

FCC RF Test Report

APPLICANT : TP-LINK TECHNOLOGIES CO., LTD.
EQUIPMENT : 300Mbps High Power Wireless N Router
BRAND NAME : TP-LINK
MODEL NAME : TL-WR841HP
FCC ID : TE7WR841HPV3
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Jan. 13, 2016 and testing was completed on Jan. 24, 2016. We, SPORTON INTERNATIONAL (SHENZHEN) 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 (SHENZHEN) INC., the test report shall not be reproduced except in full.



Reviewed by: Andy Yeh / Manager



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL (SHENZHEN) INC.

**1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town,
Nanshan District, Shenzhen, Guangdong, P. R. China**



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR611301	Rev. 01	Initial issue of report	Mar. 11, 2016

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	99% Bandwidth	-	Pass	-
3.2	15.247(b)	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	Conducted Band Edges	$\leq 30\text{dBc}$	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 0.01 dB at 2483.520 /2484.400MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 13.00 dB at 0.530 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

TP-LINK TECHNOLOGIES CO., LTD.

Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd,
Nanshan, Shenzhen, China

1.2 Manufacturer

TP-LINK TECHNOLOGIES CO., LTD.

Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd,
Nanshan, Shenzhen, China

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	300Mbps High Power Wireless N Router
Brand Name	TP-LINK
Model Name	TL-WR841HP
FCC ID	TE7WR841HPV3
EUT supports Radios application	WLAN 11b/g/n HT20/HT40

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		2412 MHz ~ 2462 MHz										
Maximum (Average) Output Power to antenna		<Chain Port 1> 802.11b : 24.46 dBm (0.2793 W) 802.11g : 26.87 dBm (0.4864 W) 802.11n HT20 : 28.10 dBm (0.6457 W) 802.11n HT40 : 18.08 dBm (0.0643 W) <Chain Port 2> 802.11b : 23.78 dBm (0.2388 W) 802.11g : 26.28 dBm (0.4246 W) 802.11n HT20 : 28.01 dBm (0.6324 W) 802.11n HT40 : 19.86 dBm (0.0968 W) <Chain Port 1+2> 802.11b : 27.57 dBm (0.5715 W) 802.11g : 27.58 dBm (0.5728 W) 802.11n HT20 : 28.46 dBm (0.7015 W) 802.11n HT40 : 21.49 dBm (0.1409 W)										
99% Occupied Bandwidth		802.11b : 13.74MHz 802.11g : 16.63MHz 802.11n HT20 : 17.78MHz 802.11n HT40 : 35.96MHz										
Antenna Type / Gain		<Chain Port 1> 802.11b/g/n : Dipole Antenna with gain 7.50 dBi <Chain Port 2> 802.11b/g/n : Dipole Antenna with gain 7.50 dBi										
Type of Modulation		802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)										
Antenna Function for Transmitter		<table><tr><td></td><td>Chain Port 1</td><td>Chain Port 2</td></tr><tr><td>802.11 b/g/n SISO</td><td>V</td><td>V</td></tr><tr><td>802.11 b/g/n MIMO</td><td>V</td><td>V</td></tr></table>			Chain Port 1	Chain Port 2	802.11 b/g/n SISO	V	V	802.11 b/g/n MIMO	V	V
	Chain Port 1	Chain Port 2										
802.11 b/g/n SISO	V	V										
802.11 b/g/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 (SHENZHEN) INC.	
Test Site Location	1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595	
Test Site No.	Sporton Site No.	
	TH01-SZ	CO01-SZ

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.	
Test Site Location	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755- 3320-2398	
Test Site No.	Sporton Site No.	FCC Registration No.
	03CH01-SZ	831040

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 v03r04
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ ANSI C63.10-2013

Remark:

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

2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz) and radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

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 Average Power (dBm)							
Power vs. Channel				Power vs. Data Rate			
Channel	Frequency (MHz)	Chain Port	Data Rate 1Mbps	Channel	2Mbps	5.5Mbps	11Mbps
CH 01	2412	1	23.24	CH 06	24.43	24.41	24.43
CH 06	2437	1	24.46				
CH 11	2462	1	21.20				
CH 01	2412	2	23.78	CH 01	23.76	23.72	23.76
CH 06	2437	2	23.05				
CH 11	2462	2	22.06				
CH 01	2412	1+2(1)	22.12	CH 06	24.24	24.23	24.21
CH 06	2437	1+2(1)	24.25				
CH 11	2462	1+2(1)	20.19				
CH 01	2412	1+2(2)	22.36	CH 06	24.83	24.81	24.80
CH 06	2437	1+2(2)	24.86				
CH 11	2462	1+2(2)	20.34				
CH 01	2412	1+2	25.25	CH 06	27.55	27.54	27.53
CH 06	2437	1+2	27.57				
CH 11	2462	1+2	23.27				

2.4GHz 802.11g Average Power (dBm)											
Power vs. Channel				Power vs. MCS Index							
Channel	Frequency (MHz)	Chain Port	Data Rate 6Mbps	Channel	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH 01	2412	1	18.13	CH 06	26.84	26.83	26.78	26.80	26.81	26.80	26.80
CH 06	2437	1	26.87								
CH 11	2462	1	16.12								
CH 01	2412	2	18.55	CH 06	26.21	26.19	26.18	26.24	26.20	26.25	26.17
CH 06	2437	2	26.28								
CH 11	2462	2	17.43								
CH 01	2412	1+2(1)	17.58	CH 06	24.82	24.85	24.75	24.78	24.77	24.80	24.78
CH 06	2437	1+2(1)	24.86								
CH 11	2462	1+2(1)	18.46								
CH 01	2412	1+2(2)	17.38	CH 06	24.19	24.24	24.17	24.20	24.19	24.20	24.19
CH 06	2437	1+2(2)	24.26								
CH 11	2462	1+2(2)	18.14								
CH 01	2412	1+2	20.49	CH 06	27.53	27.57	27.48	27.51	27.50	27.52	27.50
CH 06	2437	1+2	27.58								
CH 11	2462	1+2	21.31								



2.4GHz 802.11n HT20 Average Power (dBm)											
Power vs. Channel				Power vs. MCS Index							
Channel	Frequency (MHz)	Chain Port	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	1	17.80	CH 06	28.07	28.03	28.00	28.02	28.04	27.98	28.01
CH 06	2437	1	28.10								
CH 11	2462	1	16.85								
CH 01	2412	2	19.49	CH 06	27.96	27.95	27.89	27.91	27.91	27.89	27.90
CH 06	2437	2	28.01								
CH 11	2462	2	19.77								
CH 01	2412	1+2(1)	16.12	CH 06	25.61	25.60	25.54	25.56	25.55	25.56	25.56
CH 06	2437	1+2(1)	25.65								
CH 11	2462	1+2(1)	16.16								
CH 01	2412	1+2(2)	16.41	CH 06	25.20	25.16	25.13	25.14	25.13	25.15	25.13
CH 06	2437	1+2(2)	25.25								
CH 11	2462	1+2(2)	16.56								
CH 01	2412	1+2	19.28	CH 06	28.42	28.39	28.35	28.37	28.36	28.37	28.36
CH 06	2437	1+2	28.46								
CH 11	2462	1+2	19.37								

2.4GHz 802.11n HT40 Average Power (dBm)											
Power vs. Channel				Power vs. MCS Index							
Channel	Frequency (MHz)	Chain Port	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 03	2422	1	12.92	CH 06	18.00	17.99	18.02	18.05	18.03	18.03	18.02
CH 06	2437	1	18.08								
CH 09	2452	1	12.51								
CH 03	2422	2	15.84	CH 06	19.81	19.79	19.83	19.84	19.82	19.83	19.84
CH 06	2437	2	19.86								
CH 09	2452	2	15.20								
CH 03	2422	1+2(1)	14.18	CH 06	18.27	18.29	18.27	18.28	18.29	18.26	18.26
CH 06	2437	1+2(1)	18.33								
CH 09	2452	1+2(1)	11.64								
CH 03	2422	1+2(2)	14.83	CH 06	18.55	18.52	18.58	18.58	18.56	18.55	18.58
CH 06	2437	1+2(2)	18.63								
CH 09	2452	1+2(2)	11.60								
CH 03	2422	1+2	17.53	CH 06	21.43	21.42	21.44	21.44	21.44	21.42	21.43
CH 06	2437	1+2	21.49								
CH 09	2452	1+2	14.63								

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.

Single Antenna

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

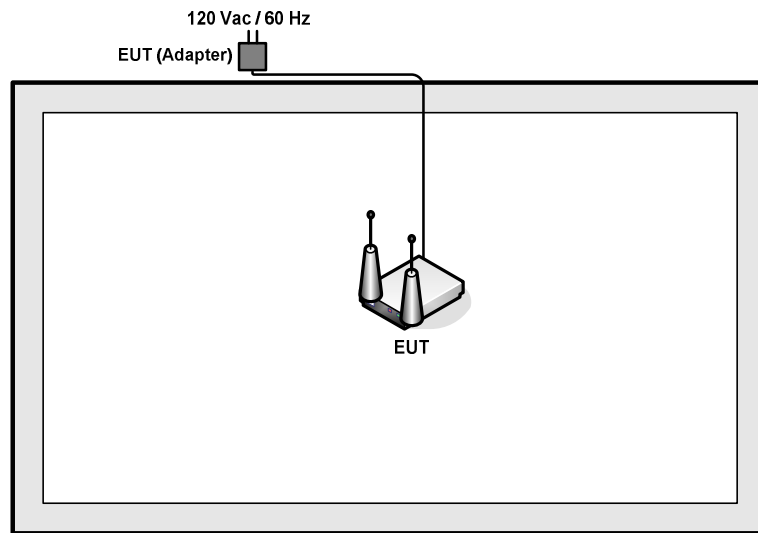
MIMO Antenna

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

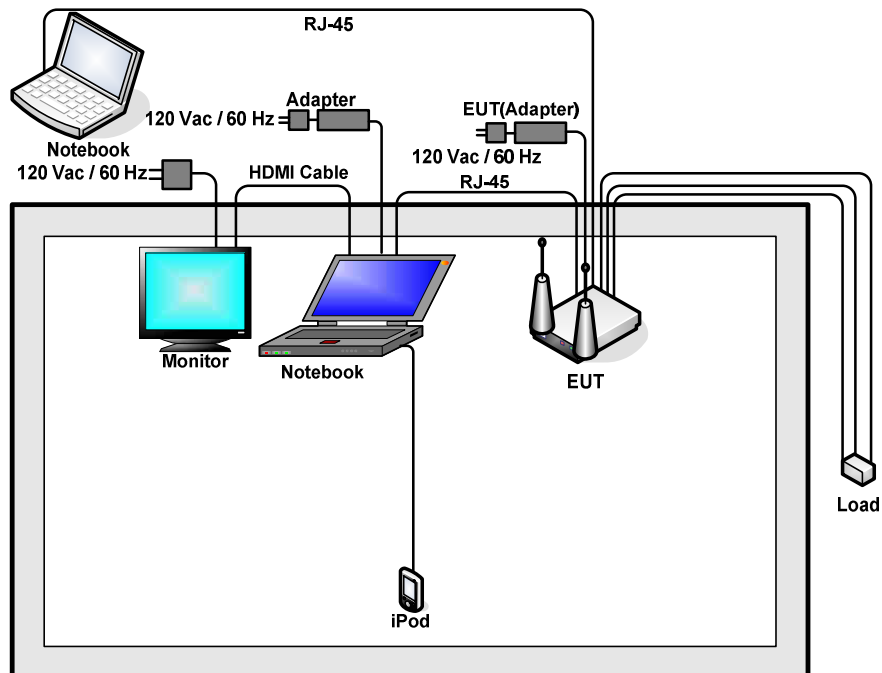
Test Cases	
AC Conducted Emission	Mode 1 : WLAN Link + LAN Link + LAN Load + WAN Link + Adapter
Remark: For radiated test cases, the tests were performed with adapter.	

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.	Notebook	Lenovo	E540	Doc	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
2.	Notebook	Lenovo	G480	N/A	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	Monitor	DELL	OPTIPLEX 390MT (D12M)	FCC DoC	N/A	Unshielded, 1.8 m
4.	iPod	Apple	MC690ZP/A	FCC DoC	Unshielded, 1.8m	N/A
5.	HDMI Cable	N/A	N/A	N/A	Shielded, 1.2 m	N/A
6.	Load	N/A	N/A	N/A	N/A	N/A

2.6 EUT Operation Test Setup

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

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



2.7 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 5 dB and 10dB attenuator.

$$\begin{aligned}\text{Offset (dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 5 + 10 = 15 \text{ (dB)}\end{aligned}$$

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.

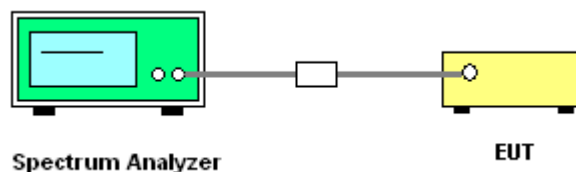
3.1.2 Measuring Instruments

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 v03r04.
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.

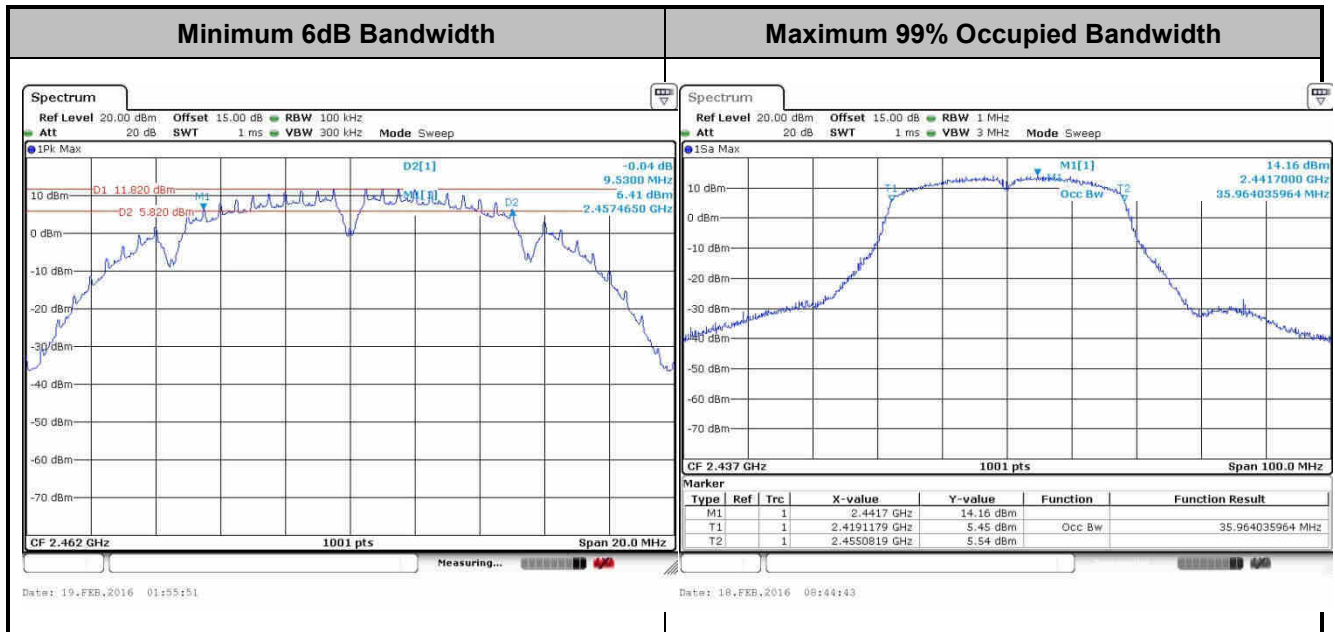
3.1.4 Test Setup





3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A of this report.



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

3.2 Maximum Average Output Power Measurement

3.2.1 Limit of Average Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for average output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the average 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.

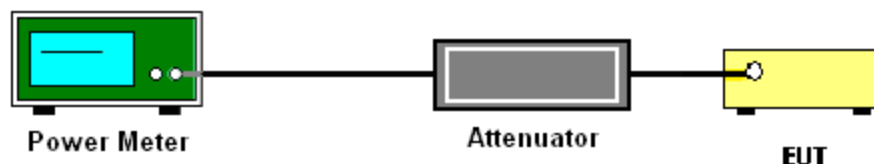
3.2.2 Measuring Instruments

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 v03r04 section 9.2.3.1 Method AVGPM (Measurement using an RF average power meter).
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 Average output Power

Please refer to Appendix A of this report.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The 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 AVGSA-3 of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r04.
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 = RMS, Sweep time = auto couple. Allow max hold to run for at least 60 s, or longer as needed to allow the trace to 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.

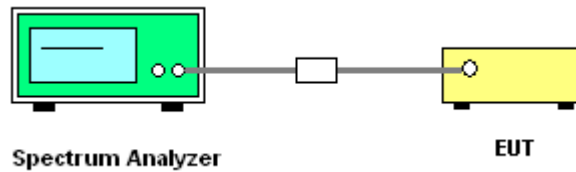
If measurements performed using method (2) plus 10 log (N) exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

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.

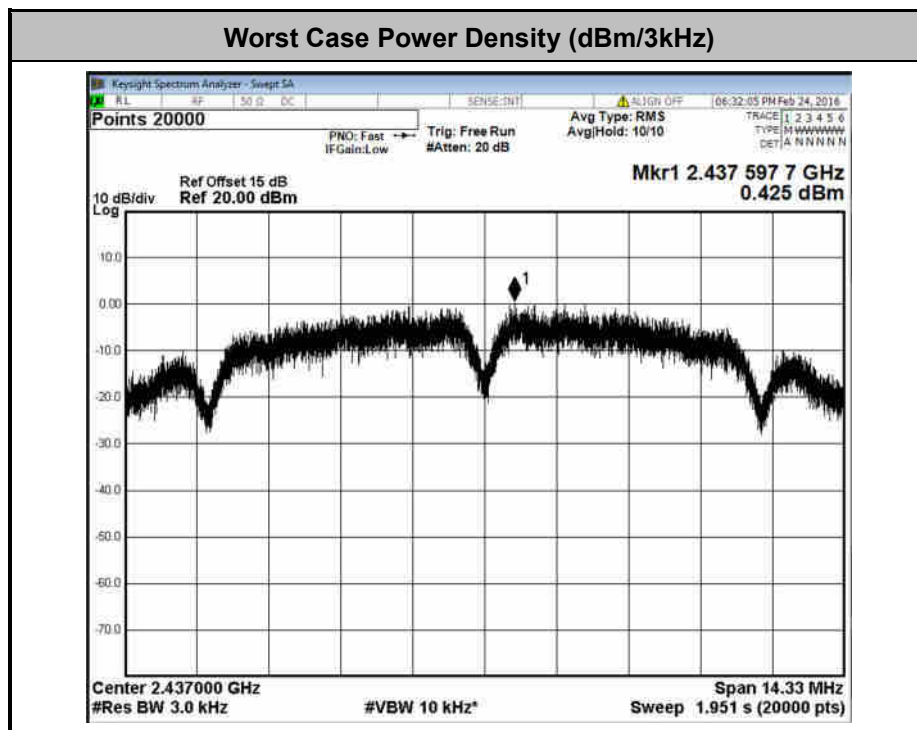
Method (2): Measure and add 10 log (N) dB, where N is the number of outputs. (N=2)

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A of this 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).

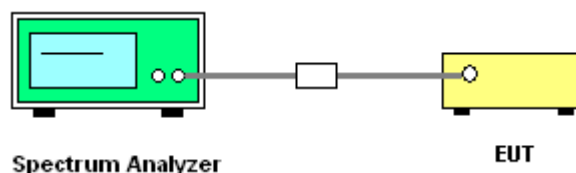
3.4.2 Measuring Instruments

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 v03r04.
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

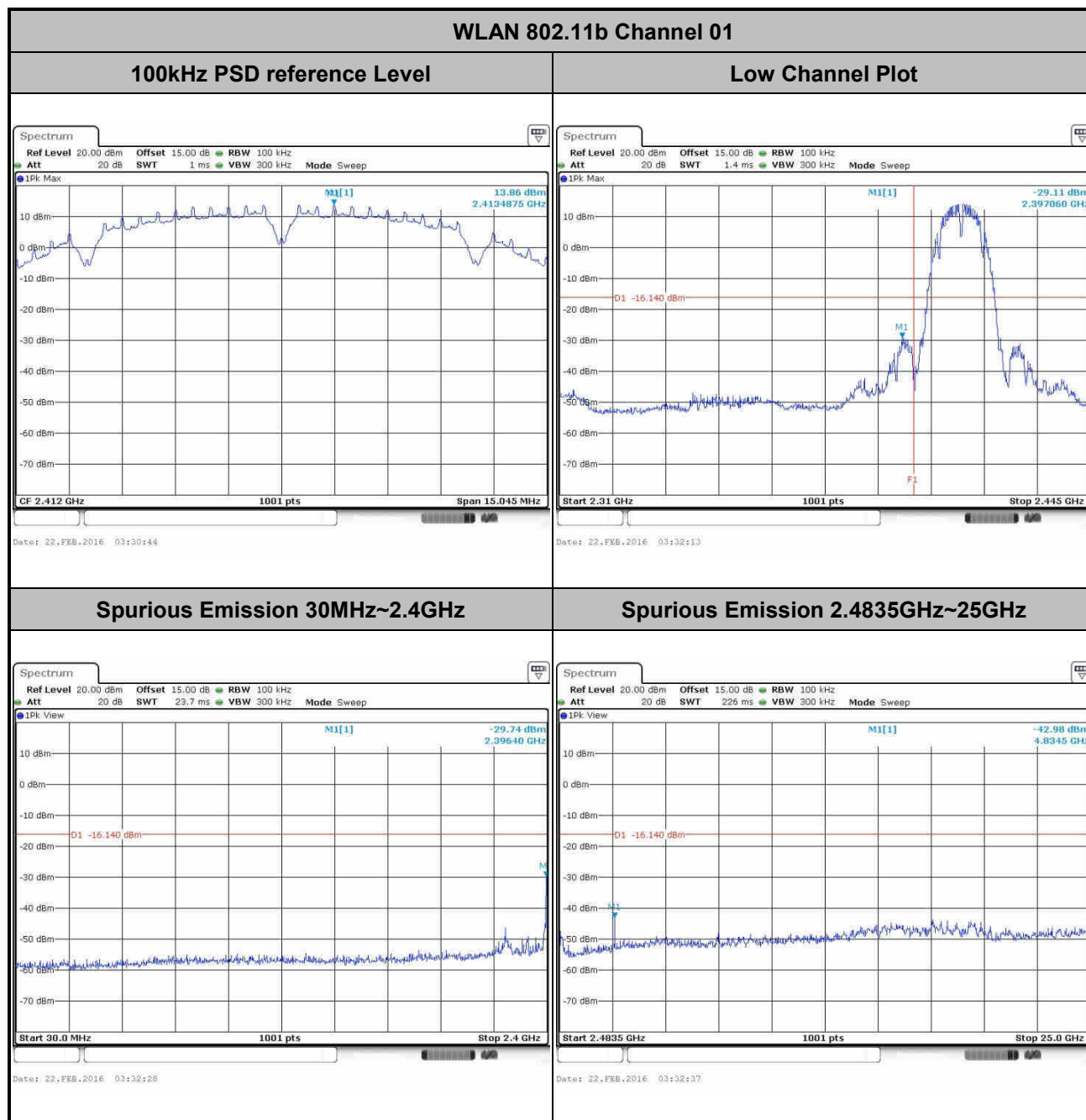




3.4.5 Test Result of Conducted Band Edges and Spurious Emission

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

Number of TX	1	Chain Port :	1
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Mygai Mo

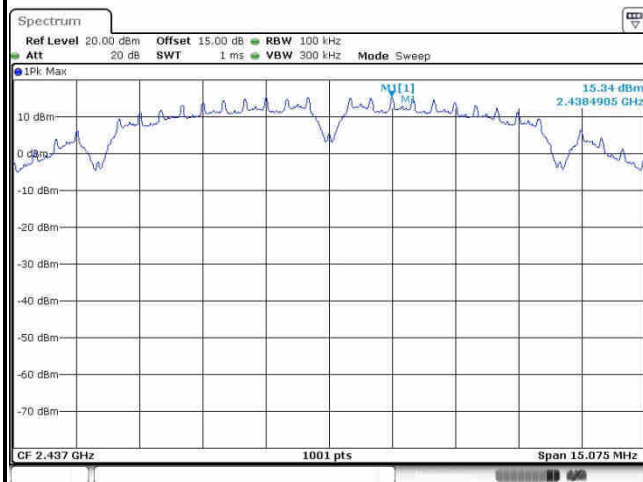




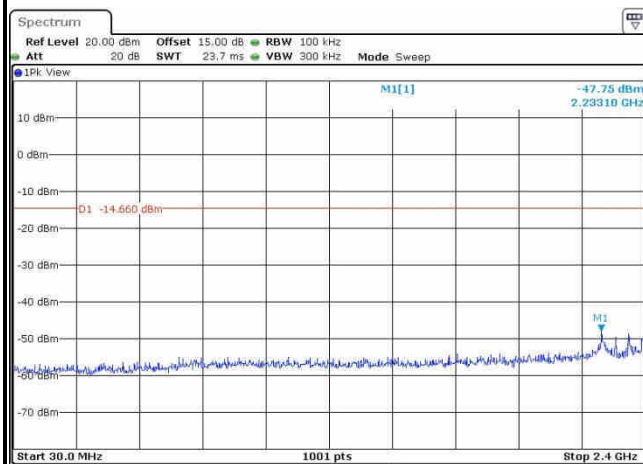
Number of TX :	1	Chain Port :	1
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Mygai Mo

WLAN 802.11b Channel 06

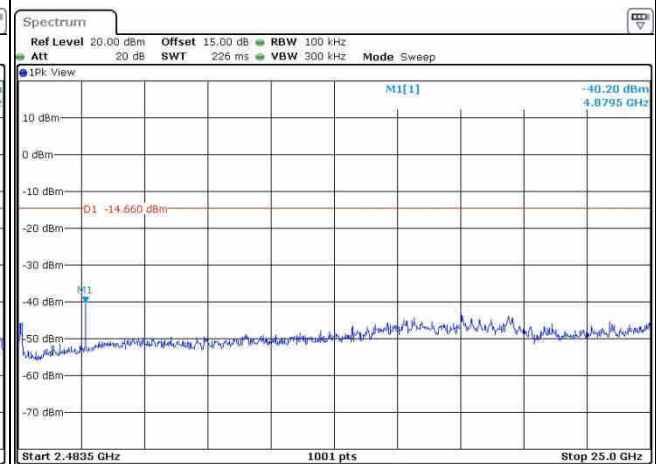
100kHz PSD reference Level



Spurious Emission 30MHz~2.4GHz

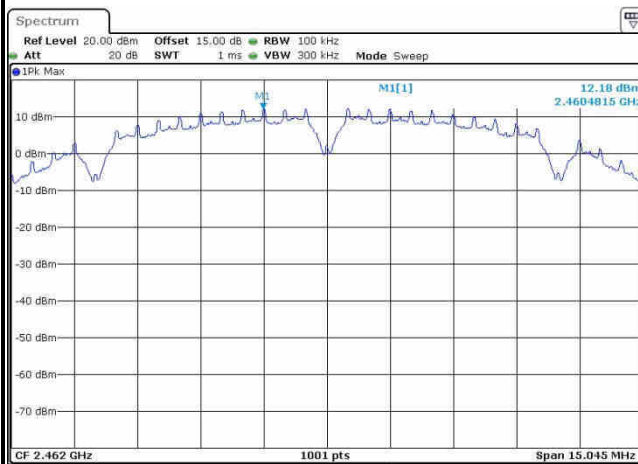


Spurious Emission 2.4835GHz~25GHz

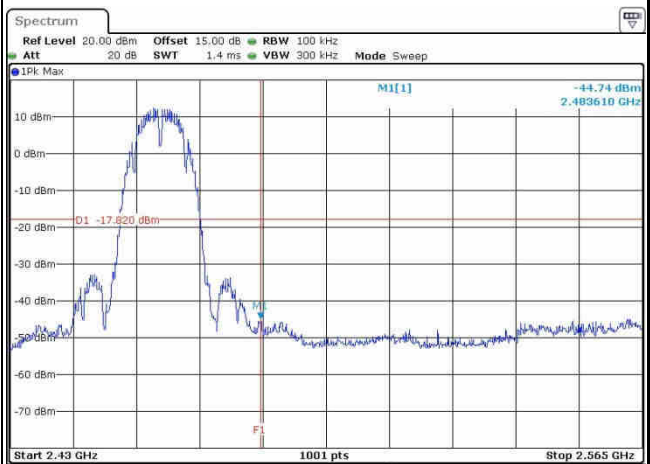




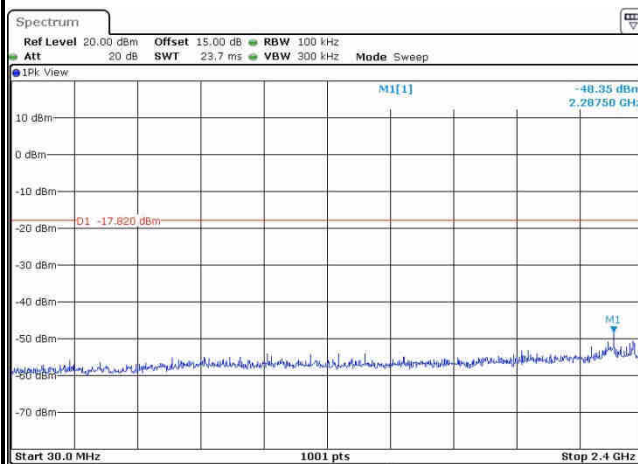
Number of TX :	1	Chain Port :	1
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Mygai Mo

WLAN 802.11b Channel 11**100kHz PSD reference Level**

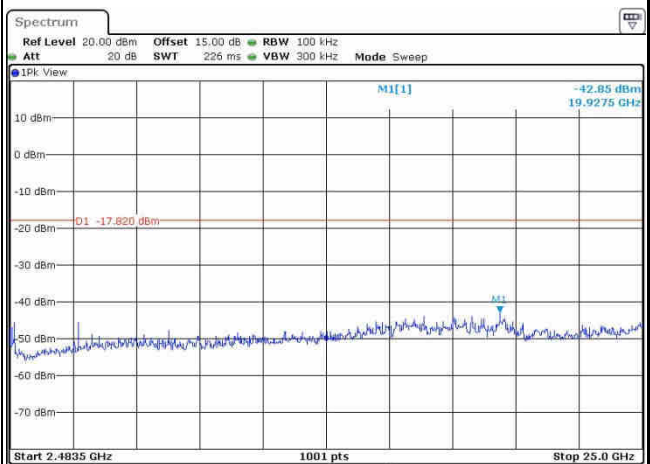
Date: 22.FEB.2016 03:38:04

High Channel Plot

Date: 22.FEB.2016 03:38:28

Spurious Emission 30MHz~2.4GHz

Date: 22.FEB.2016 03:38:41

Spurious Emission 2.4835GHz~25GHz

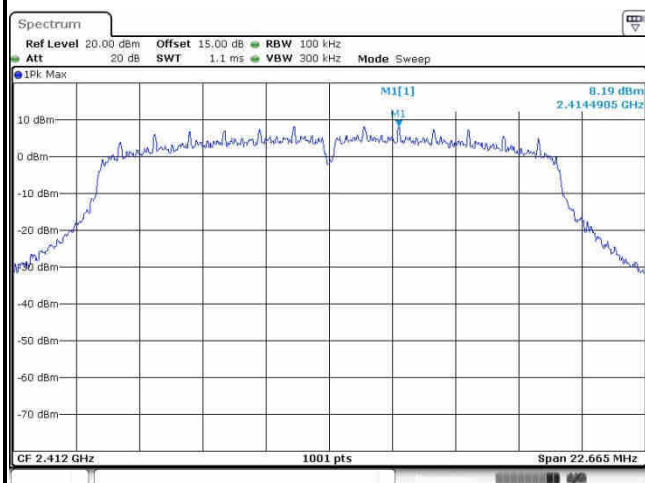
Date: 22.FEB.2016 03:38:48



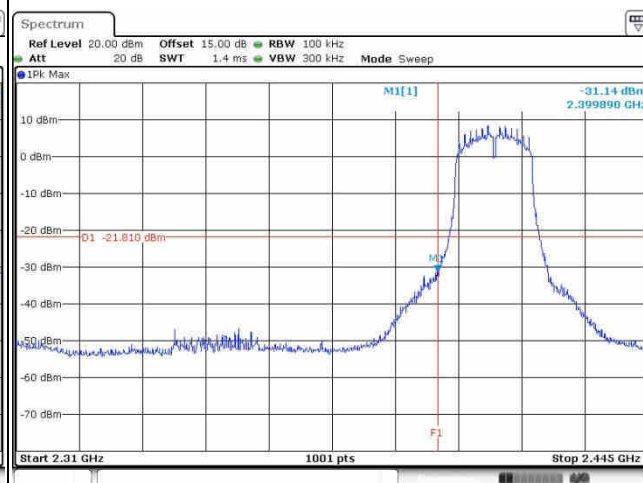
Number of TX :	1	Chain Port :	1
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Mygai Mo

WLAN 802.11g Channel 01

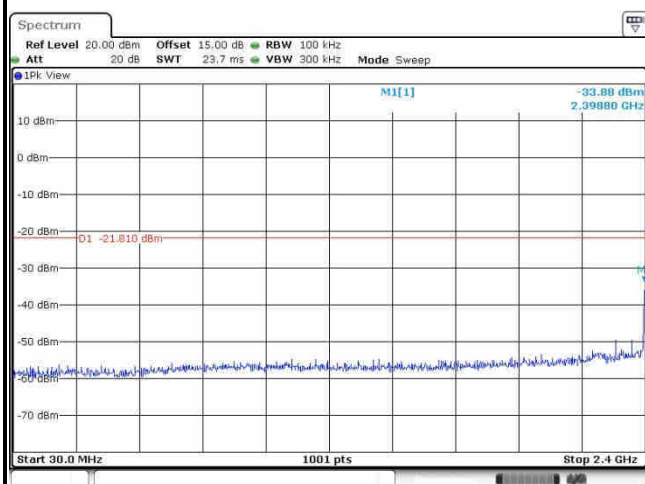
100kHz PSD reference Level



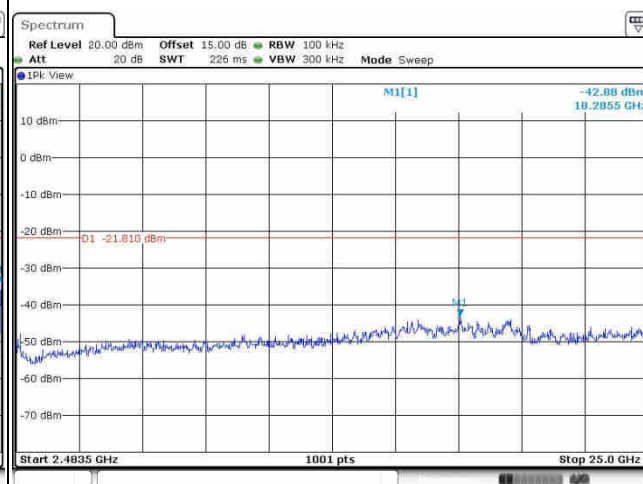
Low Channel Plot



Spurious Emission 30MHz~2.4GHz



Spurious Emission 2.4835GHz~25GHz

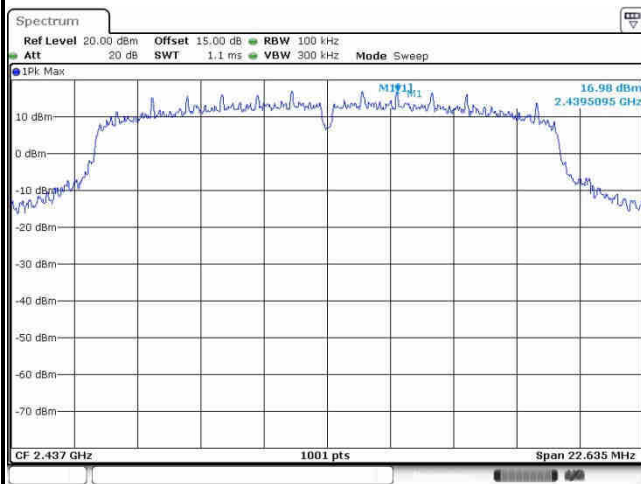




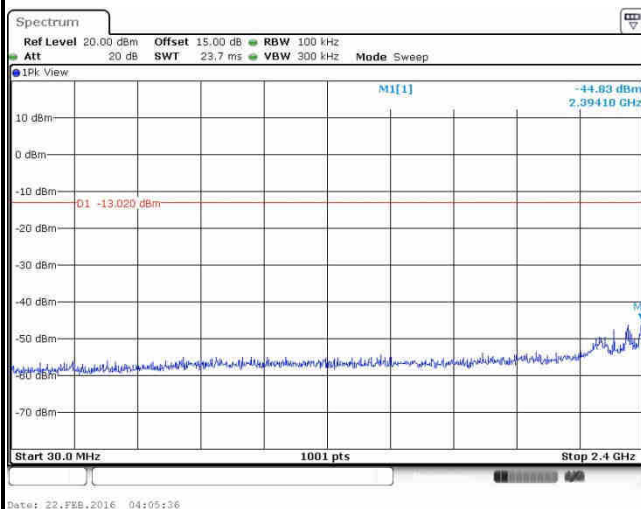
Number of TX :	1	Chain Port :	1
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Mygai Mo

WLAN 802.11g Channel 06

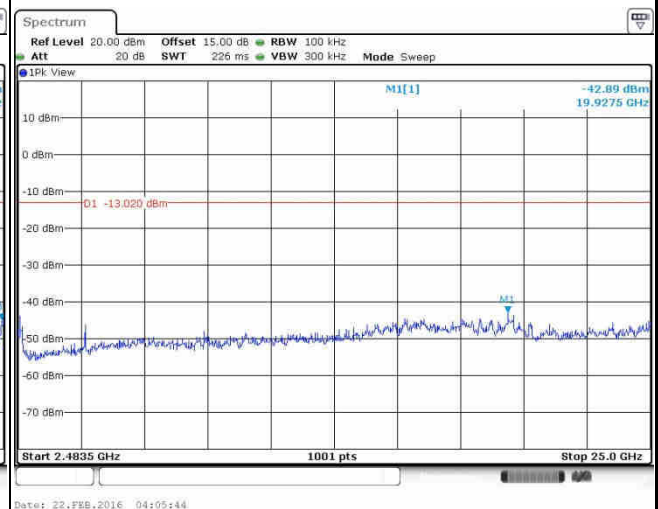
100kHz PSD reference Level



Spurious Emission 30MHz~2.4GHz

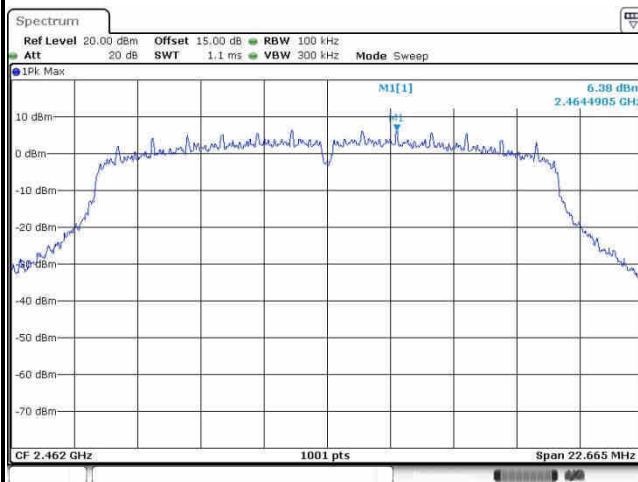
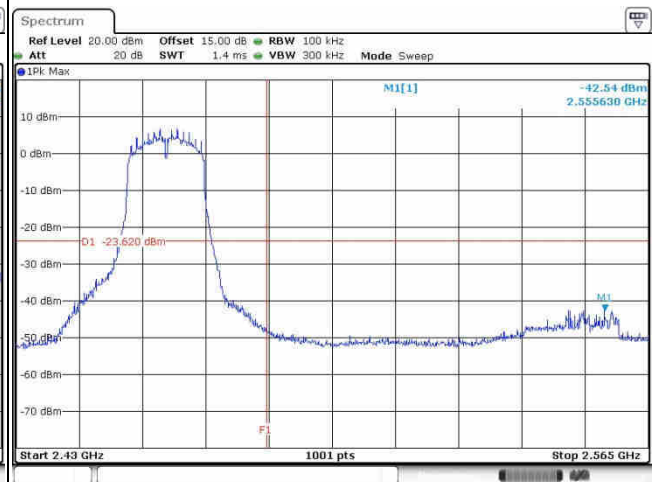
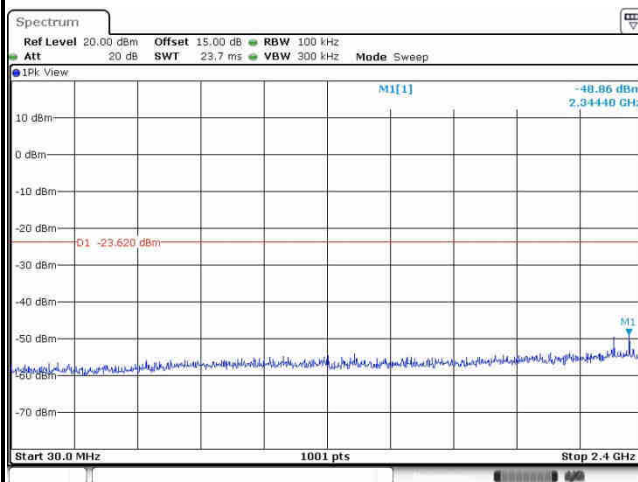
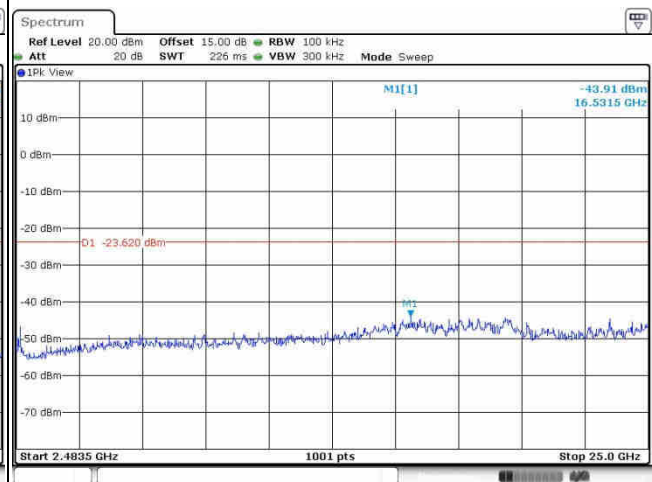


Spurious Emission 2.4835GHz~25GHz





Number of TX :	1	Chain Port :	1
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Mygai Mo

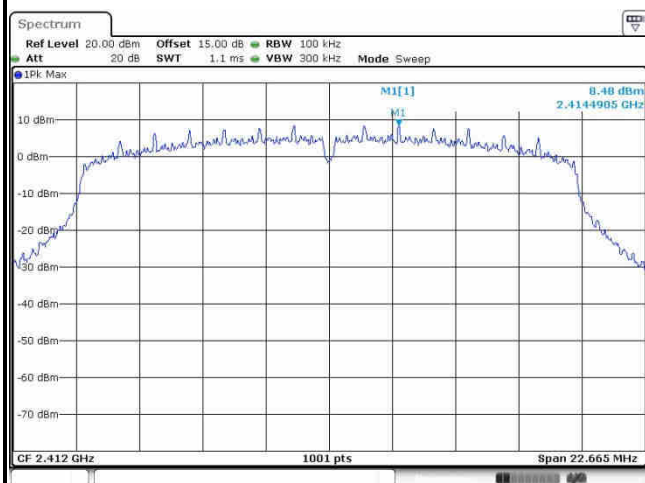
WLAN 802.11g Channel 11**100kHz PSD reference Level****High Channel Plot****Spurious Emission 30MHz~2.4GHz****Spurious Emission 2.4835GHz~25GHz**



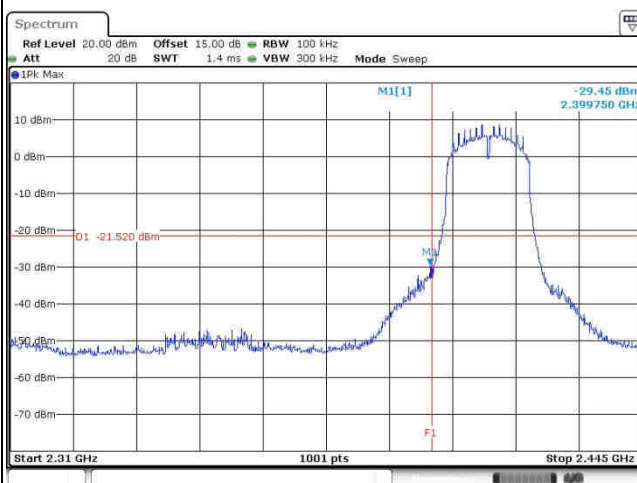
Number of TX :	1	Chain Port :	1
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Mygai Mo

WLAN 802.11n HT20 Channel 01

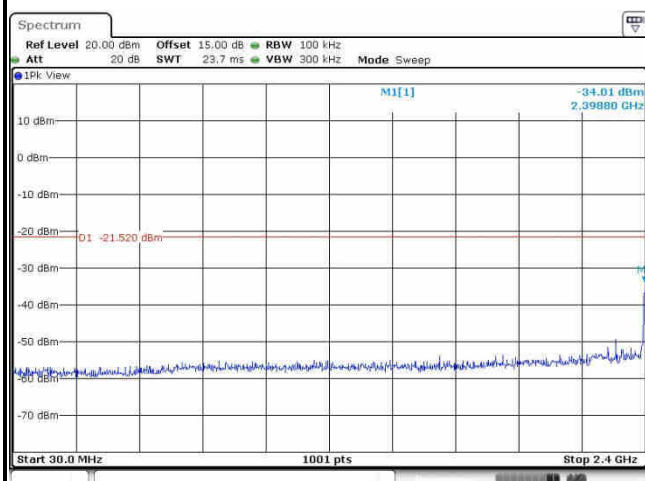
100kHz PSD reference Level



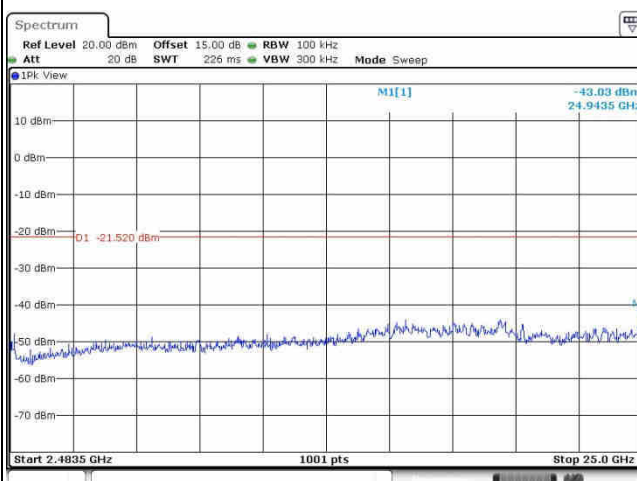
Low Channel Plot



Spurious Emission 30MHz~2.4GHz

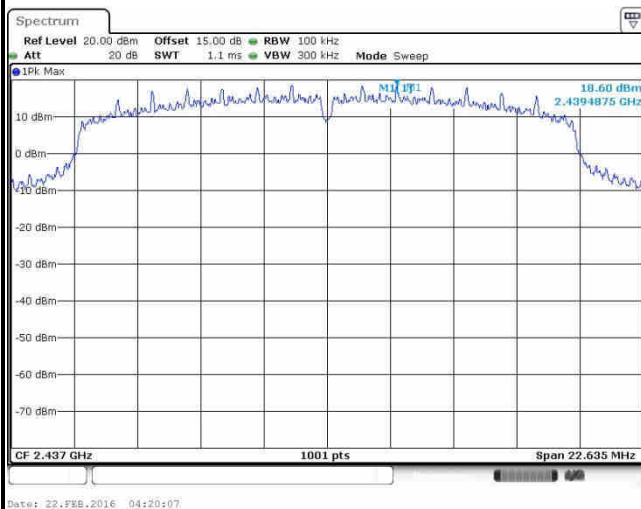
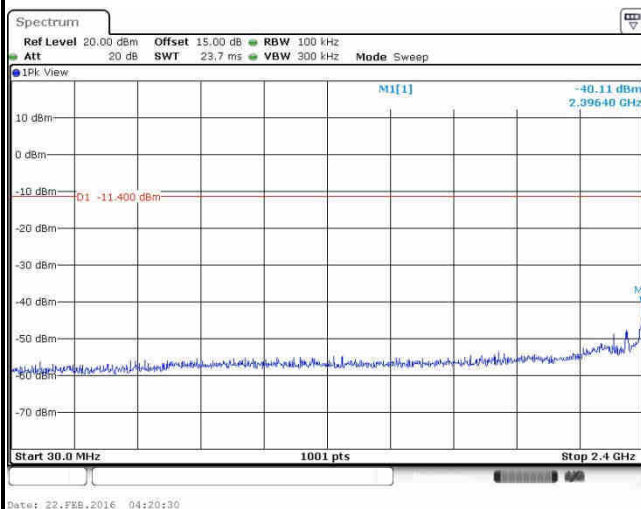
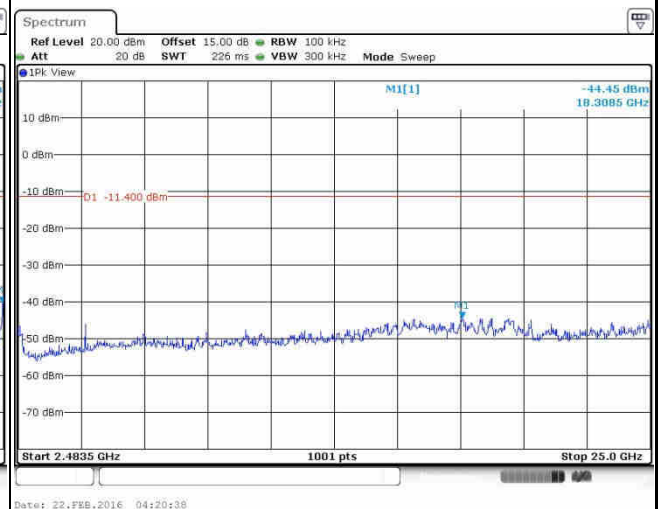


Spurious Emission 2.4835GHz~25GHz



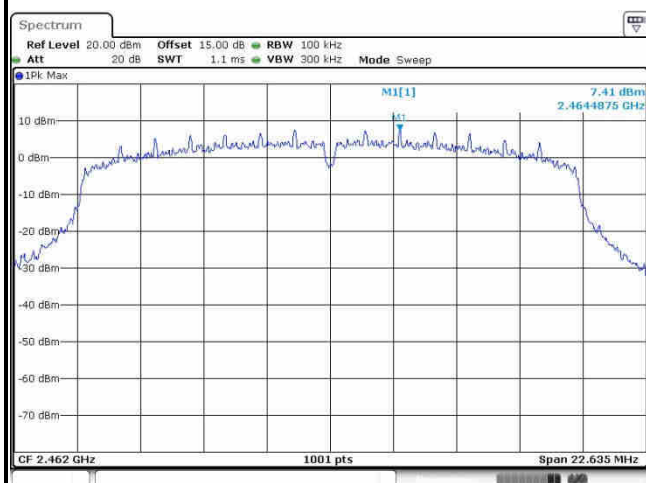
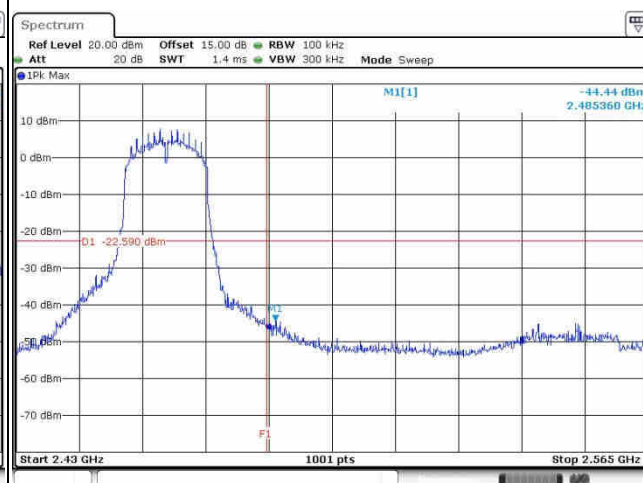
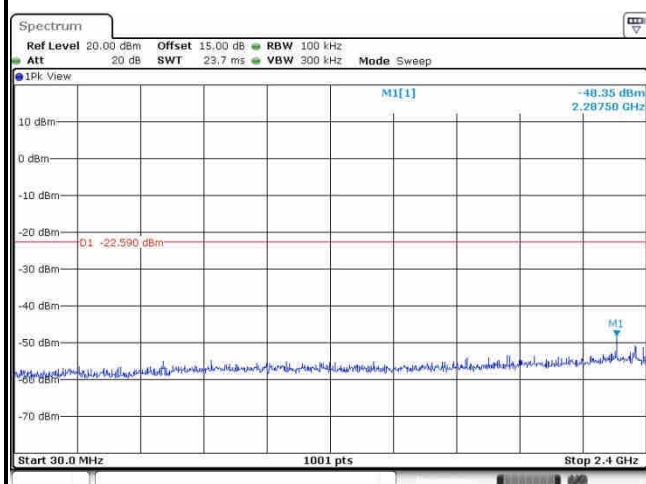
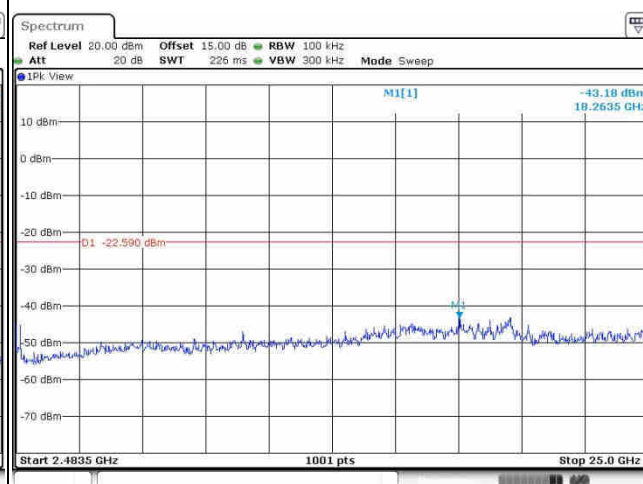


Number of TX :	1	Chain Port :	1
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Mygai Mo

WLAN 802.11n HT20 Channel 06**100kHz PSD reference Level****Spurious Emission 30MHz~2.4GHz****Spurious Emission 2.4835GHz~25GHz**



Number of TX :	1	Chain Port :	1
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Mygai Mo

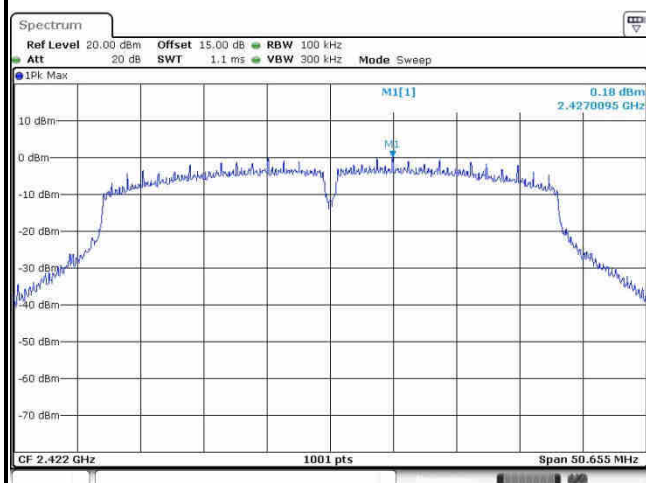
WLAN 802.11n HT20 Channel 11**100kHz PSD reference Level****High Channel Plot****Spurious Emission 30MHz~2.4GHz****Spurious Emission 2.4835GHz~25GHz**



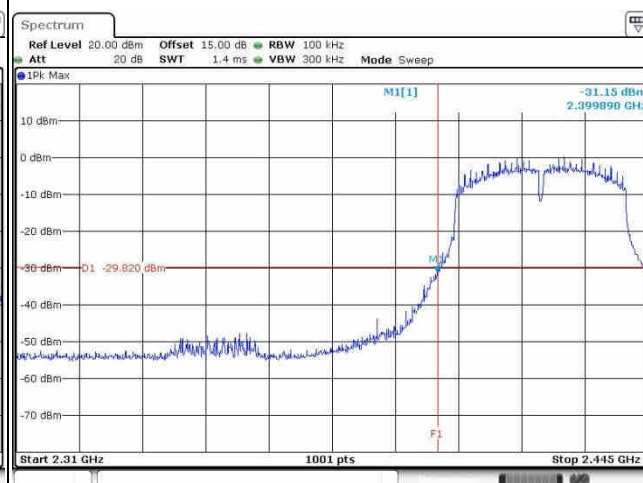
Number of TX :	1	Chain Port :	1
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	03	Test Engineer :	Mygai Mo

WLAN 802.11n HT40 Channel 03

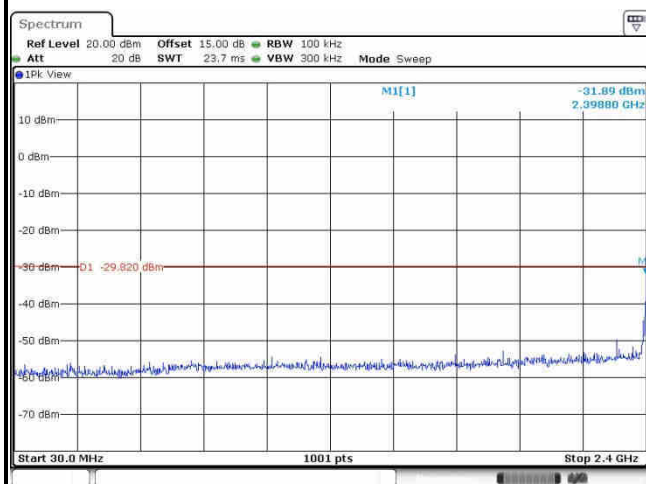
100kHz PSD reference Level



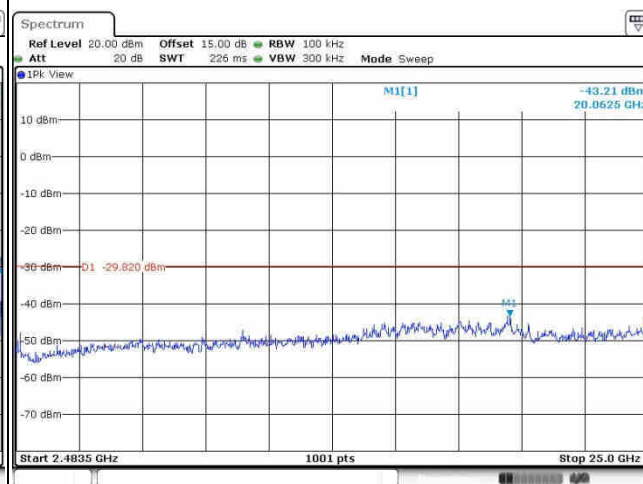
Low Channel Plot



Spurious Emission 30MHz~2.4GHz

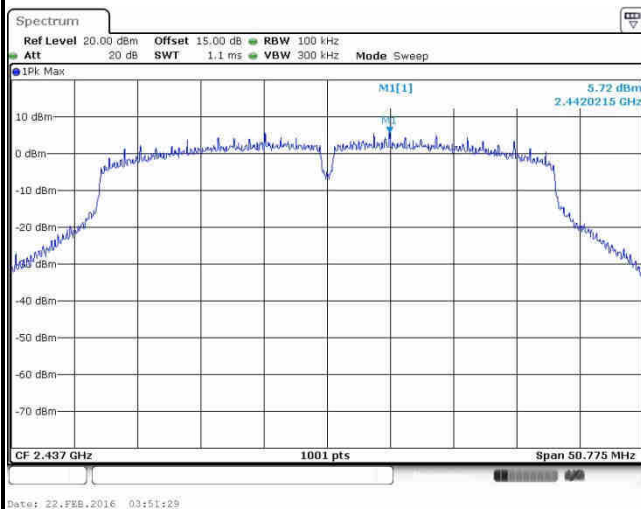
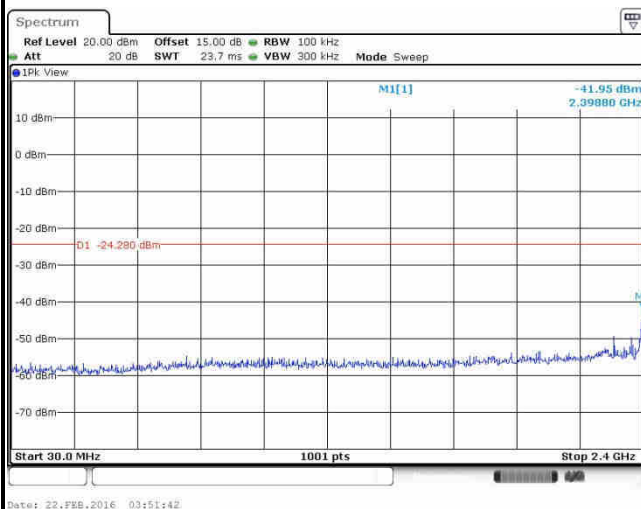
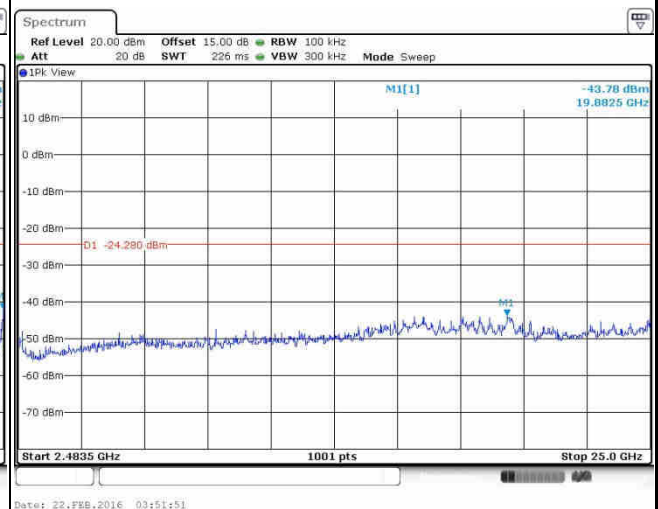


Spurious Emission 2.4835GHz~25GHz





Number of TX :	1	Chain Port :	1
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Mygai Mo

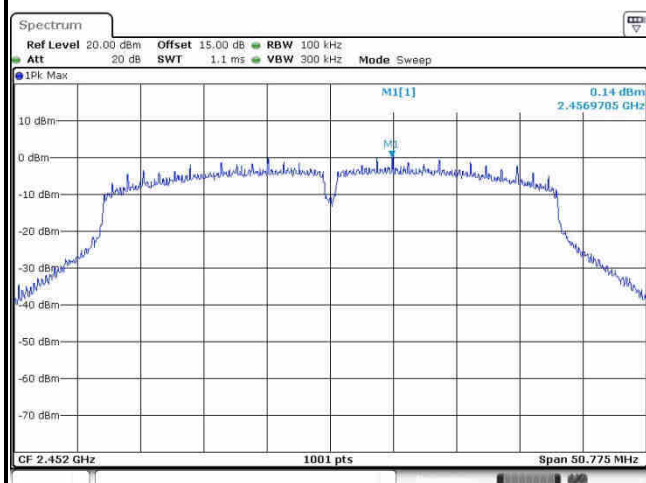
WLAN 802.11n HT40 Channel 06**100kHz PSD reference Level****Spurious Emission 30MHz~2.4GHz****Spurious Emission 2.4835GHz~25GHz**



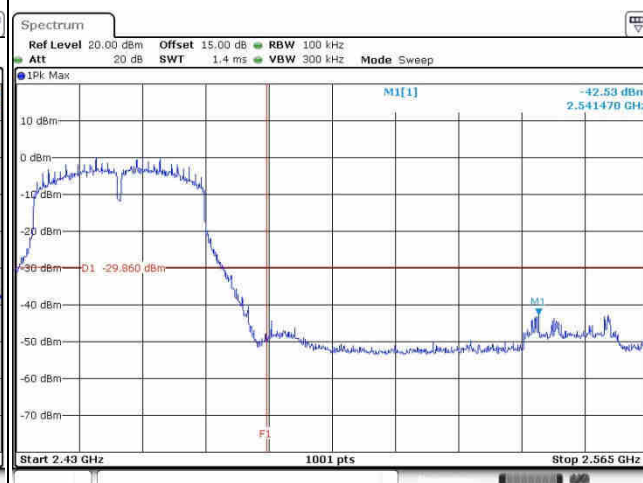
Number of TX :	1	Chain Port :	1
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	09	Test Engineer :	Mygai Mo

WLAN 802.11n HT40 Channel 09

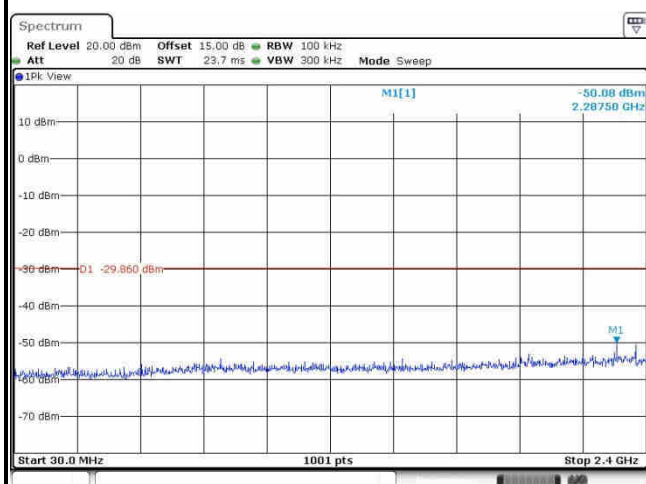
100kHz PSD reference Level



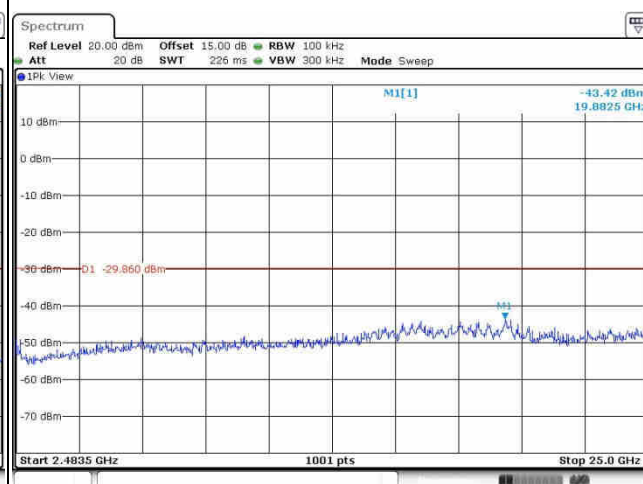
High Channel Plot



Spurious Emission 30MHz~2.4GHz



Spurious Emission 2.4835GHz~25GHz



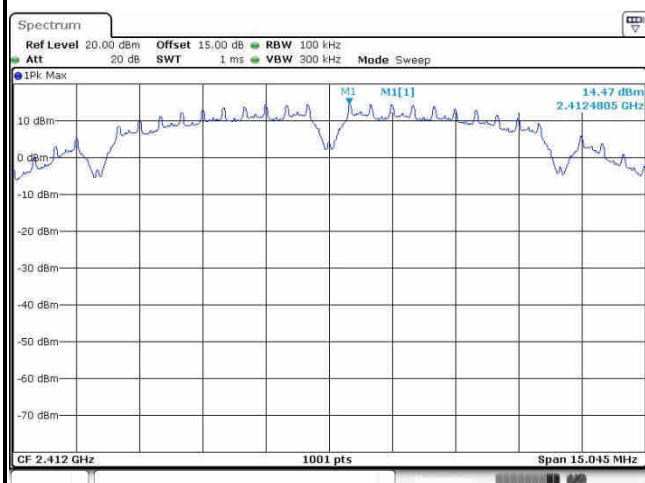


Number of TX = 1, Chain Port 1 (Measured)

Number of TX	1	Chain Port :	2
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Mygai Mo

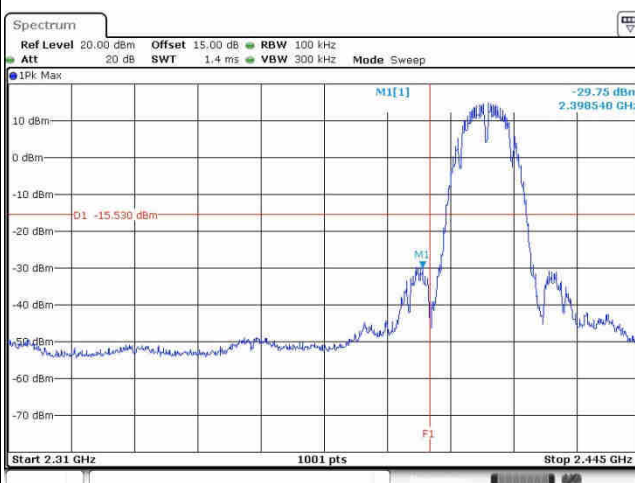
WLAN 802.11b Channel 01

100kHz PSD reference Level



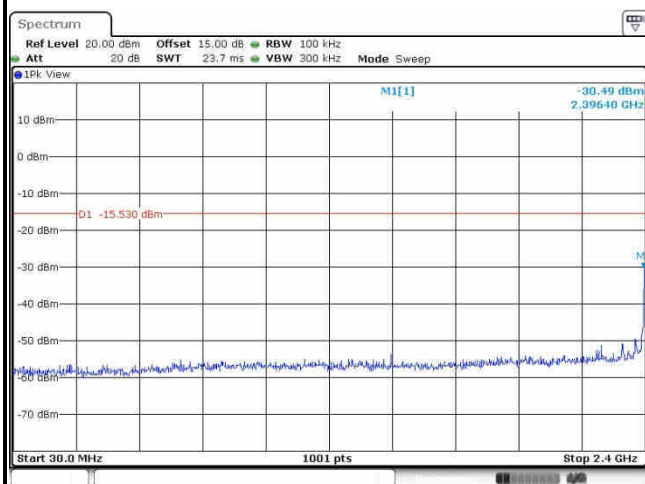
Date: 22.FEB.2016 09:00:21

Low Channel Plot



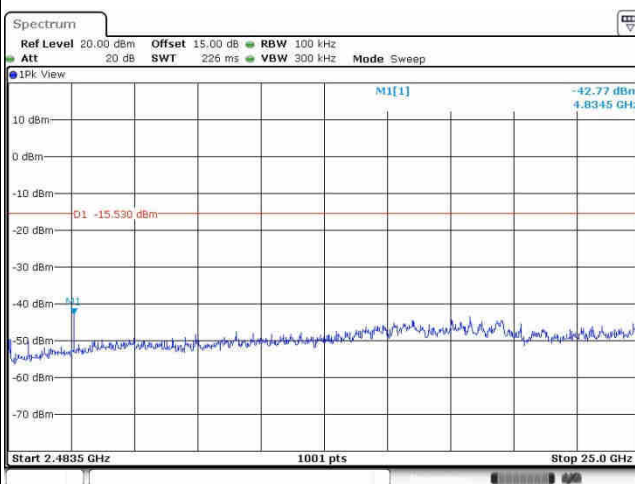
Date: 22.FEB.2016 09:01:16

Spurious Emission 30MHz~2.4GHz



Date: 22.FEB.2016 09:01:29

Spurious Emission 2.4835GHz~25GHz



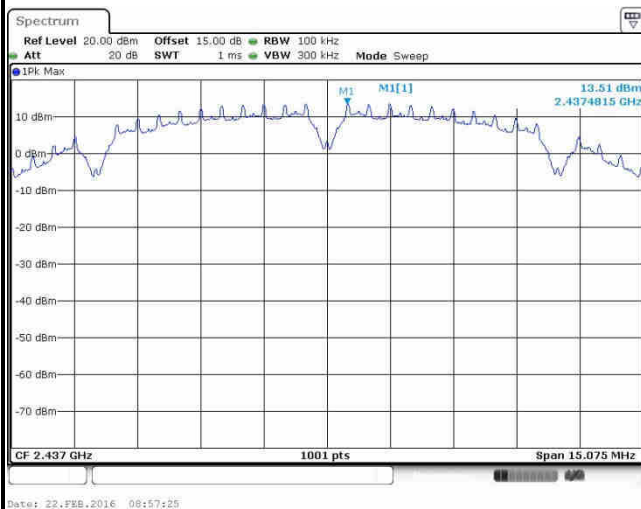
Date: 22.FEB.2016 09:01:37



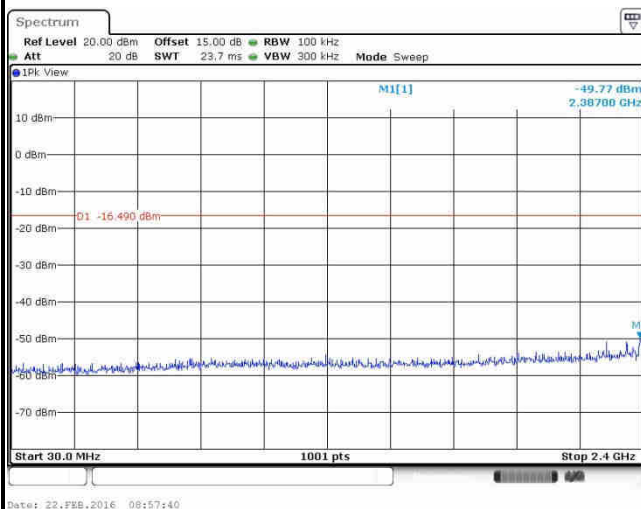
Number of TX :	1	Chain Port :	2
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Mygai Mo

WLAN 802.11b Channel 06

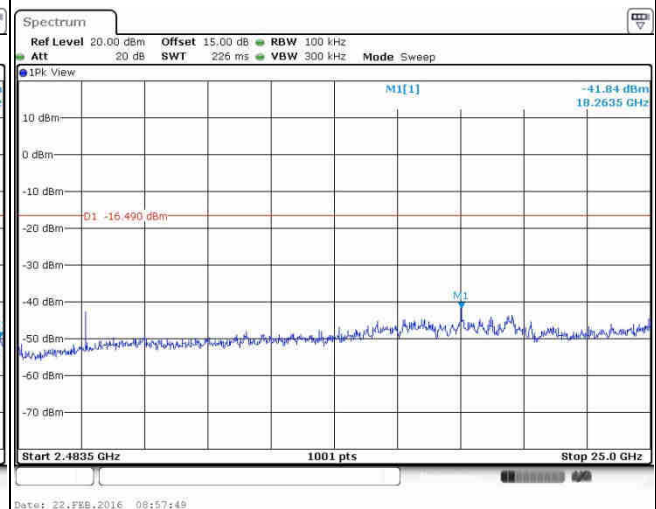
100kHz PSD reference Level



Spurious Emission 30MHz~2.4GHz



Spurious Emission 2.4835GHz~25GHz

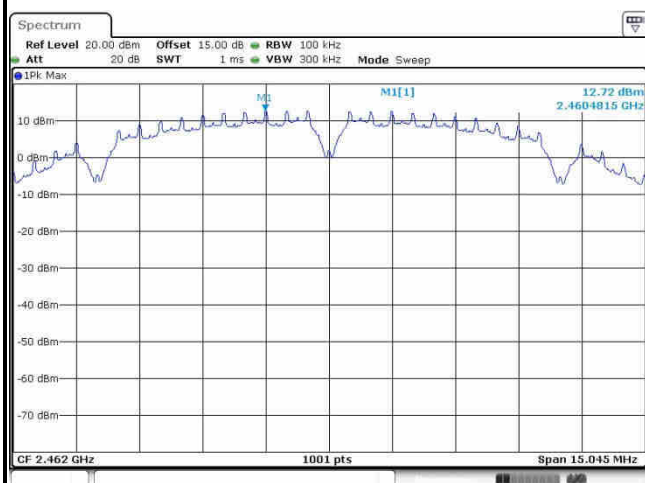




Number of TX :	1	Chain Port :	2
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Mygai Mo

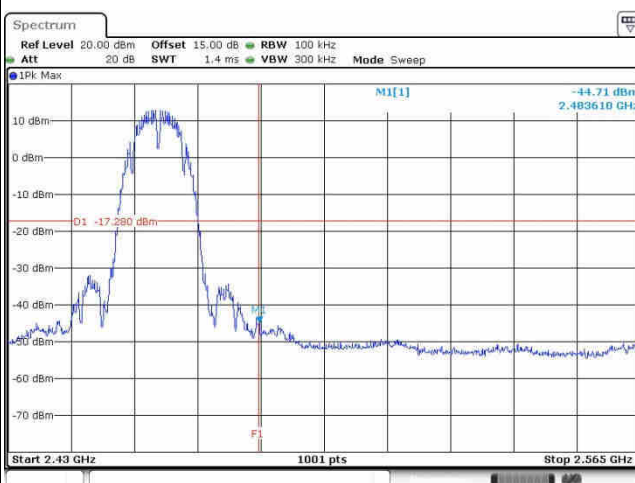
WLAN 802.11b Channel 11

100kHz PSD reference Level



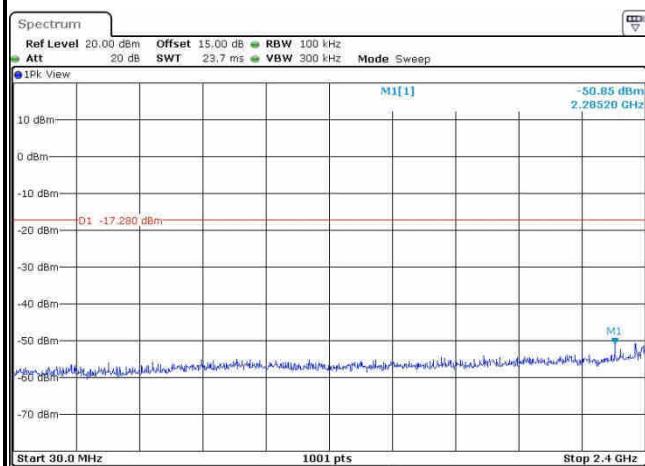
Date: 22.FEB.2016 09:05:51

High Channel Plot



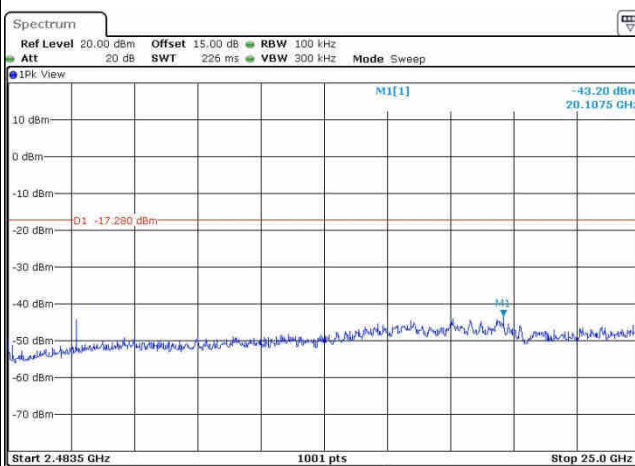
Date: 22.FEB.2016 09:06:57

Spurious Emission 30MHz~2.4GHz



Date: 22.FEB.2016 09:07:09

Spurious Emission 2.4835GHz~25GHz



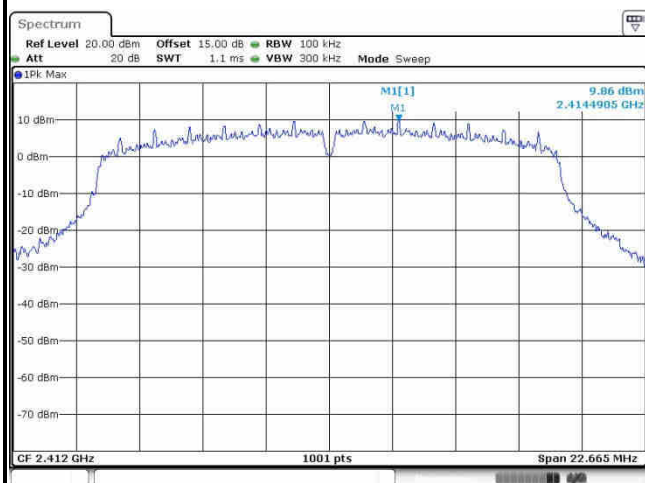
Date: 22.FEB.2016 09:07:16



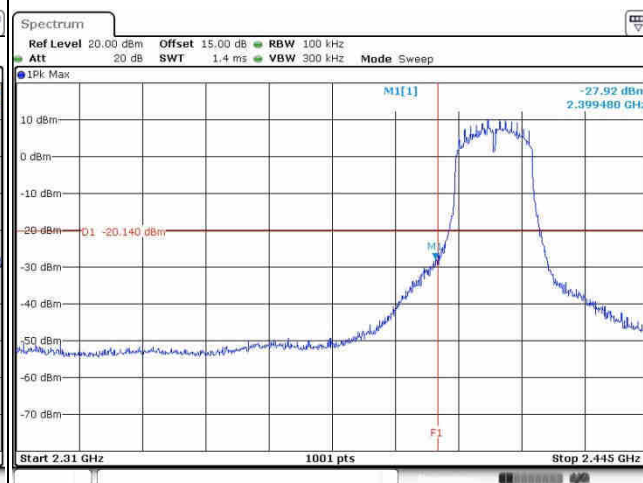
Number of TX :	1	Chain Port :	2
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Mygai Mo

WLAN 802.11g Channel 01

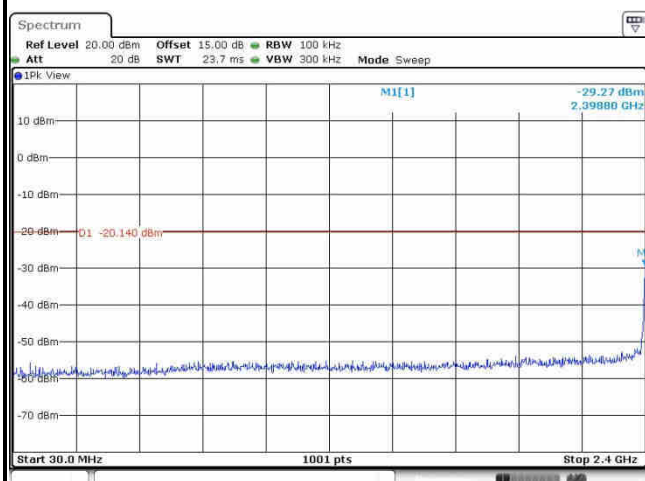
100kHz PSD reference Level



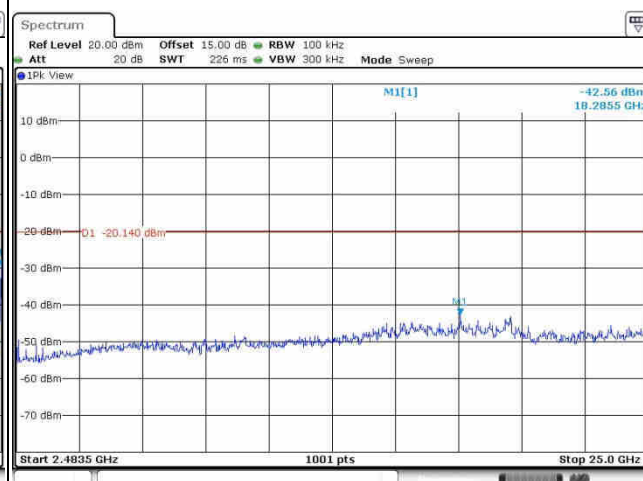
Low Channel Plot



Spurious Emission 30MHz~2.4GHz



Spurious Emission 2.4835GHz~25GHz

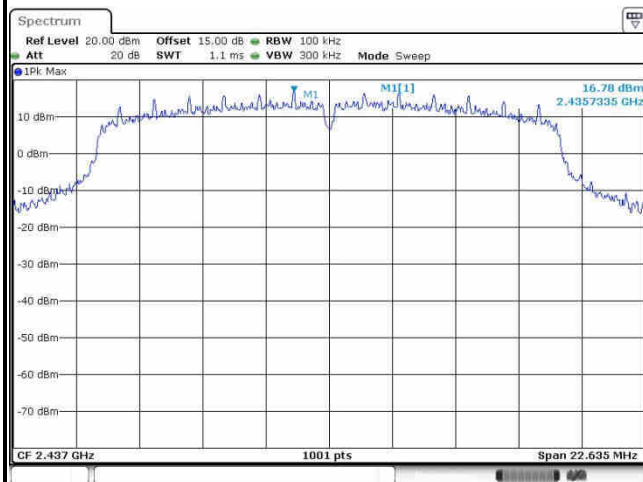




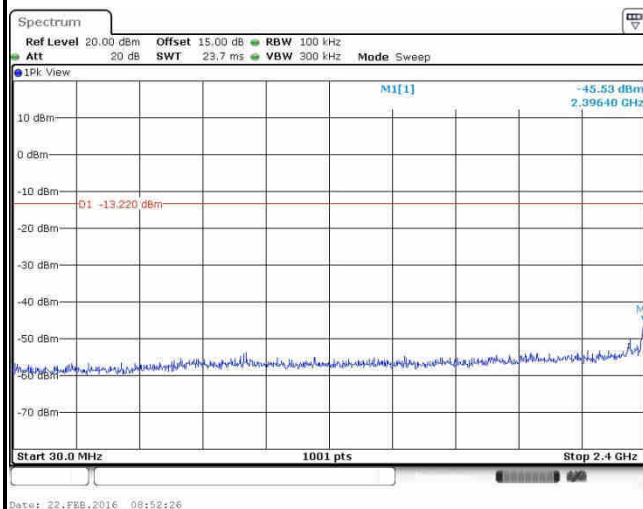
Number of TX :	1	Chain Port :	2
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Mygai Mo

WLAN 802.11g Channel 06

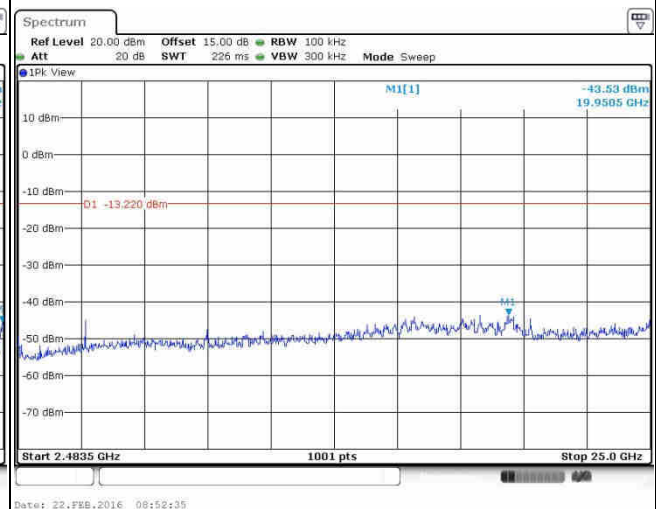
100kHz PSD reference Level



Spurious Emission 30MHz~2.4GHz



Spurious Emission 2.4835GHz~25GHz

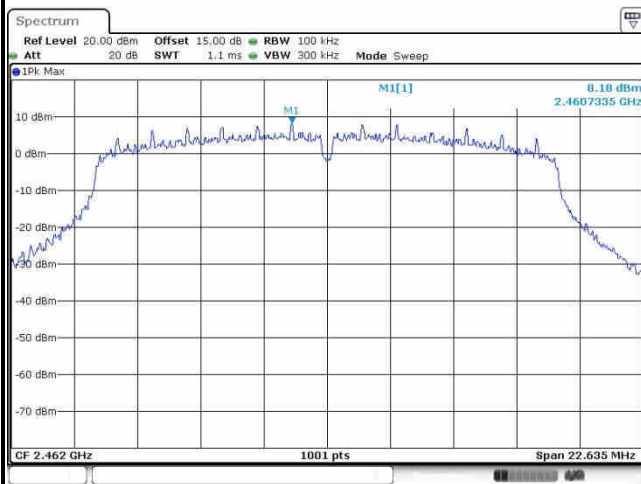




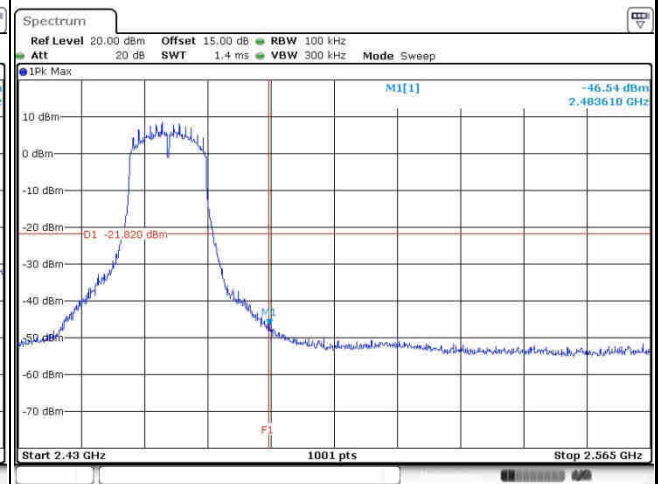
Number of TX :	1	Chain Port :	2
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Mygai Mo

WLAN 802.11g Channel 11

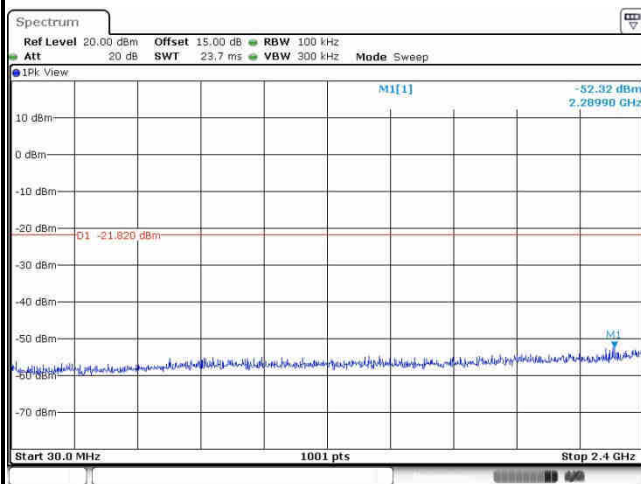
100kHz PSD reference Level



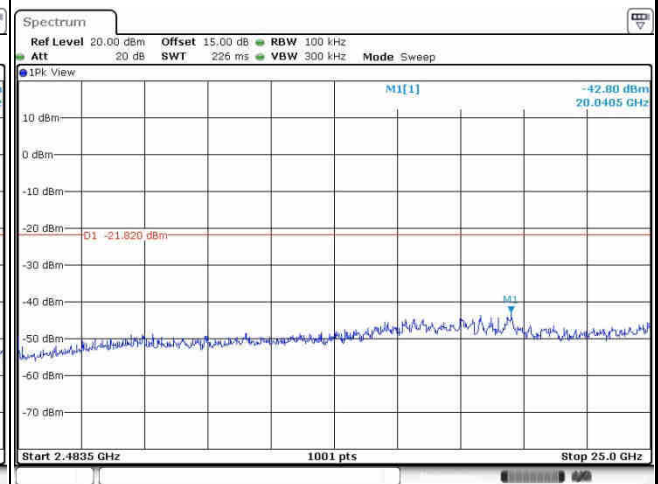
High Channel Plot



Spurious Emission 30MHz~2.4GHz



Spurious Emission 2.4835GHz~25GHz

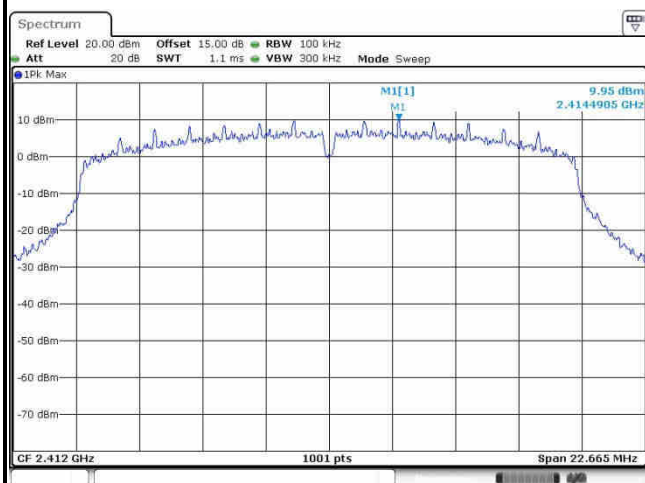




Number of TX :	1	Chain Port :	2
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Mygai Mo

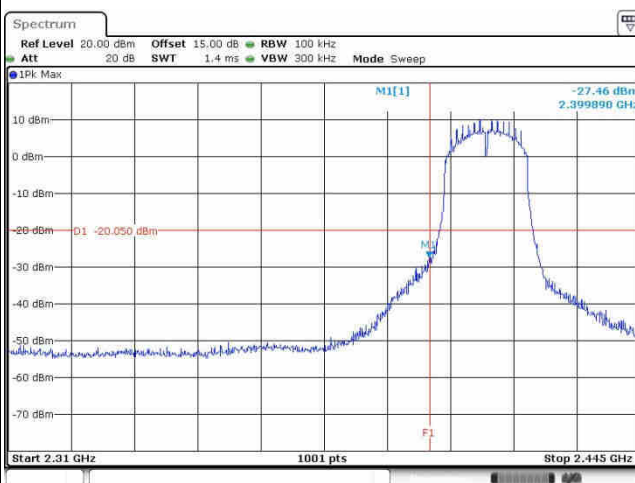
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



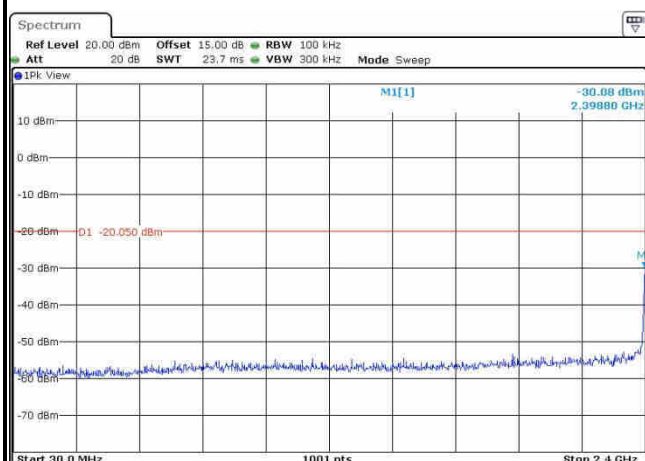
Date: 22.FEB.2016 08:31:40

Low Channel Plot



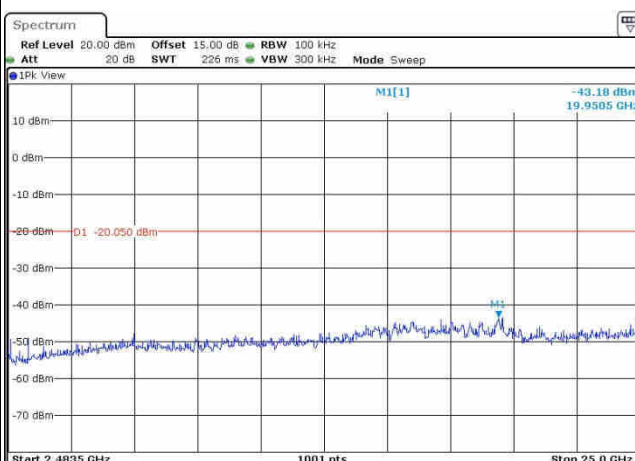
Date: 22.FEB.2016 08:32:13

Spurious Emission 30MHz~2.4GHz



Date: 22.FEB.2016 08:32:31

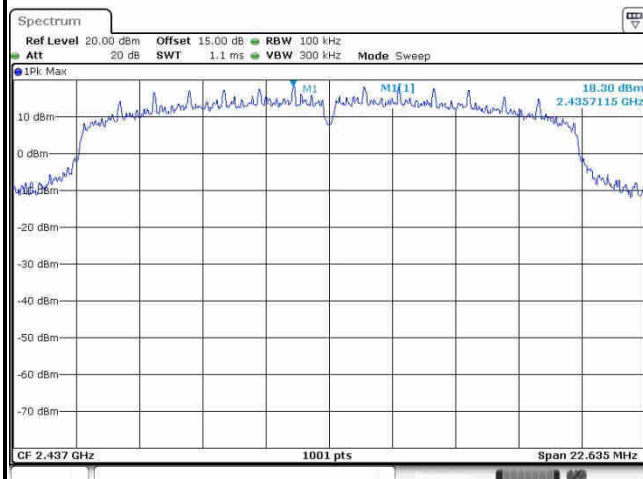
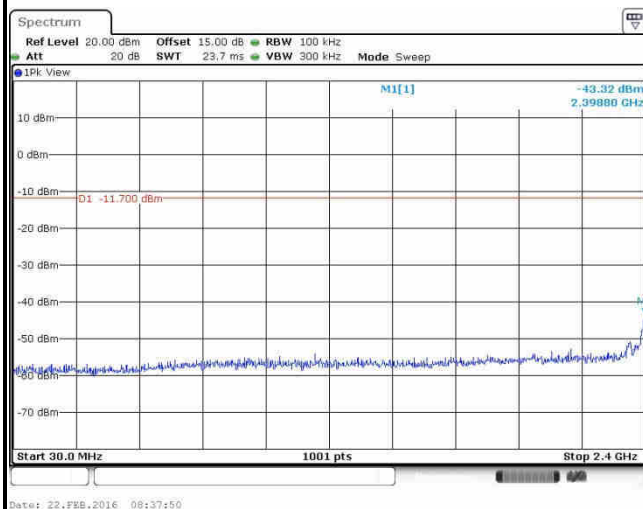
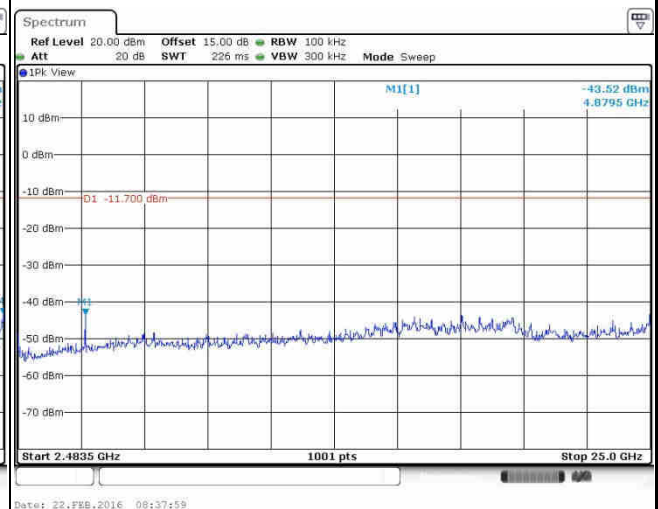
Spurious Emission 2.4835GHz~25GHz



Date: 22.FEB.2016 08:32:40

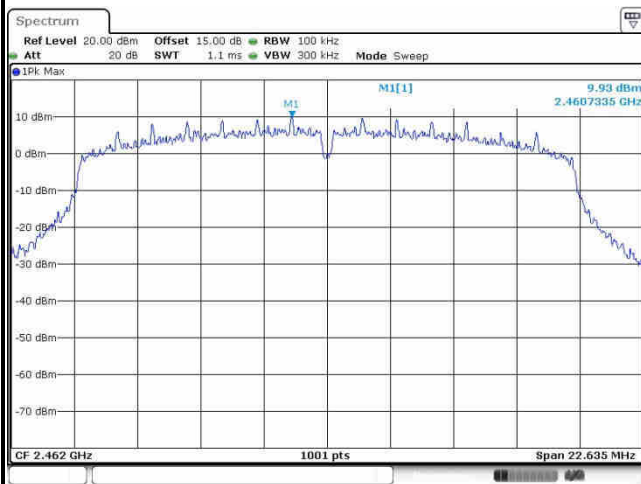
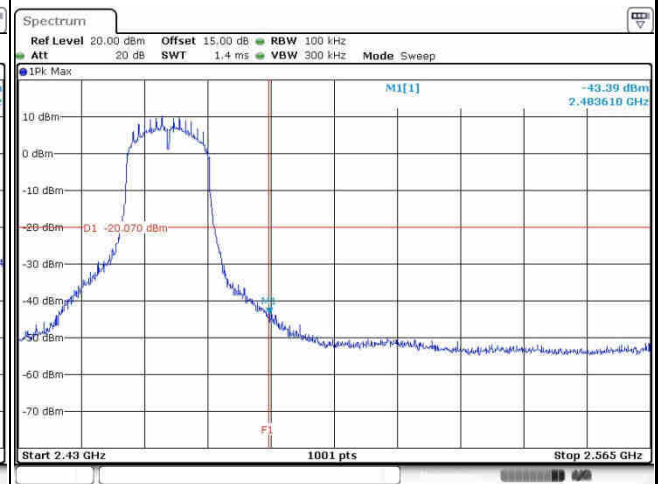
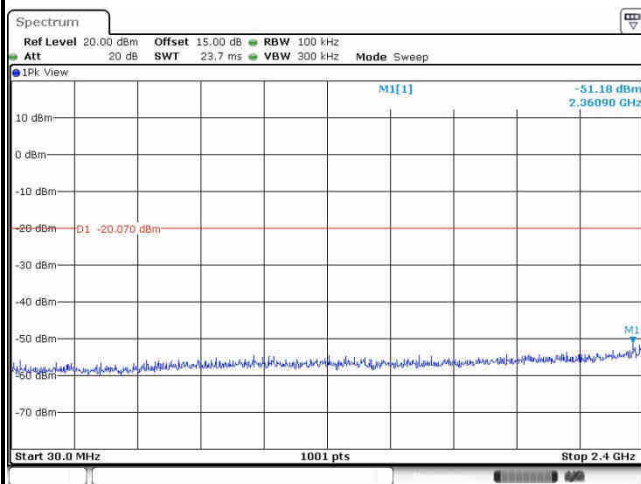
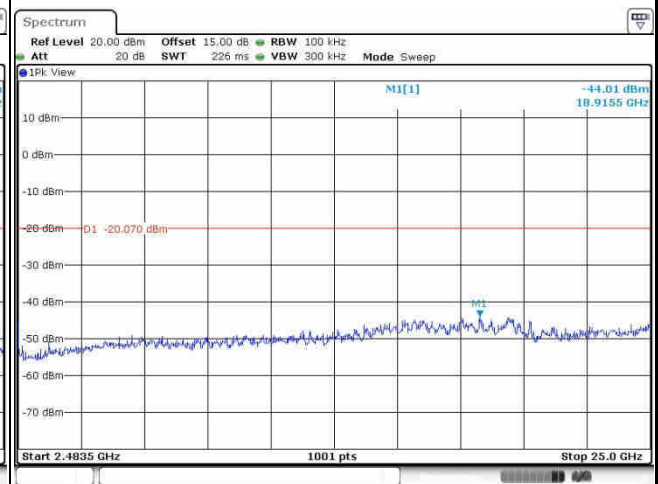


Number of TX :	1	Chain Port :	2
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Mygai Mo

WLAN 802.11n HT20 Channel 06**100kHz PSD reference Level****Spurious Emission 30MHz~2.4GHz****Spurious Emission 2.4835GHz~25GHz**

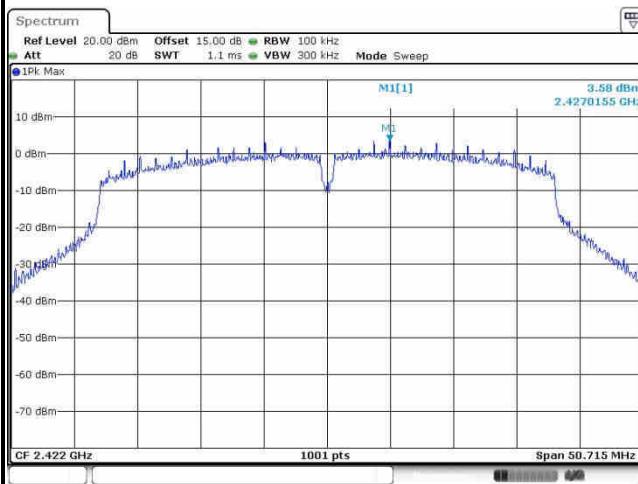


Number of TX :	1	Chain Port :	2
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Mygai Mo

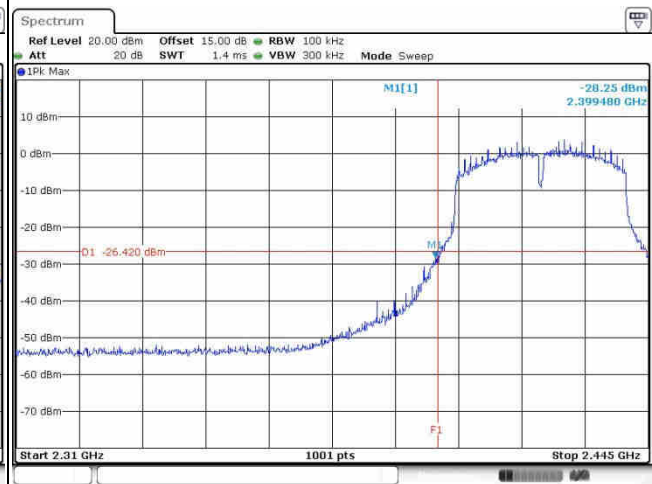
WLAN 802.11n HT20 Channel 11**100kHz PSD reference Level****High Channel Plot****Spurious Emission 30MHz~2.4GHz****Spurious Emission 2.4835GHz~25GHz**



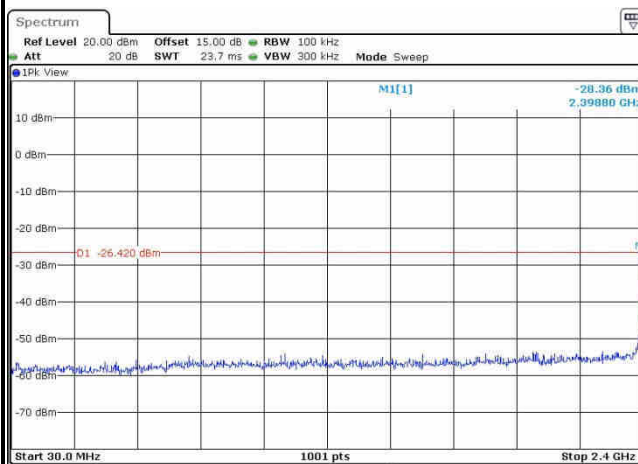
Number of TX :	1	Chain Port :	2
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	03	Test Engineer :	Mygai Mo

WLAN 802.11n HT40 Channel 03**100kHz PSD reference Level**

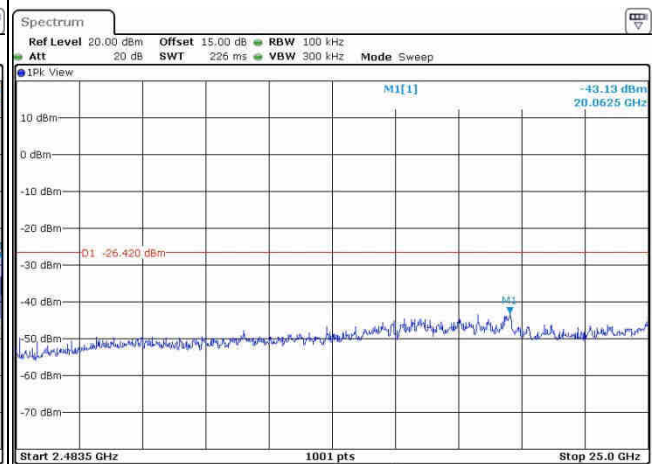
Date: 22.FEB.2016 08:20:58

Low Channel Plot

Date: 22.FEB.2016 08:21:27

Spurious Emission 30MHz~2.4GHz

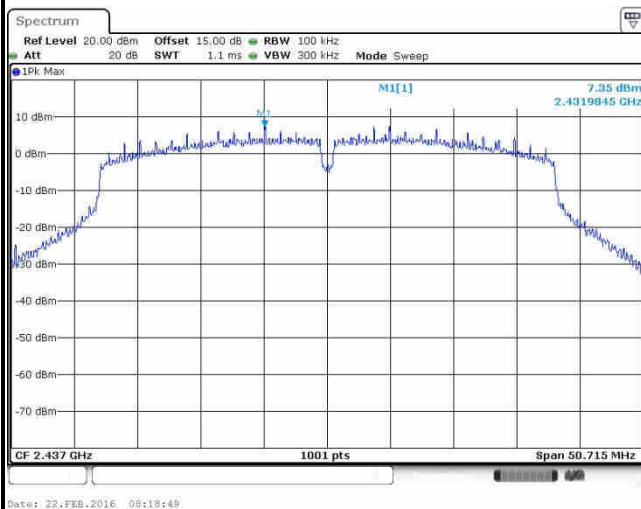
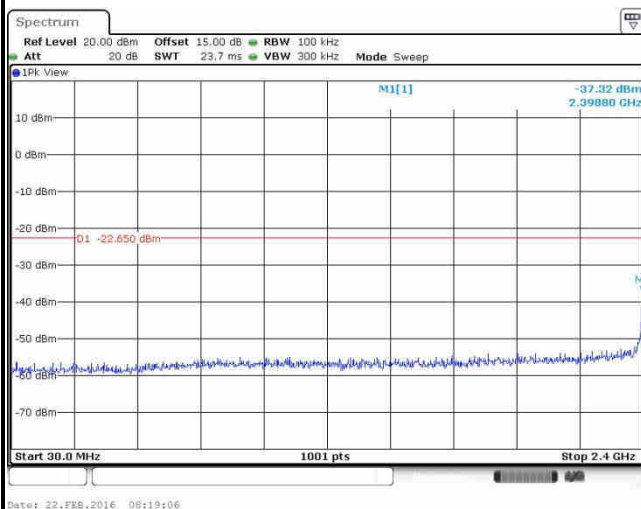
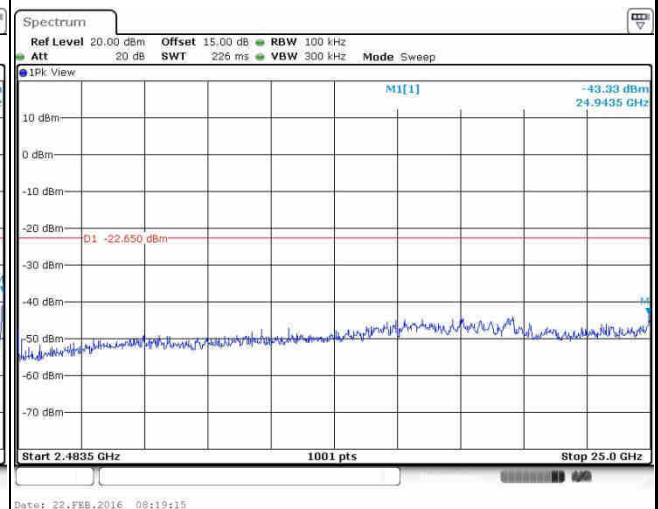
Date: 22.FEB.2016 08:21:42

Spurious Emission 2.4835GHz~25GHz

Date: 22.FEB.2016 08:21:50

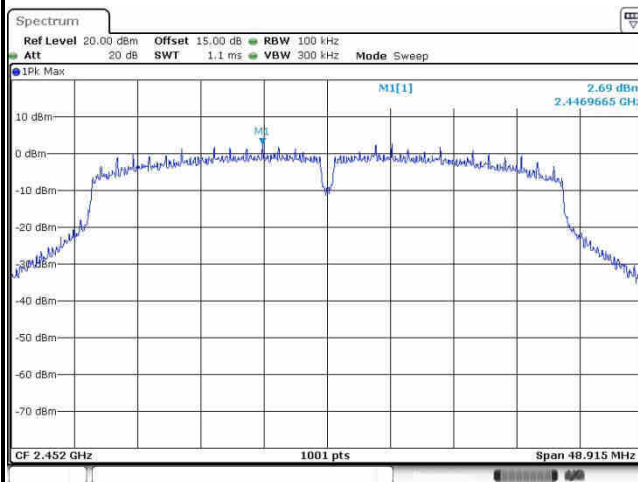
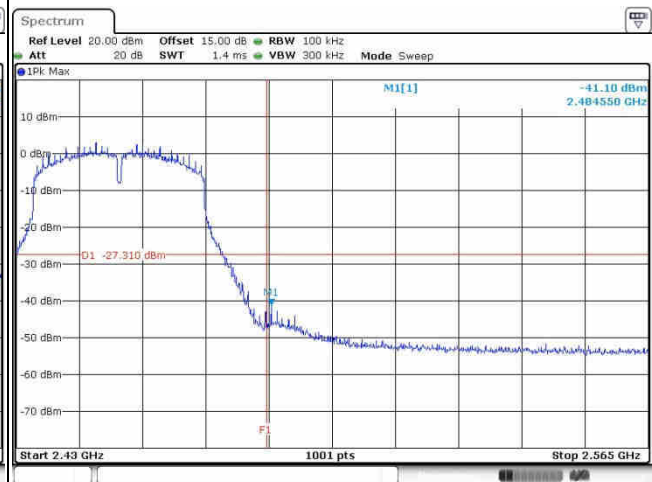
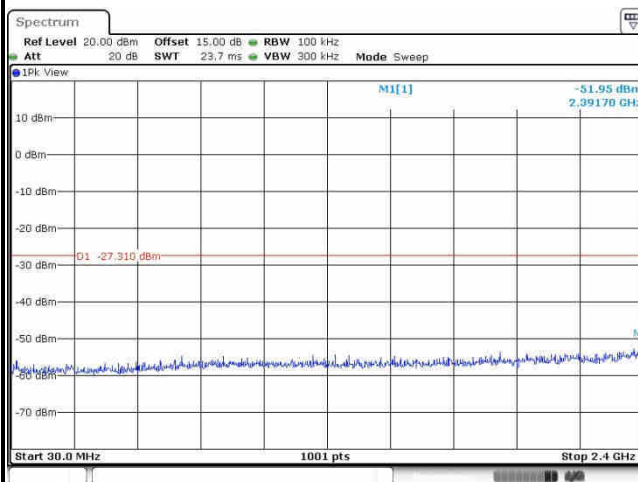
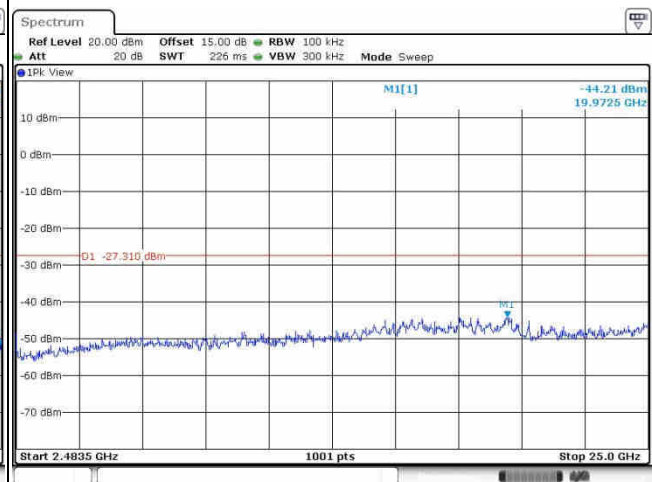


Number of TX :	1	Chain Port :	2
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Mygai Mo

WLAN 802.11n HT40 Channel 06**100kHz PSD reference Level****Spurious Emission 30MHz~2.4GHz****Spurious Emission 2.4835GHz~25GHz**



Number of TX :	1	Chain Port :	2
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	09	Test Engineer :	Mygai Mo

WLAN 802.11n HT40 Channel 09**100kHz PSD reference Level****High Channel Plot****Spurious Emission 30MHz~2.4GHz****Spurious Emission 2.4835GHz~25GHz**

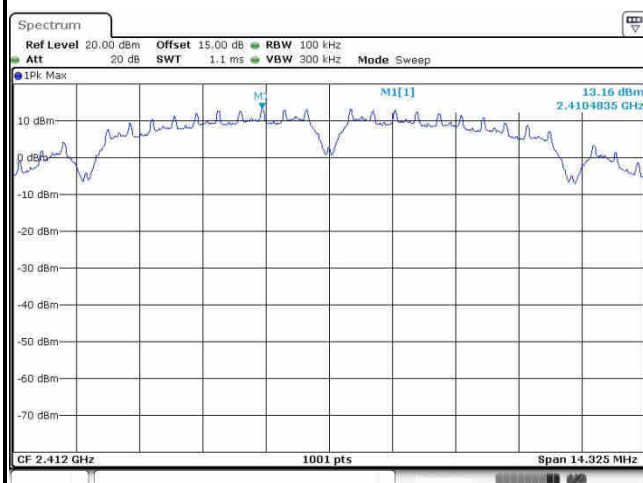


Number of TX = 2, Chain Port 1+2(1) (Measured)

Number of TX :	2	Chain Port :	1+2(1)
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Mygai Mo

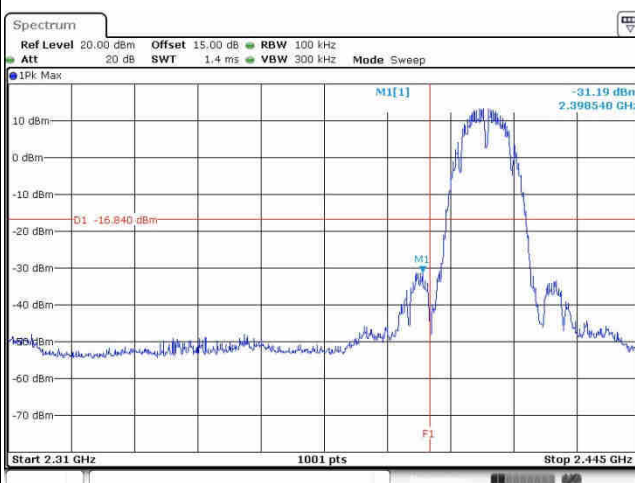
WLAN 802.11b Channel 01

100kHz PSD reference Level



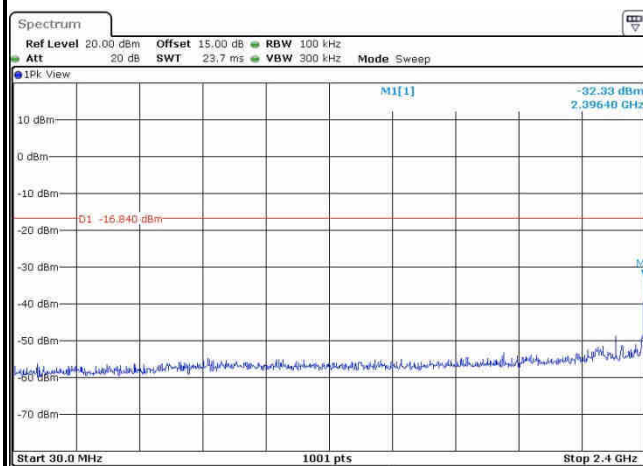
Date: 22.FEB.2016 05:18:57

Low Channel Plot



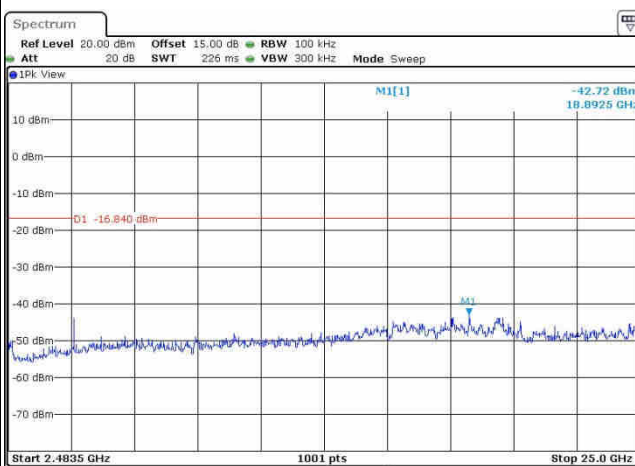
Date: 22.FEB.2016 05:19:32

Spurious Emission 30MHz~2.4GHz



Date: 22.FEB.2016 05:19:49

Spurious Emission 2.4835GHz~25GHz



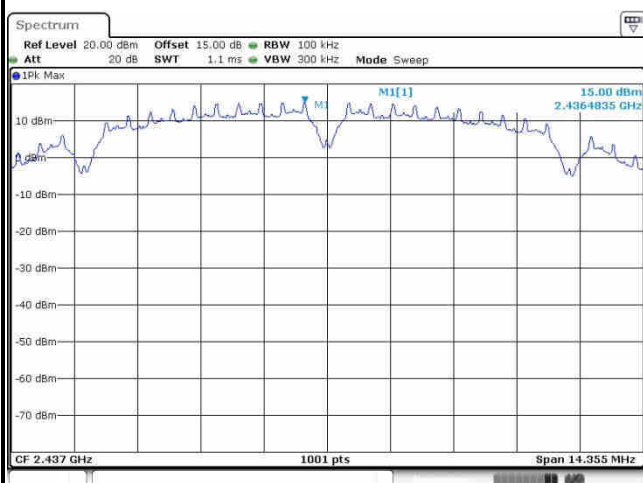
Date: 22.FEB.2016 05:19:57



Number of TX :	2	Chain Port :	1+2(1)
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Mygai Mo

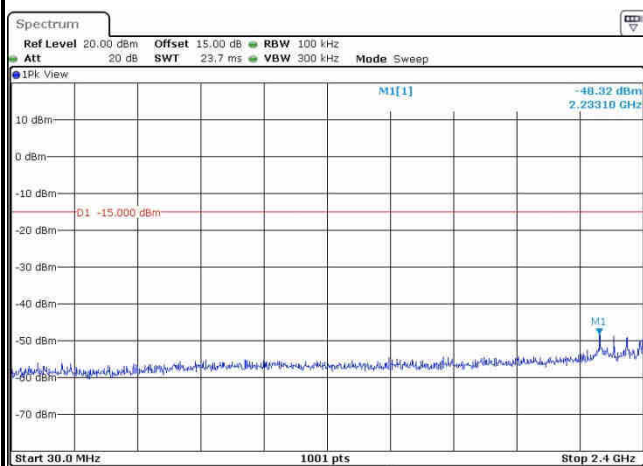
WLAN 802.11b Channel 06

100kHz PSD reference Level



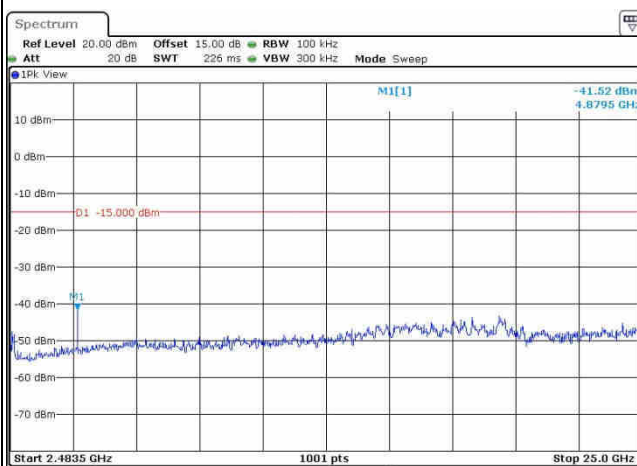
Date: 22.FEB.2016 05:21:01

Spurious Emission 30MHz~2.4GHz



Date: 22.FEB.2016 05:21:19

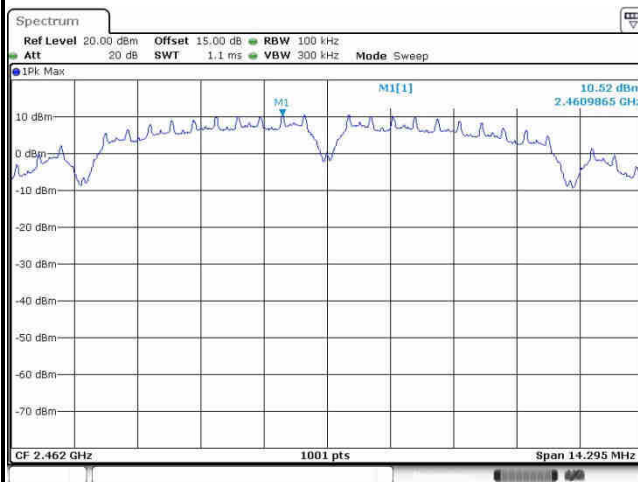
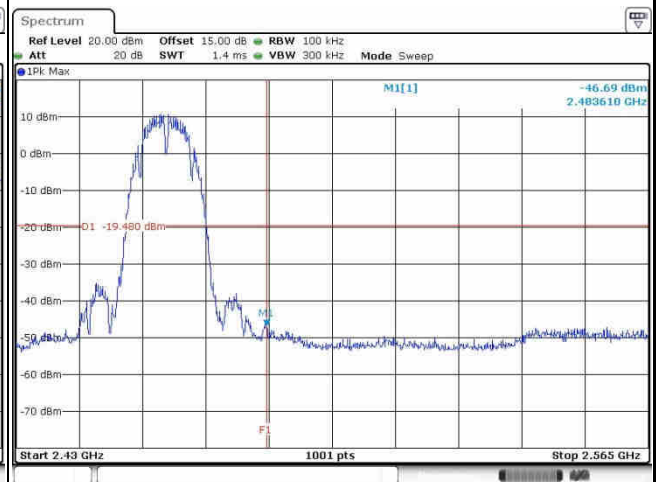
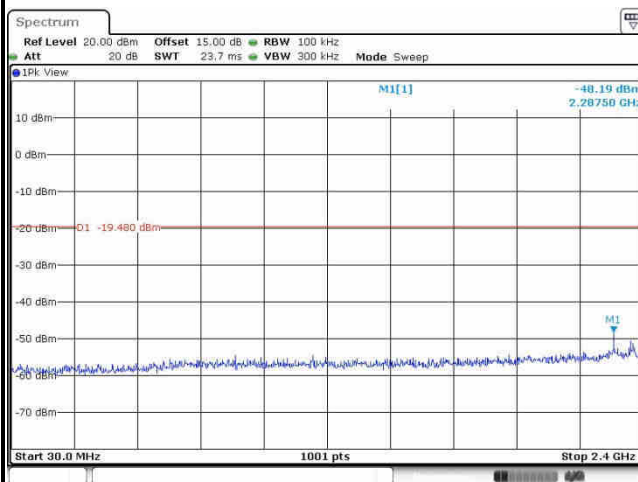
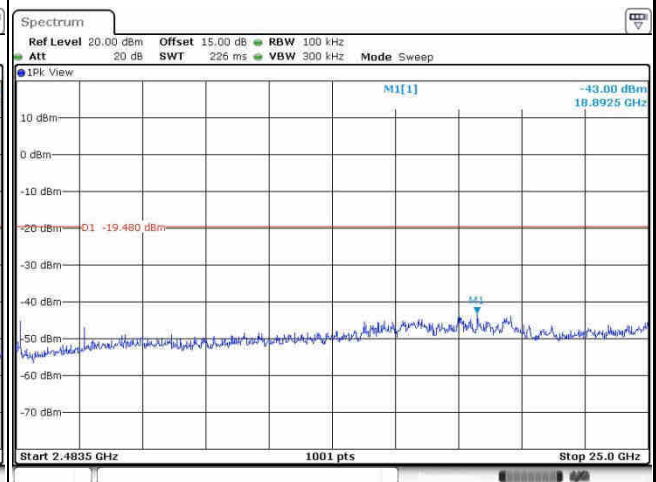
Spurious Emission 2.4835GHz~25GHz



Date: 22.FEB.2016 05:21:27



Number of TX :	2	Chain Port :	1+2(1)
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Mygai Mo

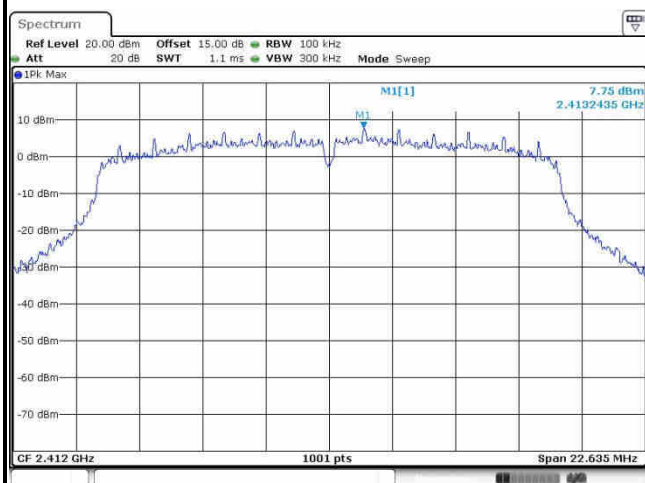
WLAN 802.11b Channel 11**100kHz PSD reference Level****High Channel Plot****Spurious Emission 30MHz~2.4GHz****Spurious Emission 2.4835GHz~25GHz**



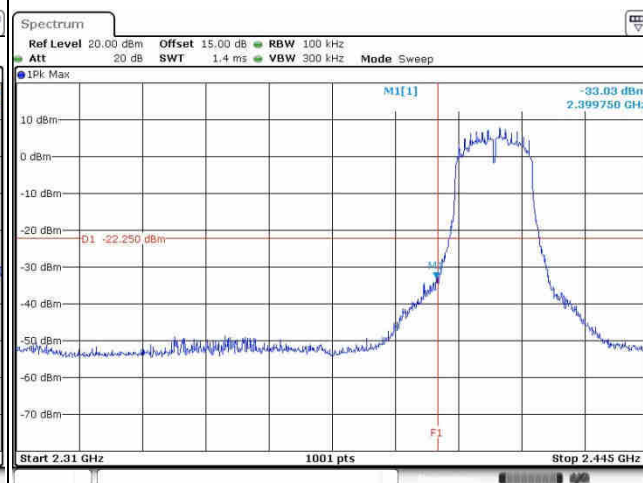
Number of TX :	2	Chain Port :	1+2(1)
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Mygai Mo

WLAN 802.11g Channel 01

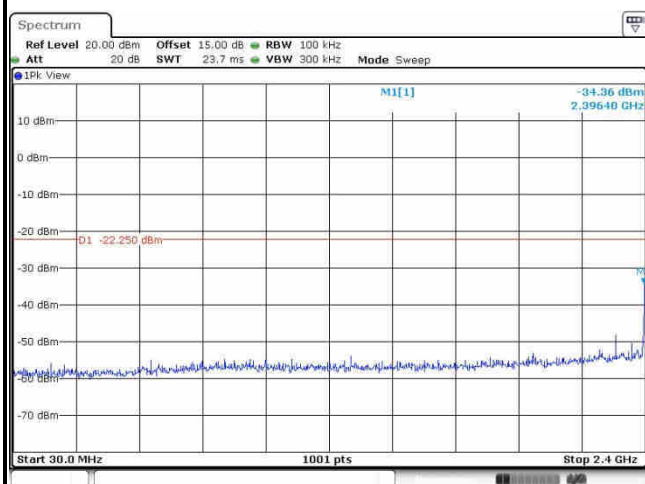
100kHz PSD reference Level



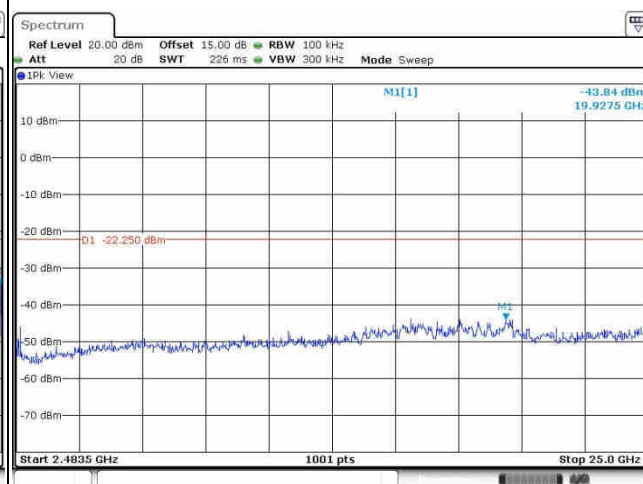
Low Channel Plot



Spurious Emission 30MHz~2.4GHz

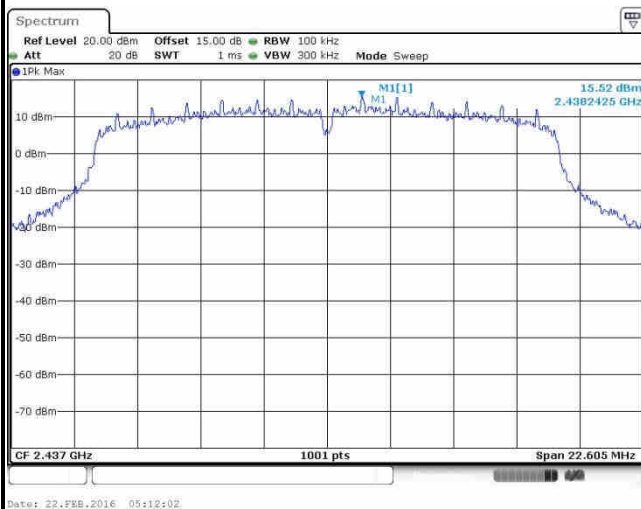
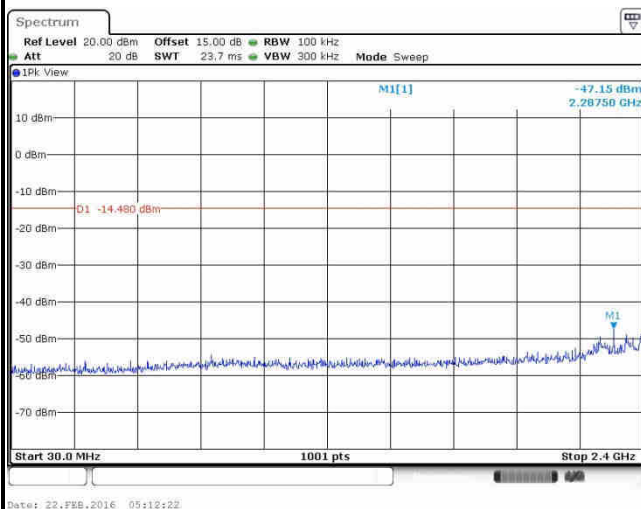
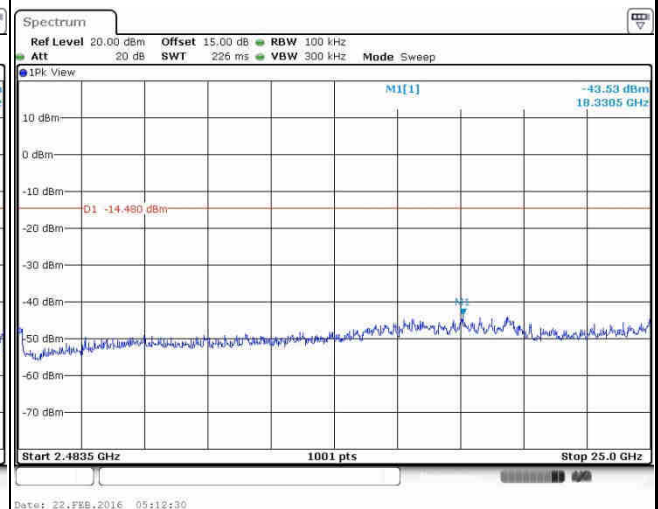


Spurious Emission 2.4835GHz~25GHz





Number of TX :	2	Chain Port :	1+2(1)
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Mygai Mo

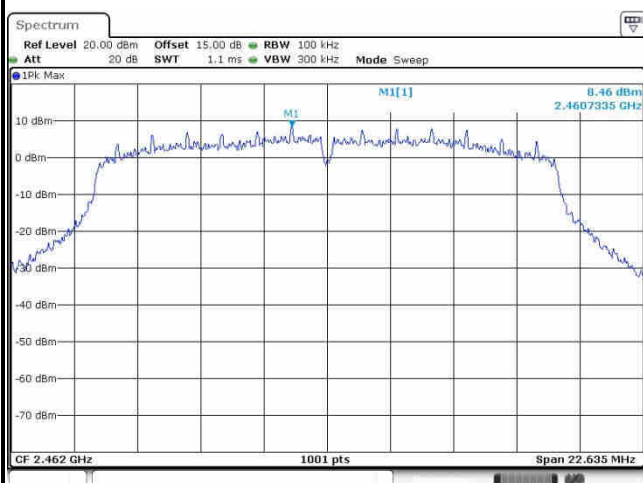
WLAN 802.11g Channel 06**100kHz PSD reference Level****Spurious Emission 30MHz~2.4GHz****Spurious Emission 2.4835GHz~25GHz**



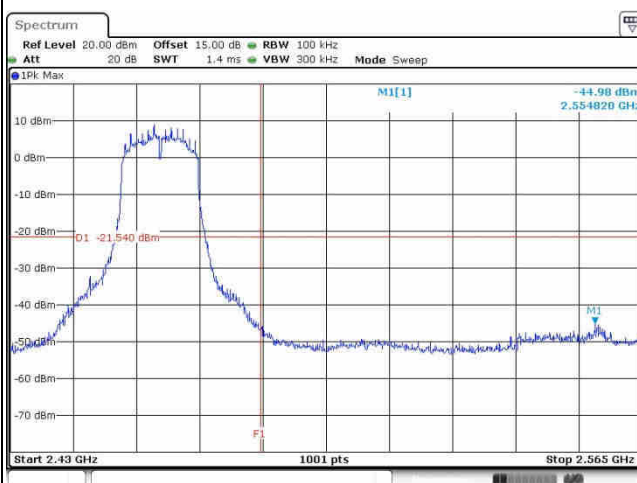
Number of TX :	2	Chain Port :	1+2(1)
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Mygai Mo

WLAN 802.11g Channel 11

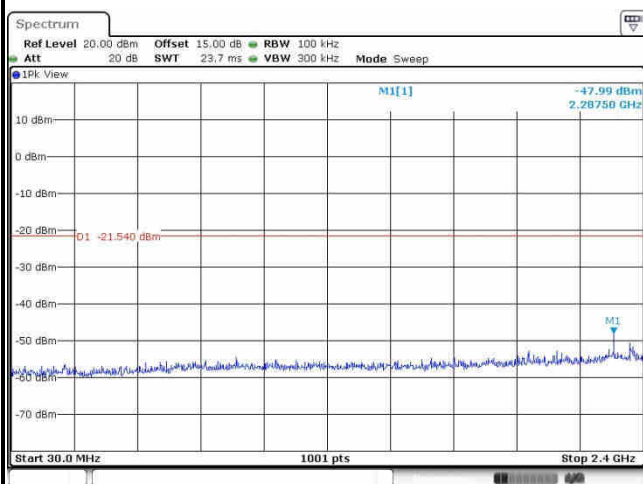
100kHz PSD reference Level



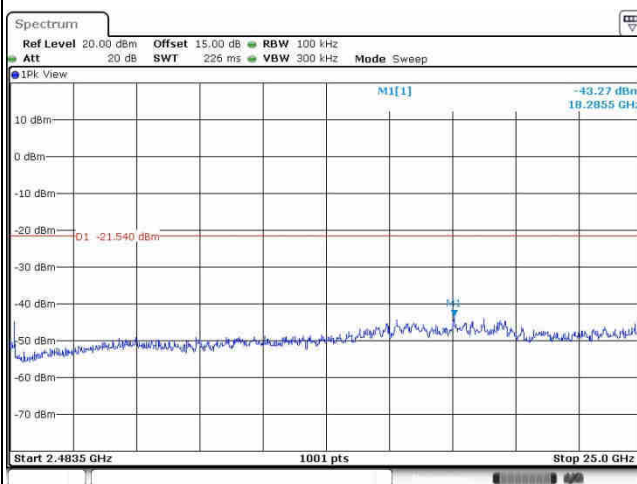
High Channel Plot



Spurious Emission 30MHz~2.4GHz



Spurious Emission 2.4835GHz~25GHz

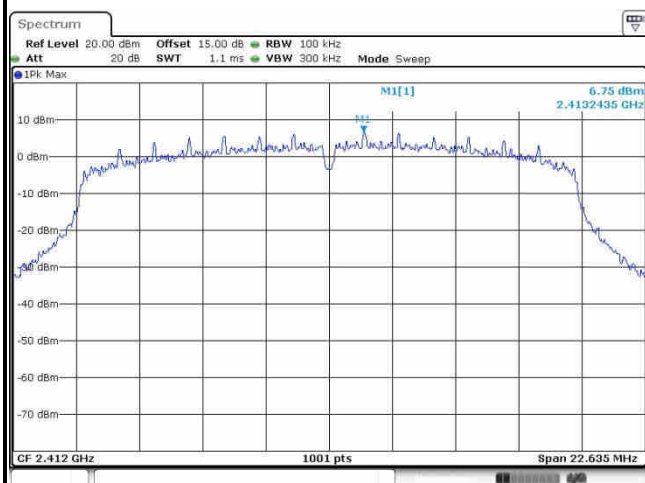




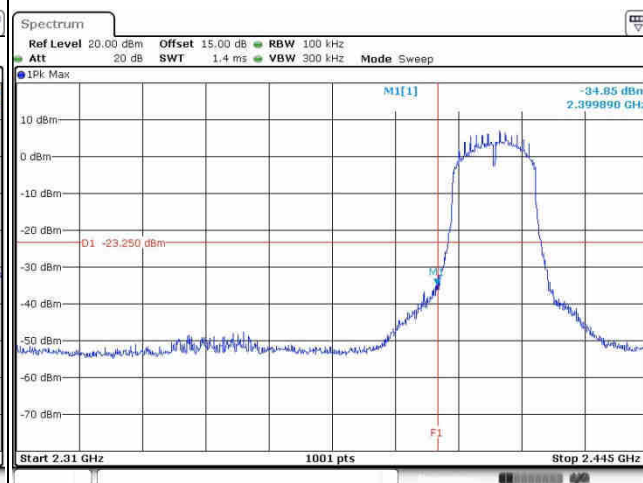
Number of TX :	2	Chain Port :	1+2(1)
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Mygai Mo

WLAN 802.11n HT20 Channel 01

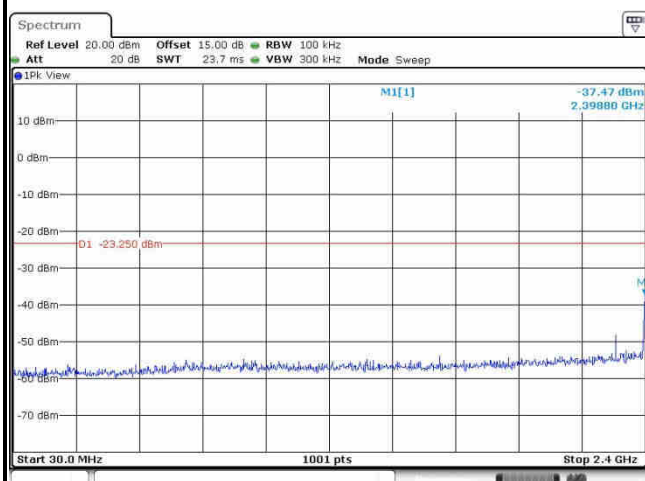
100kHz PSD reference Level



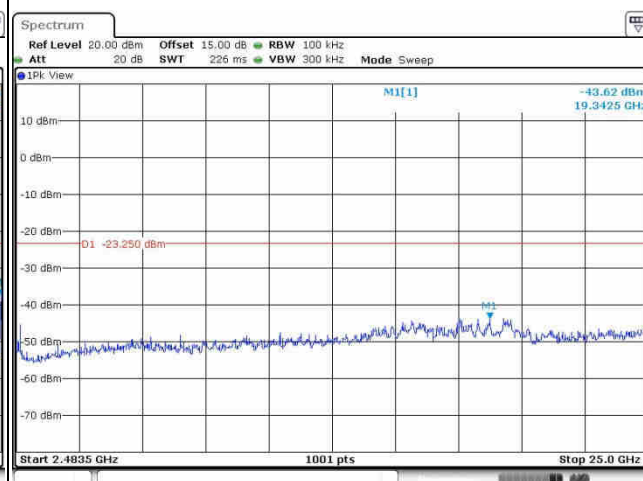
Low Channel Plot



Spurious Emission 30MHz~2.4GHz



Spurious Emission 2.4835GHz~25GHz

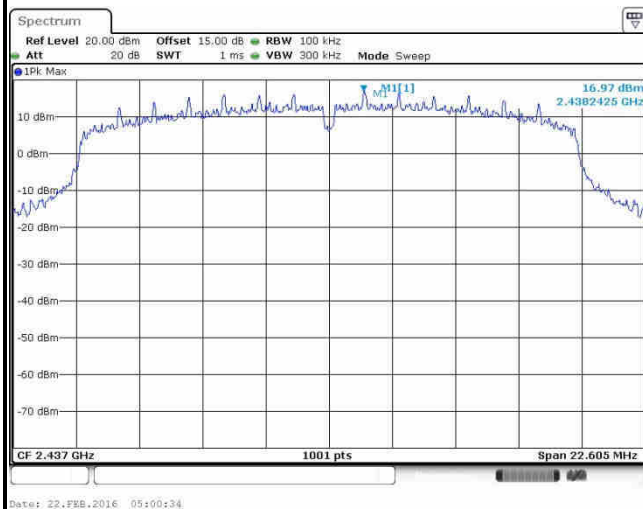




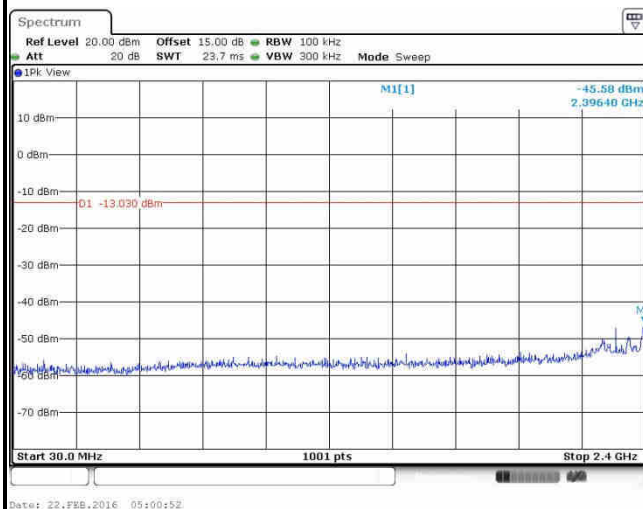
Number of TX :	2	Chain Port :	1+2(1)
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Mygai Mo

WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



Spurious Emission 30MHz~2.4GHz



Spurious Emission 2.4835GHz~25GHz

