

NCC RF Test Report

APPLICANT : 香港商優比快科技有限公司台灣分公司
EQUIPMENT : Mesh 無線延伸器
BRAND NAME : ULABS
MODEL NAME : AFi-P-HD
STANDARD : NCC LP0002 (2016-08-23)

The product was received on Mar. 22, 2016 and testing was completed on Jul. 20, 2016. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

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



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
TR630314-07C	Rev. 01	Initial issue of report	Dec. 18, 2017

SUMMARY OF TEST RESULT

Report Section	NCC Rule	Description	Limit	Result	Remark
3.1	LP0002 3.10.1.6(2)(A)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	99% Bandwidth	-	Pass	-
3.2	LP0002 3.10.1.2(1)(C)	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	LP0002 3.10.1.6(2)(B)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	LP0002 3.10.1.5	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	LP0002 3.10.1.5	Radiated Band Edges and Radiated Spurious Emission	LP0002 3.10.1.5	Pass	Under limit 0.26 dB at 2388.960 MHz
3.6	LP0002 2.11	Receiver Radiated Emission	LP0002 2.8	Pass	Under limit 0.13 dB at 188.120 MHz
3.7	LP0002 2.3	AC Conducted Emission	LP0002 2.3	Pass	Under limit 8.10 dB at 25.870 MHz
3.8	LP0002 2.2 3.10.1.3 3.10.1.4	Antenna Requirement	N/A	Pass	-
3.9	LP0002 2.2 5.20.2	Maximum Power Density	LP0002 5.20.2.1 5.20.2.2	Pass	-

1 General Description

1.1 Applicant

香港商優比快科技有限公司台灣分公司
臺北市信義區松仁路 107 號 12 樓

1.2 Manufacturer

Ubiquiti Networks, Inc.
685 Third Avenue, 27th Floor New York, New York 10017 USA

1.3 Product Feature of Equipment Under Test

Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac.

Product Specification subjective to this standard	
Antenna Type	WLAN: Internal Antenna Bluetooth: Internal Antenna

1.4 Modification of EUT

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

1.5 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1190 / TW0007 / TW1095 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	Sporton Site No.		
	TH02-HY	CO05-HY	03CH06-HY

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

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd Rd. Guishan Dist, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855		
Test Site No.	Sporton Site No. :		
	03CH13-HY		

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

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No.30-2, Dingfu Tsuen, Linkou District, New Taipei City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855		
Test Site No.	Sporton Site No.		
	OS04-LK		

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



1.6 Applicable Standards

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

- ♦ NCC LP0002 (2016-08-23)
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ ANSI C63.10-2013

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2 Test Configuration of Equipment Under Test

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

2.1 Carrier Frequency and Channel

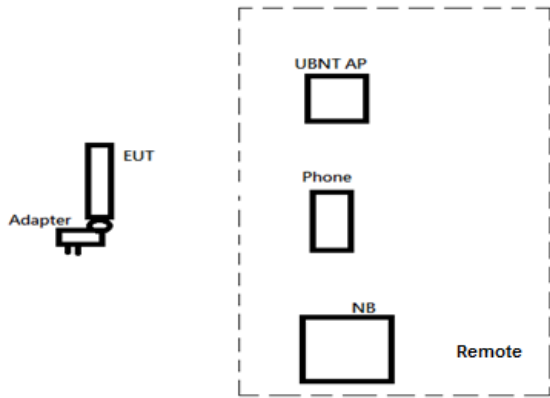
Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		

2.2 Test Mode

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

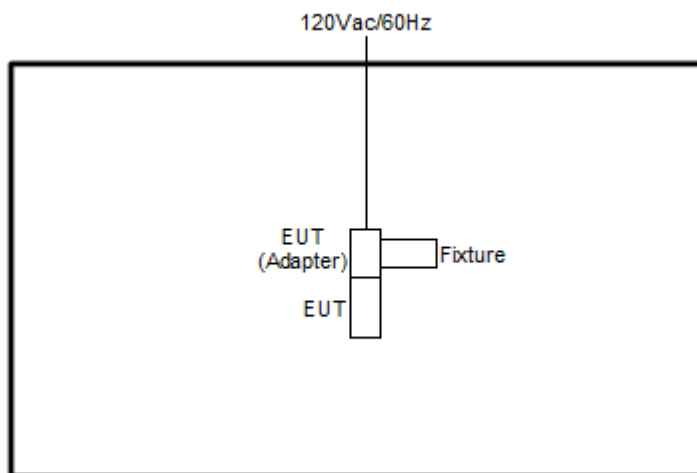
MIMO Antenna

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

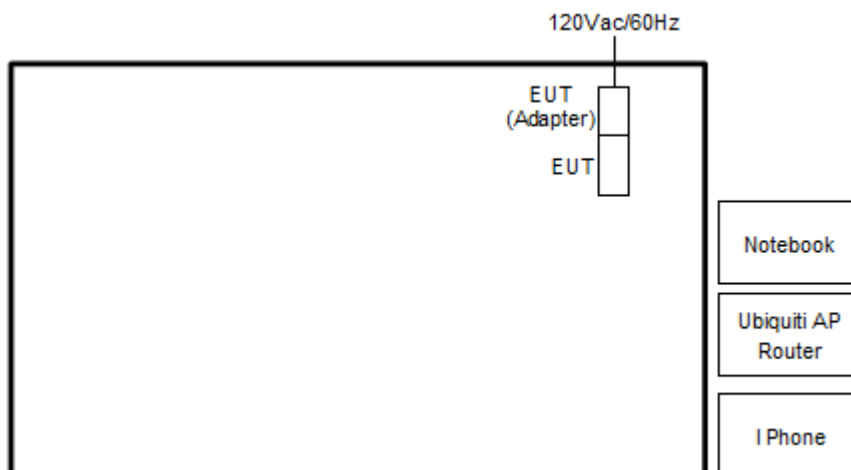
Test Cases	
AC Conducted Emission	Mode 1 : WLAN (2.4GHz) Link + Adapter
	Mode 2 : BT Tx + PoE
	Mode 3 : BLE Tx + PoE
	Mode 4 : WLAN Idle + Adapter
Radiated Emission	Mode 1 : WLAN Idle + Adapter
Remark: The worst case of conducted emission is mode 3; only the test data of it was reported.	
Remark: The following figure was the connection diagram.	
	

2.3 Connection Diagram of Test System

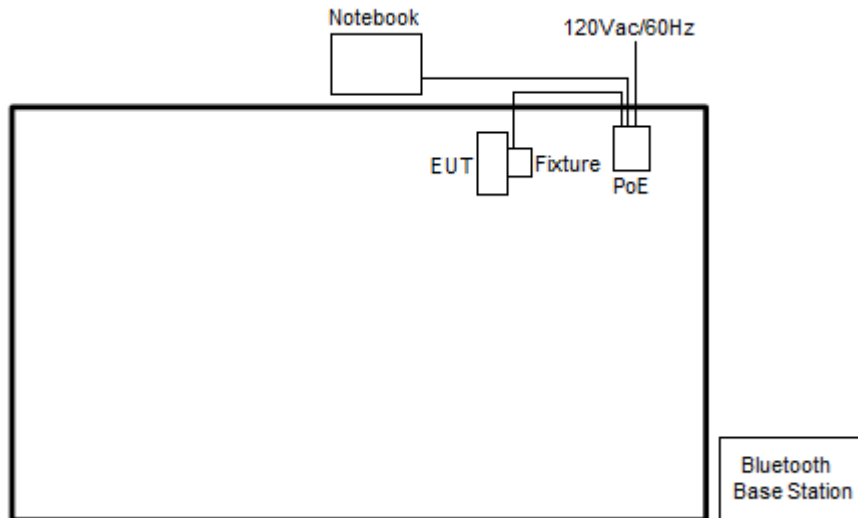
<WLAN Tx Mode>



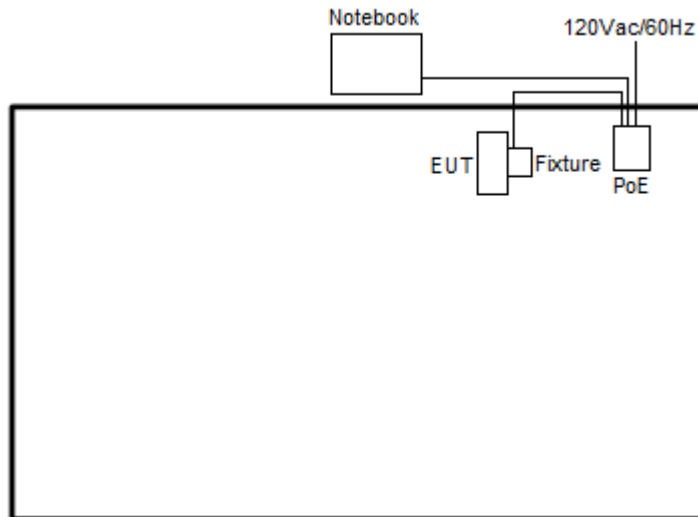
<AC Conducted Emission for WLAN (2.4GHz) Link Mode>



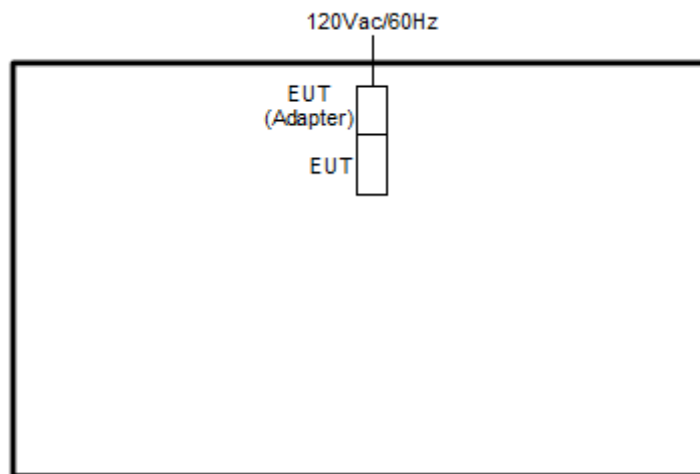
<AC Conducted Emission for BT Tx Mode>



<AC Conducted Emission for BT LE Tx Mode>



<Receiver Radiated/Conducted Emission Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Ubiquiti AP Router	Ubiquiti	AFi-R	N/A	N/A	N/A
2.	Fixture	N/A	N/A	N/A	N/A	N/A
3.	I Phone	Apple	I Phone6S	N/A	N/A	N/A
4.	PoE	Ubiquiti	GP-A240-050G	N/A	N/A	POE
5.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

2.5 EUT Operation Test Setup

For WLAN function, programmed RF utility, “cart” installed in the notebook make the EUT provide functions like channel selection and power level for continuous transmitting and receiving signals.

2.6 Measurement Results Explanation Example

For all conducted test items:

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

Example:

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

Offset = RF cable loss + attenuator factor.

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

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

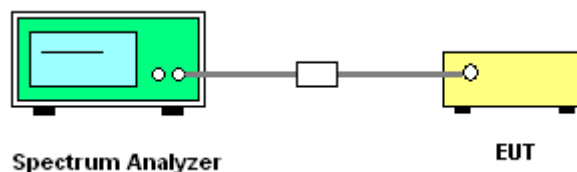
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

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

3.1.4 Test Setup

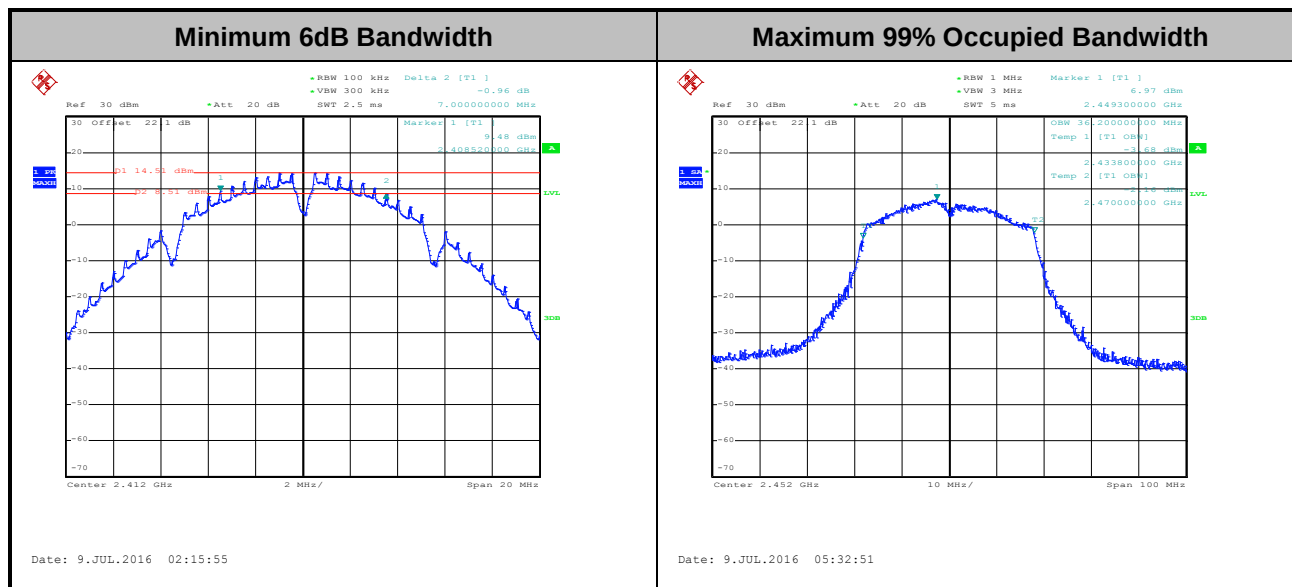




3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.

<PTP & PTMP>



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.

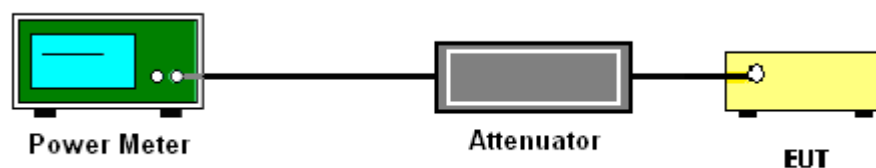
3.2.2 Measuring Instruments

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 v04 section 9.1.2 PKPM1 Peak power meter method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.
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.

3.2.6 Test Result of Average output Power (Reporting Only)

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
7. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

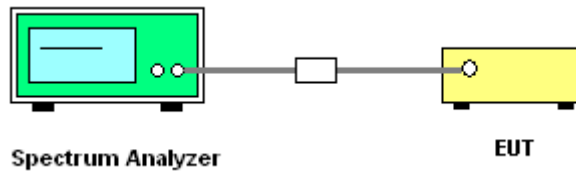
If measurements performed using method (2) plus $10 \log(N)$ exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

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)

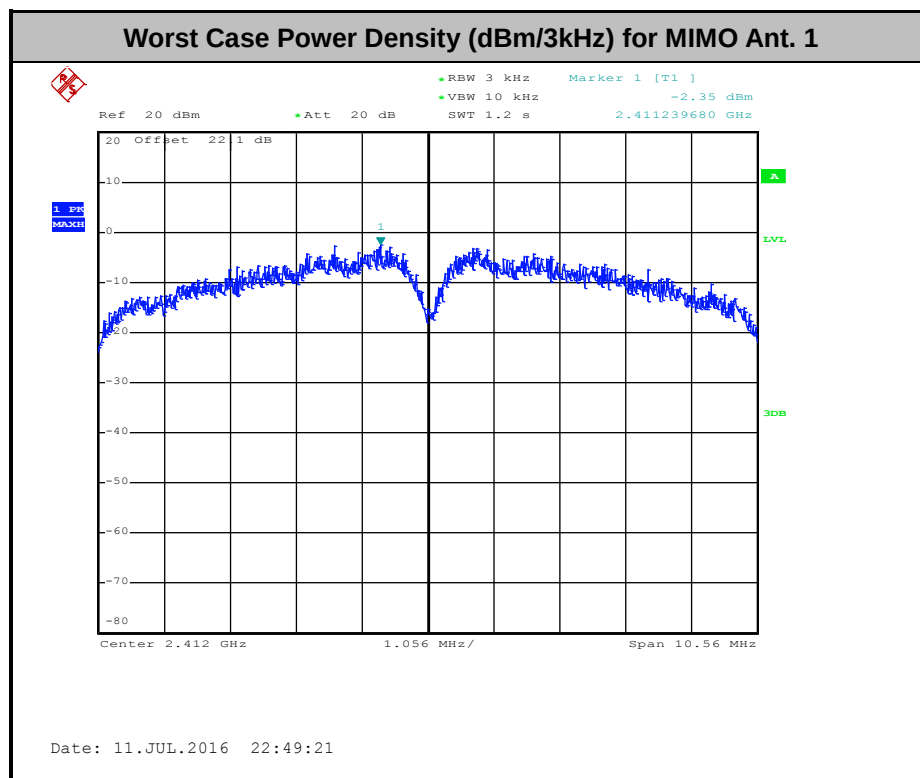
3.3.4 Test Setup



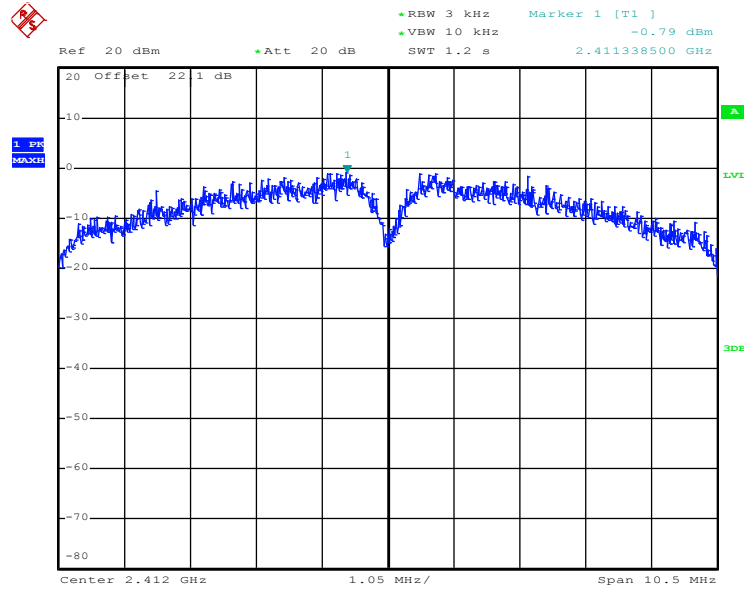
3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

<PTP & PTMP>

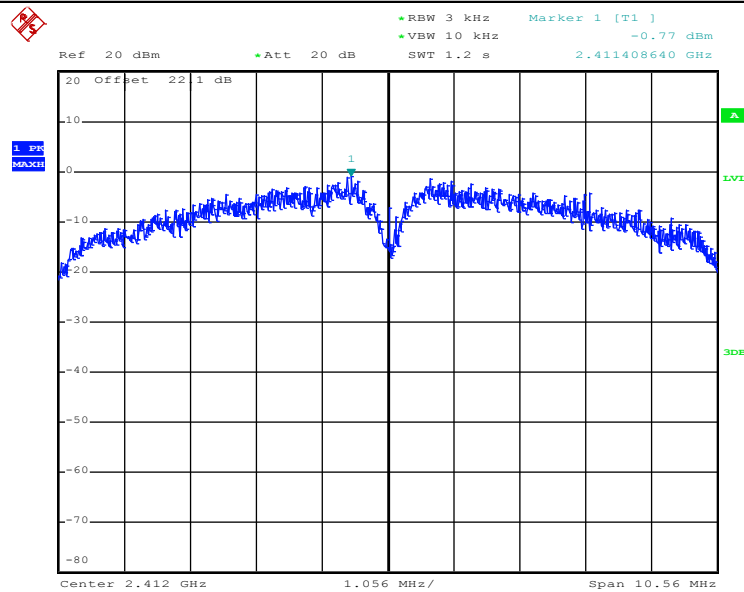


Worst Case Power Density (dBm/3kHz) for MIMO Ant. 2



Date: 11.JUL.2016 22:50:08

Worst Case Power Density (dBm/3kHz) for MIMO Ant. 3



Date: 11.JUL.2016 22:51:05

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 NCC LP0002 section 2.7, must also comply with the radiated emission limits specified in NCC LP0002 section 2.8.

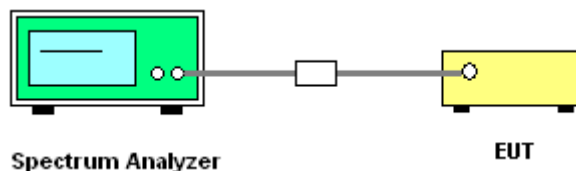
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

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

3.4.4 Test Setup





3.4.5 Test Result of Conducted Band Edges and Spurious Emission

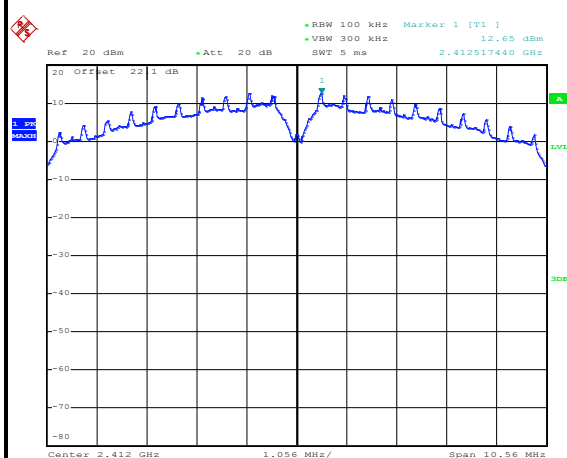
<PTP & PTMP>

Number of TX = 3, Ant. 1 (Measured)

Number of TX	3	Ant. :	1
Test Mode :	802.11b	Temperature :	21~25℃
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	PH Yang

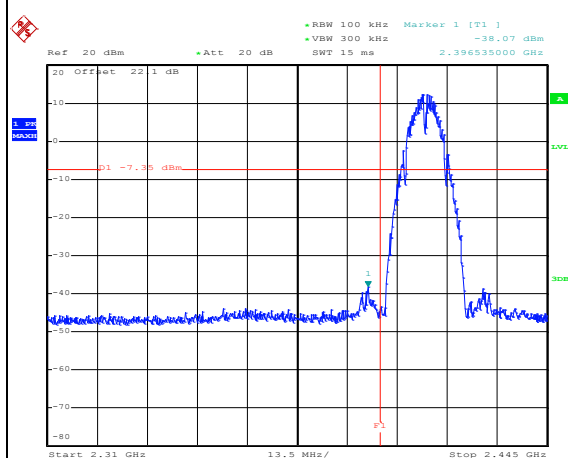
WLAN 802.11b Channel 01

100kHz PSD reference Level



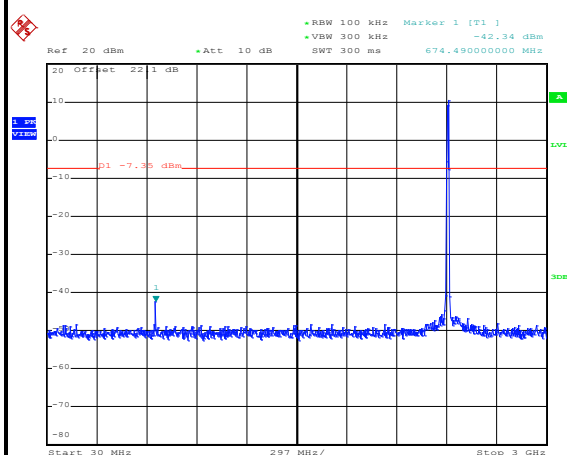
Date: 9.JUL.2016 01:49:32

Low Channel Plot



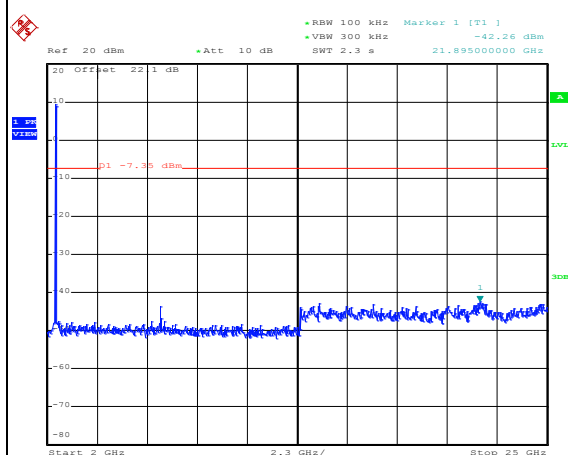
Date: 9.JUL.2016 01:50:00

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 01:51:13

Spurious Emission 2GHz~25GHz



Date: 9.JUL.2016 01:51:21

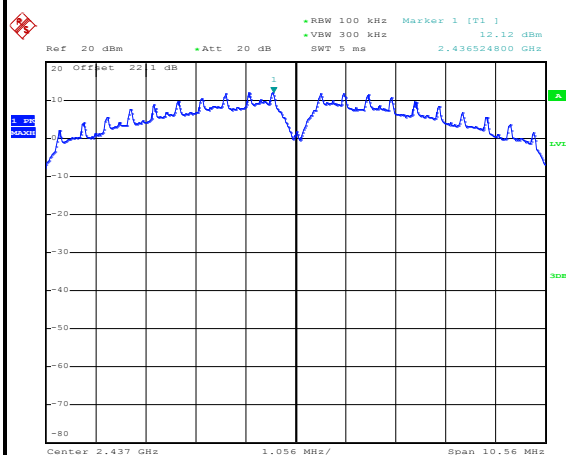


Number of TX :	3	Ant. :	1
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	PH Yang

WLAN 802.11b Channel 06

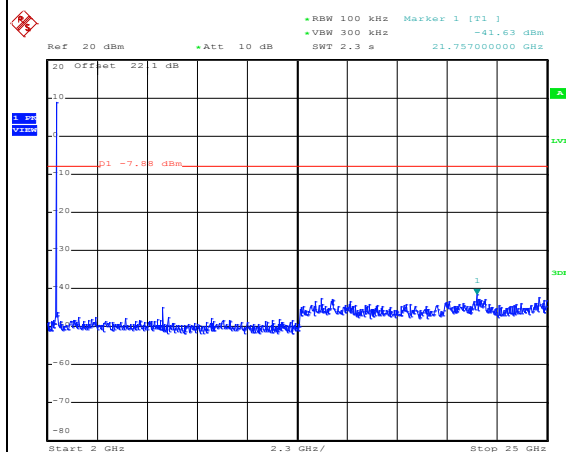
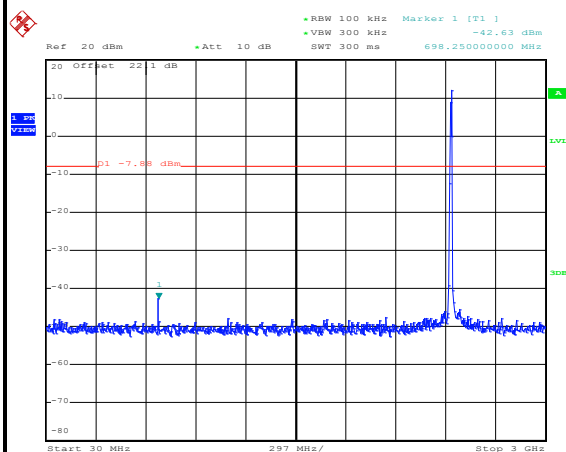
100kHz PSD reference Level

Mid Channel Plot



Spurious Emission 30MHz~3GHz

Spurious Emission 2GHz~25GHz

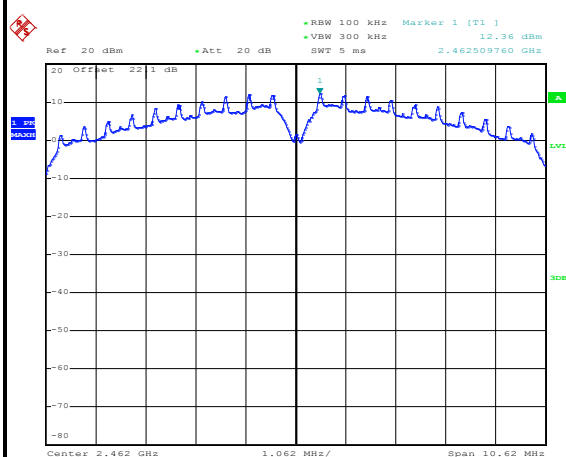




Number of TX :	3	Ant. :	1
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	PH Yang

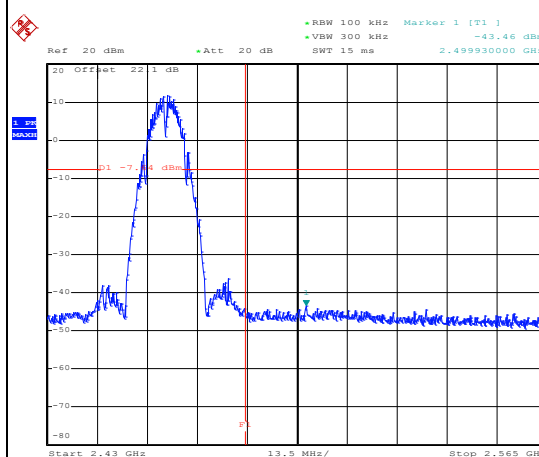
WLAN 802.11b Channel 11

100kHz PSD reference Level



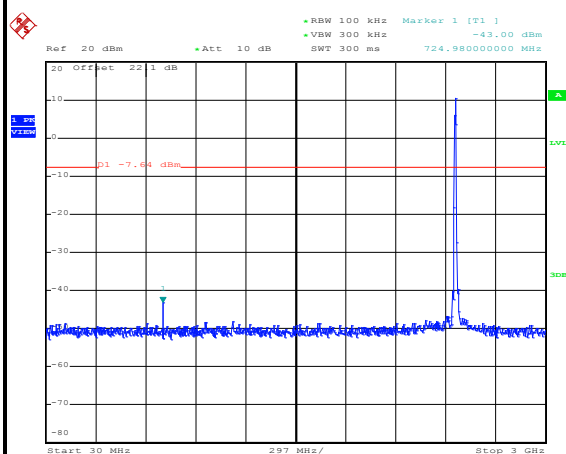
Date: 9.JUL.2016 02:05:34

High Channel Plot



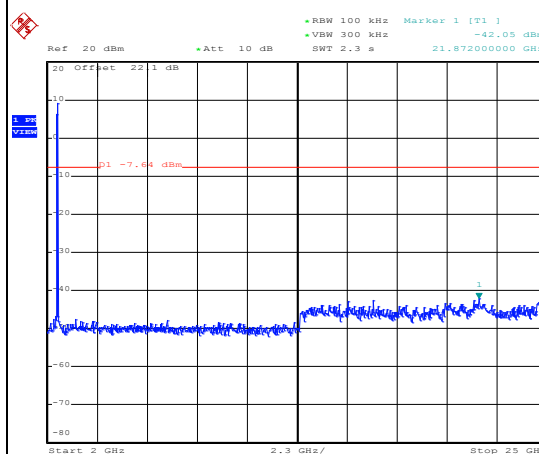
Date: 9.JUL.2016 02:05:56

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 02:07:39

Spurious Emission 2GHz~25GHz



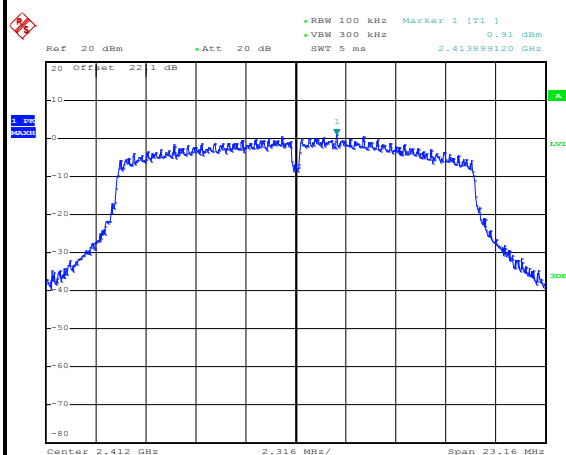
Date: 9.JUL.2016 02:07:48



Number of TX :	3	Ant. :	1
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	PH Yang

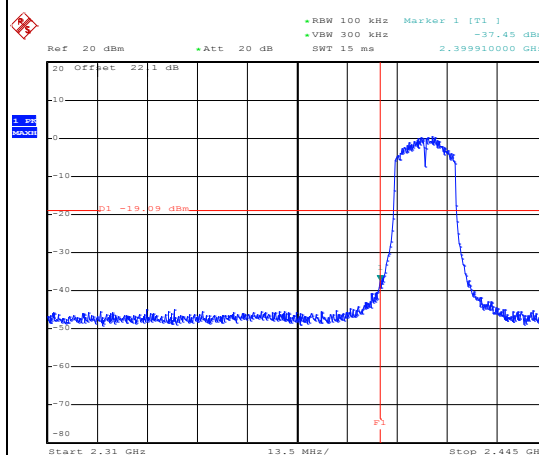
WLAN 802.11g Channel 01

100kHz PSD reference Level



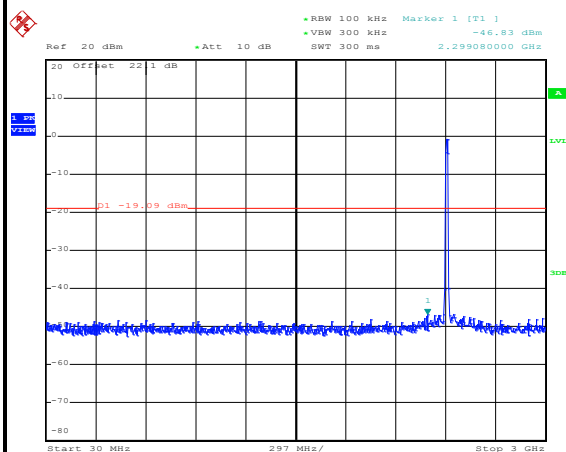
Date: 9.JUL.2016 02:58:18

Low Channel Plot



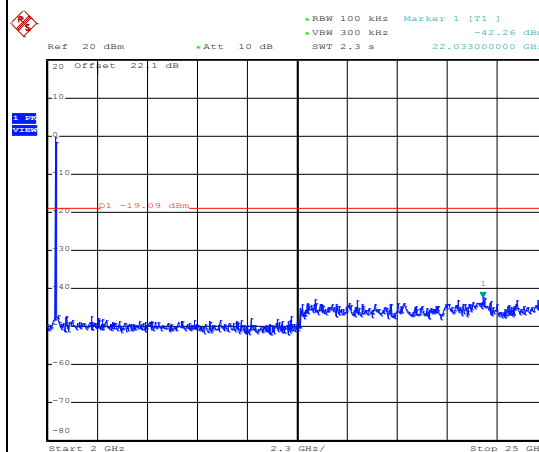
Date: 9.JUL.2016 02:59:09

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 02:59:20

Spurious Emission 2GHz~25GHz



Date: 9.JUL.2016 02:59:29

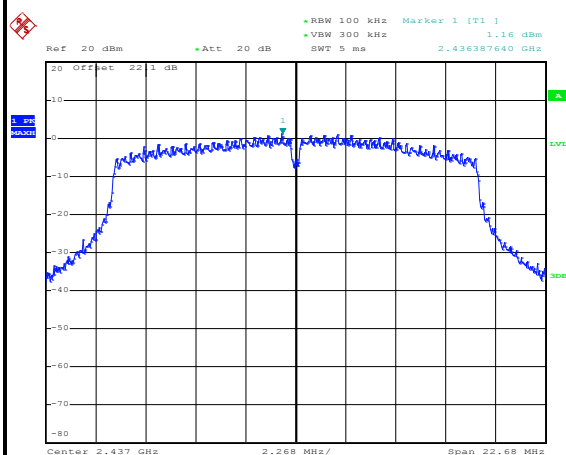


Number of TX :	3	Ant. :	1
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	PH Yang

WLAN 802.11g Channel 06

100kHz PSD reference Level

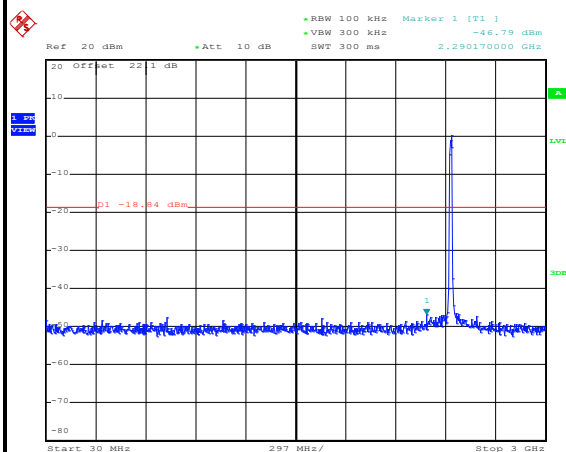
Mid Channel Plot



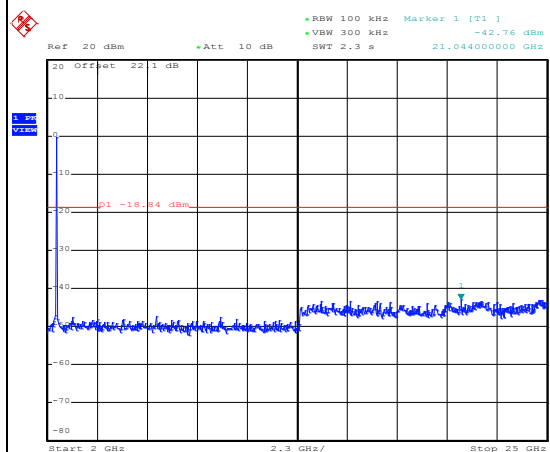
Date: 9.JUL.2016 03:08:35

Spurious Emission 30MHz~3GHz

Spurious Emission 2GHz~25GHz



Date: 9.JUL.2016 03:09:10



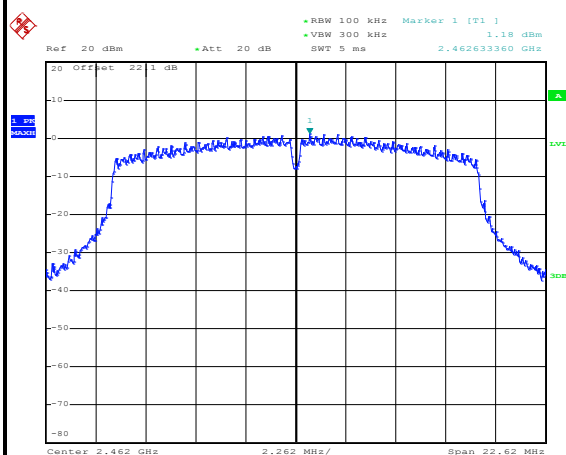
Date: 9.JUL.2016 03:09:19



Number of TX :	3	Ant. :	1
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	PH Yang

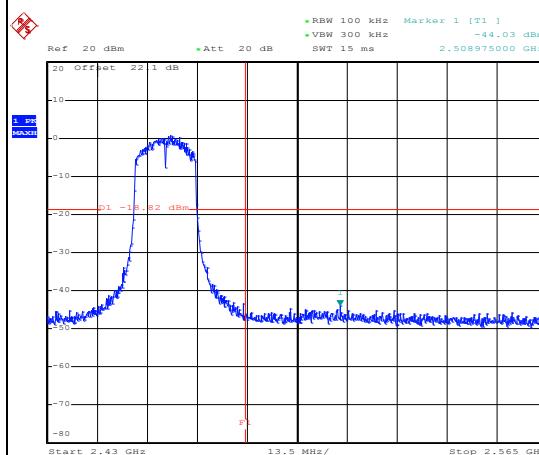
WLAN 802.11g Channel 11

100kHz PSD reference Level



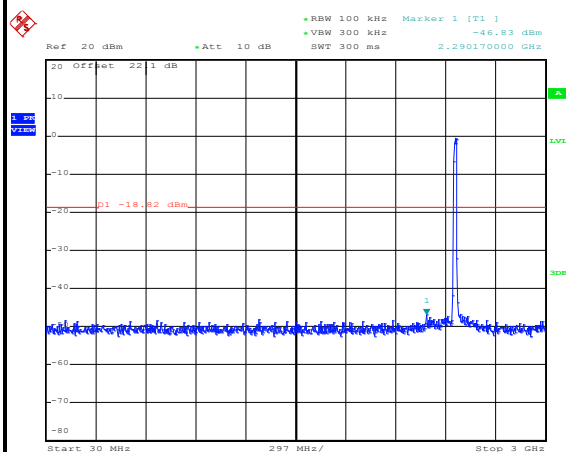
Date: 9.JUL.2016 03:11:47

High Channel Plot



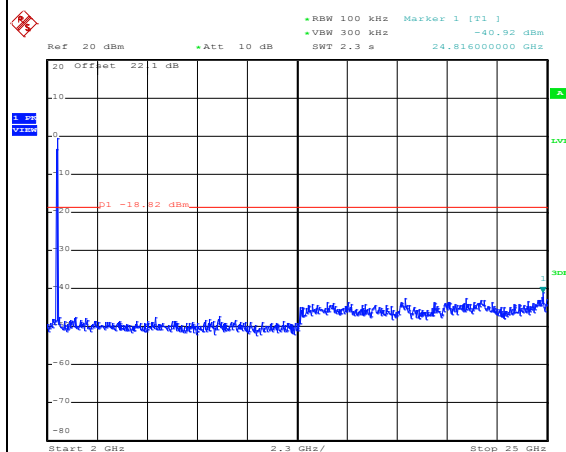
Date: 9.JUL.2016 03:12:00

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 03:12:12

Spurious Emission 2GHz~25GHz



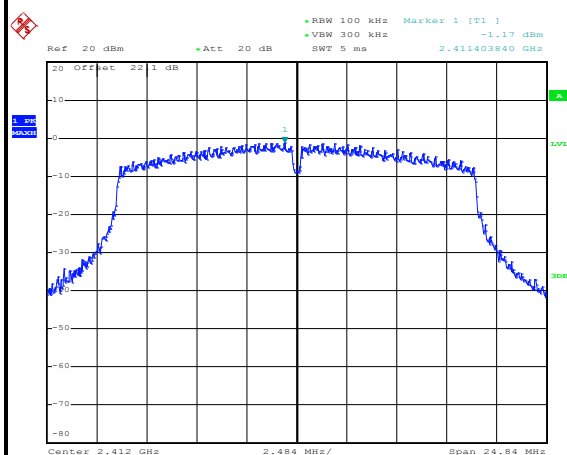
Date: 9.JUL.2016 03:12:20



Number of TX :	3	Ant. :	1
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	PH Yang

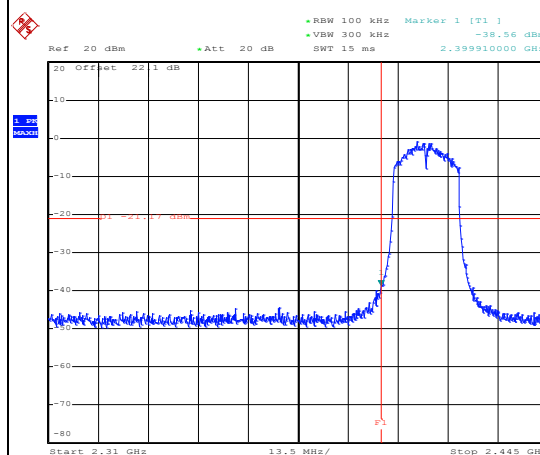
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



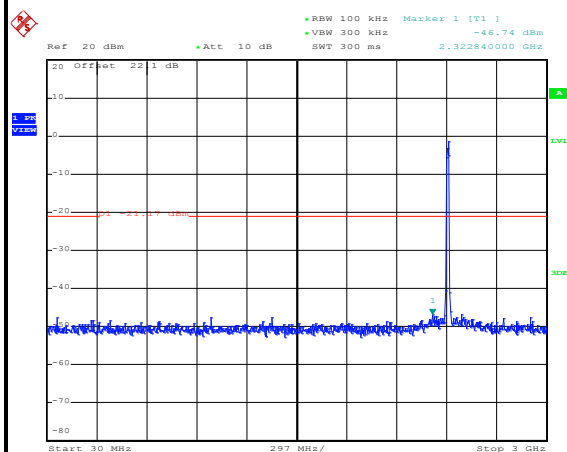
Date: 9.JUL.2016 04:14:52

Low Channel Plot



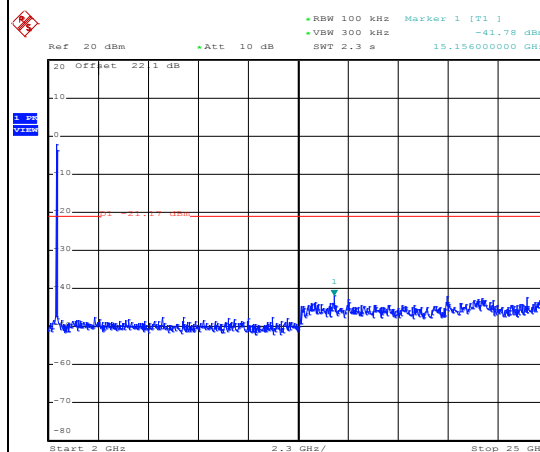
Date: 9.JUL.2016 04:15:35

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 04:15:46

Spurious Emission 2GHz~25GHz



Date: 9.JUL.2016 04:15:54

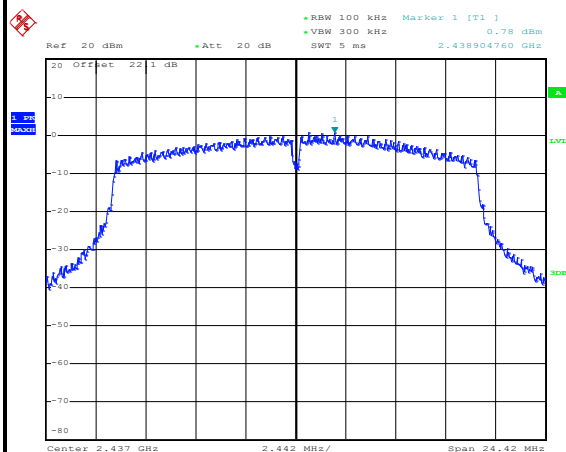


Number of TX :	3	Ant. :	1
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	PH Yang

WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level

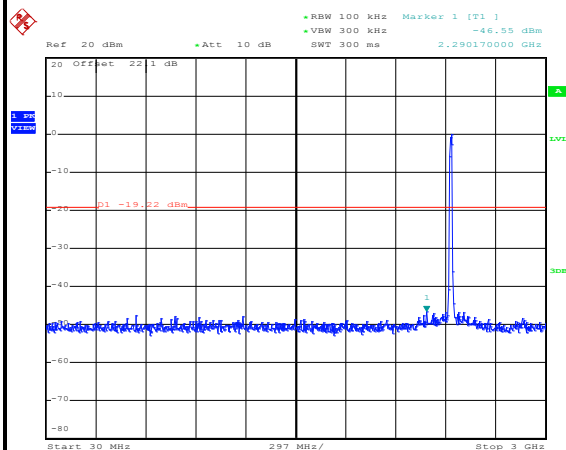
Mid Channel Plot



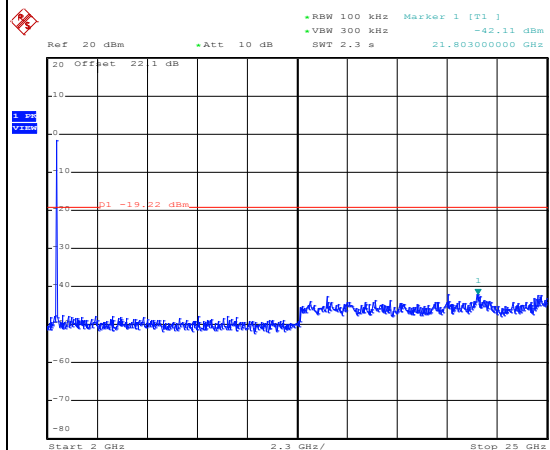
Date: 9.JUL.2016 04:11:49

Spurious Emission 30MHz~3GHz

Spurious Emission 2GHz~25GHz



Date: 9.JUL.2016 04:12:22



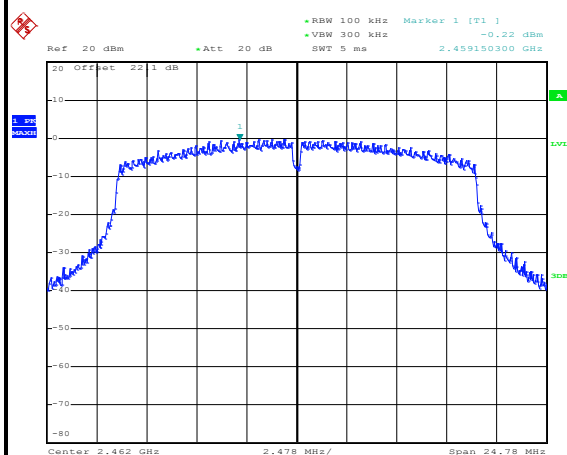
Date: 9.JUL.2016 04:12:31



Number of TX :	3	Ant. :	1
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	PH Yang

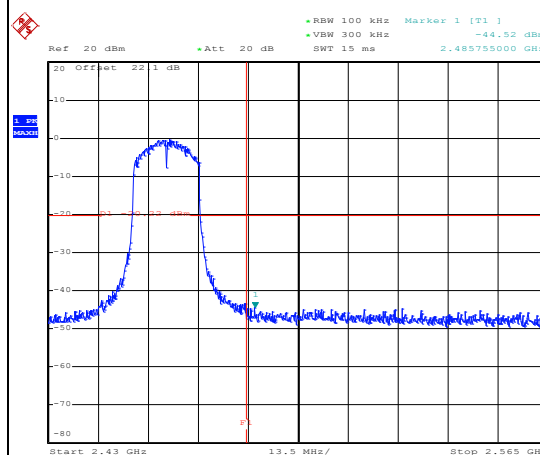
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



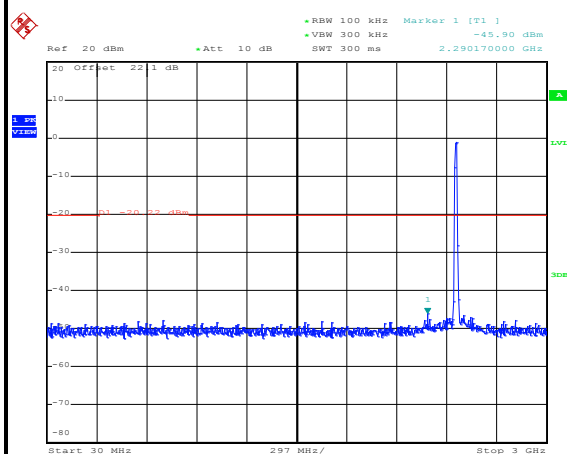
Date: 9.JUL.2016 04:09:13

High Channel Plot



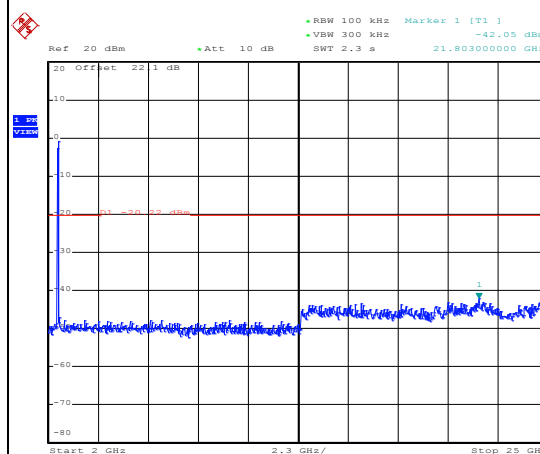
Date: 9.JUL.2016 04:09:29

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 04:09:40

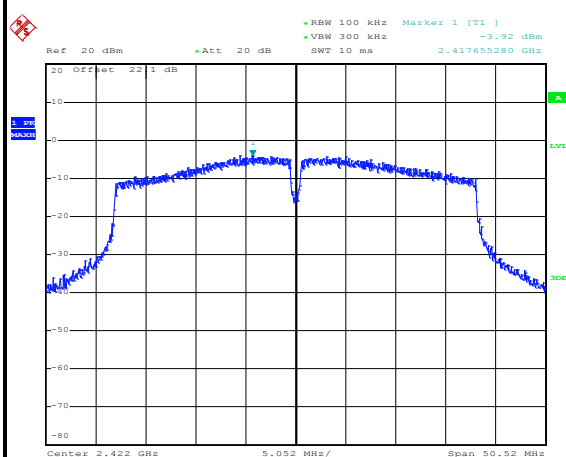
Spurious Emission 2GHz~25GHz



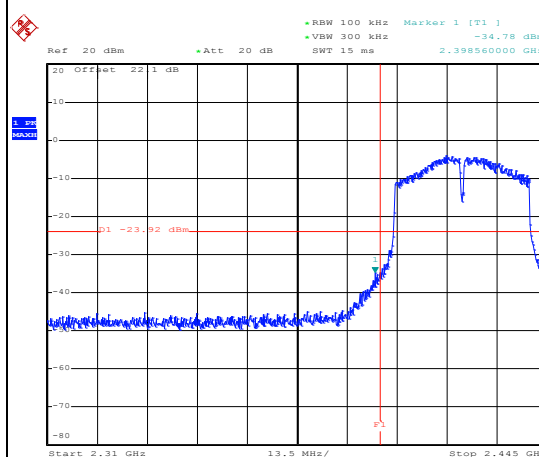
Date: 9.JUL.2016 04:09:49



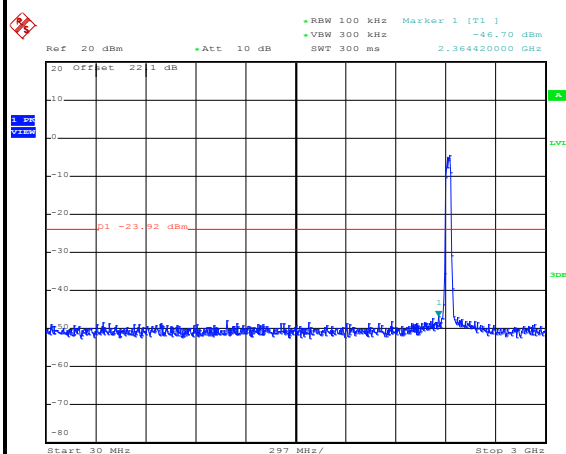
Number of TX :	3	Ant. :	1
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	03	Test Engineer :	PH Yang

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

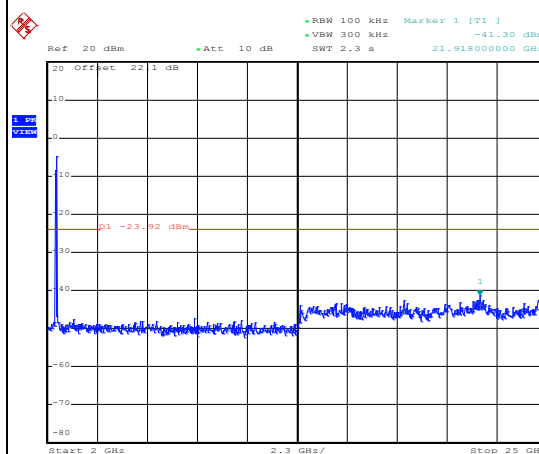
Date: 9.JUL.2016 04:24:16

Low Channel Plot

Date: 9.JUL.2016 04:24:28

Spurious Emission 30MHz~3GHz

Date: 9.JUL.2016 04:24:40

Spurious Emission 2GHz~25GHz

Date: 9.JUL.2016 04:24:48

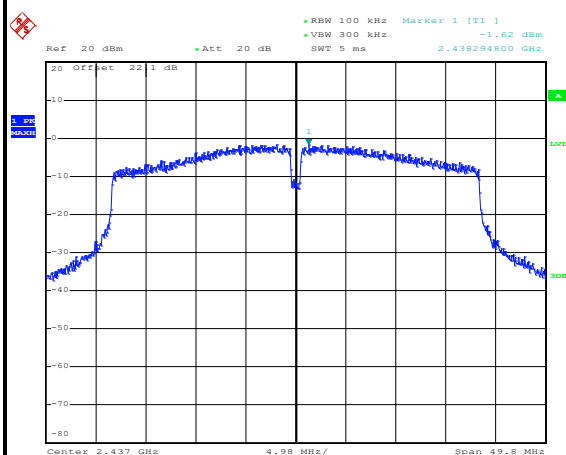


Number of TX :	3	Ant. :	1
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	PH Yang

WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level

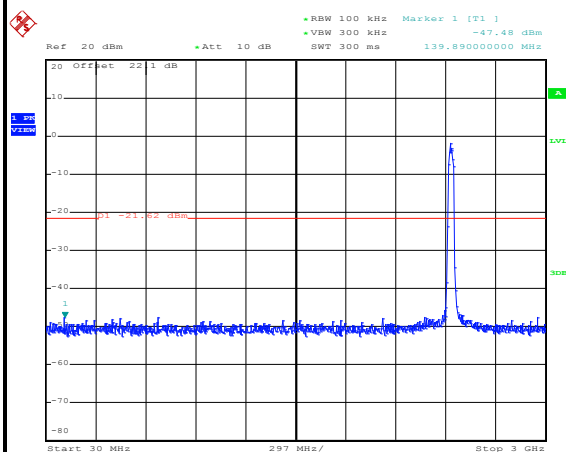
Mid Channel Plot



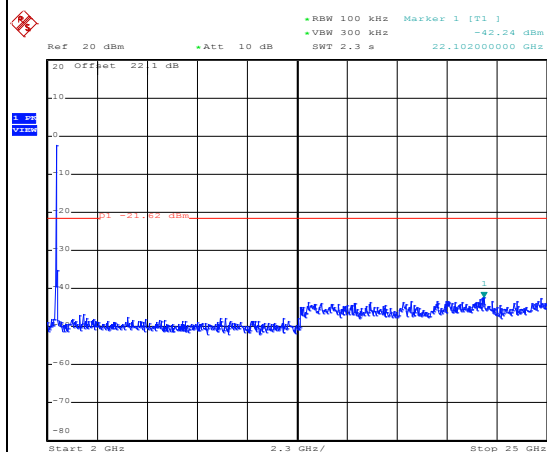
Date: 9.JUL.2016 04:27:43

Spurious Emission 30MHz~3GHz

Spurious Emission 2GHz~25GHz



Date: 9.JUL.2016 04:27:54



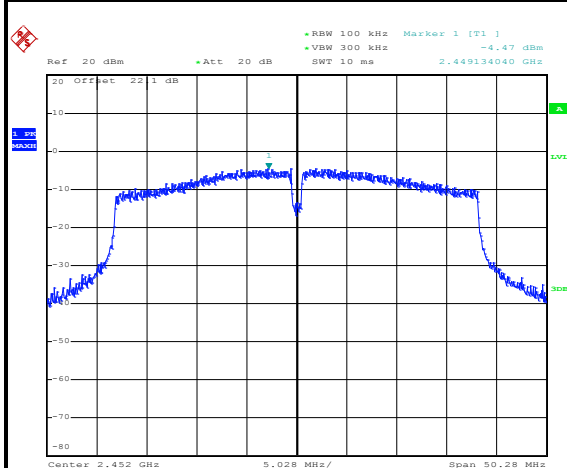
Date: 9.JUL.2016 04:28:02



Number of TX :	3	Ant. :	1
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	09	Test Engineer :	PH Yang

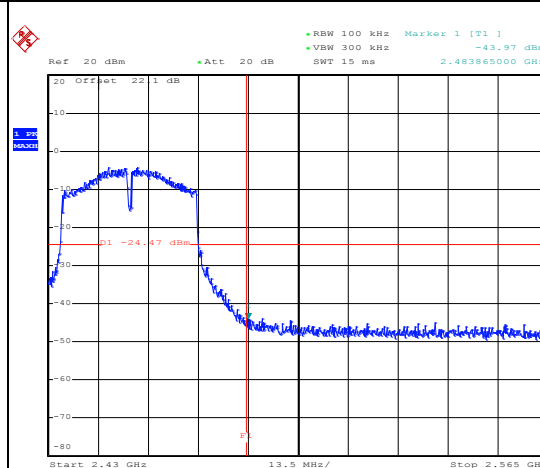
WLAN 802.11n HT40 Channel 09

100kHz PSD reference Level



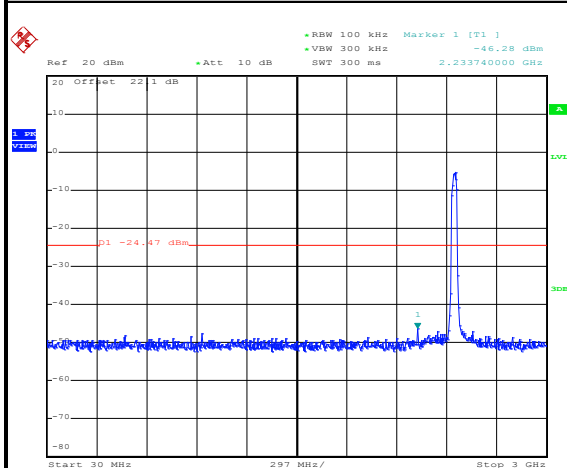
Date: 9.JUL.2016 04:32:47

High Channel Plot



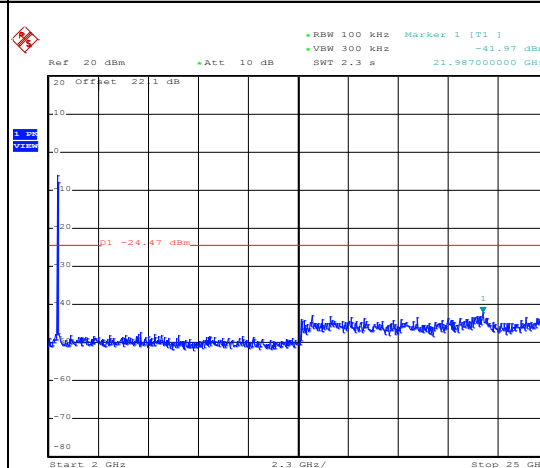
Date: 9.JUL.2016 04:33:02

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 04:33:13

Spurious Emission 2GHz~25GHz



Date: 9.JUL.2016 04:33:22

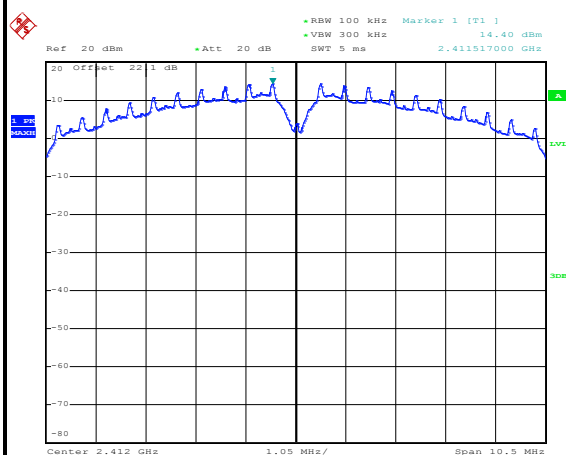


Number of TX = 3, Ant. 2 (Measured)

Number of TX :	3	Ant. :	2
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	PH Yang

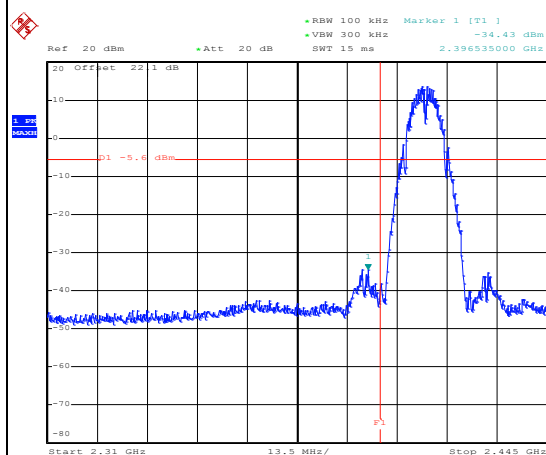
WLAN 802.11b Channel 01

100kHz PSD reference Level



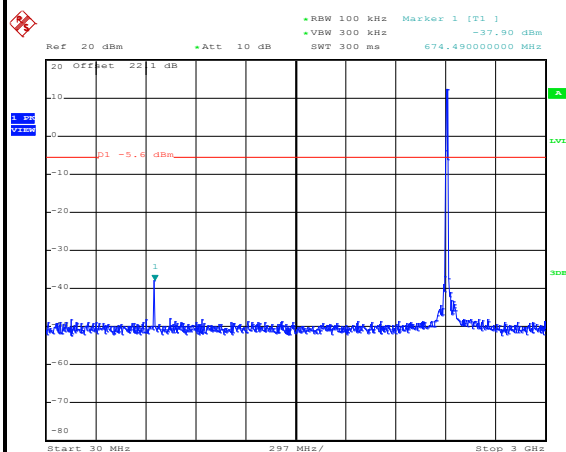
Date: 9.JUL.2016 02:17:05

Low Channel Plot



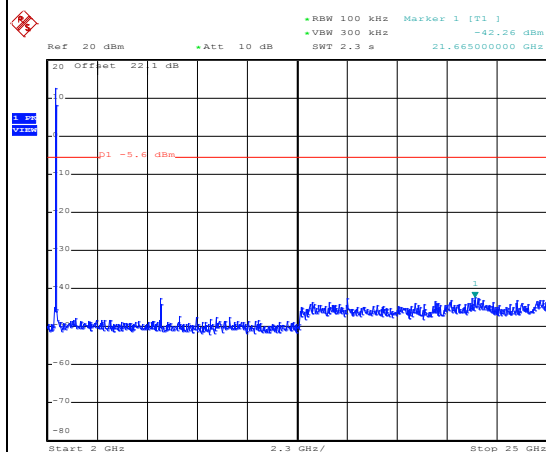
Date: 9.JUL.2016 02:17:31

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 02:25:44

Spurious Emission 2GHz~25GHz



Date: 9.JUL.2016 02:26:41

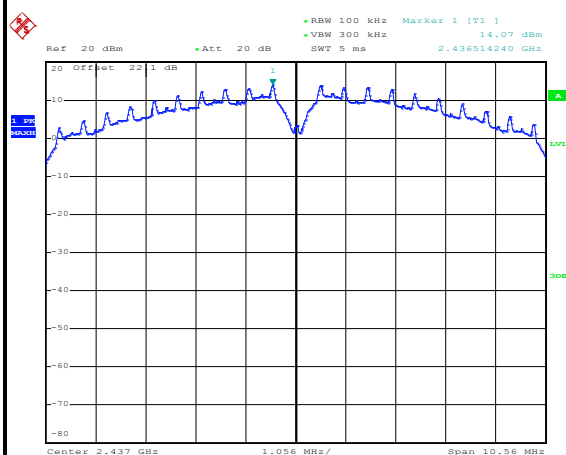


Number of TX :	3	Ant. :	2
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	PH Yang

WLAN 802.11b Channel 06

100kHz PSD reference Level

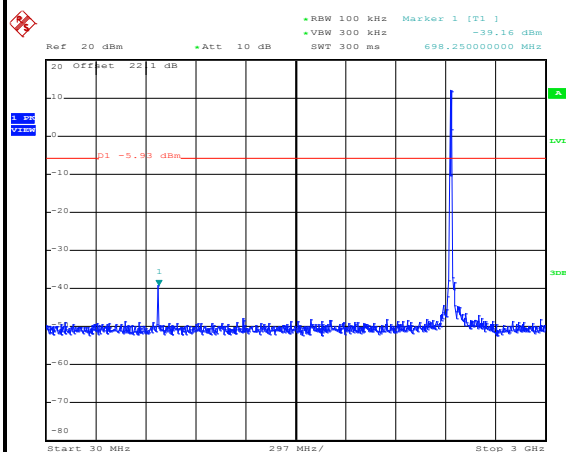
Mid Channel Plot



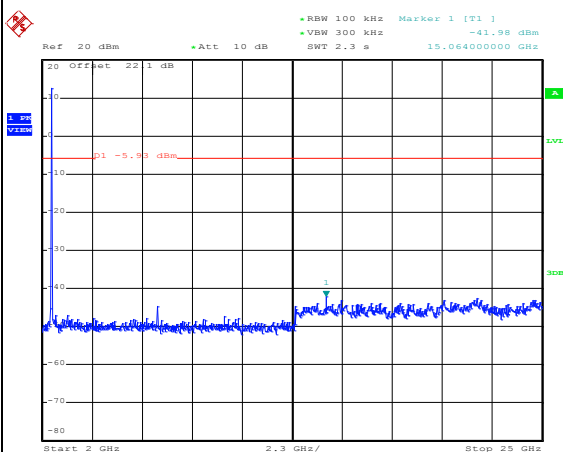
Date: 9.JUL.2016 02:13:38

Spurious Emission 30MHz~3GHz

Spurious Emission 2GHz~25GHz



Date: 9.JUL.2016 02:14:16



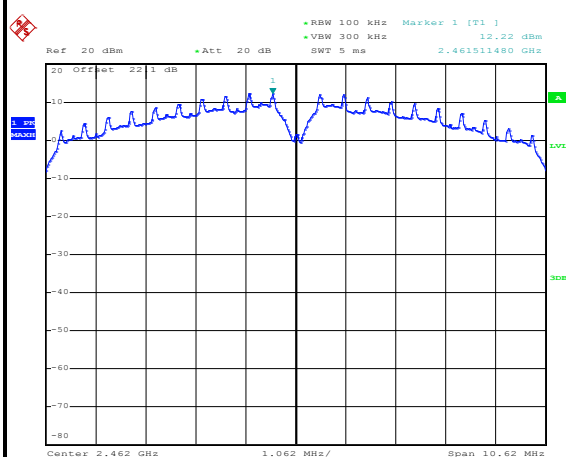
Date: 9.JUL.2016 02:14:25



Number of TX :	3	Ant. :	2
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	PH Yang

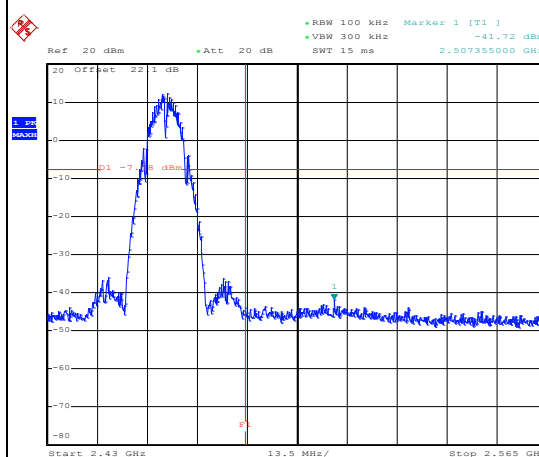
WLAN 802.11b Channel 11

100kHz PSD reference Level



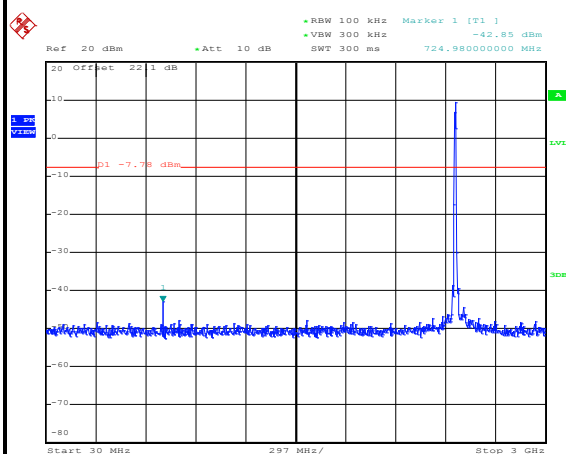
Date: 9.JUL.2016 02:10:25

High Channel Plot



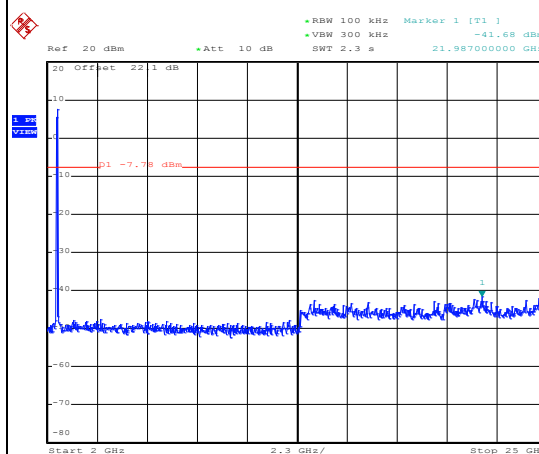
Date: 9.JUL.2016 02:10:43

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 02:11:05

Spurious Emission 2GHz~25GHz



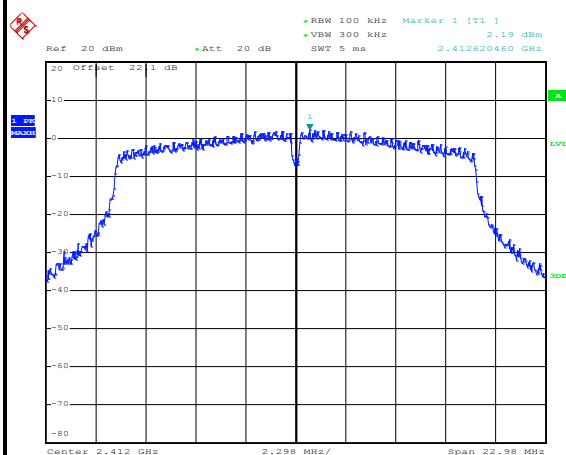
Date: 9.JUL.2016 02:11:13



Number of TX :	3	Ant. :	2
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	PH Yang

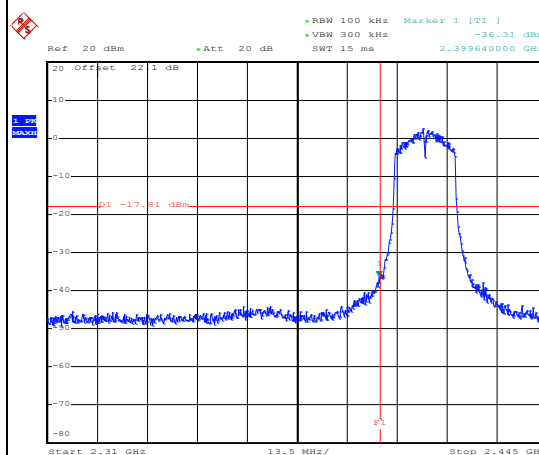
WLAN 802.11g Channel 01

100kHz PSD reference Level



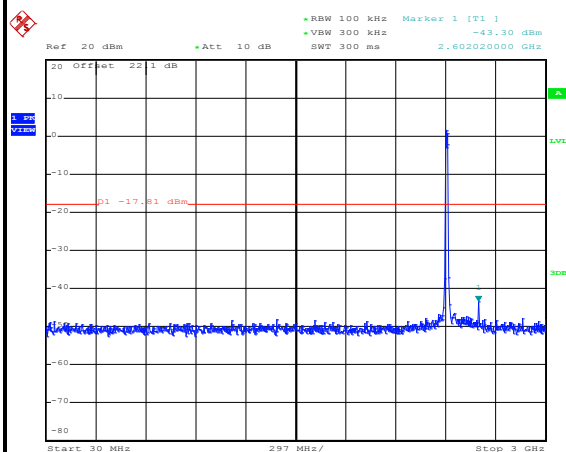
Date: 9.JUL.2016 03:32:52

Low Channel Plot



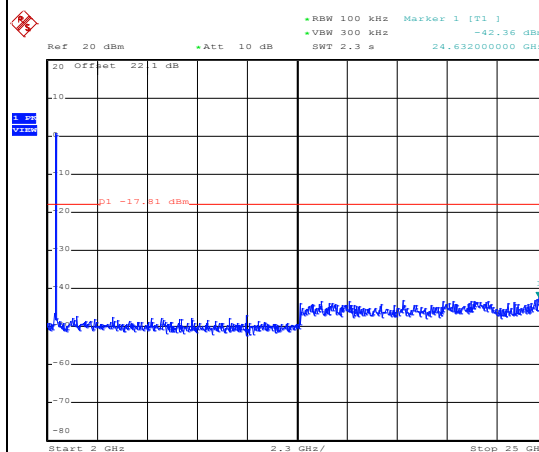
Date: 9.JUL.2016 03:33:14

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 03:33:25

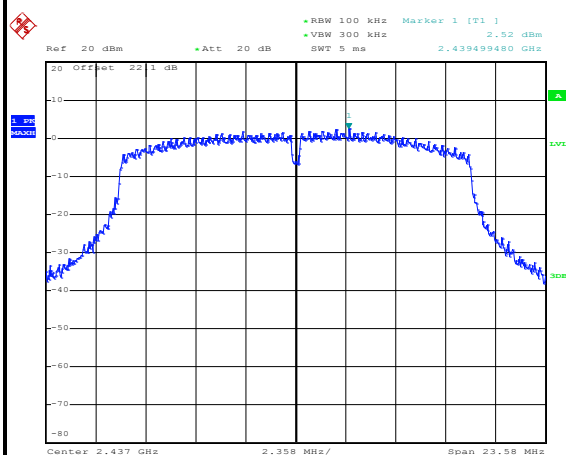
Spurious Emission 2GHz~25GHz



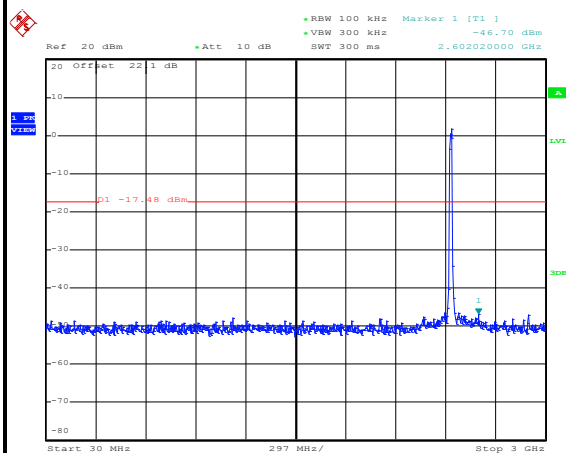
Date: 9.JUL.2016 03:33:33



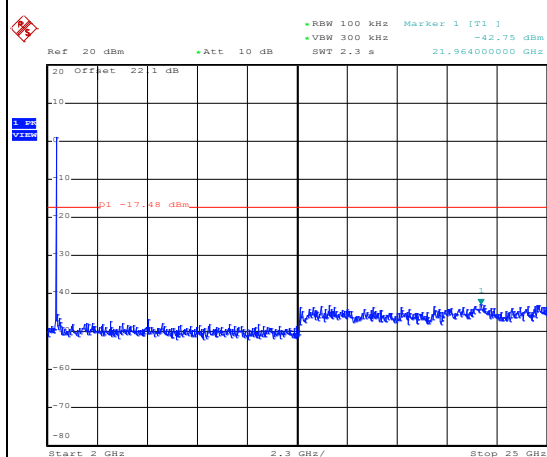
Number of TX :	3	Ant. :	2
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	PH Yang

WLAN 802.11g Channel 06**100kHz PSD reference Level****Mid Channel Plot**

Date: 9.JUL.2016 03:30:45

Spurious Emission 30MHz~3GHz**Spurious Emission 2GHz~25GHz**

Date: 9.JUL.2016 03:30:56



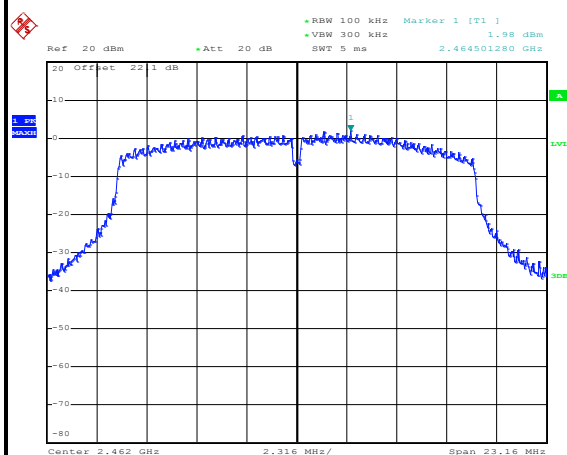
Date: 9.JUL.2016 03:31:05



Number of TX :	3	Ant. :	2
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	PH Yang

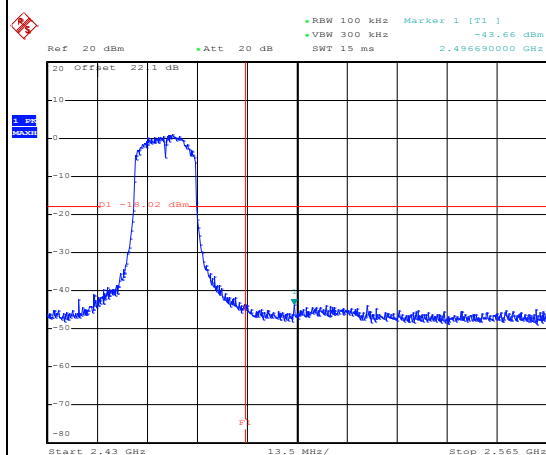
WLAN 802.11g Channel 11

100kHz PSD reference Level



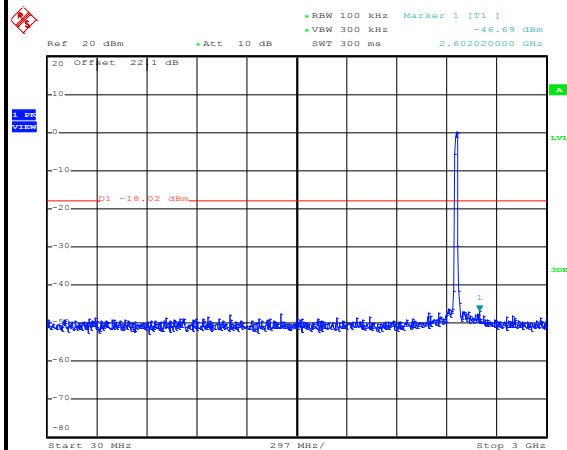
Date: 9.JUL.2016 03:27:26

High Channel Plot



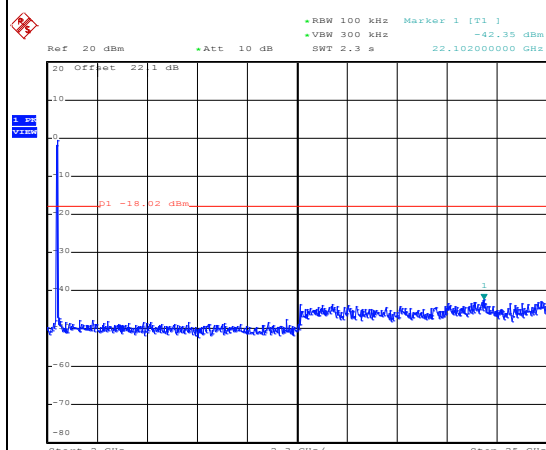
Date: 9.JUL.2016 03:27:47

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 03:27:58

Spurious Emission 2GHz~25GHz



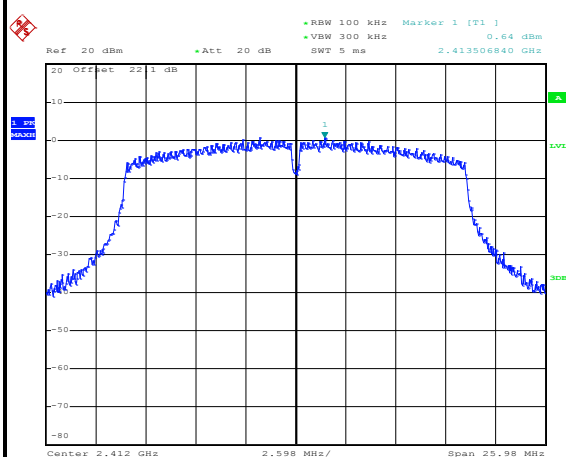
Date: 9.JUL.2016 03:28:07



Number of TX :	3	Ant. :	2
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	PH Yang

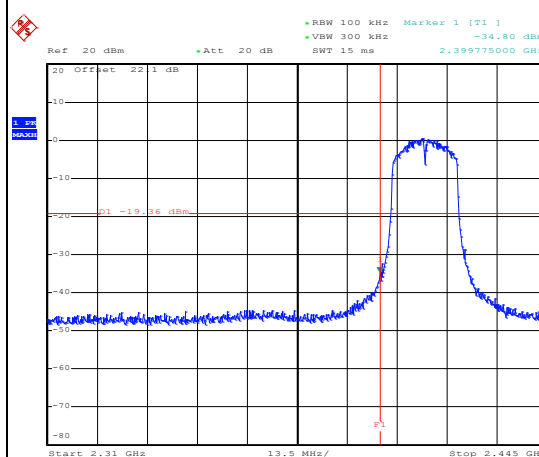
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



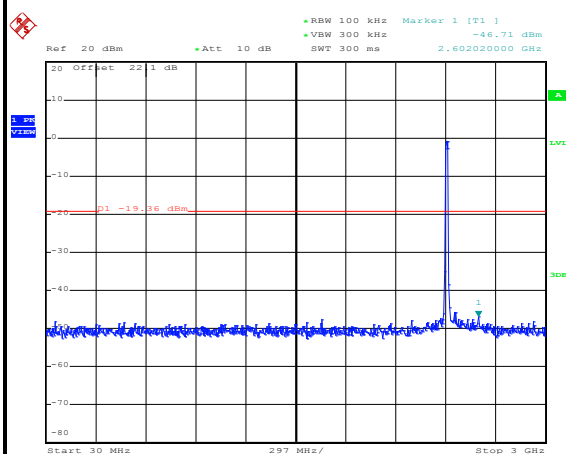
Date: 9.JUL.2016 04:18:06

Low Channel Plot



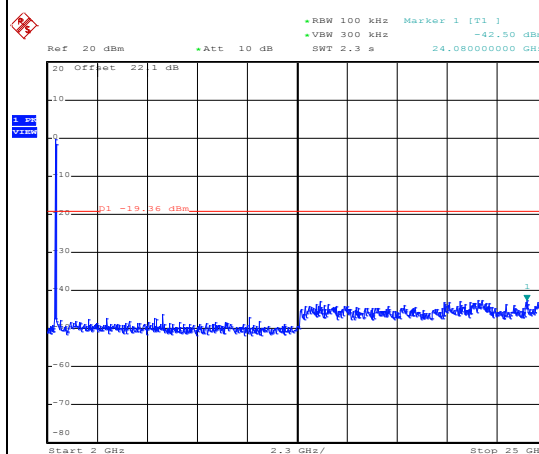
Date: 9.JUL.2016 04:18:45

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 04:18:57

Spurious Emission 2GHz~25GHz



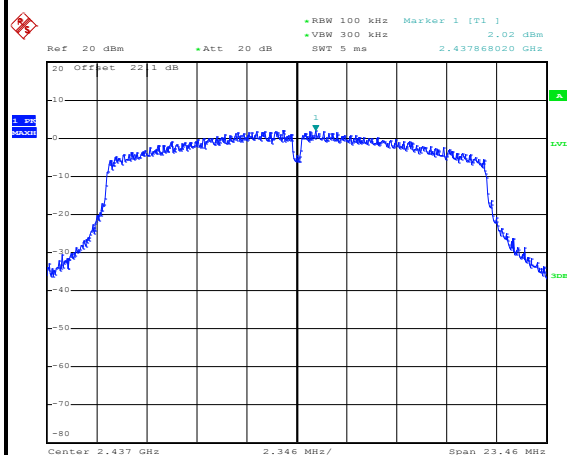
Date: 9.JUL.2016 04:19:05



Number of TX :	3	Ant. :	2
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	PH Yang

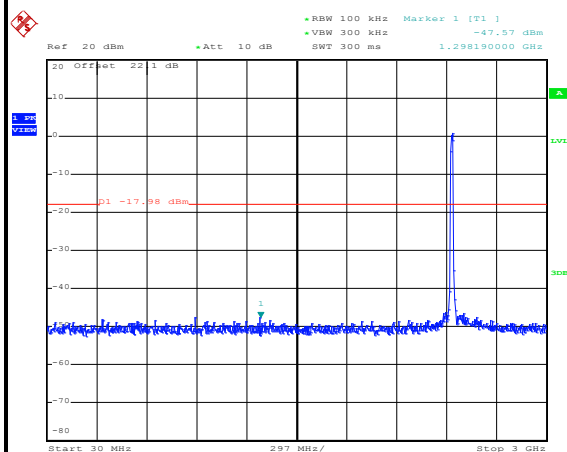
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



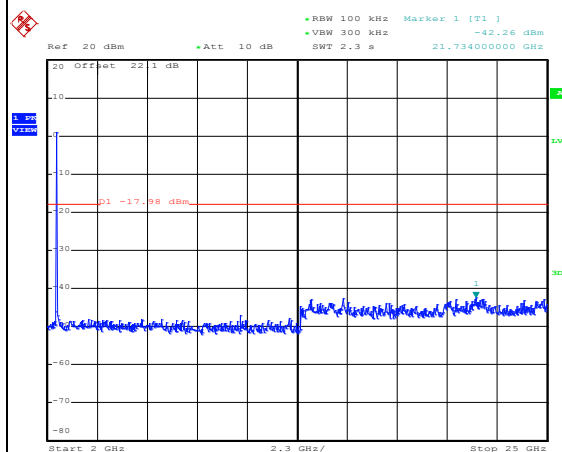
Date: 9.JUL.2016 04:03:52

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 04:04:03

Spurious Emission 2GHz~25GHz



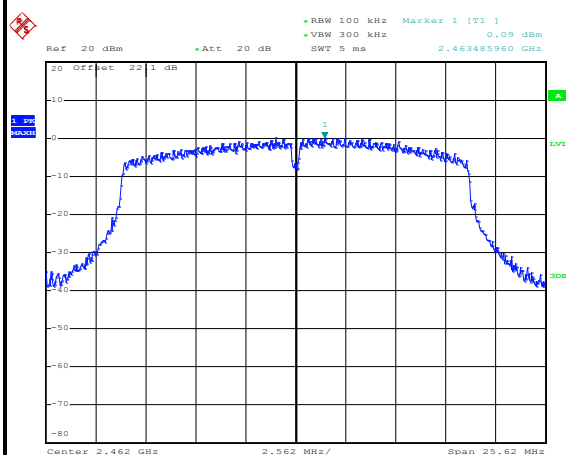
Date: 9.JUL.2016 04:04:12



Number of TX :	3	Ant. :	2
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	PH Yang

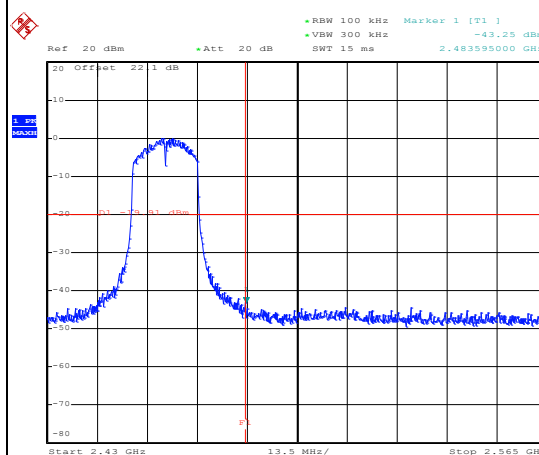
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



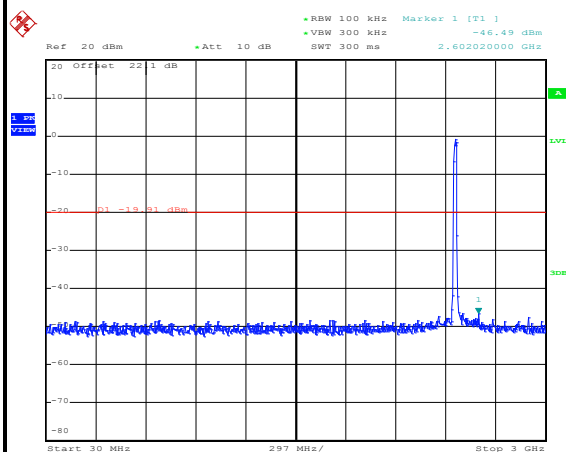
Date: 9.JUL.2016 04:06:09

High Channel Plot



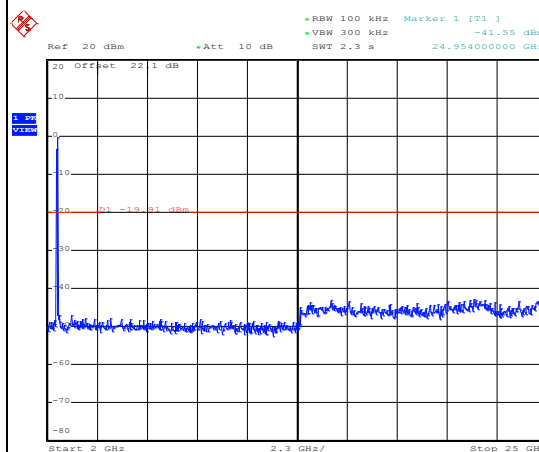
Date: 9.JUL.2016 04:06:24

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 04:06:38

Spurious Emission 2GHz~25GHz



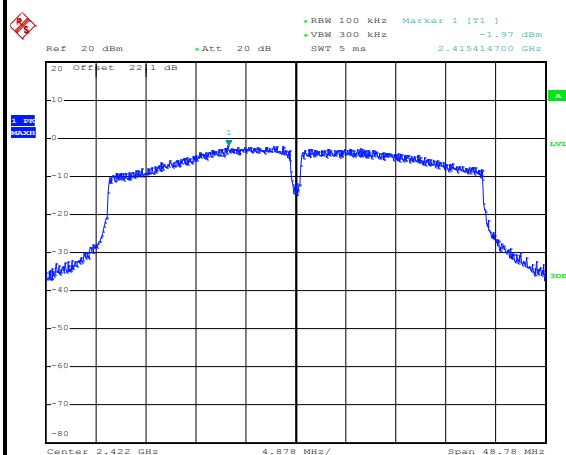
Date: 9.JUL.2016 04:06:47



Number of TX :	3	Ant. :	2
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	03	Test Engineer :	PH Yang

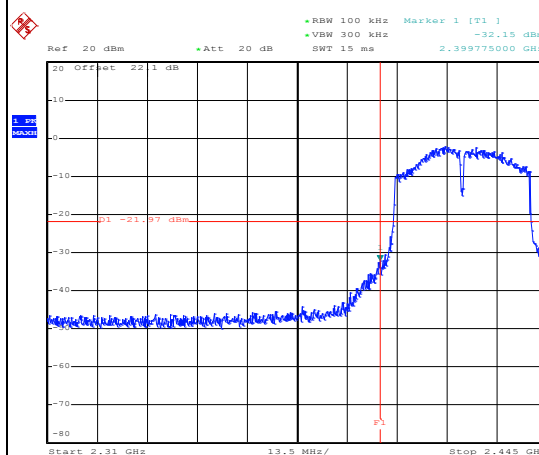
WLAN 802.11n HT40 Channel 03

100kHz PSD reference Level



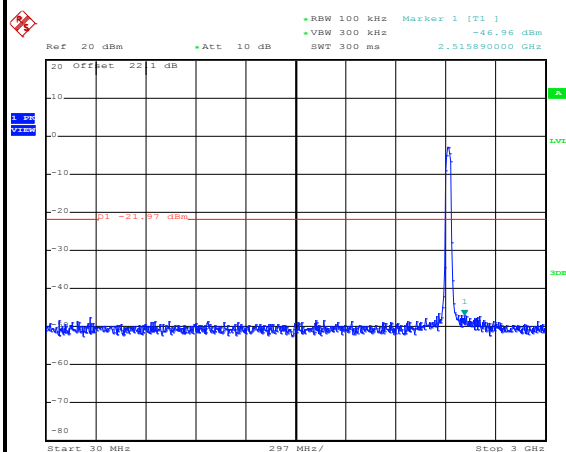
Date: 9.JUL.2016 04:47:27

Low Channel Plot



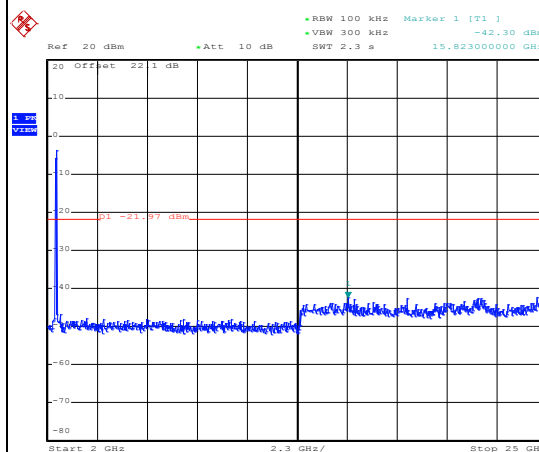
Date: 9.JUL.2016 04:47:40

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 04:47:52

Spurious Emission 2GHz~25GHz



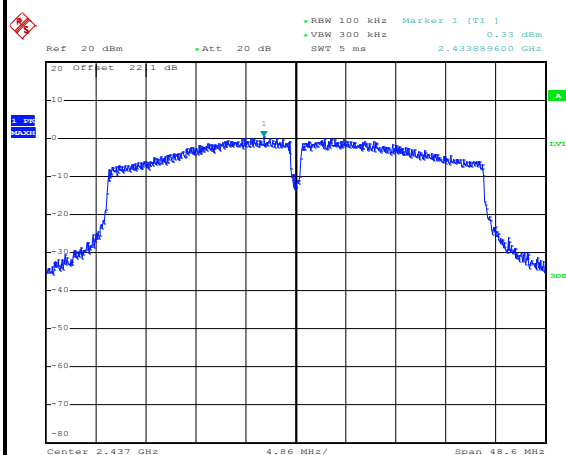
Date: 9.JUL.2016 04:48:01



Number of TX :	3	Ant. :	2
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	PH Yang

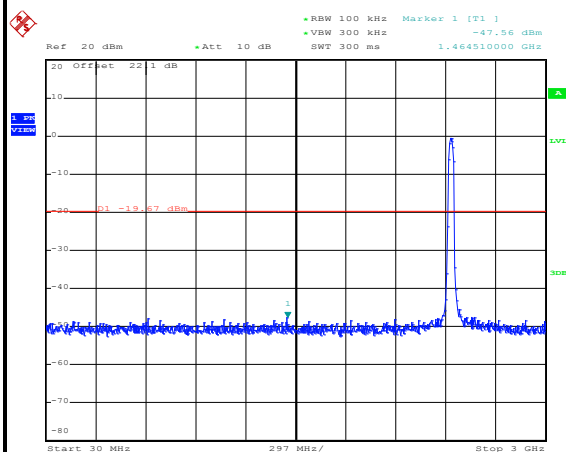
WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



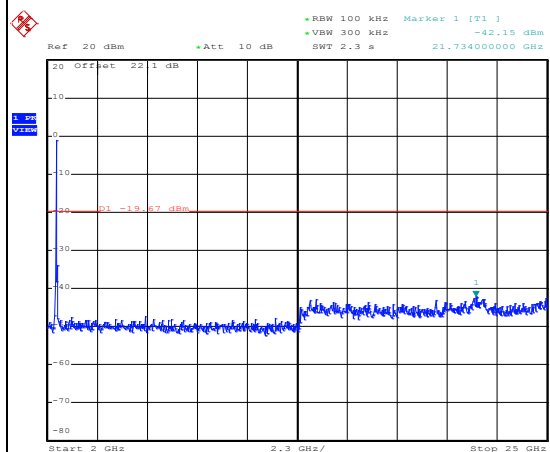
Date: 9.JUL.2016 04:44:31

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 04:44:42

Spurious Emission 2GHz~25GHz



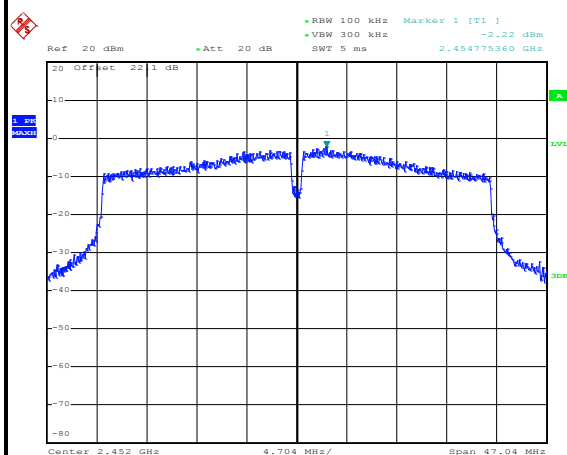
Date: 9.JUL.2016 04:44:51



Number of TX :	3	Ant. :	2
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	09	Test Engineer :	PH Yang

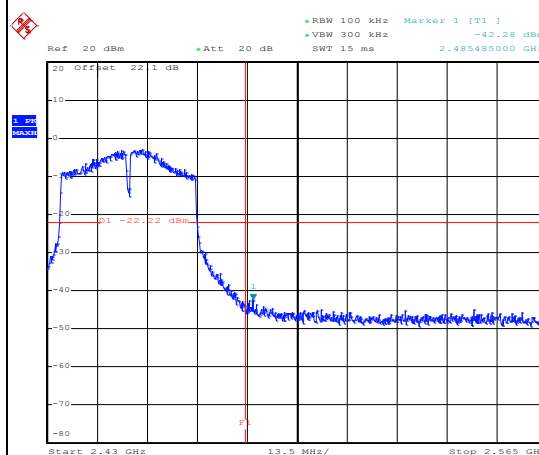
WLAN 802.11n HT40 Channel 09

100kHz PSD reference Level



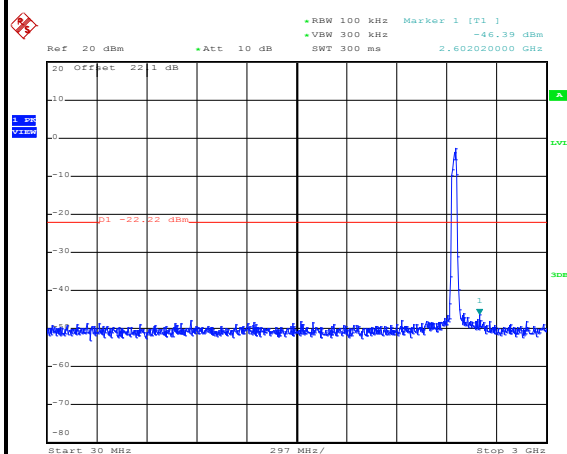
Date: 9.JUL.2016 06:35:59

High Channel Plot



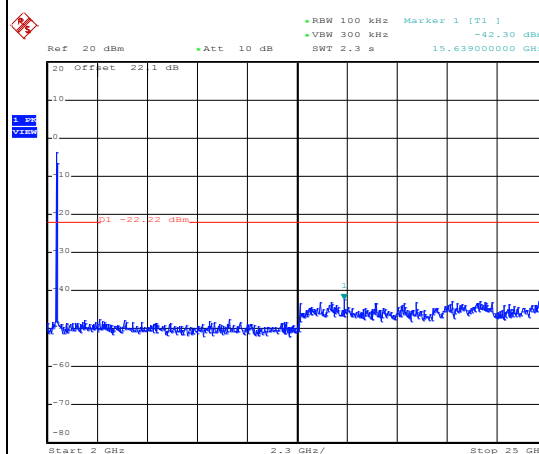
Date: 9.JUL.2016 06:36:13

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 06:36:24

Spurious Emission 2GHz~25GHz



Date: 9.JUL.2016 06:36:32

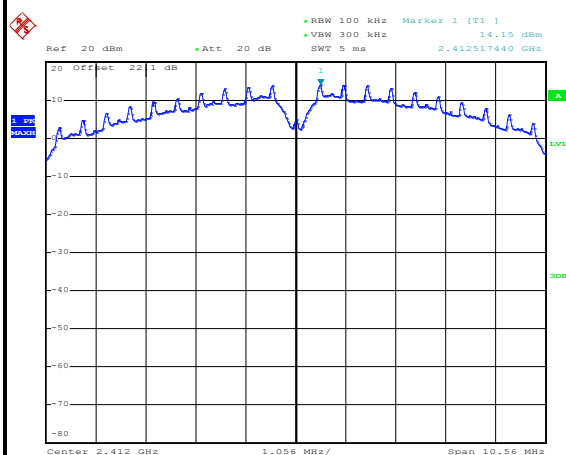


Number of TX = 3, Ant. 3 (Measured)

Number of TX :	3	Ant. :	3
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	PH Yang

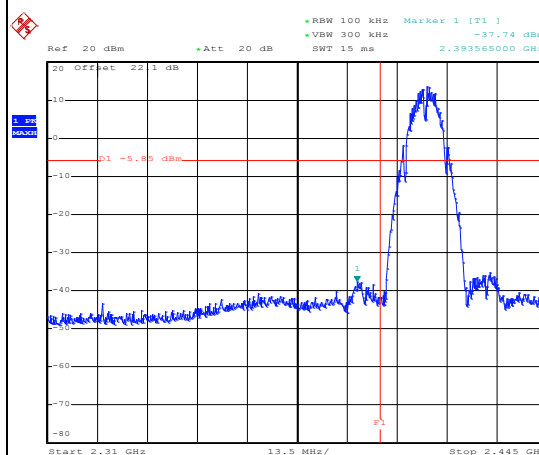
WLAN 802.11b Channel 01

100kHz PSD reference Level



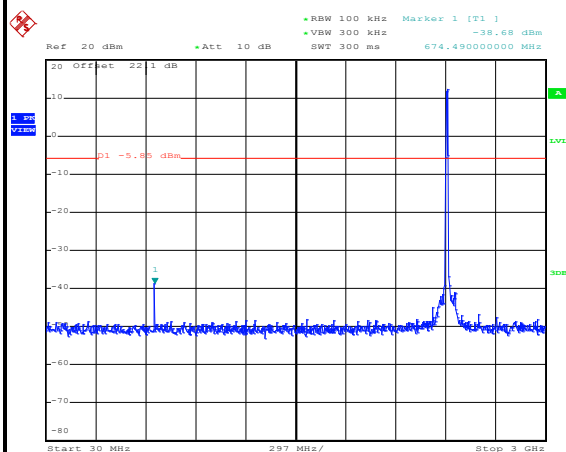
Date: 9.JUL.2016 02:35:34

Low Channel Plot



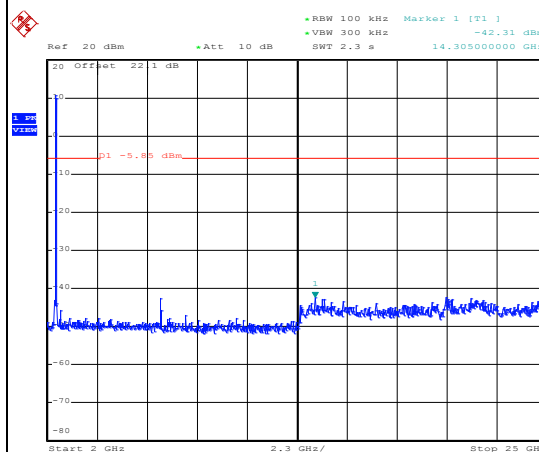
Date: 9.JUL.2016 02:35:49

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 02:36:00

Spurious Emission 2GHz~25GHz



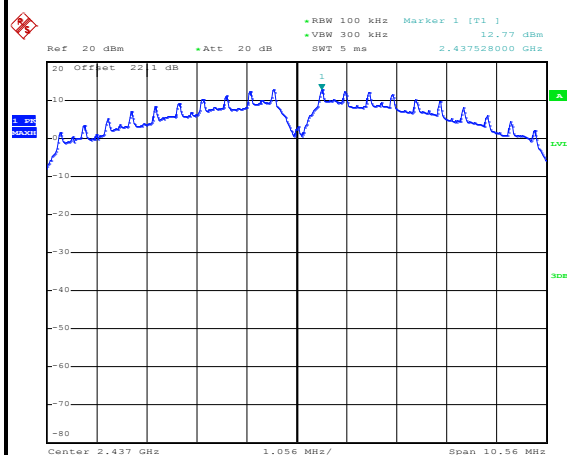
Date: 9.JUL.2016 02:36:09



Number of TX :	3	Ant. :	3
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	PH Yang

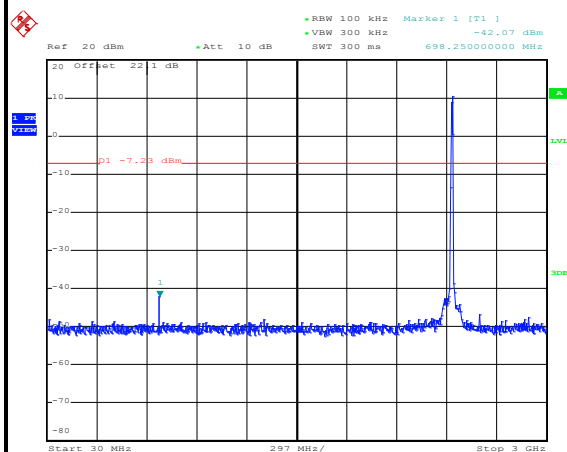
WLAN 802.11b Channel 06

100kHz PSD reference Level



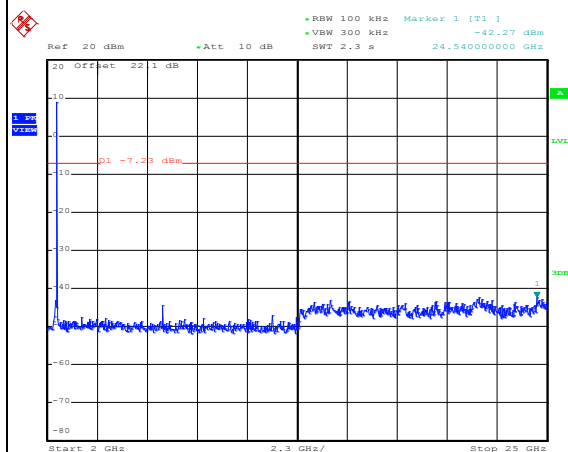
Date: 9.JUL.2016 02:40:56

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 02:41:08

Spurious Emission 2GHz~25GHz



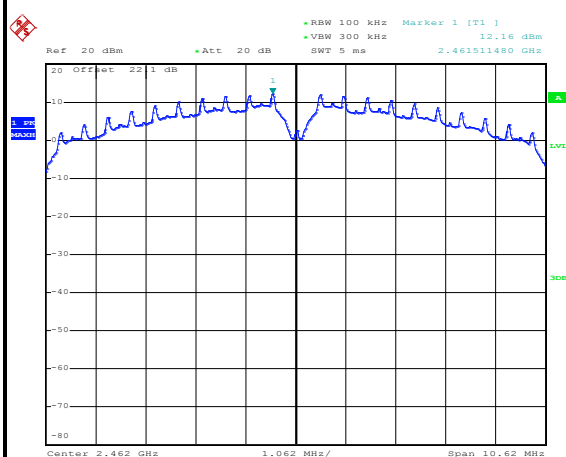
Date: 9.JUL.2016 02:41:16



Number of TX :	3	Ant. :	3
Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	PH Yang

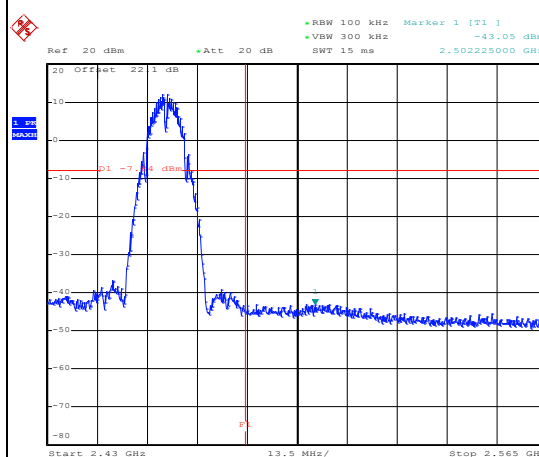
WLAN 802.11b Channel 11

100kHz PSD reference Level



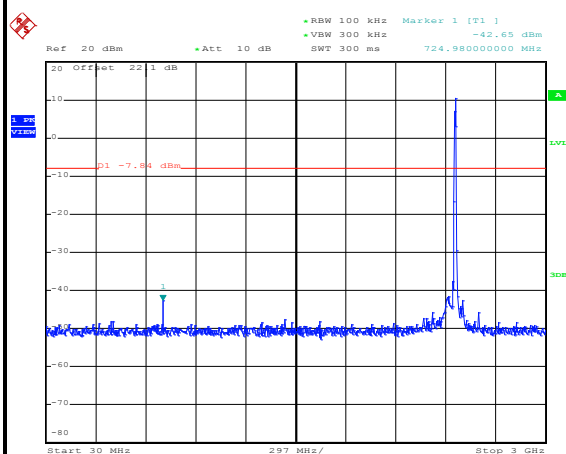
Date: 9.JUL.2016 02:45:22

High Channel Plot



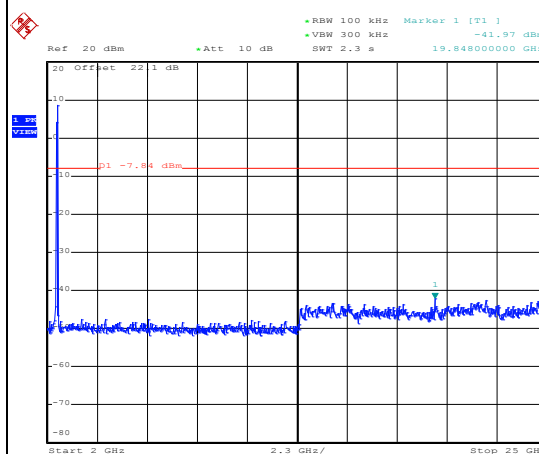
Date: 9.JUL.2016 02:45:54

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 02:47:08

Spurious Emission 2GHz~25GHz



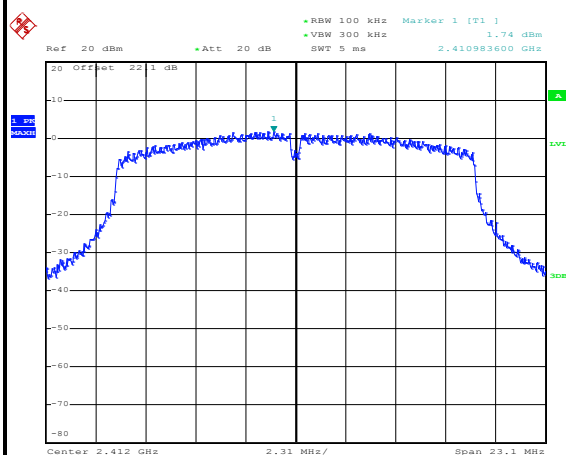
Date: 9.JUL.2016 02:46:35



Number of TX :	3	Ant. :	3
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	PH Yang

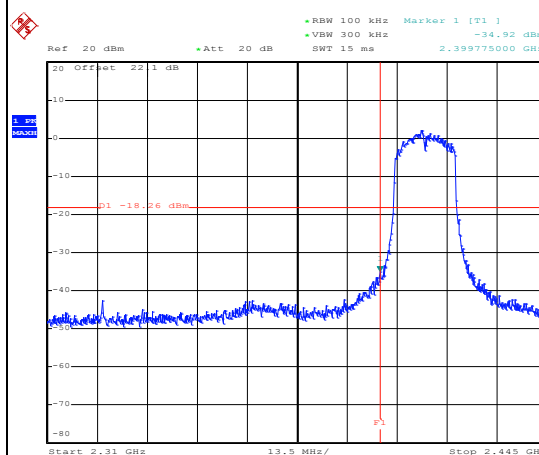
WLAN 802.11g Channel 01

100kHz PSD reference Level



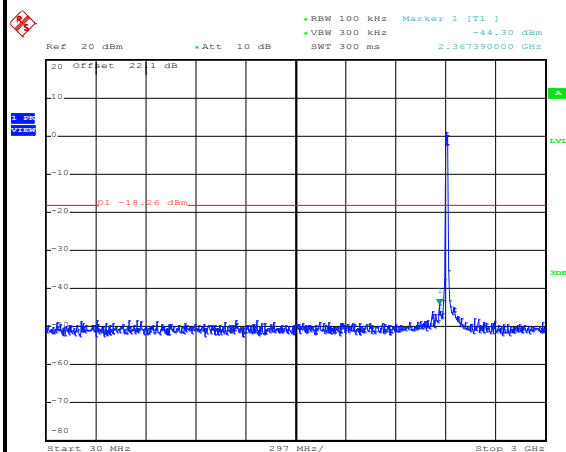
Date: 9.JUL.2016 03:35:32

Low Channel Plot



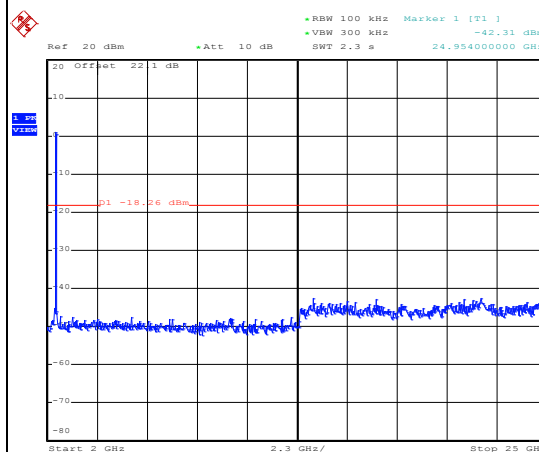
Date: 9.JUL.2016 03:36:07

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 03:36:19

Spurious Emission 2GHz~25GHz



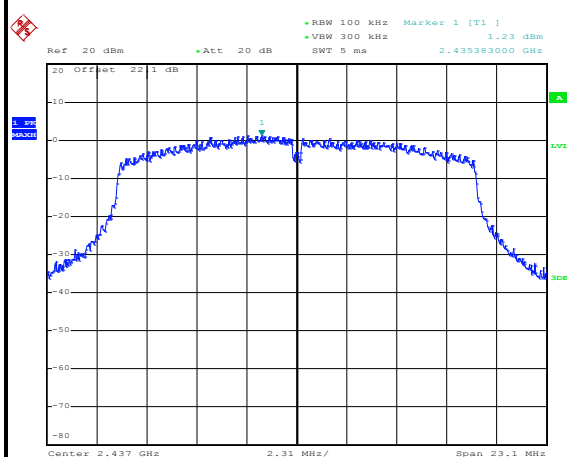
Date: 9.JUL.2016 03:36:27



Number of TX :	3	Ant. :	3
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	PH Yang

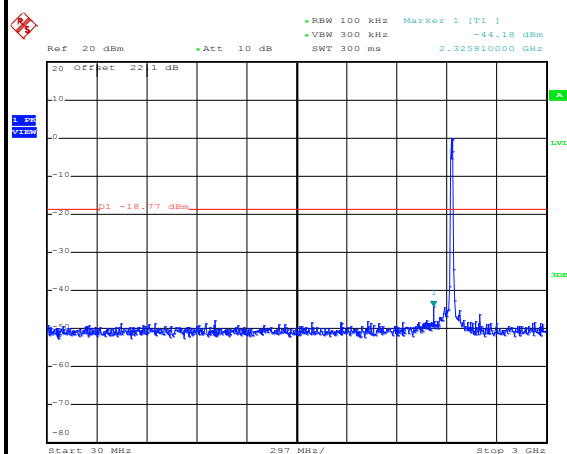
WLAN 802.11g Channel 06

100kHz PSD reference Level



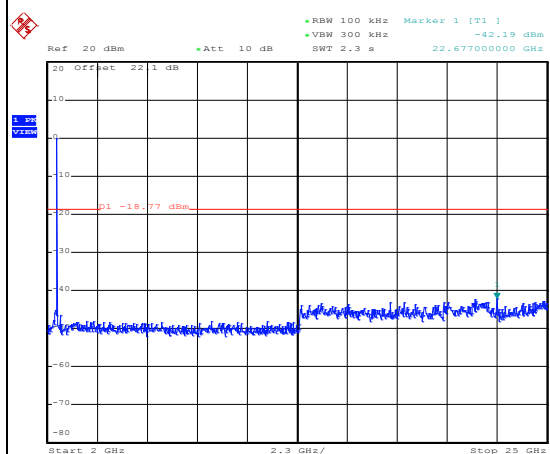
Date: 9.JUL.2016 03:38:58

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 03:39:30

Spurious Emission 2GHz~25GHz



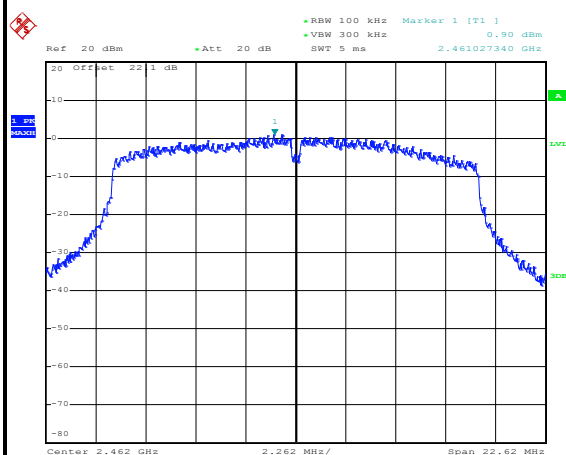
Date: 9.JUL.2016 03:39:38



Number of TX :	3	Ant. :	3
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	PH Yang

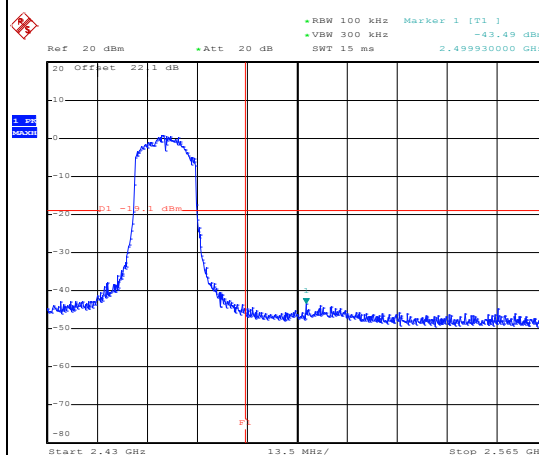
WLAN 802.11g Channel 11

100kHz PSD reference Level



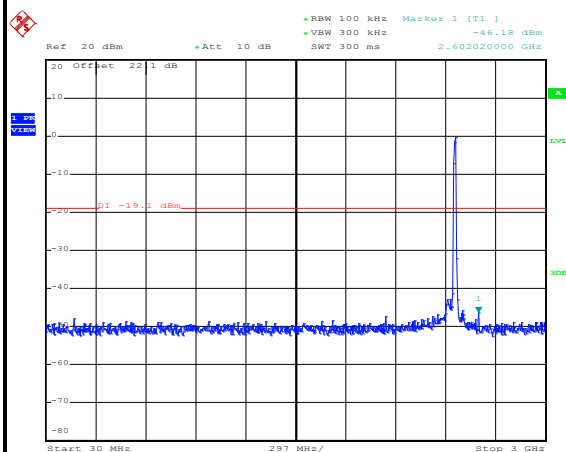
Date: 9.JUL.2016 03:42:25

High Channel Plot



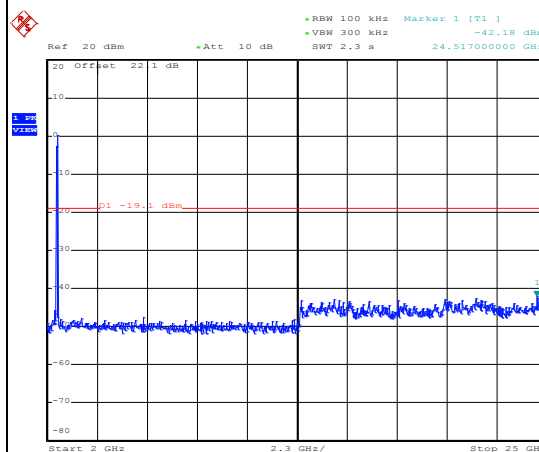
Date: 9.JUL.2016 03:42:49

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 03:43:00

Spurious Emission 2GHz~25GHz



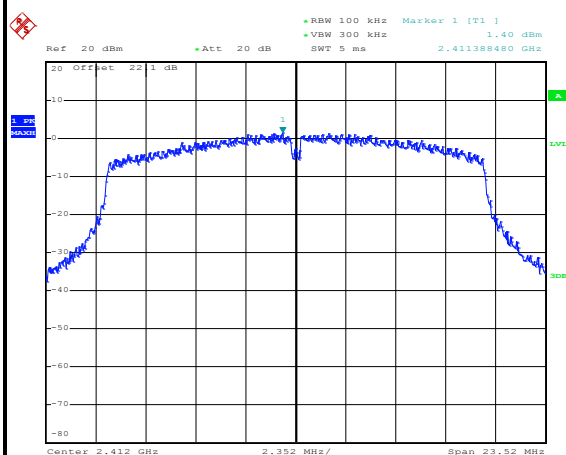
Date: 9.JUL.2016 03:43:09



Number of TX :	3	Ant. :	3
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	PH Yang

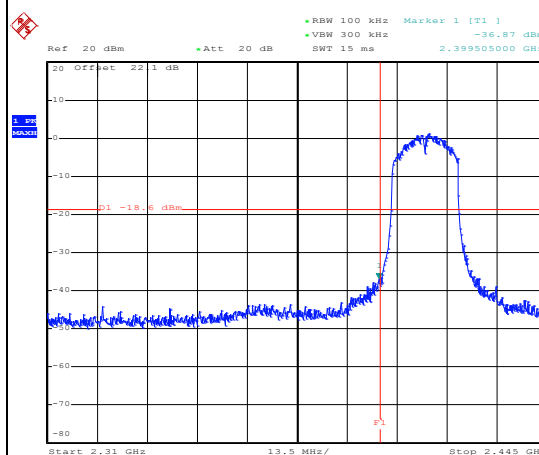
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



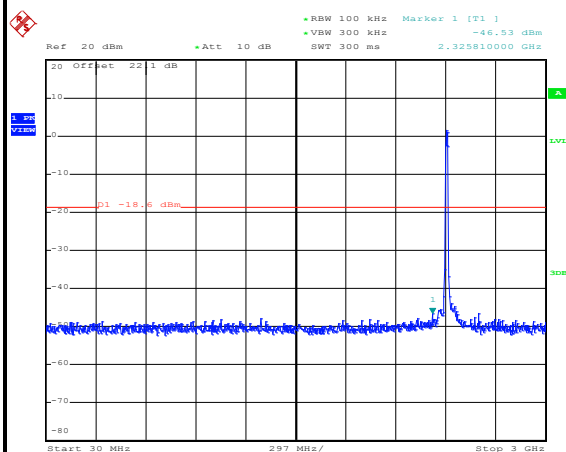
Date: 9.JUL.2016 03:54:23

Low Channel Plot



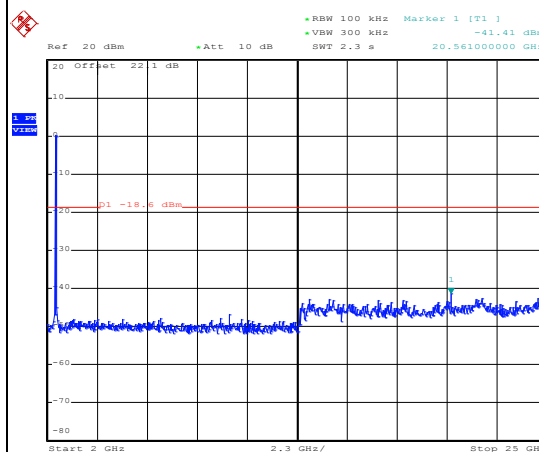
Date: 9.JUL.2016 03:54:57

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 03:56:01

Spurious Emission 2GHz~25GHz



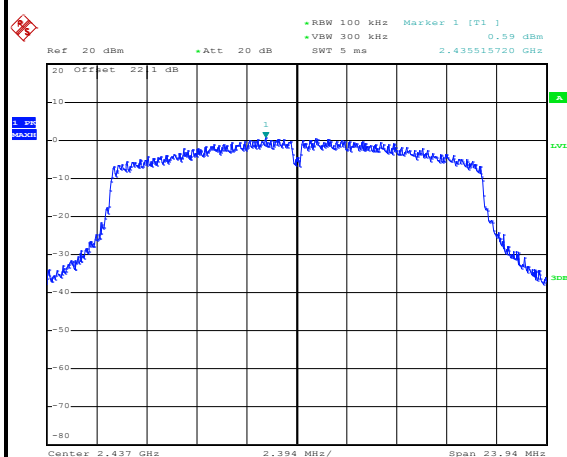
Date: 9.JUL.2016 03:55:39



Number of TX :	3	Ant. :	3
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	PH Yang

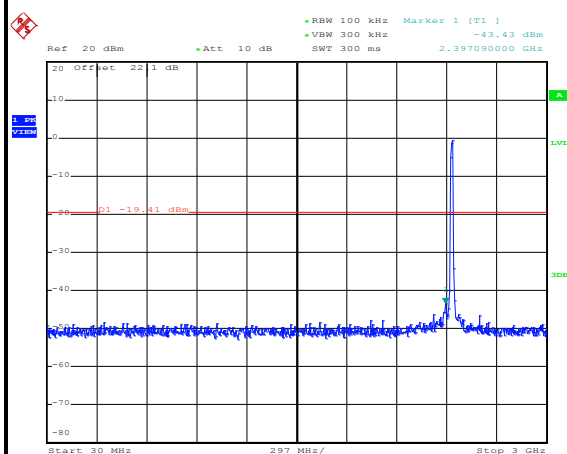
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



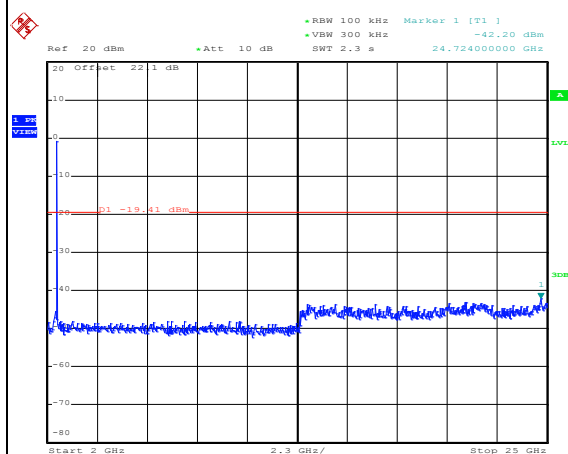
Date: 9.JUL.2016 03:50:19

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 03:50:35

Spurious Emission 2GHz~25GHz



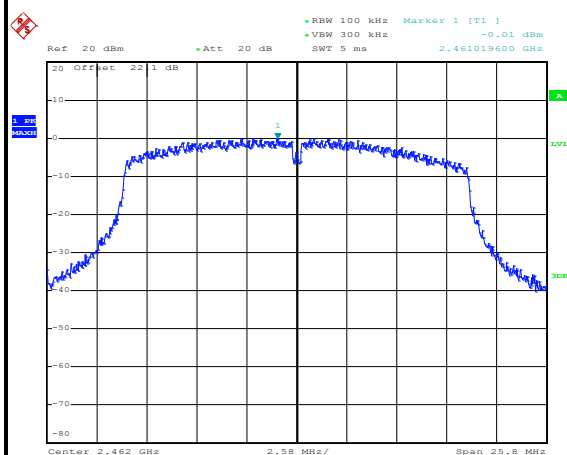
Date: 9.JUL.2016 03:50:43



Number of TX :	3	Ant. :	3
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	PH Yang

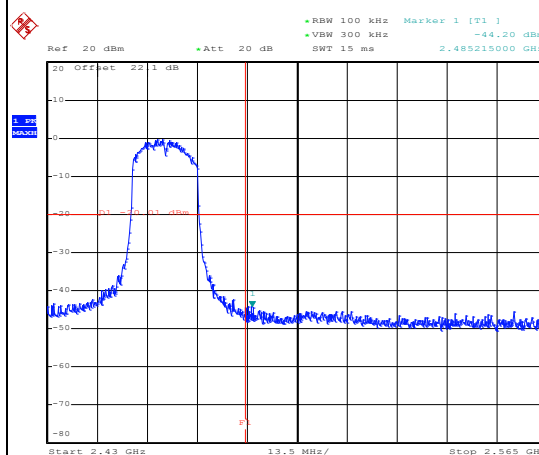
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



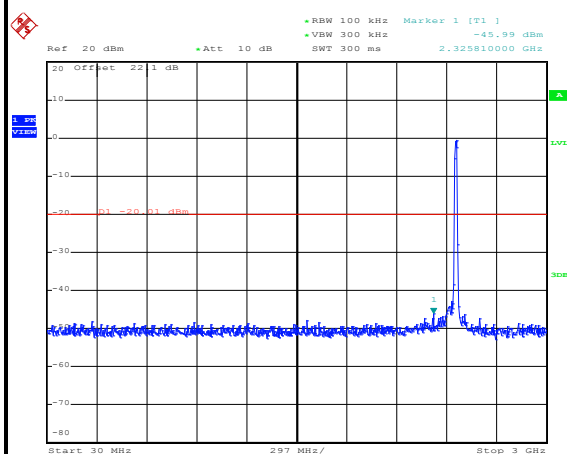
Date: 9.JUL.2016 03:46:22

High Channel Plot



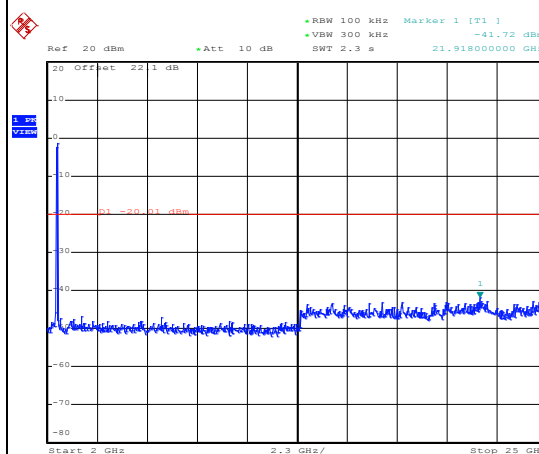
Date: 9.JUL.2016 03:46:34

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 03:47:15

Spurious Emission 2GHz~25GHz



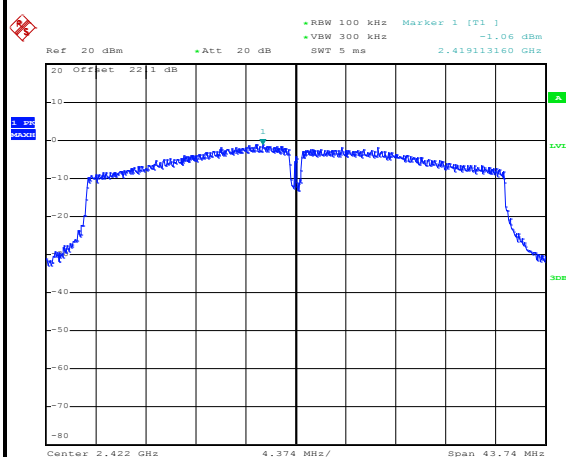
Date: 9.JUL.2016 03:46:54



Number of TX :	3	Ant. :	3
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	03	Test Engineer :	PH Yang

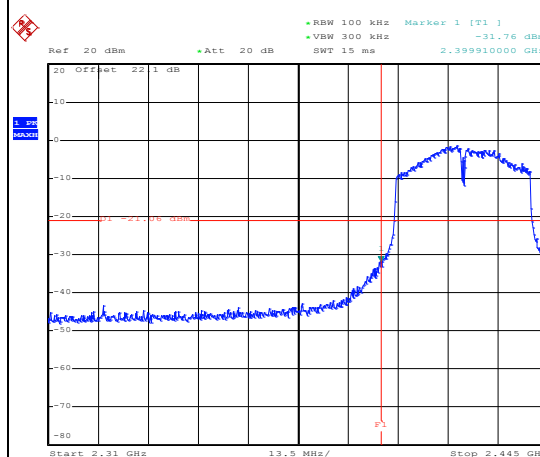
WLAN 802.11n HT40 Channel 03

100kHz PSD reference Level



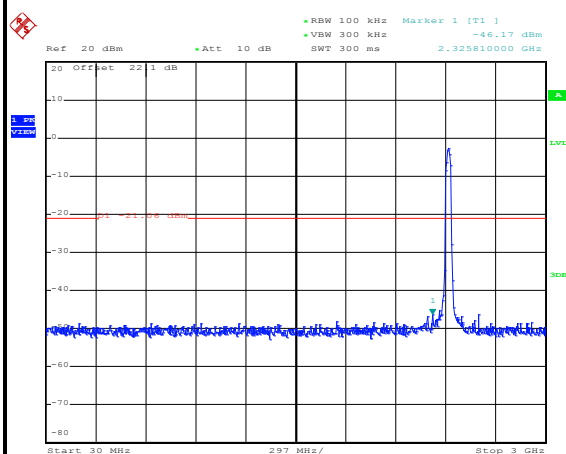
Date: 9.JUL.2016 05:08:18

Low Channel Plot



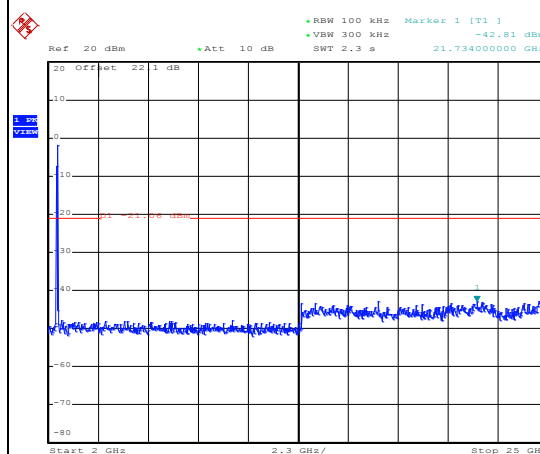
Date: 9.JUL.2016 05:09:16

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 05:09:29

Spurious Emission 2GHz~25GHz



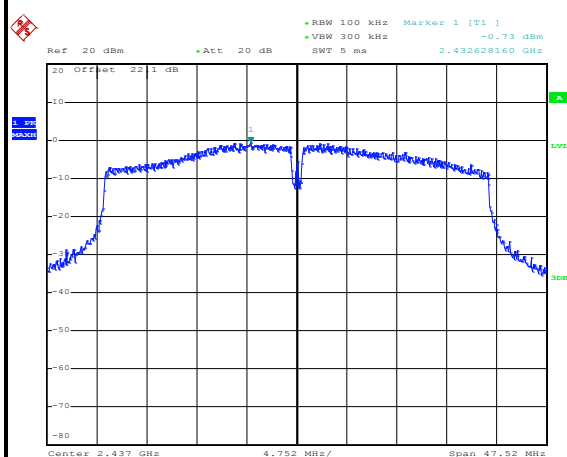
Date: 9.JUL.2016 05:09:37



Number of TX :	3	Ant. :	3
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	PH Yang

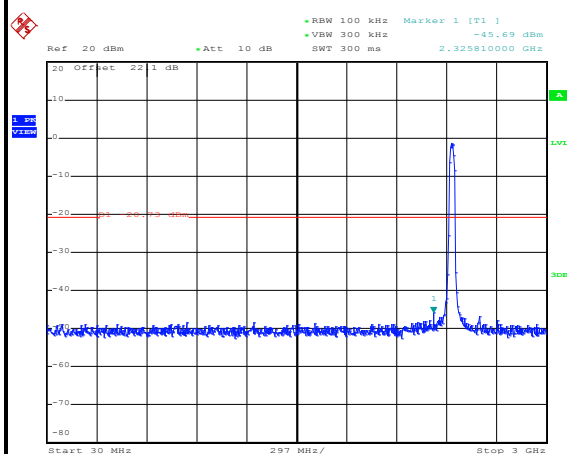
WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



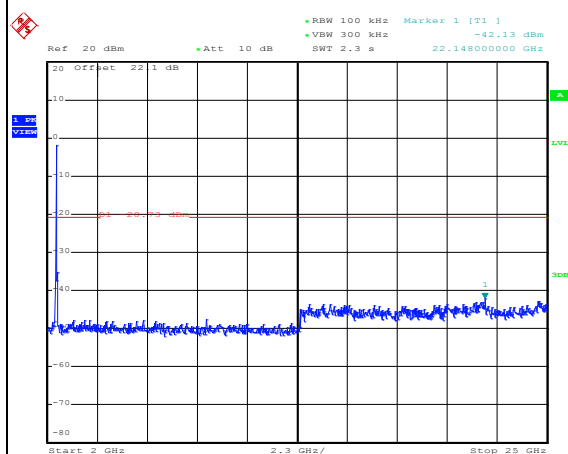
Date: 9.JUL.2016 05:18:53

Spurious Emission 30MHz~3GHz



Date: 9.JUL.2016 05:20:04

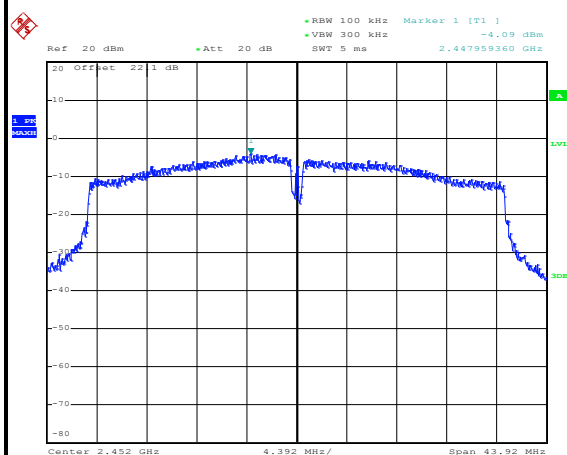
Spurious Emission 2GHz~25GHz



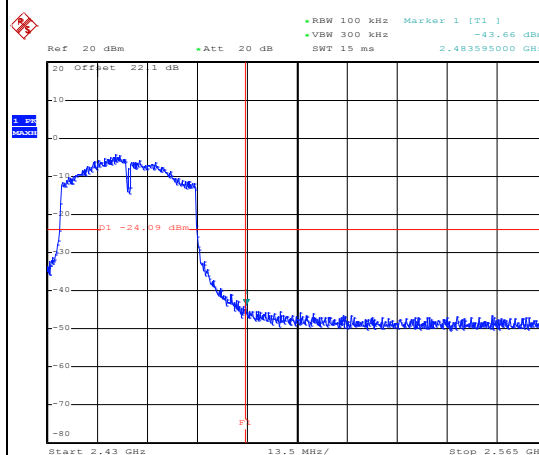
Date: 9.JUL.2016 05:20:13



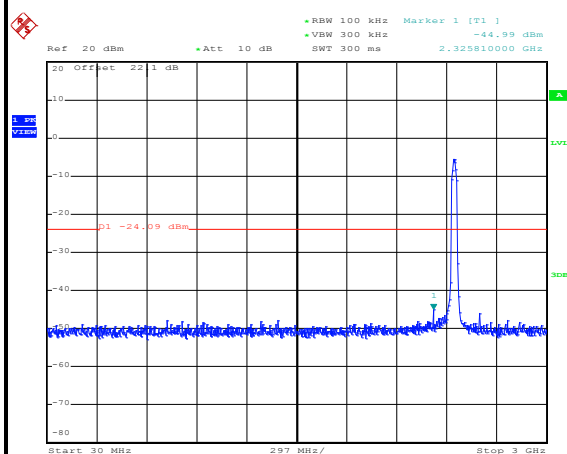
Number of TX :	3	Ant. :	3
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	09	Test Engineer :	PH Yang

WLAN 802.11n HT40 Channel 09**100kHz PSD reference Level**

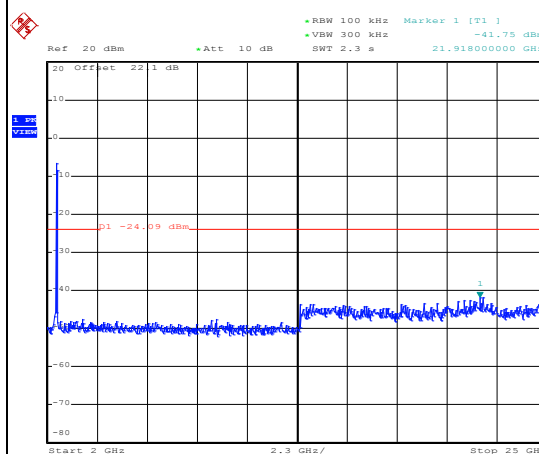
Date: 9.JUL.2016 05:28:52

High Channel Plot

Date: 9.JUL.2016 05:29:04

Spurious Emission 30MHz~3GHz

Date: 9.JUL.2016 05:29:15

Spurious Emission 2GHz~25GHz

Date: 9.JUL.2016 05:29:23

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 NCC LP0002 section 2.8 limits as below.

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

3.5.2 Measuring Instruments

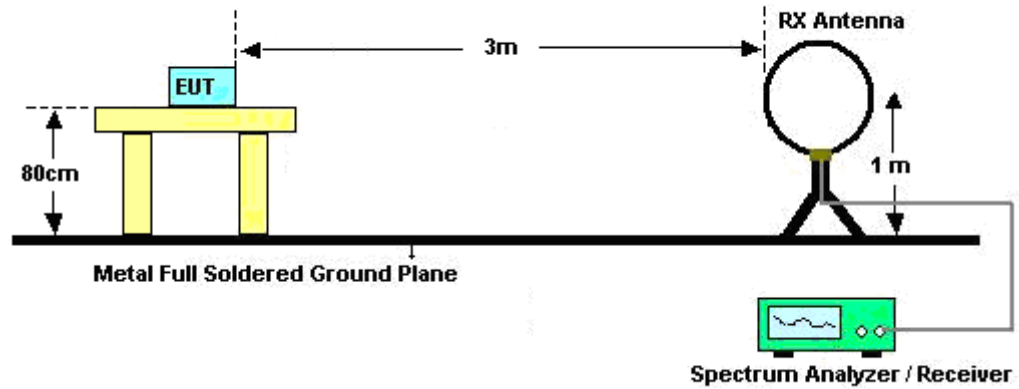
The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

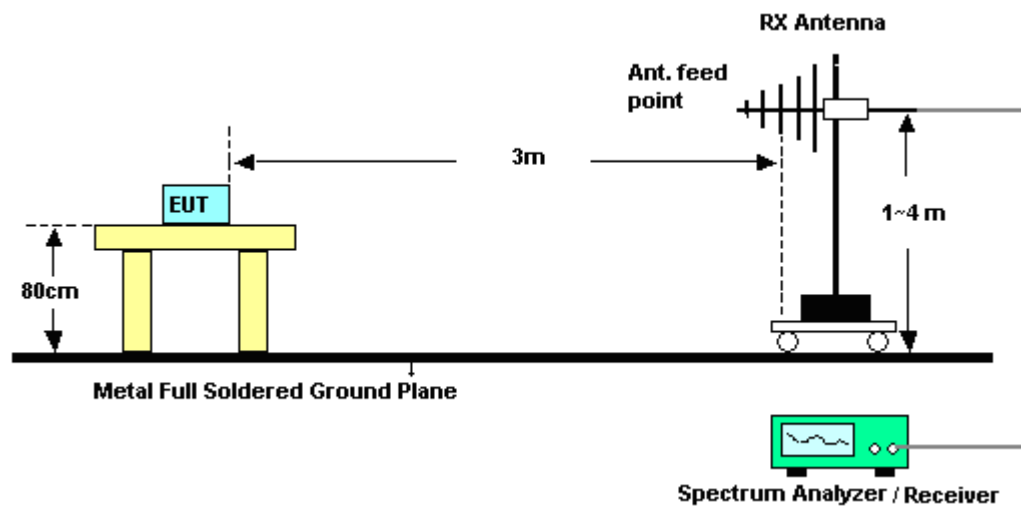
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

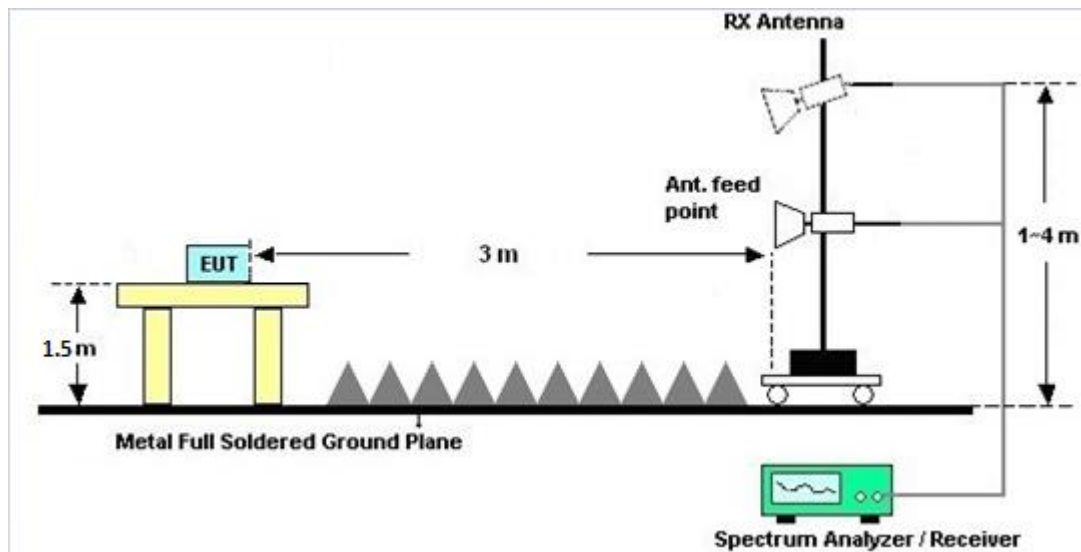
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per NCC LP0002 section 5.13 was not reported.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C and D.

3.5.7 Duty Cycle

Please refer to Appendix E.

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

Please refer to Appendix C and D.

3.6 Test of Receiver Radiated Emission Measurement

3.6.1 Limit of Receiver Radiated Emission

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

3.6.2 Measuring Instruments

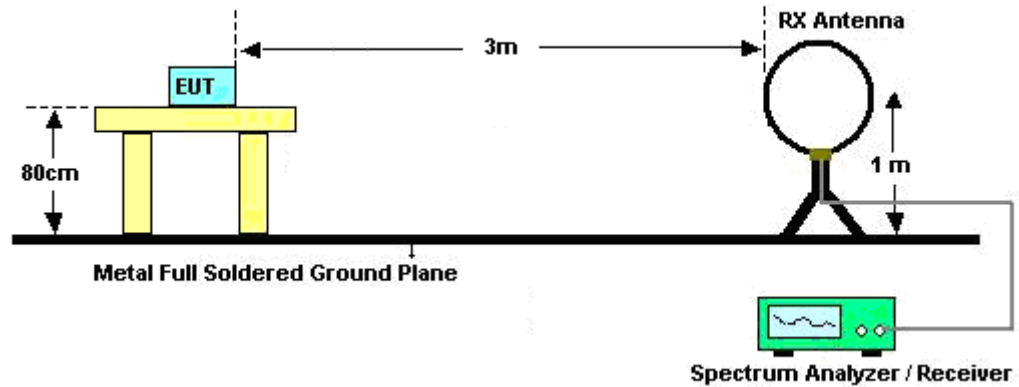
The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

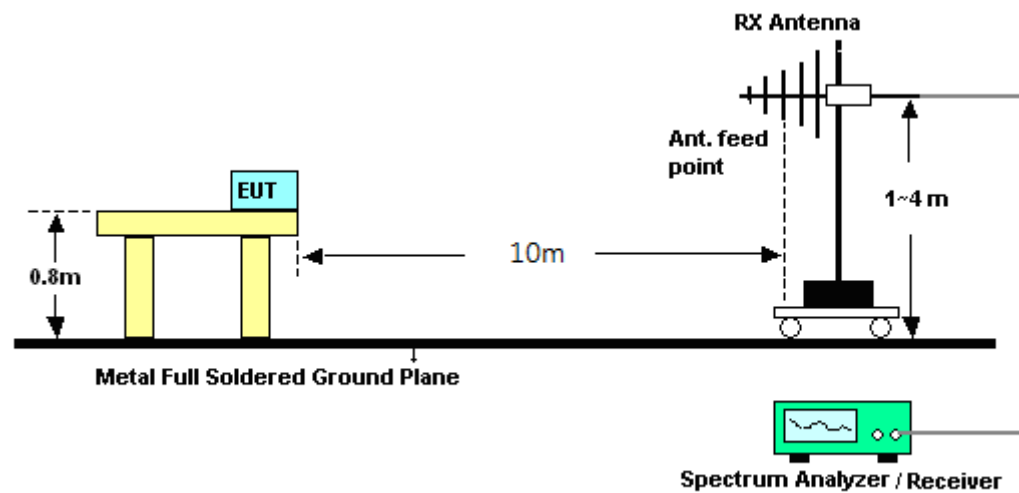
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, 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.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
8. Emission level (dBμV/m) = 20 log Emission level (μV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

3.6.4 Test Setup

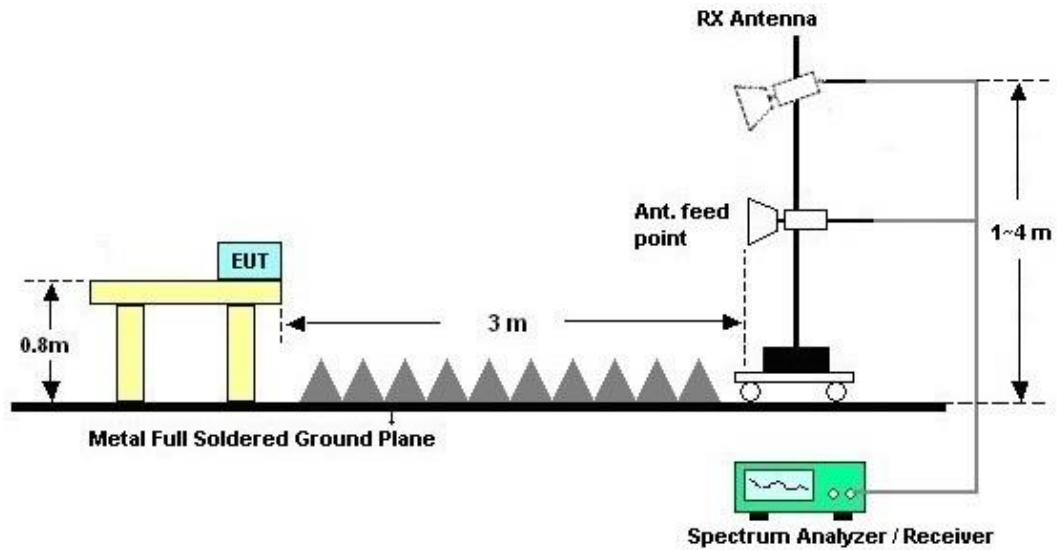
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.6.5 Test Result of Receiver Radiated Spurious Emissions (9kHz ~ 30MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per NCC LP0002 section 5.13 was not reported.

3.6.6 Test Result of Receiver Radiated Spurious Emission (30MHz ~ 5th Harmonic)

Please refer to Appendix D.

3.7 AC Conducted Emission Measurement

3.7.1 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.

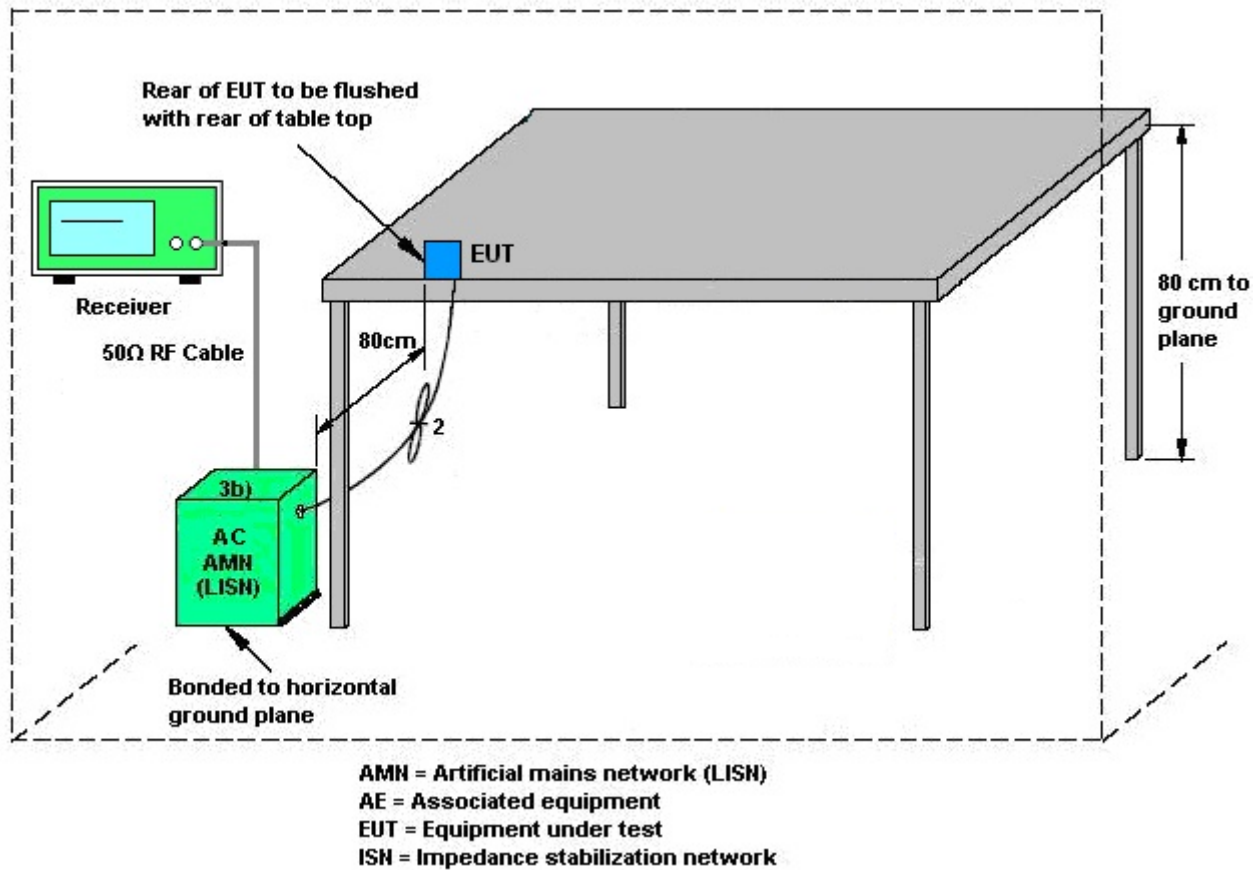
3.7.2 Measuring Instruments

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

3.7.3 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.

3.7.4 Test Setup



3.7.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



3.8 Antenna Requirements

3.8.1 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 LP0002 Section 2.2, Section 3.10.1.3, and Section 3.10.1.4.

3.8.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.8.3 Antenna Gain

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = $10 \log(N_{ANT}/N_{SS}=1)$ dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$.

Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain;

The EUT supports CDD mode.

For power, the directional gain G_{ANT} is set equal to the antenna having the highest gain, i.e., F)2)f)i).

For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

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.

<PTMP>

				DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
	Ant. 1 (dBi)	Ant. 2 (dBi)	Ant. 3 (dBi)				
2.4 GHz	5.00	5.00	5.00	5.00	8.01	0.00	2.01

Power Limit Reduction = $DG(\text{Power}) - 6\text{dBi}$, (min = 0)

PSD Limit Reduction = $DG(\text{PSD}) - 6\text{dBi}$, (min = 0)

<PTP>

				DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
	Ant. 1 (dBi)	Ant. 2 (dBi)	Ant. 3 (dBi)				
2.4 GHz	5.00	5.00	5.00	5.00	9.77	0.00	1.00

Power Limit Reduction = $\text{Floor} [(DG(\text{Power}) - 6) / 3]$ dBi, (min = 0)

PSD Limit Reduction = $\text{Floor} [(DG(\text{PSD}) - 6) / 3]$ dBi, (min = 0)

3.9 Maximum Power Density

3.9.1 RF Exposure Limit Introduction

According to NCC LP0002, the criteria listed in Table shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §5.20.2.1 and §5.20.2.2.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna

3.9.2 Standalone Power Density Calculation

Maximum Power Density				
Max. Power	Gain	EIRP	20 cm PSD	Limit
26.86	5	31.86	0.305	1
dBm	dBi	dBm	mW/cm ²	mW/cm ²



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	1218006	300MHz~40GHz	Oct. 07, 2015	Mar. 22, 2016 ~ Jul. 11, 2016	Oct. 06, 2016	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	0846202	300MHz~40GHz	Oct. 05, 2015	Mar. 22, 2016 ~ Jul. 11, 2016	Oct. 04, 2016	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz-40GHz	Nov. 23, 2015	Mar. 22, 2016 ~ Jul. 11, 2016	Nov. 22, 2016	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jun. 14, 2016~ Jul. 13, 2016	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Aug. 26, 2015	Jun. 14, 2016~ Jul. 13, 2016	Aug. 25, 2016	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 02, 2015	Jun. 14, 2016~ Jul. 13, 2016	Dec. 01, 2016	Conduction (CO05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Sep. 02, 2015	Jun. 30, 2016 ~ Jul. 20, 2016	Sep. 01, 2016	Radiation (03CH13-HY)
Preamplifier	MITEQ	TTA0204	1872107	2GHz~40GHz	Feb. 15, 2016	Jun. 30, 2016 ~ Jul. 20, 2016	Feb. 14, 2017	Radiation (03CH13-HY)
Amplifier	Sonoma-Instrument	310 N	187282	10MHz~1GHz	Dec. 31, 2015	Jun. 30, 2016 ~ Jul. 20, 2016	Dec. 30, 2016	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D	40103	30MHz to 1GHz	Jan. 13, 2016	Jun. 30, 2016 ~ Jul. 20, 2016	Jan. 12, 2017	Radiation (03CH13-HY)
EMI Test Receiver	Keysight	N9038A (MXE)	MY55420170	N/A	Mar. 10, 2016	Jun. 30, 2016 ~ Jul. 20, 2016	Mar. 09, 2017	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1241	1GHz ~ 18GHz	Apr. 25, 2016	Jun. 30, 2016 ~ Jul. 20, 2016	Apr. 24, 2017	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY53270147	1GHz~26.5GHz	Jan. 30, 2016	Jun. 30, 2016 ~ Jul. 20, 2016	Jan. 29, 2017	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY55370526	N/A	Mar. 14, 2016	Jun. 30, 2016 ~ Jul. 20, 2016	Mar. 13, 2017	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Jun. 30, 2016 ~ Jul. 20, 2016	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Jun. 30, 2016 ~ Jul. 20, 2016	N/A	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 02, 2015	Jun. 30, 2016 ~ Jul. 20, 2016	Nov. 01, 2016	Radiation (03CH13-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Amplifier	HP	8447D	2944A08242	0.1MHz ~ 1.3GHz	Dec. 07, 2015	Jun. 20, 2016	Dec. 06, 2016	Radiation (OS04-LK)
Spectrum Analyzer	R&S	FSP 7	100639	9 kHz ~ 7GHz	Oct. 13, 2015	Jun. 20, 2016	Oct. 12, 2016	Radiation (OS04-LK)
Test Receiver	R&S	ESCS 30	838251/004	9 kHz ~ 2.75 GHz	Dec. 30, 2015	Jun. 20, 2016	Dec. 29, 2016	Radiation (OS04-LK)
Bilog Antenna	TESEQ & EMCI	CBL6112B & N-6-05	35377 & AT-N0518	30 MHz ~ 2 GHz	Nov. 12, 2015	Jun. 20, 2016	Nov. 11, 2016	Radiation (OS04-LK)
Turn Table	EMCO	2080	9711-2021	0~360 degree	N/A	Jun. 20, 2016	N/A	Radiation (OS04-LK)
Antenna Mast	EMCO	2075	9711-2115	1 m~4 m	N/A	Jun. 20, 2016	N/A	Radiation (OS04-LK)
EMI Test Receiver	Rohde & Schwarz	ESU26	100472	20Hz~26.5GHz	Jan. 07, 2016	Jun. 30, 2016	Jan. 06, 2017	Radiation (03CH06-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1156	1GHz~18GHz	Aug. 21, 2015	Jun. 30, 2016	Aug. 20, 2016	Radiation (03CH06-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1850117	1GHz ~ 18GHz	Jun. 22, 2016	Jun. 30, 2016	Jun. 21, 2017	Radiation (03CH06-HY)
Controller	INN-CO	EM1000	060782	Control Turn table & Ant Mast	N/A	Jun. 30, 2016	N/A	Radiation (03CH06-HY)
Antenna Mast	MF	MF-7802	MF78020821 2	1m~4m	N/A	Jun. 30, 2016	N/A	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0-360 degree	N/A	Jun. 30, 2016	N/A	Radiation (03CH06-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.70
--	------

<For 03CH06-HY >

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.70
--	------

<For 03CH13-HY >

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.90
--	------

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.40
--	------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.30
--	------

<For OS04-LK >

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.00
--	------

Appendix A. Conducted Test Results

Test Engineer:	Bill Kuo	Temperature:	21~25	°C
Test Date:	2016/3/22~2016/7/11	Relative Humidity:	51~54	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band												
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	99% Occupied BW (MHz)			6dB BW (MHz)			6dB BW Limit (MHz)	Pass/Fail
					Ant 1	Ant 2	Ant 3	Ant 1	Ant 2	Ant 3		
11b	1Mbps	2	1	2412	11.80	11.65	11.80	7.04	7.00	7.04	0.50	Pass
11b	1Mbps	2	6	2437	11.75	11.70	11.80	7.04	7.04	7.04	0.50	Pass
11b	1Mbps	2	11	2462	11.95	11.95	11.95	7.08	7.08	7.08	0.50	Pass
11g	6Mbps	2	1	2412	16.65	16.75	16.65	15.44	15.32	15.40	0.50	Pass
11g	6Mbps	2	6	2437	16.65	16.60	16.70	15.12	15.72	15.40	0.50	Pass
11g	6Mbps	2	11	2462	16.70	16.75	16.65	15.08	15.44	15.08	0.50	Pass
HT20	MCS0	2	1	2412	17.80	17.90	17.70	16.56	17.32	15.68	0.50	Pass
HT20	MCS0	2	6	2437	17.70	17.65	17.70	16.28	15.64	15.96	0.50	Pass
HT20	MCS0	2	11	2462	17.75	17.85	17.75	16.52	17.08	17.20	0.50	Pass
HT40	MCS0	2	3	2422	36.10	36.00	36.10	33.68	32.52	29.16	0.50	Pass
HT40	MCS0	2	6	2437	36.10	35.80	35.90	33.20	32.40	31.68	0.50	Pass
HT40	MCS0	2	9	2452	36.10	36.00	36.20	33.52	31.36	29.28	0.50	Pass

TEST RESULTS DATA
Peak Output Power

2.4GHz Band															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)				Conducted Power Limit (dBm)			DG (dBi)			Pass /Fail
					Ant 1	Ant 2	Ant 3	SUM	Ant 1	Ant 2	Ant 3	Ant 1	Ant 2	Ant 3	
11b	1Mbps	3	1	2412	24.92	24.81	25.40	29.82	30.00			5.00			Pass
11b	1Mbps	3	6	2437	24.68	24.39	24.23	29.21	30.00			5.00			Pass
11b	1Mbps	3	11	2462	24.09	24.30	24.63	29.12	30.00			5.00			Pass
11g	6Mbps	3	1	2412	23.53	25.08	25.03	29.37	30.00			5.00			Pass
11g	6Mbps	3	6	2437	23.97	25.25	24.99	29.54	30.00			5.00			Pass
11g	6Mbps	3	11	2462	24.42	23.83	24.41	29.00	30.00			5.00			Pass
HT20	MCS0	3	1	2412	23.95	24.70	24.51	29.17	30.00			5.00			Pass
HT20	MCS0	3	6	2437	24.62	24.96	24.98	29.63	30.00			5.00			Pass
HT20	MCS0	3	11	2462	23.91	24.31	24.51	29.02	30.00			5.00			Pass
HT40	MCS0	3	3	2422	20.35	22.09	21.99	26.32	30.00			5.00			Pass
HT40	MCS0	3	6	2437	24.30	25.29	24.39	29.45	30.00			5.00			Pass
HT40	MCS0	3	9	2452	19.62	20.95	19.59	24.87	30.00			5.00			Pass

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

TEST RESULTS DATA
Average Output Power
(Reporting Only)

2.4GHz Band											
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)			Average Conducted Power (dBm)			
					Ant 1	Ant 2	Ant 3	Ant 1	Ant 2	Ant 3	SUM
11b	1Mbps	3	1	2412	0.00	0.00	0.00	22.31	21.81	22.13	26.86
11b	1Mbps	3	6	2437	0.00	0.00	0.00	21.80	21.43	21.30	26.29
11b	1Mbps	3	11	2462	0.00	0.00	0.00	21.09	21.21	22.34	26.36
11g	6Mbps	3	1	2412	0.00	0.00	0.00	14.48	15.38	15.48	19.91
11g	6Mbps	3	6	2437	0.00	0.00	0.00	14.02	15.81	15.41	19.92
11g	6Mbps	3	11	2462	0.00	0.00	0.00	14.86	14.54	14.31	19.35
HT20	MCS0	3	1	2412	0.00	0.00	0.00	14.04	15.43	14.79	19.56
HT20	MCS0	3	6	2437	0.00	0.00	0.00	14.38	15.41	15.08	19.75
HT20	MCS0	3	11	2462	0.00	0.00	0.00	14.40	15.32	14.44	19.51
HT40	MCS0	3	3	2422	0.00	0.00	0.00	11.89	13.79	13.59	17.94
HT40	MCS0	3	6	2437	0.00	0.00	0.00	16.64	17.32	16.26	21.53
HT40	MCS0	3	9	2452	0.00	0.00	0.00	11.45	12.45	11.05	16.46

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

TEST RESULTS DATA
Peak Power Spectral Density

<For PTMP Mode>

2.4GHz Band															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)				DG (dBi)			Peak PSD Limit (dBm/3kHz)			Pass/Fail
					Ant 1	Ant 2	Ant 3	Worse + 4.77	Ant 1	Ant 2	Ant 3	Ant 1	Ant 2	Ant 3	
11b	1Mbps	3	1	2412	-2.35	-0.79	-0.77	4.00	9.77			4.23			Pass
11b	1Mbps	3	6	2437	-1.75	-1.62	-1.86	3.15	9.77			4.23			Pass
11b	1Mbps	3	11	2462	-2.12	-2.04	-2.32	2.73	9.77			4.23			Pass
11g	6Mbps	3	1	2412	-12.16	-9.89	-10.45	-5.12	9.77			4.23			Pass
11g	6Mbps	3	6	2437	-11.09	-10.50	-10.47	-5.70	9.77			4.23			Pass
11g	6Mbps	3	11	2462	-11.08	-10.65	-10.51	-5.74	9.77			4.23			Pass
HT20	MCS0	3	1	2412	-13.29	-10.99	-10.00	-5.23	9.77			4.23			Pass
HT20	MCS0	3	6	2437	-11.61	-8.69	-11.11	-3.92	9.77			4.23			Pass
HT20	MCS0	3	11	2462	-11.59	-12.23	-11.73	-6.82	9.77			4.23			Pass
HT40	MCS0	3	3	2422	-15.16	-14.09	-10.87	-6.10	9.77			4.23			Pass
HT40	MCS0	3	6	2437	-12.37	-9.76	-10.15	-4.99	9.77			4.23			Pass
HT40	MCS0	3	9	2452	-16.41	-13.91	-9.99	-5.22	9.77			4.23			Pass

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

TEST RESULTS DATA
Peak Power Spectral Density

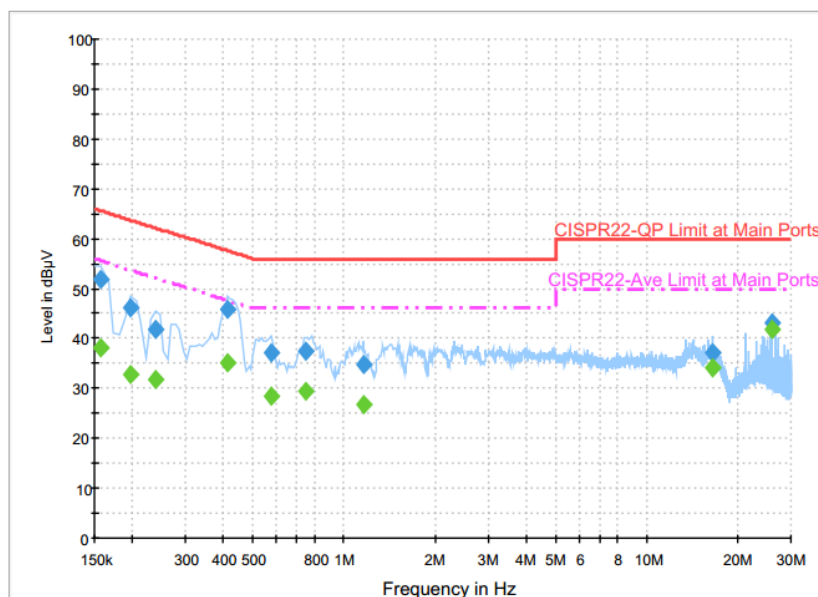
<For PTP Mode>

2.4GHz Band															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)				DG (dBi)			Peak PSD Limit (dBm/3kHz)			Pass/Fail
					Ant 1	Ant 2	Ant 3	Worse + 4.77	Ant 1	Ant 2	Ant 3	Ant 1	Ant 2	Ant 3	
11b	1Mbps	3	1	2412	-2.35	-0.79	-0.77	4.00	9.77			7.00			Pass
11b	1Mbps	3	6	2437	-1.75	-1.62	-1.86	3.15	9.77			7.00			Pass
11b	1Mbps	3	11	2462	-2.12	-2.04	-2.32	2.73	9.77			7.00			Pass
11g	6Mbps	3	1	2412	-12.16	-9.89	-10.45	-5.12	9.77			7.00			Pass
11g	6Mbps	3	6	2437	-11.09	-10.50	-10.47	-5.70	9.77			7.00			Pass
11g	6Mbps	3	11	2462	-11.08	-10.65	-10.51	-5.74	9.77			7.00			Pass
HT20	MCS0	3	1	2412	-13.29	-10.99	-10.00	-5.23	9.77			7.00			Pass
HT20	MCS0	3	6	2437	-11.61	-8.69	-11.11	-3.92	9.77			7.00			Pass
HT20	MCS0	3	11	2462	-11.59	-12.23	-11.73	-6.82	9.77			7.00			Pass
HT40	MCS0	3	3	2422	-15.16	-14.09	-10.87	-6.10	9.77			7.00			Pass
HT40	MCS0	3	6	2437	-12.37	-9.76	-10.15	-4.99	9.77			7.00			Pass
HT40	MCS0	3	9	2452	-16.41	-13.91	-9.99	-5.22	9.77			7.00			Pass

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

Appendix B. AC Conducted Emission Test Results

Test Mode :	Mode 3	Temperature :	22~23°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	59~60%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	BLE Tx + PoE		



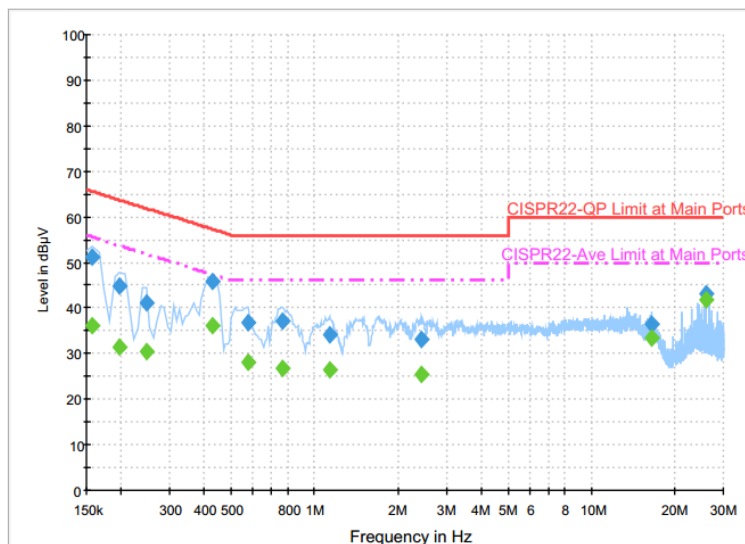
Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	51.8	Off	L1	19.6	13.8	65.6
0.198000	46.2	Off	L1	19.6	17.5	63.7
0.238000	42.0	Off	L1	19.6	20.2	62.2
0.414000	45.7	Off	L1	19.6	11.9	57.6
0.574000	37.0	Off	L1	19.6	19.0	56.0
0.750000	37.6	Off	L1	19.6	18.4	56.0
1.158000	34.9	Off	L1	19.7	21.1	56.0
16.462000	37.2	Off	L1	20.5	22.8	60.0
25.870000	43.2	Off	L1	20.9	16.8	60.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	38.0	Off	L1	19.6	17.6	55.6
0.198000	32.8	Off	L1	19.6	20.9	53.7
0.238000	31.7	Off	L1	19.6	20.5	52.2
0.414000	35.3	Off	L1	19.6	12.3	47.6
0.574000	28.6	Off	L1	19.6	17.4	46.0
0.750000	29.6	Off	L1	19.6	16.4	46.0
1.158000	26.6	Off	L1	19.7	19.4	46.0
16.462000	34.1	Off	L1	20.5	15.9	50.0
25.870000	41.9	Off	L1	20.9	8.1	50.0

Test Mode :	Mode 3	Temperature :	22~23°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	59~60%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	BLE Tx + PoE		


Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	51.3	Off	N	19.6	14.3	65.6
0.198000	44.8	Off	N	19.6	18.9	63.7
0.246000	41.1	Off	N	19.6	20.8	61.9
0.430000	45.8	Off	N	19.6	11.5	57.3
0.574000	36.7	Off	N	19.6	19.3	56.0
0.766000	37.0	Off	N	19.6	19.0	56.0
1.134000	34.1	Off	N	19.6	21.9	56.0
2.446000	33.2	Off	N	19.7	22.8	56.0
16.462000	36.6	Off	N	20.5	23.4	60.0
25.870000	43.1	Off	N	21.1	16.9	60.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	36.1	Off	N	19.6	19.5	55.6
0.198000	31.6	Off	N	19.6	22.1	53.7
0.246000	30.4	Off	N	19.6	21.5	51.9
0.430000	36.2	Off	N	19.6	11.1	47.3
0.574000	28.0	Off	N	19.6	18.0	46.0
0.766000	26.7	Off	N	19.6	19.3	46.0
1.134000	26.6	Off	N	19.6	19.4	46.0
2.446000	25.5	Off	N	19.7	20.5	46.0
16.462000	33.4	Off	N	20.5	16.6	50.0
25.870000	41.7	Off	N	21.1	8.3	50.0



Appendix C. Radiated Spurious Emission

Test Engineer :	Elvis Chen, Bill Chang, and Kyle Chuang	Temperature :	22~24°C
		Relative Humidity :	43~44%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant. 1+2+3	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		2367.015	61.42	-12.58	74	58.39	27.07	7.24	31.28	119	44	P	H
		2366.49	52.43	-1.57	54	49.4	27.07	7.24	31.28	119	44	A	H
	*	2414	117.56	-	-	114.33	27.19	7.31	31.27	119	44	P	H
	*	2414	114.48	-	-	111.25	27.19	7.31	31.27	119	44	A	H
													H
													H
		2360.61	58.08	-15.92	74	55.06	27.07	7.24	31.29	100	140	P	V
		2366.175	47.46	-6.54	54	44.43	27.07	7.24	31.28	100	140	A	V
	*	2412	112.15	-	-	108.92	27.19	7.31	31.27	100	140	P	V
	*	2412	109.06	-	-	105.83	27.19	7.31	31.27	100	140	A	V
													V
													V
802.11b CH 06 2437MHz		2384.62	63.34	-10.66	74	60.2	27.11	7.31	31.28	215	84	P	H
		2389.52	53.06	-0.94	54	49.88	27.15	7.31	31.28	215	84	A	H
	*	2436	119	-	-	115.67	27.23	7.36	31.26	215	84	P	H
	*	2436	115.89	-	-	112.56	27.23	7.36	31.26	215	84	A	H
		2484.39	60.03	-13.97	74	56.52	27.36	7.4	31.25	215	84	P	H
		2483.5	50.35	-3.65	54	46.84	27.36	7.4	31.25	215	84	A	H
		2382.94	57.72	-16.28	74	54.58	27.11	7.31	31.28	114	143	P	V
		2389.52	48	-6	54	44.82	27.15	7.31	31.28	114	143	A	V
	*	2438	112.75	-	-	109.37	27.28	7.36	31.26	114	143	P	V
	*	2436	109.44	-	-	106.11	27.23	7.36	31.26	114	143	A	V
		2484.04	57.5	-16.5	74	53.99	27.36	7.4	31.25	114	143	P	V
		2500	47.67	-6.33	54	44.11	27.4	7.4	31.24	114	143	A	V



802.11b CH 11 2462MHz	*	2462	119.47	-	-	116.01	27.32	7.4	31.26	267	84	P	H
	*	2462	116.28	-	-	112.82	27.32	7.4	31.26	267	84	A	H
		2486.32	61.96	-12.04	74	58.45	27.36	7.4	31.25	267	84	P	H
		2486.2	53.66	-0.34	54	50.15	27.36	7.4	31.25	267	84	A	H
													H
													H
	*	2462	111.34	-	-	107.88	27.32	7.4	31.26	100	160	P	V
	*	2462	108.26	-	-	104.8	27.32	7.4	31.26	100	160	A	V
		2499.76	58.32	-15.68	74	54.76	27.4	7.4	31.24	100	160	P	V
		2500	49.61	-4.39	54	46.05	27.4	7.4	31.24	100	160	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI Ant. 1+2+3	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	51.85	-22.15	74	60.13	31.22	11.68	51.18	103	105	P	H
		4824	49.29	-4.71	54	57.57	31.22	11.68	51.18	103	105	A	H
													H
													H
		4824	54.4	-19.6	74	62.68	31.22	11.68	51.18	100	89	P	V
		4824	52.11	-1.89	54	60.39	31.22	11.68	51.18	100	89	A	V
													V
													V
802.11b CH 06 2437MHz		4874	53.58	-20.42	74	61.89	31.31	11.53	51.15	377	224	P	H
		4874	49.18	-4.82	54	57.49	31.31	11.53	51.15	377	224	A	H
		7311	51.12	-22.88	74	51.84	36.27	13.81	50.8	174	163	P	H
		7311	47.94	-6.06	54	48.66	36.27	13.81	50.8	174	163	A	H
		4874	51.82	-22.18	74	60.13	31.31	11.53	51.15	104	58	P	V
		4874	48.81	-5.19	54	57.12	31.31	11.53	51.15	104	58	A	V
		7311	51.04	-22.96	74	51.76	36.27	13.81	50.8	100	70	P	V
		7311	47.53	-6.47	54	48.25	36.27	13.81	50.8	100	70	A	V
802.11b CH 11 2462MHz		4924	51.6	-22.4	74	59.97	31.39	11.37	51.13	395	101	P	H
		4924	44.79	-9.21	54	53.16	31.39	11.37	51.13	395	101	A	H
		7386	51.39	-22.61	74	51.73	36.51	13.95	50.8	102	124	P	H
		7386	44.48	-9.52	54	44.82	36.51	13.95	50.8	102	124	A	H
		4926	51.74	-22.26	74	60.11	31.39	11.37	51.13	118	154	P	V
		4926	46.23	-7.77	54	54.6	31.39	11.37	51.13	118	154	A	V
		7386	51.58	-22.42	74	51.92	36.51	13.95	50.8	100	142	P	V
		7386	45.97	-8.03	54	46.31	36.51	13.95	50.8	100	142	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 (Band Edge @ 3m)

WIFI Ant. 1+2+3	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		2369.01	61.01	-12.99	74	57.94	27.11	7.24	31.28	123	56	P	H
		2369.22	50.7	-3.3	54	47.63	27.11	7.24	31.28	123	56	A	H
	*	2414	113.14	-	-	109.91	27.19	7.31	31.27	123	56	P	H
	*	2414	106.43	-	-	103.2	27.19	7.31	31.27	123	56	A	H
													H
													H
		2371.32	59.67	-14.33	74	56.6	27.11	7.24	31.28	369	115	P	V
		2371.32	49.12	-4.88	54	46.05	27.11	7.24	31.28	369	115	A	V
	*	2414	109.67	-	-	106.44	27.19	7.31	31.27	369	115	P	V
	*	2414	102.61	-	-	99.38	27.19	7.31	31.27	369	115	A	V
													V
													V
802.11g CH 06 2437MHz		2388.12	59.29	-14.71	74	56.11	27.15	7.31	31.28	238	83	P	H
		2388.96	49.56	-4.44	54	46.38	27.15	7.31	31.28	238	83	A	H
	*	2438	114.84	-	-	111.46	27.28	7.36	31.26	238	83	P	H
	*	2438	107.62	-	-	104.24	27.28	7.36	31.26	238	83	A	H
		2486.14	60.84	-13.16	74	57.33	27.36	7.4	31.25	238	83	P	H
		2486.21	49.75	-4.25	54	46.24	27.36	7.4	31.25	238	83	A	H
		2389.1	55.49	-18.51	74	52.31	27.15	7.31	31.28	154	160	P	V
		2387.14	45.41	-8.59	54	42.23	27.15	7.31	31.28	154	160	A	V
	*	2438	106.19	-	-	102.81	27.28	7.36	31.26	154	160	P	V
	*	2438	98.44	-	-	95.06	27.28	7.36	31.26	154	160	A	V
		2485.86	56.21	-17.79	74	52.7	27.36	7.4	31.25	154	160	P	V
		2500	47.35	-6.65	54	43.79	27.4	7.4	31.24	154	160	A	V



802.11g CH 11 2462MHz	*	2464	114.78	-	-	111.32	27.32	7.4	31.26	106	61	P	H
	*	2464	107.55	-	-	104.09	27.32	7.4	31.26	106	61	A	H
		2483.76	62.72	-11.28	74	59.21	27.36	7.4	31.25	106	61	P	H
		2483.52	50.16	-3.84	54	46.65	27.36	7.4	31.25	106	61	A	H
													H
													H
	*	2462	109.63	-	-	106.17	27.32	7.4	31.26	100	109	P	V
	*	2462	102.15	-	-	98.69	27.32	7.4	31.26	100	109	A	V
		2483.88	57.31	-16.69	74	53.8	27.36	7.4	31.25	100	109	P	V
		2500	47.89	-6.11	54	44.33	27.4	7.4	31.24	100	109	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI Ant. 1+2+3	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	42.07	-31.93	74	50.35	31.22	11.68	51.18	100	0	P	H
													H
													H
													H
		4824	45.13	-28.87	74	53.41	31.22	11.68	51.18	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4874	46.21	-27.79	74	54.52	31.31	11.53	51.15	100	0	P	H
		7311	47.77	-26.23	74	48.49	36.27	13.81	50.8	100	0	P	H
													H
													H
		4874	44.08	-29.92	74	52.39	31.31	11.53	51.15	100	0	P	V
		7311	47.85	-26.15	74	48.57	36.27	13.81	50.8	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4924	40.96	-33.04	74	49.33	31.39	11.37	51.13	100	0	P	H
		7386	47.02	-26.98	74	47.36	36.51	13.95	50.8	100	0	P	H
													H
													H
		4924	39.67	-34.33	74	48.04	31.39	11.37	51.13	100	0	P	V
		7386	47.01	-26.99	74	47.35	36.51	13.95	50.8	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1+2+3	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		2369.22	60.93	-13.07	74	57.86	27.11	7.24	31.28	100	83	P	H
		2368.905	50.83	-3.17	54	47.76	27.11	7.24	31.28	100	83	A	H
	*	2414	113.51	-	-	110.28	27.19	7.31	31.27	100	83	P	H
	*	2414	106	-	-	102.77	27.19	7.31	31.27	100	83	A	H
													H
													H
		2369.115	55.65	-18.35	74	52.58	27.11	7.24	31.28	100	159	P	V
		2368.905	46.15	-7.85	54	43.08	27.11	7.24	31.28	100	159	A	V
	*	2414	107.33	-	-	104.1	27.19	7.31	31.27	100	159	P	V
	*	2414	99.99	-	-	96.76	27.19	7.31	31.27	100	159	A	V
													V
													V
802.11n HT20 CH 06 2437MHz		2386.02	58.67	-15.33	74	55.49	27.15	7.31	31.28	100	67	P	H
		2385.6	48.71	-5.29	54	45.53	27.15	7.31	31.28	100	67	A	H
	*	2438	113.14	-	-	109.76	27.28	7.36	31.26	100	67	P	H
	*	2438	105.72	-	-	102.34	27.28	7.36	31.26	100	67	A	H
		2484.95	59.42	-14.58	74	55.91	27.36	7.4	31.25	100	67	P	H
		2483.5	49.29	-4.71	54	45.78	27.36	7.4	31.25	100	67	A	H
		2386.72	56.97	-17.03	74	53.79	27.15	7.31	31.28	400	109	P	V
		2386.58	47.38	-6.62	54	44.2	27.15	7.31	31.28	400	109	A	V
	*	2438	109.46	-	-	106.08	27.28	7.36	31.26	400	109	P	V
	*	2438	102.07	-	-	98.69	27.28	7.36	31.26	400	109	A	V
		2493.63	55.92	-18.08	74	52.36	27.4	7.4	31.24	400	109	P	V
		2487.26	45.87	-8.13	54	42.36	27.36	7.4	31.25	400	109	A	V



802.11n HT20 CH 11 2462MHz	*	2464	113.15	-	-	109.69	27.32	7.4	31.26	278	67	P	H
	*	2464	106.04	-	-	102.58	27.32	7.4	31.26	278	67	A	H
		2484.64	62.88	-11.12	74	59.37	27.36	7.4	31.25	278	67	P	H
		2483.52	50.31	-3.69	54	46.8	27.36	7.4	31.25	278	67	A	H
													H
													H
	*	2464	107.25	-	-	103.79	27.32	7.4	31.26	100	160	P	V
	*	2464	99.88	-	-	96.42	27.32	7.4	31.26	100	160	A	V
		2499.96	56.61	-17.39	74	53.05	27.4	7.4	31.24	100	160	P	V
		2499.96	48.68	-5.32	54	45.12	27.4	7.4	31.24	100	160	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1+2+3	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	42.6	-31.4	74	50.88	31.22	11.68	51.18	100	0	P	H
													H
													H
													H
		4824	42.09	-31.91	74	50.37	31.22	11.68	51.18	100	0	P	V
													V
													V
													V
802.11n HT20 CH 06 2437MHz		4874	42.64	-31.36	74	50.95	31.31	11.53	51.15	100	0	P	H
		7311	47.82	-26.18	74	48.54	36.27	13.81	50.8	100	0	P	H
													H
													H
		4874	46.79	-27.21	74	55.1	31.31	11.53	51.15	100	0	P	V
		7311	46.79	-27.21	74	47.51	36.27	13.81	50.8	100	0	P	V
													V
													V
802.11n HT20 CH 11 2462MHz		4924	40.79	-33.21	74	49.16	31.39	11.37	51.13	100	0	P	H
		7386	47.76	-26.24	74	48.1	36.51	13.95	50.8	100	0	P	H
													H
													H
		4924	40.26	-33.74	74	48.63	31.39	11.37	51.13	100	0	P	V
		7386	47.42	-26.58	74	47.76	36.51	13.95	50.8	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1+2+3	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		2389.38	63.88	-10.12	74	60.7	27.15	7.31	31.28	277	77	P	H
		2388.96	53.74	-0.26	54	50.56	27.15	7.31	31.28	277	77	A	H
	*	2422	112.49	-	-	109.16	27.23	7.36	31.26	277	77	P	H
	*	2422	104.94	-	-	101.61	27.23	7.36	31.26	277	77	A	H
		2483.69	57.07	-16.93	74	53.56	27.36	7.4	31.25	277	77	P	H
		2500	46.56	-7.44	54	43	27.4	7.4	31.24	277	77	A	H
		2387.56	57.19	-16.81	74	54.01	27.15	7.31	31.28	100	126	P	V
		2389.94	47.12	-6.88	54	43.93	27.15	7.31	31.27	100	126	A	V
	*	2422	105.43	-	-	102.1	27.23	7.36	31.26	100	126	P	V
	*	2422	98.12	-	-	94.79	27.23	7.36	31.26	100	126	A	V
		2499.79	58.22	-15.78	74	54.66	27.4	7.4	31.24	100	126	P	V
		2500	52.06	-1.94	54	48.5	27.4	7.4	31.24	100	126	A	V
802.11n HT40 CH 06 2437MHz		2378.6	61.15	-12.85	74	58.08	27.11	7.24	31.28	156	50	P	H
		2386.44	50.62	-3.38	54	47.44	27.15	7.31	31.28	156	50	A	H
	*	2437	115.4	-	-	112.02	27.28	7.36	31.26	156	50	P	H
	*	2437	107.57	-	-	104.19	27.28	7.36	31.26	156	50	A	H
		2484.67	60.74	-13.26	74	57.23	27.36	7.4	31.25	156	50	P	H
		2484.6	49.42	-4.58	54	45.91	27.36	7.4	31.25	156	50	A	H
		2388.82	56.77	-17.23	74	53.59	27.15	7.31	31.28	104	84	P	V
		2389.94	47.91	-6.09	54	44.72	27.15	7.31	31.27	104	84	A	V
	*	2437	108.99	-	-	105.61	27.28	7.36	31.26	104	84	P	V
	*	2437	101.58	-	-	98.2	27.28	7.36	31.26	104	84	A	V
		2499.86	56.84	-17.16	74	53.28	27.4	7.4	31.24	104	84	P	V
		2500	49.77	-4.23	54	46.21	27.4	7.4	31.24	104	84	A	V



802.11n HT40 CH 09 2452MHz		2362.64	57.14	-16.86	74	54.12	27.07	7.24	31.29	188	92	P	H
		2389.94	47.03	-6.97	54	43.84	27.15	7.31	31.27	188	92	A	H
	*	2452	111.57	-	-	108.19	27.28	7.36	31.26	188	92	P	H
	*	2452	104.04	-	-	100.66	27.28	7.36	31.26	188	92	A	H
		2484.6	63.01	-10.99	74	59.5	27.36	7.4	31.25	188	92	P	H
		2483.5	52.87	-1.13	54	49.36	27.36	7.4	31.25	188	92	A	H
		2365.3	54.47	-19.53	74	51.44	27.07	7.24	31.28	110	157	P	V
		2374.96	45.53	-8.47	54	42.46	27.11	7.24	31.28	110	157	A	V
	*	2452	105.44	-	-	102.06	27.28	7.36	31.26	110	157	P	V
	*	2452	98	-	-	94.62	27.28	7.36	31.26	110	157	A	V
		2500	57.76	-16.24	74	54.2	27.4	7.4	31.24	110	157	P	V
		2500	49.96	-4.04	54	46.4	27.4	7.4	31.24	110	157	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+3	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	41.22	-32.78	74	49.45	31.25	11.68	51.16	100	0	P	H
		7266	46.9	-27.1	74	47.78	36.17	13.75	50.8	100	0	P	H
													H
													H
		4844	40.42	-33.58	74	48.65	31.25	11.68	51.16	100	0	P	V
		7266	46.63	-27.37	74	47.51	36.17	13.75	50.8	100	0	P	V
													V
													V
802.11n HT40 CH 06 2437MHz		4874	42.96	-31.04	74	51.27	31.31	11.53	51.15	100	0	P	H
		7311	47.12	-26.88	74	47.84	36.27	13.81	50.8	100	0	P	H
													H
													H
		4874	41.79	-32.21	74	50.1	31.31	11.53	51.15	100	0	P	V
		7311	48.5	-25.5	74	49.22	36.27	13.81	50.8	100	0	P	V
													V
													V
802.11n HT40 CH 09 2452MHz		4904	41.9	-32.1	74	50.32	31.36	11.37	51.15	100	0	P	H
		7356	47.28	-26.72	74	47.79	36.41	13.88	50.8	100	0	P	H
													H
													H
		4904	41.25	-32.75	74	49.67	31.36	11.37	51.15	100	0	P	V
		7356	47.96	-26.04	74	48.47	36.41	13.88	50.8	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												