 11</p>
<b>Avg.</b>	<p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 11</p>	<p>Site : 03CH13-HY            Condition : AVG_54 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 11</p>

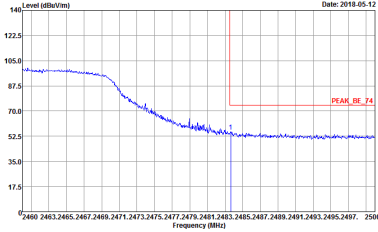
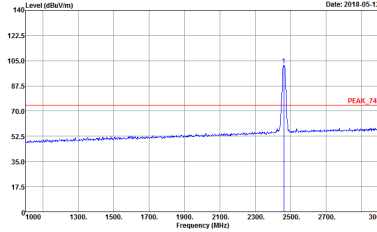
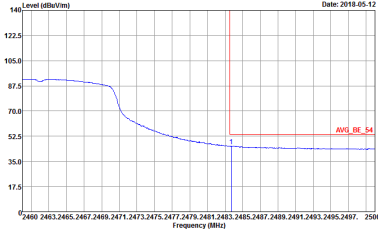
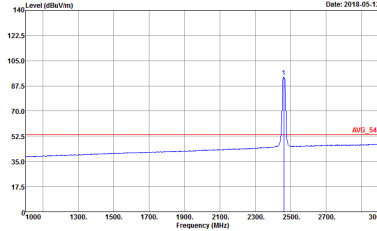


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Vertical	Fundamental
<p><b>Peak</b></p>	 <p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 11</p>	<p>Left Blank</p>
<p><b>Avg.</b></p>	 <p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 11</p>	<p>Left Blank</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 12</p>	 <p>Site : 03CH13-HY            Condition : PEAK_74 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 12</p>
Avg.	 <p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:1000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 12</p>	 <p>Site : 03CH13-HY            Condition : AVG_54 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:1000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 12</p>

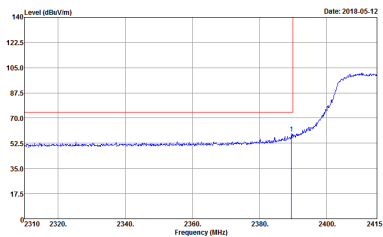
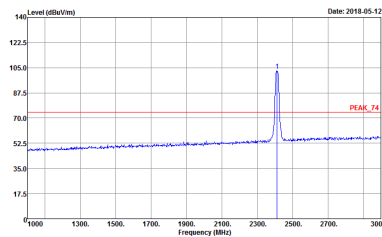
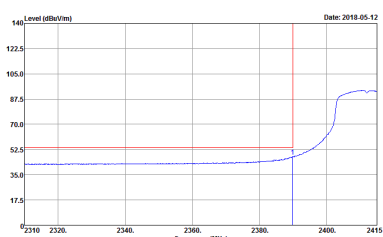
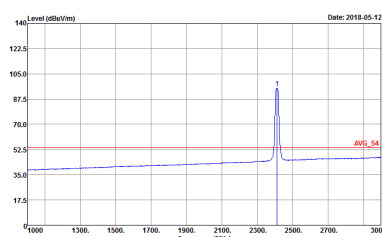


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 VERTICAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 12</p>	 <p>Site : 03CH13-HY            Condition : PEAK_74 3m HORN_91200_1241 VERTICAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 12</p>
Avg.	 <p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 VERTICAL            RBW:1000.000KHz VBW:1000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 12</p>	 <p>Site : 03CH13-HY            Condition : AVG_54 3m HORN_91200_1241 VERTICAL            RBW:1000.000KHz VBW:1000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 12</p>



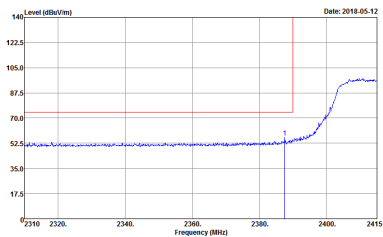
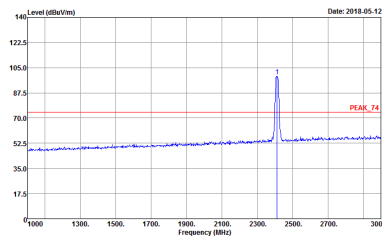
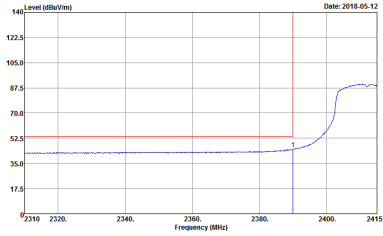
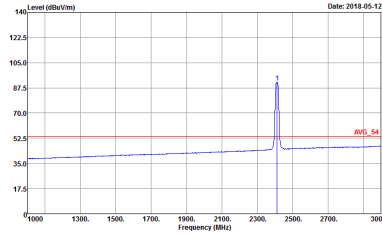
2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Fundamental
<b>Peak</b>	 <p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 13</p>	 <p>Site : 03CH13-HY            Condition : PEAK_74 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 13</p>
<b>Avg.</b>	 <p>Site : 03CH13-HY            Condition : AV6_BE_54 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:1.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 13</p>	 <p>Site : 03CH13-HY            Condition : AV6_54 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:1.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 13</p>



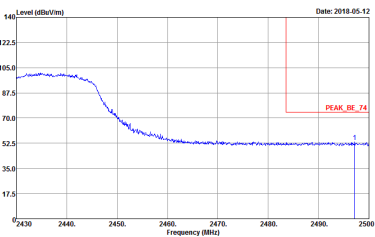
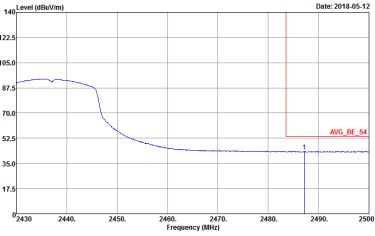


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Vertical	Fundamental
Peak	 <p>Date: 2018-05-12</p> <p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 13</p>	 <p>Date: 2018-05-12</p> <p>Site : 03CH13-HY            Condition : PEAK_74 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 13</p>
Avg.	 <p>Date: 2018-05-12</p> <p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 13</p>	 <p>Date: 2018-05-12</p> <p>Site : 03CH13-HY            Condition : AVG_54 3m HORN_91200_1241 VERTICAL            Detector : Peak            Project : 832801            Mode : 13</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Horizontal	Fundamental
<b>Peak</b>	<p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 14</p>	<p>Site : 03CH13-HY            Condition : PEAK_74 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 14</p>
<b>Avg.</b>	<p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 14</p>	<p>Site : 03CH13-HY            Condition : AVG_54 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 14</p>

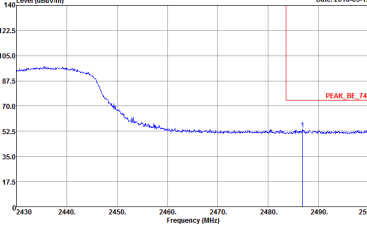
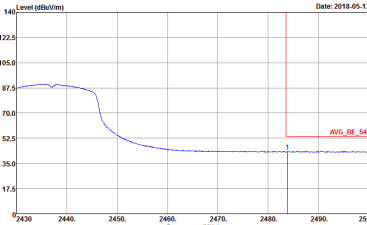


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Horizontal	Fundamental
<p><b>Peak</b></p>	 <p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 14</p>	<p>Left blank</p>
<p><b>Avg.</b></p>	 <p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 HORIZONTAL            Detector : Peak            Project : 832801            Mode : 14</p>	<p>Left blank</p>

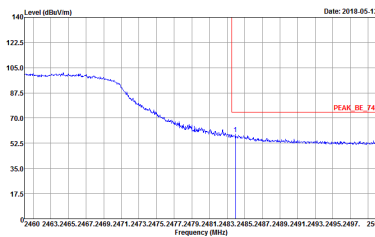
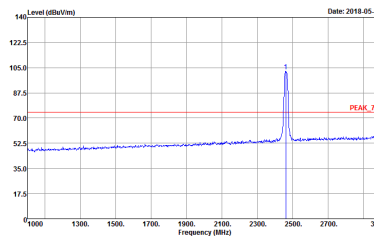
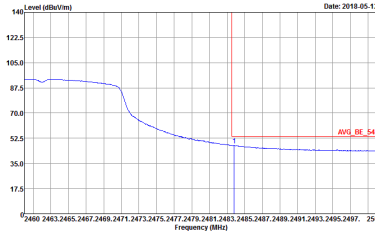
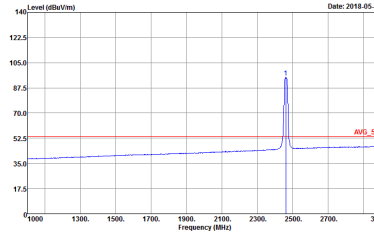


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	<p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 VERTICAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 14</p>	<p>Site : 03CH13-HY            Condition : PEAK_74 3m HORN_91200_1241 VERTICAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 14</p>
	<p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 VERTICAL            RBW:1000.000KHz VBW:1000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 14</p>	<p>Site : 03CH13-HY            Condition : AVG_54 3m HORN_91200_1241 VERTICAL            RBW:1000.000KHz VBW:1000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 14</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH13-HY  Condition : PEAK_BE_74 3m HORN_91200_1241 VERTICAL  : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto  Detector : Peak  Project : 832801  Mode : 14</p>	Left Blank
Avg.	 <p>Site : 03CH13-HY  Condition : AVG_BE_54 3m HORN_91200_1241 VERTICAL  : RBW:1000.000KHz VBW:1000KHz SWT:Auto  Detector : Peak  Project : 832801  Mode : 14</p>	Left Blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH13-HY            Condition : PEAK_BE_74 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 15</p>	 <p>Site : 03CH13-HY            Condition : PEAK_74 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:3000.000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 15</p>
Avg.	 <p>Site : 03CH13-HY            Condition : AVG_BE_54 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:1000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 15</p>	 <p>Site : 03CH13-HY            Condition : AVG_54 3m HORN_91200_1241 HORIZONTAL            RBW:1000.000KHz VBW:1000KHz SWT:Auto            Detector : Peak            Project : 832801            Mode : 15</p>



WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Vertical	Fundamental
Peak	<p>Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 832801 Mode : 15</p>	<p>Site : 03CH13-HY Condition : PEAK_74 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 832801 Mode : 15</p>
	<p>Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 832801 Mode : 15</p>	<p>Site : 03CH13-HY Condition : AVG_54 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 832801 Mode : 15</p>



2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

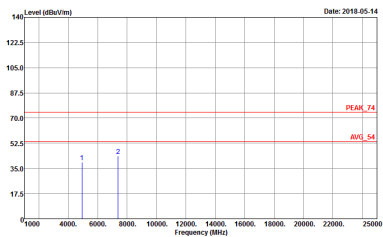
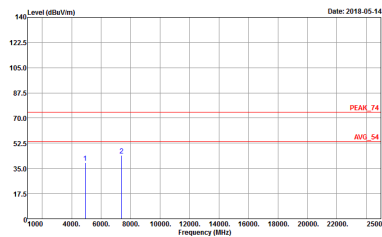
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH13-HY          Condition : PEAK_74 3m SHF_HORN_576 HORIZONTAL          Detector : Peak          Project : 832801          Mode : 7</p>	<p>Site : 03CH13-HY          Condition : PEAK_74 3m SHF_HORN_576 VERTICAL          Detector : Peak          Project : 832801          Mode : 7</p>





<b>WIFI</b>	<b>2.4GHz 2400~2483.5MHz Harmonic @ 3m</b>	
<b>ANT</b>	<b>802.11b CH06 2437MHz</b>	
<b>1</b>	<b>Horizontal</b>	<b>Vertical</b>
<b>Peak Avg.</b>	<p>Site : 03CH13-11Y Condition : PEAK_74 3m SHF_HORN_576 HORIZONTAL Detector : Peak Project : 832801 Mode : S</p>	<p>Site : 03CH13-11Y Condition : PEAK_74 3m SHF_HORN_576 VERTICAL Detector : Peak Project : 832801 Mode : S</p>

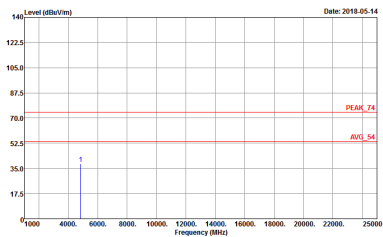
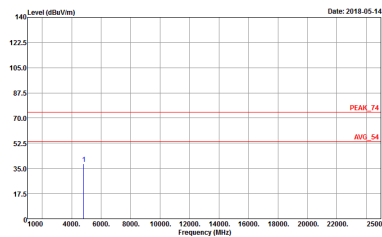


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Vertical
<p><b>Peak</b></p> <p><b>Avg.</b></p>	 <p>Site : 03CH13-11Y          Condition : PEAK_74 3m SHF_HORN_576 HORIZONTAL          Detector : Peak          Project : 832801          Mode : -9</p>	 <p>Site : 03CH13-11Y          Condition : PEAK_74 3m SHF_HORN_576 VERTICAL          Detector : Peak          Project : 832801          Mode : -9</p>

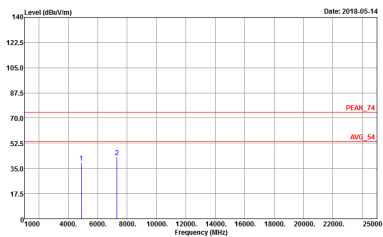
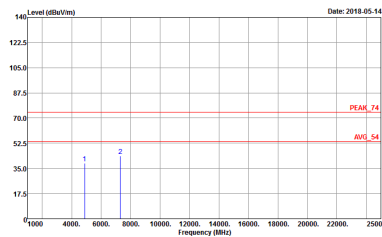


2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Vertical
<p>Peak Avg.</p>	 <p>Site : 03CH13-HY          Condition : PEAK_74 3m SHF_HORN_576 HORIZONTAL          Detector : Peak          Project : 832801          Mode : 10</p>	 <p>Site : 03CH13-HY          Condition : PEAK_74 3m SHF_HORN_576 VERTICAL          Detector : Peak          Project : 832801          Mode : 10</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1	Horizontal	Vertical
<p><b>Peak</b></p> <p><b>Avg.</b></p>	 <p>Site : 03CH13-11Y          Condition : PEAK_74 3m SHF_HORN_576 HORIZONTAL          Detector : Peak          Project : 832801          Mode : 11</p>	 <p>Site : 03CH13-11Y          Condition : PEAK_74 3m SHF_HORN_576 VERTICAL          Detector : Peak          Project : 832801          Mode : 11</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Vertical
<p><b>Peak</b></p> <p><b>Avg.</b></p>	<p>Site : 03CH13-11Y          Condition : PEAK_74 3m SHF_HORN_576 HORIZONTAL          Detector : Peak          Project : 832801          Mode : 12</p>	<p>Site : 03CH13-11Y          Condition : PEAK_74 3m SHF_HORN_576 VERTICAL          Detector : Peak          Project : 832801          Mode : 12</p>

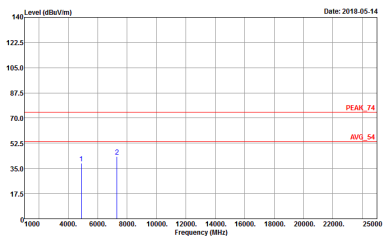
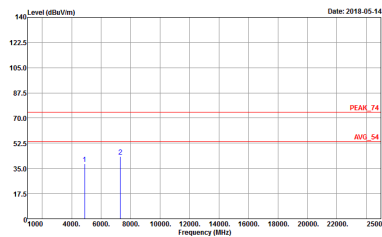


**2.4GHz 2400~2483.5MHz**

**WIFI 802.11n HT20 (Harmonic @ 3m)**

<b>WIFI</b>	<b>2.4GHz 2400~2483.5MHz Harmonic @ 3m</b>	
<b>ANT</b>	<b>802.11n HT20 CH01 2412MHz</b>	
<b>1</b>	<b>Horizontal</b>	<b>Vertical</b>
<b>Peak Avg.</b>	<p>Site : 03CH13-HY          Condition : PEAK_74 3m SHF_HORN_576 HORIZONTAL          Detector : Peak          Project : 832801          Mode : 13</p>	<p>Site : 03CH13-HY          Condition : PEAK_74 3m SHF_HORN_576 VERTICAL          Detector : Peak          Project : 832801          Mode : 13</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
1	Horizontal	Vertical
<p><b>Peak</b></p> <p><b>Avg.</b></p>	 <p>Site : 03CHE3-11Y          Condition : PEAK_74 3m SHF_HORN_576 HORIZONTAL          Detector : Peak          Project : 832801          Mode : 14</p>	 <p>Site : 03CHE3-11Y          Condition : PEAK_74 3m SHF_HORN_576 VERTICAL          Detector : Peak          Project : 832801          Mode : 14</p>

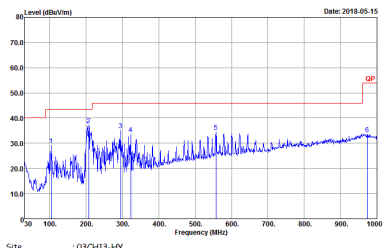
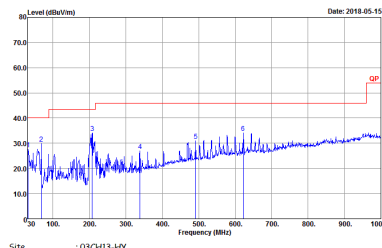


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH13-11Y Condition : PEAK_74 3m SHF_HORN_576 HORIZONTAL Detector : Peak Project : 832801 Mode : 15</p>	<p>Site : 03CH13-11Y Condition : PEAK_74 3m SHF_HORN_576 VERTICAL Detector : Peak Project : 832801 Mode : 15</p>





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

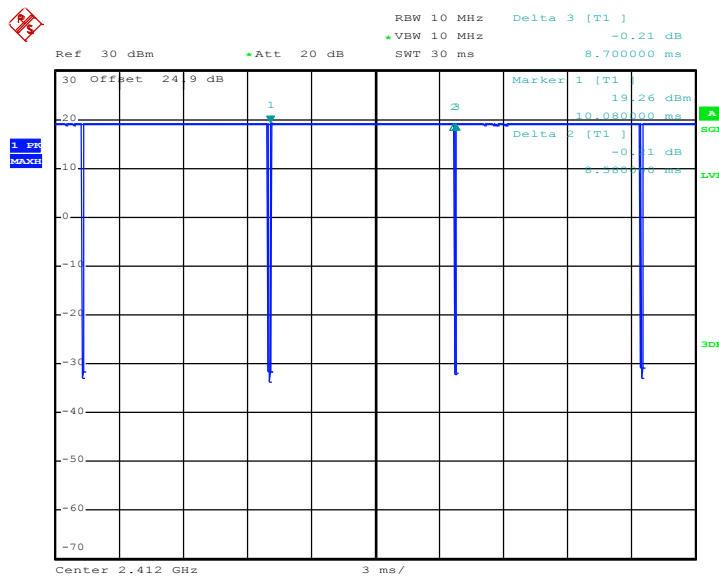
WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11b LF	
1	Horizontal	Vertical
QP / Peak	 <p>Site : 03CH13-HY Condition : 1 QP 3m BTL06_40103 HORIZONTAL Detector : Peak Project : 832801 Mode : 18</p>	 <p>Site : 03CH13-HY Condition : 1 QP 3m BTL06_40103 VERTICAL Detector : Peak Project : 832801 Mode : 18</p>



### Appendix E. Duty Cycle Plots

Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
802.11b	98.62	-	-	10Hz	0.06
802.11g	92.96	1428	0.70	1kHz	0.32
2.4GHz 802.11n HT20	92.56	1344	0.74	1kHz	0.34

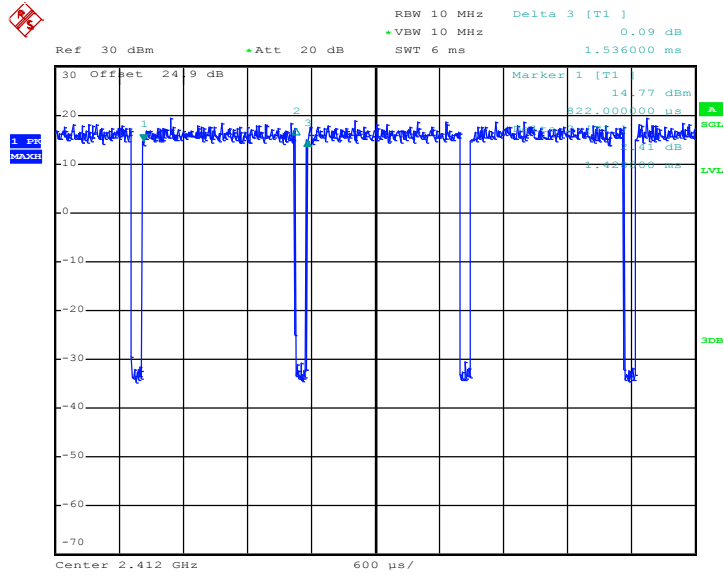
#### 802.11b



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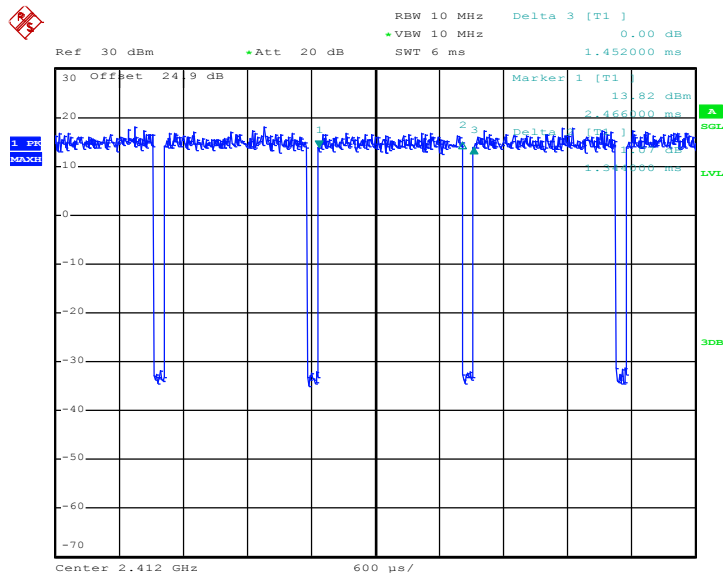


### 802.11g



Date: 18.MAY.2018 22:10:22

### 802.11n HT20



Date: 18.MAY.2018 22:18:29