

FCC RF Test Report

APPLICANT : Acer Incorporated
EQUIPMENT : WagTag
BRAND NAME : Pawbo
MODEL NAME : TK010
FCC ID : HLZTK010
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Aug. 02, 2017 and testing was completed on Sep. 13, 2017. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

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



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR780201C	Rev. 01	Initial issue of report	Nov. 08, 2017

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	99% Bandwidth	-	Pass	-
3.2	15.247(b)	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 1.29 dB at 4924.0 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 14.8 dB at 0.158 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

Acer Incorporated

8F., No. 88, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 22181, Taiwan

1.2 Manufacturer

Shanghai Sunrise Simcom Limited

No.888, Shengli Road, Qingpu Industrial Park, Shanghai, P. R. China

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	WagTag
Brand Name	Pawbo
Model Name	TK010
FCC ID	HLZTK010
EUT supports Radios application	GPRS/EGPRS/WCDMA/HSPA/HSPA+(16QAM uplink is not supported)/ WLAN 2.4GHz 802.11b/g/n HT20/ Bluetooth v3.0 + EDR/Bluetooth v4.0 LE
IMEI/SN Code	Conducted: 358919089992522 Conduction: JROVO74DDIJJGYTK Radiation: JJRGDEIJNN9T85OZ
HW Version	V1.01
SW Version	V1.1.0008
EUT Stage	Production Unit

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz
Maximum (Peak) Output Power to antenna	802.11b : 17.77 dBm (0.0598 W) 802.11g : 20.10 dBm (0.1023 W) 802.11n HT20 : 20.20 dBm (0.1047 W)
99% Occupied Bandwidth	802.11b : 12.85MHz 802.11g : 17.55MHz 802.11n HT20 : 18.30MHz
Antenna Type / Gain	Monopole Antenna with gain -1.50 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 Modification of EUT

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

1.6 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1098 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	Sporton Site No.		
	TH05-HY	CO05-HY	03CH13-HY

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

1.7 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

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: conducted emission (150 kHz to 30 MHz) and radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.

2.1 Carrier Frequency and Channel

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

2.2 Test Mode

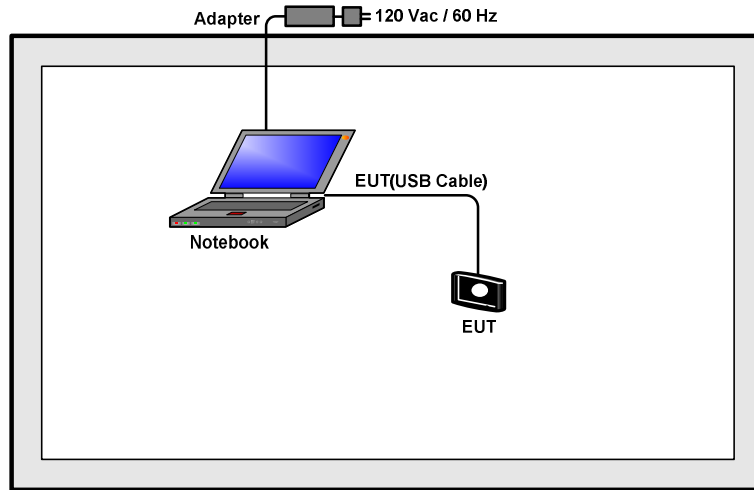
Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates as below table.

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

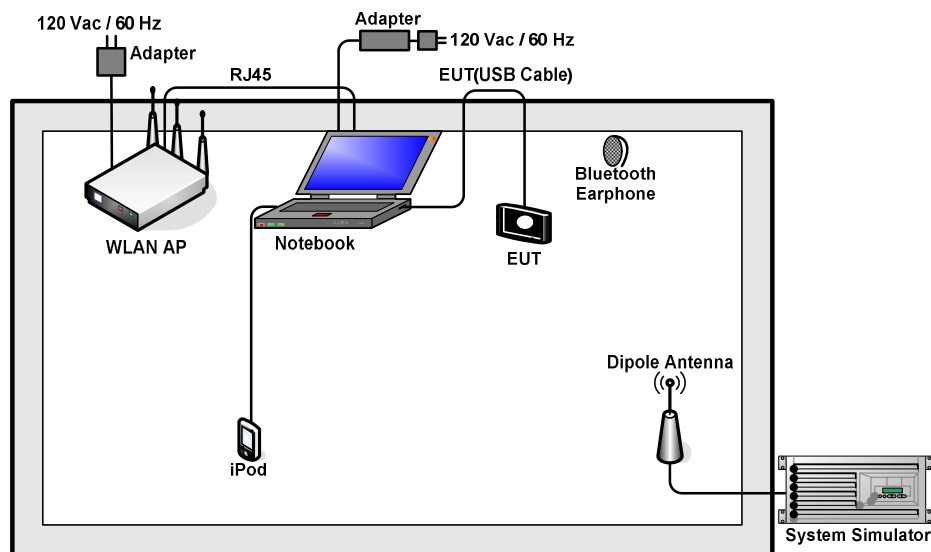
Test Cases	
AC Conducted Emission	Mode 1: GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Notebook)
Remark: For Radiated TCs, The tests were performance with USB Cable charging from Notebook.	

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8m
2.	Bluetooth Earphone	SonyErricsson	MW600	PY700A2029	N/A	N/A
3.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8m
4.	Notebook	Dell	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	iPod	Apple	A1285	DoC	Shielded, 1.0m	N/A

2.5 EUT Operation Test Setup

For WLAN function, the engineering test program was provided and enabled to make EUT continuous transmit/receive.

For AC power line conducted emissions, the EUT was set to connect with the Notebook under large package sizes transmission.

2.6 Measurement Results Explanation Example

For all conducted test items:

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

Offset(dB) = 25.4 (dB)

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

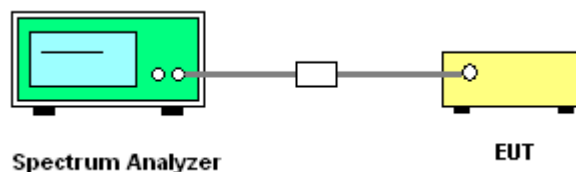
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

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

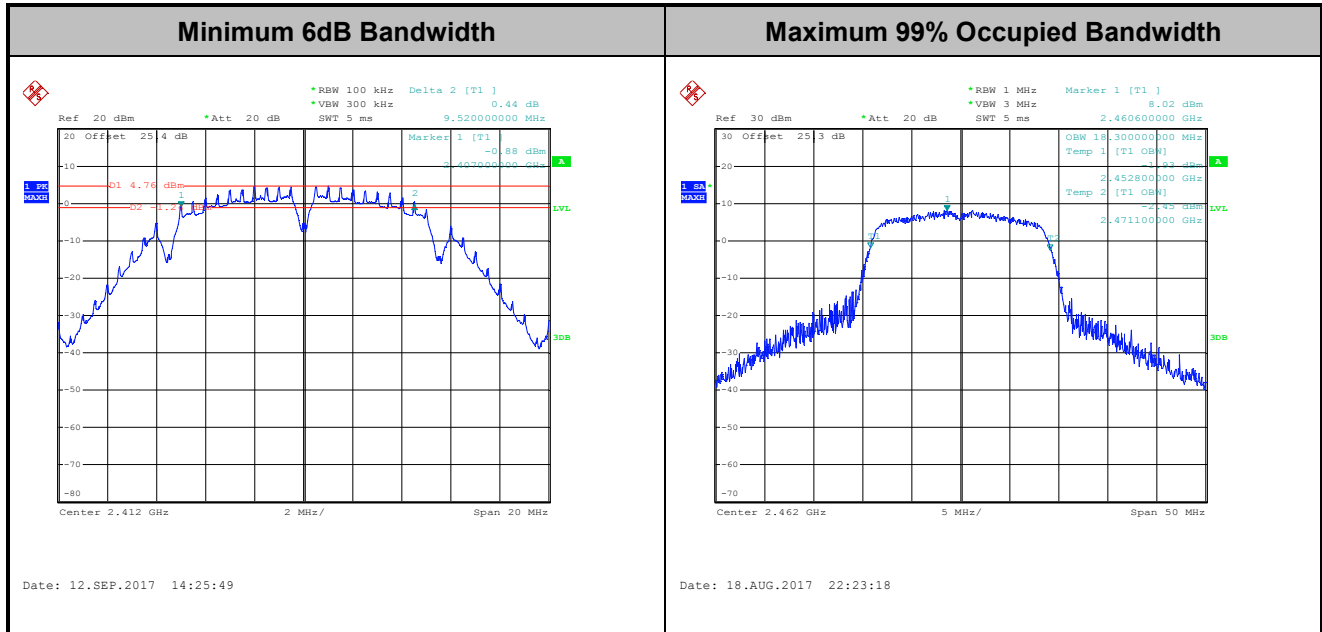
3.1.4 Test Setup





3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.



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

3.2 Output Power Measurement

3.2.1 Limit of Output Power

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

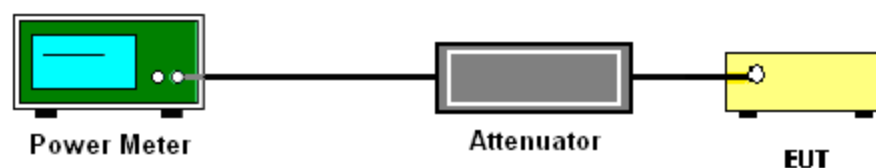
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v04 section 9.1.2 PKPM1 Peak power meter method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Please refer to Appendix A.

3.2.6 Test Result of Average output Power (Reporting Only)

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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

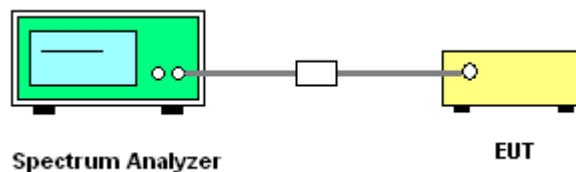
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

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

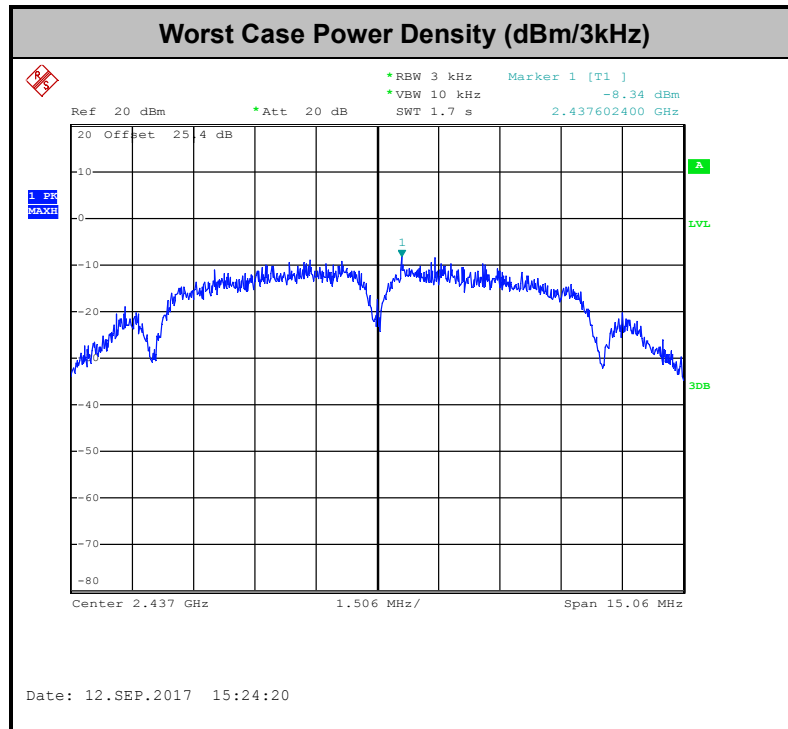
3.3.4 Test Setup





3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

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

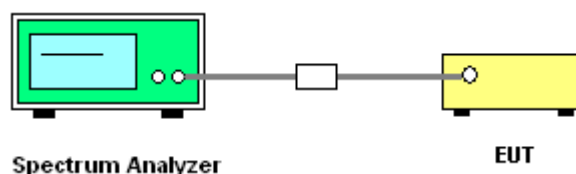
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

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

3.4.4 Test Setup



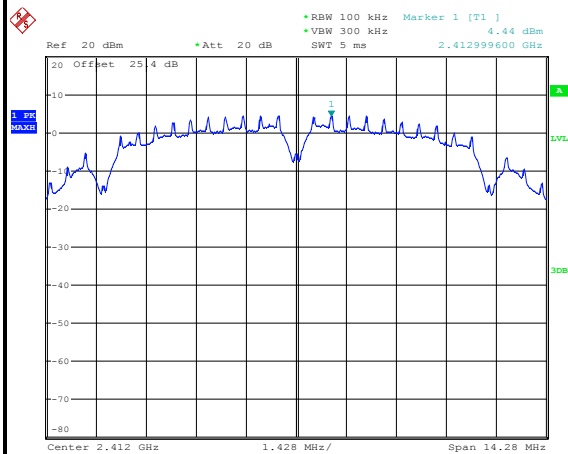


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

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

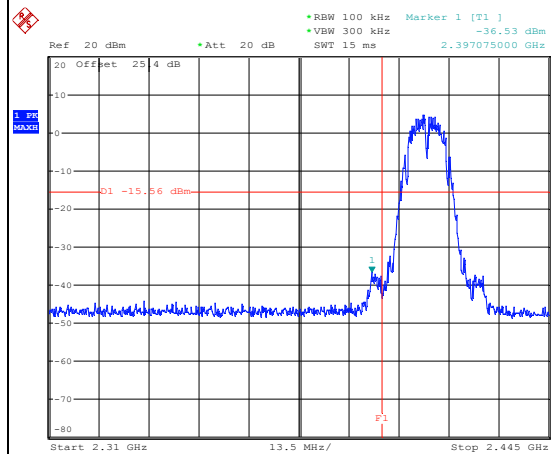
WLAN 802.11b Channel 01

100kHz PSD reference Level



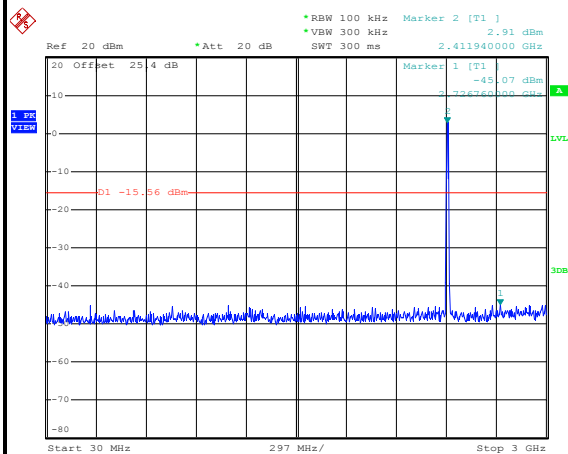
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Low Channel Plot



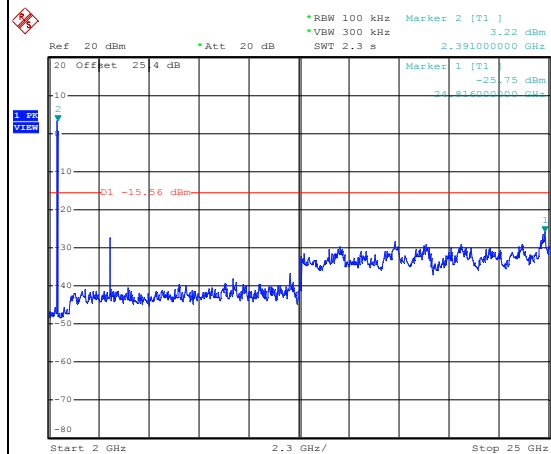
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Spurious Emission 30MHz~3GHz



Date: 12.SEP.2017 14:29:50

Spurious Emission 2GHz~25GHz

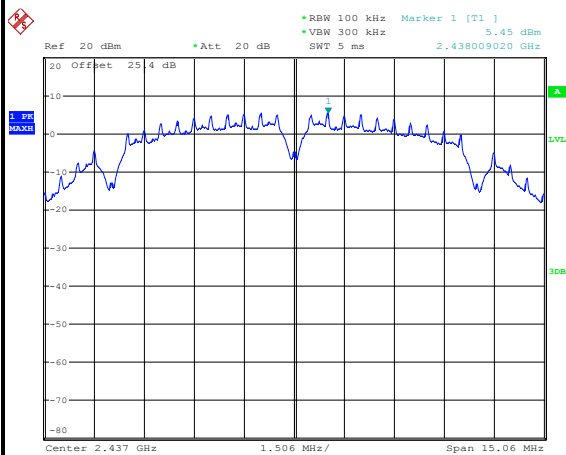


Date: 12.SEP.2017 14:29:58

Test Mode :	802.11b	Temperature :	21~25℃
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Aking chang/Reece Lin

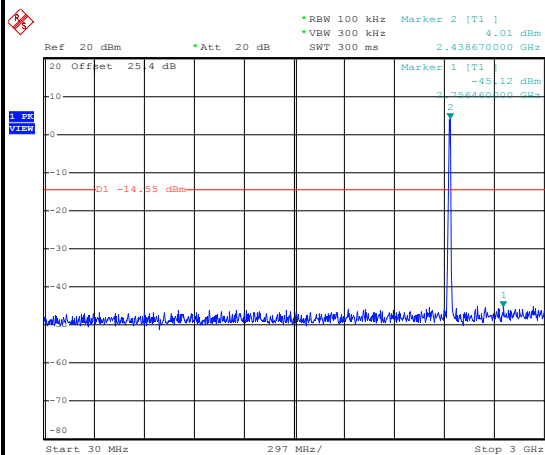
WLAN 802.11b Channel 06

100kHz PSD reference Level



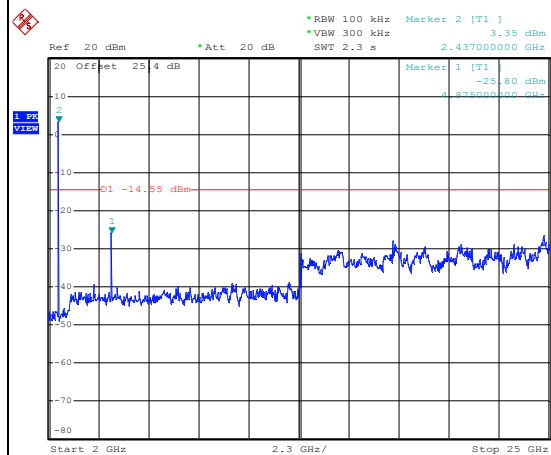
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Spurious Emission 30MHz~3GHz



Date: 12.SEP.2017 15:25:55

Spurious Emission 2GHz~25GHz



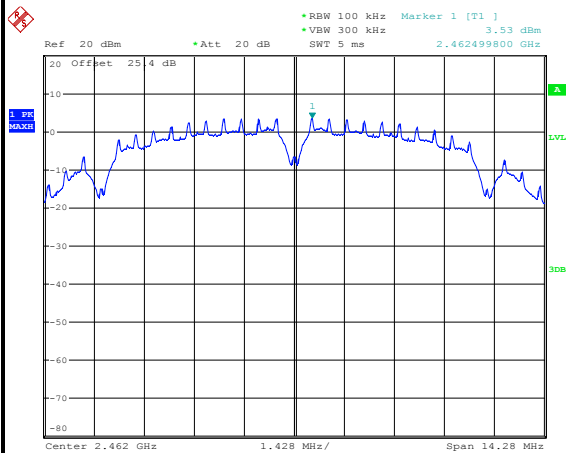
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Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Aking chang/Reece Lin

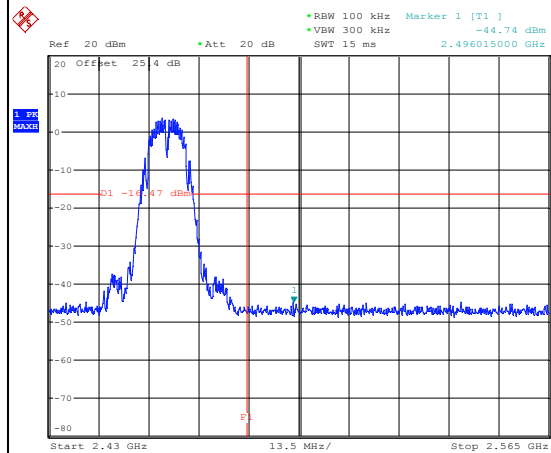
WLAN 802.11b Channel 11

100kHz PSD reference Level



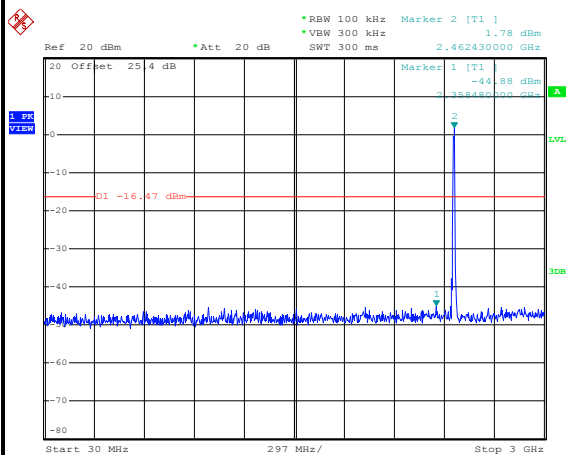
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High Channel Plot



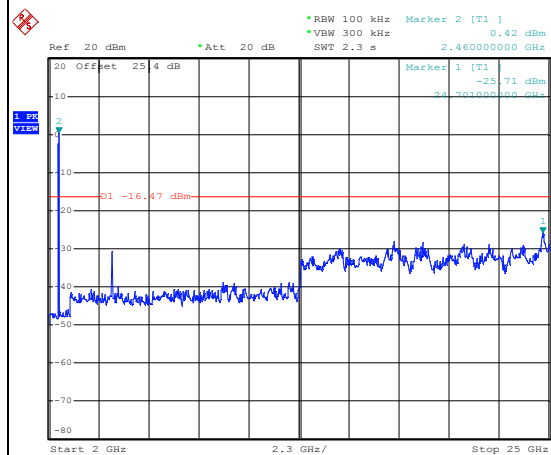
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Spurious Emission 30MHz~3GHz



Date: 12.SEP.2017 14:38:01

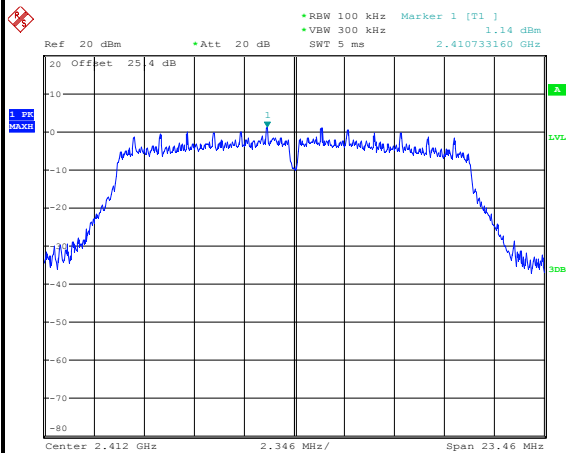
Spurious Emission 2GHz~25GHz



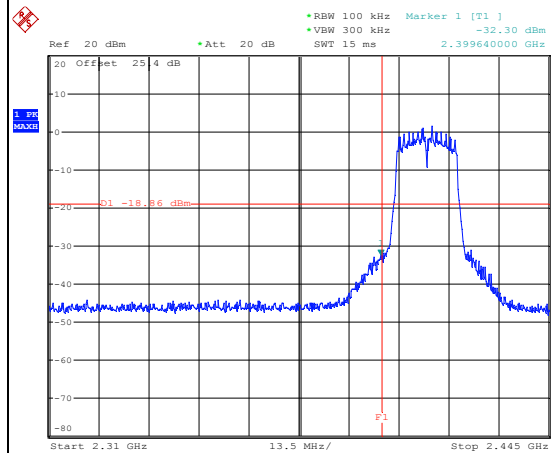
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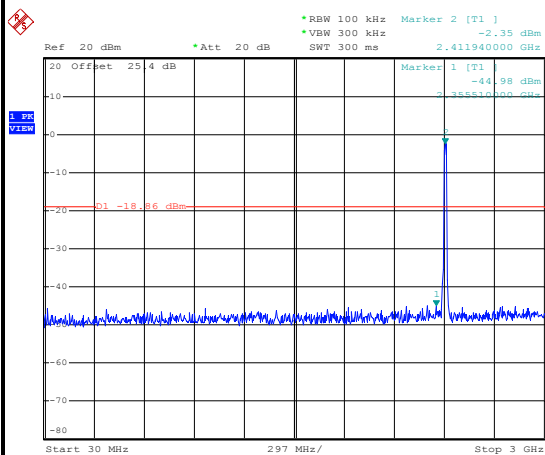
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Aking chang/Reece Lin

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

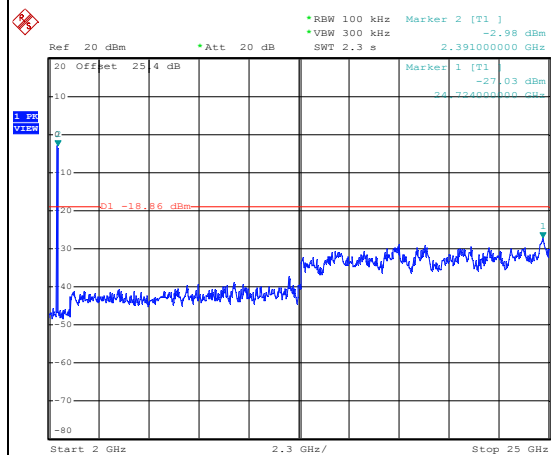
Date: 12.SEP.2017 15:39:10

Low Channel Plot

Date: 12.SEP.2017 15:39:54

Spurious Emission 30MHz~3GHz

Date: 12.SEP.2017 15:40:05

Spurious Emission 2GHz~25GHz

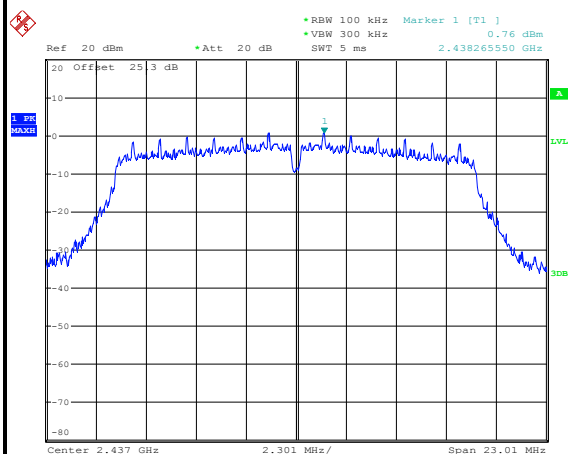
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Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Aking chang/Reece Lin

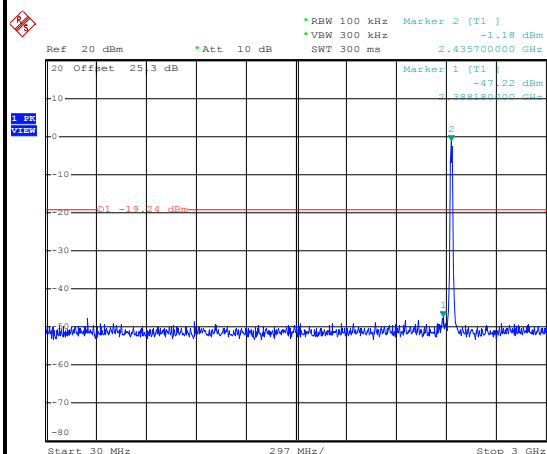
WLAN 802.11g Channel 06

100kHz PSD reference Level



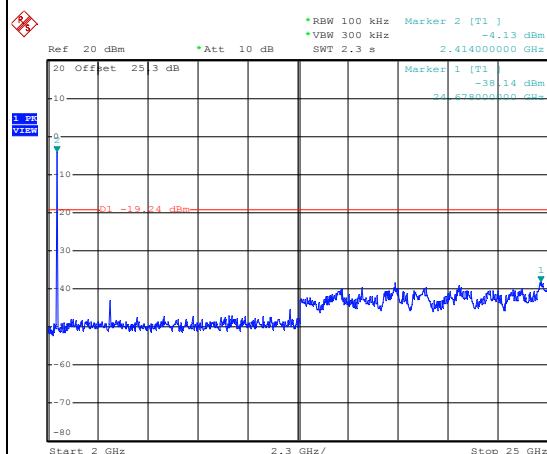
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Spurious Emission 30MHz~3GHz



Date: 18.AUG.2017 22:05:39

Spurious Emission 2GHz~25GHz



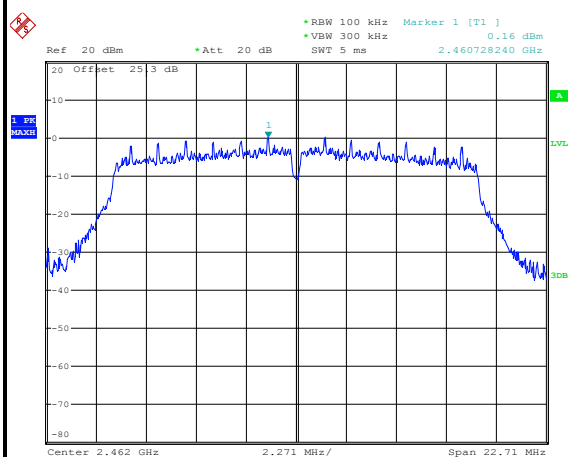
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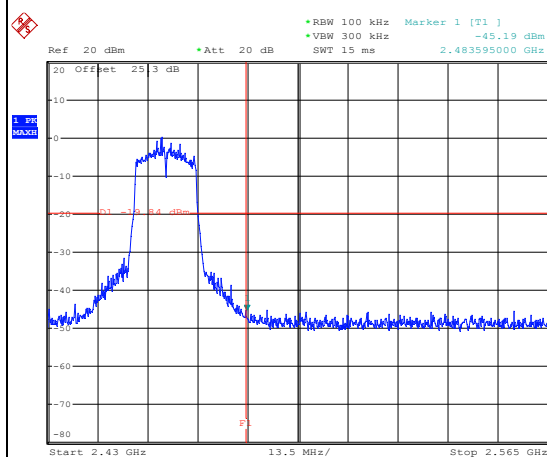
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Aking chang/Reece Lin

WLAN 802.11g Channel 11

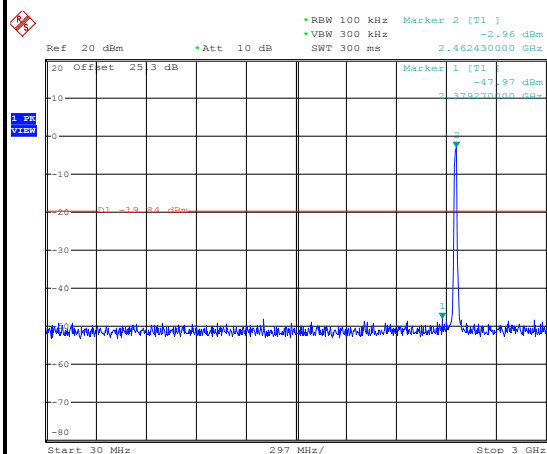
100kHz PSD reference Level



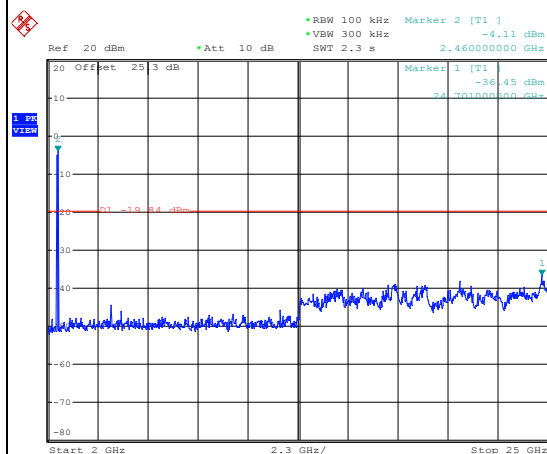
High Channel Plot



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz

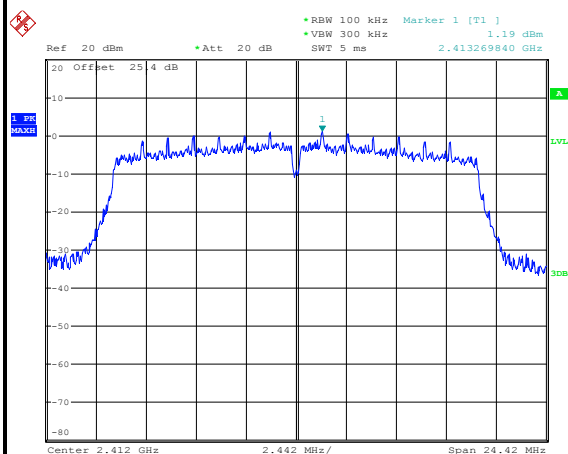




Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Aking chang/Reece Lin

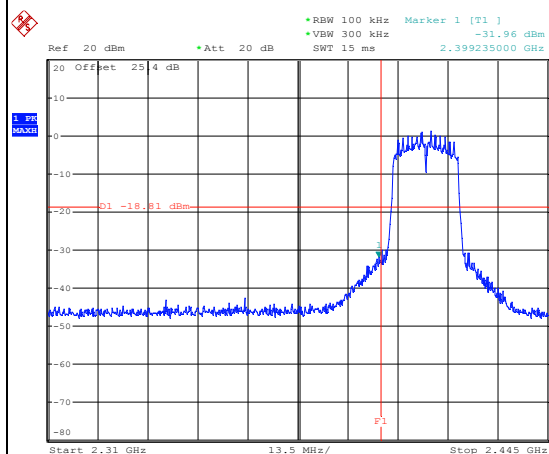
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



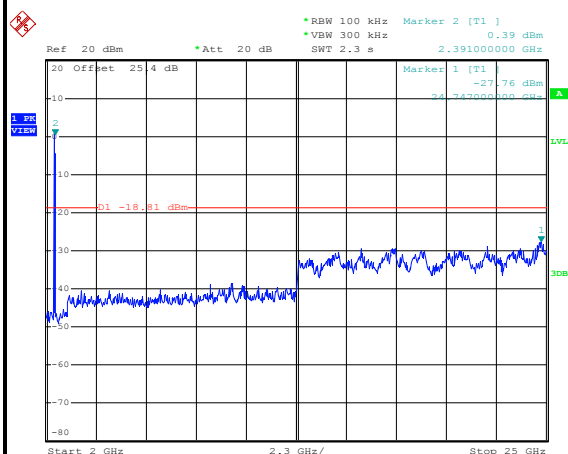
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Low Channel Plot



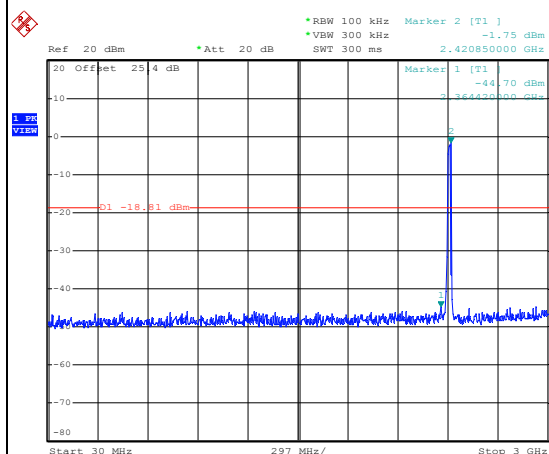
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Spurious Emission 30MHz~3GHz



Date: 12.SEP.2017 15:48:05

Spurious Emission 2GHz~25GHz



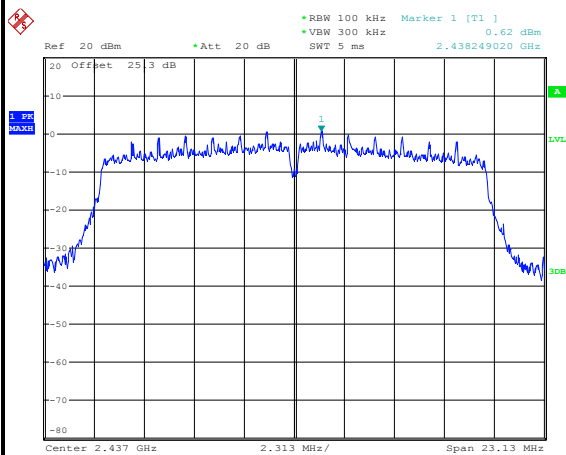
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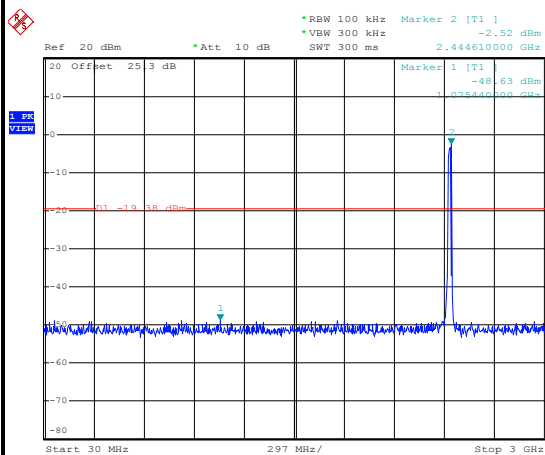
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Aking chang/Reece Lin

WLAN 802.11n HT20 Channel 06

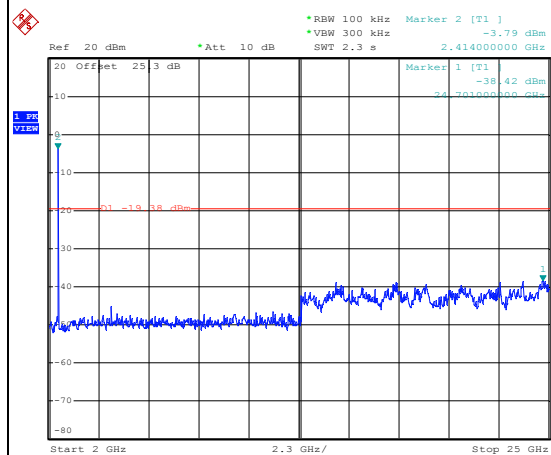
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz

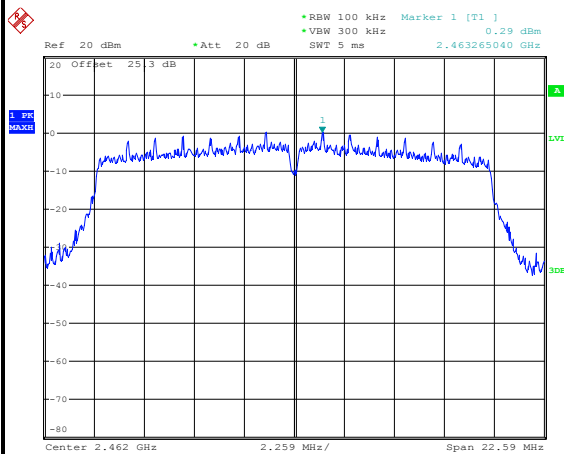


Spurious Emission 2GHz~25GHz

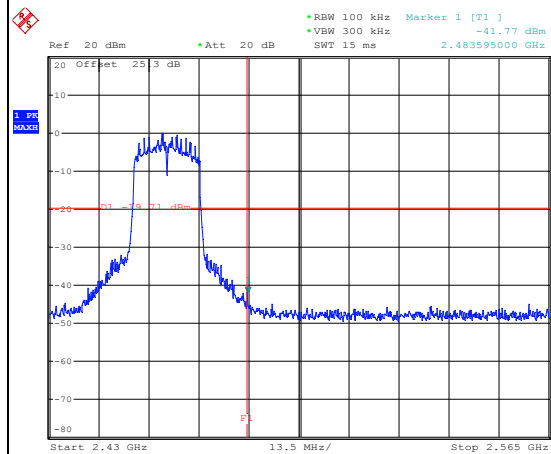




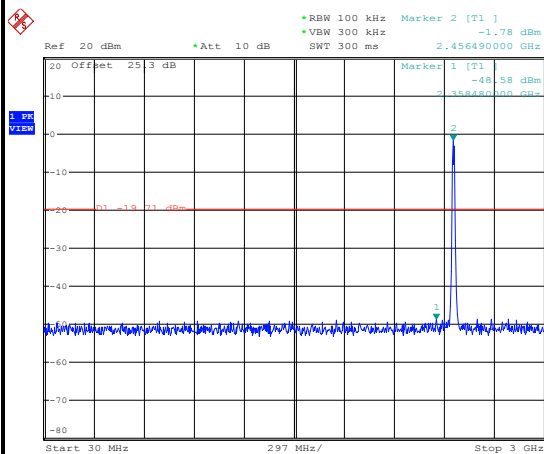
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Aking chang/Reece Lin

WLAN 802.11n HT20 Channel 11**100kHz PSD reference Level**

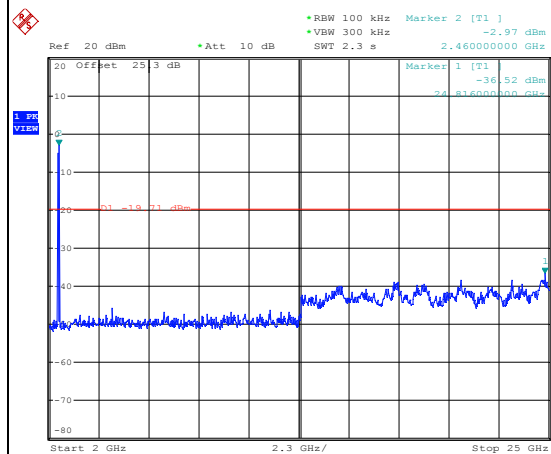
Date: 18.AUG.2017 22:21:58

High Channel Plot

Date: 18.AUG.2017 22:22:17

Spurious Emission 30MHz~3GHz

Date: 18.AUG.2017 22:22:30

Spurious Emission 2GHz~25GHz

Date: 18.AUG.2017 22:22:38

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

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

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

3.5.2 Measuring Instruments

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



3.5.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.

For average measurement:

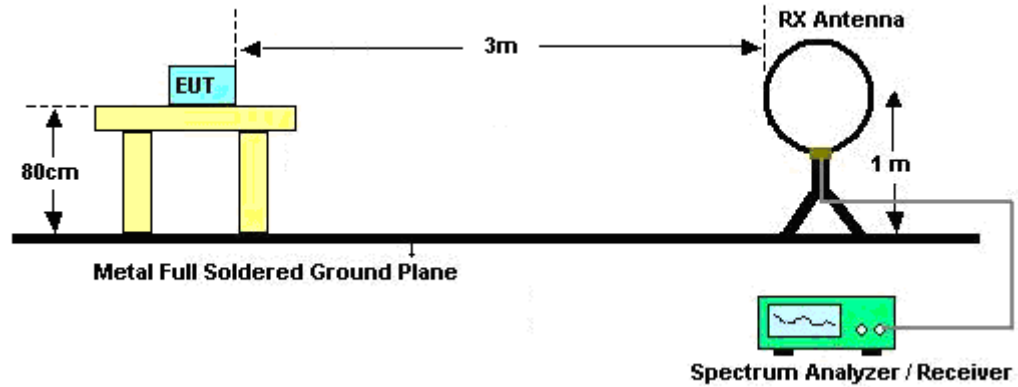
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

For average measurement:

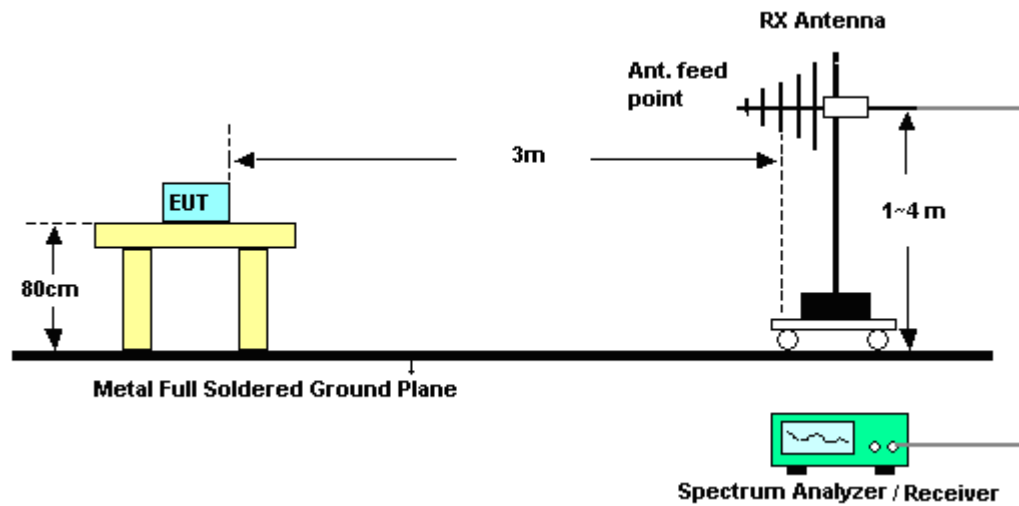
 - Detector = power averaging (rms), set sweep point ≥ 2 span / RBW.
 - Averaging type = power averaging(RMS)
 - The correction factor shall be offset is $10 \log (1/x)$, where x is the duty cycle.

3.5.4 Test Setup

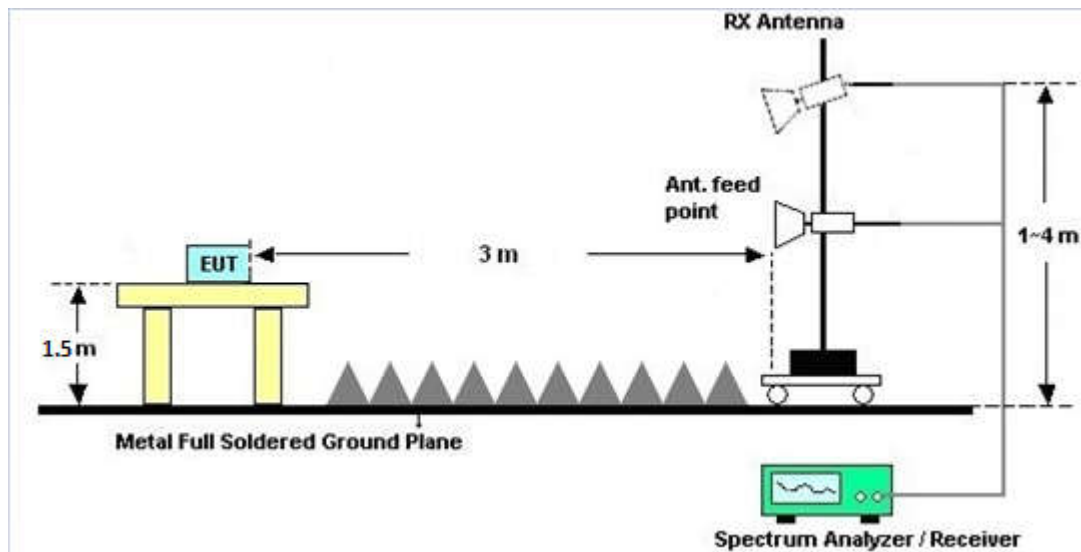
For radiated emissions below 30MHz



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.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B and C.

3.5.7 Duty Cycle

Please refer to Appendix D.

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

Please refer to Appendix B and C.

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

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

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

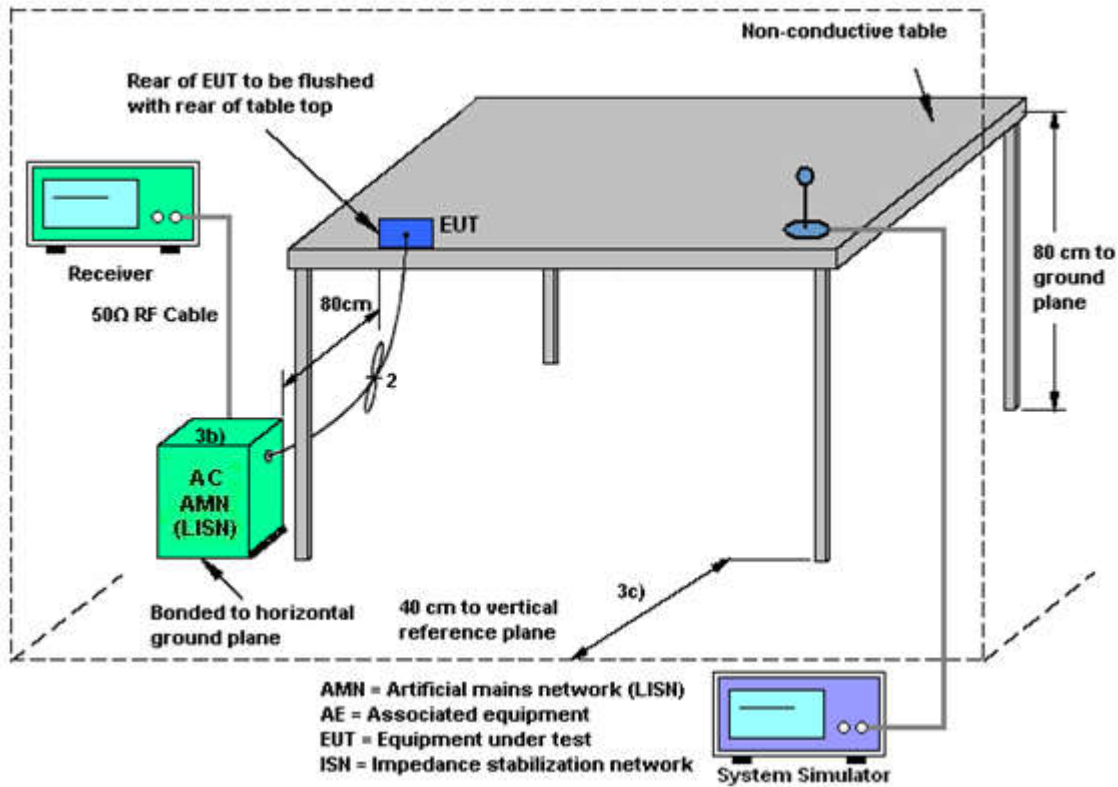
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

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

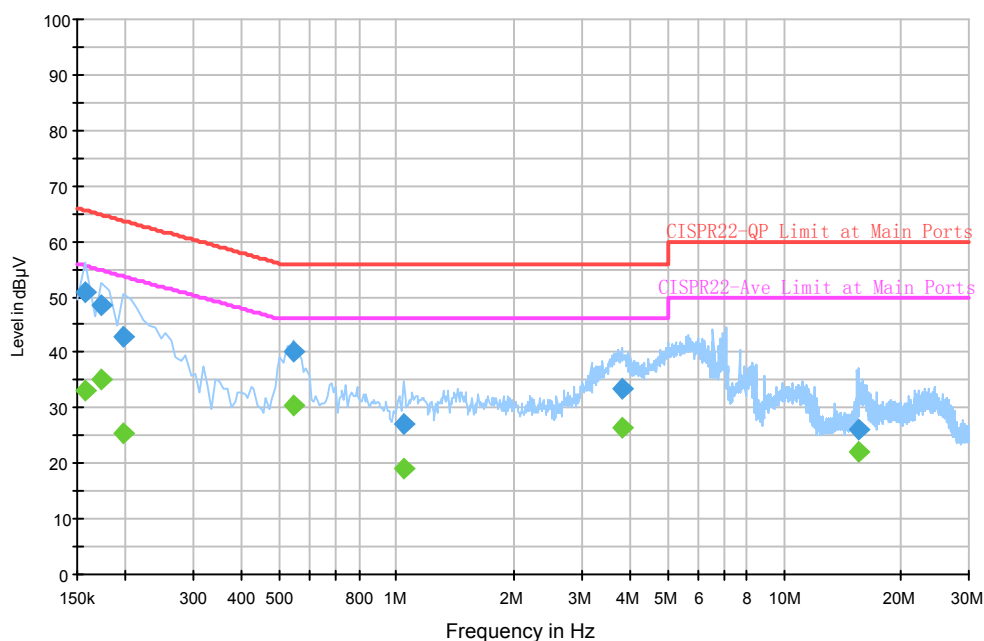
3.6.4 Test Setup





3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	26~27°C
Test Engineer :	Shareef Yu	Relative Humidity :	56~58%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Notebook)		



Final Result : Quasi-Peak

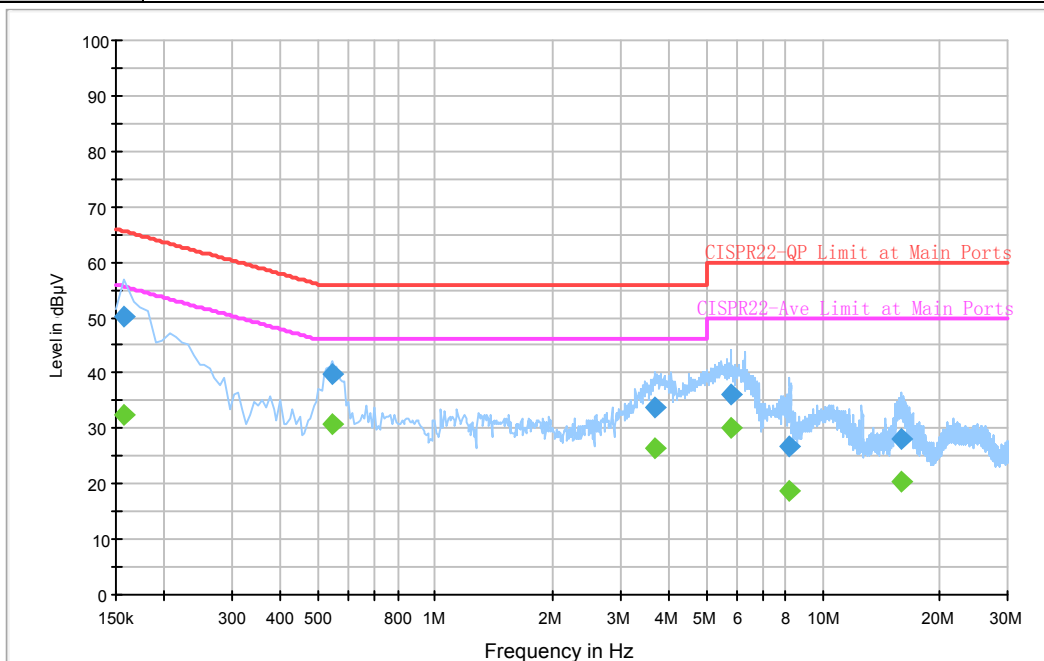
Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	50.8	Off	L1	19.5	14.8	65.6
0.174000	48.3	Off	L1	19.5	16.5	64.8
0.198000	43.0	Off	L1	19.5	20.7	63.7
0.542000	40.2	Off	L1	19.5	15.8	56.0
1.046000	26.9	Off	L1	19.5	29.1	56.0
3.838000	33.5	Off	L1	19.6	22.5	56.0
15.526000	26.3	Off	L1	19.7	33.7	60.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	33.0	Off	L1	19.5	22.6	55.6
0.174000	35.1	Off	L1	19.5	19.7	54.8
0.198000	25.4	Off	L1	19.5	28.3	53.7
0.542000	30.6	Off	L1	19.5	15.4	46.0
1.046000	19.2	Off	L1	19.5	26.8	46.0
3.838000	26.4	Off	L1	19.6	19.6	46.0
15.526000	22.2	Off	L1	19.7	27.8	50.0



Test Mode :	Mode 1	Temperature :	26~27°C
Test Engineer :	Shareef Yu	Relative Humidity :	56~58%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Notebook)		

**Final Result : Quasi-Peak**

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	50.2	Off	N	19.5	15.4	65.6
0.542000	39.8	Off	N	19.5	16.2	56.0
3.694000	33.9	Off	N	19.6	22.1	56.0
5.822000	36.0	Off	N	19.6	24.0	60.0
8.230000	26.6	Off	N	19.7	33.4	60.0
15.998000	28.2	Off	N	19.8	31.8	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	32.4	Off	N	19.5	23.2	55.6
0.542000	30.7	Off	N	19.5	15.3	46.0
3.694000	26.5	Off	N	19.6	19.5	46.0
5.822000	30.1	Off	N	19.6	19.9	50.0
8.230000	18.7	Off	N	19.7	31.3	50.0
15.998000	20.3	Off	N	19.8	29.7	50.0



3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Agilent	E4416A	GB41292344	NA	Dec. 26, 2016	Aug.17.2017~ Aug.18.2017	Dec. 25, 2017	Conducted (TH05-HY)
Power Sensor	Agilent	E9327A	US40441548	50MHz~18GHz	Dec. 26, 2016	Aug.17.2017~ Aug.18.2017	Dec. 25, 2017	Conducted (TH05-HY)
Hygrometer	TECEP	DTM-303B	TP157151	N/A	Mar. 20, 2017	Aug.17.2017~ Aug.18.2017	Mar. 19, 2018	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz-40GHz	Nov. 25, 2016	Aug.17.2017~ Aug.18.2017	Nov. 24, 2017	Conducted (TH05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	May 15, 2017	Sep. 07, 2017 ~ Sep. 12, 2017	May 14, 2019	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	40103&04	30MHz to 1GHz	Jan. 07, 2017	Sep. 07, 2017 ~ Sep. 12, 2017	Jan. 06, 2018	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1241	1GHz ~ 18GHz	May 02, 2017	Sep. 07, 2017 ~ Sep. 12, 2017	May 01, 2018	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 08, 2016	Sep. 07, 2017 ~ Sep. 12, 2017	Nov. 07, 2017	Radiation (03CH13-HY)
Amplifier	Sonoma-Instrument	310 N	187282	9KHz~1GHz	Dec. 21, 2016	Sep. 07, 2017 ~ Sep. 12, 2017	Dec. 20, 2017	Radiation (03CH13-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590074	1GHz~18GHz	May 22, 2017	Sep. 07, 2017 ~ Sep. 12, 2017	May 21, 2018	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY53270147	1GHz~26.5GHz	Jan. 09, 2017	Sep. 07, 2017 ~ Sep. 12, 2017	Jan. 08, 2018	Radiation (03CH13-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY53290053	20Hz to 26.5GHz	Jan. 12, 2017	Sep. 07, 2017 ~ Sep. 12, 2017	Jan. 11, 2018	Radiation (03CH13-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Sep. 07, 2017 ~ Sep. 12, 2017	N/A	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Sep. 07, 2017 ~ Sep. 12, 2017	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Sep. 07, 2017 ~ Sep. 12, 2017	N/A	Radiation (03CH13-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Sep. 13, 2017	N/A	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	May 02, 2017	Sep. 13, 2017	May 01, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 29, 2016	Sep. 13, 2017	Nov. 28, 2017	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 05, 2017	Sep. 13, 2017	Jan. 04, 2018	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 05, 2017	Sep. 13, 2017	Jan. 04, 2018	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100472	20Hz~26.5GHz	Dec. 29, 2016	Sep. 13, 2017	Dec. 28, 2017	Conduction (CO05-HY)

NCR: No Calibration Required

5 Uncertainty of Evaluation

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.4dB
--	-------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.3dB
--	-------



Appendix A. Conducted Test Results

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Aking chang/Reece Lin	Temperature:	21~25	°C
Test Date:	2017/8/18~2017/9/12	Relative Humidity:	51~54	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band								
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	12.60	9.52	0.50	Pass
11b	1Mbps	1	6	2437	12.85	10.04	0.50	Pass
11b	1Mbps	1	11	2462	12.55	9.52	0.50	Pass
11g	6Mbps	1	1	2412	17.55	15.64	0.50	Pass
11g	6Mbps	1	6	2437	17.45	15.34	0.50	Pass
11g	6Mbps	1	11	2462	17.40	15.14	0.50	Pass
HT20	MCS0	1	1	2412	18.30	16.28	0.50	Pass
HT20	MCS0	1	6	2437	18.20	15.42	0.50	Pass
HT20	MCS0	1	11	2462	18.30	15.06	0.50	Pass

TEST RESULTS DATA
Peak Power Table

2.4GHz Band										
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
11b	1Mbps	1	1	2412	16.72	30.00	-1.50	15.22	36.00	Pass
11b	1Mbps	1	6	2437	17.77	30.00	-1.50	16.27	36.00	Pass
11b	1Mbps	1	11	2462	15.45	30.00	-1.50	13.95	36.00	Pass
11g	6Mbps	1	1	2412	20.10	30.00	-1.50	18.60	36.00	Pass
11g	6Mbps	1	6	2437	19.75	30.00	-1.50	18.25	36.00	Pass
11g	6Mbps	1	11	2462	19.33	30.00	-1.50	17.83	36.00	Pass
HT20	MCS0	1	1	2412	20.20	30.00	-1.50	18.70	36.00	Pass
HT20	MCS0	1	6	2437	19.77	30.00	-1.50	18.27	36.00	Pass
HT20	MCS0	1	11	2462	19.24	30.00	-1.50	17.74	36.00	Pass

TEST RESULTS DATA
Average Power Table
(Reporting Only)

2.4GHz Band						
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
11b	1Mbps	1	1	2412	0.00	13.71
11b	1Mbps	1	6	2437	0.00	14.87
11b	1Mbps	1	11	2462	0.00	12.40
11g	6Mbps	1	1	2412	0.12	11.94
11g	6Mbps	1	6	2437	0.12	11.55
11g	6Mbps	1	11	2462	0.12	11.12
HT20	MCS0	1	1	2412	0.16	12.00
HT20	MCS0	1	6	2437	0.16	11.56
HT20	MCS0	1	11	2462	0.16	11.16

TEST RESULTS DATA
Peak Power Density

2.4GHz Band								
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
11b	1Mbps	1	1	2412	-10.08	-1.50	8.00	Pass
11b	1Mbps	1	6	2437	-8.34	-1.50	8.00	Pass
11b	1Mbps	1	11	2462	-10.68	-1.50	8.00	Pass
11g	6Mbps	1	1	2412	-12.02	-1.50	8.00	Pass
11g	6Mbps	1	6	2437	-14.50	-1.50	8.00	Pass
11g	6Mbps	1	11	2462	-14.16	-1.50	8.00	Pass
HT20	MCS0	1	1	2412	-13.38	-1.50	8.00	Pass
HT20	MCS0	1	6	2437	-13.33	-1.50	8.00	Pass
HT20	MCS0	1	11	2462	-12.81	-1.50	8.00	Pass



Appendix B. Radiated Spurious Emission

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2386.23	51.82	-22.18	74	41.16	26.89	4.83	30.99	325	241	P	H
		2389.905	42.5	-11.5	54	31.84	26.89	4.83	30.99	325	241	A	H
	*	2412	100.29	-	-	89.54	26.94	4.87	30.99	325	241	P	H
	*	2412	97.45	-	-	86.7	26.94	4.87	30.99	325	241	A	H
		2381.295	51.83	-22.17	74	41.22	26.84	4.83	30.99	368	281	P	V
		2389.905	41.19	-12.81	54	30.53	26.89	4.83	30.99	368	281	A	V
	*	2412	96.61	-	-	85.86	26.94	4.87	30.99	368	281	P	V
	*	2412	93.35	-	-	82.6	26.94	4.87	30.99	368	281	A	V
802.11b CH 06 2437MHz		2362.64	53.19	-20.81	74	42.66	26.79	4.8	30.99	319	232	P	H
		2386.44	40.91	-13.09	54	30.25	26.89	4.83	30.99	319	232	A	H
	*	2437	102.1	-	-	91.23	27.04	4.88	30.98	319	232	P	H
	*	2437	99.18	-	-	88.31	27.04	4.88	30.98	319	232	A	H
		2489.29	52.36	-21.64	74	41.26	27.2	4.93	30.96	319	232	P	H
		2484.88	41.01	-12.99	54	29.97	27.15	4.93	30.97	319	232	A	H
		2351.72	52.19	-21.81	74	41.69	26.79	4.78	31	400	268	P	V
		2387.56	40.43	-13.57	54	29.77	26.89	4.83	30.99	400	268	A	V
	*	2437	99.74	-	-	88.87	27.04	4.88	30.98	400	268	P	V
	*	2437	96.65	-	-	85.78	27.04	4.88	30.98	400	268	A	V
		2487.12	51.41	-22.59	74	40.37	27.15	4.93	30.97	400	268	P	V
		2484.74	40.79	-13.21	54	29.75	27.15	4.93	30.97	400	268	A	V



802.11b CH 11 2462MHz	*	2462	101.72	-	-	90.76	27.1	4.9	30.97	310	231	P	H
	*	2462	98.73	-	-	87.77	27.1	4.9	30.97	310	231	A	H
		2491.72	53.01	-20.99	74	41.91	27.2	4.93	30.96	310	231	P	H
		2485.92	42.54	-11.46	54	31.5	27.15	4.93	30.97	310	231	A	H
	*	2462	98.02	-	-	87.06	27.1	4.9	30.97	395	276	P	V
	*	2462	95.02	-	-	84.06	27.1	4.9	30.97	395	276	A	V
		2487.84	52.73	-21.27	74	41.63	27.2	4.93	30.96	395	276	P	V
		2485.88	41.57	-12.43	54	30.53	27.15	4.93	30.97	395	276	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	53.93	-20.07	74	71.77	31.56	7.33	57.24	238	325	P	H
		4824	52.55	-1.45	54	70.39	31.56	7.33	57.24	238	325	A	H
		4824	53.08	-20.92	74	70.92	31.56	7.33	57.24	400	292	P	V
		4824	51.42	-2.58	54	69.26	31.56	7.33	57.24	400	292	A	V
802.11b CH 06 2437MHz		4874	53.93	-20.07	74	71.53	31.63	7.44	57.17	247	327	P	H
		4874	52.65	-1.35	54	70.25	31.63	7.44	57.17	247	327	A	H
		7311	45.95	-28.05	74	57.47	36.16	9.13	57.27	100	0	P	H
		4874	52.99	-21.01	74	70.59	31.63	7.44	57.17	370	291	P	V
		4874	51.3	-2.7	54	68.9	31.63	7.44	57.17	370	291	A	V
		7311	43.22	-30.78	74	54.74	36.16	9.13	57.27	100	0	P	V
802.11b CH 11 2462MHz		4924	54.09	-19.91	74	71.47	31.7	7.52	57.1	272	327	P	H
		4924	52.71	-1.29	54	70.09	31.7	7.52	57.1	272	327	A	H
		7386	45.35	-28.65	74	56.8	36.31	9.18	57.38	100	0	P	H
		4924	51.11	-22.89	74	68.49	31.7	7.52	57.1	384	297	P	V
		4924	49.76	-4.24	54	67.14	31.7	7.52	57.1	384	297	A	V
		7386	44.47	-29.53	74	55.92	36.31	9.18	57.38	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		2389.59	59.26	-14.74	74	48.6	26.89	4.83	30.99	367	231	P	H
		2390	47.35	-6.65	54	36.69	26.89	4.83	30.99	367	231	A	H
	*	2412	103.37	-	-	92.62	26.94	4.87	30.99	367	231	P	H
	*	2412	95.79	-	-	85.04	26.94	4.87	30.99	367	231	A	H
		2389.275	53.22	-20.78	74	42.56	26.89	4.83	30.99	399	270	P	V
		2389.695	42.92	-11.08	54	32.26	26.89	4.83	30.99	399	270	A	V
	*	2412	97.27	-	-	86.52	26.94	4.87	30.99	399	270	P	V
	*	2412	89.88	-	-	79.13	26.94	4.87	30.99	399	270	A	V
802.11g CH 06 2437MHz		2342.76	52.57	-21.43	74	42.13	26.73	4.78	31	400	233	P	H
		2356.9	42.77	-11.23	54	32.27	26.79	4.78	31	400	233	A	H
	*	2437	101.34	-	-	90.47	27.04	4.88	30.98	400	233	P	H
	*	2437	94.08	-	-	83.21	27.04	4.88	30.98	400	233	A	H
		2484.32	52.12	-21.88	74	41.08	27.15	4.93	30.97	400	233	P	H
		2483.5	42.07	-11.93	54	31.03	27.15	4.93	30.97	400	233	A	H
		2362.64	51.48	-22.52	74	40.95	26.79	4.8	30.99	400	264	P	V
		2385.88	41.83	-12.17	54	31.17	26.89	4.83	30.99	400	264	A	V
	*	2437	98.66	-	-	87.79	27.04	4.88	30.98	400	264	P	V
	*	2437	91.48	-	-	80.61	27.04	4.88	30.98	400	264	A	V
		2489.92	51.66	-22.34	74	40.56	27.2	4.93	30.96	400	264	P	V
		2485.65	42	-12	54	30.96	27.15	4.93	30.97	400	264	A	V



802.11g CH 11 2462MHz	*	2462	104.22	-	-	93.26	27.1	4.9	30.97	398	229	P	H
	*	2462	96.83	-	-	85.87	27.1	4.9	30.97	398	229	A	H
		2483.6	59.51	-14.49	74	48.47	27.15	4.93	30.97	398	229	P	H
		2483.52	46.33	-7.67	54	35.29	27.15	4.93	30.97	398	229	A	H
	*	2462	96.83	-	-	85.87	27.1	4.9	30.97	110	129	P	V
	*	2462	89.19	-	-	78.23	27.1	4.9	30.97	110	129	A	V
		2488.48	52.32	-21.68	74	41.22	27.2	4.93	30.96	110	129	P	V
		2485.56	42.06	-11.94	54	31.02	27.15	4.93	30.97	110	129	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	43.82	-30.18	74	61.66	31.56	7.33	57.24	100	0	P	H
		4824	44.13	-29.87	74	61.97	31.56	7.33	57.24	100	0	P	V
802.11g CH 06 2437MHz		4874	42.96	-31.04	74	60.56	31.63	7.44	57.17	100	0	P	H
		7311	43.41	-30.59	74	54.93	36.16	9.13	57.27	100	0	P	H
		4874	41.93	-32.07	74	59.53	31.63	7.44	57.17	100	0	P	V
		7311	43.88	-30.12	74	55.4	36.16	9.13	57.27	100	0	P	V
802.11g CH 11 2462MHz		4924	44.44	-29.56	74	61.82	31.7	7.52	57.1	100	0	P	H
		7386	44.86	-29.14	74	56.31	36.31	9.18	57.38	100	0	P	H
		4924	43.52	-30.48	74	60.9	31.7	7.52	57.1	100	0	P	V
		7386	44.1	-29.9	74	55.55	36.31	9.18	57.38	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		2390	62.64	-11.36	74	51.98	26.89	4.83	30.99	370	228	P	H
		2390	48.64	-5.36	54	37.98	26.89	4.83	30.99	370	228	A	H
	*	2412	102.16	-	-	91.41	26.94	4.87	30.99	370	228	P	H
	*	2412	94.54	-	-	83.79	26.94	4.87	30.99	370	228	A	H
		2390	53.07	-20.93	74	42.41	26.89	4.83	30.99	400	270	P	V
		2390	43.24	-10.76	54	32.58	26.89	4.83	30.99	400	270	A	V
	*	2412	96.91	-	-	86.16	26.94	4.87	30.99	400	270	P	V
	*	2412	89.57	-	-	78.82	26.94	4.87	30.99	400	270	A	V
802.11n HT20 CH 06 2437MHz		2369.36	51.67	-22.33	74	41.09	26.84	4.8	30.99	358	228	P	H
		2389.66	42.41	-11.59	54	31.75	26.89	4.83	30.99	358	228	A	H
	*	2437	102.31	-	-	91.44	27.04	4.88	30.98	358	228	P	H
	*	2437	94.88	-	-	84.01	27.04	4.88	30.98	358	228	A	H
		2494.75	51.39	-22.61	74	40.29	27.2	4.93	30.96	358	228	P	H
		2487.47	42.14	-11.86	54	31.1	27.15	4.93	30.97	358	228	A	H
		2381.54	51.56	-22.44	74	40.95	26.84	4.83	30.99	396	265	P	V
		2385.6	41.61	-12.39	54	30.95	26.89	4.83	30.99	396	265	A	V
	*	2437	98.93	-	-	88.06	27.04	4.88	30.98	396	265	P	V
	*	2437	91.5	-	-	80.63	27.04	4.88	30.98	396	265	A	V
		2499.23	52	-22	74	40.9	27.2	4.93	30.96	396	265	P	V
		2483.5	41.88	-12.12	54	30.84	27.15	4.93	30.97	396	265	A	V



802.11n HT20 CH 11 2462MHz	*	2462	102.39	-	-	91.43	27.1	4.9	30.97	351	234	P	H
	*	2462	94.72	-	-	83.76	27.1	4.9	30.97	351	234	A	H
		2483.52	59.1	-14.9	74	48.06	27.15	4.93	30.97	351	234	P	H
		2484	46.27	-7.73	54	35.23	27.15	4.93	30.97	351	234	A	H
	*	2462	98.99	-	-	88.03	27.1	4.9	30.97	390	269	P	V
	*	2462	91.45	-	-	80.49	27.1	4.9	30.97	390	269	A	V
		2485	56.43	-17.57	74	45.39	27.15	4.93	30.97	390	269	P	V
		2483.96	44.55	-9.45	54	33.51	27.15	4.93	30.97	390	269	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		4824	44.24	-29.76	74	62.08	31.56	7.33	57.24	100	0	P	H
		4824	42.92	-31.08	74	60.76	31.56	7.33	57.24	100	0	P	V
802.11n HT20 CH 06 2437MHz		4874	43.15	-30.85	74	60.75	31.63	7.44	57.17	100	0	P	H
		7311	44.14	-29.86	74	55.66	36.16	9.13	57.27	100	0	P	H
		4874	41.04	-32.96	74	58.64	31.63	7.44	57.17	100	0	P	V
		7311	44.1	-29.9	74	55.62	36.16	9.13	57.27	100	0	P	V
802.11n HT20 CH 11 2462MHz		4924	43.77	-30.23	74	61.15	31.7	7.52	57.1	100	0	P	H
		7386	44.42	-29.58	74	55.87	36.31	9.18	57.38	100	0	P	H
		4924	42.06	-31.94	74	59.44	31.7	7.52	57.1	100	0	P	V
		7386	44.7	-29.3	74	56.15	36.31	9.18	57.38	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

Emission below 1GHz

2.4GHz WIFI 802.11b (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz 802.11b LF		154.2	30.48	-13.02	43.5	47.94	13.5	1.27	32.28	-	-	P	H
		250.05	31.99	-14.01	46	47.36	15.16	1.59	32.2	-	-	P	H
		297.3	34.86	-11.14	46	49.61	15.6	1.72	32.13	-	-	P	H
		437.9	37.75	-8.25	46	48.26	19.48	2.1	32.17	100	0	P	H
		663.3	33.61	-12.39	46	39.82	23.35	2.51	32.18	-	-	P	H
		720	31.34	-14.66	46	36.37	24.36	2.64	32.13	-	-	P	H
		30.54	33.4	-6.6	40	43.37	21.8	0.59	32.34	100	0	P	V
		119.91	24.9	-18.6	43.5	42.53	13.51	1.09	32.29	-	-	P	V
		166.35	24.88	-18.62	43.5	43.98	11.77	1.35	32.28	-	-	P	V
		331.5	31.33	-14.67	46	44.98	16.61	1.81	32.14	-	-	P	V
		424.6	30.95	-15.05	46	41.6	19.39	2.03	32.16	-	-	P	V
		663.3	34.45	-11.55	46	40.66	23.35	2.51	32.18	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Note symbol

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



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

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

1. Level(dBμV/m) =

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

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

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

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

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



Appendix C. Radiated Spurious Emission Plots

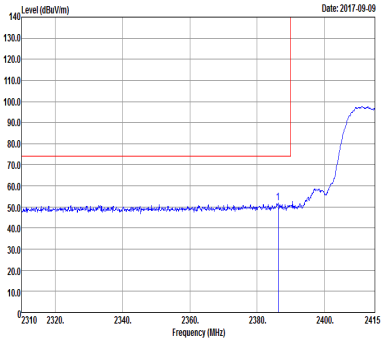
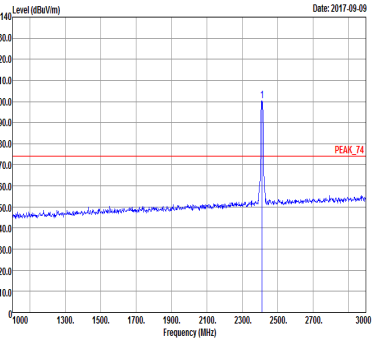
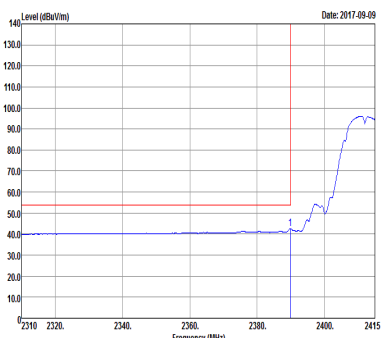
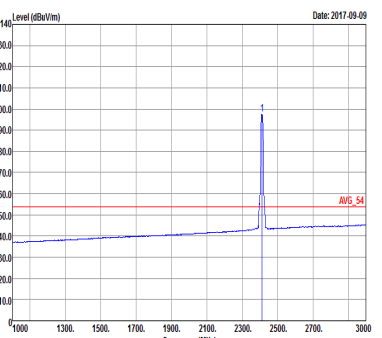
Note symbol

-L	Low channel location
-R	High channel location

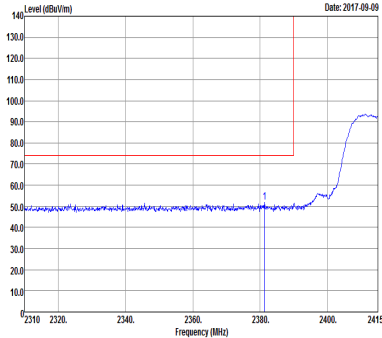
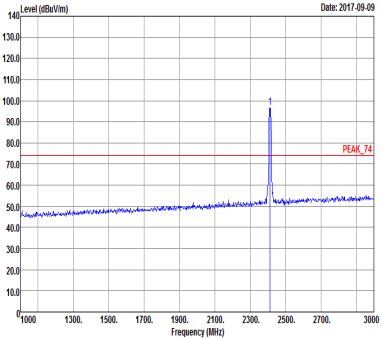
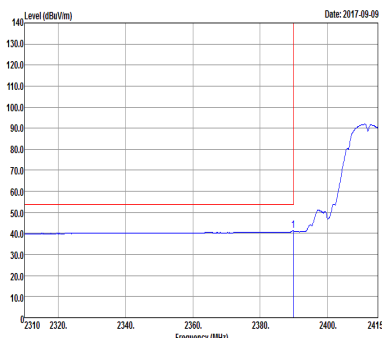
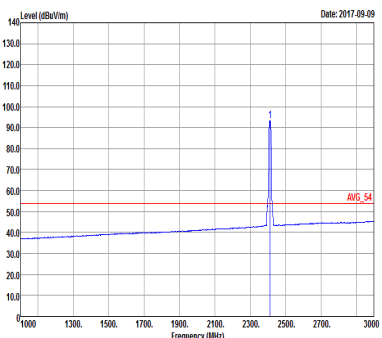


2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : AVG_54 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak

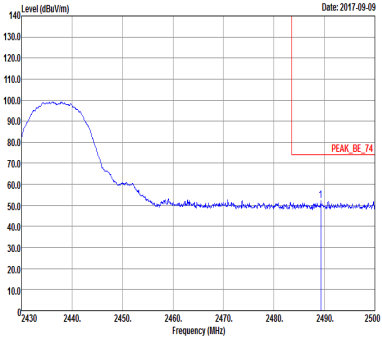
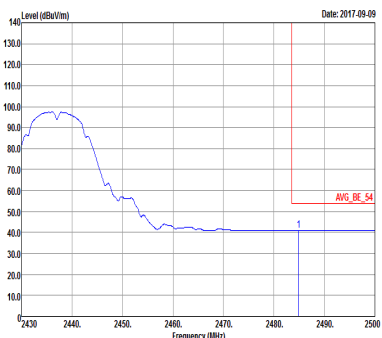


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	 Site : 03CH13-HY Condition : AV6_BE_54 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : AV6_54 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak

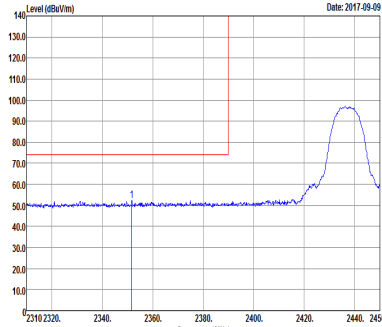
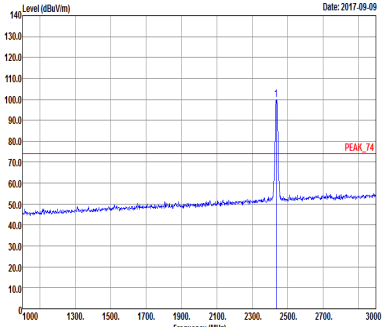
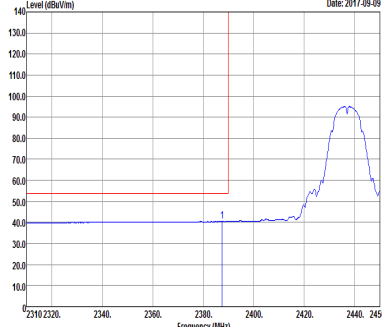
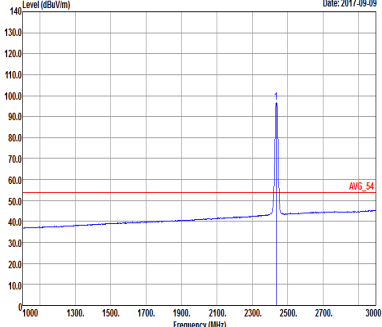


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH13-HY Condition : PEAK_74 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak	Site : 03CH13-HY Condition : AVG_54 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak

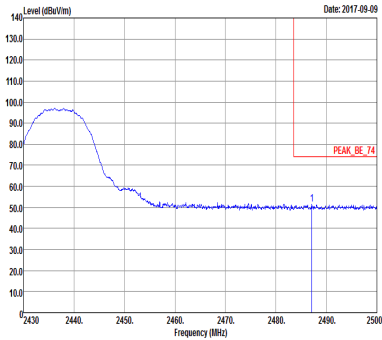
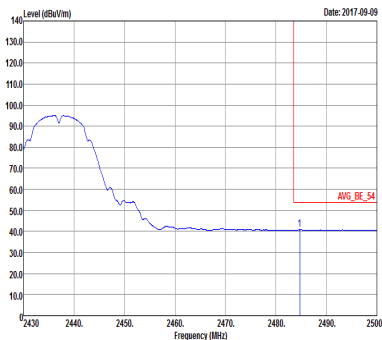


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left blank
Average	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak	Left blank

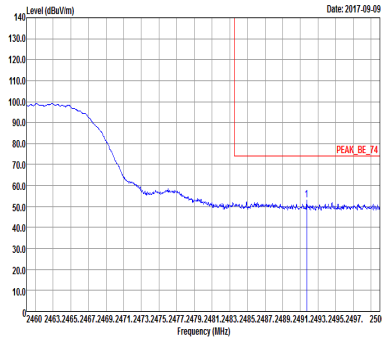
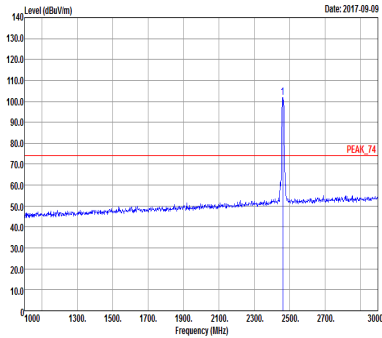
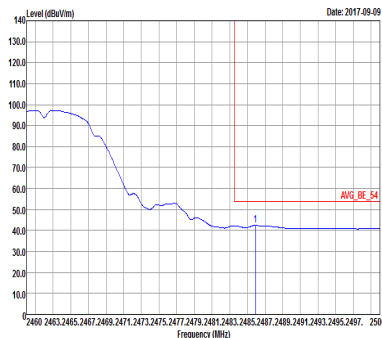
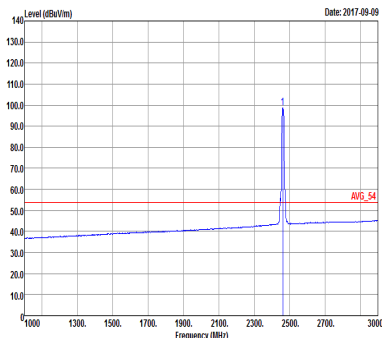


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : AVG_54 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak

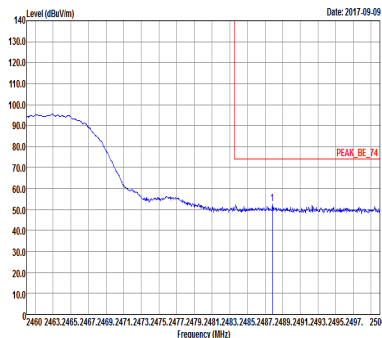
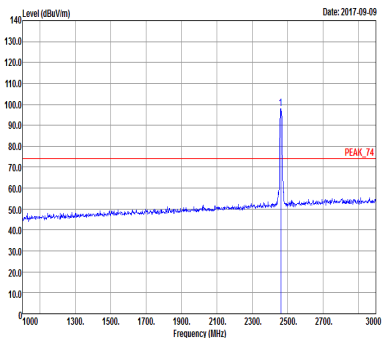
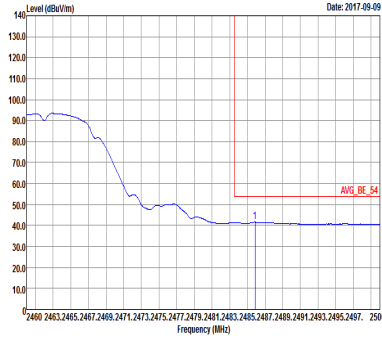
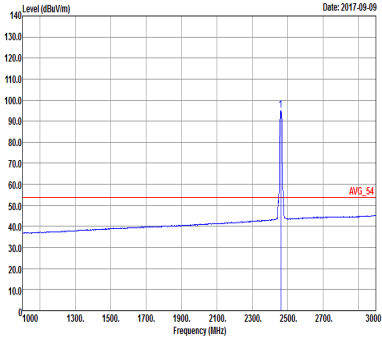


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left blank
Average	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak	Left blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : AVG_54 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : AVG_54 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak



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

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Fundamental
Peak	Level (dBuV/m) vs Frequency (MHz) for Horizontal band edge. The graph shows a rising signal starting around 2380 MHz, reaching approximately 100 dBuV/m at 2415 MHz. A red line marks the peak level at approximately 75 dBuV/m. Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Level (dBuV/m) vs Frequency (MHz) for Fundamental band edge. The graph shows a sharp peak at approximately 2412 MHz, reaching approximately 110 dBuV/m. A red line marks the peak level at approximately 75 dBuV/m, labeled PEAK_74. Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	Level (dBuV/m) vs Frequency (MHz) for Horizontal band edge. The graph shows a rising signal starting around 2380 MHz, reaching approximately 95 dBuV/m at 2415 MHz. A red line marks the average level at approximately 55 dBuV/m. Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak	Level (dBuV/m) vs Frequency (MHz) for Fundamental band edge. The graph shows a sharp peak at approximately 2412 MHz, reaching approximately 100 dBuV/m. A red line marks the average level at approximately 55 dBuV/m, labeled AVG_54. Site : 03CH13-HY Condition : AVG_54 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak

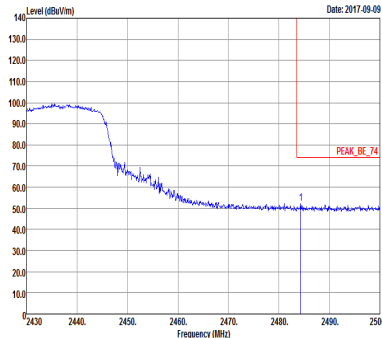
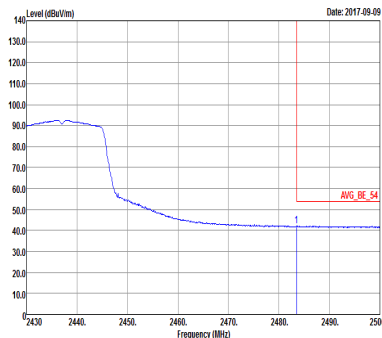


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Vertical	Fundamental
Peak	Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	Site : 03CH13-HY Condition : AV6_BE_54 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak	Site : 03CH13-HY Condition : AV6_54 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak

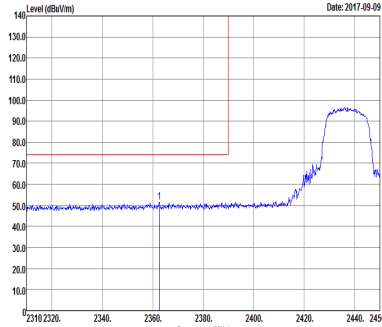
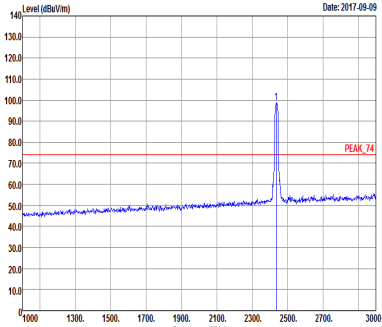
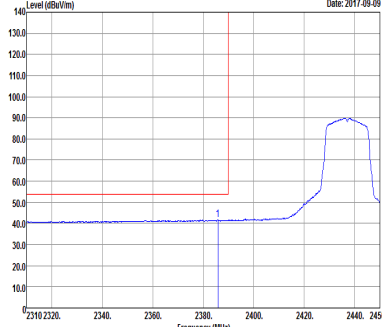
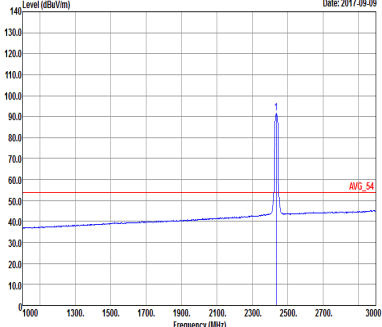


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH13-HY Condition : PEAK_74 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	Site : 03CH13-HY Condition : AV6_54 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak	Site : 03CH13-HY Condition : AV6_54 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak

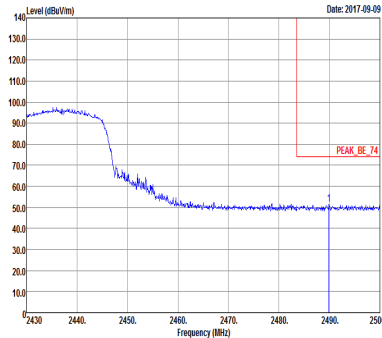
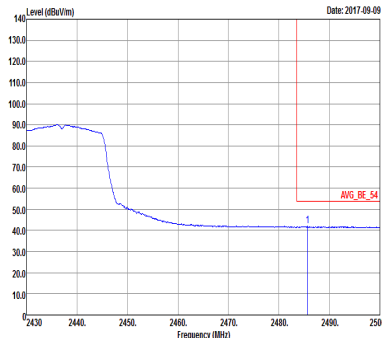


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left blank
Average	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:1000KHz SWT:Auto Detector : Peak	Left blank

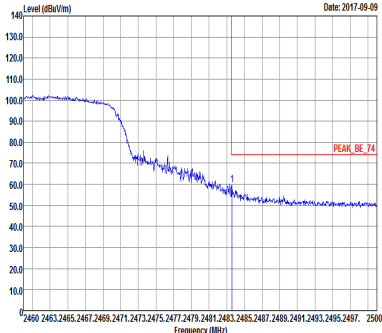
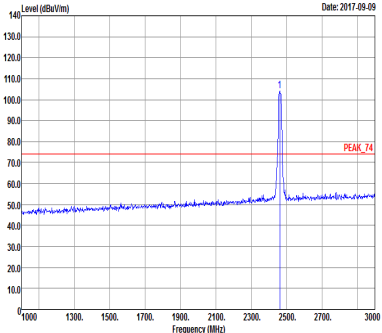
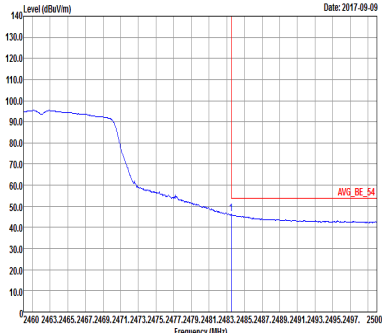
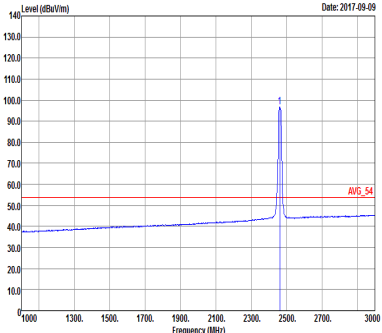


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	 Site : 03CH13-HY Condition : AV6_BE_54 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : AV6_54 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak

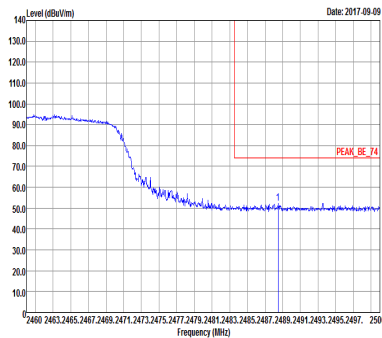
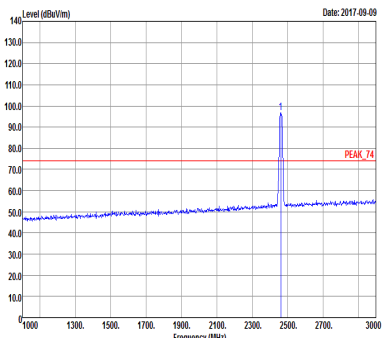
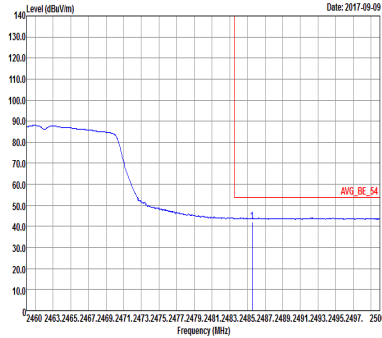
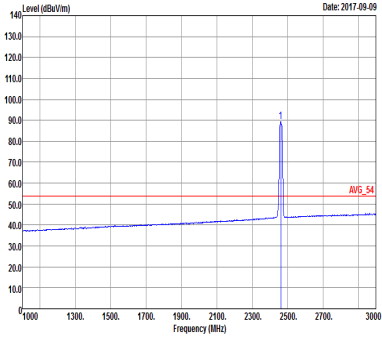


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left Blank
Average	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak	Left Blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : AVG_54 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : PEAK_74 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : AVG_54 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak

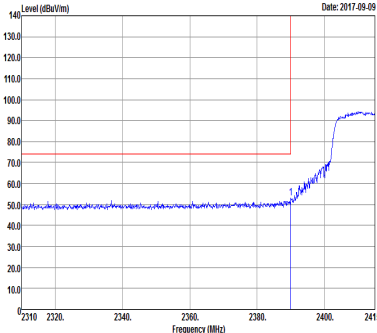
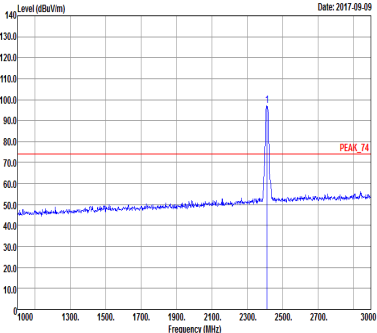
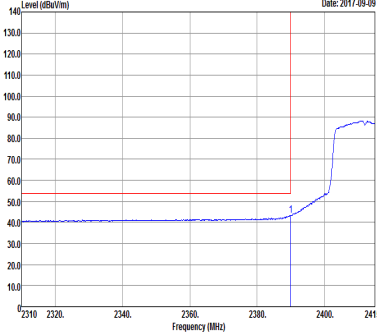
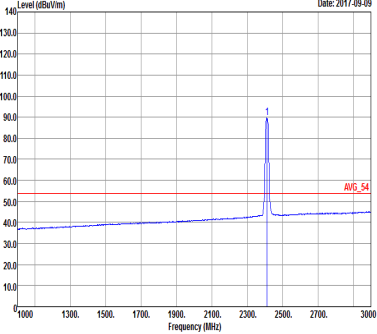


2.4GHz 2400~2483.5MHz

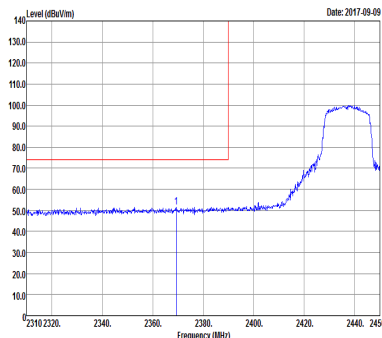
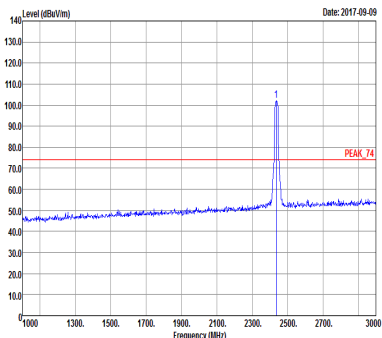
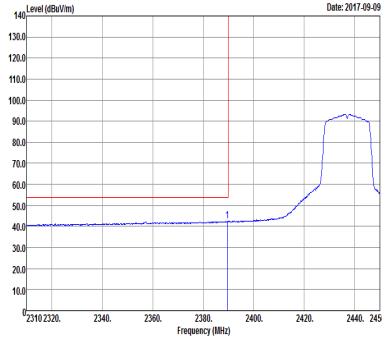
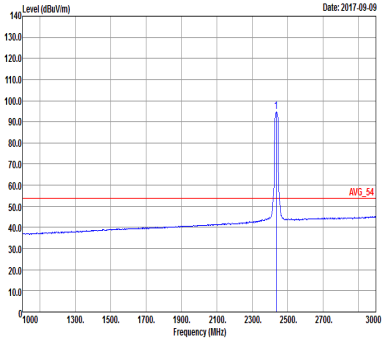
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Fundamental
Peak	Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	Site : 03CH13-HY Condition : AV6_BE_54 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak	Site : 03CH13-HY Condition : AV6_54 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak

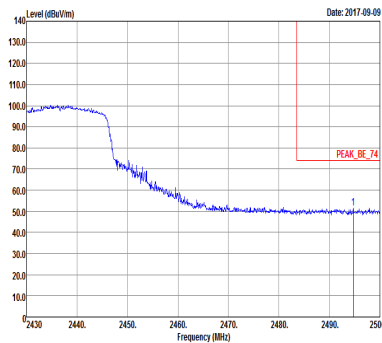
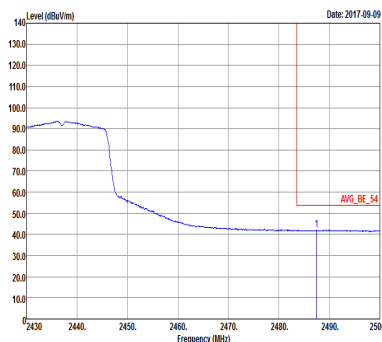


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Vertical	Fundamental
Peak	 Level (dBm/1m) Date: 2017-09-09 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Level (dBm/1m) Date: 2017-09-09 Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	 Level (dBm/1m) Date: 2017-09-09 Site : 03CH13-HY Condition : AV6_BE_54 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak	 Level (dBm/1m) Date: 2017-09-09 Site : 03CH13-HY Condition : AV6_54 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak

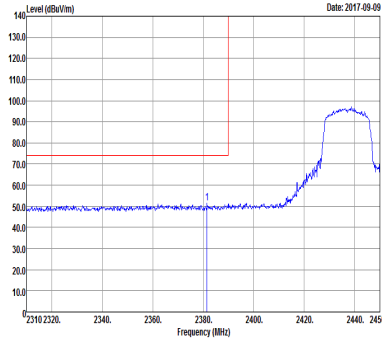
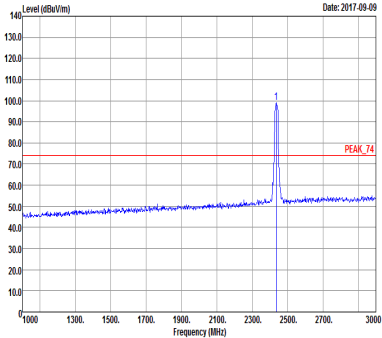
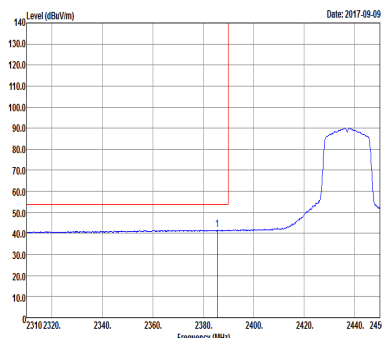
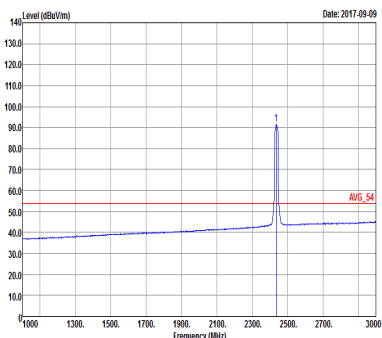


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	 Site : 03CH13-HY Condition : AV6_BE_54 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : AV6_54 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak

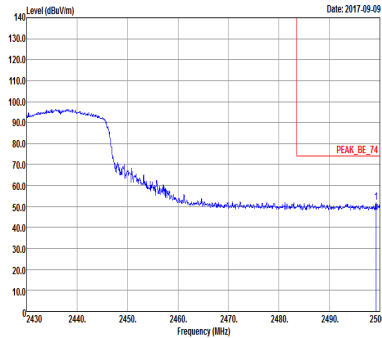
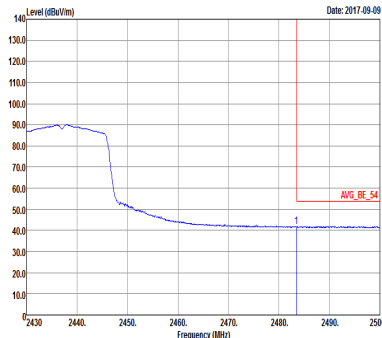


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left blank
Average	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak	Left blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	 Site : 03CH13-HY Condition : AV6_BE_54 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:1000KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : AV6_54 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:1000KHz SWT:Auto Detector : Peak

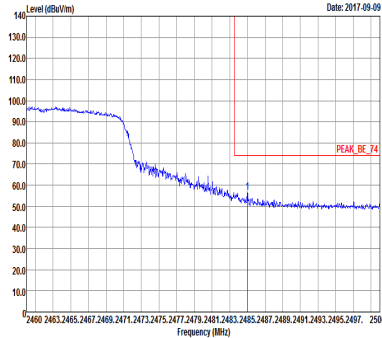
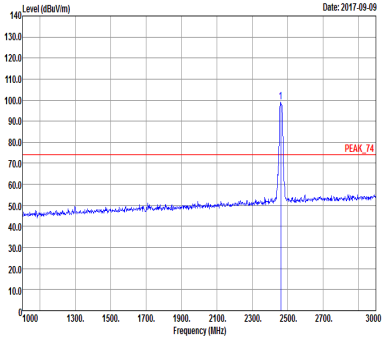
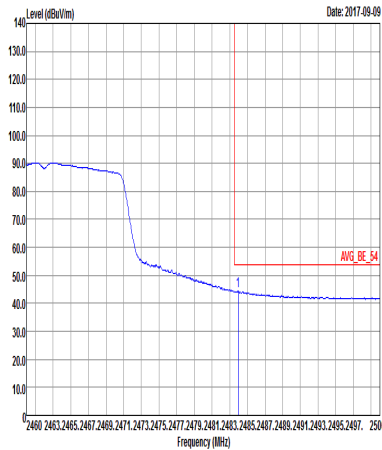
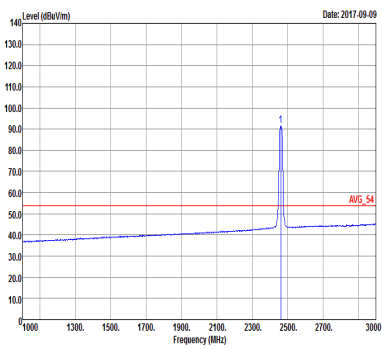


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left Blank
Average	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak	Left Blank



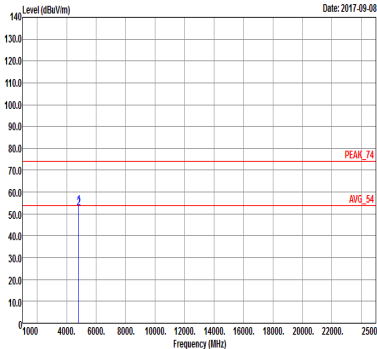
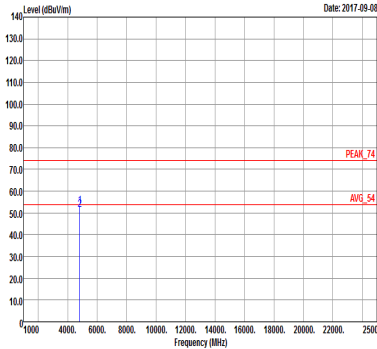
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Fundamental
Peak	Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak	Site : 03CH13-HY Condition : AVG_54 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak



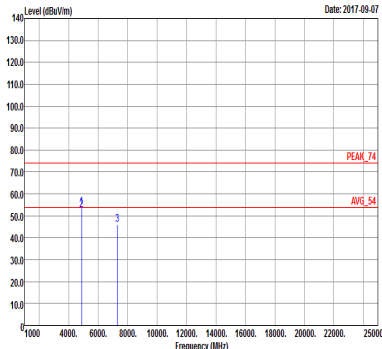
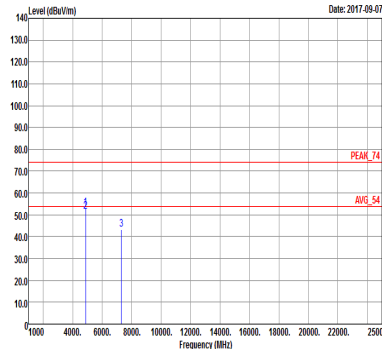
WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : PEAK_74 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Average	 Site : 03CH13-HY Condition : AV6_BE_54 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak	 Site : 03CH13-HY Condition : AV6_54 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak



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	 Site : 03CH13-HY Condition : PEAK_74 3m SHF_HORN_584 HORIZONTAL Detector : Peak	 Site : 03CH13-HY Condition : PEAK_74 3m SHF_HORN_584 VERTICAL Detector : Peak



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1	Horizontal	Vertical
Peak	 Site : 03CH13-HY Condition : PEAK_74 3m SHF_HORN_584 HORIZONTAL Detector : Peak	 Site : 03CH13-HY Condition : PEAK_74 3m SHF_HORN_584 VERTICAL Detector : Peak



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Vertical
Peak	Site : 03CH13-HY Condition : PEAK_74 3m SHF_HORN_584 HORIZONTAL Detector : Peak	Site : 03CH13-HY Condition : PEAK_74 3m SHF_HORN_584 VERTICAL Detector : Peak



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

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Vertical
Peak	Level (dBm/1m) Date: 2017-09-07 Site : 03CH13-HY Condition : PEAK_74 3m SHF_HORN_584 HORIZONTAL Detector : Peak	Level (dBm/1m) Date: 2017-09-07 Site : 03CH13-HY Condition : PEAK_74 3m SHF_HORN_584 VERTICAL Detector : Peak



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1	Horizontal	Vertical
Peak	Level (dBuV/m) Date: 2017-09-08 Site : 03CHI3-HY Condition : PEAK_74 3m SHF_HORN_584 HORIZONTAL Detector : Peak	Level (dBuV/m) Date: 2017-09-08 Site : 03CHI3-HY Condition : PEAK_74 3m SHF_HORN_584 VERTICAL Detector : Peak



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Vertical
Peak	Level (dBuV/m) Date: 2017-09-08 Site : 03CH13-HY Condition : PEAK_74 3m SHF_HORN_584 HORIZONTAL Detector : Peak	Level (dBuV/m) Date: 2017-09-08 Site : 03CH13-HY Condition : PEAK_74 3m SHF_HORN_584 VERTICAL Detector : Peak



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

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Vertical
Peak	Level (dBμV/m) Date: 2017-09-07 Site : 03CHI3-HY Condition : PEAK_74 3m SHF_HORN_584 HORIZONTAL Detector : Peak	Level (dBμV/m) Date: 2017-09-07 Site : 03CHI3-HY Condition : PEAK_74 3m SHF_HORN_584 VERTICAL Detector : Peak



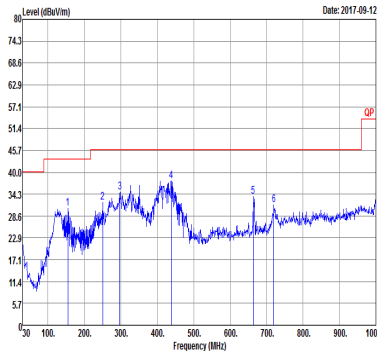
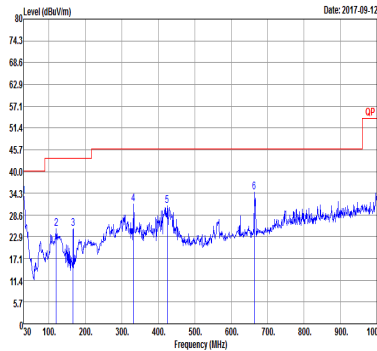
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
1	Horizontal	Vertical
Peak	Level (dBuV/m) Date: 2017-09-08 Site : 03CHI3-HY Condition : PEAK_74 3m SHF_HORN_584 HORIZONTAL Detector : Peak	Level (dBuV/m) Date: 2017-09-08 Site : 03CHI3-HY Condition : PEAK_74 3m SHF_HORN_584 VERTICAL Detector : Peak



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Vertical
Peak	Site : 03CH13-HY Condition : PEAK_74 3m SHF_HORN_584 HORIZONTAL Detector : Peak	Site : 03CH13-HY Condition : PEAK_74 3m SHF_HORN_584 VERTICAL Detector : Peak



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

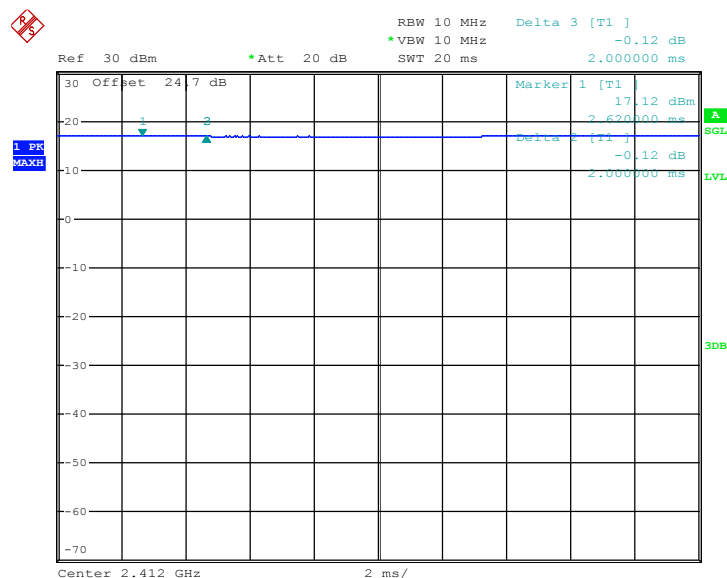
WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11b LF	
1	Horizontal	Vertical
Peak	 Site : 03CH13-HY Condition : QP 3m BIL06_40103 HORIZONTAL Detector : Peak	 Site : 03CH13-HY Condition : QP 3m BIL06_40103 VERTICAL Detector : Peak



Appendix D. Duty Cycle Plots

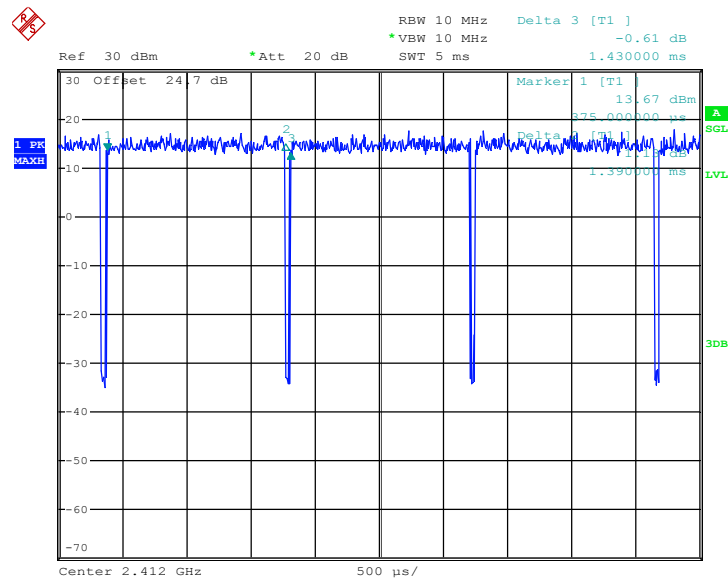
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	100.00	-	-	10Hz
802.11g	97.20	1.390	0.719	1kHz
802.11n HT20	96.30	1.300	0.769	1kHz

802.11b





802.11g





802.11n20

