



FCC RF Test Report

APPLICANT : ZTE CORPORATION
EQUIPMENT : Rogers HSPA/LTE CPE
BRAND NAME : ZTE
MODEL NAME : MF275R
FCC ID : SRQ-MF275R
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Jun. 05, 2015 and testing was completed on Jul. 10, 2015. We, SPORTON INTERNATIONAL (KUNSHAN) 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 (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China



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SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	RSS-247 5.2(1)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	RSS-Gen 6.6	99% Bandwidth	-	Pass	-
3.2	15.247(b)	RSS-247 A5.4(4)	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	RSS-247 5.2(2)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	RSS-247 5.5	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
			Conducted Spurious Emission		Pass	-
3.5	15.247(d)	RSS-247 5.5	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 1.28 dB at 4824.000 MHz
3.6	15.207	RSS-GEN 8.8	AC Conducted Emission	15.207(a)	Pass	Under limit 13.29 dB at 0.150 MHz
3.7	15.203 & 15.247(b)	N/A	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

1.2 Manufacturer

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Rogers HSPA/LTE CPE
Brand Name	ZTE
Model Name	MF275R
FCC ID	SRQ-MF275R
EUT supports Radios application	WCDMA/HSPA/HSPA+(Downlink Only)/DC-HSDPA/LTE/ WLAN 2.4GHz 802. 11b/g/n HT20/HT40/ WLAN 5GHz 802. 11a/n HT20/HT40/
IMEI Code	Conducted:004401783465665 Radiation:004401783465832 Conduction:004401783465632
HW Version	dgpB
SW Version	MF275R1.0.5
EUT Stage	Identical Prototype

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 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 : 22.98 dBm (0.1986 W) 802.11g : 24.38 dBm (0.2742 W) 802.11n HT20 : 27.47 dBm (0.5585 W) 802.11n HT40 : 27.30 dBm (0.5370 W)																
99% Occupied Bandwidth	802.11b : 12.09MHz 802.11g : 16.88MHz 802.11n HT20 : 17.98MHz 802.11n HT40 : 38.26MHz																
Antenna Type	WLAN for Chain Port 1: Monopole Antenna with gain 2.68 dBi WLAN for Chain Port 2: Monopole Antenna with gain 4.51 dBi																
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)																
Antenna Function for Transmitter	<table border="1"> <thead> <tr> <th></th> <th>Chain Port 1</th> <th>Chain Port 2</th> </tr> </thead> <tbody> <tr> <td>802.11 b</td> <td>V</td> <td>V</td> </tr> <tr> <td>802.11 g</td> <td>V</td> <td>V</td> </tr> <tr> <td>802.11 n SISO</td> <td>V</td> <td>V</td> </tr> <tr> <td>802.11 n MIMO</td> <td>V</td> <td>V</td> </tr> </tbody> </table>			Chain Port 1	Chain Port 2	802.11 b	V	V	802.11 g	V	V	802.11 n SISO	V	V	802.11 n MIMO	V	V
	Chain Port 1	Chain Port 2															
802.11 b	V	V															
802.11 g	V	V															
802.11 n SISO	V	V															
802.11 n MIMO	V	V															



1.5 Modification of EUT

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

1.6 Testing Location

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.			
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958			
Test Site No.	Sporton Site No.			FCC/IC Registration No.
	TH01-KS	03CH02-KS	CO01-KS	418269/4086E

Note: The test site complies with ANSI C63.4 2009 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 v03r03
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ ANSI C63.10-2013
- ♦ IC RSS-247 Issue 1
- ♦ IC RSS-Gen Issue 4

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 for frequency above 1GHz 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).

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 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 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 Peak Power (dBm)							
Power vs. Channel				Power vs. Data Rate			
Channel	Frequency (MHz)	Chain Port	Data Rate	Channel	2Mbps	5.5Mbps	11Mbps
			1Mbps				
CH 01	2412	1	18.37	CH 06	19.14	19.13	19.21
CH 06	2437	1	19.23				
CH 11	2462	1	17.41				
CH 01	2412	2	22.74	CH 06	22.96	22.97	22.93
CH 06	2437	2	22.98				
CH 11	2462	2	22.39				

2.4GHz 802.11g Peak Power (dBm)											
Power vs. Channel				Power vs. Data Rate							
Channel	Frequency (MHz)	Chain Port	Data Rate	Channel	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
			6Mbps								
CH 01	2412	1	22.83	CH 06	23.94	23.76	23.80	23.68	23.85	23.86	23.96
CH 06	2437	1	24.01								
CH 11	2462	1	22.48								
CH 01	2412	2	23.62	CH 06	24.21	24.01	24.33	24.35	24.31	24.12	24.21
CH 06	2437	2	24.38								
CH 11	2462	2	23.37								

2.4GHz 802.11n HT20 Peak Power (dBm)											
Power vs. Channel				Power vs. MCS Index							
Channel	Frequency (MHz)	Chain Port	MCS Index	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
			MCS0								
CH 01	2412	1	24.95	CH 06	25.61	25.55	25.50	25.43	25.37	24.96	24.24
CH 06	2437	1	25.63								
CH 11	2462	1	23.96								
CH 01	2412	2	24.98	CH 06	25.66	25.67	25.72	25.46	25.42	24.99	24.29
CH 06	2437	2	25.76								
CH 11	2462	2	24.96								
CH 01	2412	1+2(1)	23.60	CH 06	24.54	24.19	24.02	24.05	24.14	24.04	23.99
CH 06	2437	1+2(1)	24.56								
CH 11	2462	1+2(1)	22.97								
CH 01	2412	1+2(2)	23.45	CH 06	24.15	24.14	24.34	23.77	23.91	23.87	23.90
CH 06	2437	1+2(2)	24.36								
CH 11	2462	1+2(2)	23.04								
CH 01	2412	1+2	26.54	CH 06	27.36	27.18	27.19	26.92	27.04	26.97	26.96
CH 06	2437	1+2	27.47								
CH 11	2462	1+2	26.02								



2.4GHz 802.11n HT40 Peak Power (dBm)											
Power vs. Channel				Power vs. MCS Index							
Channel	Frequency (MHz)	Chain Port	MCS Index	MCS1	Channel	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
			MCS0								
CH 03	2422	1	24.23	25.06	CH 06	25.21	24.97	24.78	24.65	24.27	23.06
CH 06	2437	1	24.46	25.31							
CH 09	2452	1	23.68	24.52							
CH 03	2422	2	24.00	25.11	CH 06	25.02	24.68	24.57	24.65	24.66	24.72
CH 06	2437	2	24.04	25.32							
CH 09	2452	2	23.83	25.04							
CH 03	2422	1+2(1)	22.04	23.85	CH 06	23.88	23.29	23.06	23.27	22.91	23.19
CH 06	2437	1+2(1)	22.22	23.90							
CH 09	2452	1+2(1)	21.22	23.55							
CH 03	2422	1+2(2)	22.77	24.63	CH 06	24.58	23.77	24.06	23.81	23.81	24.21
CH 06	2437	1+2(2)	22.72	24.65							
CH 09	2452	1+2(2)	22.64	24.02							
CH 03	2422	1+2	25.43	27.27	CH 06	27.25	26.55	26.60	26.56	26.39	26.74
CH 06	2437	1+2	25.49	27.30							
CH 09	2452	1+2	25.00	26.80							

Note: Chain Port 1+2 is a calculated result from sum of the power Chain Port 1+2(1) and Chain Port 1+2(2).



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.

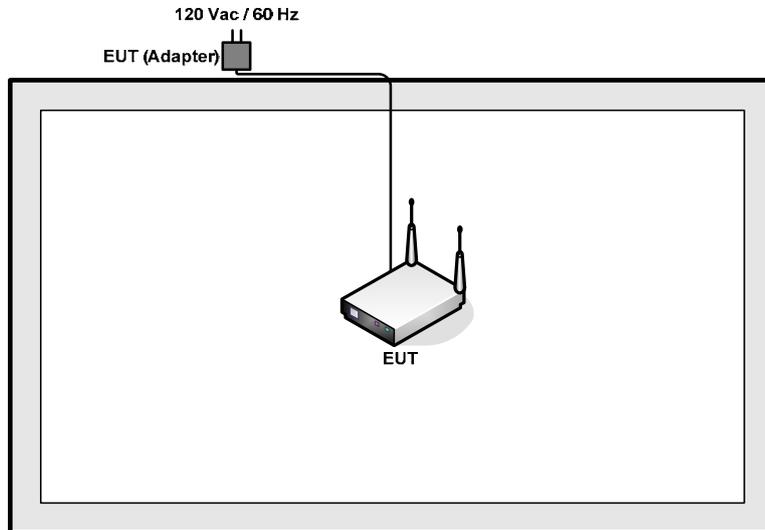
<2.4GHz>

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS1

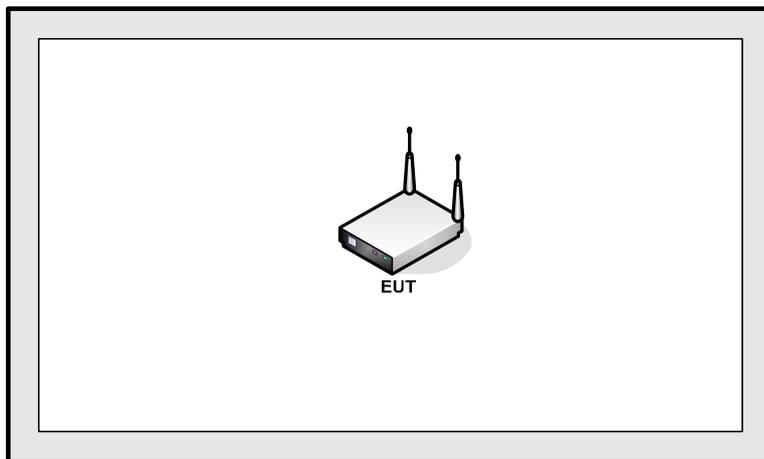
Test Cases	
AC Conducted Emission	Mode 1 : WCDMA Band V Idle + WLAN (2.4G) Link + Adapter
Remark: For radiated TCs, the tests were performed with adapter.	

2.4 Connection Diagram of Test System

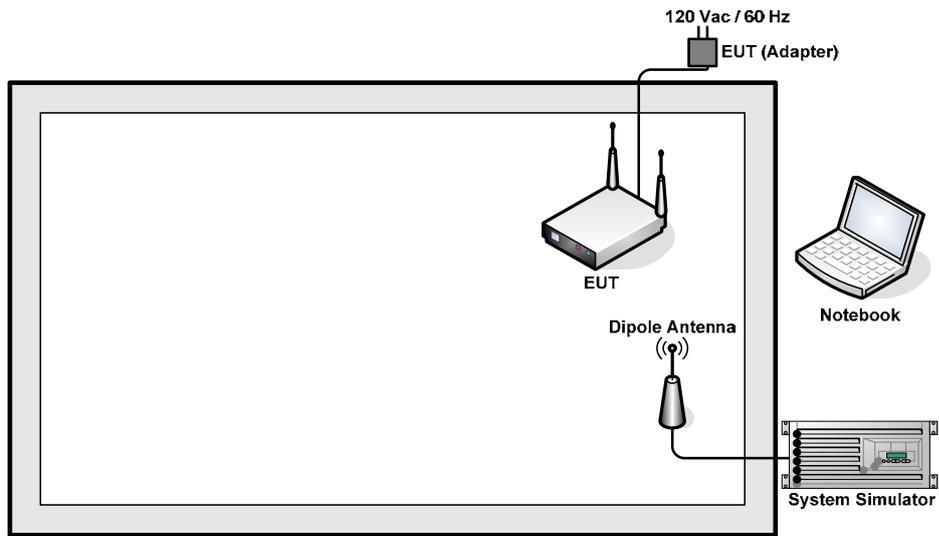
<WLAN 802.11b/g/n HT40Tx Mode>



<WLAN 802.11n HT20Tx 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.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	Notebook	Lenovo	G480	PRC4	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m

2.6 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuously transmit/receive.

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



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

Offset = RF cable loss.

Following shows an offset computation example with cable loss 6dB.

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)}. \\ &= 6 \text{ (dB)} \end{aligned}$$

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

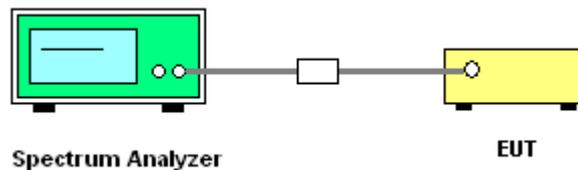
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

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

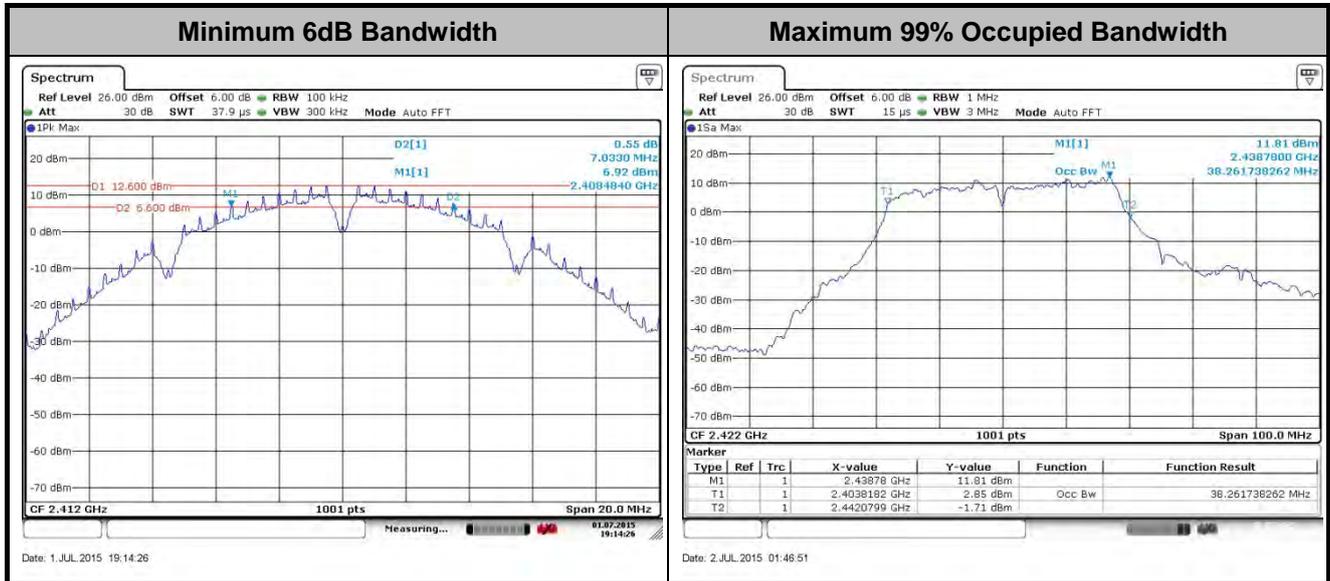
3.1.4 Test Setup





3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A of this test report.



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

3.2 Peak Output Power Measurement

3.2.1 Limit of Peak Output Power

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

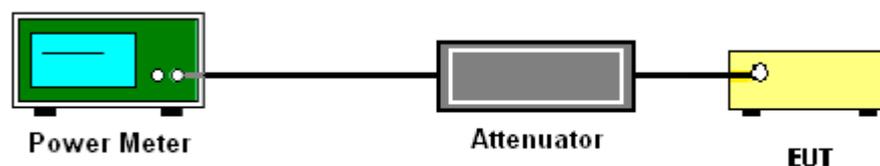
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v03r03 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.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

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.
7. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

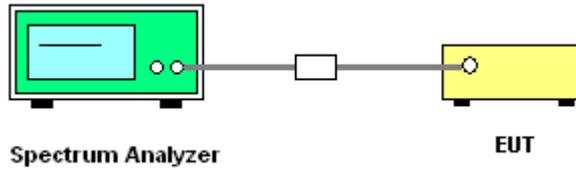
If measurements performed using method (2) plus $10 \log(N)$ exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

Method (1): Measure and sum the spectra across the outputs.

The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

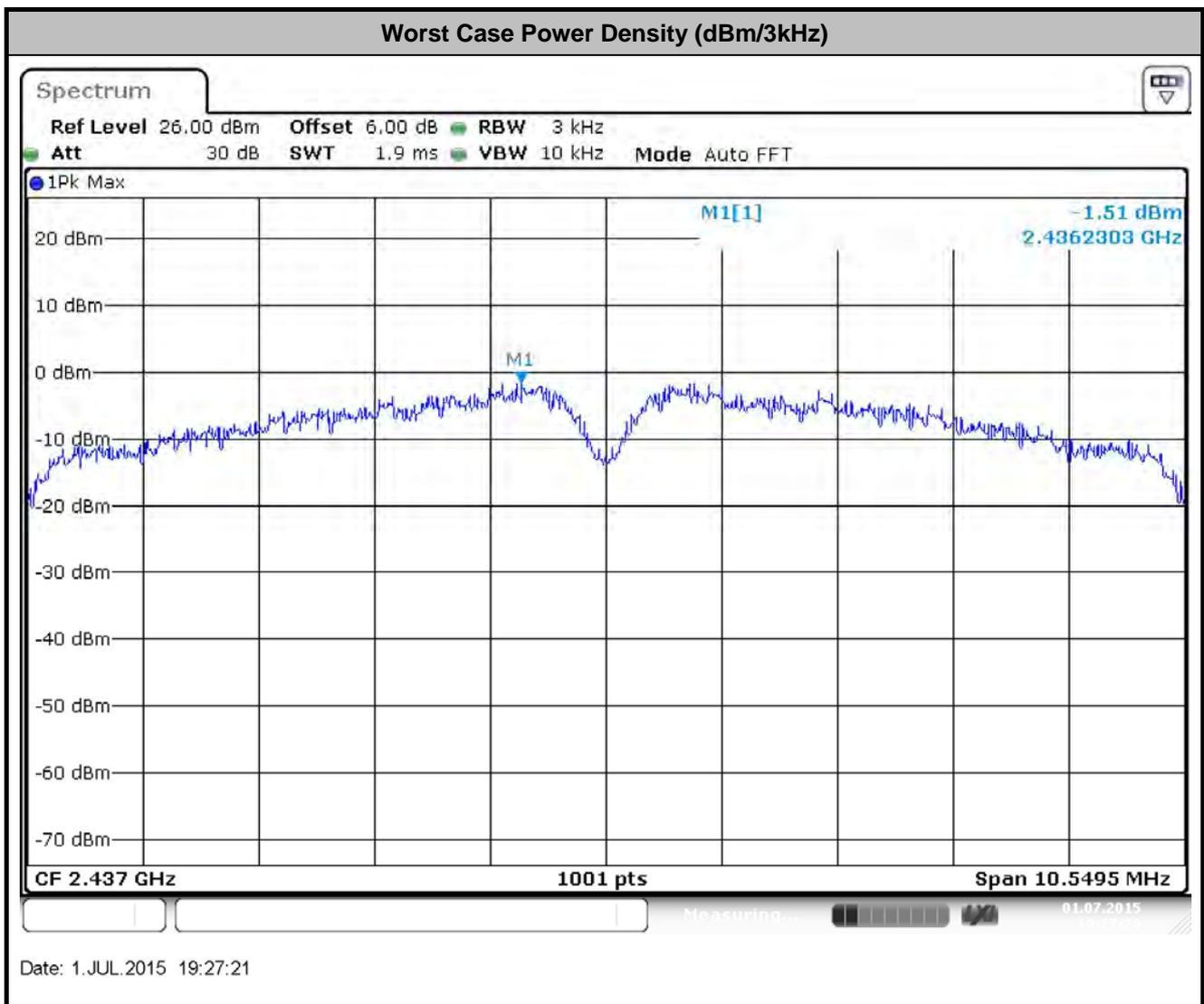
Method (2): Measure and add $10 \log(N)$ dB, where N is the number of outputs. (N=2)

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).

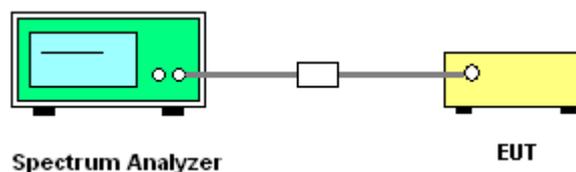
3.4.2 Measuring Instruments

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

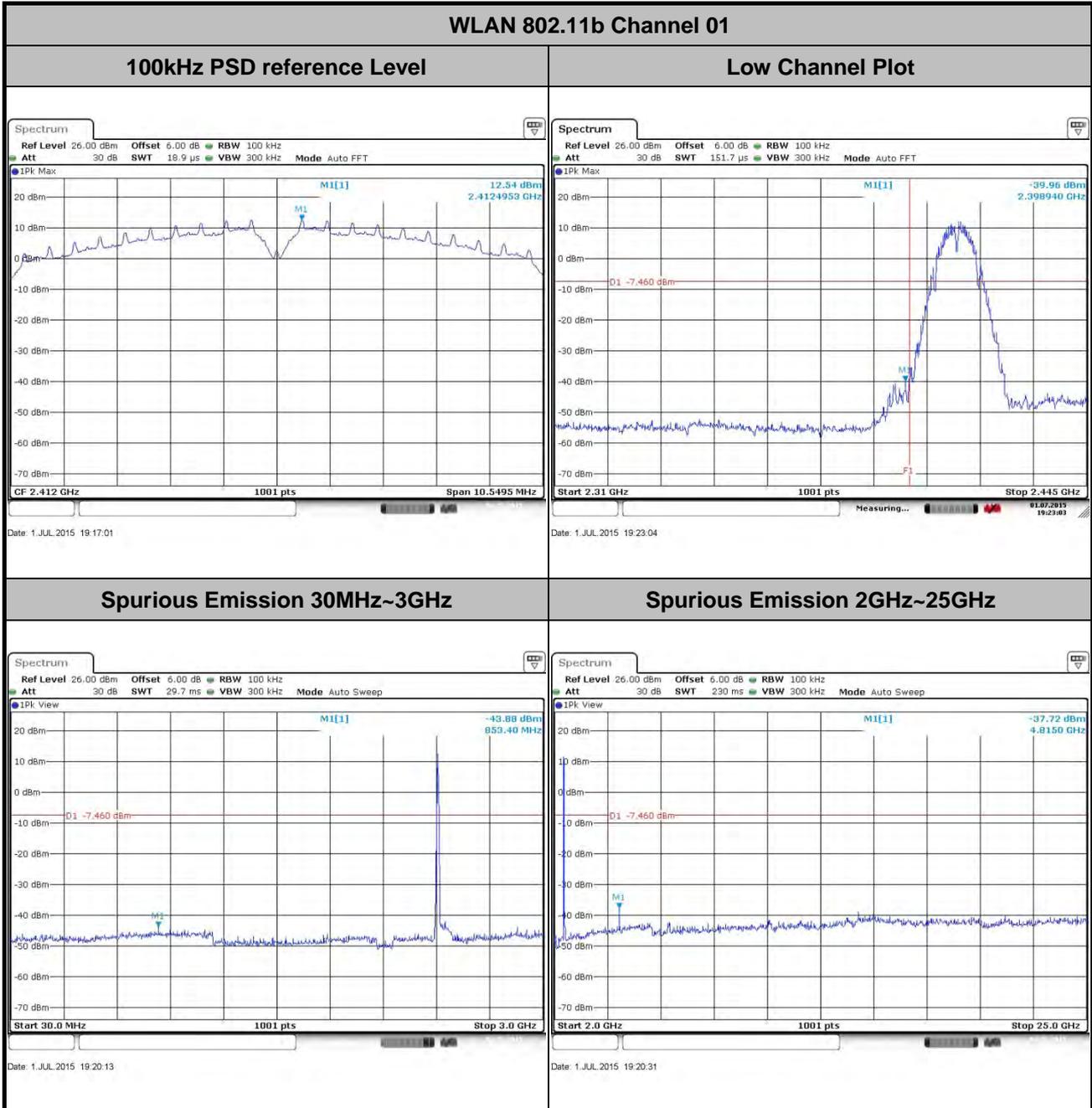




3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Number of TX = 1, Chain Port 2 (Measured)

Number of TX	1	Ant. :	2
Test Mode :	802.11b	Temperature :	24~25°C
Test Band :	2.4GHz Low	Relative Humidity :	49~51%
Test Channel :	01	Test Engineer :	Issac Song

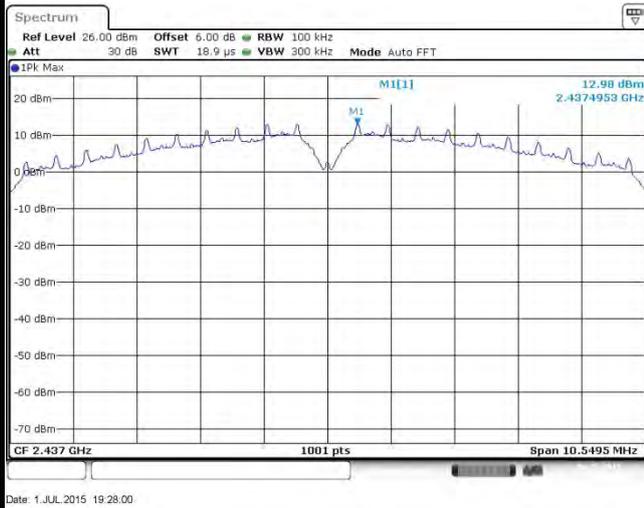




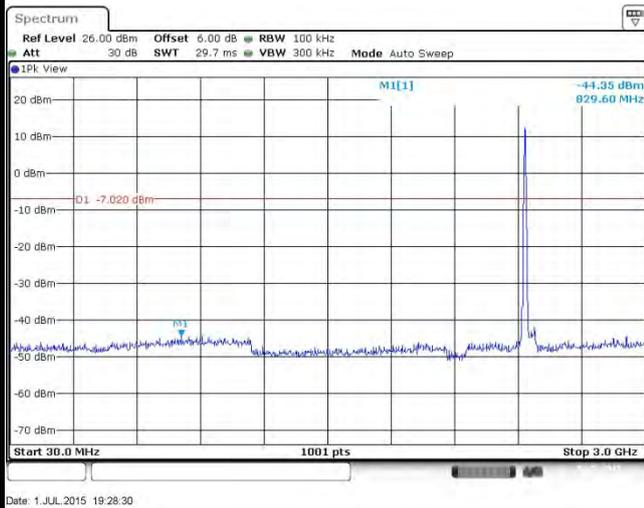
Number of TX :	1	Ant. :	2
Test Mode :	802.11b	Temperature :	24~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	49~51%
Test Channel :	06	Test Engineer :	Issac Song

WLAN 802.11b Channel 06

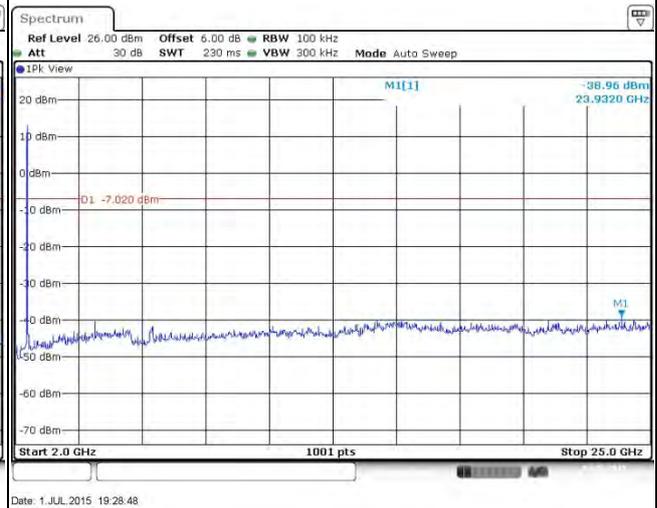
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz

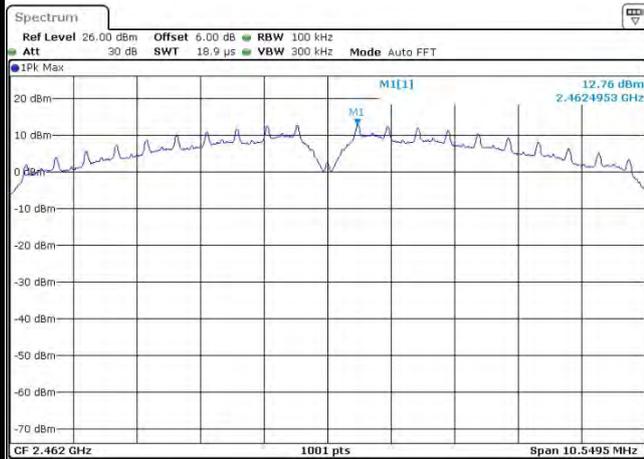




Number of TX :	1	Ant. :	2
Test Mode :	802.11b	Temperature :	24~25°C
Test Band :	2.4GHz High	Relative Humidity :	49~51%
Test Channel :	11	Test Engineer :	Issac Song

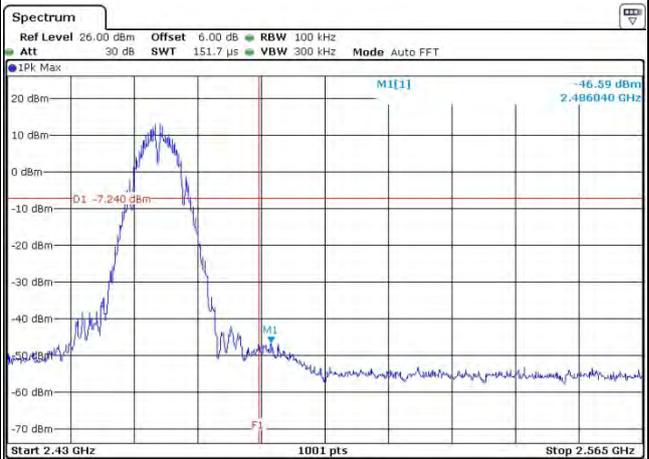
WLAN 802.11b Channel 11

100kHz PSD reference Level



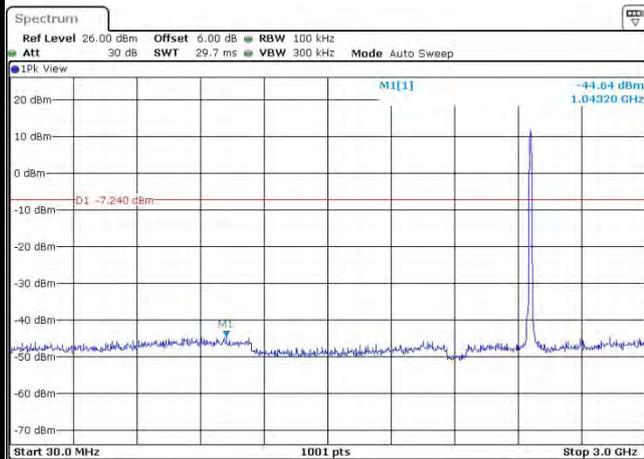
Date: 1 JUL 2015 19:33:31

High Channel Plot



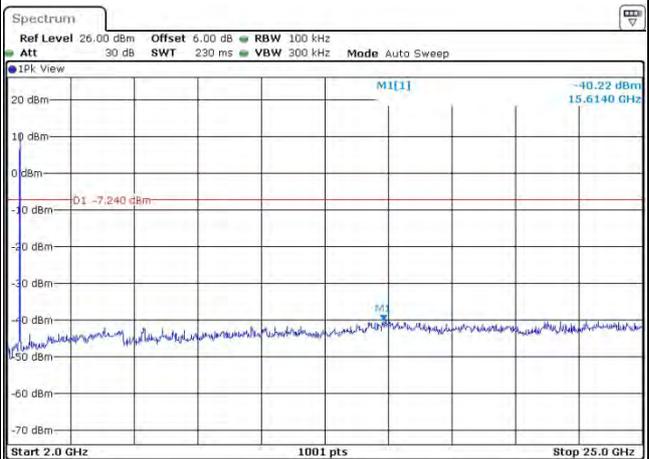
Date: 1 JUL 2015 19:37:03

Spurious Emission 30MHz~3GHz



Date: 1 JUL 2015 19:35:01

Spurious Emission 2GHz~25GHz



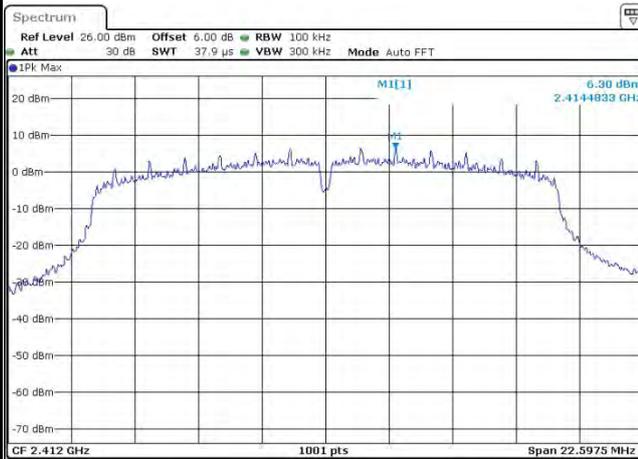
Date: 1 JUL 2015 19:35:19



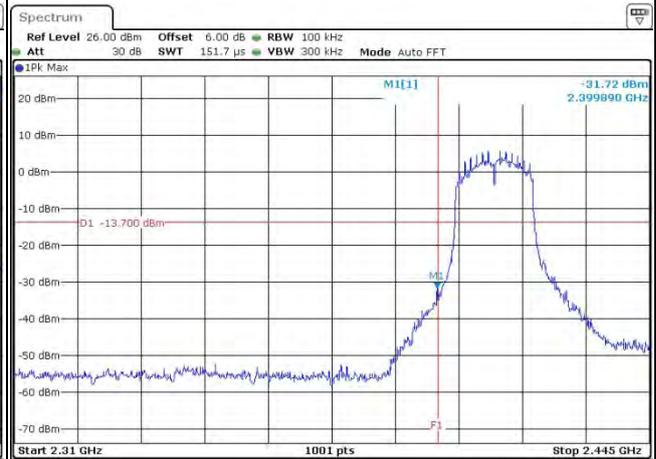
Number of TX :	1	Ant. :	2
Test Mode :	802.11g	Temperature :	24~25°C
Test Band :	2.4GHz Low	Relative Humidity :	49~51%
Test Channel :	01	Test Engineer :	Issac Song

WLAN 802.11g Channel 01

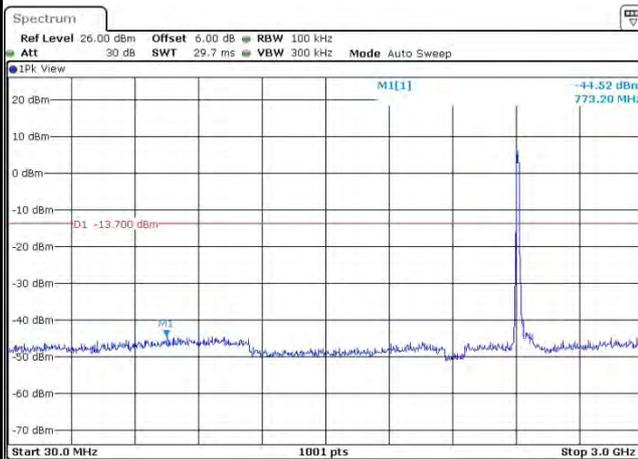
100kHz PSD reference Level



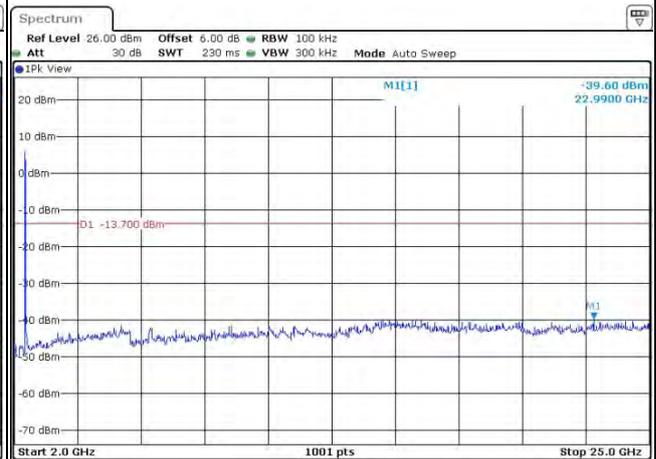
Low Channel Plot



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz

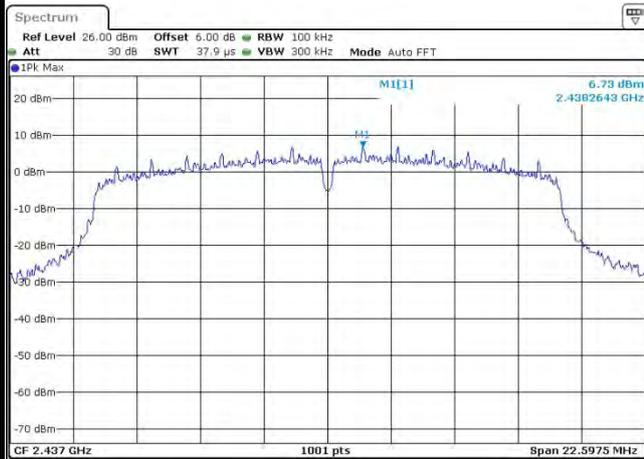




Number of TX :	1	Ant. :	2
Test Mode :	802.11g	Temperature :	24~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	49~51%
Test Channel :	06	Test Engineer :	Issac Song

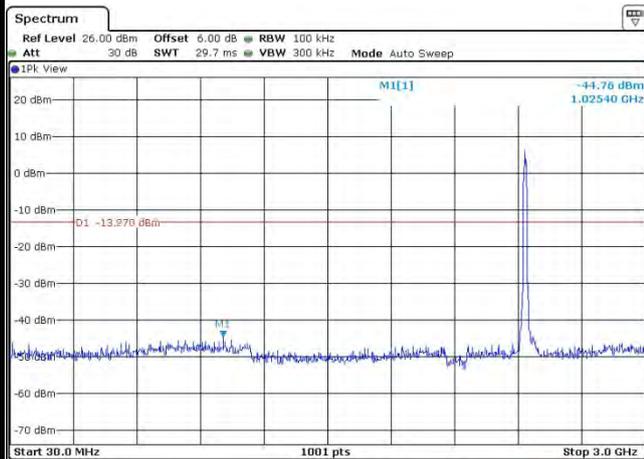
WLAN 802.11g Channel 06

100kHz PSD reference Level



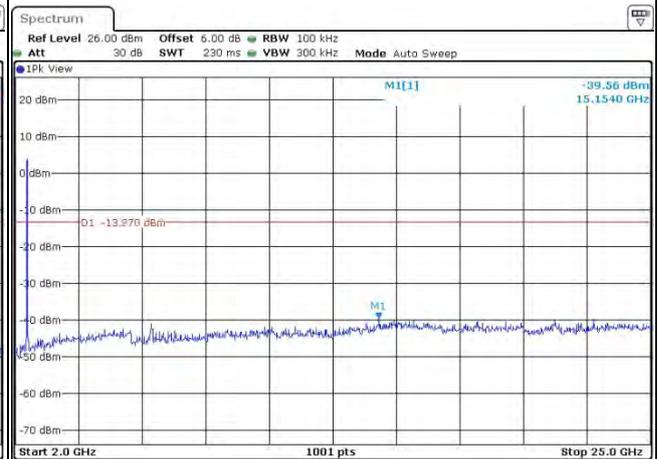
Date: 1.JUL.2015 19:53:22

Spurious Emission 30MHz~3GHz



Date: 1.JUL.2015 19:57:48

Spurious Emission 2GHz~25GHz



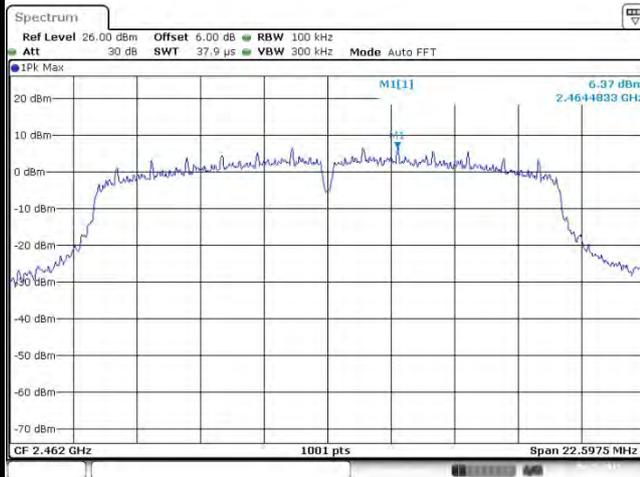
Date: 1.JUL.2015 19:55:05



Number of TX :	1	Ant. :	2
Test Mode :	802.11g	Temperature :	24~25°C
Test Band :	2.4GHz High	Relative Humidity :	49~51%
Test Channel :	11	Test Engineer :	Issac Song

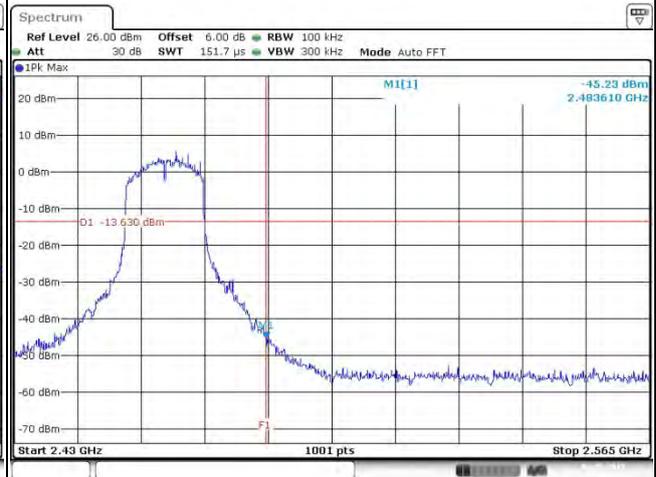
WLAN 802.11g Channel 11

100kHz PSD reference Level



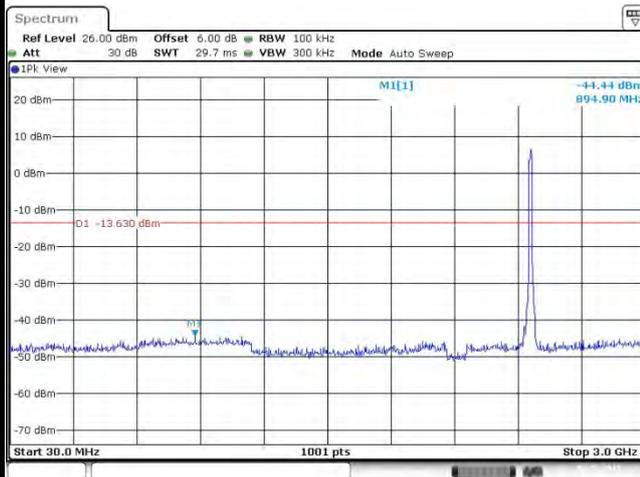
Date: 1 JUL 2015 20:04:12

High Channel Plot



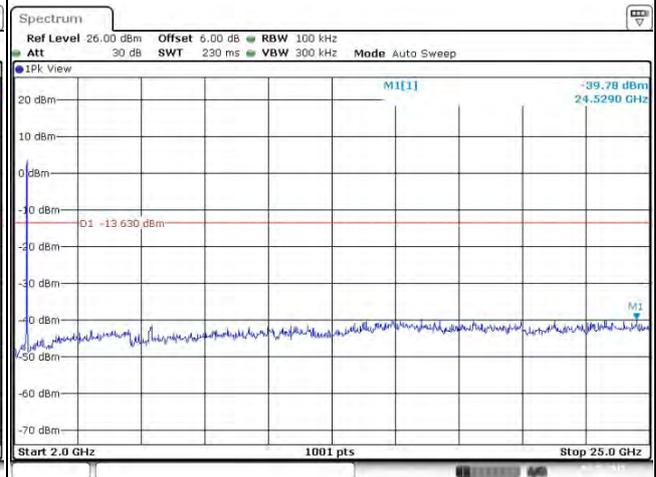
Date: 1 JUL 2015 20:05:42

Spurious Emission 30MHz~3GHz



Date: 1 JUL 2015 20:05:03

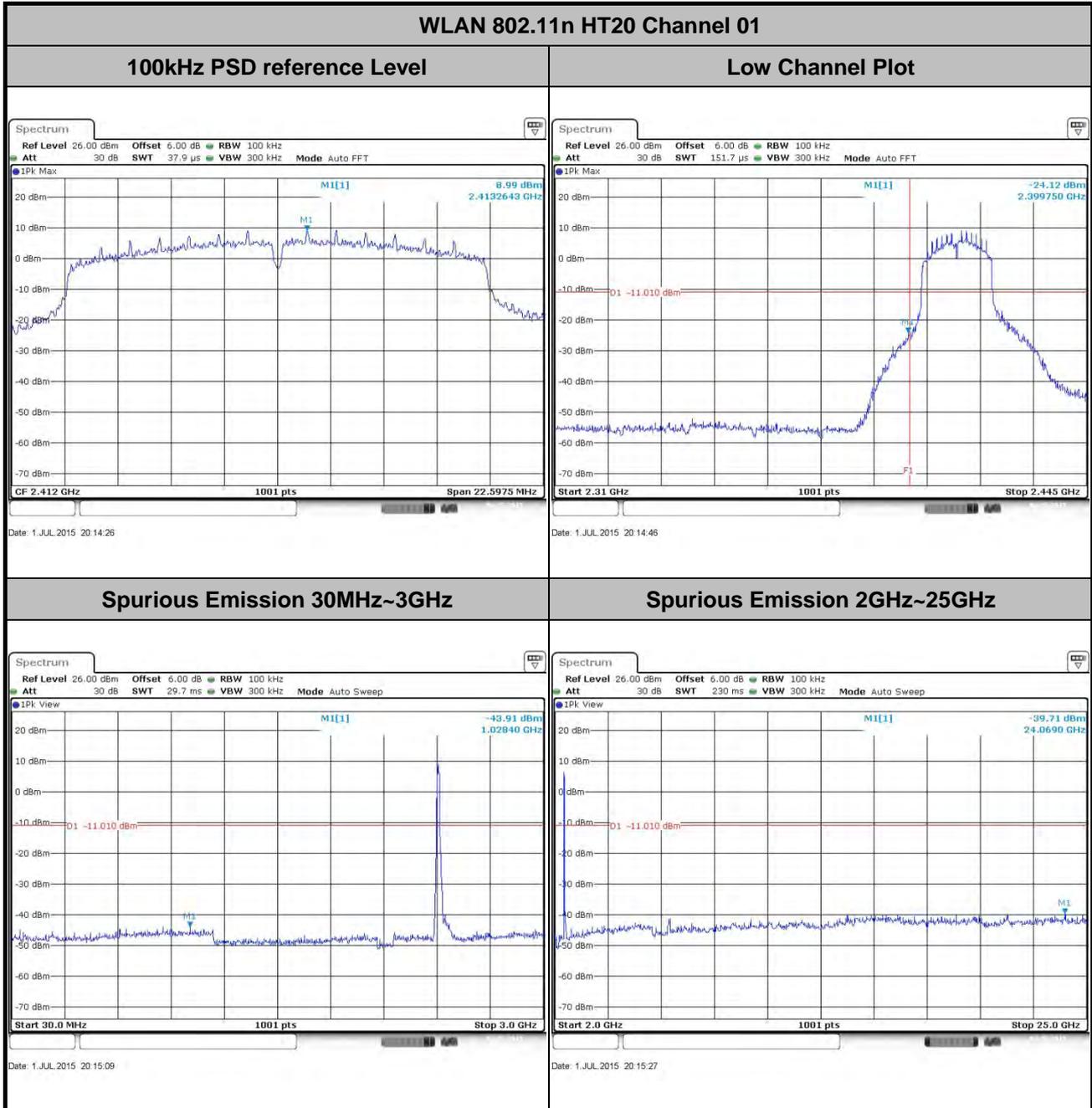
Spurious Emission 2GHz~25GHz



Date: 1 JUL 2015 20:05:21



Number of TX :	1	Ant. :	2
Test Mode :	802.11n HT20	Temperature :	24~25°C
Test Band :	2.4GHz Low	Relative Humidity :	49~51%
Test Channel :	01	Test Engineer :	Issac Song

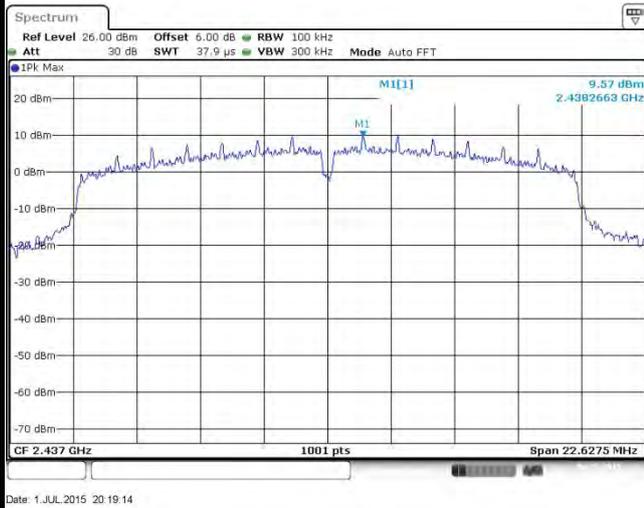




Number of TX :	1	Ant. :	2
Test Mode :	802.11n HT20	Temperature :	24~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	49~51%
Test Channel :	06	Test Engineer :	Issac Song

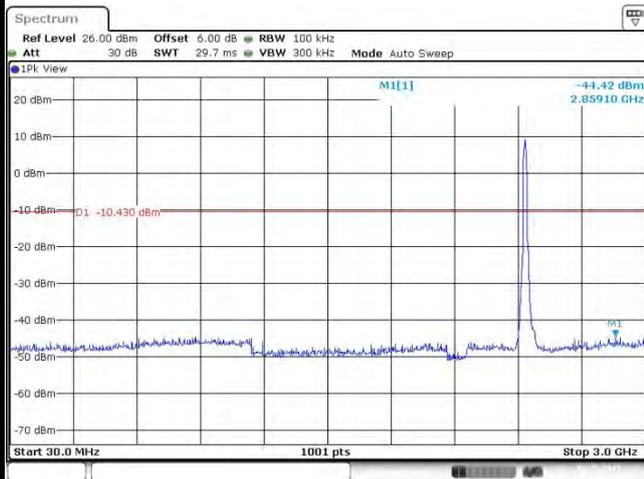
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



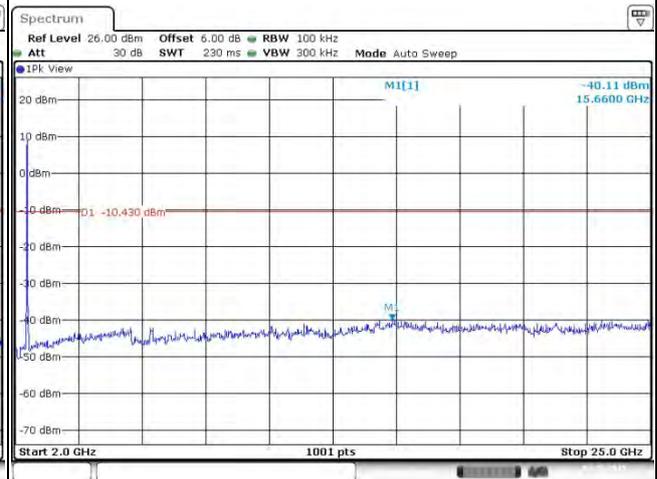
Date: 1 JUL 2015 20:19:14

Spurious Emission 30MHz~3GHz



Date: 1 JUL 2015 20:19:41

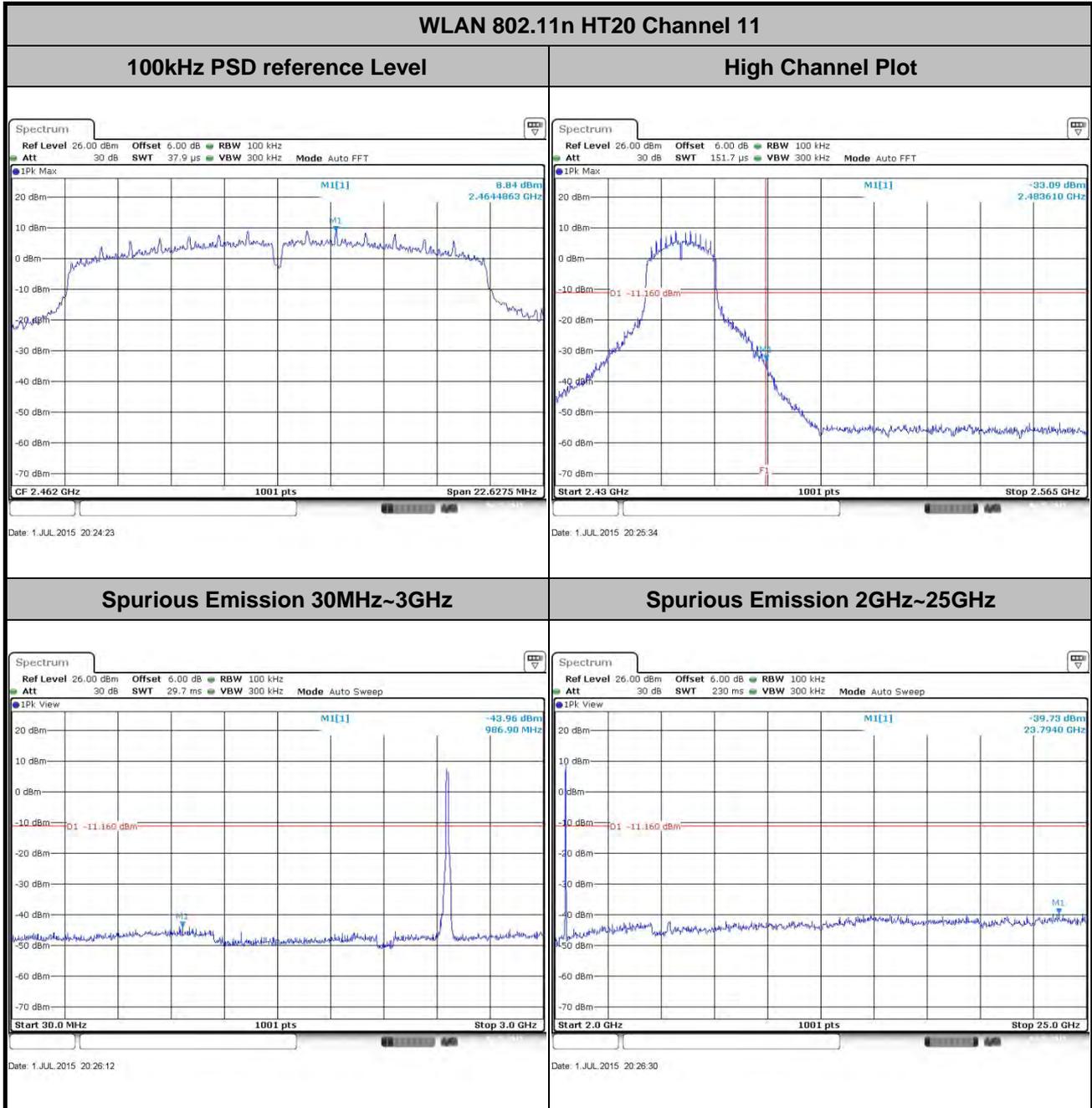
Spurious Emission 2GHz~25GHz



Date: 1 JUL 2015 20:19:59

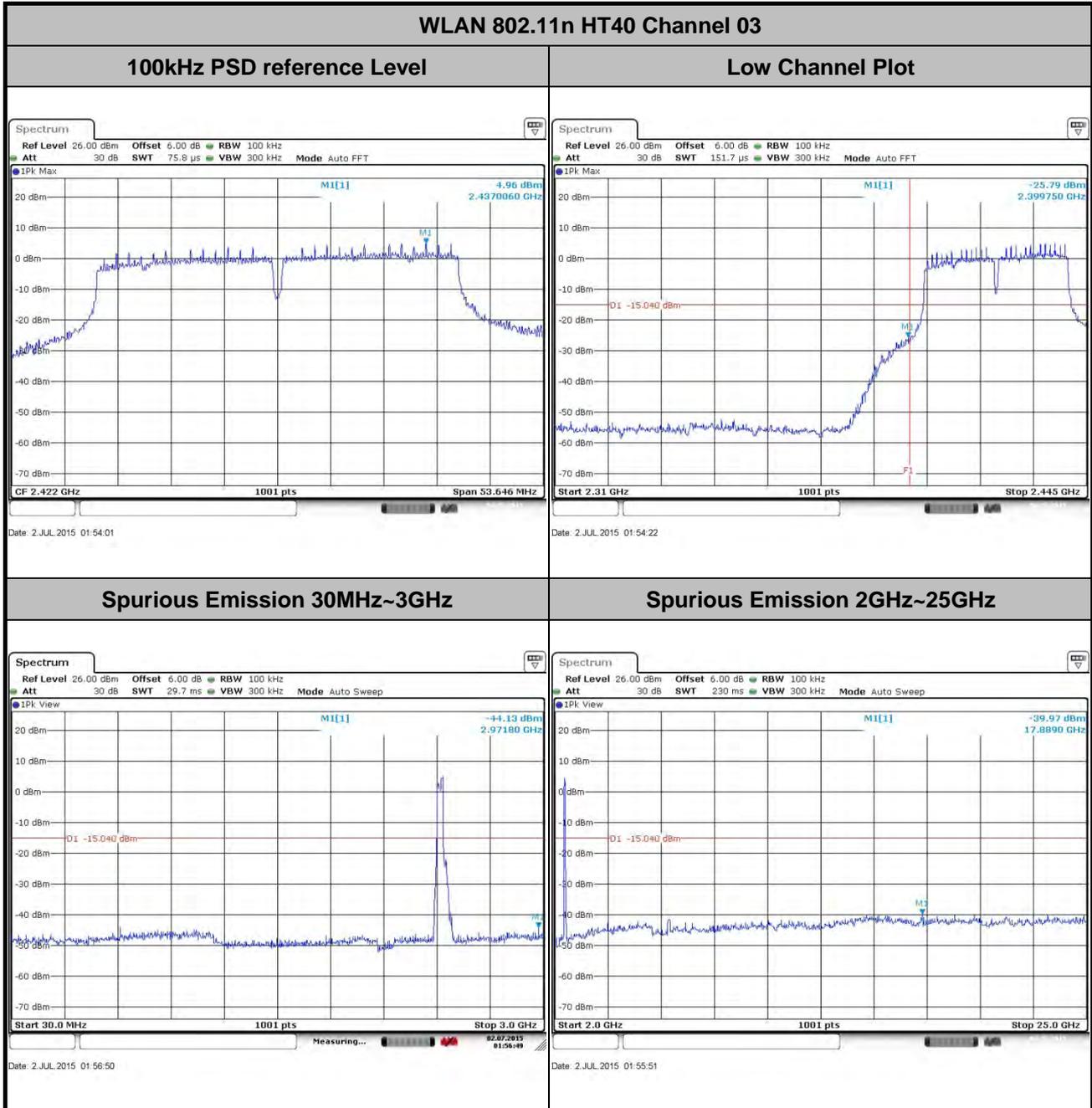


Number of TX :	1	Ant. :	2
Test Mode :	802.11n HT20	Temperature :	24~25°C
Test Band :	2.4GHz High	Relative Humidity :	49~51%
Test Channel :	11	Test Engineer :	Issac Song





Number of TX :	1	Ant. :	2
Test Mode :	802.11n HT40	Temperature :	24~25°C
Test Band :	2.4GHz Low	Relative Humidity :	49~51%
Test Channel :	03	Test Engineer :	Issac Song

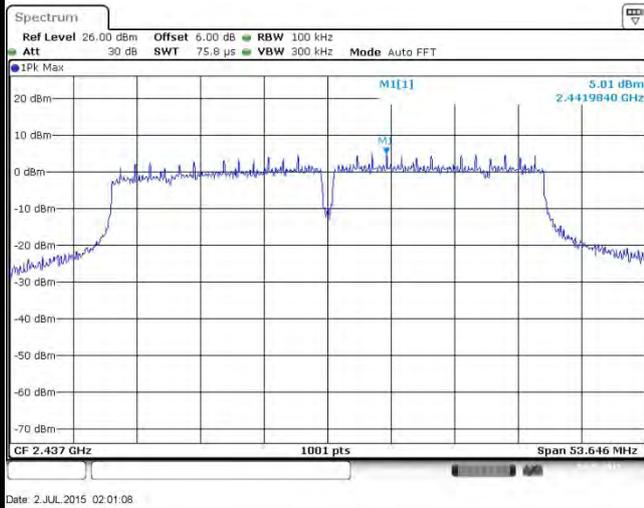




Number of TX :	1	Ant. :	2
Test Mode :	802.11n HT40	Temperature :	24~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	49~51%
Test Channel :	06	Test Engineer :	Issac Song

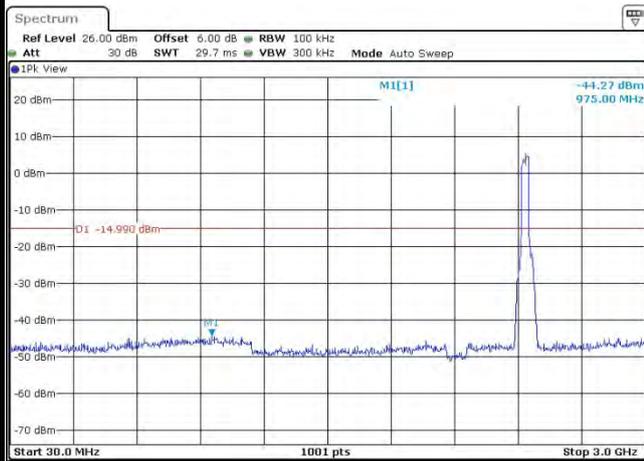
WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



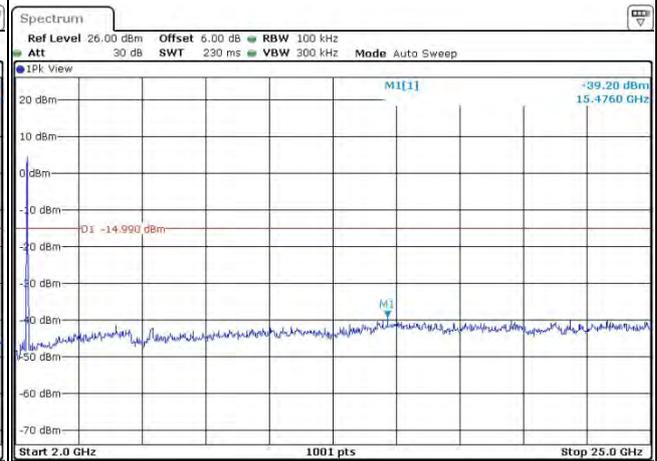
Date: 2.JUL.2015 02:01:08

Spurious Emission 30MHz~3GHz



Date: 2.JUL.2015 02:01:28

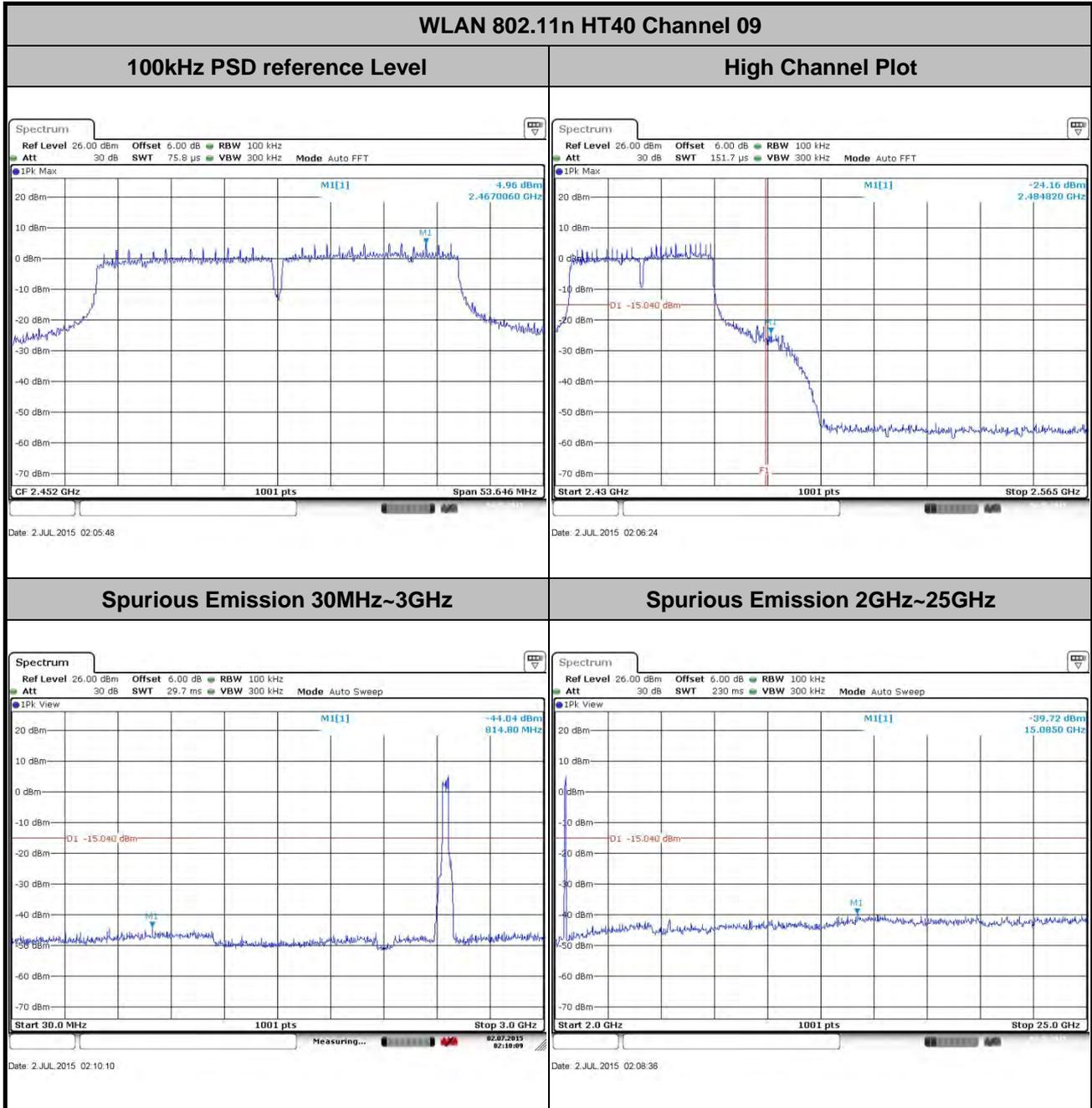
Spurious Emission 2GHz~25GHz



Date: 2.JUL.2015 02:01:46



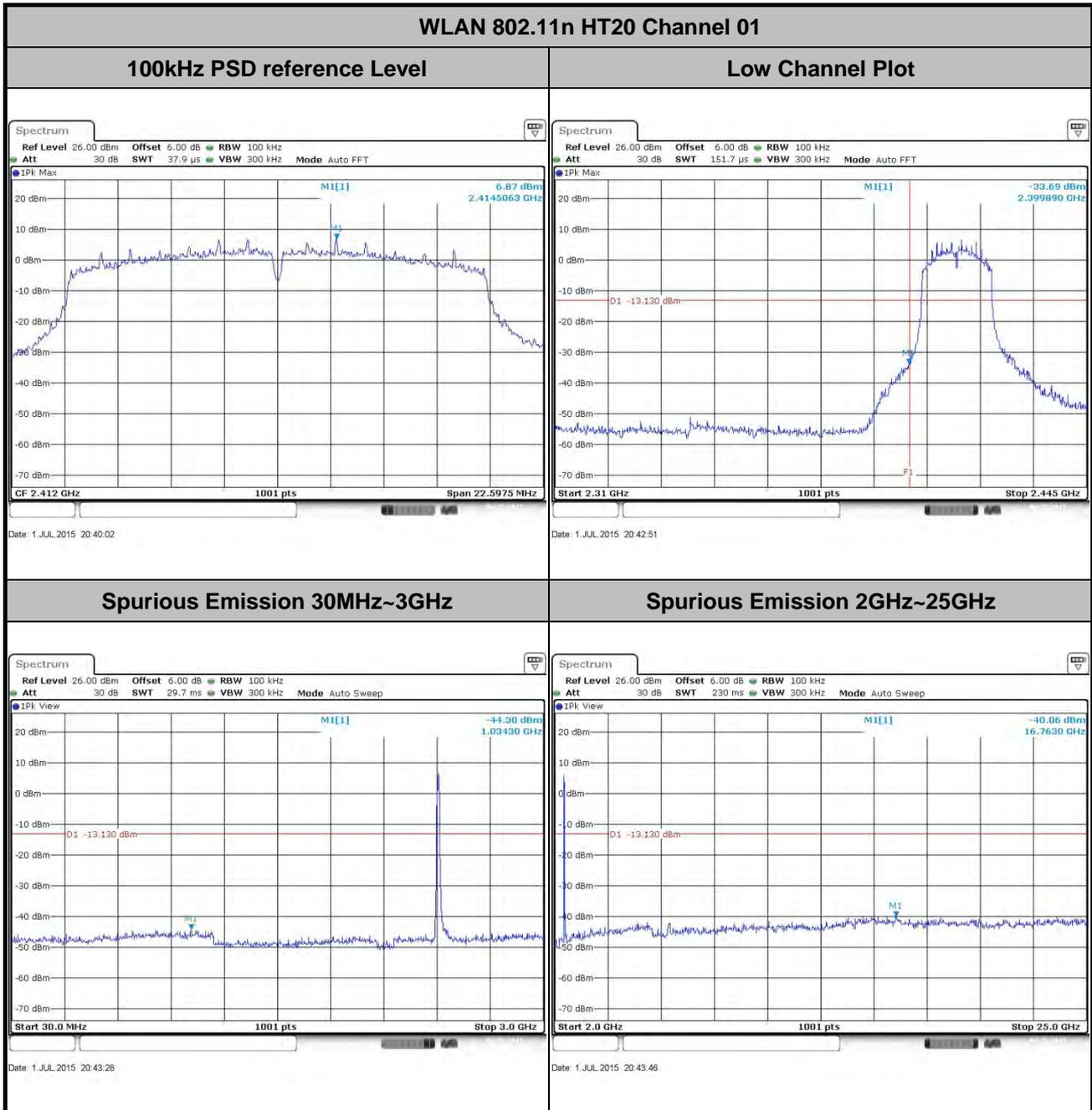
Number of TX :	1	Ant. :	2
Test Mode :	802.11n HT40	Temperature :	24~25°C
Test Band :	2.4GHz High	Relative Humidity :	49~51%
Test Channel :	09	Test Engineer :	Issac Song





Number of TX = 2, Chain Port 1+2(1) (Measured)

Number of TX :	2	Ant. :	1+2(1)
Test Mode :	802.11n HT20	Temperature :	24~25°C
Test Band :	2.4GHz Low	Relative Humidity :	49~51%
Test Channel :	01	Test Engineer :	Issac Song

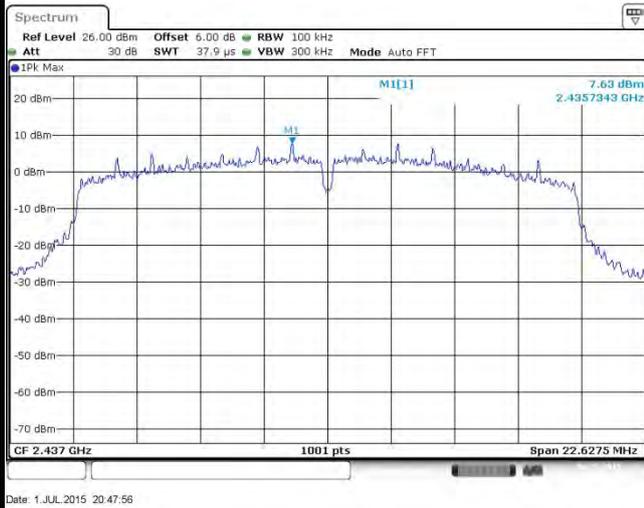




Number of TX :	2	Ant. :	1+2(1)
Test Mode :	802.11n HT20	Temperature :	24~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	49~51%
Test Channel :	06	Test Engineer :	Issac Song

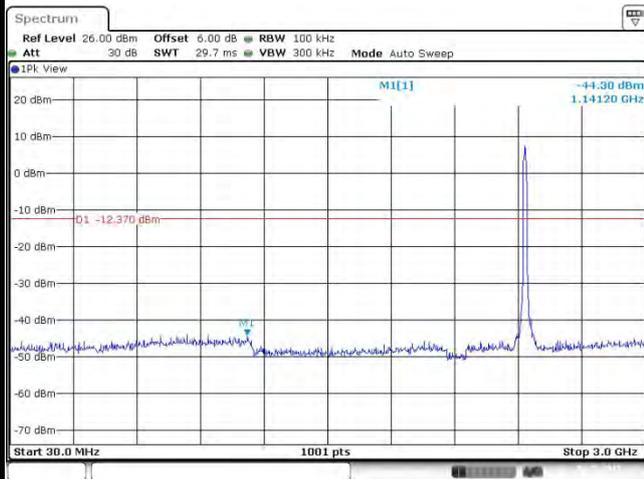
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



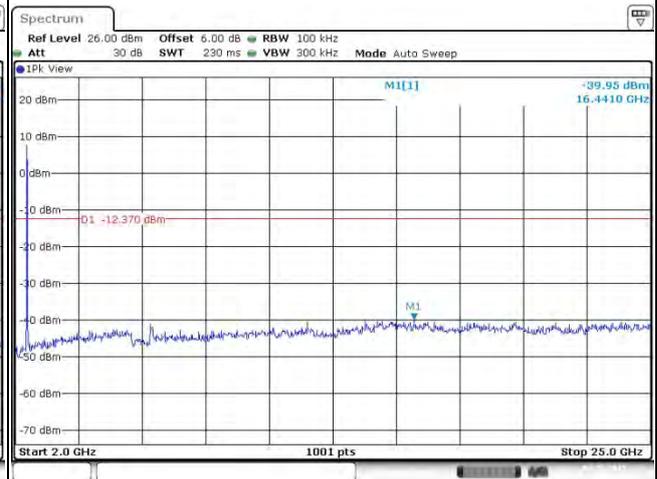
Date: 1.JUL.2015 20:47:56

Spurious Emission 30MHz~3GHz



Date: 1.JUL.2015 20:48:32

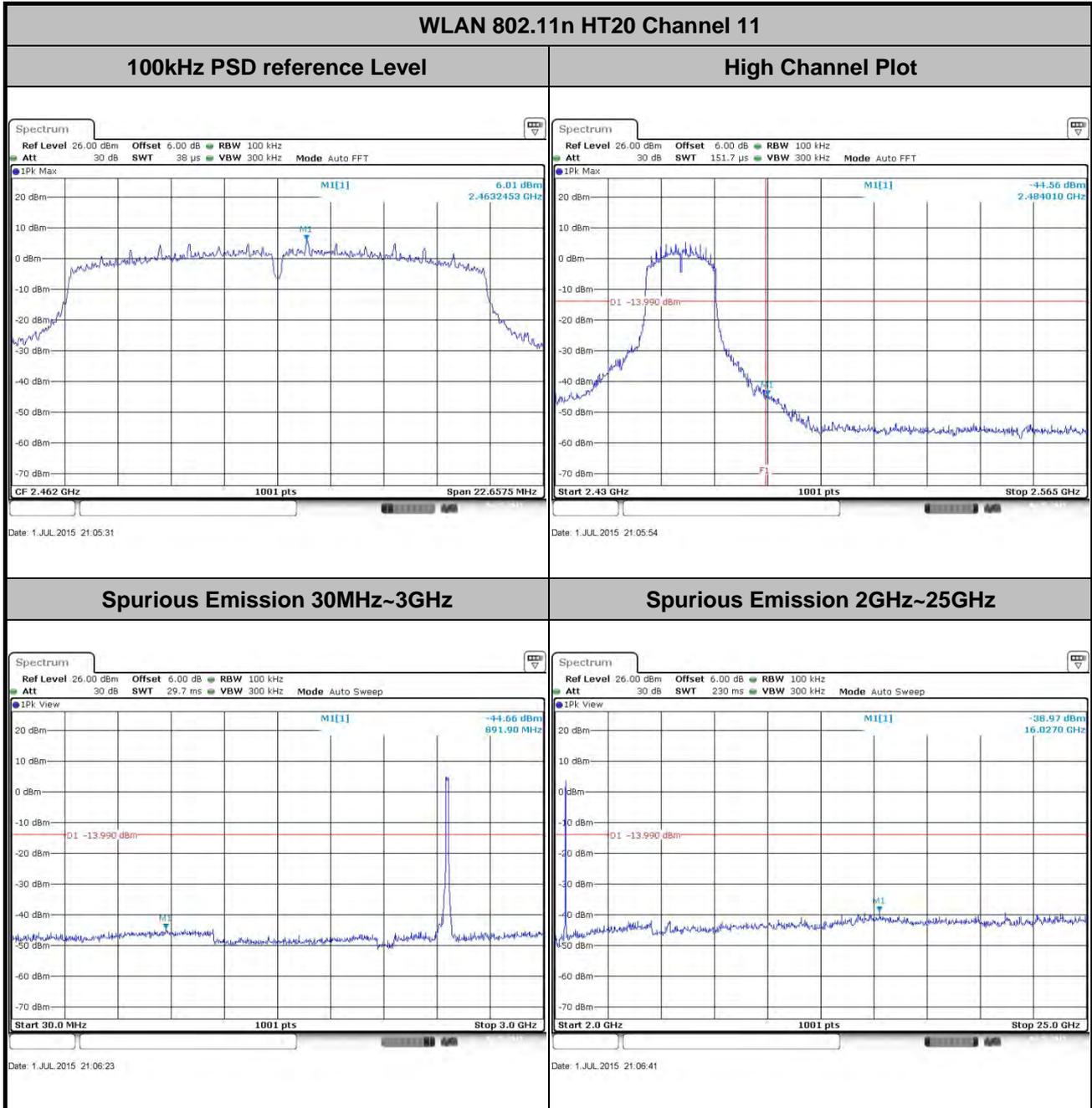
Spurious Emission 2GHz~25GHz



Date: 1.JUL.2015 20:48:49

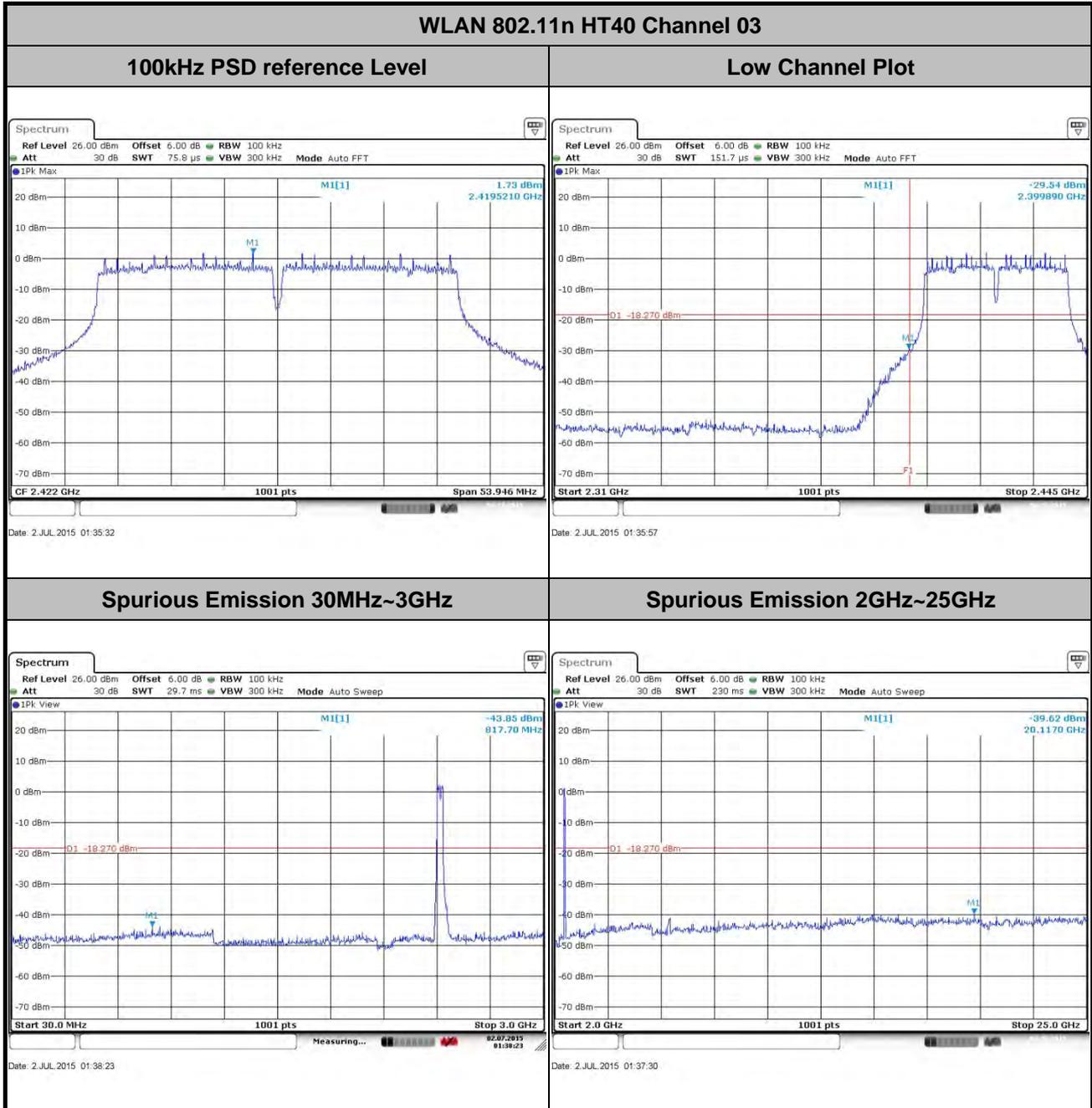


Number of TX :	2	Ant. :	1+2(1)
Test Mode :	802.11n HT20	Temperature :	24~25°C
Test Band :	2.4GHz High	Relative Humidity :	49~51%
Test Channel :	11	Test Engineer :	Issac Song





Number of TX :	2	Ant. :	1+2(1)
Test Mode :	802.11n HT40	Temperature :	24~25°C
Test Band :	2.4GHz Low	Relative Humidity :	49~51%
Test Channel :	03	Test Engineer :	Issac Song

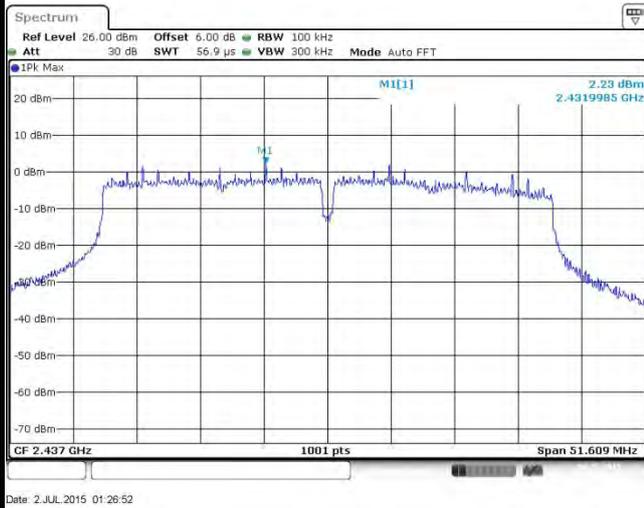




Number of TX :	2	Ant. :	1+2(1)
Test Mode :	802.11n HT40	Temperature :	24~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	49~51%
Test Channel :	06	Test Engineer :	Issac Song

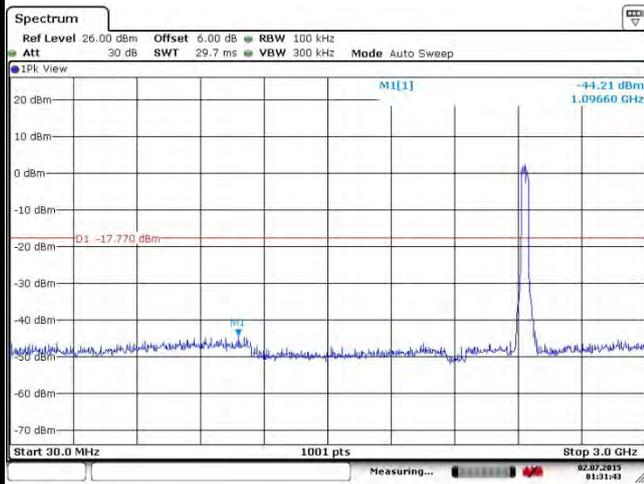
WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



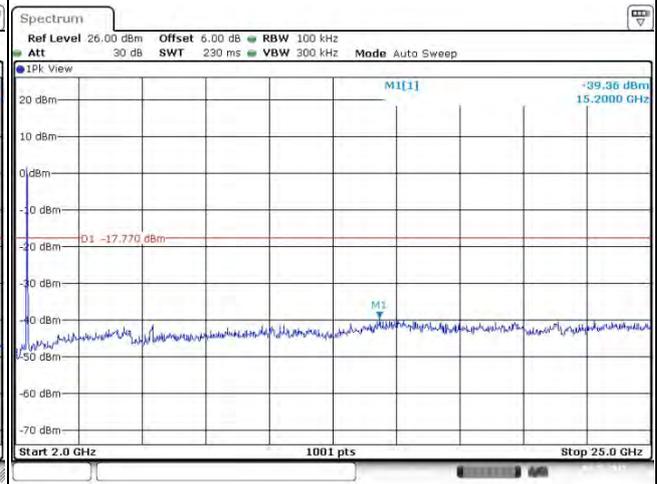
Date: 2 JUL 2015 01:26:52

Spurious Emission 30MHz~3GHz



Date: 2 JUL 2015 01:31:42

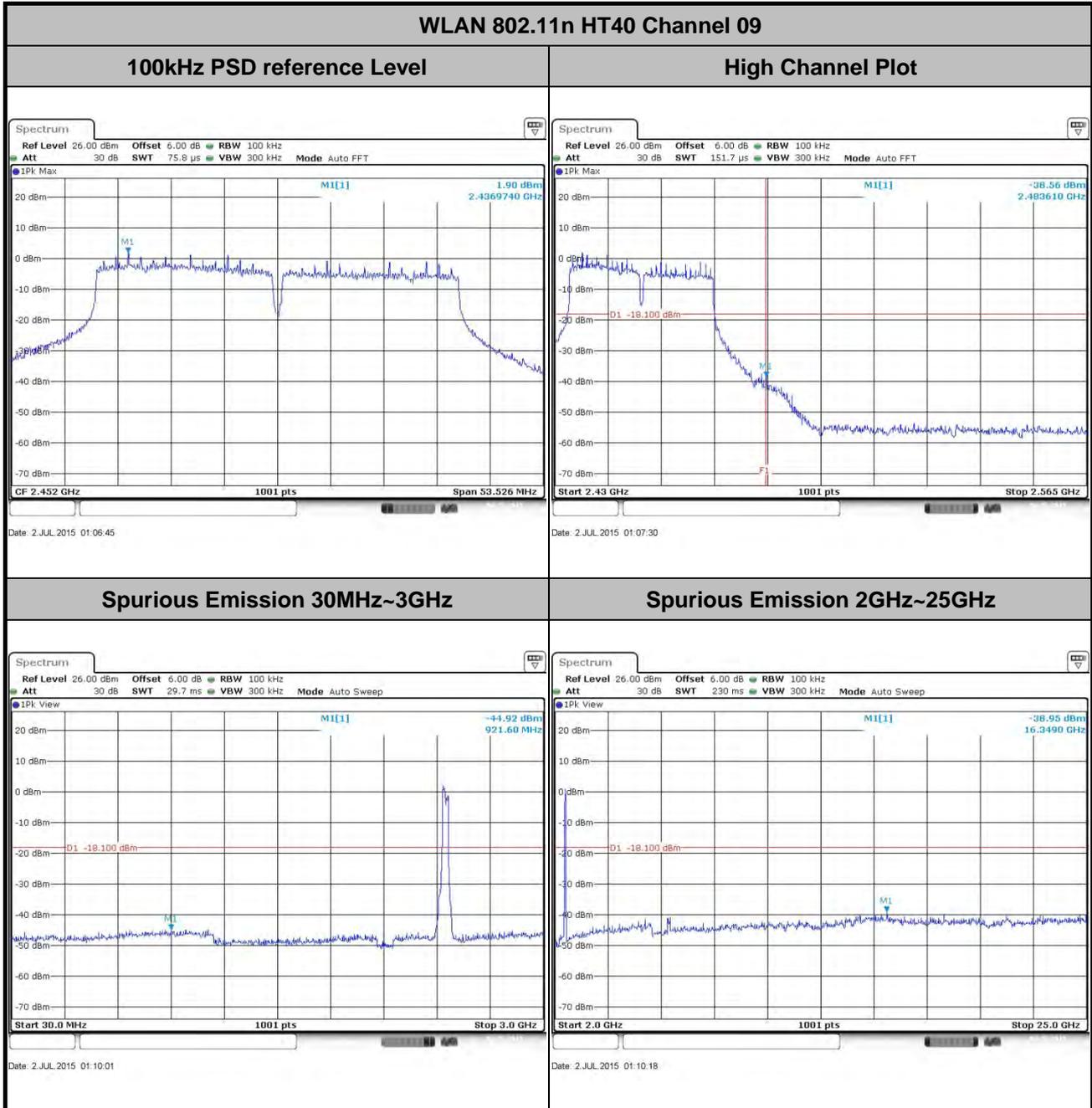
Spurious Emission 2GHz~25GHz



Date: 2 JUL 2015 01:30:41



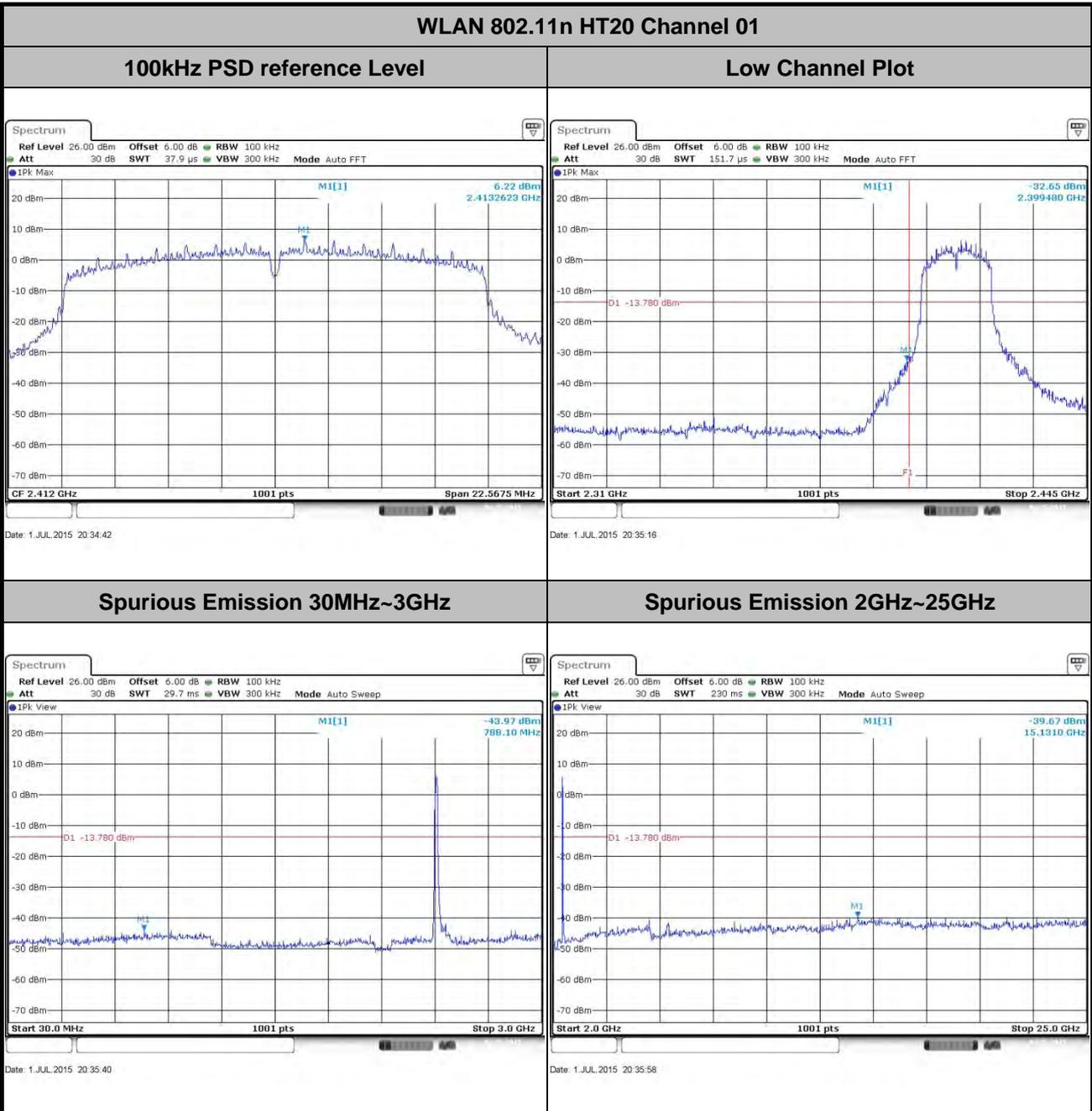
Number of TX :	2	Ant. :	1+2(1)
Test Mode :	802.11n HT40	Temperature :	24~25°C
Test Band :	2.4GHz High	Relative Humidity :	49~51%
Test Channel :	09	Test Engineer :	Issac Song





Number of TX = 2, Chain Port 1+2(2) (Measured)

Number of TX :	2	Ant. :	1+2(2)
Test Mode :	802.11n HT20	Temperature :	24~25°C
Test Band :	2.4GHz Low	Relative Humidity :	49~51%
Test Channel :	01	Test Engineer :	Issac Song

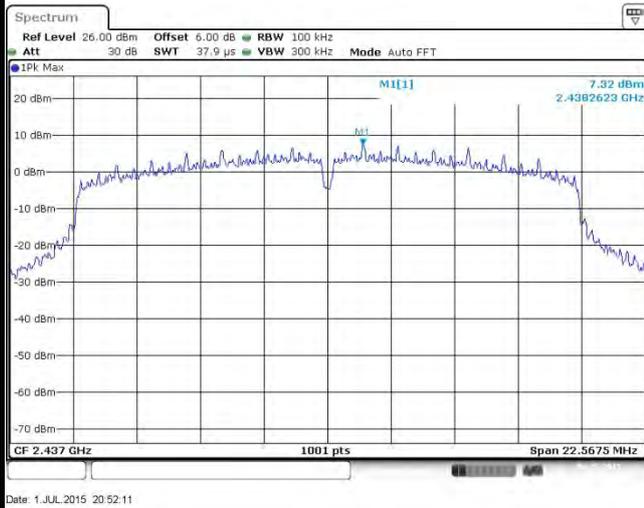




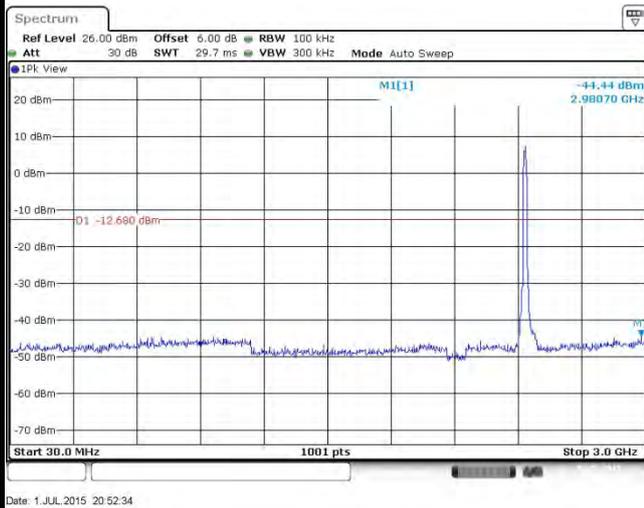
Number of TX :	2	Ant. :	1+2(2)
Test Mode :	802.11n HT20	Temperature :	24~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	49~51%
Test Channel :	06	Test Engineer :	Issac Song

WLAN 802.11n HT20 Channel 06

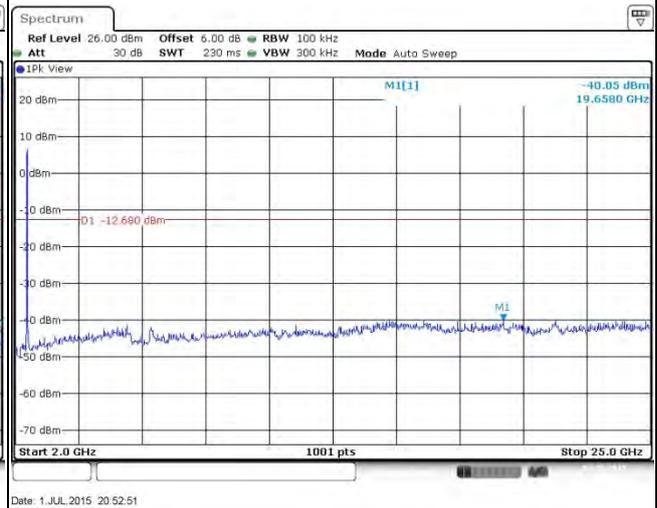
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz

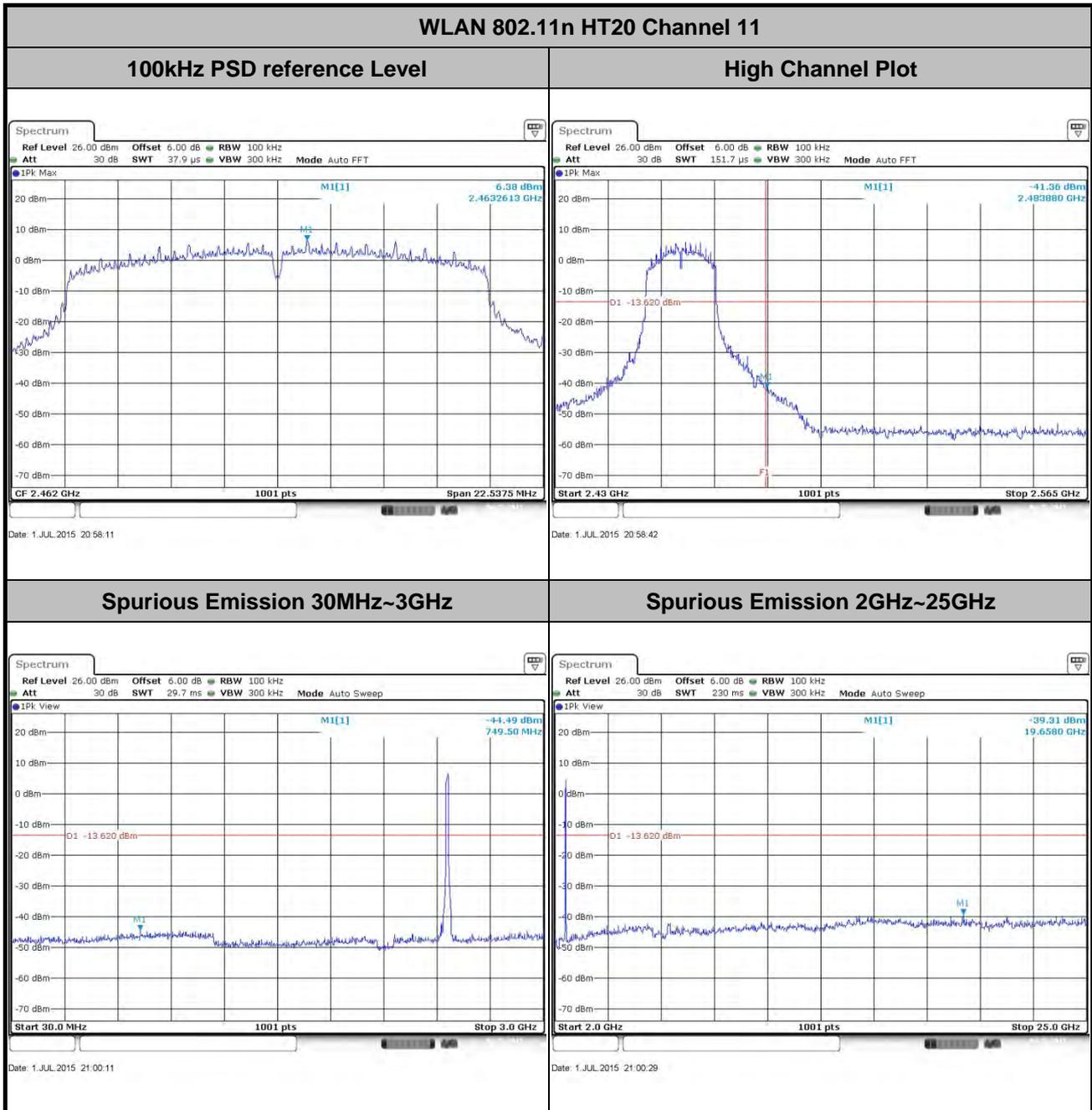


Spurious Emission 2GHz~25GHz



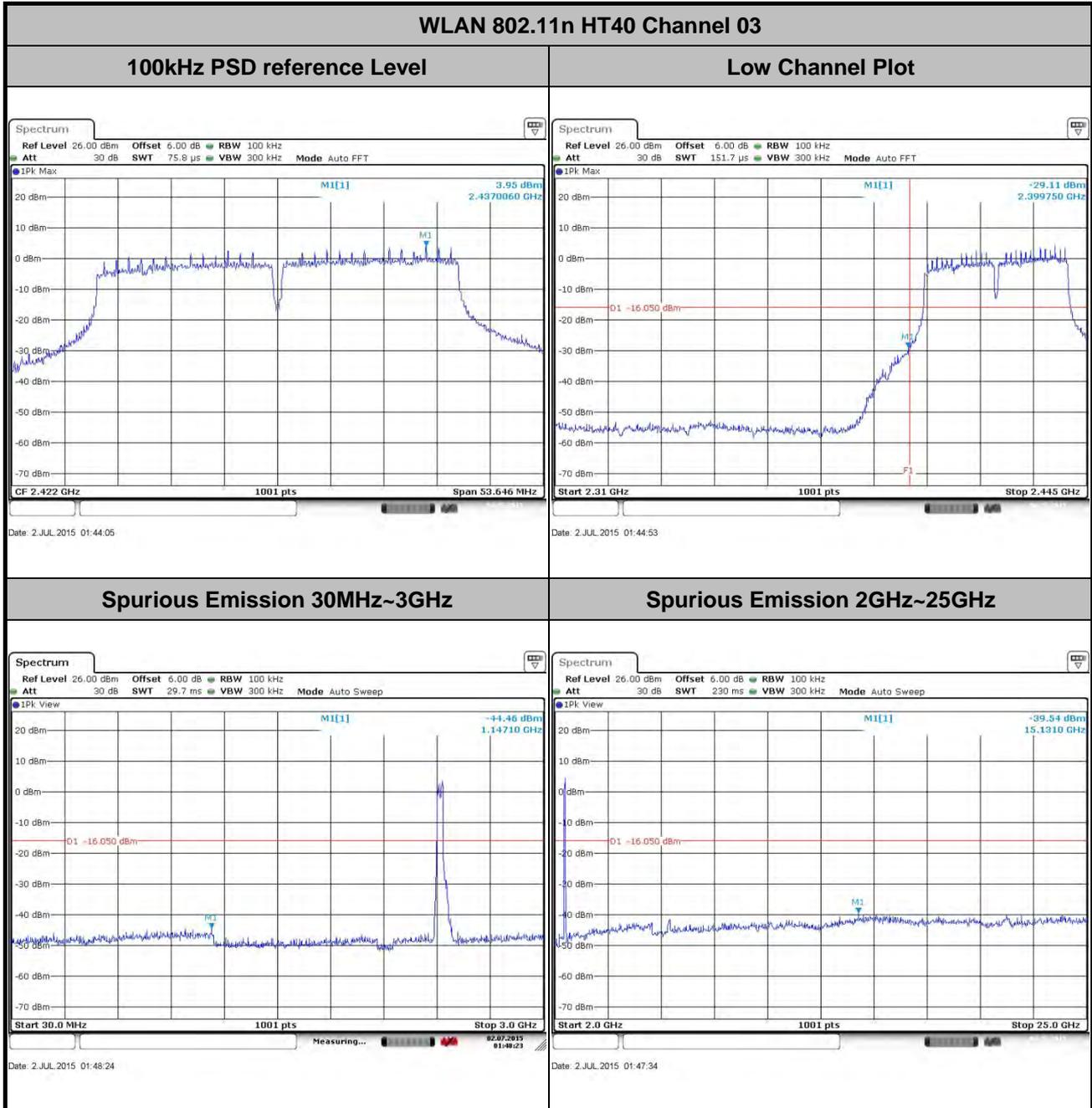


Number of TX :	2	Ant. :	1+2(2)
Test Mode :	802.11n HT20	Temperature :	24~25°C
Test Band :	2.4GHz High	Relative Humidity :	49~51%
Test Channel :	11	Test Engineer :	Issac Song





Number of TX :	2	Ant. :	1+2(2)
Test Mode :	802.11n HT40	Temperature :	24~25°C
Test Band :	2.4GHz Low	Relative Humidity :	49~51%
Test Channel :	03	Test Engineer :	Issac Song

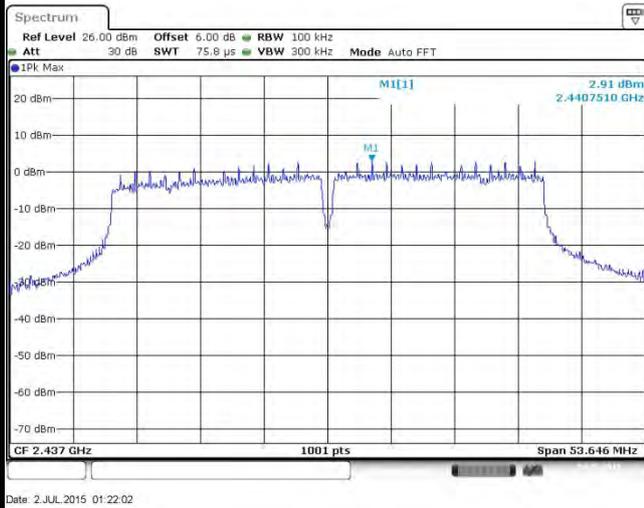




Number of TX :	2	Ant. :	1+2(2)
Test Mode :	802.11n HT40	Temperature :	24~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	49~51%
Test Channel :	06	Test Engineer :	Issac Song

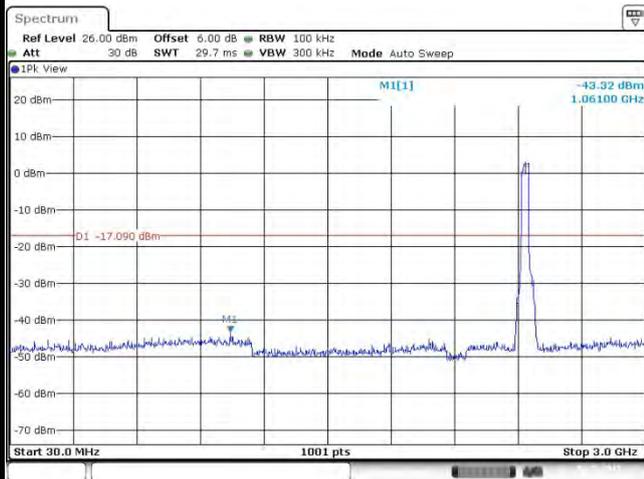
WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



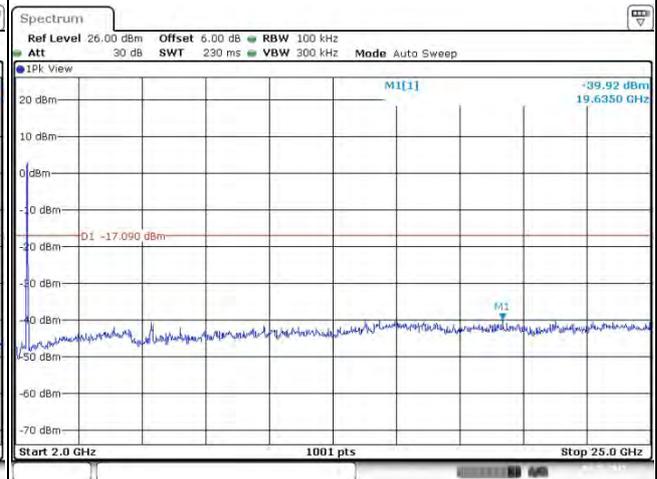
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Spurious Emission 30MHz~3GHz



Date: 2.JUL.2015 01:22:24

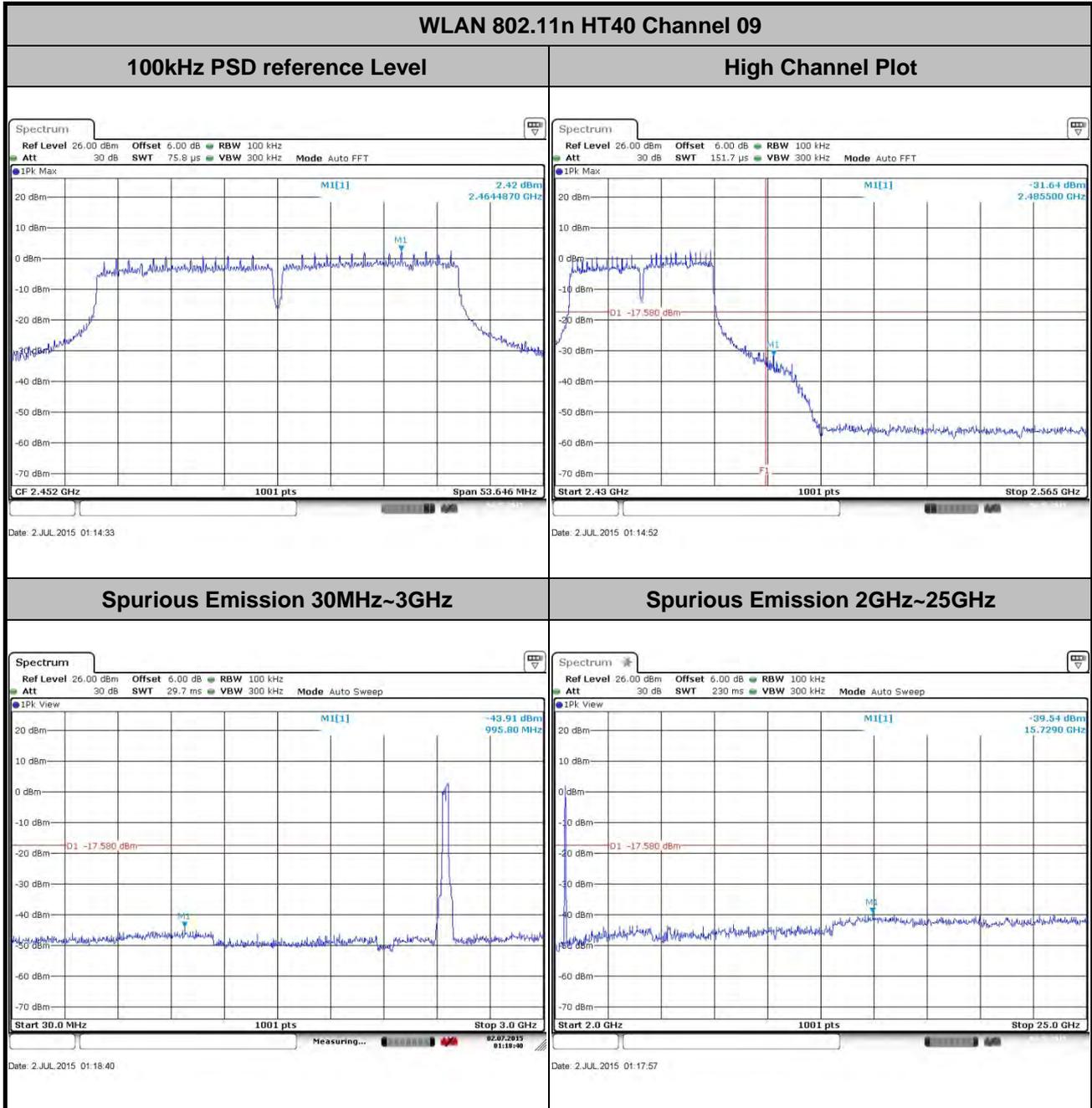
Spurious Emission 2GHz~25GHz



Date: 2.JUL.2015 01:22:42



Number of TX :	2	Ant. :	1+2(2)
Test Mode :	802.11n HT40	Temperature :	24~25°C
Test Band :	2.4GHz High	Relative Humidity :	49~51%
Test Channel :	09	Test Engineer :	Issac Song





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 Procedure

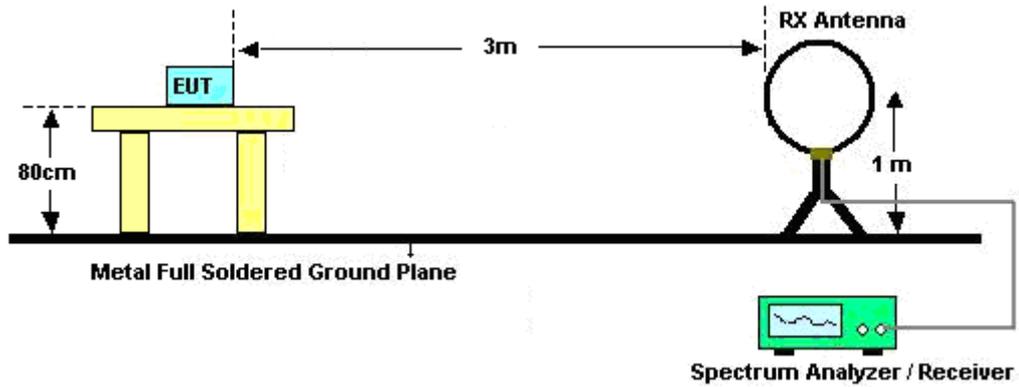
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the 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 - 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.



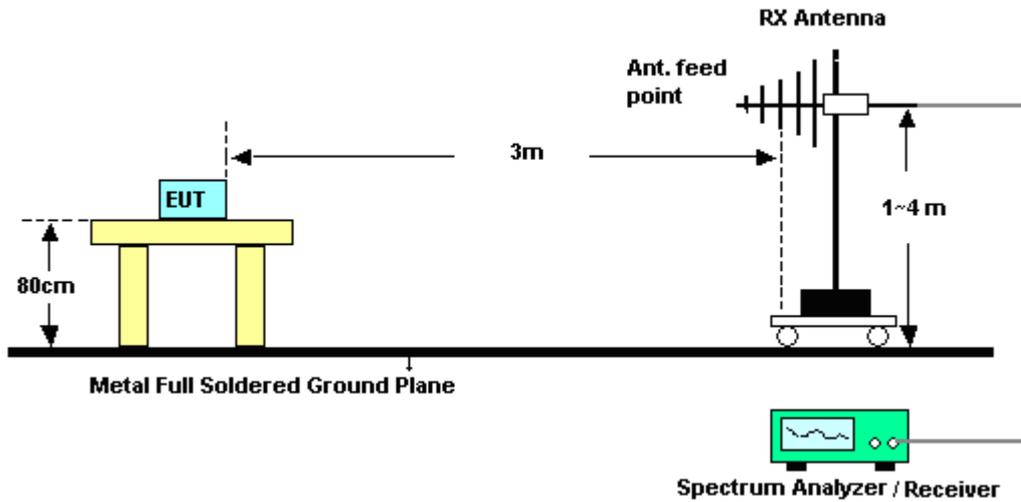
Chain Port	Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
1	802.11b	100	-	-	10Hz
2	802.11b	100	-	-	
1	802.11g	95.77	1.36	0.74	1kHz
2	802.11g	96.48	1.37	0.73	
1+2	2.4GHz 802.11n HT20	96.37	1.27	0.79	1kHz
1+2	2.4GHz 802.11n HT40	89.42	0.34	2.96	3kHz

3.5.4 Test Setup

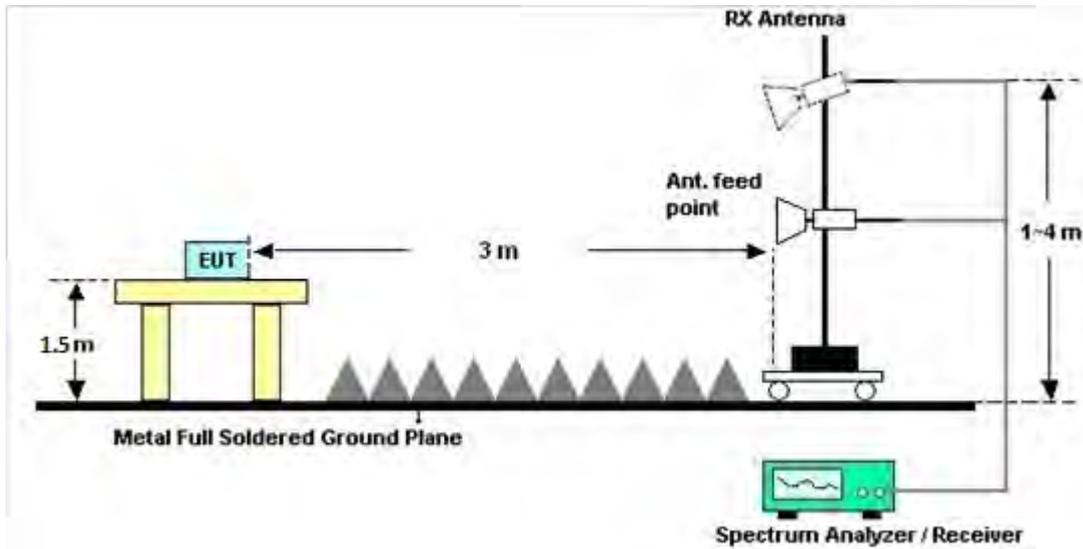
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated 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 of this test report.

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

Please refer to Appendix B of this test report.

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.

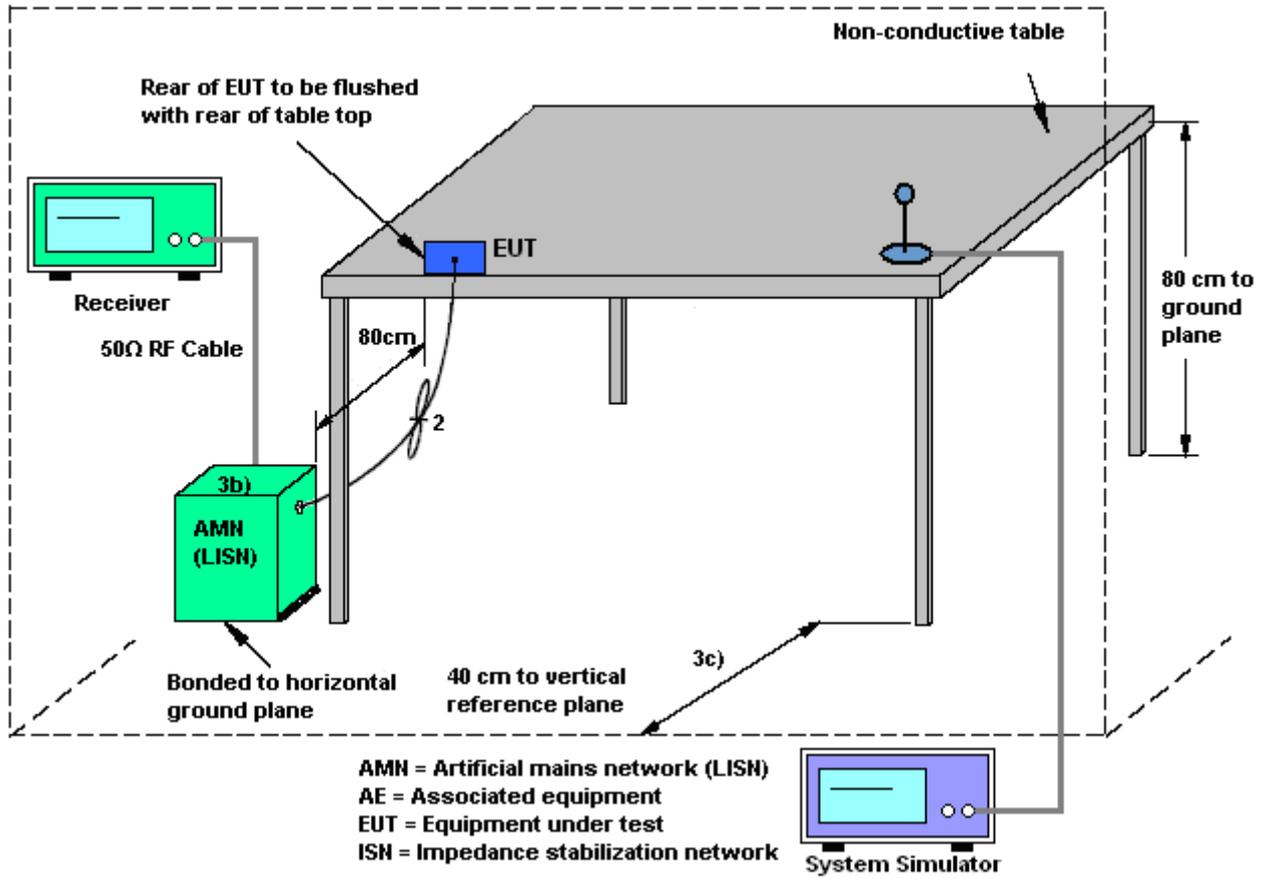
3.6.2 Measuring Instruments

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.

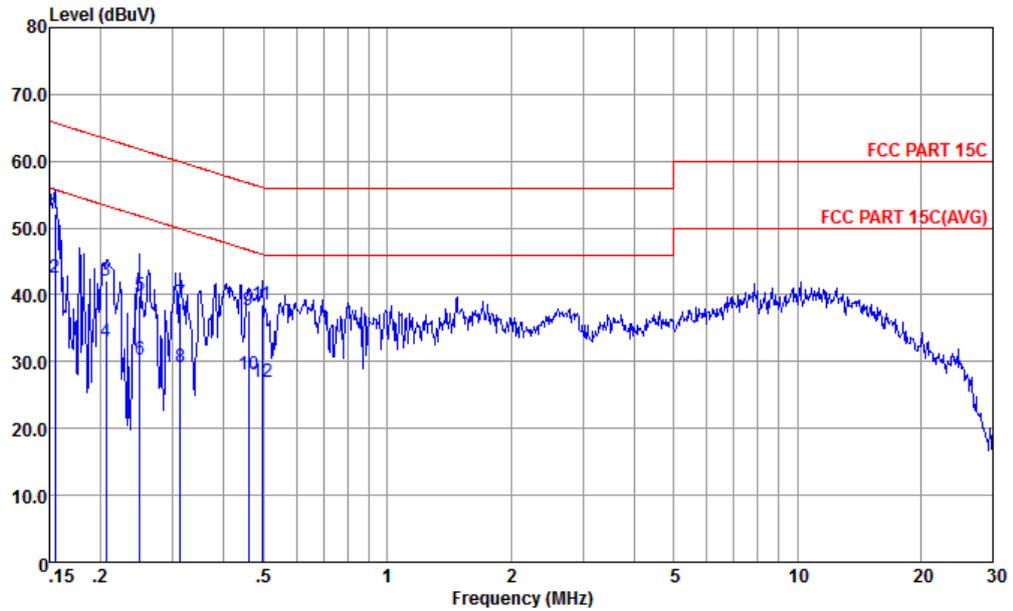
3.6.4 Test Setup





3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	22~24°C
Test Engineer :	Eko Zhang	Relative Humidity :	43~45%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band V Idle + WLAN (2.4G) Link + Adapter		

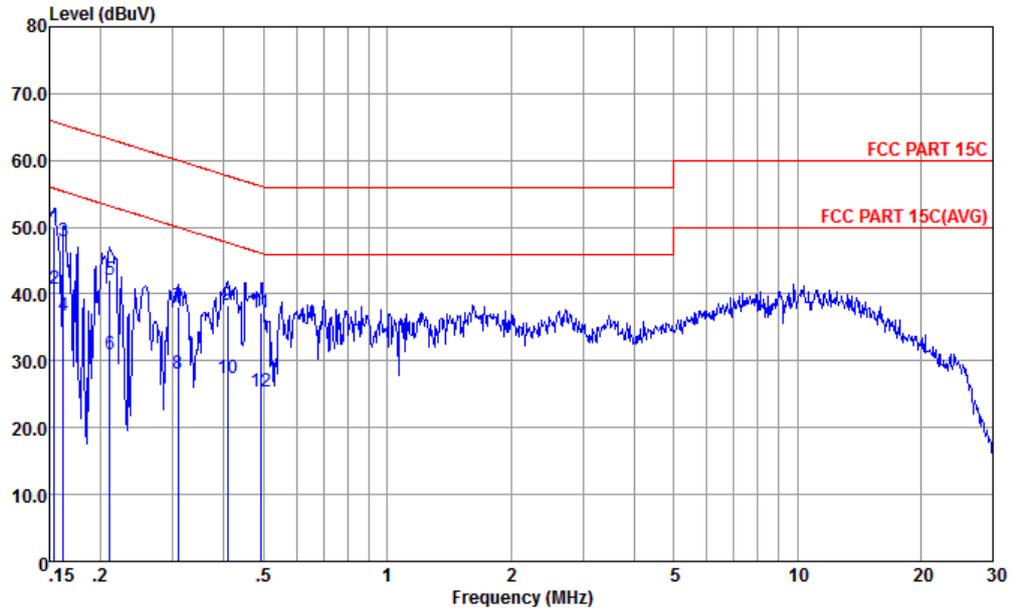


Site : CO01-KS
 Condition : FCC PART 15C LISN-L20140306 LINE
 Project : (FR) 560506
 mode : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.15	52.15	-13.59	65.74	39.90	1.87	10.38	QP
2 *	0.15	42.45	-13.29	55.74	30.20	1.87	10.38	Average
3	0.21	42.09	-21.27	63.36	30.60	0.99	10.50	QP
4	0.21	32.99	-20.37	53.36	21.50	0.99	10.50	Average
5	0.25	39.91	-21.87	61.78	28.50	0.88	10.53	QP
6	0.25	30.21	-21.57	51.78	18.80	0.88	10.53	Average
7	0.31	38.80	-21.08	59.88	27.60	0.61	10.59	QP
8	0.31	29.30	-20.58	49.88	18.10	0.61	10.59	Average
9	0.46	37.66	-19.05	56.71	26.80	0.24	10.62	QP
10	0.46	28.06	-18.65	46.71	17.20	0.24	10.62	Average
11	0.49	38.63	-17.47	56.10	27.81	0.20	10.62	QP
12	0.49	27.03	-19.07	46.10	16.21	0.20	10.62	Average



Test Mode :	Mode 1	Temperature :	22~24°C
Test Engineer :	Eko Zhang	Relative Humidity :	43~45%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band V Idle + WLAN (2.4G) Link + Adapter		



Site : CO01-KS
 Condition : FCC PART 15C LISN-N20140306 NEUTRAL
 Project : (FR) 560506
 mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15	49.82	-15.96	65.78	37.60	1.84	10.38	QP
2 *	0.15	40.72	-15.06	55.78	28.50	1.84	10.38	Average
3	0.16	47.90	-17.44	65.34	35.80	1.70	10.40	QP
4	0.16	36.70	-18.64	55.34	24.60	1.70	10.40	Average
5	0.21	42.08	-21.10	63.18	30.59	0.98	10.51	QP
6	0.21	30.98	-22.20	53.18	19.49	0.98	10.51	Average
7	0.31	38.07	-21.95	60.02	26.80	0.69	10.58	QP
8	0.31	28.17	-21.85	50.02	16.90	0.69	10.58	Average
9	0.41	38.31	-19.37	57.68	27.30	0.39	10.62	QP
10	0.41	27.51	-20.17	47.68	16.50	0.39	10.62	Average
11	0.49	37.13	-19.01	56.14	26.20	0.31	10.62	QP
12	0.49	25.43	-20.71	46.14	14.50	0.31	10.62	Average

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

Non-standard antenna connector is used.

3.7.3 Antenna Gain

FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

For CDD transmissions, directional gain is calculated as

$$Directional\ Gain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k / 20}$ if the k th antenna is being fed by spatial stream j , or zero if it is not;

G_k is the gain in dBi of the k th antenna.

The EUT supports CDD mode.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,



The directional gain “DG” is calculated as following table.

			DG	DG	Power	PSD
			for	for	Limit	Limit
	Chain Port 1	Chain Port 2	Power	PSD	Reduction	Reduction
	(dBi)	(dBi)	(dBi)	(dBi)	(dB)	(dB)
2.4 GHz	2.68	4.51	6.65	6.65	0.65	0.65

Power Limit Reduction = DG(Power) – 6dBi, (min = 0)

PSD Limit Reduction = DG(PSD) – 6dBi, (min = 0)



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Oct. 28, 2014	Jul. 01, 2015~ Jul. 10, 2015	Oct. 27, 2015	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	30MHz~40GHz	Jan. 23, 2015	Jul. 01, 2015~ Jul. 10, 2015	Jan. 22, 2016	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 23, 2015	Jul. 01, 2015~ Jul. 10, 2015	Jan. 22, 2016	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz; Max 30dBm	Sep. 29, 2014	Jun. 30, 2015	Sep. 28, 2015	Radiation (03CH02-KS)
Spectrum Analyzer	R&S	FSV40	101040	10kHz~40GHz; Max 30dBm	Sep. 25, 2014	Jun. 30, 2015	Sep. 24, 2015	Radiation (03CH02-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 13, 2014	Jun. 30, 2015	Nov. 12, 2015	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6112D	37879	30MHz~2GHz	Sep. 13, 2014	Jun. 30, 2015	Sep. 12, 2015	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Nov. 08, 2014	Jun. 30, 2015	Nov. 07, 2015	Radiation (03CH02-KS)
Active Horn Antenna	com-power	AHA-118	701030	1GHz~18GHz	Nov. 08, 2014	Jun. 30, 2015	Nov. 07, 2015	Radiation (03CH02-KS)
SHF-EHF Horn	com-power	AH-840	101070	18GHz~40GHz	Sep. 04, 2014	Jun. 30, 2015	Sep. 03, 2015	Radiation (03CH02-KS)
Amplifier	com-power	PA-103A	161069	1kHz~1000MHz / 32 dB	May 04, 2015	Jun. 30, 2015	May 03, 2016	Radiation (03CH02-KS)
Amplifier	Agilent	8449B	3008A023 84	1GHz~26.5GHz	Oct. 28, 2014	Jun. 30, 2015	Oct. 27, 2015	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002 473	N/A	NCR	Jun. 30, 2015	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Jun. 30, 2015	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Jun. 30, 2015	NCR	Radiation (03CH02-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	May 04, 2015	Jun. 24, 2015	May 03, 2016	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 25, 2014	Jun. 24, 2015	Oct. 24, 2015	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 25, 2014	Jun. 24, 2015	Oct. 24, 2015	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP00000 0811	AC 0V~300V, 45Hz~1000Hz	Oct. 25, 2014	Jun. 24, 2015	Oct. 24, 2015	Conduction (CO01-KS)



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.3dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1dB
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Appendix A. Conducted Test Results

Report Number : FR560506A

Test Engineer:	Issac Song	Temperature:	24~25	°C
Test Date:	2015/7/1~2015/7/10	Relative Humidity:	49~51	%

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
					Ant 1	Ant 2	Ant 1	Ant 2		
11b	1Mbps	1	1	2412		11.99		7.03	0.50	Pass
11b	1Mbps	1	6	2437		12.09		7.03	0.50	Pass
11b	1Mbps	1	11	2462		12.09		7.03	0.50	Pass
11g	6Mbps	1	1	2412		16.63		15.07	0.50	Pass
11g	6Mbps	1	6	2437		16.73		15.07	0.50	Pass
11g	6Mbps	1	11	2462		16.88		15.07	0.50	Pass
HT20	MCS0	1	1	2412		17.73		15.07	0.50	Pass
HT20	MCS0	1	6	2437		17.88		15.09	0.50	Pass
HT20	MCS0	1	11	2462		17.83		15.09	0.50	Pass
HT40	MCS1	1	3	2422		37.86		35.76	0.50	Pass
HT40	MCS1	1	6	2437		38.16		35.76	0.50	Pass
HT40	MCS1	1	9	2452		37.86		35.76	0.50	Pass
HT20	MCS0	2	1	2412	17.58	17.63	15.07	15.05	0.50	Pass
HT20	MCS0	2	6	2437	17.63	17.78	15.09	15.05	0.50	Pass
HT20	MCS0	2	11	2462	17.98	17.53	15.11	15.03	0.50	Pass
HT40	MCS1	2	3	2422	37.26	38.26	35.96	35.76	0.50	Pass
HT40	MCS1	2	6	2437	37.16	37.46	34.41	35.76	0.50	Pass
HT40	MCS1	2	9	2452	38.16	37.16	35.68	35.76	0.50	Pass

TEST RESULTS DATA
Peak Output Power

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
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11b	1Mbps	1	1	2412	18.37	22.74		30.00	30.00	2.68	4.51	21.05	27.25	36.00	36.00	Pass
11b	1Mbps	1	6	2437	19.23	22.98		30.00	30.00	2.68	4.51	21.91	27.49	36.00	36.00	Pass
11b	1Mbps	1	11	2462	17.41	22.39		30.00	30.00	2.68	4.51	20.09	26.90	36.00	36.00	Pass
11g	6Mbps	1	1	2412	22.83	23.62		30.00	30.00	2.68	4.51	25.51	28.13	36.00	36.00	Pass
11g	6Mbps	1	6	2437	24.01	24.38		30.00	30.00	2.68	4.51	26.69	28.89	36.00	36.00	Pass
11g	6Mbps	1	11	2462	22.48	23.37		30.00	30.00	2.68	4.51	25.16	27.88	36.00	36.00	Pass
HT20	MCS0	1	1	2412	24.95	24.98		30.00	30.00	2.68	4.51	27.63	29.49	36.00	36.00	Pass
HT20	MCS0	1	6	2437	25.63	25.76		30.00	30.00	2.68	4.51	28.31	30.27	36.00	36.00	Pass
HT20	MCS0	1	11	2462	23.96	24.96		30.00	30.00	2.68	4.51	26.64	29.47	36.00	36.00	Pass
HT40	MCS1	1	3	2422	25.06	25.11		30.00	30.00	2.68	4.51	27.74	29.62	36.00	36.00	Pass
HT40	MCS1	1	6	2437	25.31	25.32		30.00	30.00	2.68	4.51	27.99	29.83	36.00	36.00	Pass
HT40	MCS1	1	9	2452	24.52	25.04		30.00	30.00	2.68	4.51	27.20	29.55	36.00	36.00	Pass
HT20	MCS0	2	1	2412	23.60	23.45	26.54	29.35		6.65		33.19		36.00		Pass
HT20	MCS0	2	6	2437	24.56	24.36	27.47	29.35		6.65		34.12		36.00		Pass
HT20	MCS0	2	11	2462	22.97	23.04	26.02	29.35		6.65		32.67		36.00		Pass
HT40	MCS1	2	3	2422	23.85	24.63	27.27	29.35		6.65		33.92		36.00		Pass
HT40	MCS1	2	6	2437	23.90	24.65	27.30	29.35		6.65		33.95		36.00		Pass
HT40	MCS1	2	9	2452	23.55	24.02	26.80	29.35		6.65		33.45		36.00		Pass

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

TEST RESULTS DATA
Average Output Power

2.4GHz Band									
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)		
					Ant 1	Ant 2	Ant 1	Ant 2	SUM
11b	1Mbps	1	1	2412	0.00	0.00	15.23	19.81	
11b	1Mbps	1	6	2437	0.00	0.00	16.15	20.26	
11b	1Mbps	1	11	2462	0.00	0.00	14.42	19.48	
11g	6Mbps	1	1	2412	0.19	0.16	14.42	15.75	
11g	6Mbps	1	6	2437	0.19	0.16	15.39	16.35	
11g	6Mbps	1	11	2462	0.19	0.16	14.12	15.58	
HT20	MCS0	1	1	2412	0.17	0.17	18.51	18.55	
HT20	MCS0	1	6	2437	0.17	0.17	19.29	19.41	
HT20	MCS0	1	11	2462	0.17	0.17	17.69	18.96	
HT40	MCS1	1	3	2422	0.27	0.25	18.06	17.92	
HT40	MCS1	1	6	2437	0.27	0.25	18.14	18.45	
HT40	MCS1	1	9	2452	0.27	0.25	17.40	18.28	
HT20	MCS0	2	1	2412	0.16	0.16	15.68	15.81	18.76
HT20	MCS0	2	6	2437	0.16	0.16	16.46	16.41	19.45
HT20	MCS0	2	11	2462	0.16	0.16	15.19	15.39	18.30
HT40	MCS1	2	3	2422	0.26	0.26	14.46	16.39	18.54
HT40	MCS1	2	6	2437	0.26	0.26	14.58	16.63	18.73
HT40	MCS1	2	9	2452	0.26	0.26	14.53	15.96	18.31

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

TEST RESULTS DATA
Peak Power Spectral 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
					Ant 1	Ant 2	Worse + 3.01	Ant 1	Ant 2	Ant 1	Ant 2	
11b	1Mbps	1	1	2412		-2.18	-	2.68	4.51	8.00	8.00	Pass
11b	1Mbps	1	6	2437		-1.51		2.68	4.51	8.00	8.00	Pass
11b	1Mbps	1	11	2462		-2.00		2.68	4.51	8.00	8.00	Pass
11g	6Mbps	1	1	2412		-6.47		2.68	4.51	8.00	8.00	Pass
11g	6Mbps	1	6	2437		-6.31		2.68	4.51	8.00	8.00	Pass
11g	6Mbps	1	11	2462		-6.64		2.68	4.51	8.00	8.00	Pass
HT20	MCS0	1	1	2412		-4.32		2.68	4.51	8.00	8.00	Pass
HT20	MCS0	1	6	2437		-3.56		2.68	4.51	8.00	8.00	Pass
HT20	MCS0	1	11	2462		-4.33		2.68	4.51	8.00	8.00	Pass
HT40	MCS1	1	3	2422		-8.73		2.68	4.51	8.00	8.00	Pass
HT40	MCS1	1	6	2437		-8.66		2.68	4.51	8.00	8.00	Pass
HT40	MCS1	1	9	2452		-8.86		2.68	4.51	8.00	8.00	Pass
HT20	MCS0	2	1	2412	-6.71	-5.95	-2.94	6.65		7.35		Pass
HT20	MCS0	2	6	2437	-5.96	-5.20	-2.19	6.65		7.35		Pass
HT20	MCS0	2	11	2462	-8.00	-5.95	-2.94	6.65		7.35		Pass
HT40	MCS1	2	3	2422	-12.51	-10.51	-7.50	6.65		7.35		Pass
HT40	MCS1	2	6	2437	-12.35	-10.27	-7.26	6.65		7.35		Pass
HT40	MCS1	2	9	2452	-13.14	-11.50	-8.49	6.65		7.35		Pass

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



Appendix B. Radiated Spurious Emission

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

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 CH 01 2412MHz	*	2410.855	110.17	-	-	111.2	31.23	4.74	37	150	242	P	H
	*	2411.272	105.79	-	-	106.82	31.23	4.74	37	150	242	A	H
		2389.92	50.37	-23.63	74	51.47	31.2	4.72	37.02	150	242	P	H
		2390	39.01	-14.99	54	40.11	31.2	4.72	37.02	150	242	A	H
	*	2410.855	105.56	-	-	106.59	31.23	4.74	37	256	360	P	V
	*	2411.105	101.14	-	-	102.17	31.23	4.74	37	256	360	A	V
		2389.83	48.7	-25.3	74	49.8	31.2	4.72	37.02	256	360	P	V
		2390	36.58	-17.42	54	37.68	31.2	4.72	37.02	256	360	A	V
802.11b CH 06 2437MHz	*	2436.907	111.9	-	-	112.81	31.29	4.77	36.97	150	205	P	H
	*	2437.408	106.51	-	-	107.42	31.29	4.77	36.97	150	205	A	H
	*	2436.99	111.93	-	-	112.84	31.29	4.77	36.97	150	262	P	V
	*	2437.408	106.48	-	-	107.39	31.29	4.77	36.97	150	262	A	V



802.11b CH 11 2462MHz	*	2460.872	105.17	-	-	106.03	31.31	4.79	36.96	150	245	P	H
	*	2461.206	100.64	-	-	101.5	31.31	4.79	36.96	150	245	A	H
		2487.04	52.09	-21.91	74	52.89	31.34	4.8	36.94	150	245	P	H
		2483.52	39.68	-14.32	54	40.48	31.34	4.8	36.94	150	251	A	H
	*	2460.872	99.63	-	-	100.49	31.31	4.79	36.96	300	298	P	V
	*	2461.206	95.22	-	-	96.08	31.31	4.79	36.96	300	298	A	V
		2484.48	49.8	-24.2	74	50.6	31.34	4.8	36.94	300	298	P	V
		2483.6	37.11	-16.89	54	37.91	31.34	4.8	36.94	300	298	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	57.53	-16.47	74	52.45	34.93	6.83	36.68	150	127	P	H
	!	4824	52.72	-1.28	54	47.64	34.93	6.83	36.68	150	127	A	H
		4824	56.58	-17.42	74	51.5	34.93	6.83	36.68	300	177	P	V
	!	4824	51.26	-2.74	54	46.18	34.93	6.83	36.68	300	177	A	V
802.11b CH 06 2437MHz		4875	51.95	-22.05	74	46.79	34.95	6.87	36.66	150	0	P	H
		4875	44.1	-9.9	54	38.94	34.95	6.87	36.66	150	0	A	H
		7311	50.1	-23.9	74	42.46	35.76	8.57	36.69	150	22	P	H
		4875	56.14	-17.86	74	50.98	34.95	6.87	36.66	289	8	P	V
		4875	46.23	-7.77	54	41.07	34.95	6.87	36.66	289	8	A	V
		7311	48.28	-25.72	74	40.64	35.76	8.57	36.69	150	360	P	V
802.11b CH 11 2462MHz		4923	53.78	-20.22	74	48.54	34.97	6.92	36.65	150	152	P	H
		4923	43.91	-10.09	54	38.67	34.97	6.92	36.65	150	152	A	H
		7386	48.99	-25.01	74	41.31	35.78	8.68	36.78	150	36	P	H
		4923	54.05	-19.95	74	48.81	34.97	6.92	36.65	300	180	P	V
		4923	44.71	-9.29	54	39.47	34.97	6.92	36.65	300	180	A	V
		7386	49	-25	74	41.32	35.78	8.68	36.78	150	178	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	*	2410.187	108.8	-	-	109.83	31.23	4.74	37	150	239	P	H
	*	2410.521	98.72	-	-	99.75	31.23	4.74	37	150	239	A	H
		2389.92	60.48	-13.52	74	61.58	31.2	4.72	37.02	150	239	P	H
		2390	40.14	-13.86	54	41.24	31.2	4.72	37.02	150	239	A	H
	*	2410.104	105.34	-	-	106.37	31.23	4.74	37	256	360	P	V
	*	2410.187	94.84	-	-	95.87	31.23	4.74	37	256	360	A	V
		2389.02	52.54	-21.46	74	53.64	31.2	4.72	37.02	256	360	P	V
		2390	37.74	-16.26	54	38.84	31.2	4.72	37.02	256	360	A	V
802.11g CH 06 2437MHz	*	2440.748	109.71	-	-	110.62	31.29	4.77	36.97	150	243	P	H
	*	2438.827	99.36	-	-	100.27	31.29	4.77	36.97	150	243	A	H
	*	2438.41	105.23	-	-	106.14	31.29	4.77	36.97	277	360	P	V
	*	2438.744	95.35	-	-	96.26	31.29	4.77	36.97	277	360	A	V



802.11g CH 11 2462MHz	*	2460.788	107.18	-	-	108.04	31.31	4.79	36.96	150	245	P	H
	*	2460.287	97.27	-	-	98.13	31.31	4.79	36.96	150	245	A	H
	!	2485.16	70.13	-3.87	74	72.87	31.34	4.8	36.94	150	245	P	H
		2483.56	42.9	-11.1	54	43.7	31.34	4.8	36.94	150	245	A	H
	*	2464.128	101.24	-	-	102.1	31.31	4.79	36.96	247	0	P	V
	*	2459.869	90.69	-	-	91.55	31.31	4.79	36.96	247	0	A	V
		2486.2	63.61	-10.39	74	64.41	31.34	4.8	36.94	247	0	P	V
		2483.84	37.66	-16.34	54	38.46	31.34	4.8	36.94	247	0	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	52.86	-21.14	74	47.78	34.93	6.83	36.68	150	120	P	H
		4824	38.66	-15.34	54	33.58	34.93	6.83	36.68	150	120	A	H
		4827	48.48	-25.52	74	43.4	34.93	6.83	36.68	150	0	P	V
802.11g CH 06 2437MHz		4872	49.28	-24.72	74	44.12	34.95	6.87	36.66	150	118	P	H
		7311	46.81	-27.19	74	39.17	35.76	8.57	36.69	169	285	P	H
		4875	46.56	-27.44	74	41.4	34.95	6.87	36.66	169	228	P	V
		7311	48.06	-25.94	74	40.42	35.76	8.57	36.69	150	20	P	V
802.11g CH 11 2462MHz		4923	47.3	-26.7	74	42.06	34.97	6.92	36.65	152	166	P	H
		7386	47.57	-26.43	74	39.89	35.78	8.68	36.78	150	132	P	H
		4923	45.81	-28.19	74	40.57	34.97	6.92	36.65	200	185	P	V
		7386	47.46	-26.54	74	39.78	35.78	8.68	36.78	150	115	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission below 1GHz

2.4GHz WIFI 802.11b (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	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		30	24.81	-15.19	40	40.2	19.1	0.73	35.22	100	122	P	H
		71.71	23.02	-16.98	40	49.42	7.52	1.09	35.01			P	H
		185.2	22.6	-20.9	43.5	45.91	9.93	1.76	35			P	H
		317.12	17.06	-28.94	46	35.71	13.88	2.34	34.87			P	H
		470.38	17.57	-28.43	46	32.34	17.12	2.86	34.75			P	H
		559.62	19.45	-26.55	46	32.61	18.26	3.16	34.58			P	H
		30	26.23	-13.77	40	41.62	19.1	0.73	35.22	152	14	P	V
		61.04	25.45	-14.55	40	53.17	6.68	1.02	35.42			P	V
		191.02	18.2	-25.3	43.5	41.72	9.72	1.79	35.03			P	V
		341.37	16.33	-29.67	46	34.53	14.41	2.42	35.03			P	V
		647.89	21.41	-24.59	46	33.87	18.98	3.39	34.83			P	V
		789.51	21.89	-24.11	46	32.43	20.19	3.78	34.51			P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Emission below 1GHz

2.4GHz WIFI 802.11g (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 802.11g LF		31.94	26.38	-13.62	40	42.37	18.5	0.75	35.24	174	221	P	H
		71.71	26.02	-13.98	40	52.42	7.52	1.09	35.01			P	H
		185.2	21.6	-21.9	43.5	44.91	9.93	1.76	35			P	H
		296.75	16.85	-29.15	46	35.96	13.38	2.27	34.76			P	H
		470.38	16.57	-29.43	46	31.34	17.12	2.86	34.75			P	H
		547.98	18.68	-27.32	46	31.89	18.16	3.13	34.5			P	H
		52.31	28.29	-11.71	40	54.47	8.18	0.95	35.31	165	225	P	V
		99.84	15.26	-28.24	43.5	37.22	12.1	1.29	35.35			P	V
		191.02	16.2	-27.3	43.5	39.72	9.72	1.79	35.03			P	V
		341.37	18.33	-27.67	46	36.53	14.41	2.42	35.03			P	V
		547.01	22.25	-23.75	46	35.48	18.15	3.12	34.5			P	V
		720.64	22.23	-23.77	46	33.78	19.51	3.61	34.67			P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz	*	2410.938	107.96	-	-	108.99	31.23	4.74	37	150	87	P	H
	*	2411.189	103.7	-	-	104.73	31.23	4.74	37	150	87	P	H
		2364.27	47.36	-26.64	74	48.54	31.16	4.68	37.02	150	87	P	H
		2390	35.38	-18.62	54	36.48	31.2	4.72	37.02	150	87	A	H
	*	2410.938	107.37	-	-	108.4	31.23	4.74	37	300	285	P	V
	*	2411.189	102.6	-	-	103.63	31.23	4.74	37	300	285	A	V
		2343.39	47.71	-26.29	74	48.91	31.15	4.66	37.01	300	285	P	V
		2390	35.23	-18.77	54	36.33	31.2	4.72	37.02	300	285	A	V
802.11b CH 06 2437MHz	*	2438.076	109.28	-	-	110.19	31.29	4.77	36.97	156	59	P	H
	*	2437.742	104.48	-	-	105.39	31.29	4.77	36.97	156	59	A	H
	*	2438.076	108.35	-	-	109.26	31.29	4.77	36.97	291	288	P	V
	*	2437.742	103.43	-	-	104.34	31.29	4.77	36.97	291	288	A	V



802.11b CH 11 2462MHz	*	2460.872	107.23	-	-	108.09	31.31	4.79	36.96	150	59	P	H
	*	2461.206	102.68	-	-	103.54	31.31	4.79	36.96	150	59	A	H
		2485.332	52.56	-21.44	74	53.36	31.34	4.8	36.94	150	59	P	H
		2486.016	41.02	-12.98	54	41.82	31.34	4.8	36.94	150	59	A	H
	*	2460.872	106.27	-	-	107.13	31.31	4.79	36.96	300	289	P	V
	*	2461.289	102	-	-	102.86	31.31	4.79	36.96	300	289	A	V
		2484.762	50.35	-23.65	74	51.15	31.34	4.8	36.94	300	289	P	V
		2485.788	40.21	-13.79	54	41.01	31.34	4.8	36.94	300	289	A	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI Ant. 2	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	56.53	-17.47	74	51.45	34.93	6.83	36.68	150	22	P	H
	!	4824	51.26	-2.74	54	46.18	34.93	6.83	36.68	150	22	A	H
		4824	57.73	-16.27	74	52.65	34.93	6.83	36.68	150	95	P	V
	!	4824	50.12	-3.88	54	45.04	34.93	6.83	36.68	150	95	A	V
802.11b CH 06 2437MHz		4875	53.98	-20.02	74	48.82	34.95	6.87	36.66	150	104	P	H
	!	4875	48.16	-5.84	54	43	34.95	6.87	36.66	150	104	A	H
		7311	56.83	-17.17	74	49.19	35.76	8.57	36.69	300	149	P	H
	!	7311	51.21	-2.79	54	43.57	35.76	8.57	36.69	300	149	A	H
		4875	54.9	-19.1	74	49.74	34.95	6.87	36.66	183	90	P	V
	!	4875	49.21	-4.79	54	44.05	34.95	6.87	36.66	183	90	A	V
		7311	57.21	-16.79	74	49.57	35.76	8.57	36.69	300	125	P	V
	!	7311	51.52	-2.48	54	43.88	35.76	8.57	36.69	300	125	A	V
802.11b CH 11 2462MHz		4926	48.69	-25.31	74	43.45	34.97	6.92	36.65	158	202	P	H
		4926	43.91	-10.09	54	38.67	34.97	6.92	36.65	158	202	A	H
		7386	54.08	-19.92	74	46.4	35.78	8.68	36.78	300	310	P	H
		7386	46.6	-7.4	54	38.92	35.78	8.68	36.78	300	310	A	H
		4923	54.21	-19.79	74	48.97	34.97	6.92	36.65	200	95	P	V
	!	4923	48.52	-5.48	54	43.28	34.97	6.92	36.65	200	95	A	V
		7386	57.68	-16.32	74	50	35.78	8.68	36.78	262	92	P	V
		7386	47.13	-6.87	54	39.45	35.78	8.68	36.78	262	92	A	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 2	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	*	2410.271	107.79	-	-	108.82	31.23	4.74	37	150	87	P	H
	*	2410.855	97.72	-	-	98.75	31.23	4.74	37	150	87	A	H
		2389.74	47.8	-26.2	74	48.9	31.2	4.72	37.02	150	87	P	H
		2390	36.32	-17.68	54	37.42	31.2	4.72	37.02	150	87	A	H
	*	2412.942	106.9	-	-	107.93	31.23	4.74	37	300	285	P	V
	*	2411.272	96.84	-	-	97.87	31.23	4.74	37	300	285	A	V
		2389.38	51.4	-22.6	74	52.5	31.2	4.72	37.02	300	285	P	V
		2390	35.86	-18.14	54	36.96	31.2	4.72	37.02	300	285	A	V
802.11g CH 06 2437MHz	*	2440.164	110.13	-	-	111.04	31.29	4.77	36.97	150	56	P	H
	*	2439.83	98.91	-	-	99.82	31.29	4.77	36.97	150	56	A	H
	*	2441.082	109.11	-	-	110.02	31.29	4.77	36.97	269	291	P	V
	*	2441.416	98.42	-	-	99.33	31.29	4.77	36.97	269	291	A	V



802.11g CH 11 2462MHz	*	2463.042	107.81	-	-	108.67	31.31	4.79	36.96	150	59	P	H
	*	2460.12	97.08	-	-	97.94	31.31	4.79	36.96	150	59	A	H
	!	2483.56	70.19	-3.81	74	72.99	31.34	4.8	36.94	150	59	P	H
		2483.72	42.56	-11.44	54	43.36	31.34	4.8	36.94	150	59	A	H
	*	2462.208	106.7	-	-	107.56	31.31	4.79	36.96	300	292	P	V
	*	2460.454	95.99	-	-	96.85	31.31	4.79	36.96	300	292	A	V
	!	2483.88	70.8	-3.2	74	71.6	31.34	4.8	36.94	300	292	P	V
		2483.52	42.37	-11.63	54	43.17	31.34	4.8	36.94	300	292	A	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI Ant. 2	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		4821	49.58	-24.42	74	44.5	34.93	6.83	36.68	150	187	P	H
		4827	48.08	-25.92	74	43	34.93	6.83	36.68	185	166	P	V
802.11g CH 06 2437MHz		4875	45.71	-28.29	74	40.55	34.95	6.87	36.66	165	225	P	H
		7311	47.14	-26.86	74	39.5	35.76	8.57	36.69	150	52	P	H
		4875	46.61	-27.39	74	41.45	34.95	6.87	36.66	150	46	P	V
		7311	49.8	-24.2	74	42.16	35.76	8.57	36.69	177	198	P	V
802.11g CH 11 2462MHz		4923	46.66	-27.34	74	41.42	34.97	6.92	36.65	200	332	P	H
		7386	48	-26	74	40.32	35.78	8.68	36.78	150	85	P	H
		4923	45.86	-28.14	74	40.62	34.97	6.92	36.65	150	228	P	V
		7386	49.81	-24.19	74	42.13	35.78	8.68	36.78	150	117	P	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												



Emission below 1GHz

2.4GHz WIFI 802.11b (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz 802.11b LF		30	25.81	-14.19	40	41.2	19.1	0.73	35.22	148	55	P	H
		71.71	24.02	-15.98	40	50.42	7.52	1.09	35.01			P	H
		185.2	21.6	-21.9	43.5	44.91	9.93	1.76	35			P	H
		335.55	16.5	-29.5	46	34.81	14.28	2.4	34.99			P	H
		470.38	17.57	-28.43	46	32.34	17.12	2.86	34.75			P	H
		671.17	19.09	-26.91	46	31.32	19.13	3.47	34.83			P	H
		71.71	25.47	-14.53	40	51.87	7.52	1.09	35.01	122	63	P	V
		191.02	17.2	-26.3	43.5	40.72	9.72	1.79	35.03			P	V
		341.37	15.33	-30.67	46	33.53	14.41	2.42	35.03			P	V
		447.1	15.96	-30.04	46	31.13	16.95	2.79	34.91			P	V
		647.89	20.41	-25.59	46	32.87	18.98	3.39	34.83			P	V
	936.95	21.28	-24.72	46	30.09	21.62	4.12	34.55			P	V	
Remark	3. No other spurious found. 4. All results are PASS against limit line.												



Emission below 1GHz

2.4GHz WIFI 802.11g (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.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz 802.11g LF		30	26.78	-13.22	40	42.17	19.1	0.73	35.22	100	220	P	H
		71.71	25.02	-14.98	40	51.42	7.52	1.09	35.01			P	H
		99.84	18.72	-24.78	43.5	40.68	12.1	1.29	35.35			P	H
		185.2	24.6	-18.9	43.5	47.91	9.93	1.76	35			P	H
		224	16.3	-29.7	46	38.97	10.36	1.95	34.98			P	H
		373.38	15.37	-30.63	46	32.63	15.35	2.54	35.15			P	H
		30	24.23	-15.77	40	39.62	19.1	0.73	35.22	195	302	P	V
		61.04	22.45	-17.55	40	50.17	6.68	1.02	35.42			P	V
		159.98	16.5	-27	43.5	38.93	10.85	1.63	34.91			P	V
		191.02	16.2	-27.3	43.5	39.72	9.72	1.79	35.03			P	V
		341.37	15.33	-30.67	46	33.53	14.41	2.42	35.03			P	V
		447.1	16.96	-29.04	46	32.13	16.95	2.79	34.91			P	V
Remark	3. No other spurious found. 4. All results are PASS against limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1+2	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	*	2413.694	109.43	-	-	110.46	31.23	4.74	37	201	24	P	H
	*	2413.444	99.07	-	-	100.1	31.23	4.74	37	201	24	A	H
		2389.2	54.59	-19.41	74	55.69	31.2	4.72	37.02	201	24	P	H
		2389.92	39.31	-14.69	54	40.41	31.2	4.72	37.02	201	24	A	H
	*	2408.267	106.32	-	-	107.35	31.23	4.74	37	300	164	P	V
	*	2408.434	95.03	-	-	96.06	31.23	4.74	37	300	164	A	V
		2389.11	53.92	-20.08	74	55.02	31.2	4.72	37.02	300	164	P	V
	2390	36.7	-17.3	54	37.8	31.2	4.72	37.02	300	164	A	V	
802.11n HT20 CH 06 2437MHz	*	2438.243	113.01	-	-	113.92	31.29	4.77	36.97	150	25	P	H
	*	2437.825	102.85	-	-	103.76	31.29	4.77	36.97	150	25	A	H
	*	2439.412	110.55	-	-	111.46	31.29	4.77	36.97	150	280	P	V
	*	2440.665	99.48	-	-	100.39	31.29	4.77	36.97	150	280	A	V



802.11n HT20 CH 11 2462MHz	*	2462.875	110.31	-	-	111.17	31.31	4.79	36.96	150	21	P	H
	*	2463.042	99.14	-	-	100	31.31	4.79	36.96	150	21	A	H
	!	2484.28	70.39	-3.61	74	71.19	31.34	4.8	36.94	150	21	P	H
	!	2483.56	48.68	-5.32	54	49.48	31.34	4.8	36.94	150	21	A	H
	*	2459.786	105.49	-	-	106.35	31.31	4.79	36.96	231	169	P	V
	*	2458.951	94.19	-	-	95.05	31.31	4.79	36.96	231	169	A	V
	!	2483.68	71.68	-2.32	74	72.48	31.34	4.8	36.94	231	169	P	V
		2483.68	39.45	-14.55	54	40.25	31.34	4.8	36.94	231	169	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+2	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	54.21	-19.79	74	49.13	34.93	6.83	36.68	150	24	P	H
		4824	42.15	-11.85	54	37.07	34.93	6.83	36.68	150	24	A	H
		4824	57.19	-16.81	74	52.11	34.93	6.83	36.68	300	154	P	V
		4824	43.25	-10.75	54	38.17	34.93	6.83	36.68	300	154	A	V
802.11n HT20 CH 06 2437MHz		4878	56.26	-17.74	74	51.1	34.95	6.87	36.66	150	115	P	H
		4878	43.66	-10.34	54	38.5	34.95	6.87	36.66	150	115	A	H
		7311	62.11	-11.89	74	54.47	35.76	8.57	36.69	150	16	P	H
		7311	40.22	-13.78	54	32.58	35.76	8.57	36.69	150	16	A	H
		4875	54.12	-19.88	74	48.96	34.95	6.87	36.66	150	152	P	V
		4875	46.38	-7.62	54	41.22	34.95	6.87	36.66	150	152	A	V
		7314	65.99	-8.01	74	58.35	35.76	8.57	36.69	150	64	P	V
802.11n HT20 CH 11 2462MHz		7314	44.6	-9.4	54	36.96	35.76	8.57	36.69	150	64	A	V
		4924	56.22	-17.78	74	50.98	34.97	6.92	36.65	150	115	P	H
		4924	47.39	-6.61	54	42.15	34.97	6.92	36.65	150	115	A	H
		7386	61.22	-12.78	74	53.54	35.78	8.68	36.78	150	16	P	H
		7386	41.21	-12.79	54	33.53	35.78	8.68	36.78	150	16	A	H
		4923	53.26	-20.74	74	48.02	34.97	6.92	36.65	150	23	P	V
		4923	45.21	-8.79	54	39.97	34.97	6.92	36.65	150	23	A	V
		7386	63.21	-10.79	74	55.53	35.78	8.68	36.78	150	52	P	V
	7386	43.85	-10.15	54	36.17	35.78	8.68	36.78	150	52	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 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 03 2422MHz		2390	57.6	-16.4	74	58.7	31.2	4.72	37.02	150	225	P	H
		2390	44.63	-9.37	54	45.73	31.2	4.72	37.02	150	225	A	H
	*	2418.704	107.89	-	-	108.92	31.23	4.74	37	150	225	P	H
	*	2418.37	98.01	-	-	99.04	31.23	4.74	37	150	225	A	H
		2484.96	65.35	-8.65	74	66.15	31.34	4.8	36.94	150	225	P	H
		2483.6	41.29	-12.71	54	42.09	31.34	4.8	36.94	150	225	A	H
		2390	59.93	-14.07	74	61.03	31.2	4.72	37.02	150	308	P	V
		2390	46.07	-7.93	54	47.17	31.2	4.72	37.02	150	308	A	V
	*	2416.783	108.18	-	-	109.21	31.23	4.74	37	150	308	P	V
	*	2416.95	97.81	-	-	98.84	31.23	4.74	37	150	308	A	V
		2483.84	65.92	-8.08	74	66.72	31.34	4.8	36.94	150	308	P	V
		2484.16	40.45	-13.55	54	41.25	31.34	4.8	36.94	150	308	A	V
802.11n HT40 CH 06 2437MHz	*	2441.082	110.07	-	-	110.98	31.29	4.77	36.97	300	35	P	H
	*	2440.164	99.4	-	-	100.31	31.29	4.77	36.97	300	35	A	H
		2390	53.03	-20.97	74	54.13	31.2	4.72	37.02	300	35	P	H
		2389.92	36.86	-17.14	54	37.96	31.2	4.72	37.02	300	35	A	H
		2483.52	67.98	-6.02	74	68.78	31.34	4.8	36.94	300	35	P	H
	!	2483.52	48.5	-5.5	54	49.3	31.34	4.8	36.94	300	35	A	H
	*	2444.088	111.71	-	-	112.62	31.29	4.77	36.97	294	70	P	V
	*	2443.169	101.44	-	-	102.35	31.29	4.77	36.97	294	70	A	V
		2389.56	56.66	-17.34	74	57.76	31.2	4.72	37.02	294	70	P	V
		2390	39.4	-14.6	54	40.5	31.2	4.72	37.02	294	70	A	V
!	2483.6	70.4	-3.6	74	71.2	31.34	4.8	36.94	294	70	P	V	
!	2483.6	50.13	-3.87	54	50.93	31.34	4.8	36.94	294	70	A	V	



802.11n HT40 CH 09 2452MHz	!	2483.64	51.8	-2.2	54	52.6	31.34	4.8	36.94	300	18	A	H
	!	2485.84	69.17	-4.83	74	69.97	31.34	4.8	36.94	300	18	P	H
	*	2449.181	106.3	-	-	107.21	31.29	4.77	36.97	300	18	P	H
	*	2449.348	95	-	-	95.91	31.29	4.77	36.97	300	18	A	H
		2383.98	47.64	-26.36	74	48.78	31.18	4.7	37.02	300	18	P	H
		2385.06	35.67	-18.33	54	36.81	31.18	4.7	37.02	300	18	A	H
	*	2445.341	108.21	-	-	109.12	31.29	4.77	36.97	186	69	P	V
	*	2445.09	97.58	-	-	98.49	31.29	4.77	36.97	186	69	A	V
		2389.83	50.62	-23.38	74	51.72	31.2	4.72	37.02	186	69	P	V
		2387.58	35.35	-18.65	54	36.45	31.2	4.72	37.02	186	69	A	V
	!	2485.48	68.96	-5.04	74	69.76	31.34	4.8	36.94	186	69	P	V
!	2483.52	51.1	-2.9	54	51.9	31.34	4.8	36.94	186	69	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 Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 03 2422MHz		4844	55.39	-18.61	74	50.29	34.93	6.85	36.68	150	145	P	H
		4844	42.17	-11.83	54	37.07	34.93	6.85	36.68	150	145	A	H
		7266	59.41	-14.59	74	51.78	35.76	8.53	36.66	150	155	P	H
		7266	46.15	-7.85	54	38.52	35.76	8.53	36.66	150	155	A	H
		4844	55.83	-18.17	74	50.73	34.93	6.85	36.68	150	184	P	V
		4844	42.41	-11.59	54	37.31	34.93	6.85	36.68	150	184	A	V
		7281	50.56	-23.44	74	42.93	35.76	8.53	36.66	150	360	P	V
802.11n HT40 CH 06 2437MHz		4874	55.37	-18.63	74	50.21	34.95	6.87	36.66	150	134	P	H
		4874	42.15	-11.85	54	36.99	34.95	6.87	36.66	150	134	A	H
		7311	61.62	-12.38	74	53.98	35.76	8.57	36.69	150	0	P	H
		7311	44.07	-9.93	54	36.43	35.76	8.57	36.69	150	0	A	H
		4874	54.26	-19.74	74	49.1	34.95	6.87	36.66	150	360	P	V
		4874	41.55	-12.45	54	36.39	34.95	6.87	36.66	150	360	A	V
		7311	54.26	-19.74	74	46.62	35.76	8.57	36.69	150	22	P	V
802.11n HT40 CH 09 2452MHz		4905	45.94	-28.06	74	40.73	34.96	6.9	36.65	150	200	P	H
		7356	48.32	-25.68	74	40.66	35.77	8.64	36.75	150	169	P	H
		4905	46.4	-27.6	74	41.19	34.96	6.9	36.65	150	0	P	V
		7356	46.81	-27.19	74	39.15	35.77	8.64	36.75	150	326	P	V

Remark	1. No other spurious found.
	2. All results are PASS against Peak and Average limit line.



Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (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+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz 802.11n HT20 LF		30	23.81	-16.19	40	39.2	19.1	0.73	35.22	100	203	P	H
		71.71	23.02	-16.98	40	49.42	7.52	1.09	35.01			P	H
		99.84	22.72	-20.78	43.5	44.68	12.1	1.29	35.35			P	H
		185.2	21.6	-21.9	43.5	44.91	9.93	1.76	35			P	H
		491.72	16.51	-29.49	46	30.94	17.25	2.93	34.61			P	H
		713.85	19.96	-26.04	46	31.64	19.44	3.6	34.72			P	H
		30	29.23	-10.77	40	44.62	19.1	0.73	35.22	200	115	P	V
		71.71	23.47	-16.53	40	49.87	7.52	1.09	35.01			P	V
		159.98	16.5	-27	43.5	38.93	10.85	1.63	34.91			P	V
		191.02	17.2	-26.3	43.5	40.72	9.72	1.79	35.03			P	V
	341.37	15.33	-30.67	46	33.53	14.41	2.42	35.03			P	V	
	538.28	18.14	-27.86	46	31.56	17.99	3.1	34.51			P	V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Emission below 1GHz

2.4GHz WIFI 802.11n HT40 (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+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz 802.11n HT40 LF		30	27.52	-12.48	40	42.91	19.1	0.73	35.22	100	115	P	H
		70.74	24.48	-15.52	40	51.07	7.26	1.08	34.93			P	H
		185.2	24.6	-18.9	43.5	47.91	9.93	1.76	35			P	H
		335.55	17.5	-28.5	46	35.81	14.28	2.4	34.99			P	H
		470.38	17.57	-28.43	46	32.34	17.12	2.86	34.75			P	H
		532.46	18.93	-27.07	46	32.49	17.88	3.07	34.51			P	H
		30.97	26.33	-13.67	40	42.02	18.8	0.74	35.23	145	263	P	V
		52.31	26.29	-13.71	40	52.47	8.18	0.95	35.31			P	V
		166.77	17.29	-26.21	43.5	39.96	10.6	1.66	34.93			P	V
		191.02	16.2	-27.3	43.5	39.72	9.72	1.79	35.03			P	V
		302.57	15	-31	46	33.92	13.56	2.29	34.77			P	V
		403.45	17.08	-28.92	46	33.38	16.26	2.65	35.21			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	Peak or Average
H/V	Horizontal or Vertical



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		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H
2412MHz													

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

For Peak Limit @ 2390MHz:

- 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)
- Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

- 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)
- 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”.