

FCC RF Test Report

APPLICANT : Franklin Cape Range Limited Liability Company
EQUIPMENT : Tablet PC
MODEL NAME : SV98LN
FCC ID : 2AETF-1013
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The testing was completed on Jun. 16, 2015. 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.

Report No. : FR542915-01C
Report Version : Rev. 01
Page Number : 1 of 43

Report Template No.: BU5-FR15CWL Version 1.0

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR542915-01C	Rev. 01	Initial issue of report	Jun. 29, 2015

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	-
3.2	15.247(b)	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.23 dB at 2390.000 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 18.50 dB at 0.174 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Franklin Cape Range Limited Liability Company

11555 Heron Bay Blvd., Suite 200

Coral Springs, Florida, 33076

1.2 Product Feature of Equipment Under Test

Product Feature	
Equipment	Tablet PC
Model Name	SV98LN
FCC ID	2AETF-1013
EUT supports Radios application	WLAN 11b/g/n (HT20/HT40) Bluetooth v4.0 EDR/LE

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

1.3 Product Specification subjective to this standard

Product Specification subjective to this standard	
Tx/Rx Channel Frequency Range	802.11b/g/n : 2412 MHz ~ 2462 MHz
Maximum (Peak) Output Power to Antenna	802.11b : 17.72 dBm (0.0592 W) 802.11g : 23.53 dBm (0.2254 W) 802.11n HT20 : 23.31 dBm (0.2143 W) 802.11n HT40 : 23.52 dBm (0.2249 W)
Antenna Type	802.11b/g/n : Fixed internal Antenna Type with gain 1.31 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.4 Modification of EUT

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

1.5 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 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.	
	TH02-HY	CO05-HY

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd Rd. Guishan Township, Taoyuan County, Taiwan (R.O.C.) TEL: +886-3-327-0855	
Test Site No.	Sporton Site No.	
	03CH11-HY	

Note: The test site complies with ANSI C63.4 2009 requirement.

1.6 Applicable Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03
- ANSI C63.10-2009

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. FCC permits the use of the 1.5 meter table as an alternative in C63.10-2013 through inquiry tracking number 961829.
3. 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 (Z plane) were recorded in this report.

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.2.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests shown in section 2.3.

2.1 Carrier Frequency 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 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and data rate associated with the highest power were chosen for full test shown in the following tables.

2.4GHz 802.11b mode				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	17.72	17.47	17.42	17.49

2.4GHz 802.11g mode								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	23.53	23.49	23.50	23.44	23.46	23.38	23.42	23.35

2.4GHz 802.11n HT20 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	23.31	22.92	22.98	22.76	22.79	22.88	22.85	22.73

2.4GHz 802.11n HT40 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	23.52	22.73	22.51	22.48	22.55	22.76	22.22	22.33

2.3 Test Mode

Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates from the power table described in section 2.2.

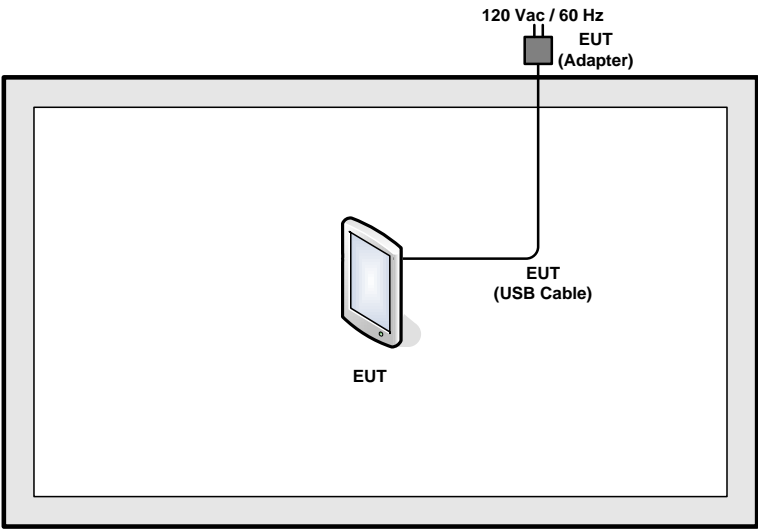
<2.4GHz>

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

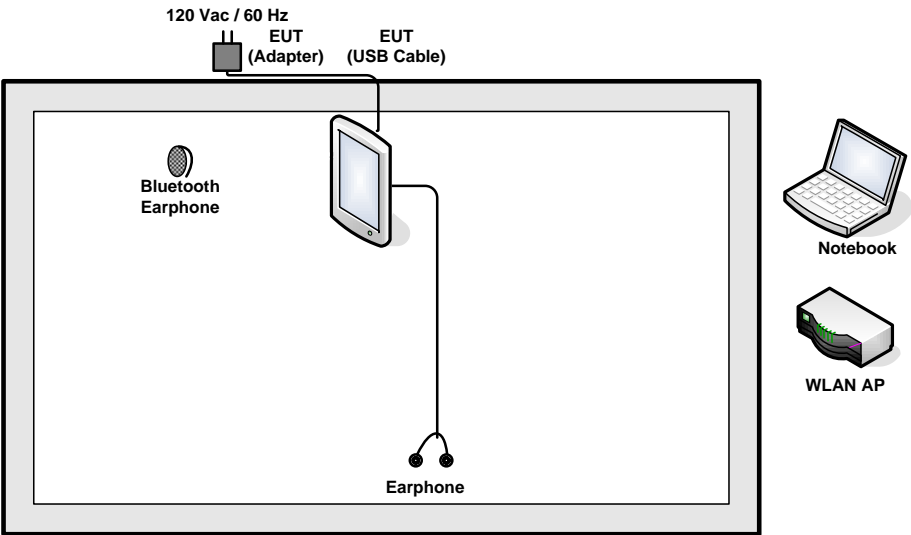
Test Cases	
AC Conducted Emission	Mode 1 : WLAN (2.4GHz) Link + Bluetooth Link + H-Pattern + Earphone + MicroSD Card + USB Cable(Charging from Adapter)

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	D-Link	DIR-865L	KA2IR865LA1	N/A	Unshielded, 1.8 m
3.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
4.	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
5.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.6 EUT Operation Test Setup

The programmed RF utility “adb command”, is installed in EUT to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testing. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

2.7 Measurement Results Explanation Example

For all conducted test items:

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

Example :

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

Offset = RF cable loss + attenuator factor.

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

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

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

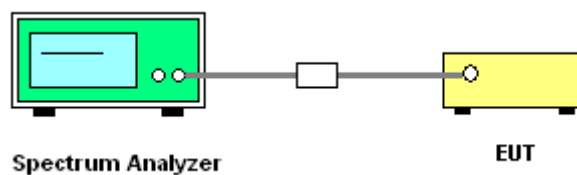
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

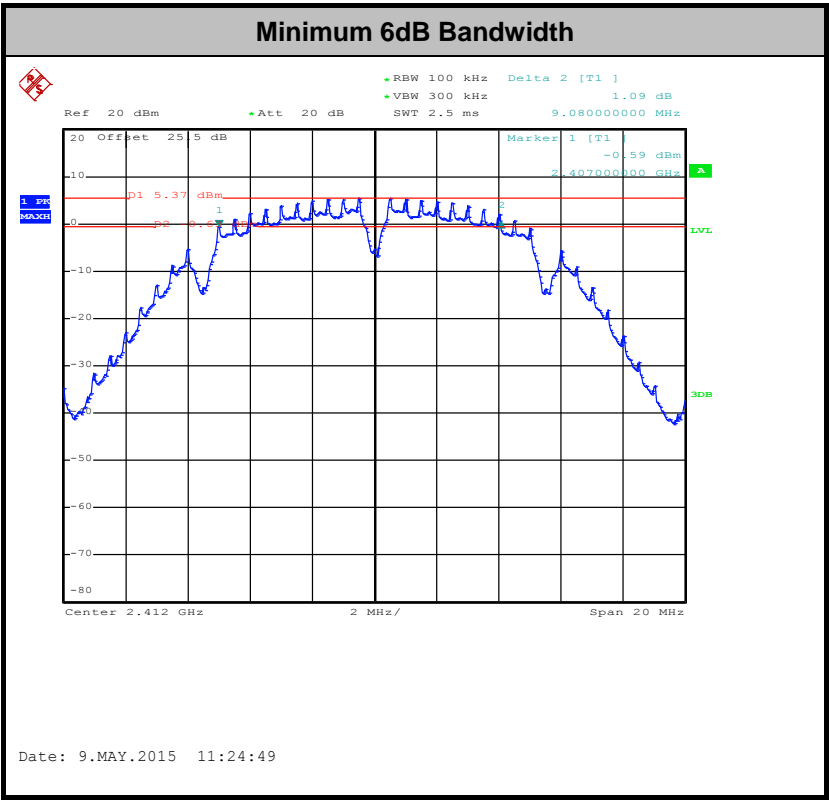
1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v03r03.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit 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. 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 of this test report.



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.

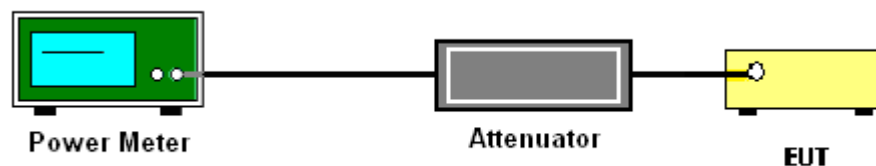
3.2.2 Measuring Instruments

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 v03r03.
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 of this test report.

3.2.6 Test Result of Average output Power (Reporting Only)

Please refer to Appendix A of this test report.

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.

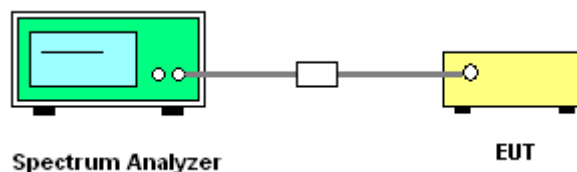
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

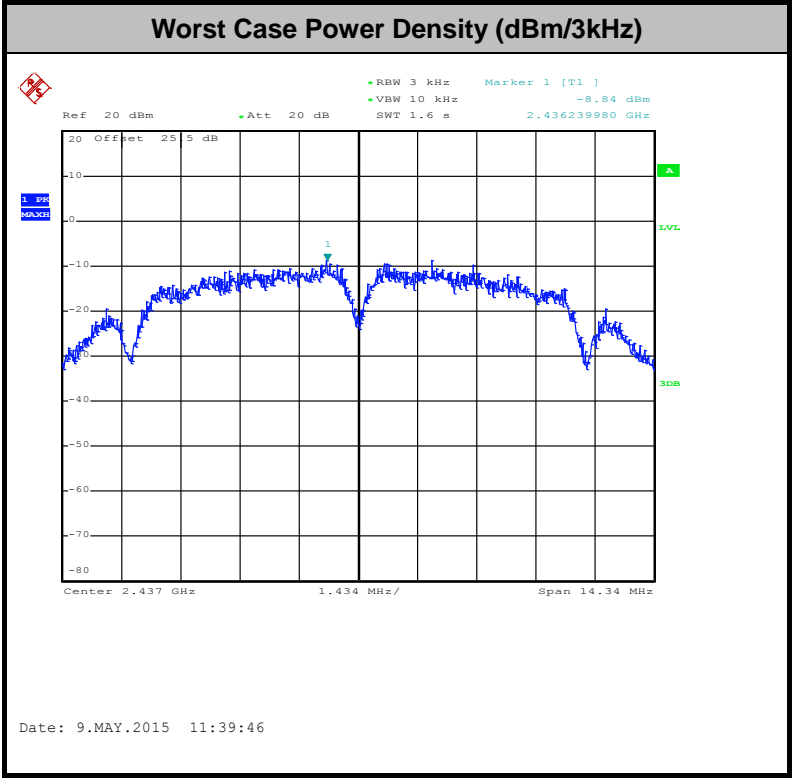
1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum 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 of this test report.



3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

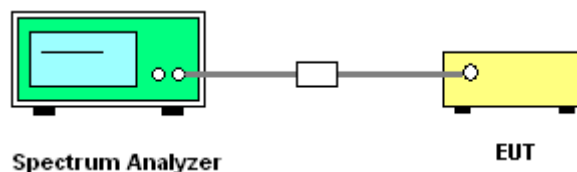
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

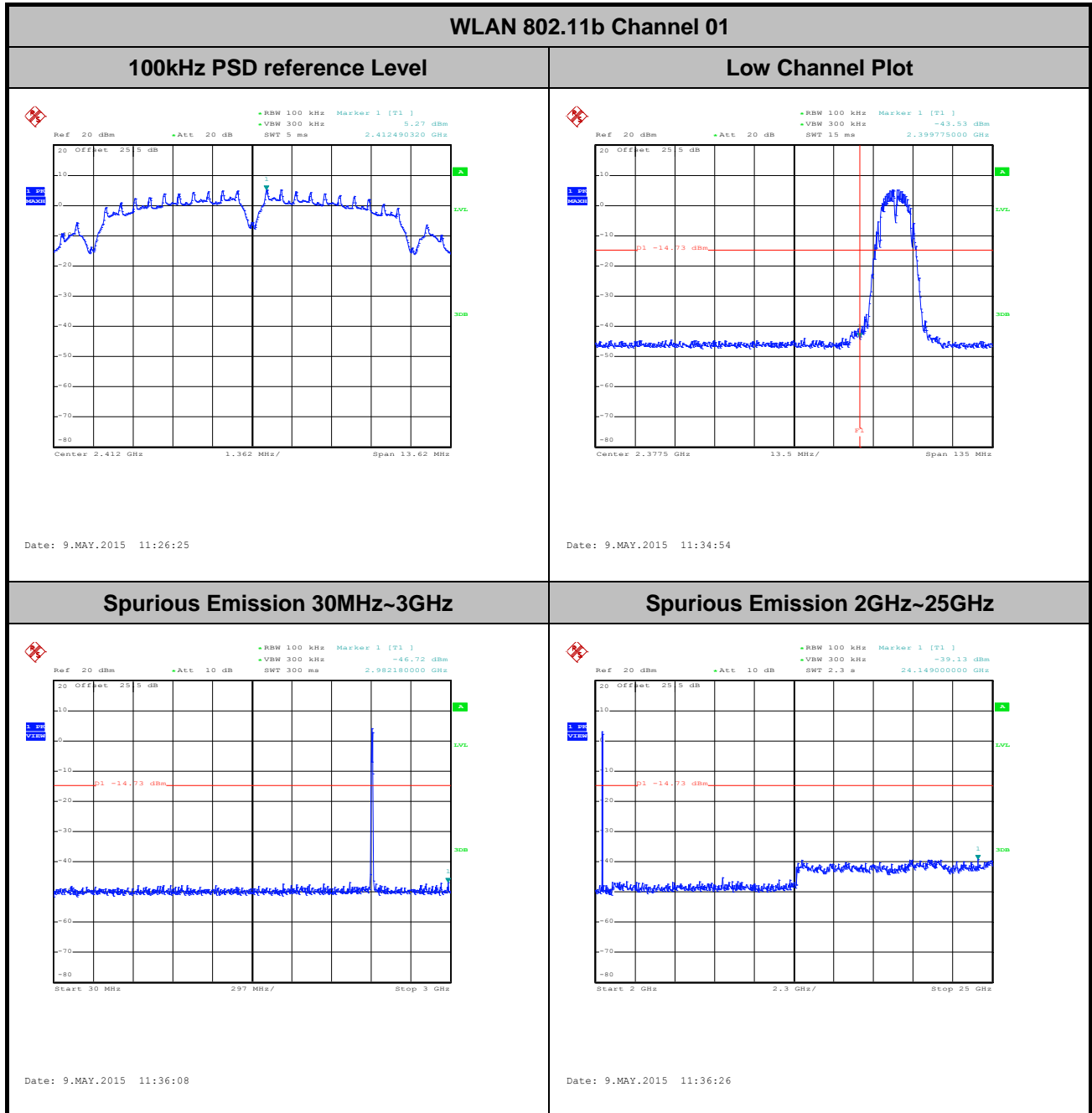
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges and Spurious Emission

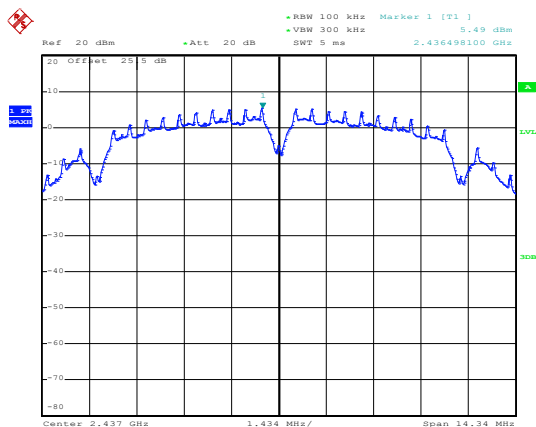
Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	45~49%
Test Channel :	01	Test Engineer :	Luffy Lin



Test Mode :	802.11b	Temperature :	24~26℃
Test Band :	2.4GHz Mid	Relative Humidity :	45~49%
Test Channel :	06	Test Engineer :	Luffy Lin

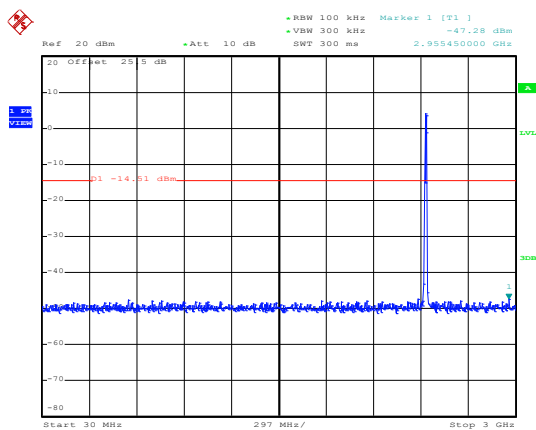
WLAN 802.11b Channel 06

100kHz PSD reference Level



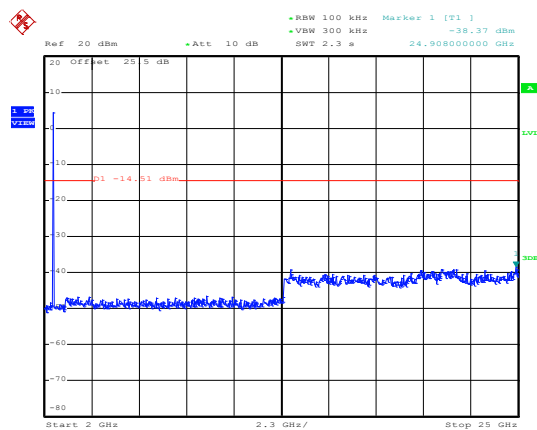
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Spurious Emission 30MHz~3GHz



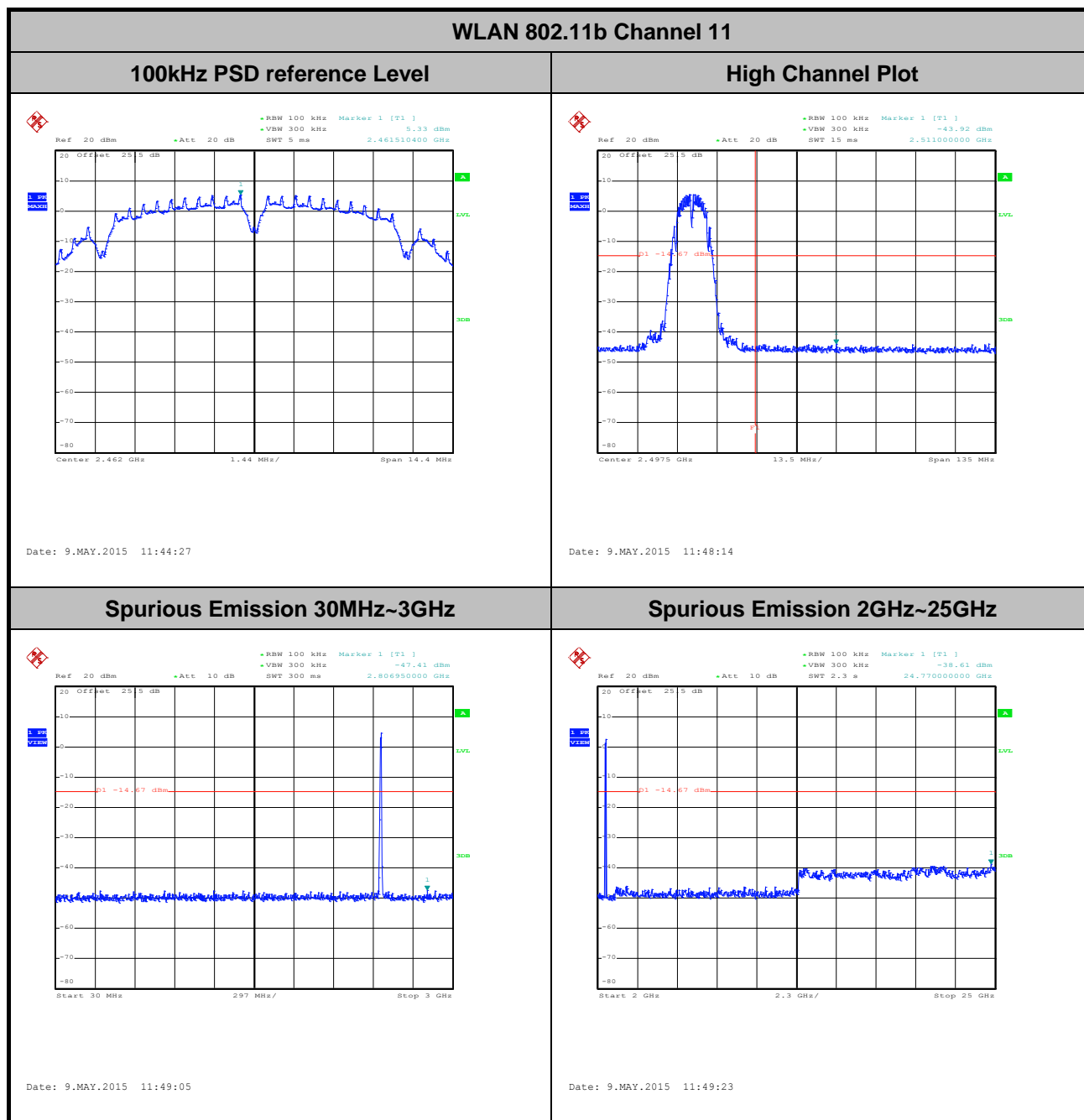
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Spurious Emission 2GHz~25GHz



Date: 9.MAY.2015 11:40:49

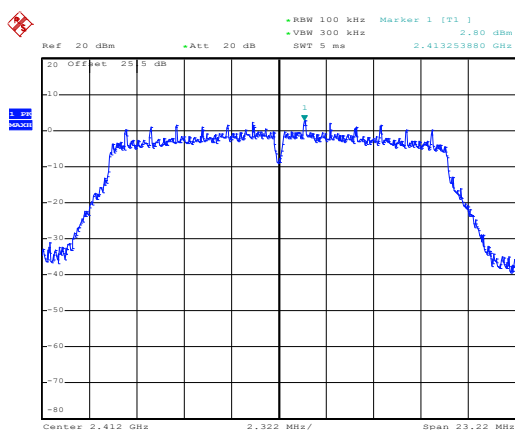
Test Mode :	802.11b	Temperature :	24~26℃
Test Band :	2.4GHz High	Relative Humidity :	45~49%
Test Channel :	11	Test Engineer :	Luffy Lin



Test Mode :	802.11g	Temperature :	24~26℃
Test Band :	2.4GHz Low	Relative Humidity :	45~49%
Test Channel :	01	Test Engineer :	Luffy Lin

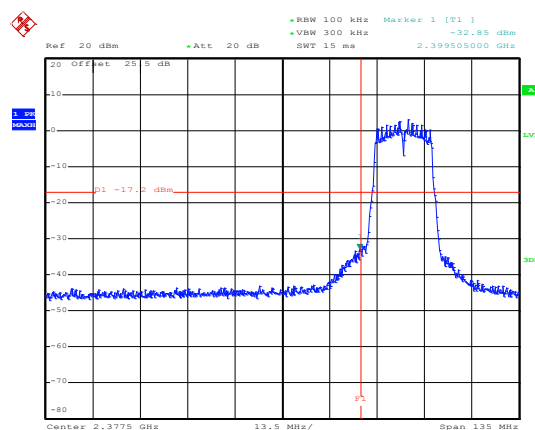
WLAN 802.11g Channel 01

100kHz PSD reference Level



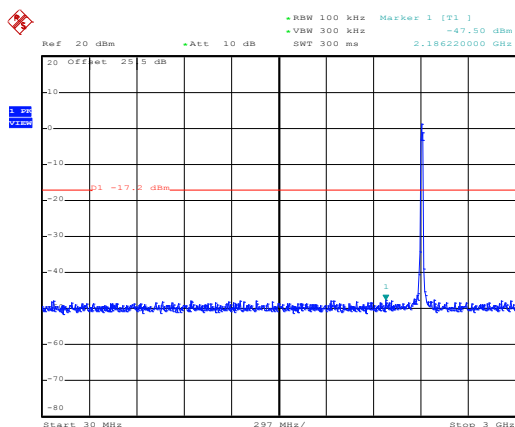
Date: 9.MAY.2015 12:18:01

Low Channel Plot



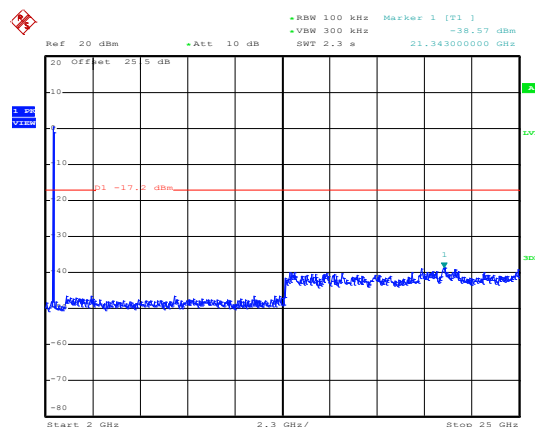
Date: 9.MAY.2015 12:20:56

Spurious Emission 30MHz~3GHz



Date: 9.MAY.2015 12:21:38

Spurious Emission 2GHz~25GHz

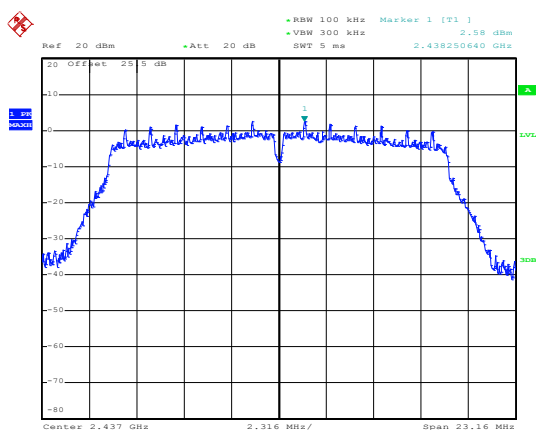


Date: 9.MAY.2015 12:21:56

Test Mode :	802.11g	Temperature :	24~26℃
Test Band :	2.4GHz Mid	Relative Humidity :	45~49%
Test Channel :	06	Test Engineer :	Luffy Lin

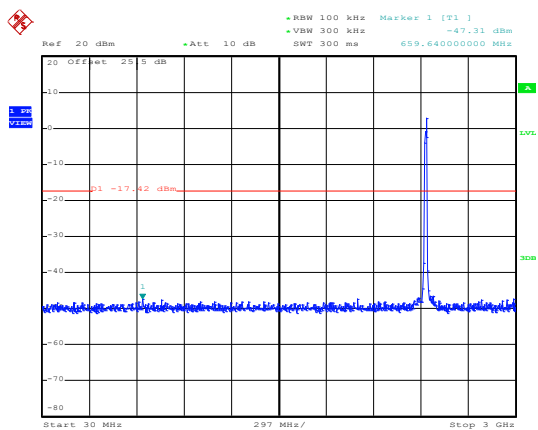
WLAN 802.11g Channel 06

100kHz PSD reference Level



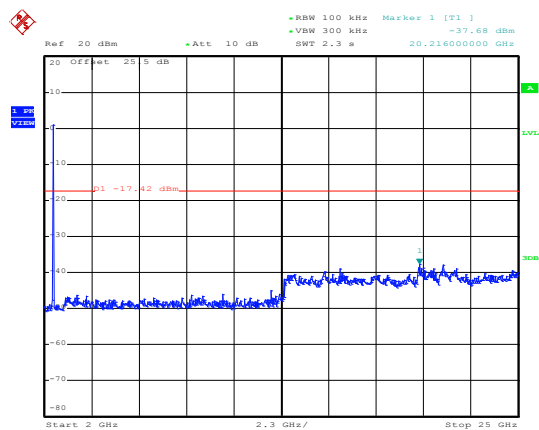
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Spurious Emission 30MHz~3GHz



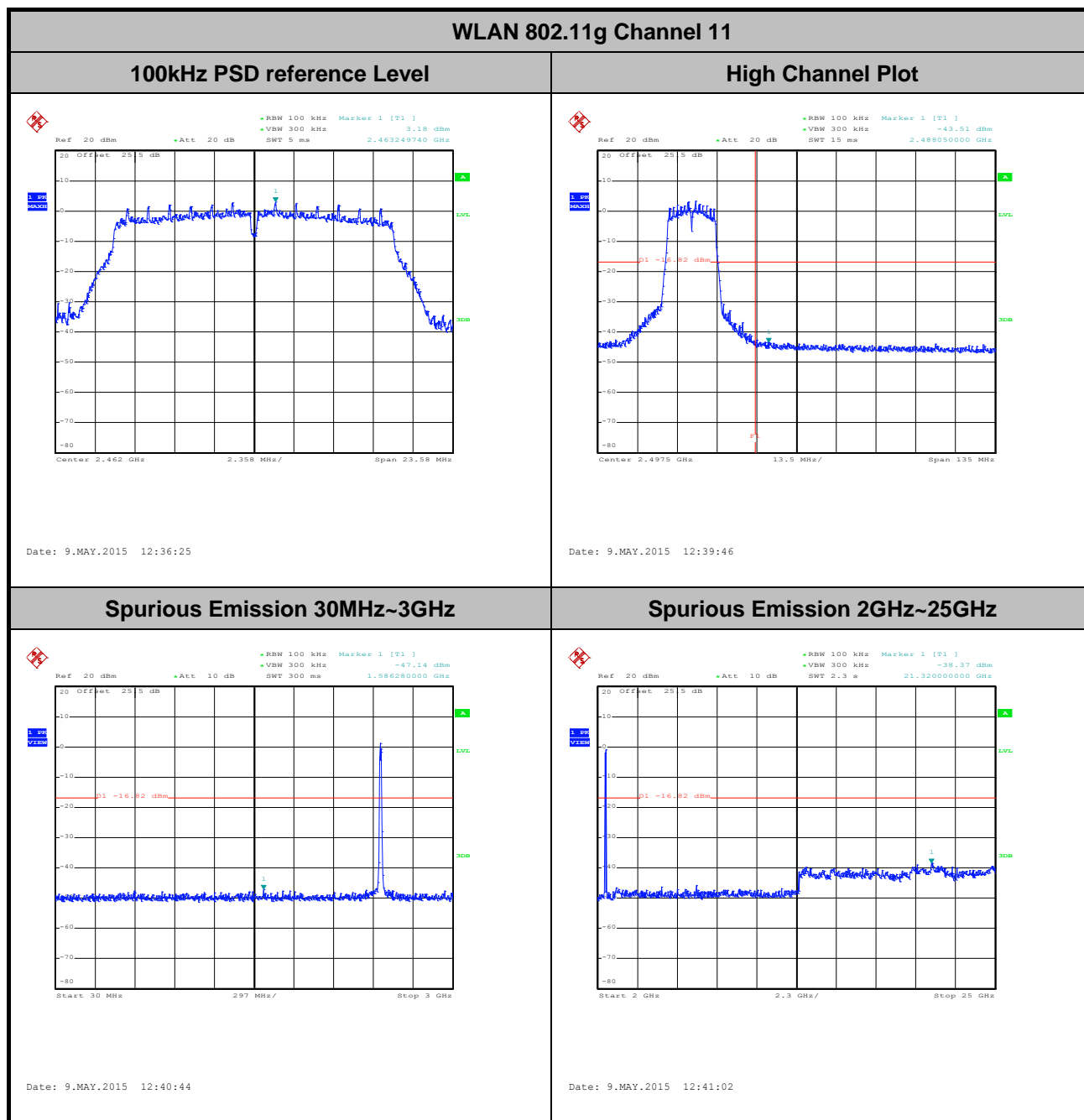
Date: 9.MAY.2015 12:27:32

Spurious Emission 2GHz~25GHz

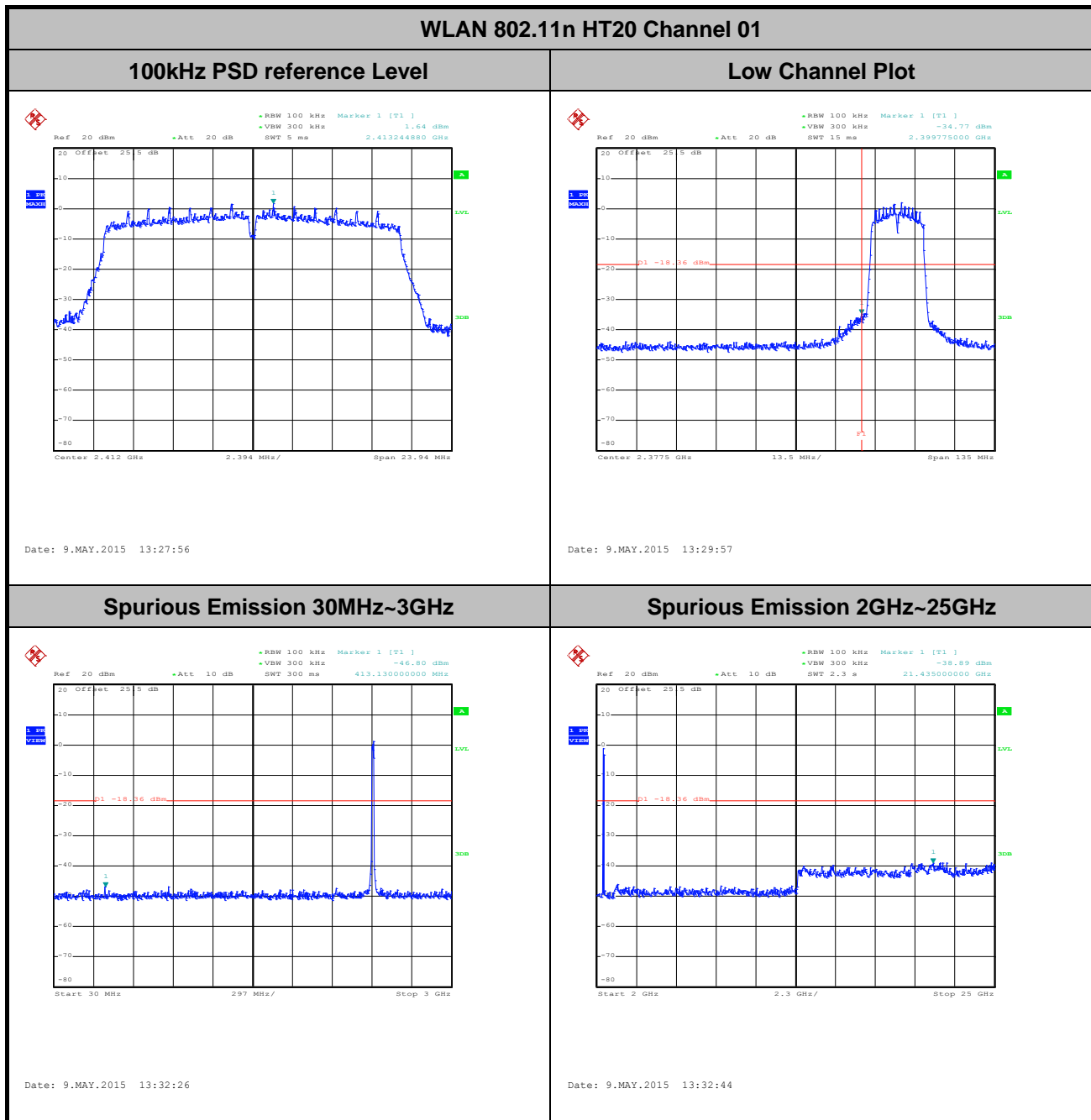


Date: 9.MAY.2015 12:27:50

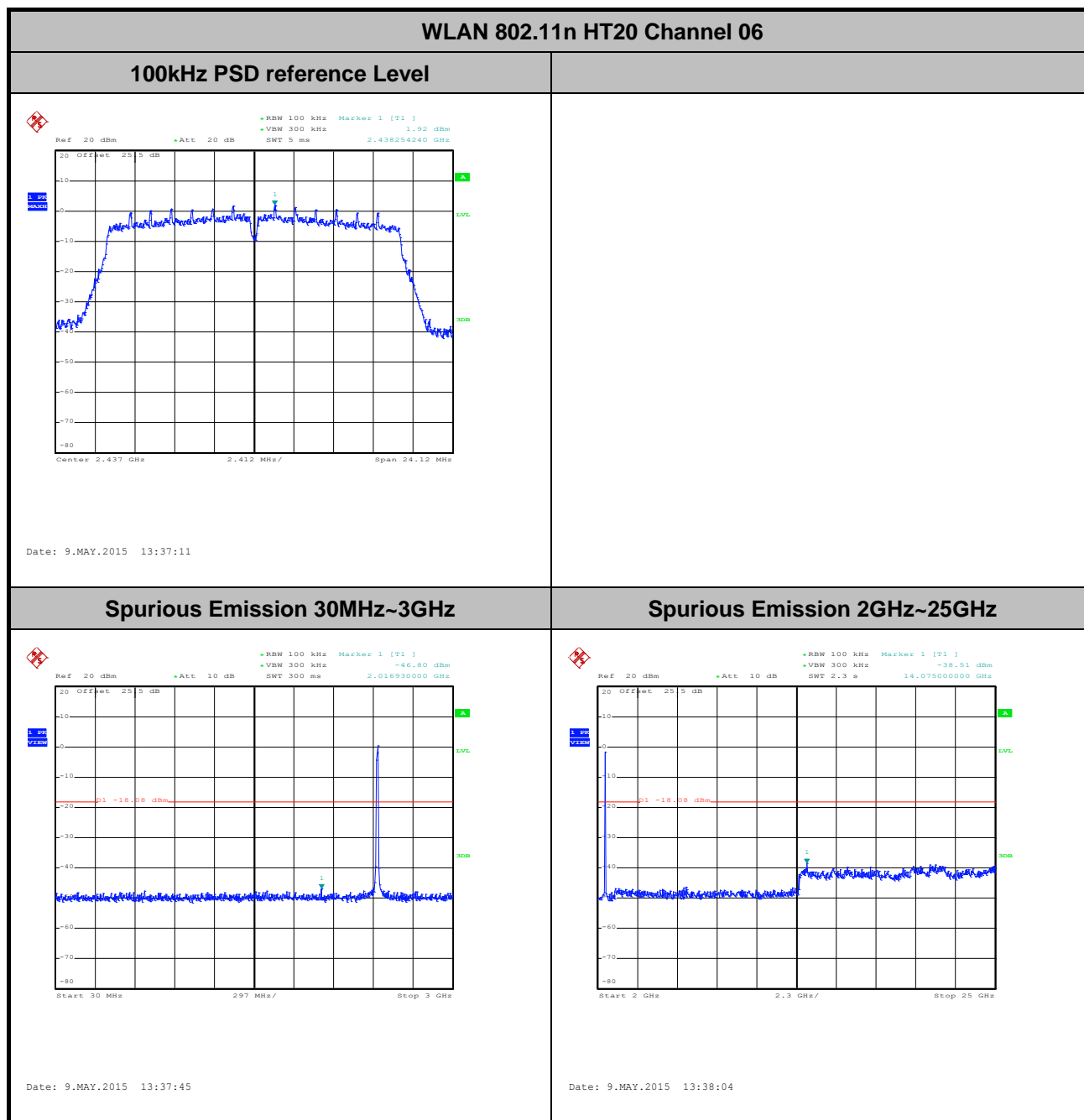
Test Mode :	802.11g	Temperature :	24~26℃
Test Band :	2.4GHz High	Relative Humidity :	45~49%
Test Channel :	11	Test Engineer :	Luffy Lin



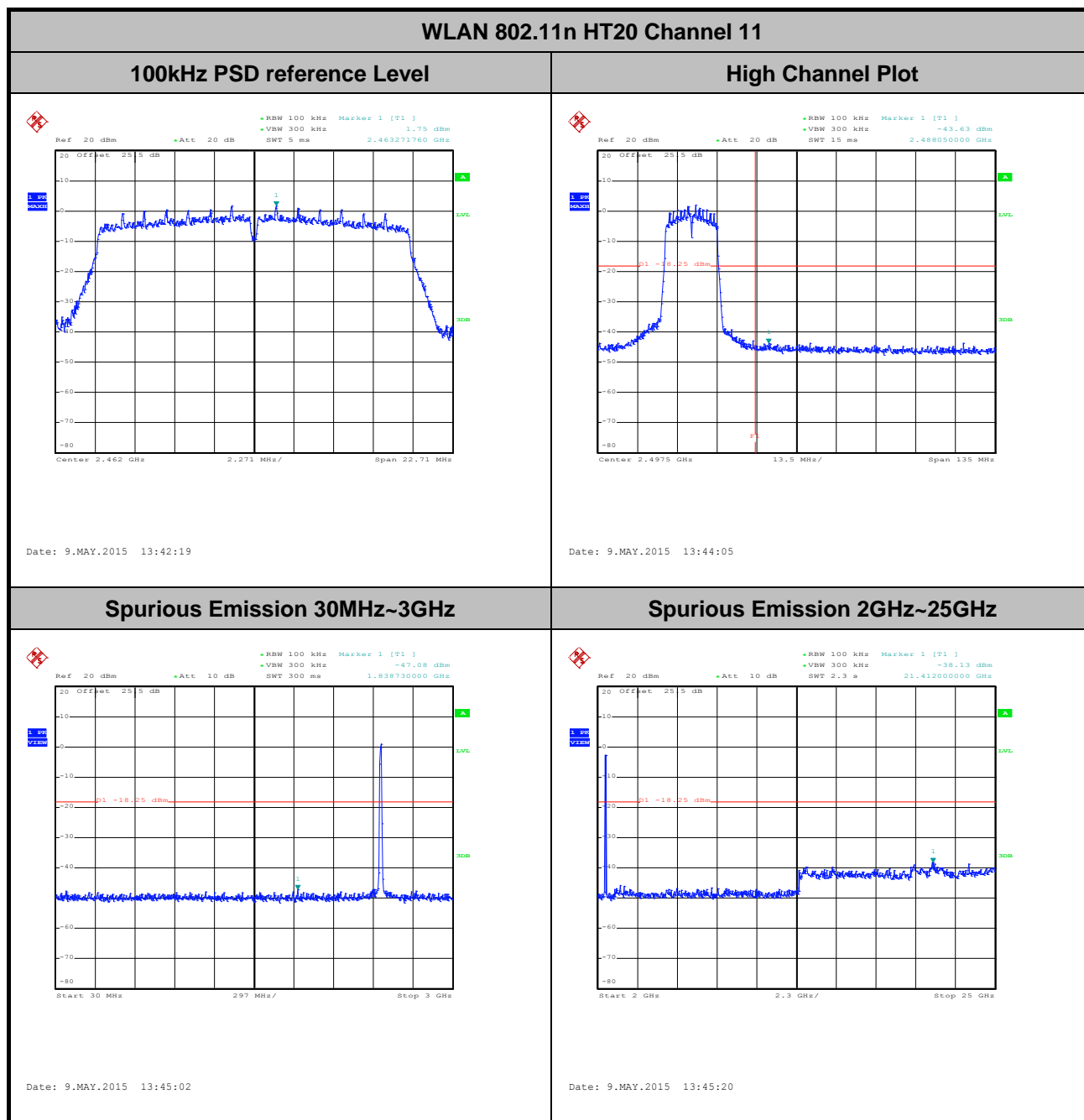
Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	2.4GHz Low	Relative Humidity :	45~49%
Test Channel :	01	Test Engineer :	Luffy Lin



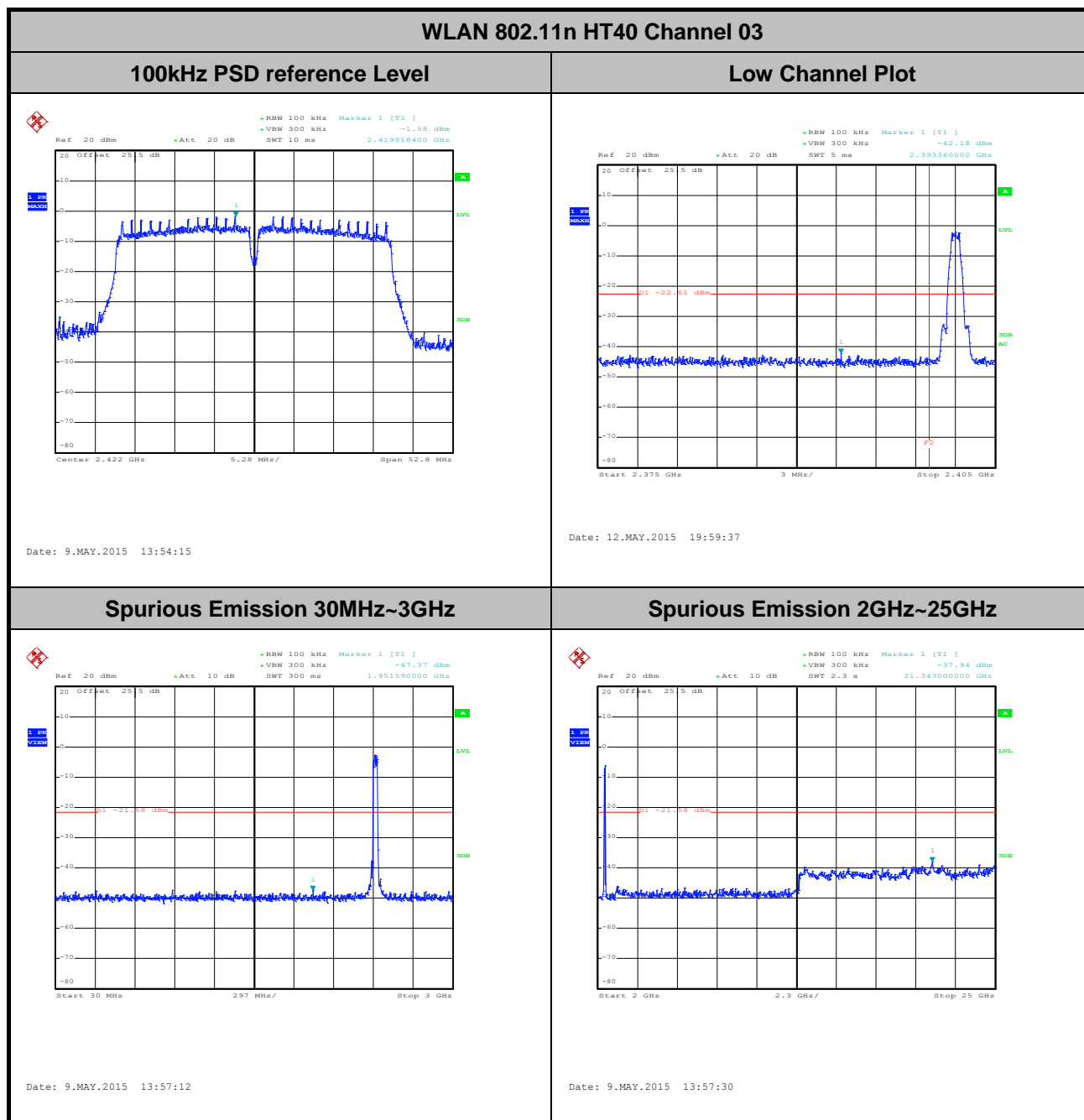
Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	2.4GHz Mid	Relative Humidity :	45~49%
Test Channel :	06	Test Engineer :	Luffy Lin



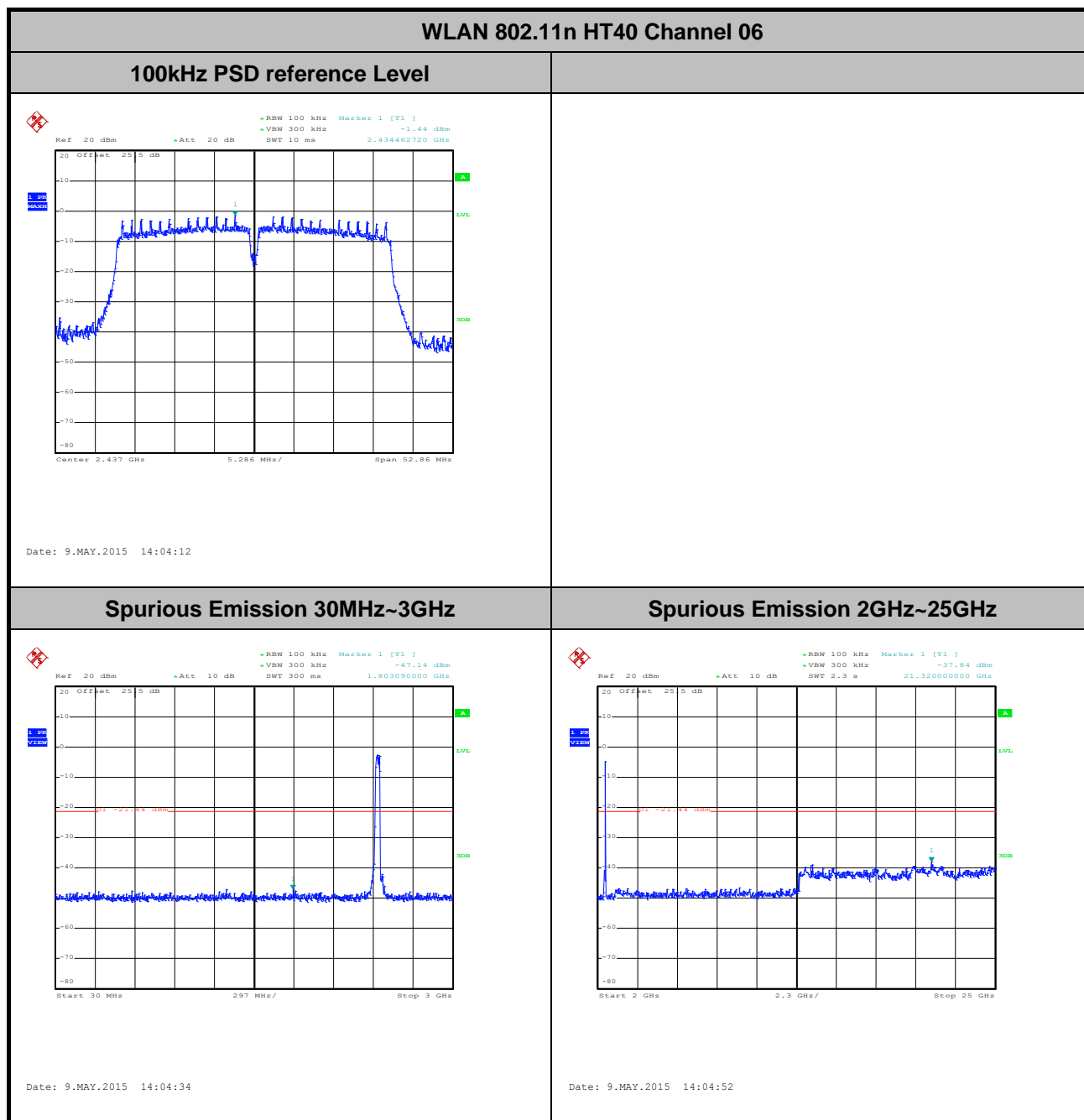
Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	2.4GHz High	Relative Humidity :	45~49%
Test Channel :	11	Test Engineer :	Luffy Lin



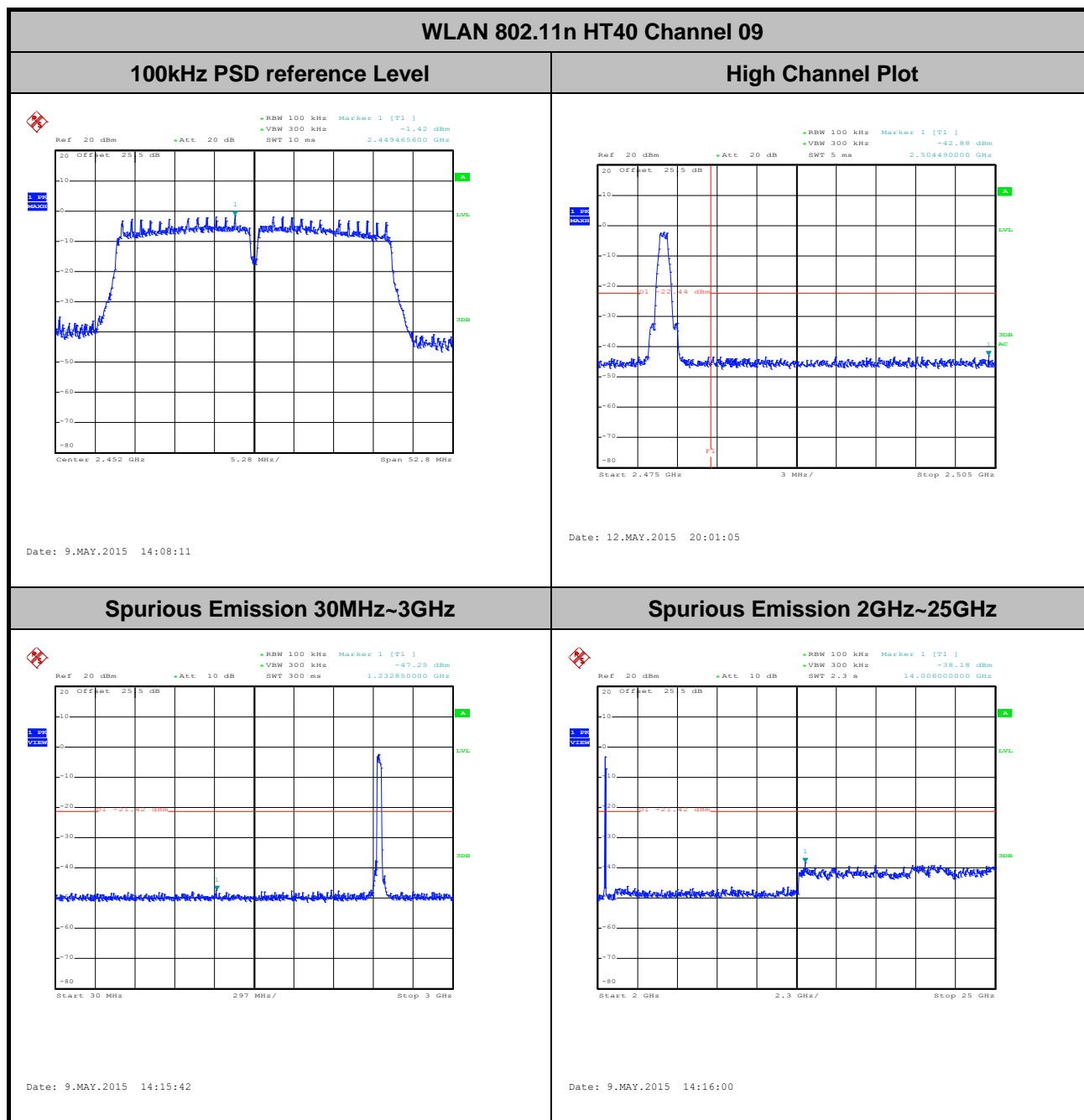
Test Mode :	802.11n HT40	Temperature :	24~26℃
Test Band :	2.4GHz Low	Relative Humidity :	45~49%
Test Channel :	03	Test Engineer :	Luffy Lin



Test Mode :	802.11n HT40	Temperature :	24~26℃
Test Band :	2.4GHz Mid	Relative Humidity :	45~49%
Test Channel :	06	Test Engineer :	Luffy Lin



Test Mode :	802.11n HT40	Temperature :	24~26℃
Test Band :	2.4GHz High	Relative Humidity :	45~49%
Test Channel :	09	Test Engineer :	Luffy Lin



3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

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

3.5.2 Measuring Instruments

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

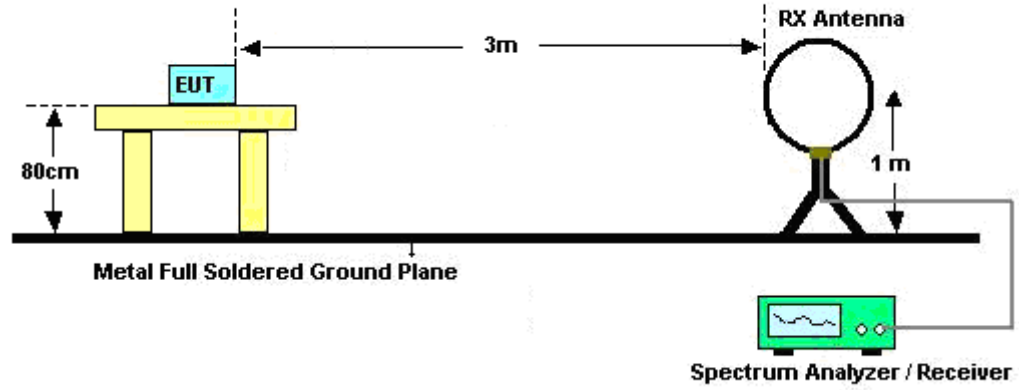
3.5.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03.
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 - Preamplifier 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.

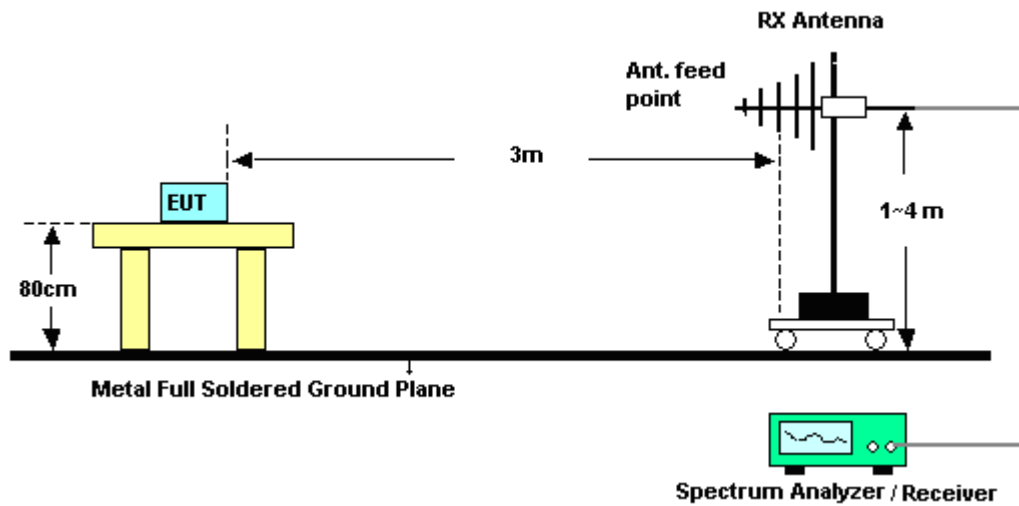
Band	Duty Cycle(%)	T(μ s)	1/T(kHz)	VBW Setting
802.11b	98.13	-	-	10Hz
802.11g	89.17	1400	0.71	1kHz
2.4GHz 802.11n HT20	87.84	1300	0.77	1kHz
2.4GHz 802.11n HT40	79.27	650	1.54	3kHz

3.5.4 Test Setup

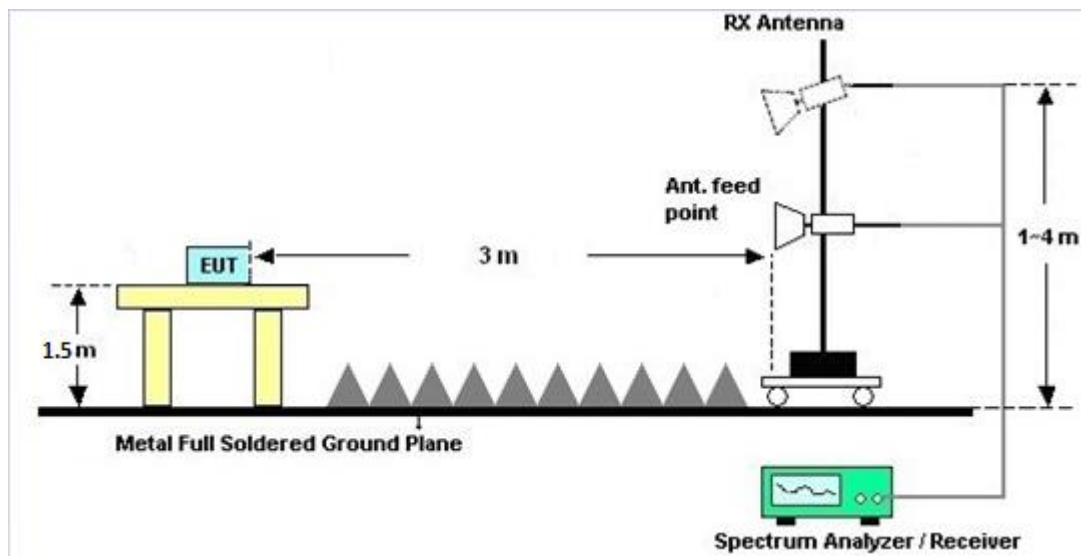
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated Spurious Emissions (9kHz ~ 30MHz)

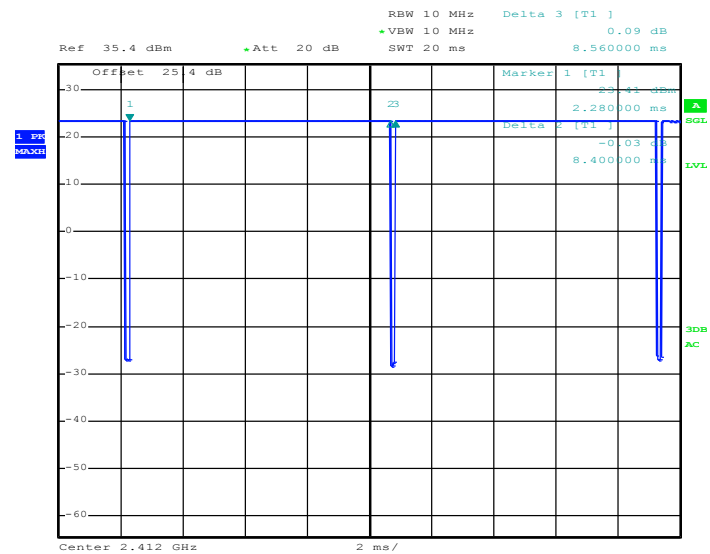
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B.

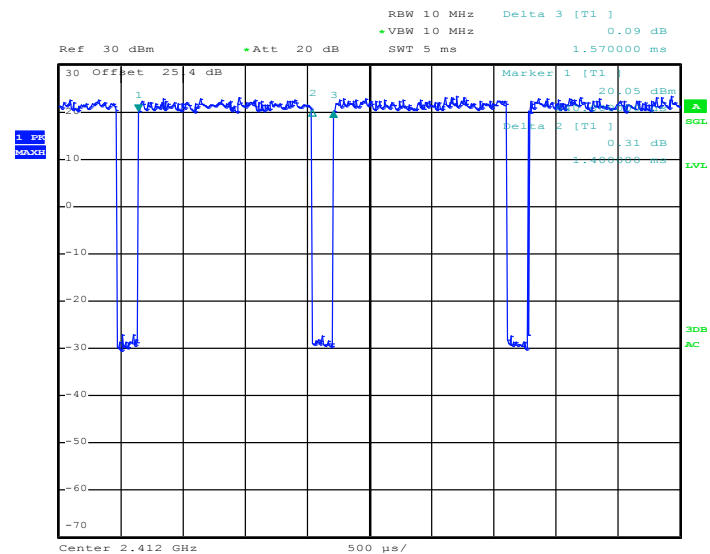
3.5.7 Duty Cycle

802.11b



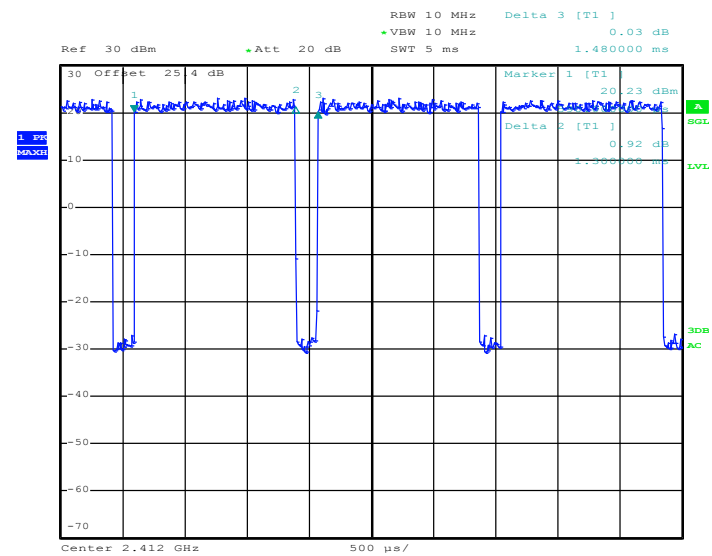
Date: 5.MAY.2015 21:15:08

802.11g



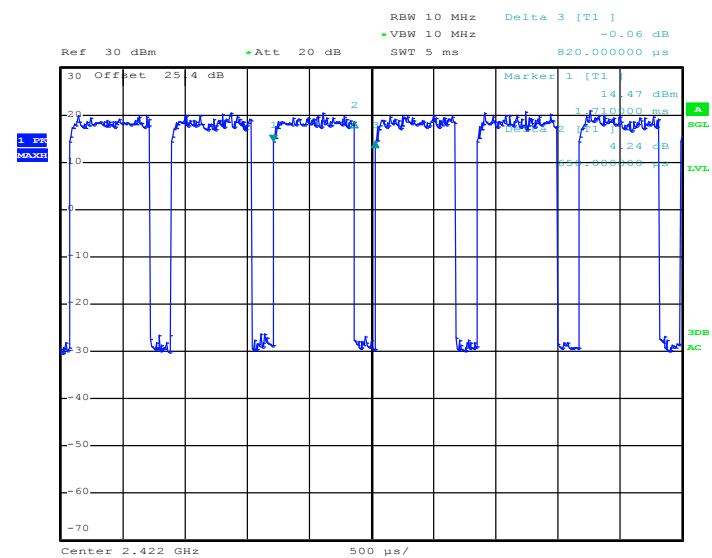
Date: 5.MAY.2015 21:18:00

802.11n HT20



Date: 5.MAY.2015 21:23:08

802.11n HT40



Date: 5.MAY.2015 21:27:43

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

Please refer to Appendix B.

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.

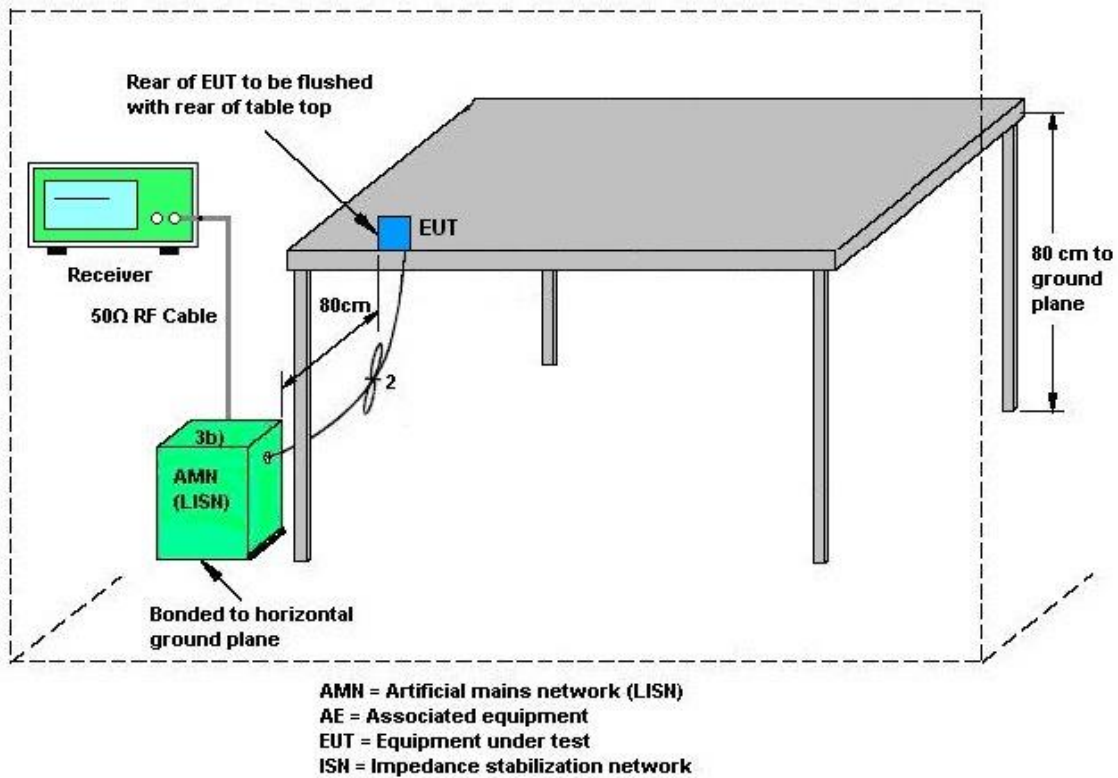
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

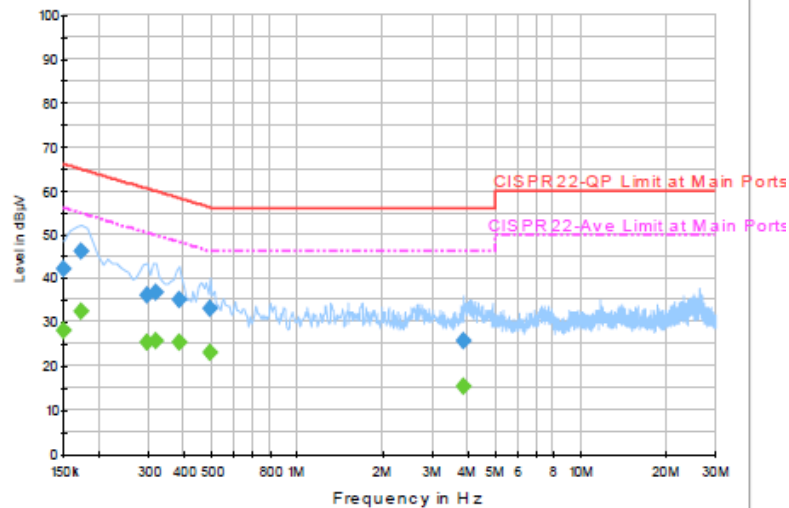
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other 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 :	23~25°C
Test Engineer :	Eric Jeng	Relative Humidity :	56~60%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN (2.4GHz) Link + Bluetooth Link + H-Pattern + Earphone + MicroSD Card + USB Cable(Charging from Adapter)		



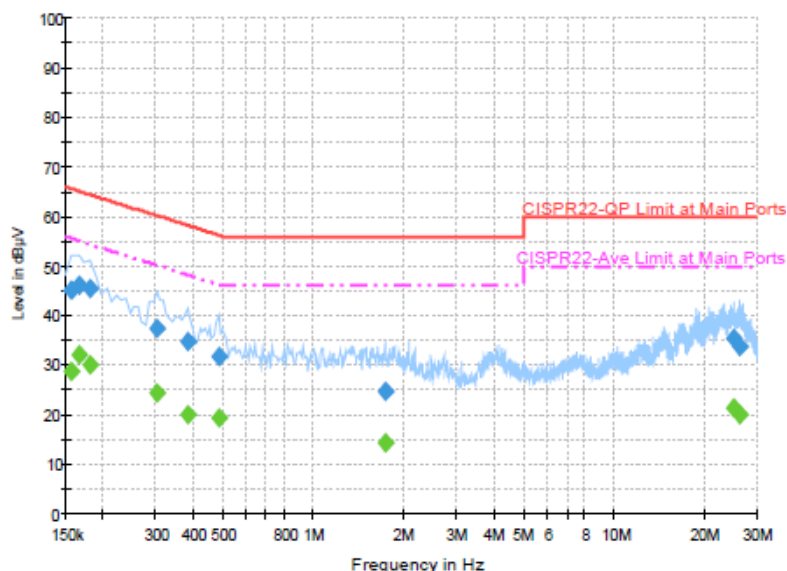
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	42.0	Off	L1	19.5	24.0	66.0
0.174000	46.3	Off	L1	19.5	18.5	64.8
0.294000	36.3	Off	L1	19.5	24.1	60.4
0.318000	36.6	Off	L1	19.5	23.2	59.8
0.382000	35.2	Off	L1	19.5	23.0	58.2
0.494000	33.0	Off	L1	19.4	23.1	56.1
3.862000	25.7	Off	L1	19.7	30.3	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	27.9	Off	L1	19.5	28.1	56.0
0.174000	32.3	Off	L1	19.5	22.5	54.8
0.294000	25.5	Off	L1	19.5	24.9	50.4
0.318000	25.9	Off	L1	19.5	23.9	49.8
0.382000	25.5	Off	L1	19.5	22.7	48.2
0.494000	23.2	Off	L1	19.4	22.9	46.1
3.862000	15.5	Off	L1	19.7	30.5	46.0

Test Mode :	Mode 1	Temperature :	23~25°C
Test Engineer :	Eric Jeng	Relative Humidity :	56~60%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN (2.4GHz) Link + Bluetooth Link + H-Pattern + Earphone + MicroSD Card + USB Cable(Charging from Adapter)		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	45.3	Off	N	19.5	20.3	65.6
0.166000	46.3	Off	N	19.4	18.9	65.2
0.182000	45.6	Off	N	19.5	18.8	64.4
0.302000	37.4	Off	N	19.5	22.8	60.2
0.382000	34.8	Off	N	19.5	23.4	58.2
0.486000	31.6	Off	N	19.5	24.6	56.2
1.734000	24.9	Off	N	19.6	31.1	56.0
25.230000	35.5	Off	N	20.1	24.5	60.0
26.310000	33.8	Off	N	20.2	26.2	60.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	28.9	Off	N	19.5	26.7	55.6
0.166000	32.2	Off	N	19.4	23.0	55.2
0.182000	30.0	Off	N	19.5	24.4	54.4
0.302000	24.4	Off	N	19.5	25.8	50.2
0.382000	20.0	Off	N	19.5	28.2	48.2
0.486000	19.4	Off	N	19.5	26.8	46.2
1.734000	14.4	Off	N	19.6	31.6	46.0
25.230000	21.5	Off	N	20.1	28.5	50.0
26.310000	20.1	Off	N	20.2	29.9	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 FCC rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

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

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Aug. 09, 2014	May 05, 2015~ May 13, 2015	Aug. 08, 2015	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Aug. 11, 2014	May 05, 2015~ May 13, 2015	Aug. 10, 2015	Conducted (TH02-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz-40GHz	Oct. 17, 2014	May 05, 2015~ May 13, 2015	Oct. 16, 2015	Conducted (TH02-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jul. 28, 2014	Jun. 15, 2015~ Jun. 16, 2015	Jul. 27, 2015	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170 584	18GHz- 40GHz	Nov. 03, 2014	Jun. 15, 2015~ Jun. 16, 2015	Nov. 02, 2015	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Nov. 24, 2014	Jun. 15, 2015~ Jun. 16, 2015	Nov. 23, 2015	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D	35414	30MHz~1GHz	Oct. 24, 2014	Jun. 15, 2015~ Jun. 16, 2015	Oct. 23, 2015	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-132 6	1GHz ~ 18GHz	Oct. 03, 2014	Jun. 15, 2015~ Jun. 16, 2015	Oct. 02, 2015	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY532700 80	1GHz~26.5GHz	Nov. 20, 2014	Jun. 15, 2015~ Jun. 16, 2015	Nov. 19, 2015	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY542004 86	10Hz ~ 44GHZ	Sep. 24, 2014	Jun. 15, 2015~ Jun. 16, 2015	Sep. 23, 2015	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Jun. 15, 2015~ Jun. 16, 2015	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0-360 degree	N/A	Jun. 15, 2015~ Jun. 16, 2015	N/A	Radiation (03CH11-HY)
Preamplifier	MITEQ	JS44-1800400 0-33-8P	1840917	18GHz ~ 40GHz	Jun. 02, 2015	Jun. 15, 2015~ Jun. 16, 2015	Jun. 01, 2016	Radiation (03CH11-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz – 2.75GHz	Dec. 01, 2014	Jun. 15, 2015	Nov. 30, 2015	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 02, 2014	Jun. 15, 2015	Dec. 01, 2015	Conduction (CO05-HY)
AC Power Source()	ChainTek	APC-1000W	N/A	N/A	N/A	Jun. 15, 2015	N/A	Conduction (CO05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.26
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.90
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Appendix A. Conducted Test Results

A1 - DTS Part

Test Engineer:	Luffy Lin	Temperature:	21~25	°C
Test Date:	2015/05/05~2015/05/13	Relative Humidity:	51~54	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band								
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	12.40	9.08	0.50	Pass
11b	1Mbps	1	6	2437	12.40	9.56	0.50	Pass
11b	1Mbps	1	11	2462	12.40	9.60	0.50	Pass
11g	6Mbps	1	1	2412	17.35	15.48	0.50	Pass
11g	6Mbps	1	6	2437	17.40	15.44	0.50	Pass
11g	6Mbps	1	11	2462	17.40	15.72	0.50	Pass
HT20	MCS0	1	1	2412	18.10	15.96	0.50	Pass
HT20	MCS0	1	6	2437	18.10	16.08	0.50	Pass
HT20	MCS0	1	11	2462	18.10	15.14	0.50	Pass
HT40	MCS0	1	3	2422	36.10	35.20	0.50	Pass
HT40	MCS0	1	6	2437	36.10	35.24	0.50	Pass
HT40	MCS0	1	9	2452	36.30	35.20	0.50	Pass

TEST RESULTS DATA
Peak Power Table

2.4GHz Band										
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
11b	1Mbps	1	1	2412	17.72	30.00	1.31	19.03	36.00	Pass
11b	1Mbps	1	6	2437	17.36	30.00	1.31	18.67	36.00	Pass
11b	1Mbps	1	11	2462	17.24	30.00	1.31	18.55	36.00	Pass
11g	6Mbps	1	1	2412	23.41	30.00	1.31	24.72	36.00	Pass
11g	6Mbps	1	6	2437	23.53	30.00	1.31	24.84	36.00	Pass
11g	6Mbps	1	11	2462	23.03	30.00	1.31	24.34	36.00	Pass
HT20	MCS0	1	1	2412	23.31	30.00	1.31	24.62	36.00	Pass
HT20	MCS0	1	6	2437	23.24	30.00	1.31	24.55	36.00	Pass
HT20	MCS0	1	11	2462	23.29	30.00	1.31	24.60	36.00	Pass
HT40	MCS0	1	3	2422	22.85	30.00	1.31	24.16	36.00	Pass
HT40	MCS0	1	6	2437	23.52	30.00	1.31	24.83	36.00	Pass
HT40	MCS0	1	9	2452	22.92	30.00	1.31	24.23	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	0.08	14.77
11b	1Mbps	1	6	2437	0.08	14.22
11b	1Mbps	1	11	2462	0.08	14.03
11g	6Mbps	1	1	2412	0.50	13.75
11g	6Mbps	1	6	2437	0.50	13.92
11g	6Mbps	1	11	2462	0.50	13.82
HT20	MCS0	1	1	2412	0.56	12.95
HT20	MCS0	1	6	2437	0.56	12.87
HT20	MCS0	1	11	2462	0.56	12.93
HT40	MCS0	1	3	2422	0.56	11.34
HT40	MCS0	1	6	2437	0.56	12.23
HT40	MCS0	1	9	2452	0.56	11.58

TEST RESULTS DATA
Peak Power Density

2.4GHz Band								
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
11b	1Mbps	1	1	2412	-9.03	1.31	8.00	Pass
11b	1Mbps	1	6	2437	-8.84	1.31	8.00	Pass
11b	1Mbps	1	11	2462	-9.55	1.31	8.00	Pass
11g	6Mbps	1	1	2412	-11.41	1.31	8.00	Pass
11g	6Mbps	1	6	2437	-11.92	1.31	8.00	Pass
11g	6Mbps	1	11	2462	-11.26	1.31	8.00	Pass
HT20	MCS0	1	1	2412	-12.75	1.31	8.00	Pass
HT20	MCS0	1	6	2437	-12.81	1.31	8.00	Pass
HT20	MCS0	1	11	2462	-10.33	1.31	8.00	Pass
HT40	MCS0	1	3	2422	-15.33	1.31	8.00	Pass
HT40	MCS0	1	6	2437	-16.17	1.31	8.00	Pass
HT40	MCS0	1	9	2452	-16.45	1.31	8.00	Pass

Appendix B. Radiated Spurious Emission

Test Engineer :	Derreck Chen and Jesse Wang	Temperature :	23~25°C
		Relative Humidity :	46~48%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		2384.34	55.11	-18.89	74	55.95	27.19	6.01	34.04	133	307	P	H
		2385.96	44.06	-9.94	54	44.86	27.23	6.01	34.04	133	307	A	H
	*	2412	104.53	-	-	105.25	27.28	6.04	34.04	133	307	P	H
	*	2412	101.8	-	-	102.52	27.28	6.04	34.04	133	307	A	H
													H
													H
		2381.91	56.54	-17.46	74	57.38	27.19	6.01	34.04	117	265	P	V
		2386.14	44.03	-9.97	54	44.83	27.23	6.01	34.04	117	265	A	V
	*	2412	104.36	-	-	105.08	27.28	6.04	34.04	117	265	P	V
	*	2412	101.81	-	-	102.53	27.28	6.04	34.04	117	265	A	V
													V
													V
802.11b CH 06 2437MHz		2356.35	53.95	-20.05	74	54.91	27.14	5.95	34.05	146	235	P	H
		2388.66	43.22	-10.78	54	44.02	27.23	6.01	34.04	146	235	A	H
	*	2437	104.02	-	-	104.64	27.37	6.04	34.03	146	235	P	H
	*	2437	101.48	-	-	102.1	27.37	6.04	34.03	146	235	A	H
		2495	54.27	-19.73	74	54.68	27.5	6.09	34	146	235	P	H
		2491.92	43.21	-10.79	54	43.62	27.5	6.09	34	146	235	A	H
		2390	53.63	-20.37	74	54.43	27.23	6.01	34.04	100	263	P	V
		2382.27	43.24	-10.76	54	44.08	27.19	6.01	34.04	100	263	A	V
	*	2437	103.52	-	-	104.14	27.37	6.04	34.03	100	263	P	V
	*	2437	100.97	-	-	101.59	27.37	6.04	34.03	100	263	A	V
		2496	54.74	-19.26	74	55.15	27.5	6.09	34	100	263	P	V
		2491.84	43.1	-10.9	54	43.51	27.5	6.09	34	100	263	A	V

802.11b CH 11 2462MHz	*	2462	103.64	-	-	104.18	27.41	6.07	34.02	162	231	P	H
	*	2462	101.09	-	-	101.63	27.41	6.07	34.02	162	231	A	H
		2483.92	54.29	-19.71	74	54.75	27.46	6.09	34.01	162	231	P	H
		2484	43.35	-10.65	54	43.81	27.46	6.09	34.01	162	231	A	H
													H
													H
	*	2462	103.28	-	-	103.82	27.41	6.07	34.02	100	264	P	V
	*	2462	100.74	-	-	101.28	27.41	6.07	34.02	100	264	A	V
		2498.72	54.12	-19.88	74	54.53	27.5	6.09	34	100	264	P	V
		2484.28	43.43	-10.57	54	43.89	27.46	6.09	34.01	100	264	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1		(MHz)	(dBμV/m)	Limit (dB)	Line (dBμV/m)	Level (dBμV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	(H/V)
802.11b CH 01 2412MHz		4824	43.96	-30.04	74	37.54	31.32	8.65	33.55	100	0	P	H
													H
													H
													H
		4824	44.11	-29.89	74	37.69	31.32	8.65	33.55	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4844	45.48	-28.52	74	38.99	31.35	8.69	33.55	100	0	P	H
		7265	49.59	-24.41	74	37.47	36.21	10.34	34.43	100	0	P	H
													H
													H
		4844	44.37	-29.63	74	37.88	31.35	8.69	33.55	100	0	P	V
		7265	48.64	-25.36	74	36.52	36.21	10.34	34.43	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4924	45.19	-28.81	74	38.45	31.49	8.79	33.54	100	0	P	H
		7385	49.11	-24.89	74	36.64	36.47	10.48	34.48	100	0	P	H
													H
													H
		4924	45.14	-28.86	74	38.4	31.49	8.79	33.54	100	0	P	V
		7385	49.3	-24.7	74	36.83	36.47	10.48	34.48	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1		(MHz)	(dBμV/m)	Limit (dB)	Line (dBμV/m)	Level (dBμV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	(H/V)
802.11g CH 01 2412MHz		2389.74	68.67	-5.33	74	69.47	27.23	6.01	34.04	132	308	P	H
		2390	50.77	-3.23	54	51.57	27.23	6.01	34.04	132	308	A	H
	*	2412	107.56	-	-	108.28	27.28	6.04	34.04	132	308	P	H
	*	2412	99.4	-	-	100.12	27.28	6.04	34.04	132	308	A	H
													H
													H
		2390	67.68	-6.32	74	68.48	27.23	6.01	34.04	115	262	P	V
		2389.92	50.48	-3.52	54	51.28	27.23	6.01	34.04	115	262	A	V
	*	2412	105.65	-	-	106.37	27.28	6.04	34.04	115	262	P	V
	*	2412	98.27	-	-	98.99	27.28	6.04	34.04	115	262	A	V
													V
													V
802.11g CH 06 2437MHz		2388.48	55.21	-18.79	74	56.01	27.23	6.01	34.04	149	232	P	H
		2389.56	45.79	-8.21	54	46.59	27.23	6.01	34.04	149	232	A	H
	*	2437	106.66	-	-	107.28	27.37	6.04	34.03	149	232	P	H
	*	2437	99.32	-	-	99.94	27.37	6.04	34.03	149	232	A	H
		2493.88	55.69	-18.31	74	56.1	27.5	6.09	34	149	232	P	H
		2486.64	45.57	-8.43	54	46.03	27.46	6.09	34.01	149	232	A	H
		2358.78	55.58	-18.42	74	56.54	27.14	5.95	34.05	100	265	P	V
		2389.2	45.96	-8.04	54	46.76	27.23	6.01	34.04	100	265	A	V
	*	2437	105.97	-	-	106.59	27.37	6.04	34.03	100	265	P	V
	*	2437	98.89	-	-	99.51	27.37	6.04	34.03	100	265	A	V
		2484	55.41	-18.59	74	55.87	27.46	6.09	34.01	100	265	P	V
		2483.56	45.35	-8.65	54	45.81	27.46	6.09	34.01	100	265	A	V

802.11g CH 11 2462MHz	*	2462	107.23	-	-	107.77	27.41	6.07	34.02	162	231	P	H
	*	2462	100.04	-	-	100.58	27.41	6.07	34.02	162	231	A	H
		2484.24	67.78	-6.22	74	68.24	27.46	6.09	34.01	162	231	P	H
		2483.84	49.61	-4.39	54	50.07	27.46	6.09	34.01	162	231	A	H
													H
													H
	*	2462	106.59	-	-	107.13	27.41	6.07	34.02	100	265	P	V
	*	2462	99.28	-	-	99.82	27.41	6.07	34.02	100	265	A	V
		2484.36	65	-9	74	65.46	27.46	6.09	34.01	100	265	P	V
		2483.72	49.53	-4.47	54	49.99	27.46	6.09	34.01	100	265	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1		(MHz)	(dBμV/m)	Limit (dB)	Line (dBμV/m)	Level (dBμV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	(H/V)
802.11g CH 01 2412MHz		4824	44.5	-29.5	74	38.08	31.32	8.65	33.55	100	0	P	H
													H
													H
													H
		4824	45.05	-28.95	74	38.63	31.32	8.65	33.55	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4872	44.43	-29.57	74	37.87	31.41	8.69	33.54	100	0	P	H
		7310	49.54	-24.46	74	37.31	36.28	10.39	34.44	100	0	P	H
													H
													H
		4872	44.89	-29.11	74	38.33	31.41	8.69	33.54	100	0	P	V
		7310	48.77	-25.23	74	36.54	36.28	10.39	34.44	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4924	45.99	-28.01	74	39.25	31.49	8.79	33.54	100	0	P	H
		7385	49.14	-24.86	74	36.67	36.47	10.48	34.48	100	0	P	H
													H
													H
		4924	44.69	-29.31	74	37.95	31.49	8.79	33.54	100	0	P	V
		7385	50.56	-23.44	74	38.09	36.47	10.48	34.48	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1		(MHz)	(dBμV/m)	Limit (dB)	Line (dBμV/m)	Level (dBμV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	(H/V)
802.11n HT20 CH 01 2412MHz		2389.83	65.05	-8.95	74	65.85	27.23	6.01	34.04	134	305	P	H
		2390	49.71	-4.29	54	50.51	27.23	6.01	34.04	134	305	A	H
	*	2412	105.39	-	-	106.11	27.28	6.04	34.04	134	305	P	H
	*	2412	98.02	-	-	98.74	27.28	6.04	34.04	134	305	A	H
													H
													H
		2389.47	64.89	-9.11	74	65.69	27.23	6.01	34.04	100	273	P	V
		2389.92	49.08	-4.92	54	49.88	27.23	6.01	34.04	100	273	A	V
	*	2412	104.18	-	-	104.9	27.28	6.04	34.04	100	273	P	V
	*	2412	97.09	-	-	97.81	27.28	6.04	34.04	100	273	A	V
													V
													V
802.11n HT20 CH 06 2437MHz		2389.11	55.68	-18.32	74	56.48	27.23	6.01	34.04	146	233	P	H
		2389.83	45.64	-8.36	54	46.44	27.23	6.01	34.04	146	233	A	H
	*	2437	104.89	-	-	105.51	27.37	6.04	34.03	146	233	P	H
	*	2437	96.89	-	-	97.51	27.37	6.04	34.03	146	233	A	H
		2491.8	55.39	-18.61	74	55.8	27.5	6.09	34	146	233	P	H
		2494.36	45.17	-8.83	54	45.58	27.5	6.09	34	146	233	A	H
		2389.65	55.32	-18.68	74	56.12	27.23	6.01	34.04	100	253	P	V
		2388	45.43	-8.57	54	46.23	27.23	6.01	34.04	100	253	A	V
	*	2437	103.95	-	-	104.57	27.37	6.04	34.03	100	253	P	V
	*	2437	96.26	-	-	96.88	27.37	6.04	34.03	100	253	A	V
		2488.56	55.11	-18.89	74	55.53	27.5	6.09	34.01	100	253	P	V
		2488.88	45.06	-8.94	54	45.48	27.5	6.09	34.01	100	253	A	V

802.11n HT20 CH 11 2462MHz	*	2462	105.15	-	-	105.69	27.41	6.07	34.02	160	227	P	H
	*	2462	97.16	-	-	97.7	27.41	6.07	34.02	160	227	A	H
		2483.92	66.3	-7.7	74	66.76	27.46	6.09	34.01	160	227	P	H
		2483.64	49.58	-4.42	54	50.04	27.46	6.09	34.01	160	227	A	H
													H
													H
	*	2462	104.56	-	-	105.1	27.41	6.07	34.02	100	248	P	V
	*	2462	96.45	-	-	96.99	27.41	6.07	34.02	100	248	A	V
		2483.72	66.42	-7.58	74	66.88	27.46	6.09	34.01	100	248	P	V
		2484.84	49.46	-4.54	54	49.92	27.46	6.09	34.01	100	248	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1		(MHz)	(dBμV/m)	Limit (dB)	Line (dBμV/m)	Level (dBμV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	(H/V)
802.11n HT20 CH 01 2412MHz		4824	44.59	-29.41	74	38.17	31.32	8.65	33.55	100	0	P	H
													H
													H
													H
		4824	44.15	-29.85	74	37.73	31.32	8.65	33.55	100	0	P	V
													V
													V
													V
802.11n HT20 CH 06 2437MHz		4872	44.91	-29.09	74	38.35	31.41	8.69	33.54	100	0	P	H
		7310	48.95	-25.05	74	36.72	36.28	10.39	34.44	100	0	P	H
													H
													H
		4872	46.16	-27.84	74	39.6	31.41	8.69	33.54	100	0	P	V
		7310	49.26	-24.74	74	37.03	36.28	10.39	34.44	100	0	P	V
													V
													V
802.11n HT20 CH 11 2462MHz		4924	44.84	-29.16	74	38.1	31.49	8.79	33.54	100	0	P	H
		7385	48.78	-25.22	74	36.31	36.47	10.48	34.48	100	0	P	H
													H
													H
		4924	45.21	-28.79	74	38.47	31.49	8.79	33.54	100	0	P	V
		7385	49.39	-24.61	74	36.92	36.47	10.48	34.48	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1		(MHz)	(dBμV/m)	Limit (dB)	Line (dBμV/m)	Level (dBμV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	(H/V)
802.11n HT40 CH 03 2422MHz		2388.48	64.18	-9.82	74	64.98	27.23	6.01	34.04	136	307	P	H
		2389.29	49.58	-4.42	54	50.38	27.23	6.01	34.04	136	307	A	H
	*	2422	100.03	-	-	100.7	27.32	6.04	34.03	136	307	P	H
	*	2422	92.1	-	-	92.77	27.32	6.04	34.03	136	307	A	H
		2484.56	58.26	-15.74	74	58.72	27.46	6.09	34.01	136	307	P	H
		2483.88	44.98	-9.02	54	45.44	27.46	6.09	34.01	136	307	A	H
		2389.11	62.82	-11.18	74	63.62	27.23	6.01	34.04	112	275	P	V
		2390	48.81	-5.19	54	49.61	27.23	6.01	34.04	112	275	A	V
	*	2422	99.7	-	-	100.37	27.32	6.04	34.03	112	275	P	V
	*	2422	91.98	-	-	92.65	27.32	6.04	34.03	112	275	A	V
		2485.24	58.67	-15.33	74	59.13	27.46	6.09	34.01	112	275	P	V
		2485.1	45.1	-8.9	54	45.56	27.46	6.09	34.01	112	275	A	V
802.11n HT40 CH 06 2437MHz		2390	65.17	-8.83	74	65.97	27.23	6.01	34.04	148	233	P	H
		2389.38	49.14	-4.86	54	49.94	27.23	6.01	34.04	148	233	A	H
	*	2437	101.84	-	-	102.46	27.37	6.04	34.03	148	233	P	H
	*	2437	94.38	-	-	95	27.37	6.04	34.03	148	233	A	H
		2483.6	64.97	-9.03	74	65.43	27.46	6.09	34.01	148	233	P	H
		2483.72	48.68	-5.32	54	49.14	27.46	6.09	34.01	148	233	A	H
		2389.74	64.45	-9.55	74	65.25	27.23	6.01	34.04	100	264	P	V
		2389.38	47.99	-6.01	54	48.79	27.23	6.01	34.04	100	264	A	V
	*	2437	101.73	-	-	102.35	27.37	6.04	34.03	100	264	P	V
	*	2437	93.85	-	-	94.47	27.37	6.04	34.03	100	264	A	V
		2483.6	64.62	-9.38	74	65.08	27.46	6.09	34.01	100	264	P	V
		2483.52	48.23	-5.77	54	48.69	27.46	6.09	34.01	100	264	A	V

802.11n HT40 CH 09 2452MHz		2384.7	57.99	-16.01	74	58.83	27.19	6.01	34.04	100	235	P	H
		2388.93	45.6	-8.4	54	46.4	27.23	6.01	34.04	100	235	A	H
	*	2452	101.32	-	-	101.9	27.37	6.07	34.02	100	235	P	H
	*	2452	93	-	-	93.58	27.37	6.07	34.02	100	235	A	H
		2486.2	65.82	-8.18	74	66.28	27.46	6.09	34.01	100	235	P	H
		2484.52	49.14	-4.86	54	49.6	27.46	6.09	34.01	100	235	A	H
		2389.47	57.51	-16.49	74	58.31	27.23	6.01	34.04	100	265	P	V
		2388.12	45.53	-8.47	54	46.33	27.23	6.01	34.04	100	265	A	V
	*	2452	100.84	-	-	101.42	27.37	6.07	34.02	100	265	P	V
	*	2452	92.95	-	-	93.53	27.37	6.07	34.02	100	265	A	V
		2484.36	65.74	-8.26	74	66.2	27.46	6.09	34.01	100	265	P	V
		2484.8	49.42	-4.58	54	49.88	27.46	6.09	34.01	100	265	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 HT40 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1		(MHz)	(dBμV/m)	Limit (dB)	Line (dBμV/m)	Level (dBμV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	(H/V)
802.11n HT40 CH 03 2422MHz		4844	44.26	-29.74	74	37.77	31.35	8.69	33.55	100	0	P	H
		7265	49.71	-24.29	74	37.59	36.21	10.34	34.43	100	0	P	H
													H
													H
		4844	45.36	-28.64	74	38.87	31.35	8.69	33.55	100	0	P	V
		7265	49.96	-24.04	74	37.84	36.21	10.34	34.43	100	0	P	V
													V
													V
802.11n HT40 CH 06 2437MHz		4872	44.2	-29.8	74	37.64	31.41	8.69	33.54	100	0	P	H
		7310	48.11	-25.89	74	35.88	36.28	10.39	34.44	100	0	P	H
													H
													H
		4872	44.41	-29.59	74	37.85	31.41	8.69	33.54	100	0	P	V
		7310	49.38	-24.62	74	37.15	36.28	10.39	34.44	100	0	P	V
													V
													V
802.11n HT40 CH 09 2452MHz		4904	44.4	-29.6	74	37.74	31.46	8.74	33.54	100	0	P	H
		7355	49.15	-24.85	74	36.78	36.4	10.44	34.47	100	0	P	H
													H
													H
		4904	44.12	-29.88	74	37.46	31.46	8.74	33.54	100	0	P	V
		7355	48.73	-25.27	74	36.36	36.4	10.44	34.47	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

2.4GHz WIFI 802.11g (LF)

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)
2.4GHz 802.11g LF		55.65	6.21	-33.79	40	31	5.97	1.04	31.8	-	-	P	H
		168.24	13.57	-29.93	43.5	34.8	8.91	1.64	31.78	-	-	P	H
		271.11	16.37	-29.63	46	33.8	12.4	1.94	31.77	-	-	P	H
		395.2	14.02	-31.98	46	28.04	15.46	2.32	31.8	-	-	P	H
		694.1	18.78	-27.22	46	28.78	18.9	3.14	32.04	-	-	P	H
		880.3	21.55	-24.45	46	29.64	20	3.44	31.53	187	209	P	H
													H
													H
													H
													H
													H
													H
		69.15	10.97	-29.03	40	36.6	5.12	1.04	31.79	-	-	P	V
		183.36	11.59	-31.91	43.5	33.53	8.2	1.64	31.78	-	-	P	V
		280.02	11.59	-34.41	46	28.91	12.5	1.94	31.76	-	-	P	V
		363.7	14.52	-31.48	46	29.4	14.74	2.17	31.79	-	-	P	V
		697.6	18.57	-27.43	46	28.57	18.9	3.14	32.04	-	-	P	V
		918.8	22.75	-23.25	46	30.29	20.19	3.55	31.28	108	28	P	V
													V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

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

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

WIFI 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		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		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”.