FCC RADIO TEST REPORT

FCC ID	:	MSQZ01QD
Equipment	:	ASUS Phone (Mobile Phone)
Brand Name	:	ASUS
Model Name	:	ASUS_Z01QD
Applicant	:	ASUSTeK COMPUTER INC. 4F, No. 150, LI-TE RD., PEITOU, TAIPEI, TAIWAN
Manufacturer	:	Arima Communications (Jiangsu) Co., LTD No. 168, Jiao Tong North Road, Wu Jiang, Su Zhou, Jiang Su, PRC.
Standard	:	FCC Part 15 Subpart C §15.247

The product was received on May 24, 2018 and testing was started from Jun. 14, 2018 and completed on Jul. 14, 2018. 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

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

Jones Tsai

Approved by: Jones Tsai

SPORTON INTERTIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

Table of Contents

History of this test report

Report No.	Version	Description	Issued Date
FR852405C	01	Initial issue of report	Jul. 25, 2018

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.247(a)(2)	6dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.247(b)	Power Output Measurement	Pass	-
3.3	15.247(e)	Power Spectral Density	Pass	-
3.4	15.247(d)	Conducted Band Edges	Pass	-
		Conducted Spurious Emission	Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	Pass	Under limit 2.23 dB at 2483.520 MHz
3.6	15.207	AC Conducted Emission	Pass	Under limit 9.88 dB at 0.152 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass	-

Reviewed by: Joseph Lin

Report Producer: Polly Tsai

1 General Description

1.1 Product Feature of Equipment Under Test

GSM/WCDMA/LTE, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac, FM Receiver, NFC, WiGig, and GNSS

Product Specification subjective to this standard	
Antenna Type	WWAN: PIFA Antenna WLAN: PIFA Antenna Bluetooth: PIFA Antenna GPS/Glonass/Galileo/BDS: PIFA Antenna NFC: Loop Antenna WiGig: Patch Antenna FM: using earphone as antenna

1.2 Modification of EUT

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

1.3 Testing Location

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

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	**Sporton Site No.**	
	TH05-HY	CO05-HY

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.**
	03CH15-HY

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

1.4 Applicable Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
- 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

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 (Y 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 modes are considering the modulation and worse data rates as below table.

Single Antenna

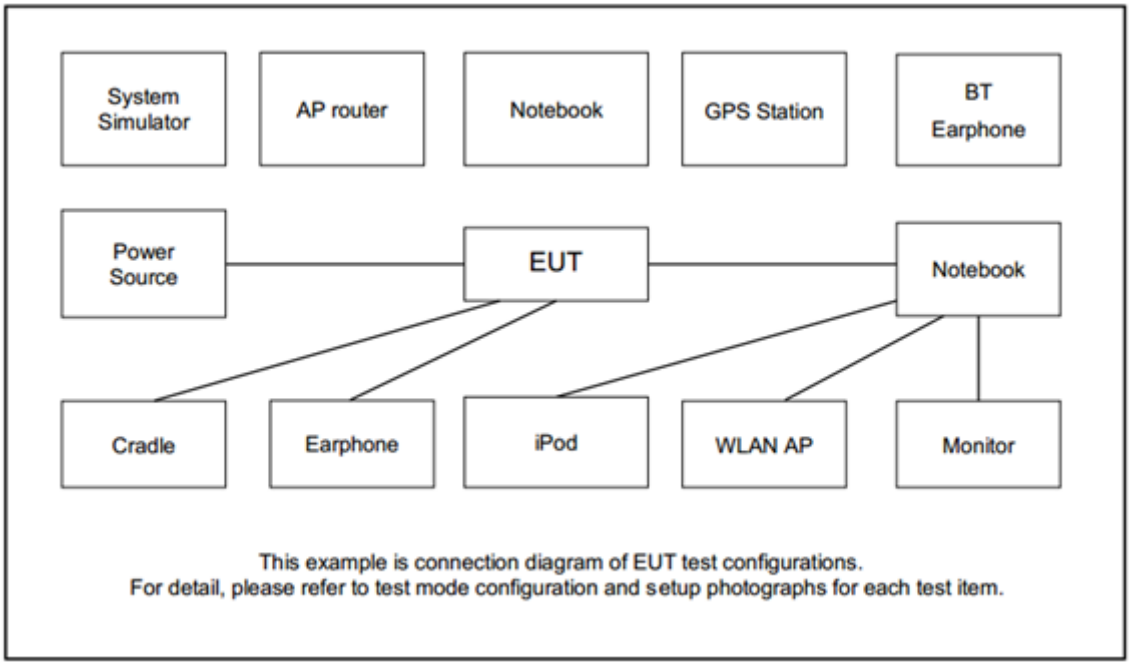
Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0

MIMO Antenna

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

Test Cases	
AC Conducted Emission	Mode 1: GSM850 Idle + Bluetooth Link + WLAN (2.4GHz) Link + NFC On + X Mode + Aura Sync + Pro Dongle Connect to JEDI (Bottom USB Port) + USB Type A - Port 1_Connect with USB 3.0 Storage Device + USB Type A - Port 2_Connect with USB 3.0 Storage Device + LAN Link + MEPG4 (Color Bar) + Pro Dongle (Charging from Adapter) + Copy Data Port 1 to 2 + SIM 1

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
3.	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
4.	Notebook	DELL	Latitude 5480	FCC DoC	N/A	N/A
5.	Bluetooth Earphone	Sony	SBH20	PY7-RD0010	N/A	Unshielded,1.8m
6.	USB 3.0 Flash Drive	Transcend	JetFlash700	FCC DoC	Shielded, 1.0m	N/A
7.	Pro Dongle	ASUS	ADSU001	FCC DoC	Unshielded, 0.63m	N/A
8.	Earphone	ASUS	EA009	N/A	Unshielded 0.84m	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “QRCT” was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting 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.

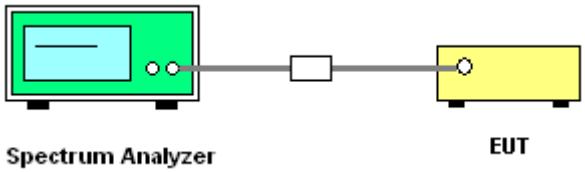
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

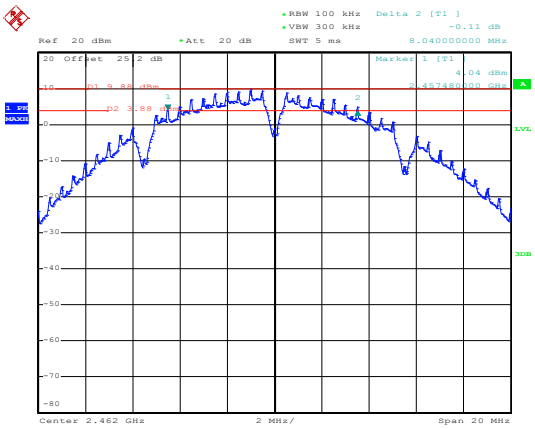
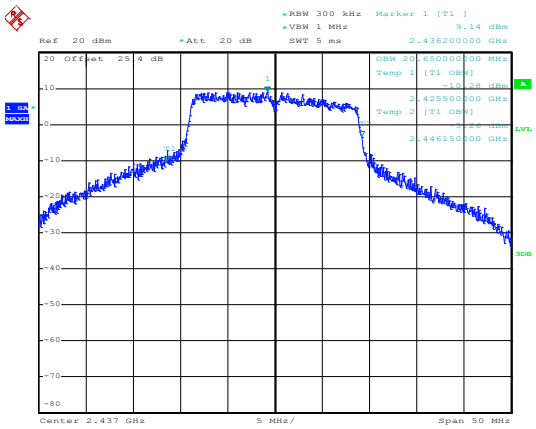
1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v04.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit 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) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) ≥ 3 * RBW.
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.

Minimum 6dB Bandwidth	Maximum 99% Occupied Bandwidth
	
Date: 22.JUN.2018 05:41:16	Date: 25.JUN.2018 14:59:54

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

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna 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.

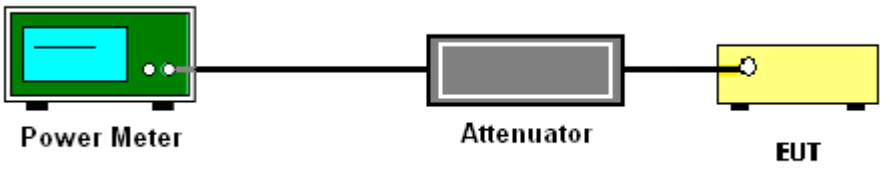
3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

3.2.3 Test Procedures

1. For Peak Power, the testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v04 section 9.1.3 PKPM1 Peak power meter method.
2. For Average Power, the testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v04 section 9.2.3.1 Method AVGPM.
3. 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.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. Measure the conducted output power and record the results in the test report.
6. 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

See list of measuring equipment 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.

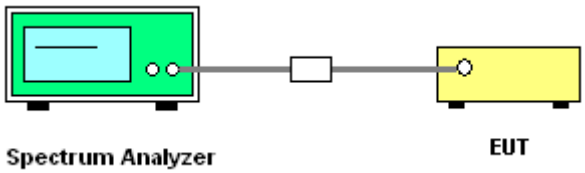
   If measurements performed using method (2) plus 10 log (N) exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

   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)

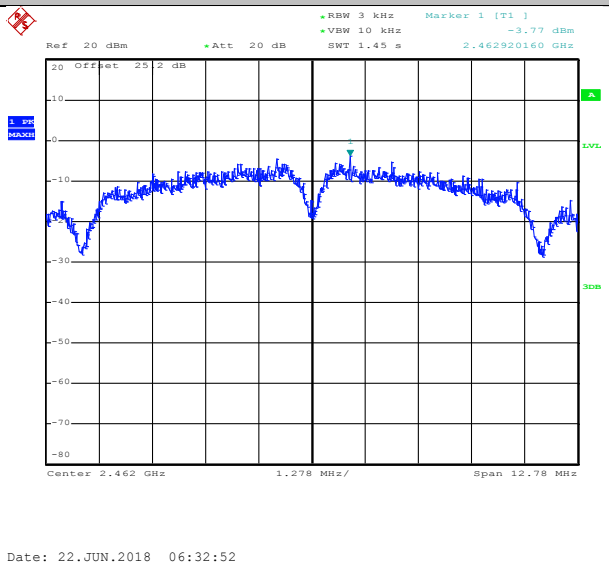
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Worst Case Power Density (dBm/3kHz)



3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

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

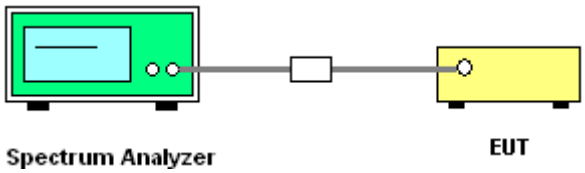
3.4.2 Measuring Instruments

See list of measuring equipment 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 per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



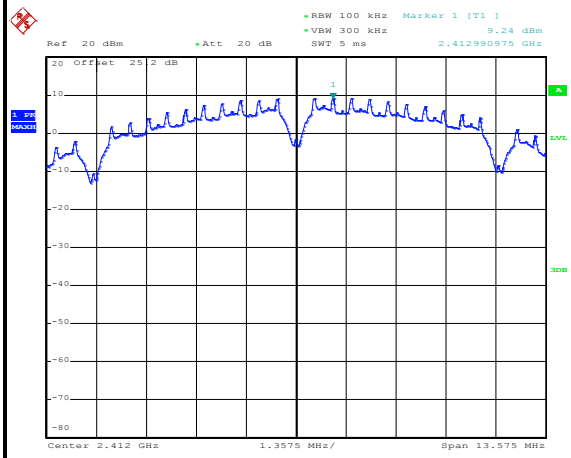
3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Engineer :	Luffy Lin and Shiang Wang	**Temperature :**	21~25℃
		Relative Humidity :	51~54%

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

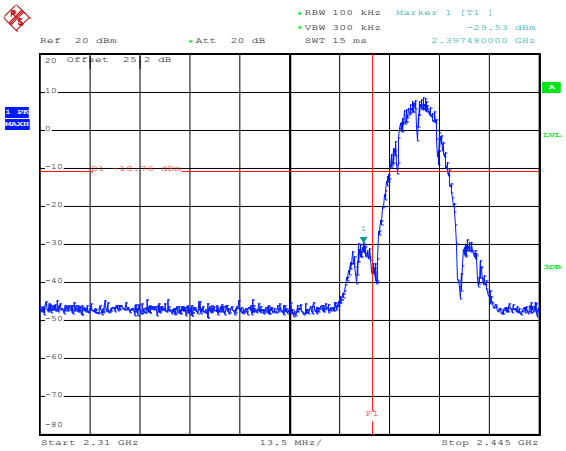
Test Mode :	802.11b	**Test Channel :**	01

100kHz PSD reference Level



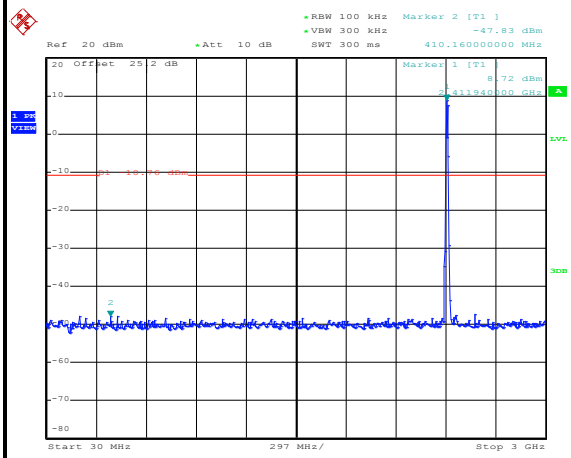
Date: 22.JUN.2018 05:27:56

Channel Plot



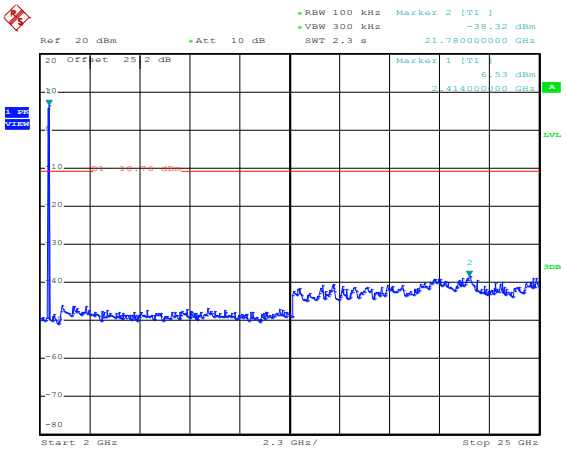
Date: 22.JUN.2018 05:28:19

Spurious Emission 30MHz~3GHz



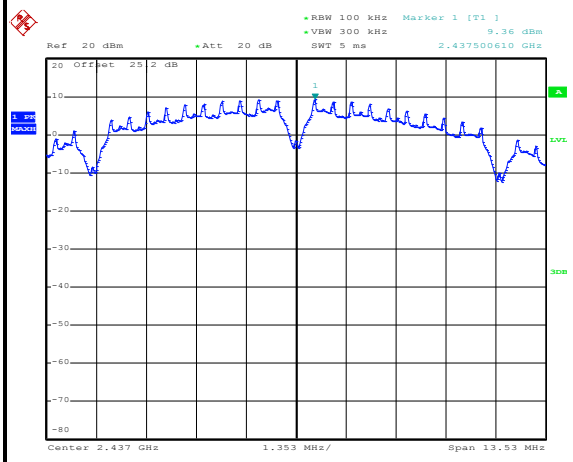
Date: 22.JUN.2018 05:29:12

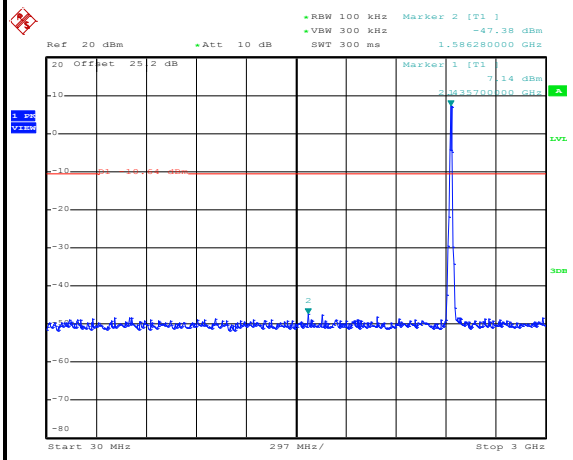
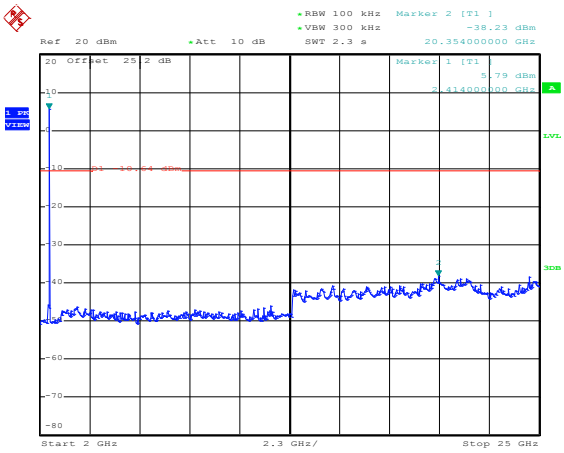
Spurious Emission 2GHz~25GHz



Date: 22.JUN.2018 05:29:29

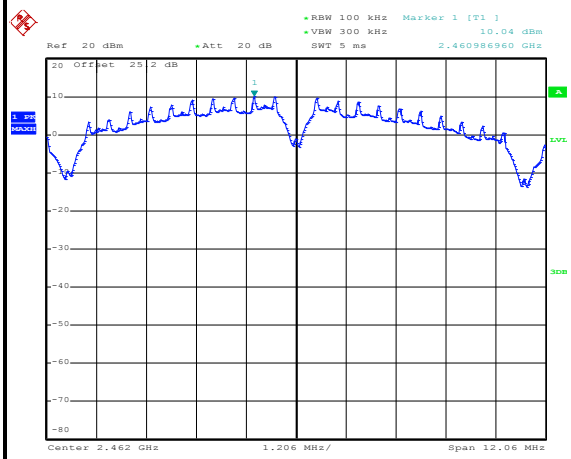
Test Mode :	802.11b	Test Channel :	06

100kHz PSD reference Level	Channel Plot
	
Date: 22.JUN.2018 05:33:40	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	
Date: 22.JUN.2018 05:33:57	Date: 22.JUN.2018 05:34:23

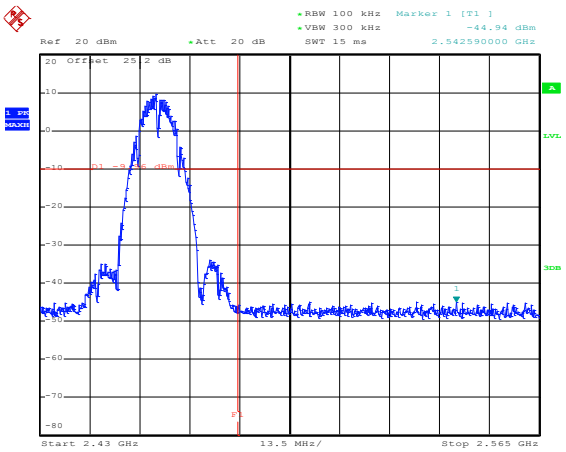
Test Mode :	802.11b	Test Channel :	11

100kHz PSD reference Level



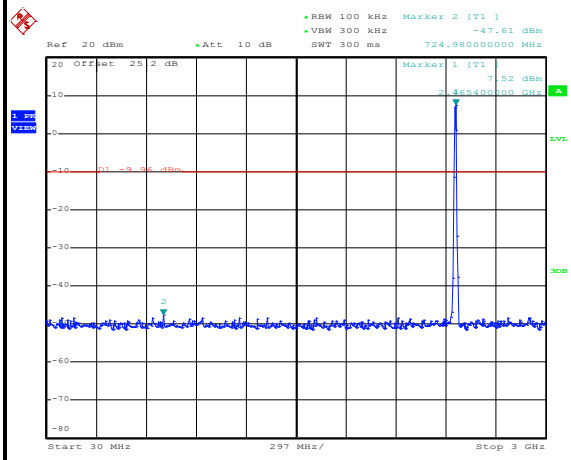
Date: 22.JUN.2018 05:41:57

Channel Plot



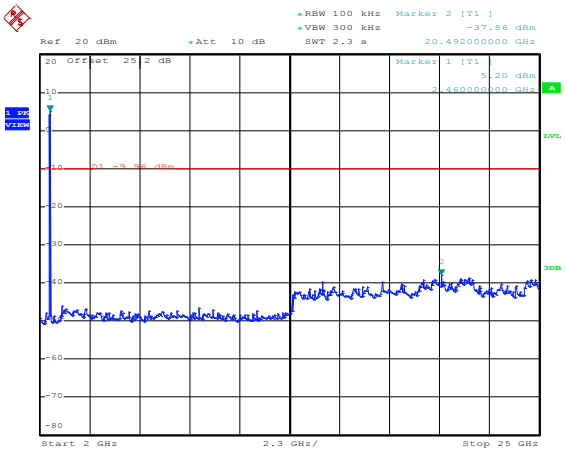
Date: 22.JUN.2018 05:42:35

Spurious Emission 30MHz~3GHz



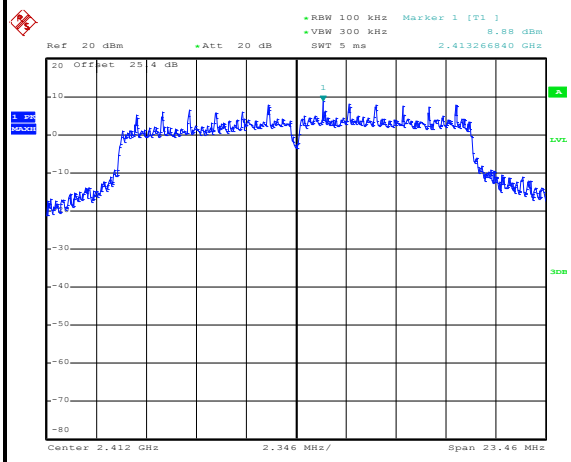
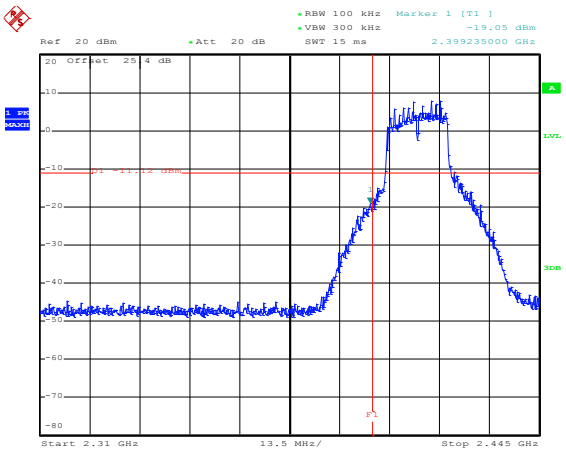
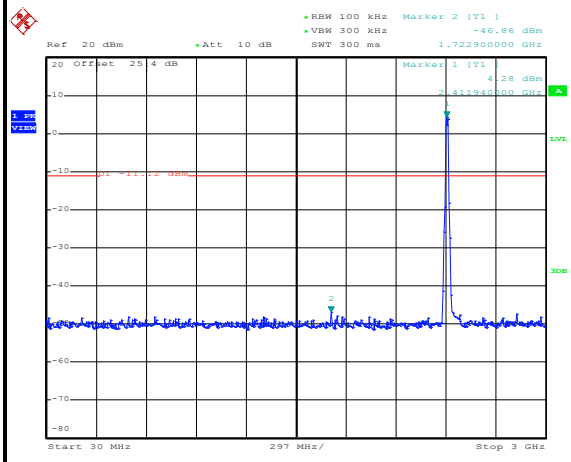
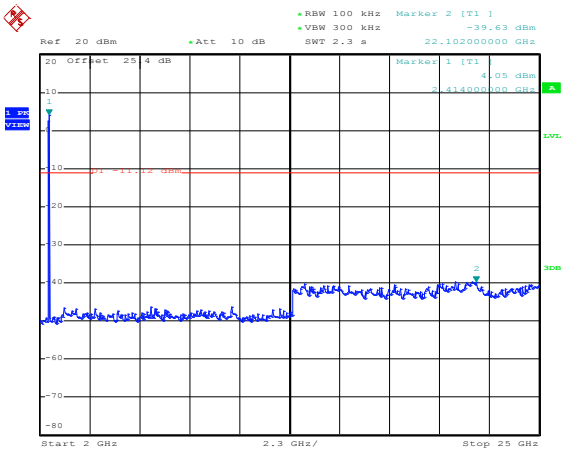
Date: 22.JUN.2018 05:43:07

Spurious Emission 2GHz~25GHz

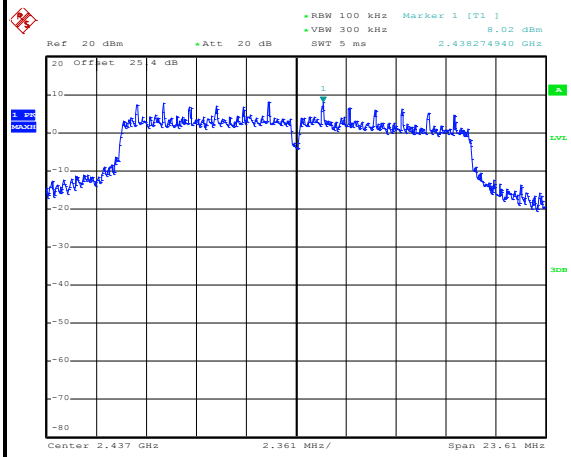


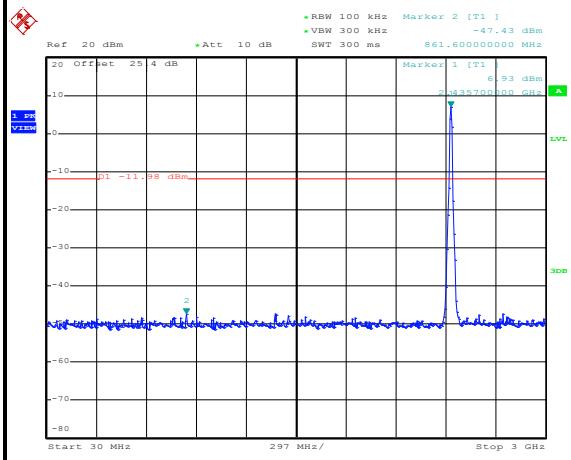
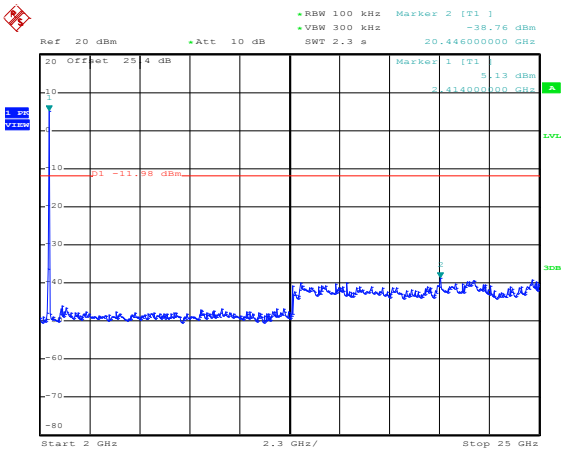
Date: 22.JUN.2018 05:43:33

Test Mode :	802.11g	Test Channel :	01

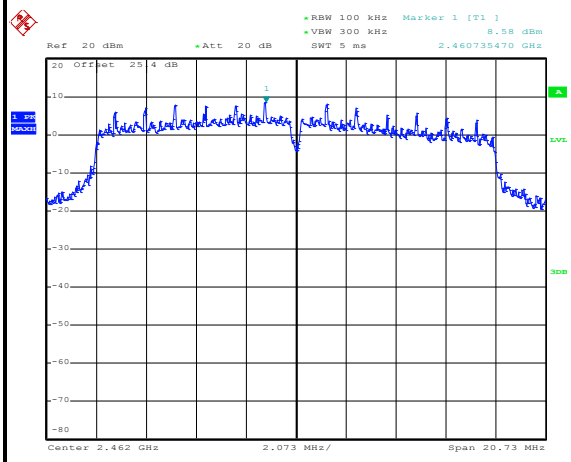
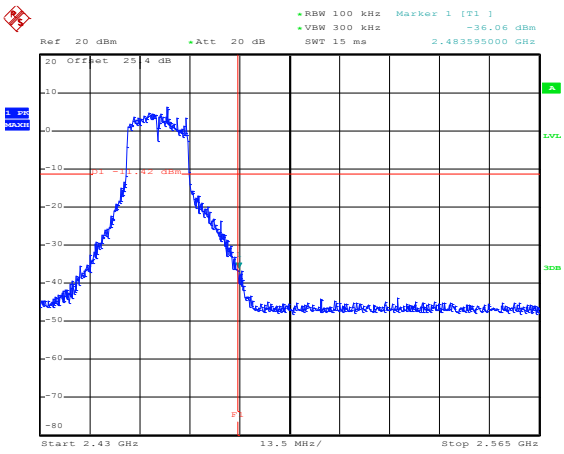
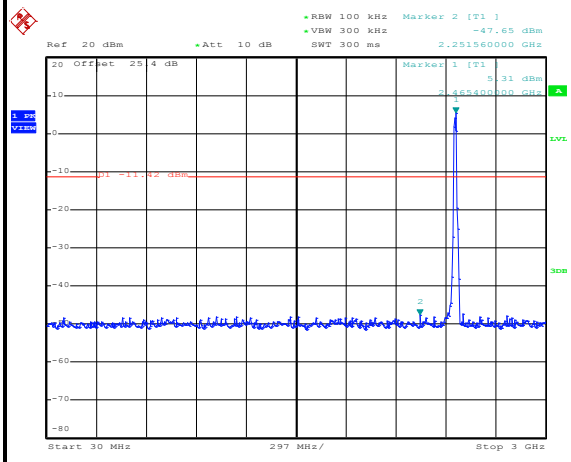
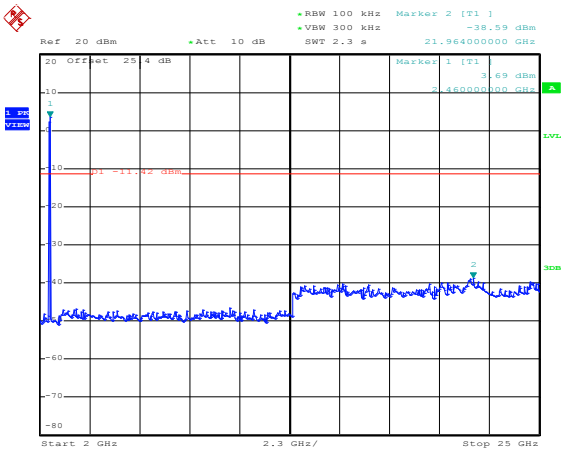
100kHz PSD reference Level	Channel Plot
	
Date: 25.JUN.2018 11:42:39	Date: 25.JUN.2018 11:42:54
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 25.JUN.2018 11:43:20	Date: 25.JUN.2018 11:43:34

Test Mode :	802.11g	Test Channel :	06

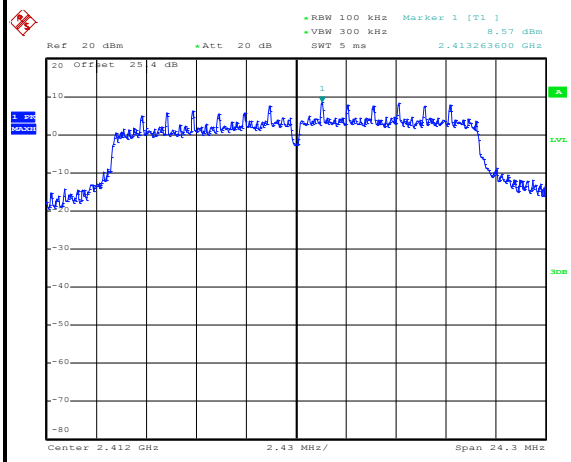
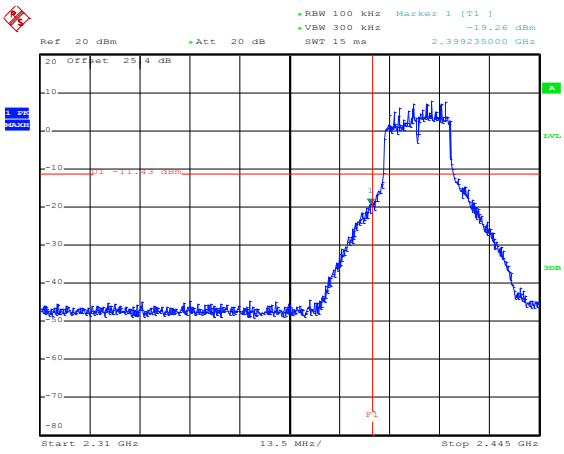
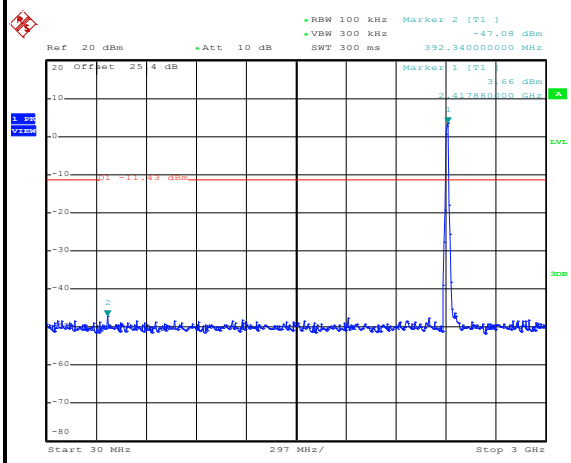
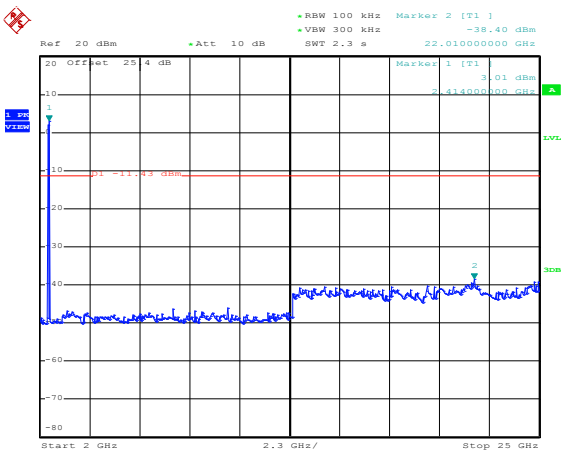
100kHz PSD reference Level	Channel Plot
	
Date: 25.JUN.2018 11:46:14	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	
Date: 25.JUN.2018 11:46:43	Date: 25.JUN.2018 11:47:00

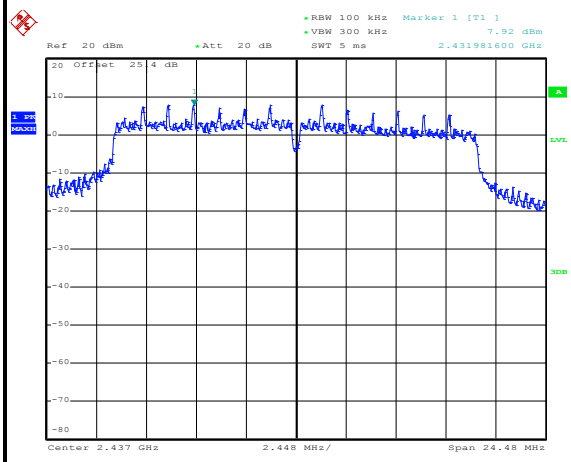
Test Mode :	802.11g	Test Channel :	11

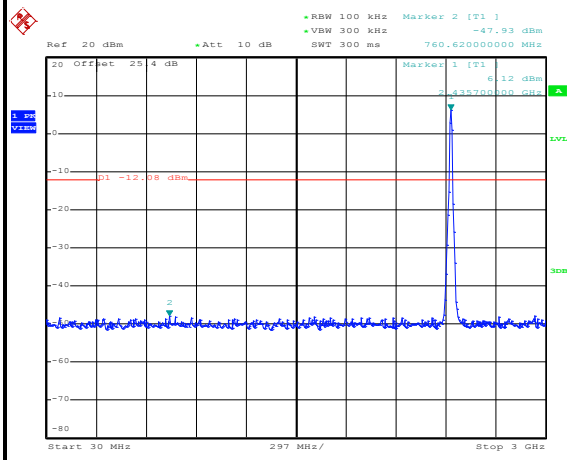
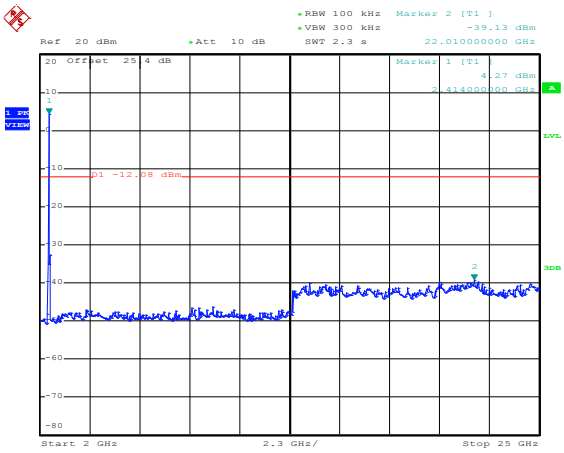
100kHz PSD reference Level	Channel Plot
	
Date: 25.JUN.2018 11:49:31	Date: 25.JUN.2018 11:50:23
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 25.JUN.2018 11:50:41	Date: 25.JUN.2018 11:50:56

Test Mode :	802.11n HT20	Test Channel :	01

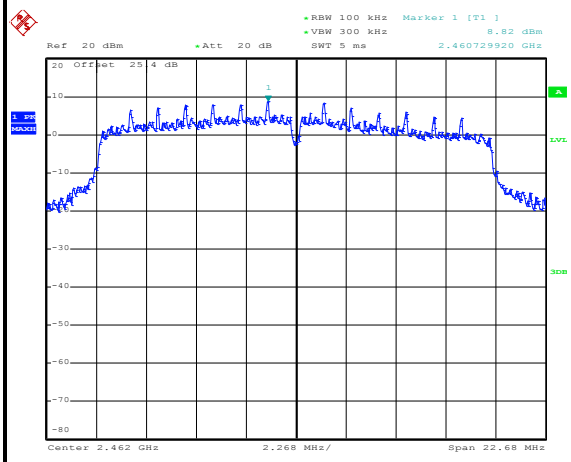
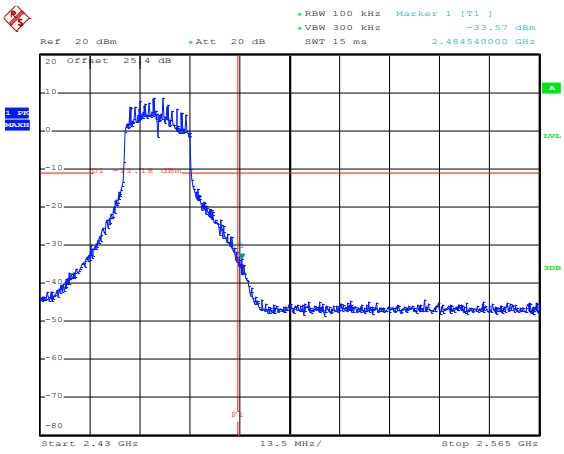
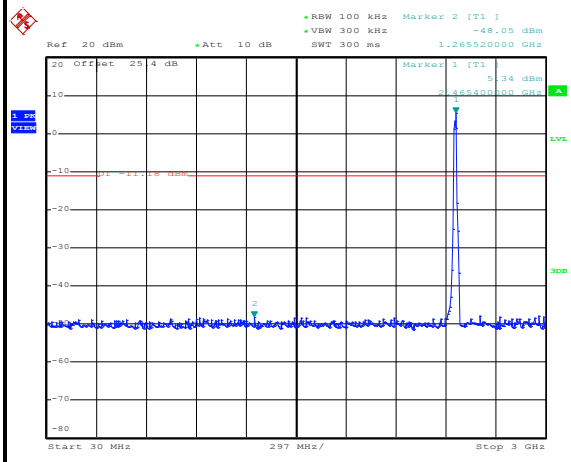
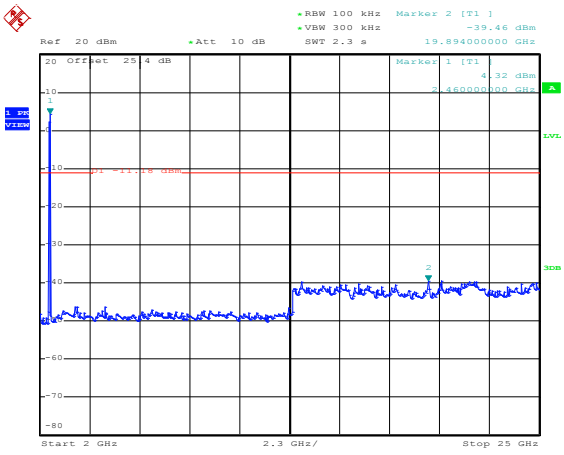
100kHz PSD reference Level	Channel Plot
	
Date: 25.JUN.2018 14:53:48	Date: 25.JUN.2018 14:54:03
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 25.JUN.2018 14:54:29	Date: 25.JUN.2018 14:55:05

Test Mode :	802.11n HT20	Test Channel :	06

100kHz PSD reference Level	Channel Plot
	
Date: 25.JUN.2018 14:57:17	

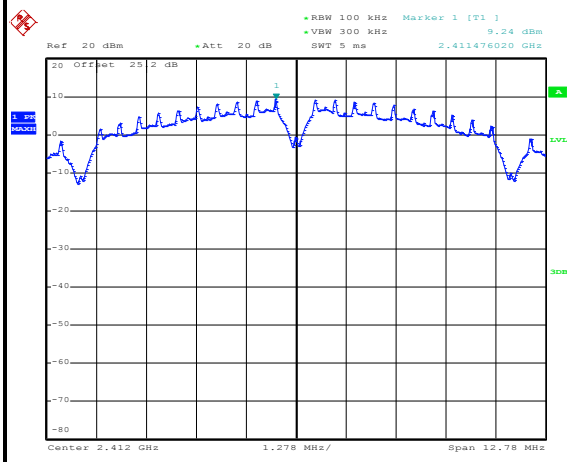
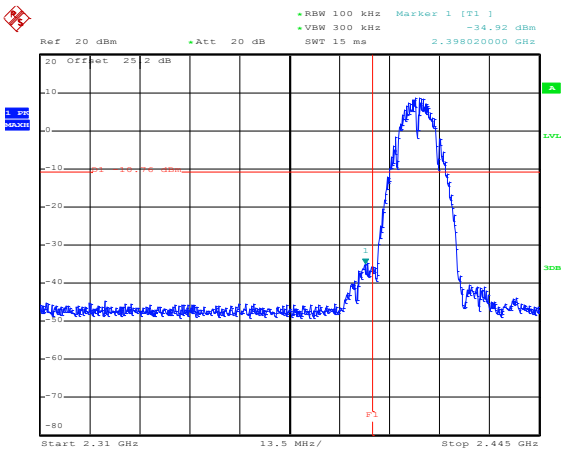
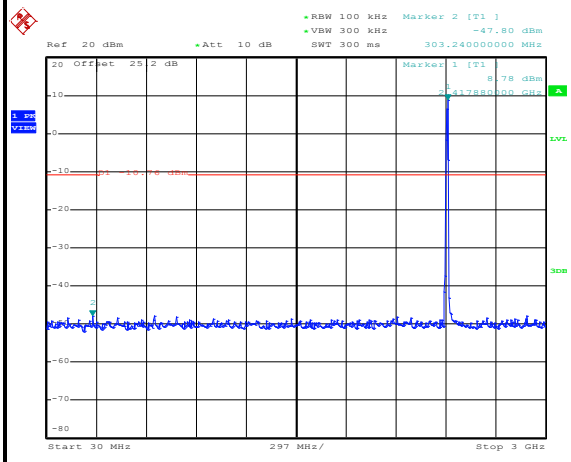
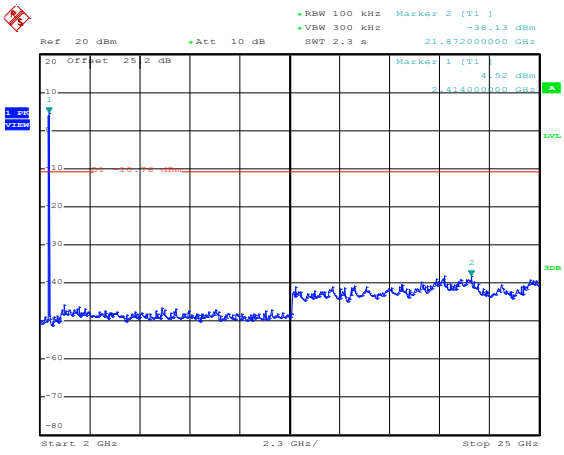
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	
Date: 25.JUN.2018 14:58:16	Date: 25.JUN.2018 14:59:37

Test Mode :	802.11n HT20	Test Channel :	11

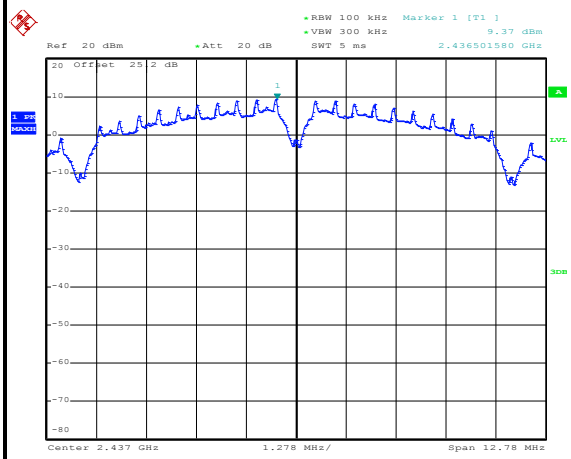
100kHz PSD reference Level	Channel Plot
	
Date: 25.JUN.2018 15:02:56	Date: 25.JUN.2018 15:03:33
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 25.JUN.2018 15:04:04	Date: 25.JUN.2018 15:04:19

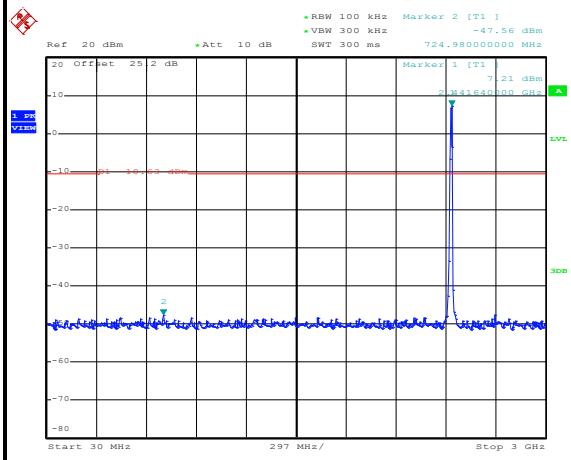
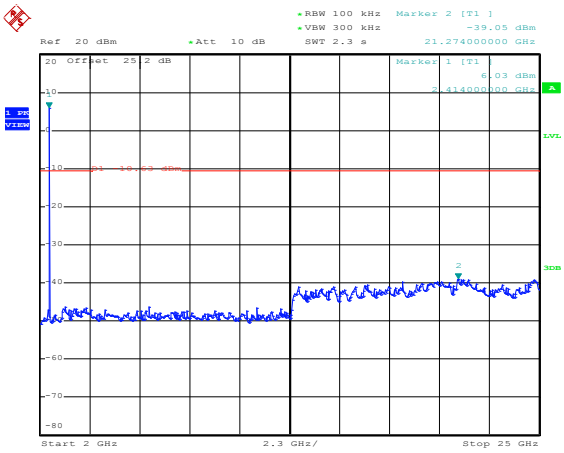
Number of TX = 1, Ant. 2 (Measured)

Test Mode :	802.11b	Test Channel :	01

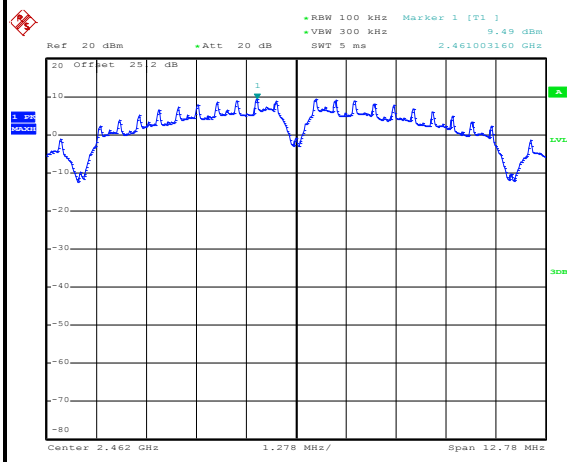
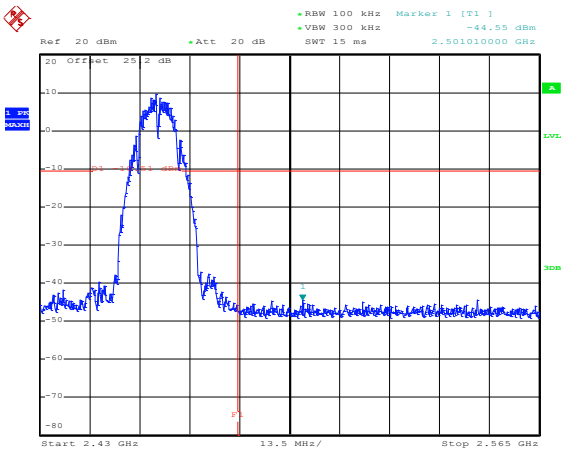
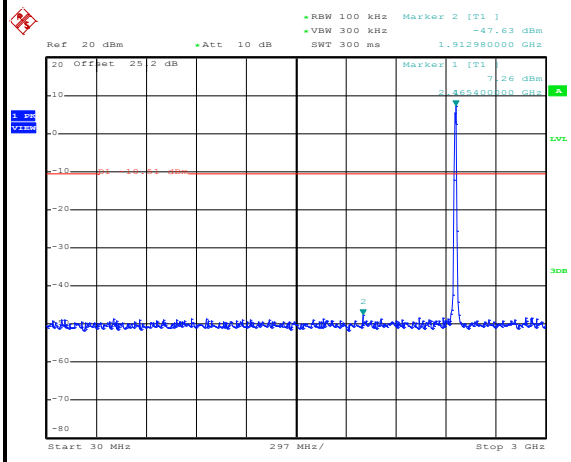
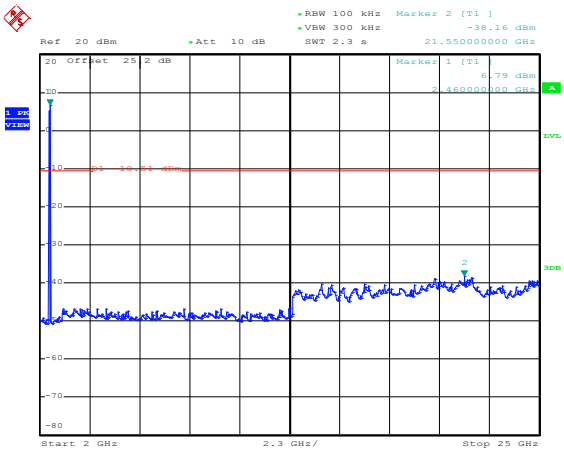
100kHz PSD reference Level	Channel Plot
	
Date: 22.JUN.2018 06:25:47	Date: 22.JUN.2018 06:26:05
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 22.JUN.2018 06:27:00	Date: 22.JUN.2018 06:27:16

Test Mode :	802.11b	Test Channel :	06

100kHz PSD reference Level	Channel Plot
	
Date: 22.JUN.2018 06:29:48	

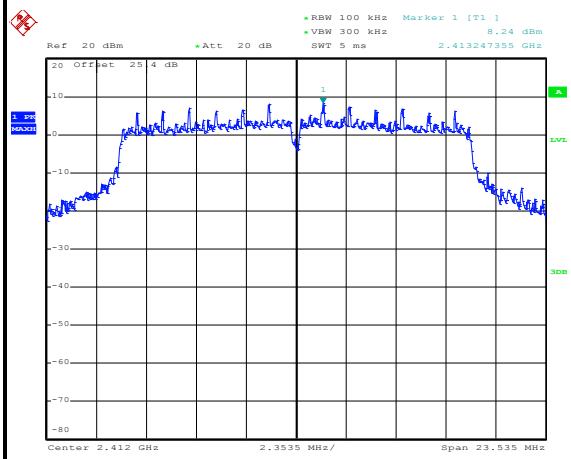
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	
Date: 22.JUN.2018 06:30:13	Date: 22.JUN.2018 06:30:31

Test Mode :	802.11b	Test Channel :	11

100kHz PSD reference Level	Channel Plot
	
Date: 22.JUN.2018 06:33:15	Date: 22.JUN.2018 06:33:34
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 22.JUN.2018 06:33:59	Date: 22.JUN.2018 06:34:14

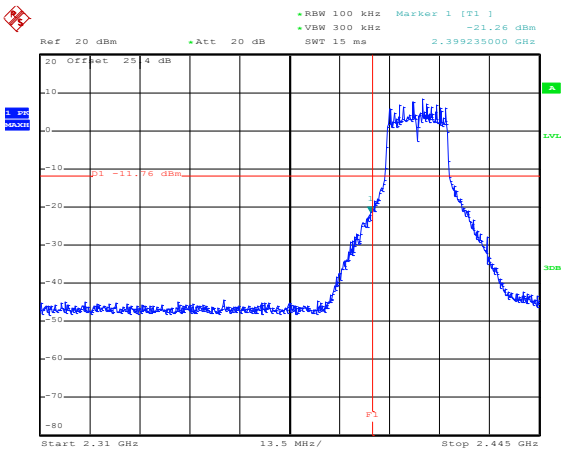
Test Mode :	802.11g	Test Channel :	01

100kHz PSD reference Level



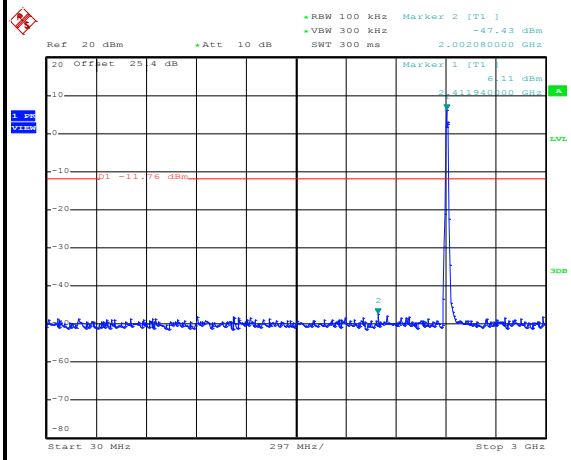
Date: 25.JUN.2018 13:39:19

Channel Plot



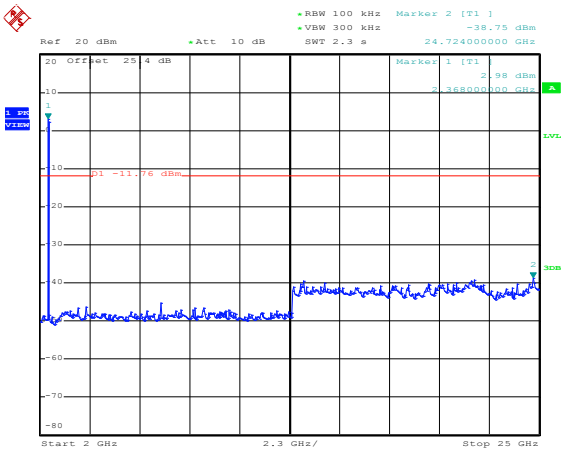
Date: 25.JUN.2018 13:39:46

Spurious Emission 30MHz~3GHz



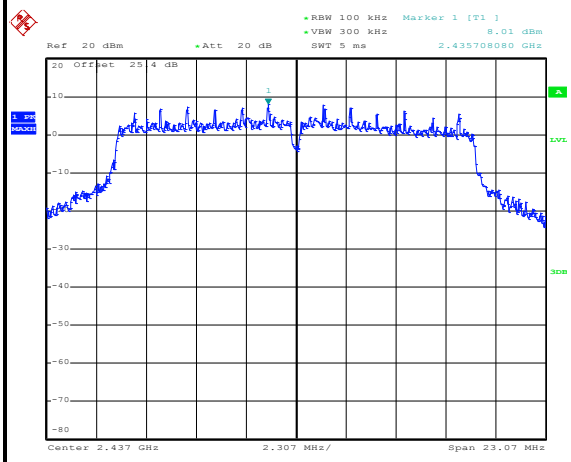
Date: 25.JUN.2018 13:40:12

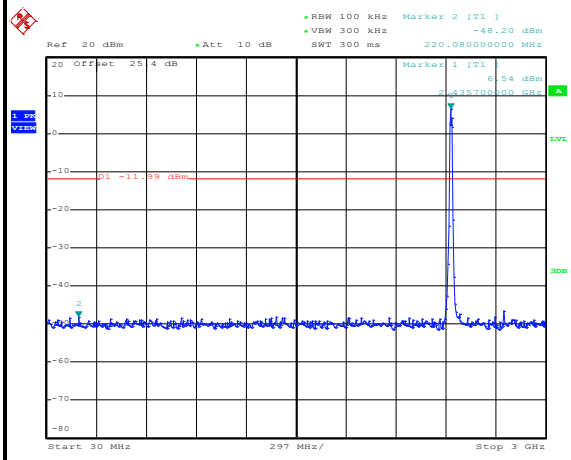
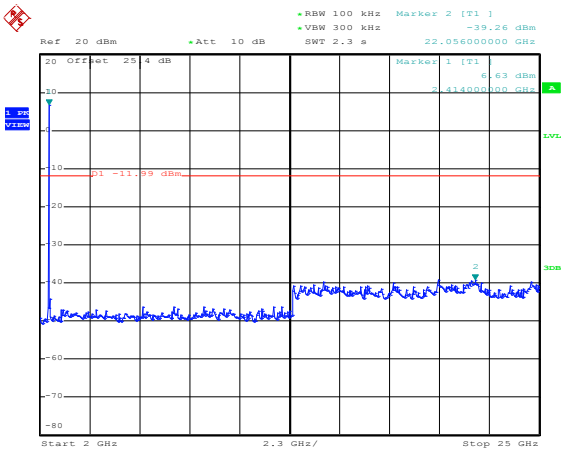
Spurious Emission 2GHz~25GHz



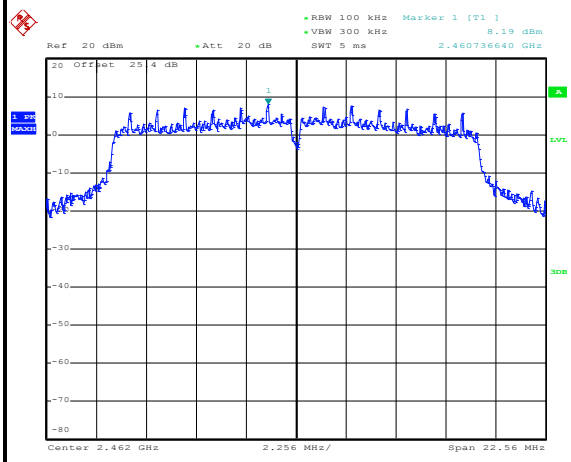
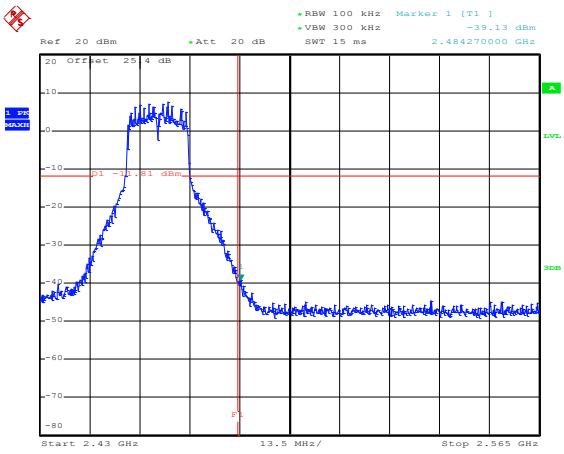
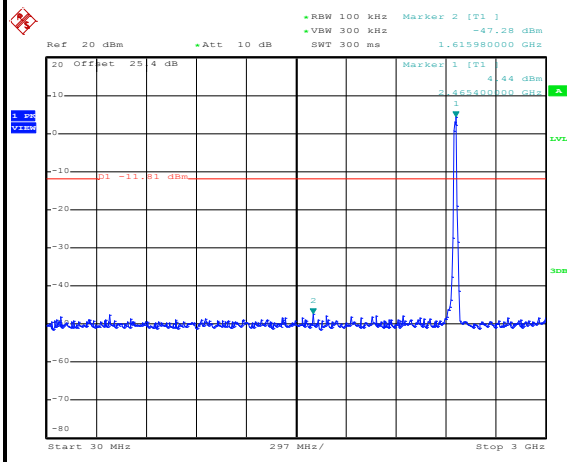
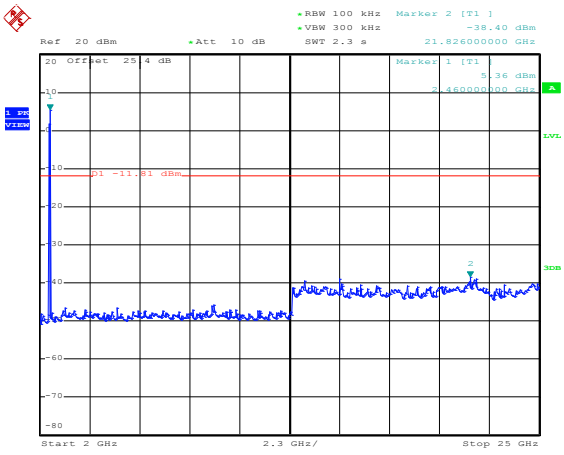
Date: 25.JUN.2018 13:40:27

Test Mode :	802.11g	Test Channel :	06

100kHz PSD reference Level	Channel Plot
	
Date: 25.JUN.2018 13:44:03	

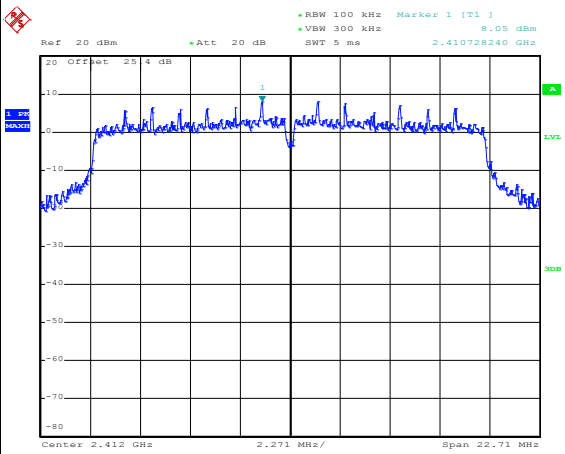
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	
Date: 25.JUN.2018 13:44:20	Date: 25.JUN.2018 13:44:34

Test Mode :	802.11g	Test Channel :	11

100kHz PSD reference Level	Channel Plot
	
Date: 25.JUN.2018 13:46:55	Date: 25.JUN.2018 13:47:14
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 25.JUN.2018 13:47:29	Date: 25.JUN.2018 13:47:44

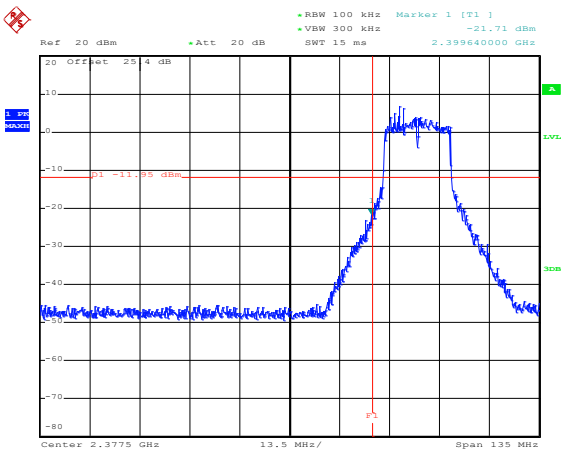
Test Mode :	802.11n HT20	Test Channel :	01

100kHz PSD reference Level



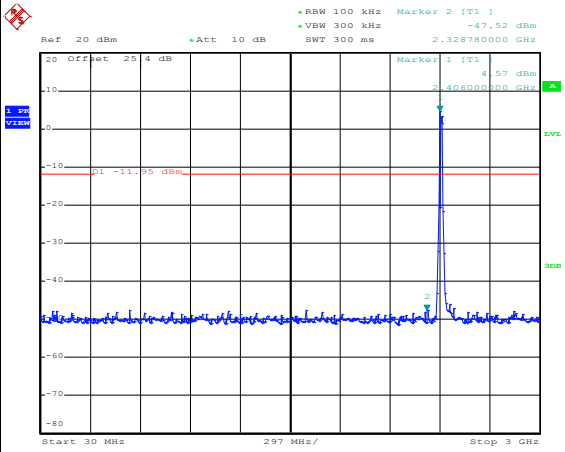
Date: 25.JUN.2018 15:19:08

Channel Plot



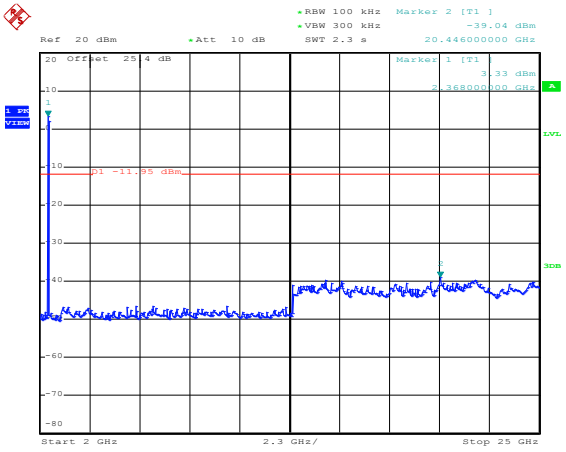
Date: 25.JUN.2018 15:19:35

Spurious Emission 30MHz~3GHz



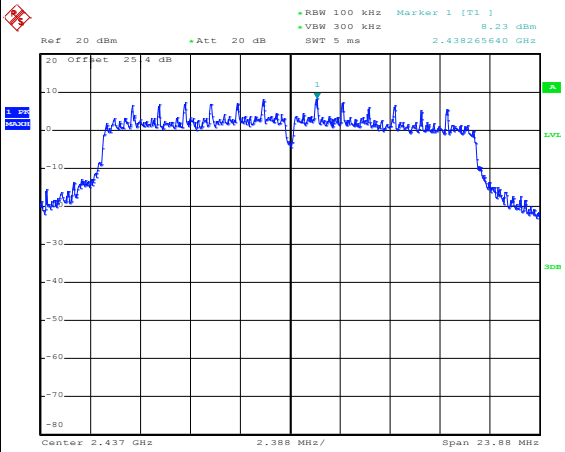
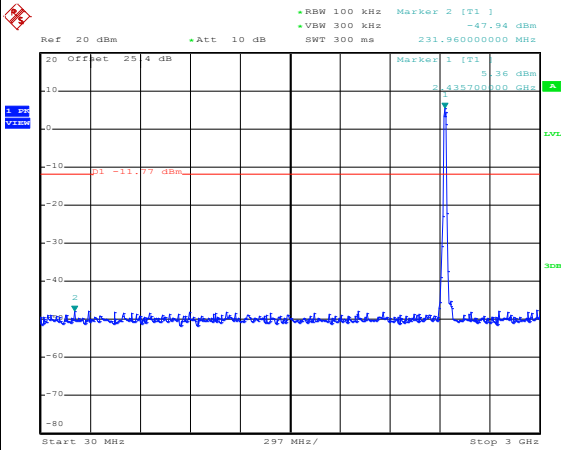
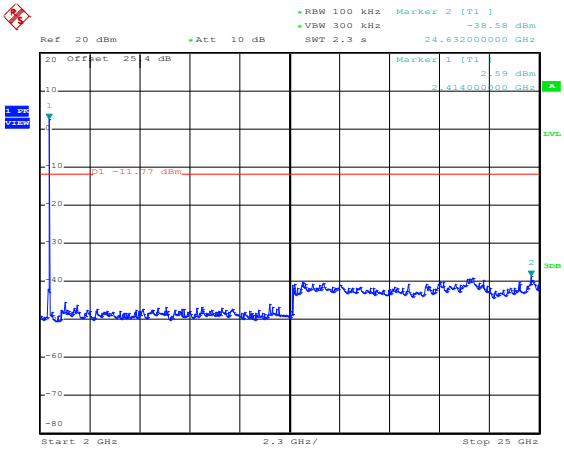
Date: 25.JUN.2018 15:20:05

Spurious Emission 2GHz~25GHz

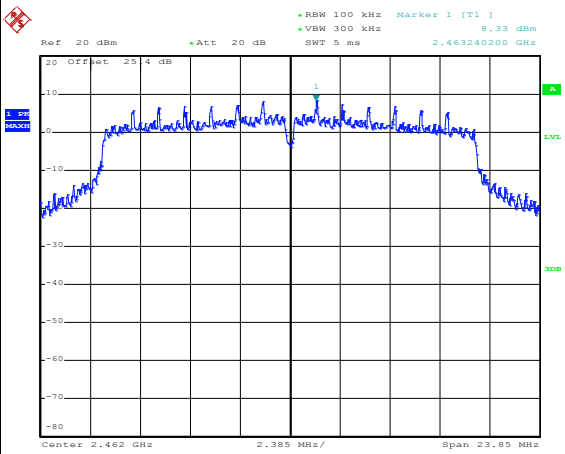
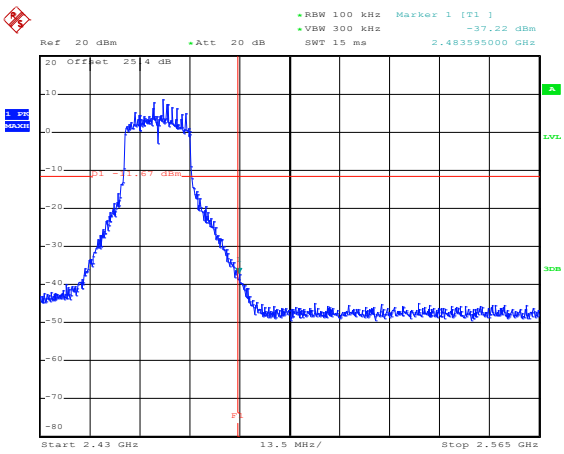
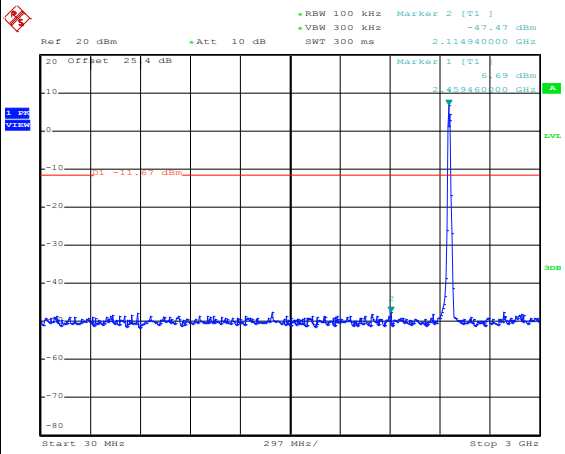
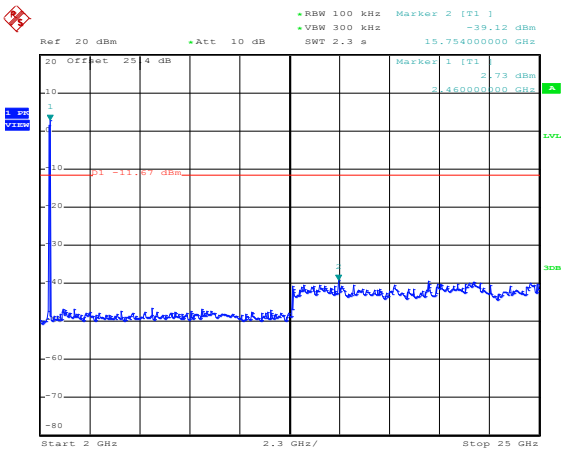


Date: 25.JUN.2018 15:20:31

Test Mode :	802.11n HT20	Test Channel :	06

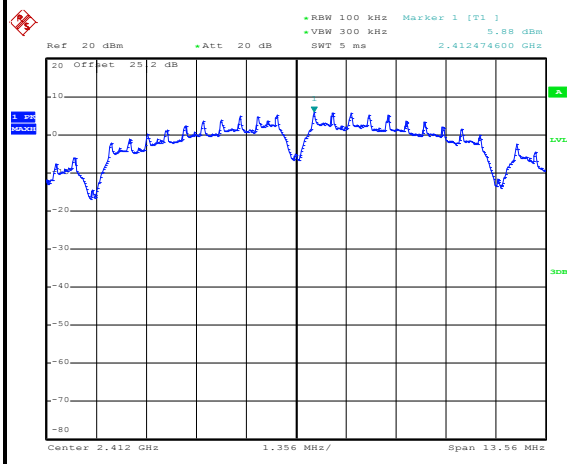
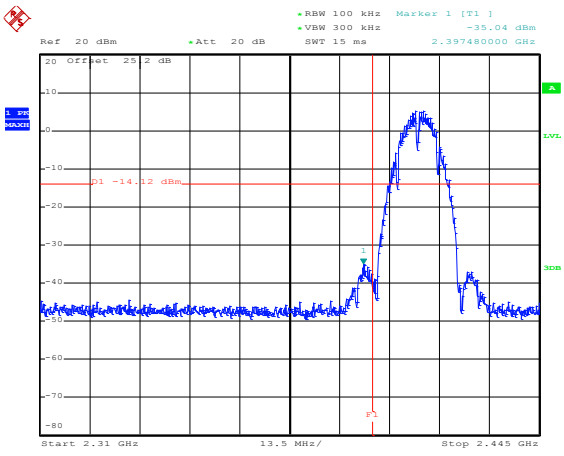
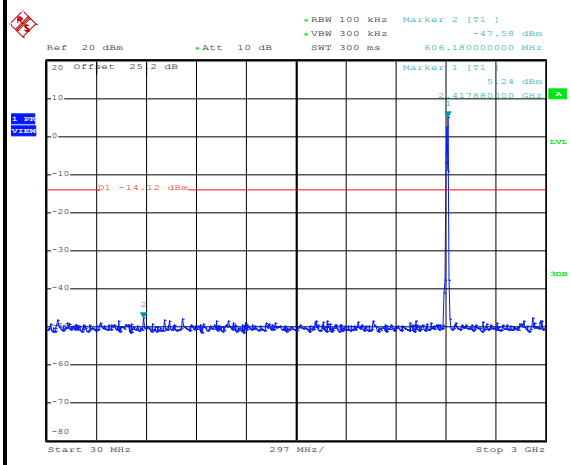
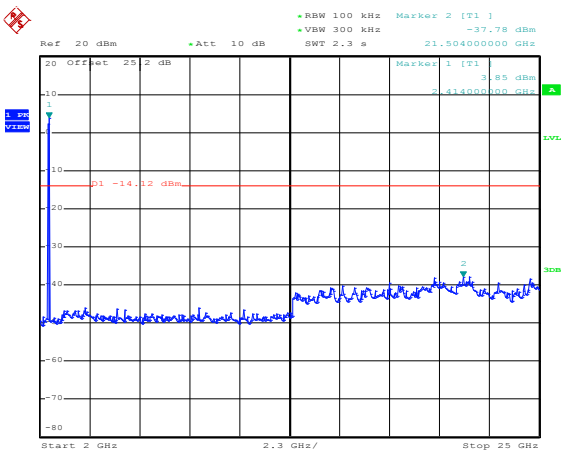
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

Test Mode :	802.11n HT20	Test Channel :	11

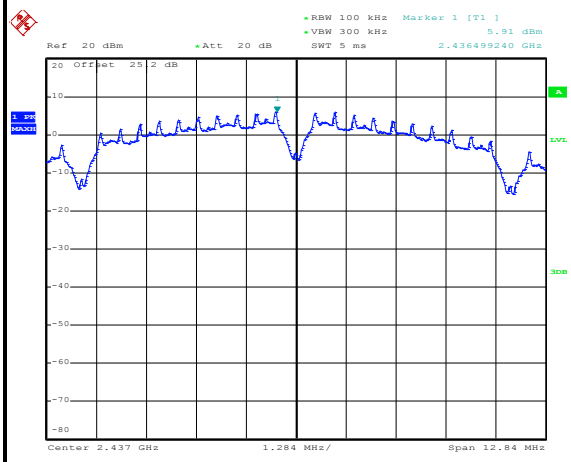
100kHz PSD reference Level	Channel Plot
	
Date: 25.JUN.2018 15:26:19	Date: 25.JUN.2018 15:26:36
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 25.JUN.2018 15:26:52	Date: 25.JUN.2018 15:27:06

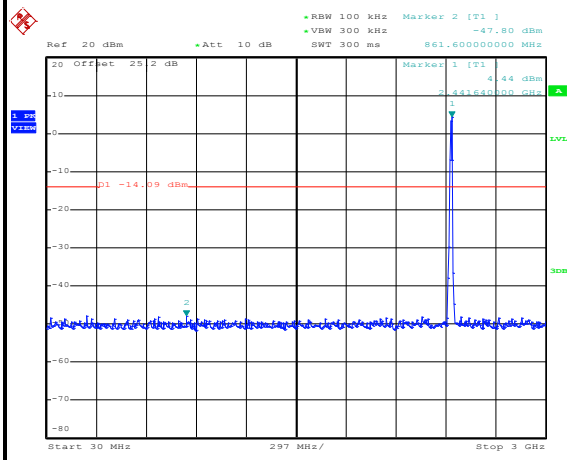
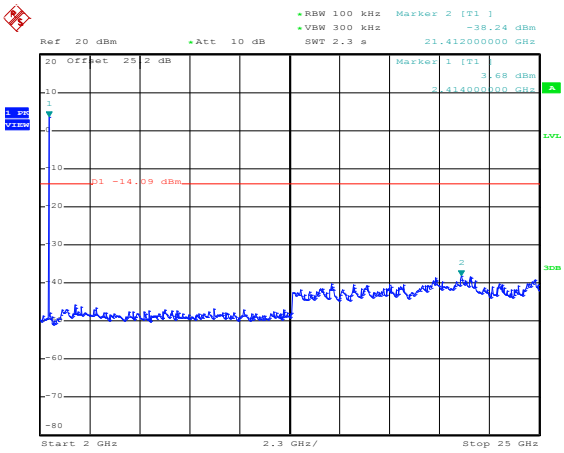
Number of TX = 2, Ant. 1 (Measured)

Test Mode :	802.11b	Test Channel :	01

100kHz PSD reference Level	Channel Plot
	
Date: 22.JUN.2018 07:07:40	Date: 22.JUN.2018 07:07:55
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 22.JUN.2018 07:08:49	Date: 22.JUN.2018 07:09:08

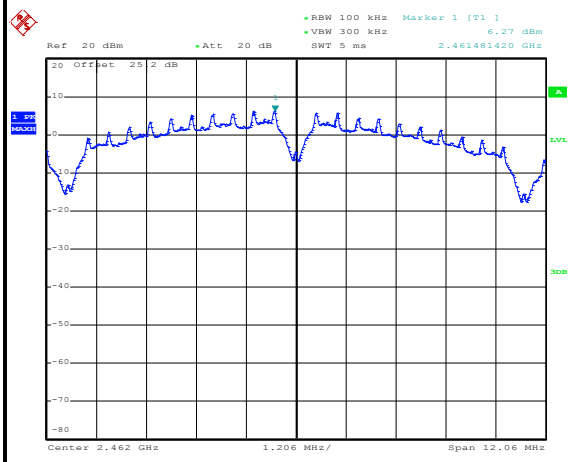
Test Mode :	802.11b	Test Channel :	06

100kHz PSD reference Level	Channel Plot
	
Date: 22.JUN.2018 07:17:43	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	
Date: 22.JUN.2018 07:18:13	Date: 22.JUN.2018 07:18:29

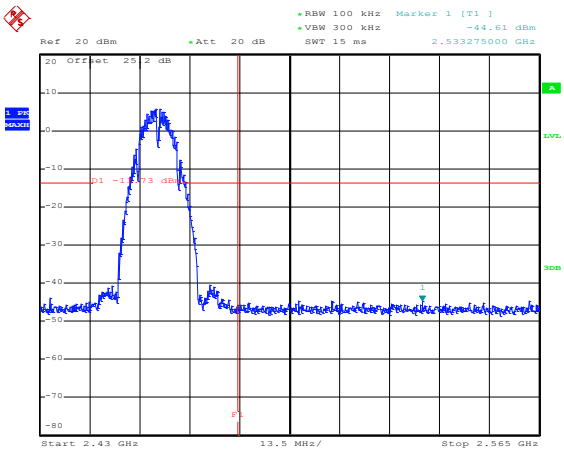
Test Mode :	802.11b	Test Channel :	11

100kHz PSD reference Level



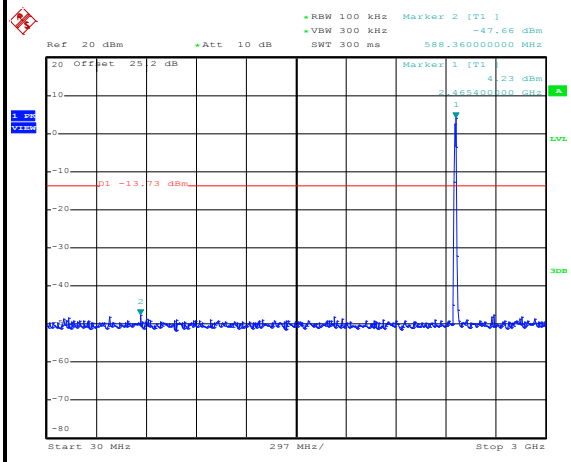
Date: 22.JUN.2018 07:25:43

Channel Plot



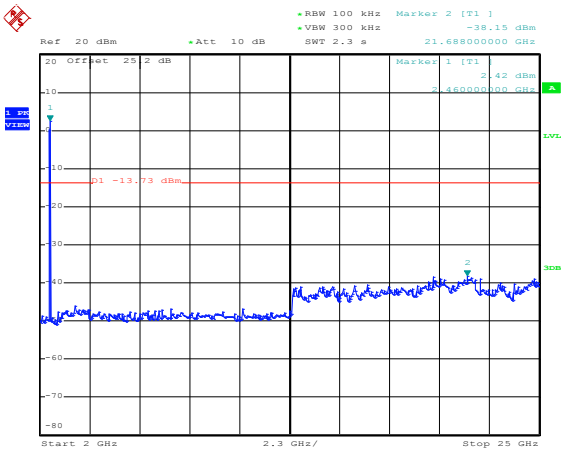
Date: 22.JUN.2018 07:26:22

Spurious Emission 30MHz~3GHz



Date: 22.JUN.2018 07:26:47

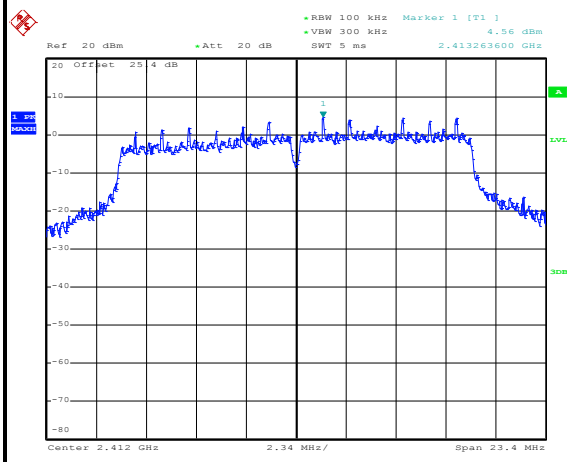
Spurious Emission 2GHz~25GHz



Date: 22.JUN.2018 07:27:03

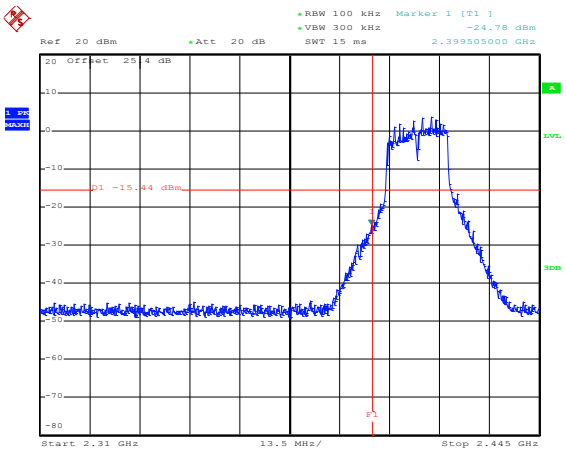
Test Mode :	802.11g	Test Channel :	01

100kHz PSD reference Level



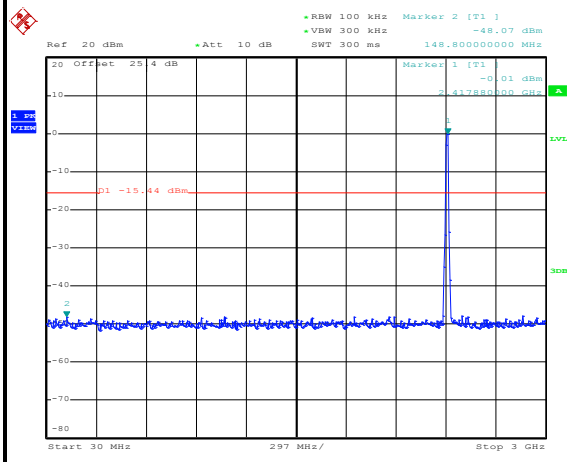
Date: 25.JUN.2018 13:58:53

Channel Plot



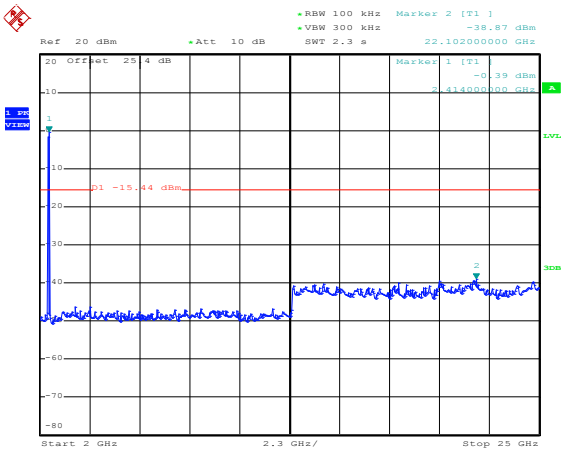
Date: 25.JUN.2018 13:59:10

Spurious Emission 30MHz~3GHz



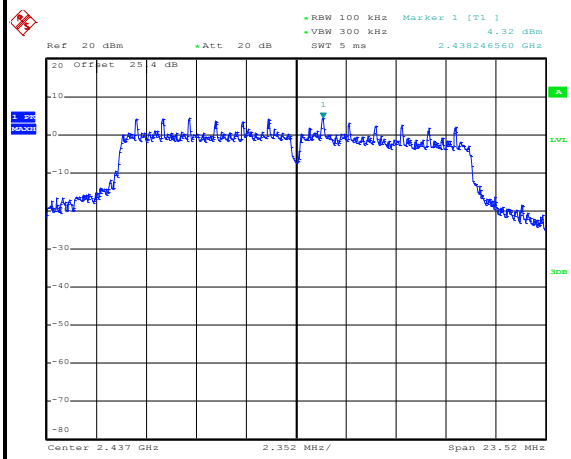
Date: 25.JUN.2018 13:59:35

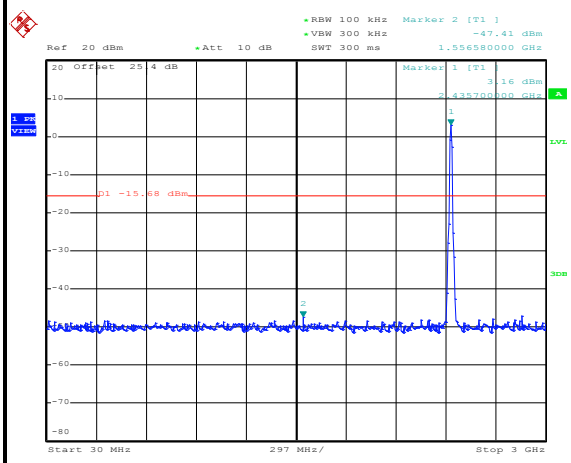
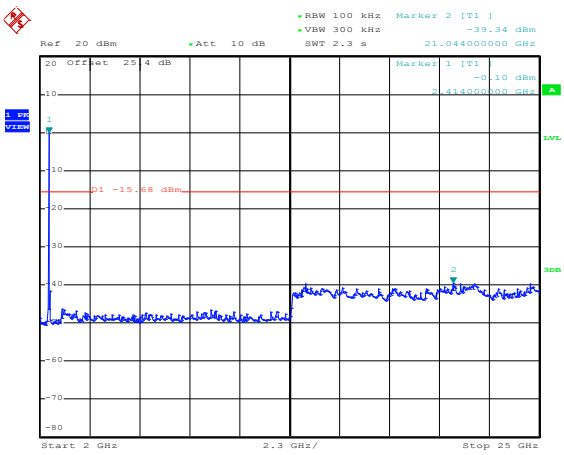
Spurious Emission 2GHz~25GHz



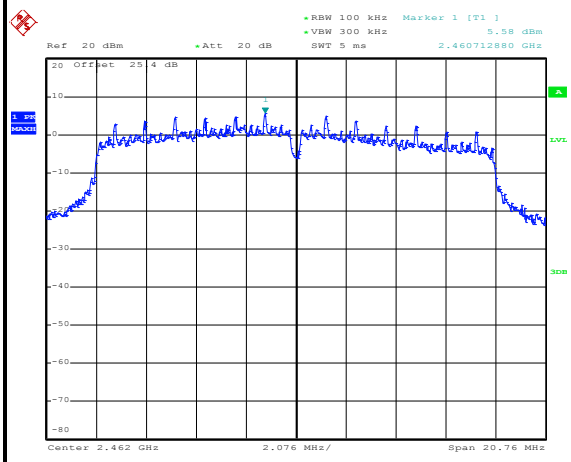
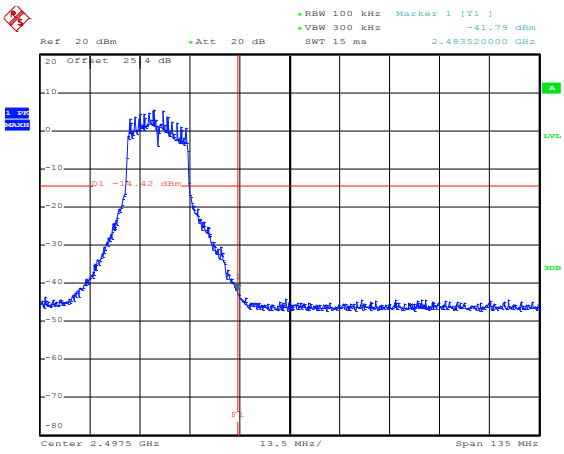
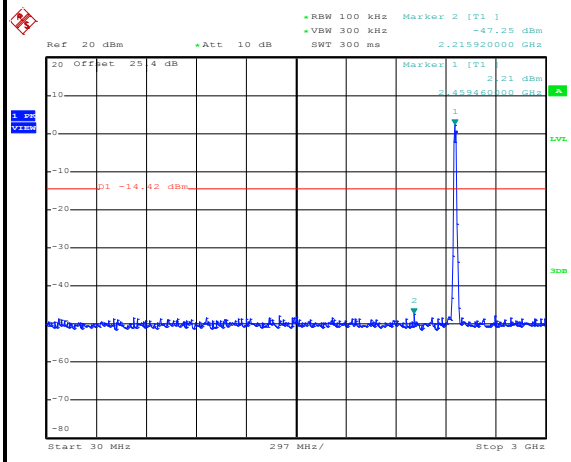
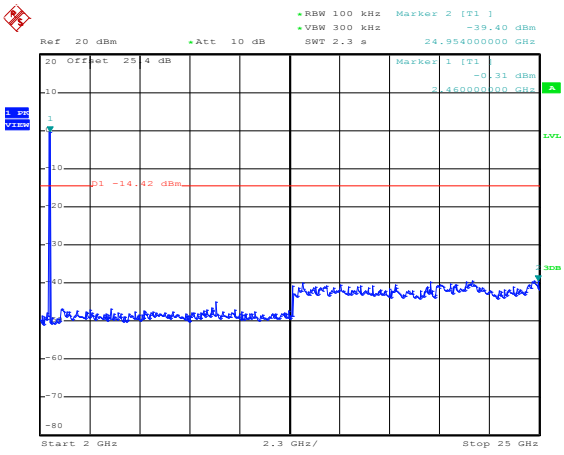
Date: 25.JUN.2018 13:59:53

Test Mode :	802.11g	Test Channel :	06

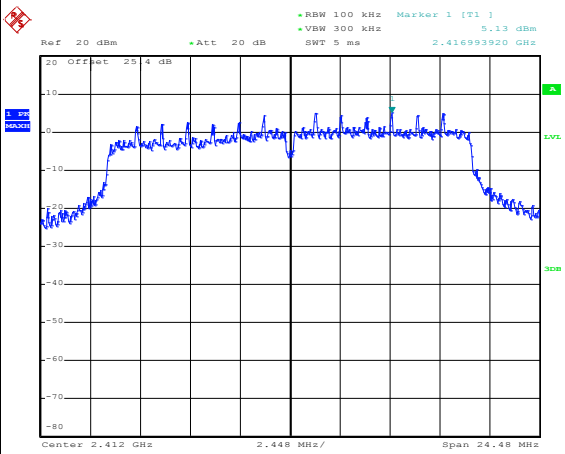
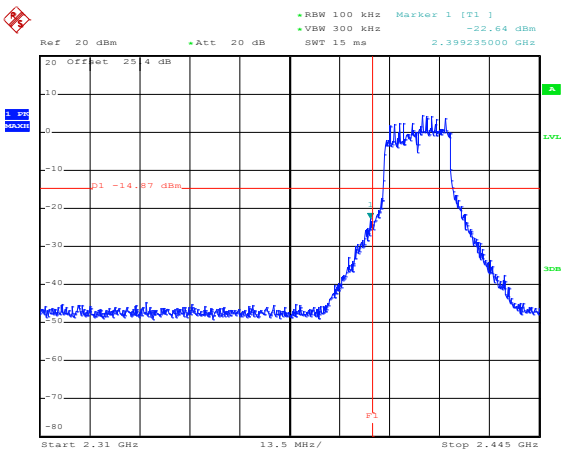
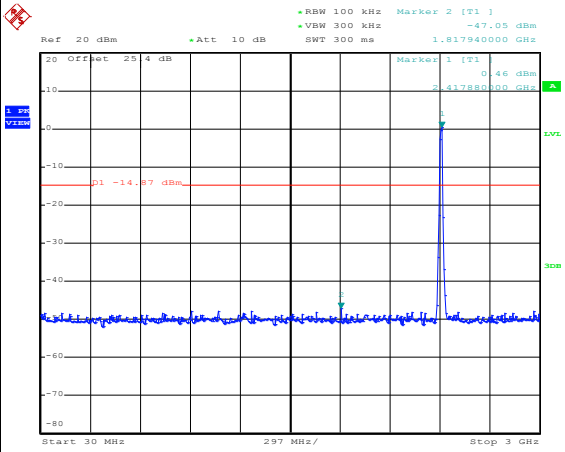
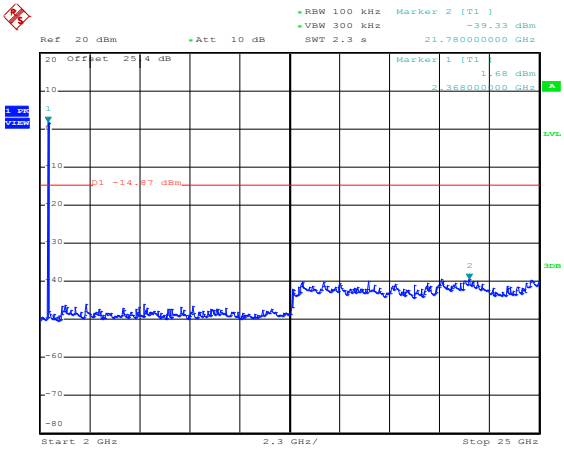
100kHz PSD reference Level	Channel Plot
 Date: 25.JUN.2018 14:02:39	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
 Date: 25.JUN.2018 14:03:01	 Date: 25.JUN.2018 14:03:26

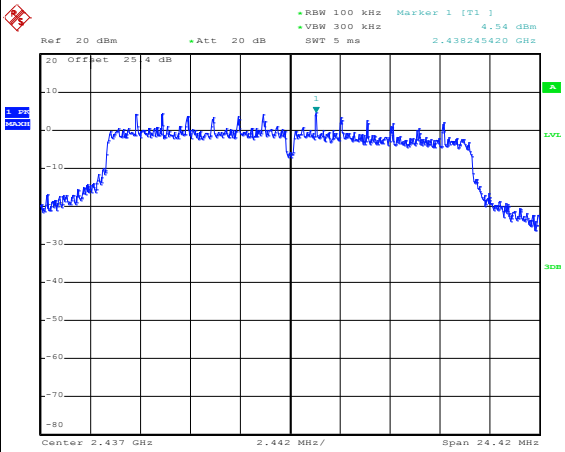
Test Mode :	802.11g	Test Channel :	11

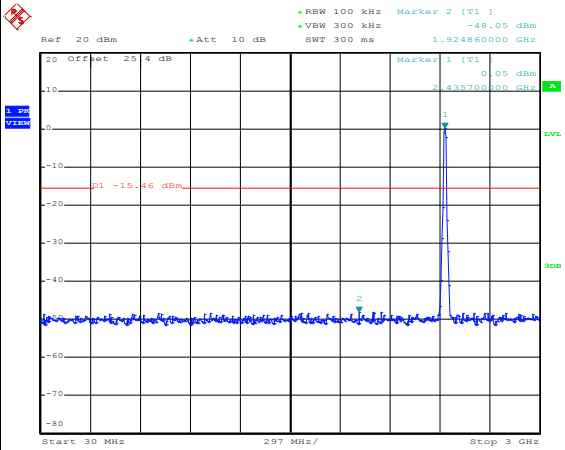
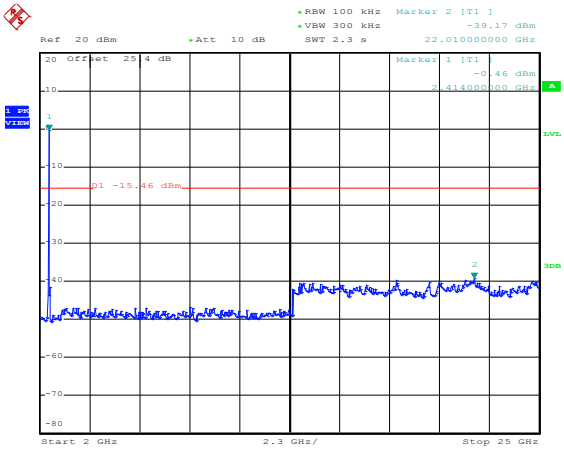
100kHz PSD reference Level	Channel Plot
	
Date: 25.JUN.2018 14:11:08	Date: 25.JUN.2018 14:13:10
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 25.JUN.2018 14:13:32	Date: 25.JUN.2018 14:14:49

Test Mode :	802.11n HT20	Test Channel :	01

100kHz PSD reference Level	Channel Plot
	
Date: 25.JUN.2018 15:37:59	Date: 25.JUN.2018 15:38:14
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 25.JUN.2018 15:38:39	Date: 25.JUN.2018 15:38:54

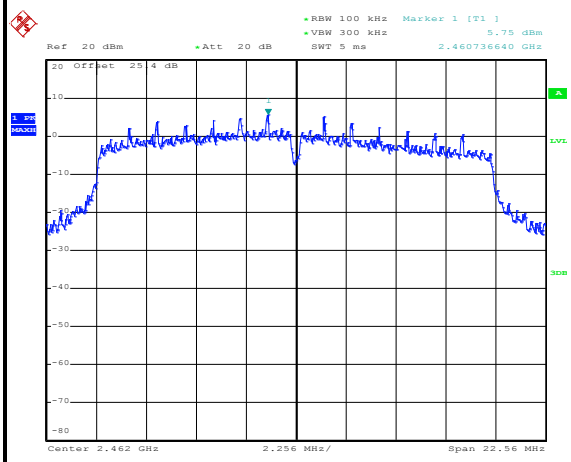
Test Mode :	802.11n HT20	Test Channel :	06

100kHz PSD reference Level	Channel Plot
	
Date: 25.JUN.2018 15:40:56	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	
Date: 25.JUN.2018 15:41:12	Date: 25.JUN.2018 15:41:29

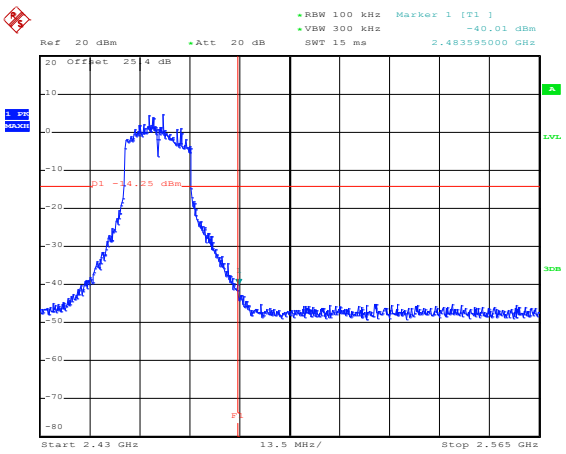
Test Mode :	802.11n HT20	Test Channel :	11

100kHz PSD reference Level



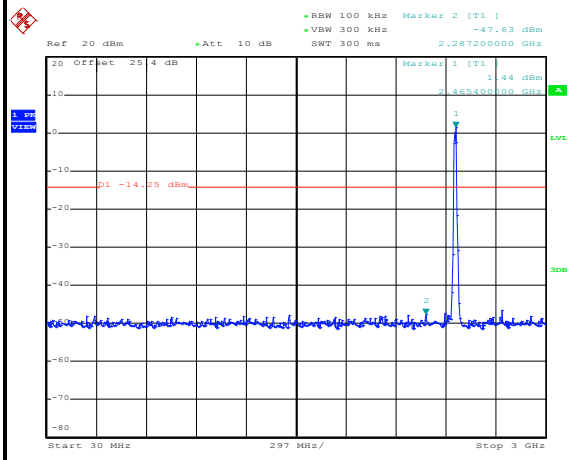
Date: 25.JUN.2018 15:46:13

Channel Plot



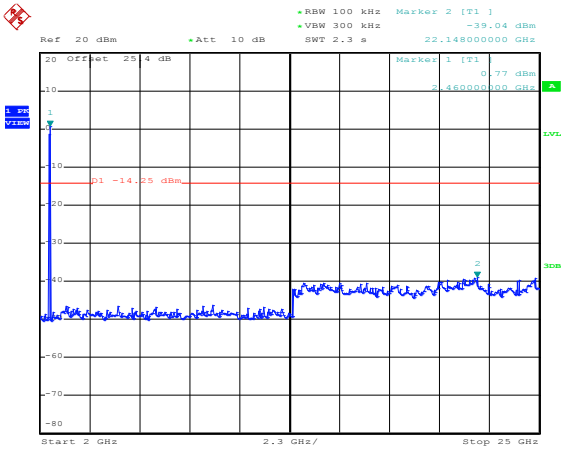
Date: 25.JUN.2018 15:48:02

Spurious Emission 30MHz~3GHz



Date: 25.JUN.2018 15:47:06

Spurious Emission 2GHz~25GHz

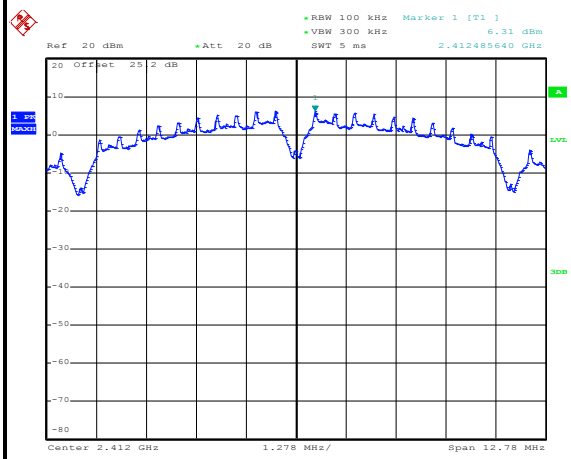


Date: 25.JUN.2018 15:47:20

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

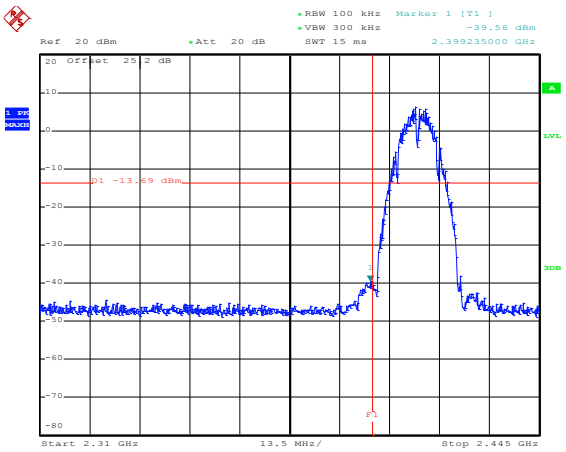
Test Mode :	802.11b	Test Channel :	01

100kHz PSD reference Level



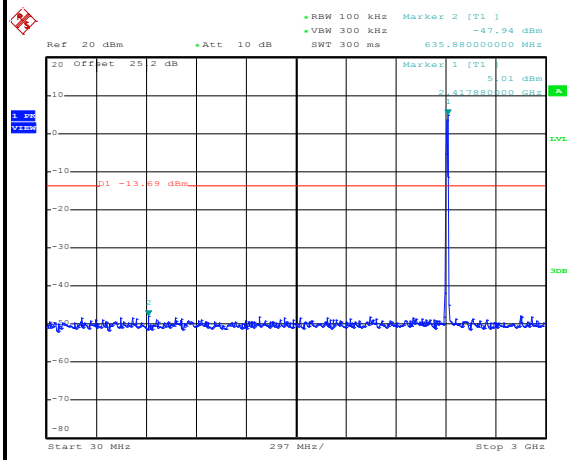
Date: 22.JUN.2018 07:11:32

Channel Plot



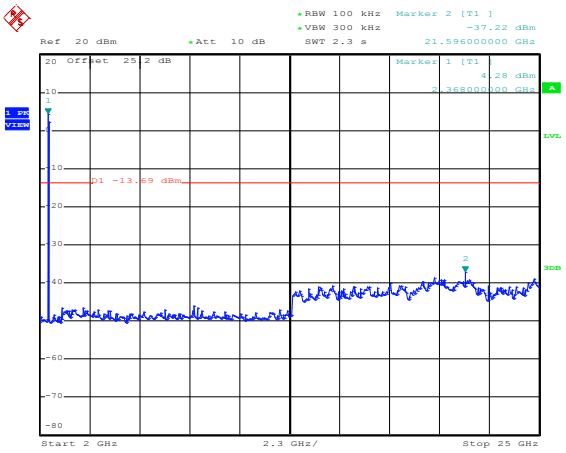
Date: 22.JUN.2018 07:11:56

Spurious Emission 30MHz~3GHz



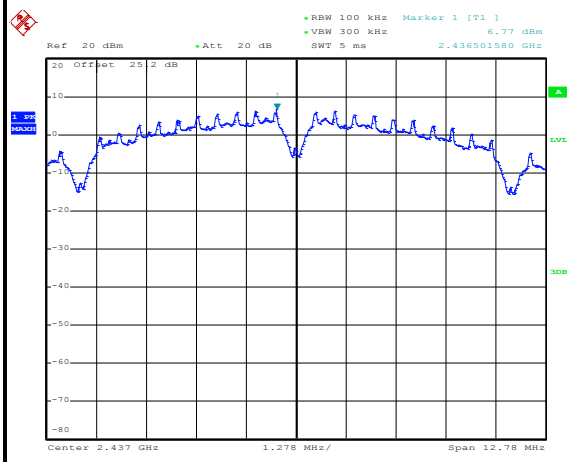
Date: 22.JUN.2018 07:12:16

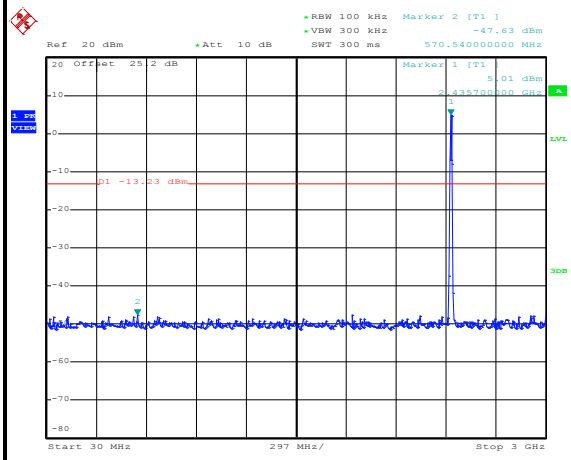
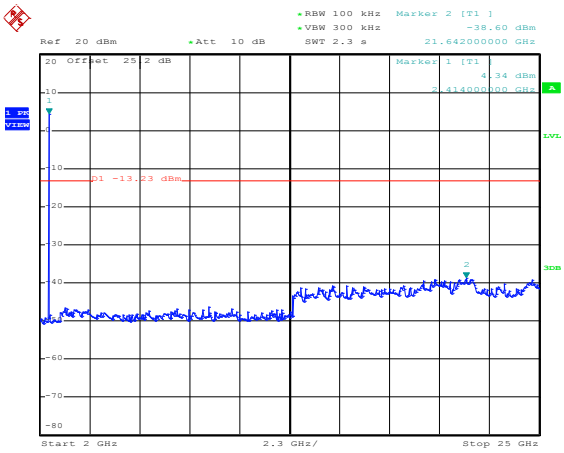
Spurious Emission 2GHz~25GHz



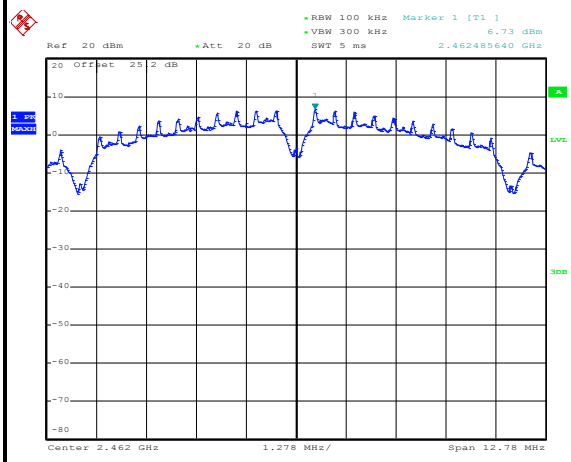
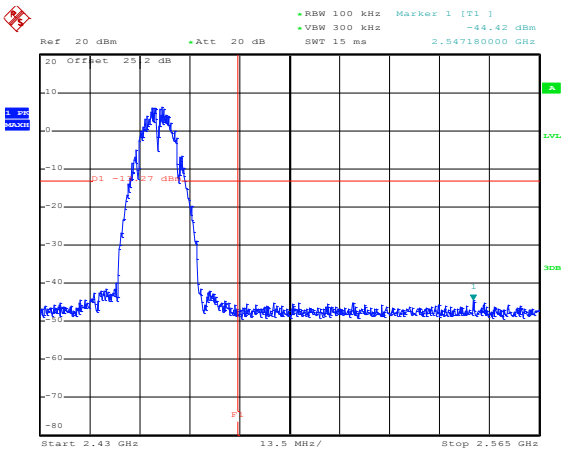
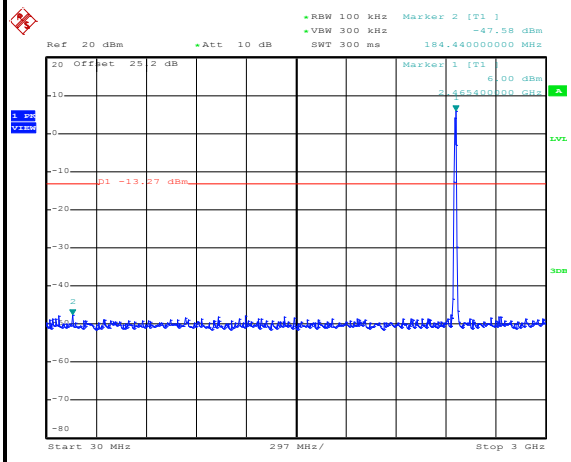
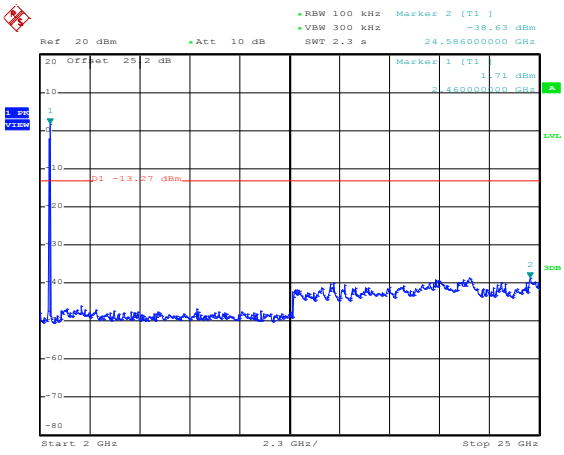
Date: 22.JUN.2018 07:12:31

Test Mode :	802.11b	Test Channel :	06

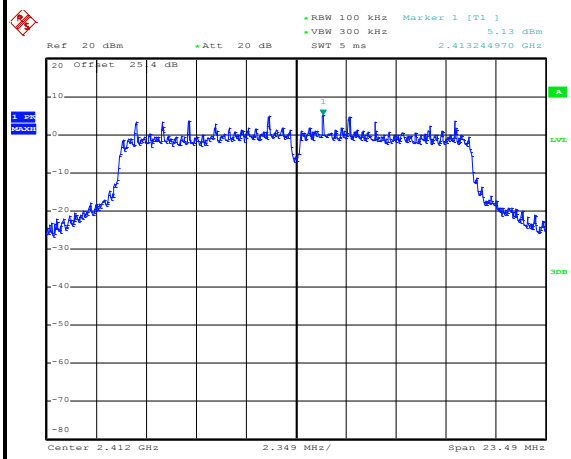
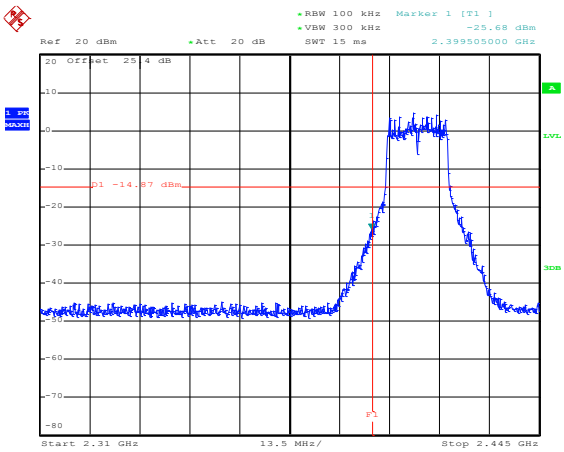
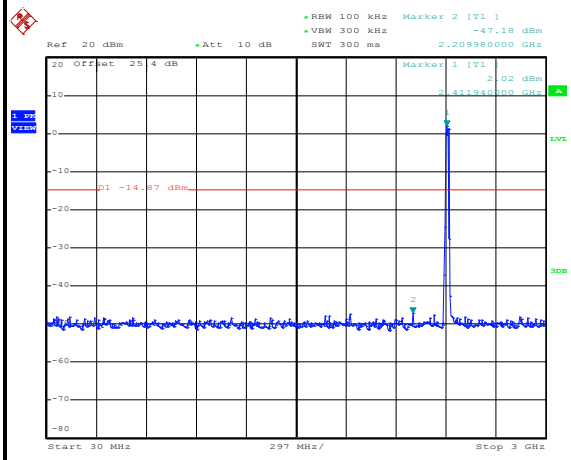
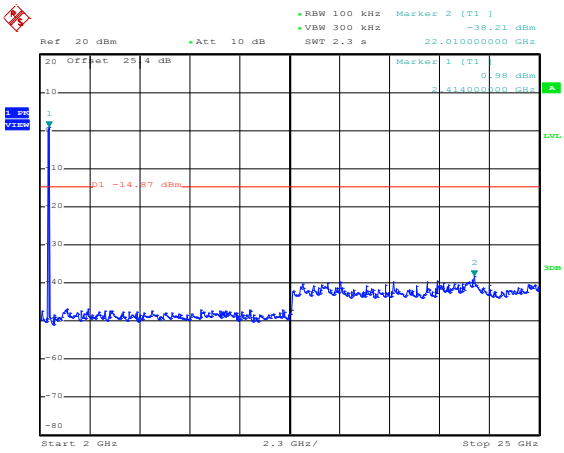
100kHz PSD reference Level	Channel Plot
	
Date: 22.JUN.2018 07:21:40	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	
Date: 22.JUN.2018 07:21:58	Date: 22.JUN.2018 07:22:15

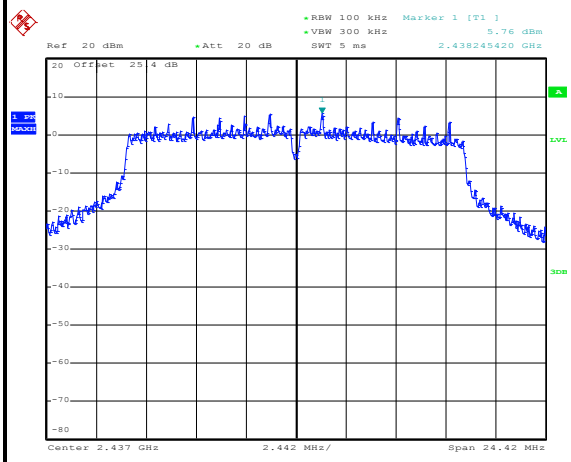
Test Mode :	802.11b	Test Channel :	11

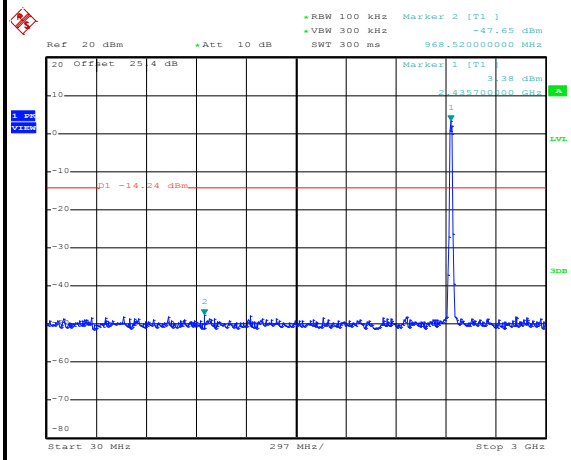
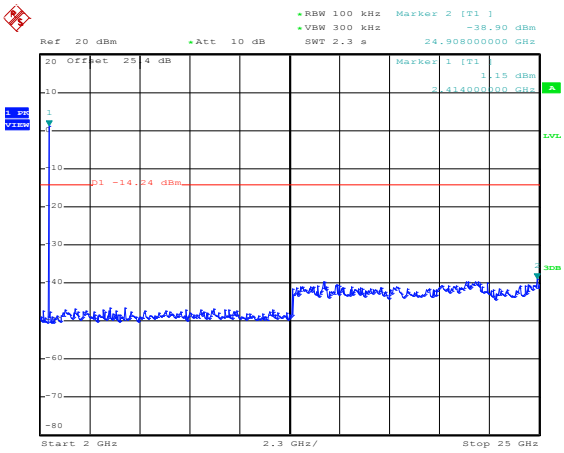
100kHz PSD reference Level	Channel Plot
	
Date: 22.JUN.2018 07:30:09	Date: 22.JUN.2018 07:30:23
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 22.JUN.2018 07:30:39	Date: 22.JUN.2018 07:30:56

Test Mode :	802.11g	Test Channel :	01

100kHz PSD reference Level	Channel Plot
	
Date: 25.JUN.2018 14:29:19	Date: 25.JUN.2018 14:29:35
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 25.JUN.2018 14:30:00	Date: 25.JUN.2018 14:30:14

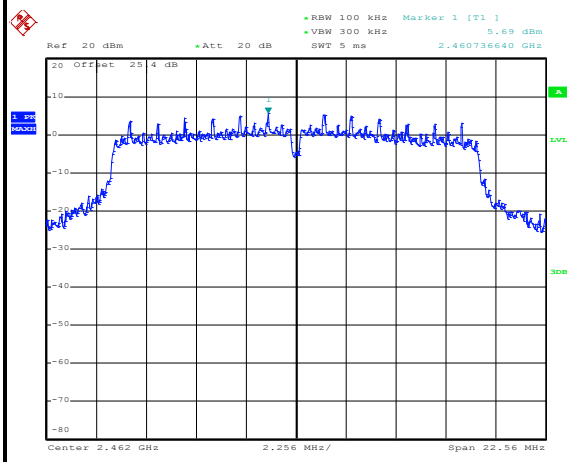
Test Mode :	802.11g	Test Channel :	06

100kHz PSD reference Level	Channel Plot
 Date: 25.JUN.2018 14:32:10	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
 Date: 25.JUN.2018 14:32:25	 Date: 25.JUN.2018 14:32:40

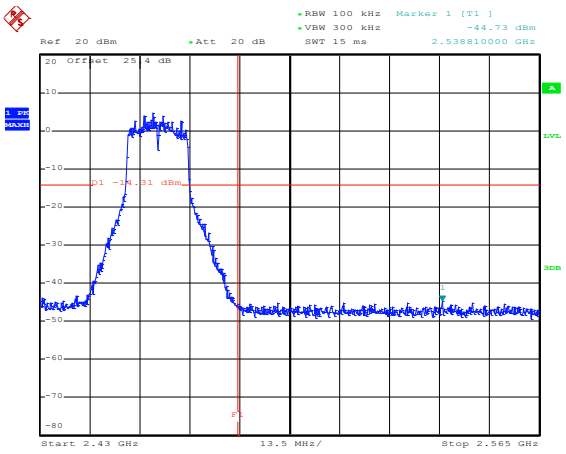
Test Mode :	802.11g	Test Channel :	11

100kHz PSD reference Level



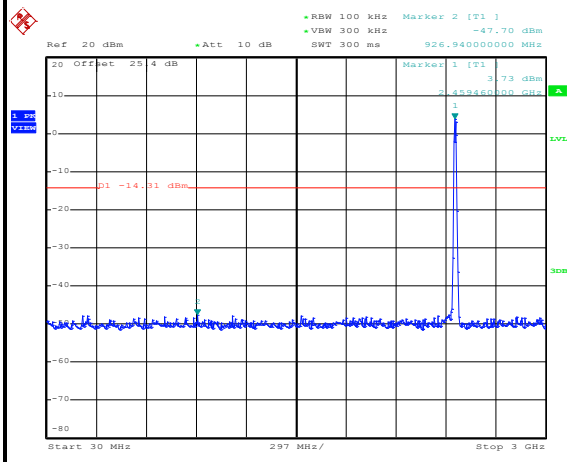
Date: 25.JUN.2018 14:36:27

Channel Plot



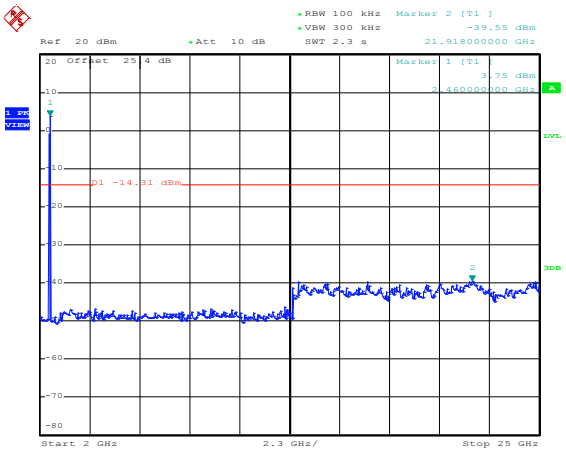
Date: 25.JUN.2018 14:36:45

Spurious Emission 30MHz~3GHz



Date: 25.JUN.2018 14:37:00

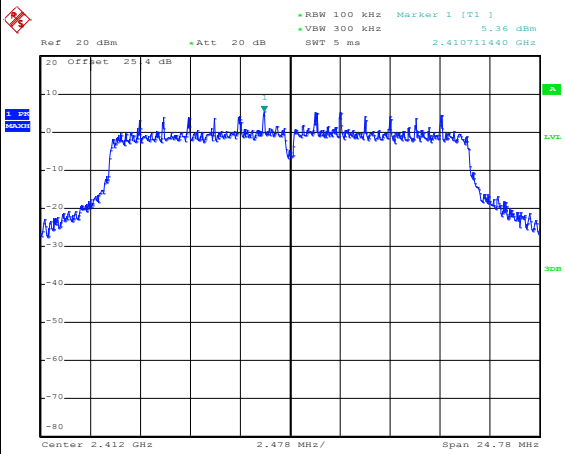
Spurious Emission 2GHz~25GHz



Date: 25.JUN.2018 14:37:15

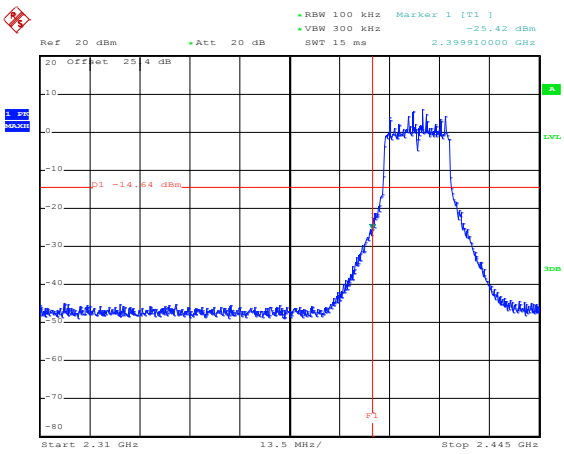
Test Mode :	802.11n HT20	Test Channel :	01

100kHz PSD reference Level



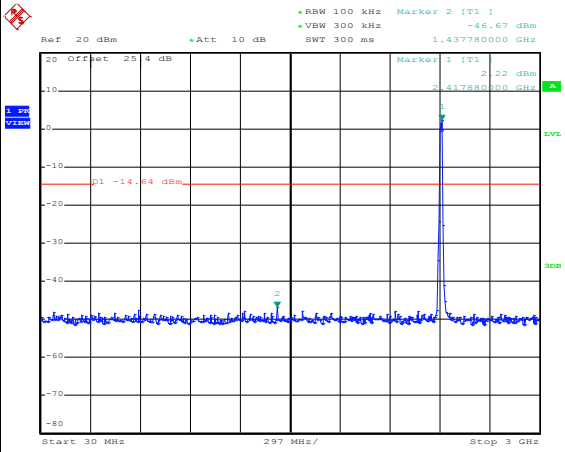
Date: 25.JUN.2018 15:54:55

Channel Plot



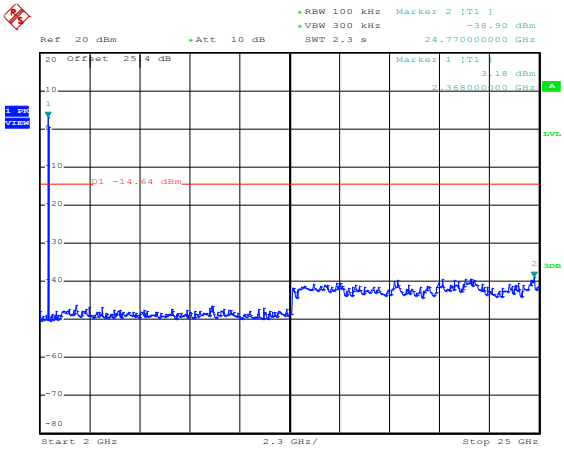
Date: 25.JUN.2018 15:55:13

Spurious Emission 30MHz~3GHz



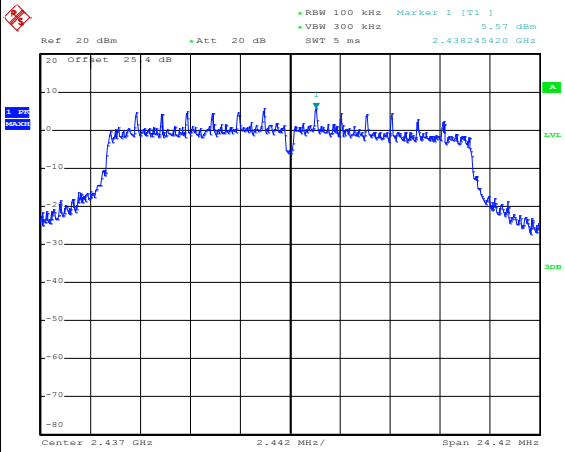
Date: 25.JUN.2018 15:55:36

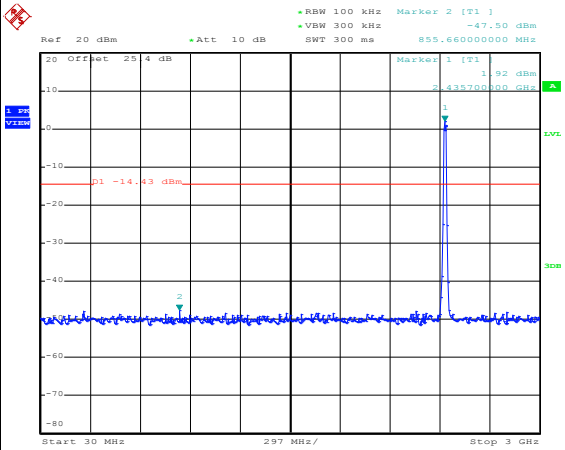
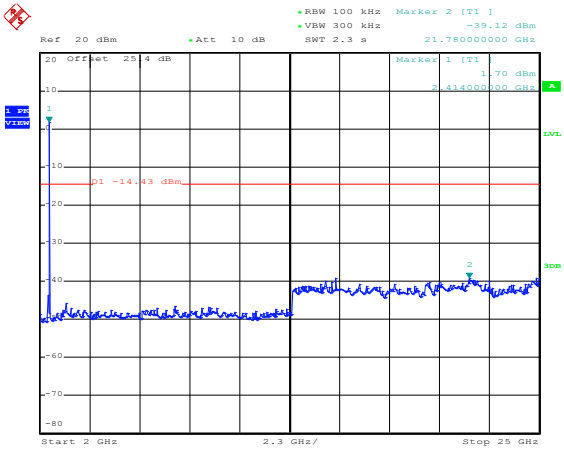
Spurious Emission 2GHz~25GHz



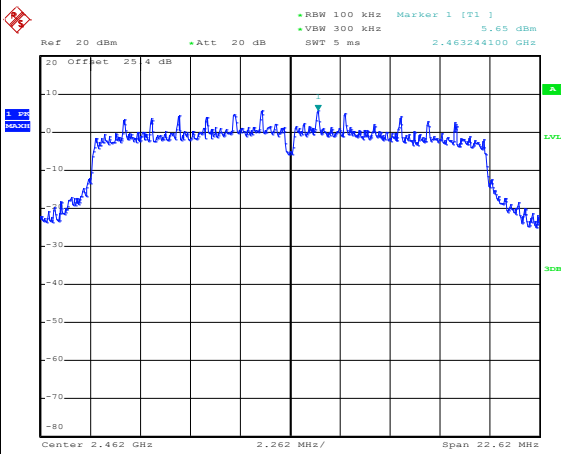
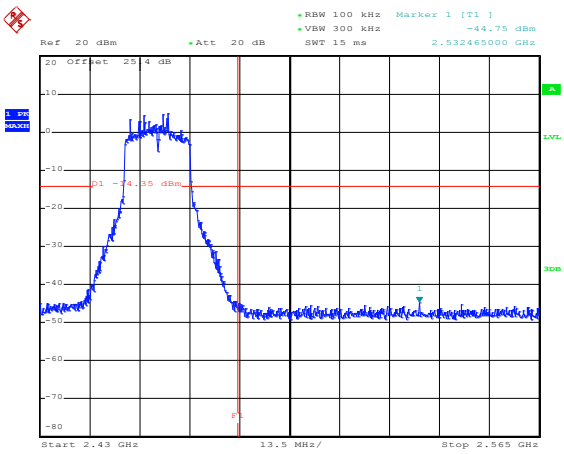
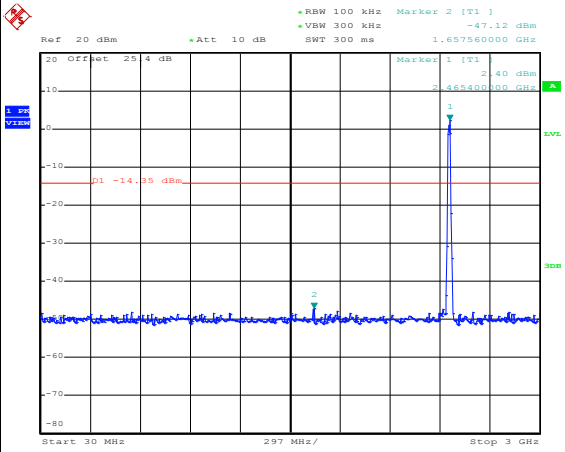
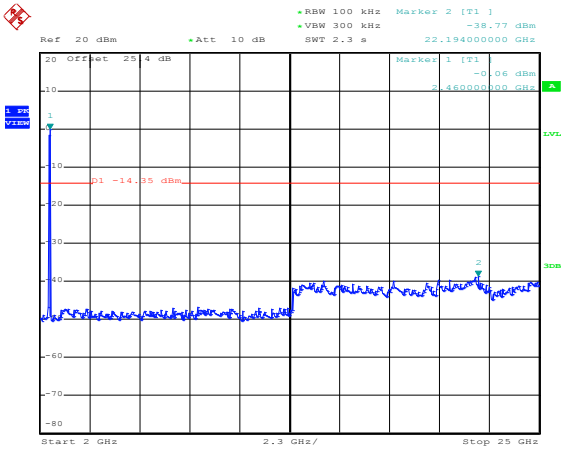
Date: 25.JUN.2018 15:55:50

Test Mode :	802.11n HT20	Test Channel :	06

100kHz PSD reference Level	Channel Plot
	
Date: 25.JUN.2018 15:57:32	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	
Date: 25.JUN.2018 15:57:53	Date: 25.JUN.2018 15:58:07

Test Mode :	802.11n HT20	Test Channel :	11

100kHz PSD reference Level	Channel Plot
	
Date: 25.JUN.2018 15:59:50	Date: 25.JUN.2018 16:00:35
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 25.JUN.2018 16:00:54	Date: 25.JUN.2018 16:01:08

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

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

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

3.5.2 Measuring Instruments

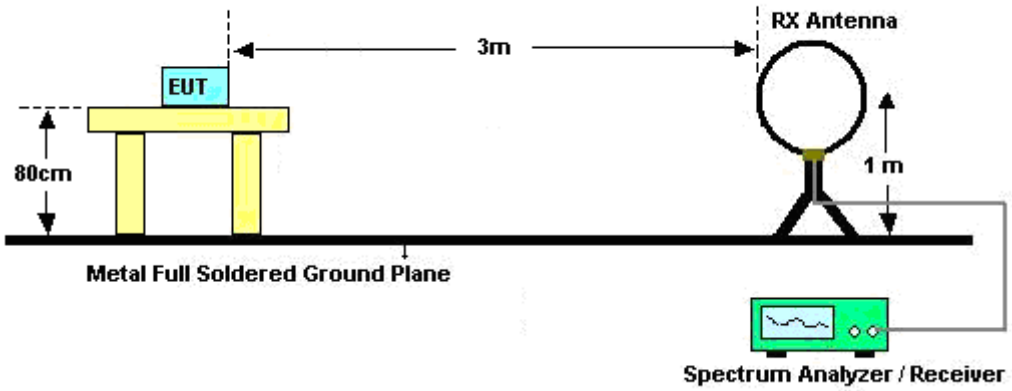
See list of measuring equipment of this test report.

3.5.3 Test Procedures

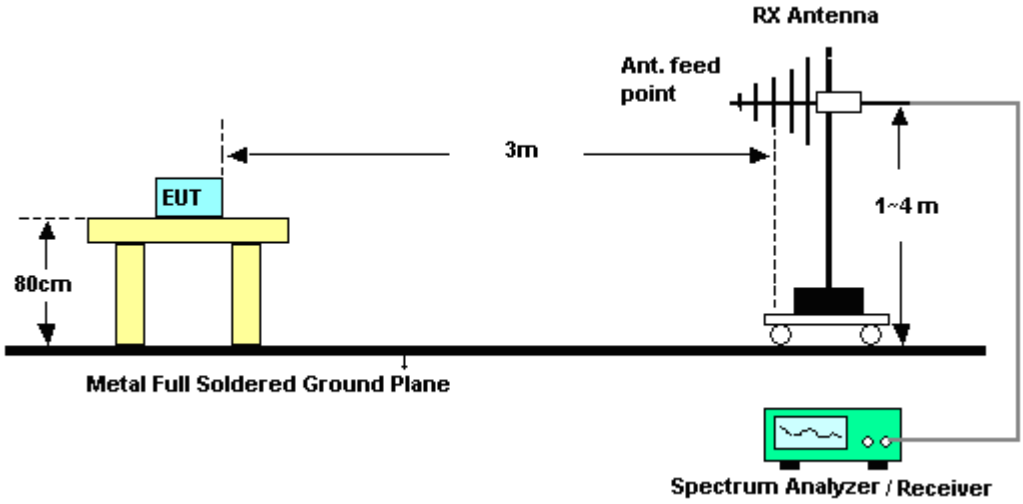
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test 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 testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
8. 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 ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 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

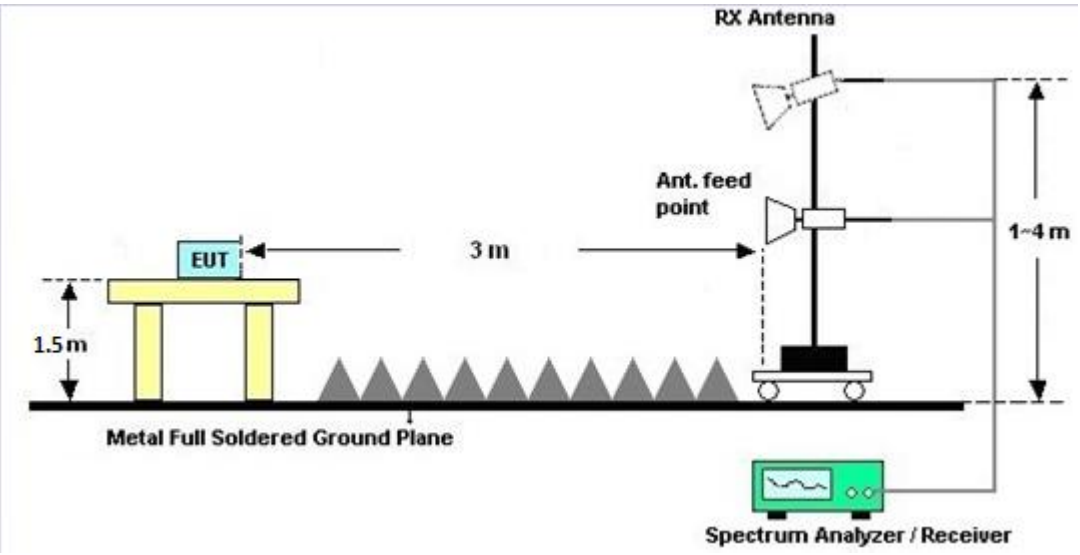
For radiated emissions below 30MHz



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 was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

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 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

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

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

*Decreases with the logarithm of the frequency.

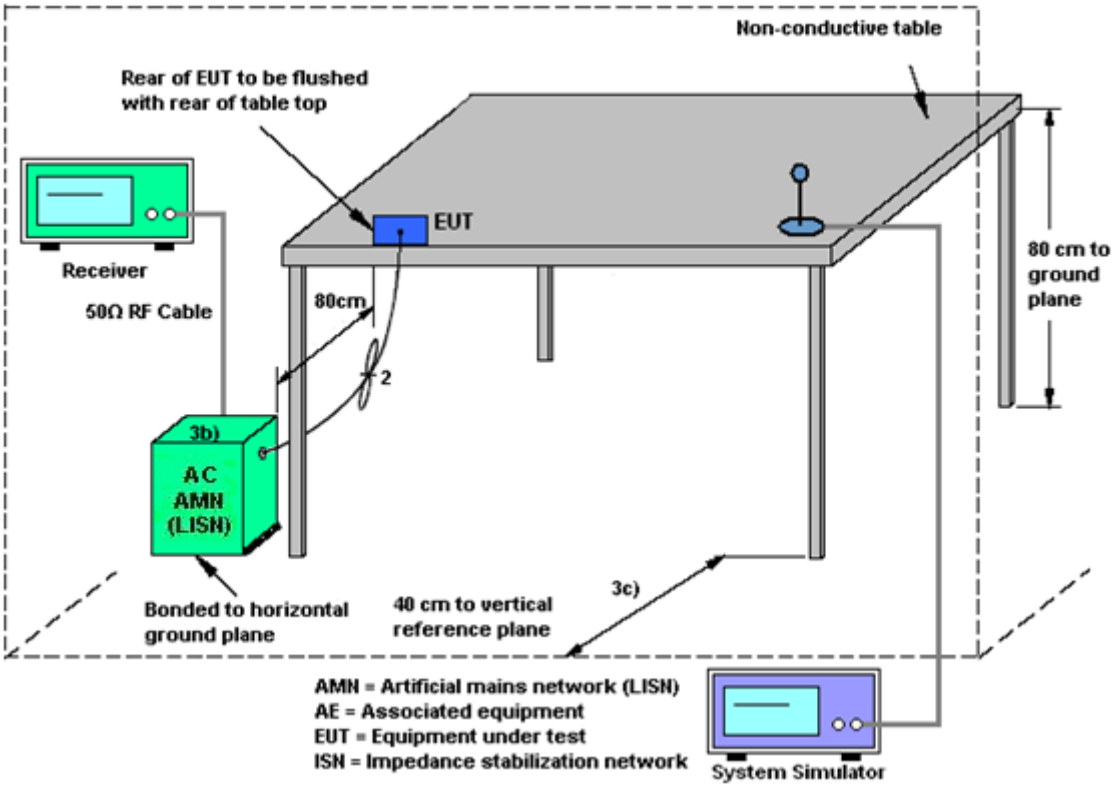
3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

3.6.3 Test Procedures

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

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting Antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached Antenna or of an Antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

<CDD Modes>

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.

<CDD Modes>

			DG for Power	DG for PSD	Power Limit Reduction	PSD Limit Reduction
	Ant. 1 (dBi)	Ant. 2 (dBi)	(dBi)	(dBi)	(dB)	(dB)
2.4 GHz	-1.93	-4.01	-1.93	0.10	0.00	0.00

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

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

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	1240001	N/A	Sep. 07, 2017	Jun. 15, 2018~ Jun. 25, 2018	Sep. 06, 2018	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	1207349	300MHz~40GHz	Sep. 07, 2017	Jun. 15, 2018~ Jun. 25, 2018	Sep. 06, 2018	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz-40GHz	Nov. 21, 2017	Jun. 15, 2018~ Jun. 25, 2018	Nov. 20, 2018	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC1300484	N/A	Mar. 01, 2018	Jun. 15, 2018~ Jun. 25, 2018	Feb. 28, 2019	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jul. 14, 2018	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	3.6GHz	Dec. 08, 2017	Jul. 14, 2018	Dec. 07, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 30, 2017	Jul. 14, 2018	Nov. 29, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Dec. 08, 2017	Jul. 14, 2018	Dec. 07, 2018	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Jul. 14, 2018	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 03, 2018	Jul. 14, 2018	Jan. 02, 2019	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 03, 2018	Jul. 14, 2018	Jan. 02, 2019	Conduction (CO05-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 23, 2017	Jun. 14, 2018 ~ Jul. 08, 2018	Nov. 22, 2018	Radiation (03CH15-HY)
Preamplifier	Jet-Power	JPA00101800-30-10P	1601180002	1GHz~18GHz	Jul. 31, 2017	Jun. 14, 2018 ~ Jul. 08, 2018	Jul. 30, 2018	Radiation (03CH15-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 05, 2017	Jun. 14, 2018 ~ Jul. 08, 2018	Dec. 04, 2018	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 26, 2017	Jun. 14, 2018 ~ Jul. 08, 2018	Dec. 25, 2018	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL6111D&00800N1D01N-06	41912&05	30MHz to 1GHz	Jan. 10, 2018	Jun. 14, 2018 ~ Jul. 08, 2018	Jan. 09, 2019	Radiation (03CH15-HY)
EMI Test Receiver	Keysight	N9038A (MXE)	MY54130085	20Hz ~ 8.4GHz	Oct. 31, 2017	Jun. 14, 2018 ~ Jul. 08, 2018	Oct. 30, 2018	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1620	1G~18GHz	Oct. 03, 2017	Jun. 14, 2018 ~ Jul. 08, 2018	Oct. 02, 2018	Radiation (03CH15-HY)
Preamplifier	Keysight	83017A	MY53270195	1GHz~26.5GHz	Aug. 21, 2017	Jun. 14, 2018 ~ Jul. 08, 2018	Aug. 20, 2018	Radiation (03CH15-HY)
Spectrum Analyzer	Agilent	E4446A	MY50180136	3Hz~44GHz	Apr. 25, 2018	Jun. 14, 2018 ~ Jul. 08, 2018	Apr. 24, 2019	Radiation (03CH15-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Jun. 14, 2018 ~ Jul. 08, 2018	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Jun. 14, 2018 ~ Jul. 08, 2018	N/A	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 27, 2017	Jun. 14, 2018 ~ Jul. 08, 2018	Nov. 26, 2018	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24	RK-001042	N/A	N/A	Jun. 14, 2018 ~ Jul. 08, 2018	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER / MTJ Cooperation	SUCOFLEX 104 / 000000-MT18A-100	MY36980/4, MY9838/4PE, D3210	30MHz~1GHz	Mar. 15, 2018	Jun. 14, 2018 ~ Jul. 08, 2018	Mar. 14, 2019	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER / MTJ Cooperation	SUCOFLEX 104 / 000000-MT18A-100	MY36980/4, MY9838/4PE, D3210	1GHz~18GHz	Mar. 15, 2018	Jun. 26, 2018 ~ Jul. 04, 2018	Mar. 14, 2019	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30M~40GHz	Oct. 17, 2017	Jun. 26, 2018 ~ Jul. 04, 2018	Oct. 16, 2018	Radiation (03CH15-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.7**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.2**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.5**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.2**

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Luffy Lin/Shiang Wang	Temperature:	21~25	°C
Test Date:	2018/6/15~2018/6/25	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 1	Ant 2		
11b	1Mbps	1	1	2412	14.30	13.80	9.05	8.52	0.50	Pass
11b	1Mbps	1	6	2437	14.60	13.65	9.02	8.52	0.50	Pass
11b	1Mbps	1	11	2462	13.40	13.80	8.04	8.52	0.50	Pass
11g	6Mbps	1	1	2412	18.25	16.95	15.64	15.69	0.50	Pass
11g	6Mbps	1	6	2437	19.85	16.80	15.74	15.38	0.50	Pass
11g	6Mbps	1	11	2462	16.70	16.90	13.82	15.04	0.50	Pass
HT20	MCS0	1	1	2412	19.10	18.05	16.20	15.14	0.50	Pass
HT20	MCS0	1	6	2437	20.65	17.95	16.32	15.92	0.50	Pass
HT20	MCS0	1	11	2462	17.80	17.90	15.12	15.90	0.50	Pass
11b	1Mbps	2	1	2412	14.25	13.80	9.04	8.52	0.50	Pass
11b	1Mbps	2	6	2437	14.45	13.80	8.56	8.52	0.50	Pass
11b	1Mbps	2	11	2462	13.35	13.75	8.04	8.52	0.50	Pass
11g	6Mbps	2	1	2412	17.10	16.75	15.60	15.66	0.50	Pass
11g	6Mbps	2	6	2437	18.00	16.75	15.68	16.28	0.50	Pass
11g	6Mbps	2	11	2462	16.60	16.60	13.84	15.04	0.50	Pass
HT20	MCS0	2	1	2412	18.10	17.90	16.32	16.52	0.50	Pass
HT20	MCS0	2	6	2437	19.05	17.90	16.28	16.28	0.50	Pass
HT20	MCS0	2	11	2462	17.65	17.75	15.04	15.08	0.50	Pass

Report Number : FR852405C

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)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11b	1Mbps	1	1	2412	19.75	20.17	-	30.00	30.00	-1.93	-4.01	17.82	16.16	36.00	36.00	Pass
11b	1Mbps	1	6	2437	19.92	20.11	-	30.00	30.00	-1.93	-4.01	17.99	16.10	36.00	36.00	Pass
11b	1Mbps	1	11	2462	20.32	20.15	-	30.00	30.00	-1.93	-4.01	18.39	16.14	36.00	36.00	Pass
11g	6Mbps	1	1	2412	21.80	22.07	-	30.00	30.00	-1.93	-4.01	19.87	18.06	36.00	36.00	Pass
11g	6Mbps	1	6	2437	21.75	22.11	-	30.00	30.00	-1.93	-4.01	19.82	18.10	36.00	36.00	Pass
11g	6Mbps	1	11	2462	22.21	22.13	-	30.00	30.00	-1.93	-4.01	20.28	18.12	36.00	36.00	Pass
HT20	MCS0	1	1	2412	21.88	22.14	-	30.00	30.00	-1.93	-4.01	19.95	18.13	36.00	36.00	Pass
HT20	MCS0	1	6	2437	21.79	22.13	-	30.00	30.00	-1.93	-4.01	19.86	18.12	36.00	36.00	Pass
HT20	MCS0	1	11	2462	21.85	22.16	-	30.00	30.00	-1.93	-4.01	19.92	18.15	36.00	36.00	Pass
11b	1Mbps	2	1	2412	16.39	17.33	19.90	30.00		-1.93		17.97		36.00		Pass
11b	1Mbps	2	6	2437	16.52	17.49	20.04	30.00		-1.93		18.11		36.00		Pass
11b	1Mbps	2	11	2462	16.46	17.25	19.88	30.00		-1.93		17.96		36.00		Pass
11g	6Mbps	2	1	2412	19.03	19.62	22.35	30.00		-1.93		20.42		36.00		Pass
11g	6Mbps	2	6	2437	18.96	20.11	22.58	30.00		-1.93		20.66		36.00		Pass
11g	6Mbps	2	11	2462	19.71	20.02	22.88	30.00		-1.93		20.95		36.00		Pass
HT20	MCS0	2	1	2412	19.36	20.11	22.76	30.00		-1.93		20.83		36.00		Pass
HT20	MCS0	2	6	2437	19.40	20.05	22.75	30.00		-1.93		20.82		36.00		Pass
HT20	MCS0	2	11	2462	19.40	20.03	22.74	30.00		-1.93		20.81		36.00		Pass

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

TEST RESULTS DATA
Average Output Power

2.4GHz Band									
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)		
					Ant 1	Ant 2	Ant 1	Ant 2	SUM
11b	1Mbps	1	1	2412	0.04	0.06	17.79	17.90	-
11b	1Mbps	1	6	2437	0.04	0.06	17.85	17.85	
11b	1Mbps	1	11	2462	0.04	0.06	17.99	17.88	
11g	6Mbps	1	1	2412	0.09	0.09	17.96	17.92	
11g	6Mbps	1	6	2437	0.09	0.09	17.79	17.86	
11g	6Mbps	1	11	2462	0.09	0.09	17.98	17.96	
HT20	MCS0	1	1	2412	0.13	0.11	17.99	17.80	
HT20	MCS0	1	6	2437	0.13	0.11	17.74	17.71	
HT20	MCS0	1	11	2462	0.13	0.11	17.91	17.90	
11b	1Mbps	2	1	2412	0.04	0.04	14.55	15.05	17.82
11b	1Mbps	2	6	2437	0.04	0.04	14.39	15.26	17.86
11b	1Mbps	2	11	2462	0.04	0.04	14.21	15.12	17.70
11g	6Mbps	2	1	2412	0.08	0.08	14.41	15.05	17.75
11g	6Mbps	2	6	2437	0.08	0.08	14.50	15.38	17.97
11g	6Mbps	2	11	2462	0.08	0.08	14.60	15.32	17.99
HT20	MCS0	2	1	2412	0.09	0.09	14.68	15.20	17.96
HT20	MCS0	2	6	2437	0.09	0.09	14.53	15.27	17.93
HT20	MCS0	2	11	2462	0.09	0.09	14.55	15.23	17.91

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

TEST RESULTS DATA
Peak Power Spectral Density

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	Worse + 3.01	Ant 1	Ant 2	Ant 1	Ant 2	
11b	1Mbps	1	1	2412	-5.10	-5.22	-	-1.93	-4.01	8.00	8.00	Pass
11b	1Mbps	1	6	2437	-5.01	-4.19	-	-1.93	-4.01	8.00	8.00	Pass
11b	1Mbps	1	11	2462	-4.51	-3.77	-	-1.93	-4.01	8.00	8.00	Pass
11g	6Mbps	1	1	2412	-7.40	-7.50	-	-1.93	-4.01	8.00	8.00	Pass
11g	6Mbps	1	6	2437	-7.28	-7.60	-	-1.93	-4.01	8.00	8.00	Pass
11g	6Mbps	1	11	2462	-6.36	-6.48	-	-1.93	-4.01	8.00	8.00	Pass
HT20	MCS0	1	1	2412	-6.99	-7.94	-	-1.93	-4.01	8.00	8.00	Pass
HT20	MCS0	1	6	2437	-8.60	-7.94	-	-1.93	-4.01	8.00	8.00	Pass
HT20	MCS0	1	11	2462	-6.38	-7.07	-	-1.93	-4.01	8.00	8.00	Pass
11b	1Mbps	2	1	2412	-8.27	-8.00	-4.99	0.10		8.00		Pass
11b	1Mbps	2	6	2437	-8.67	-7.98	-4.97	0.10		8.00		Pass
11b	1Mbps	2	11	2462	-8.94	-7.40	-4.39	0.10		8.00		Pass
11g	6Mbps	2	1	2412	-9.29	-11.12	-6.28	0.10		8.00		Pass
11g	6Mbps	2	6	2437	-10.96	-10.55	-7.54	0.10		8.00		Pass
11g	6Mbps	2	11	2462	-10.66	-9.68	-6.67	0.10		8.00		Pass
HT20	MCS0	2	1	2412	-9.66	-10.57	-6.65	0.10		8.00		Pass
HT20	MCS0	2	6	2437	-9.80	-9.24	-6.23	0.10		8.00		Pass
HT20	MCS0	2	11	2462	-10.74	-10.67	-7.66	0.10		8.00		Pass

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

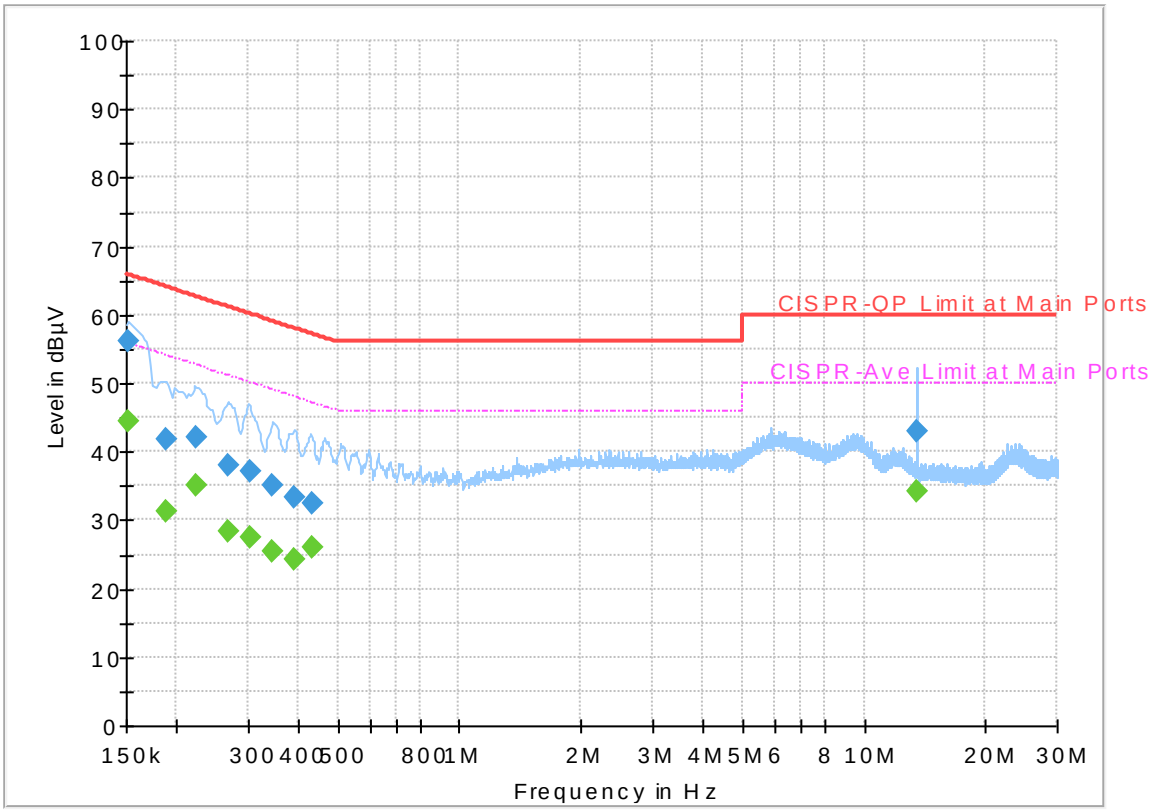
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Arthur Hsieh	**Temperature :**	25~27℃
		Relative Humidity :	51~53%

EUT Information

Report NO :	852405
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line

Full Spectrum



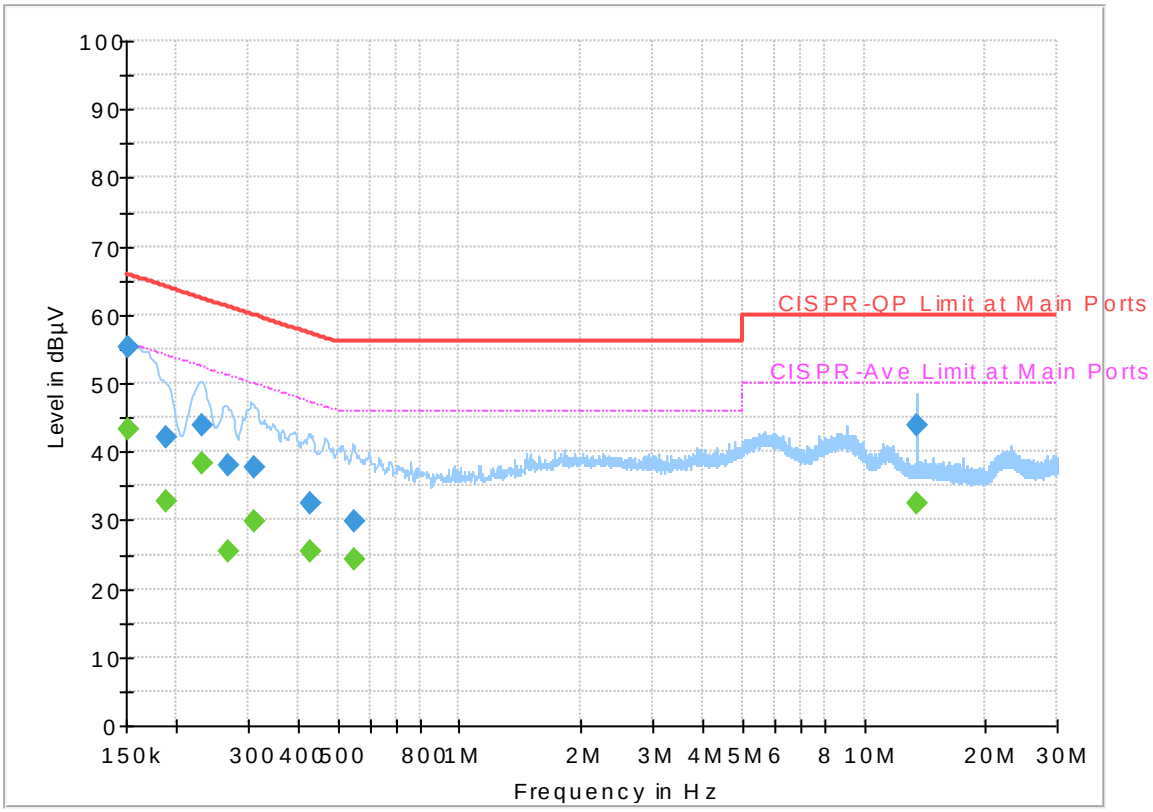
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	44.50	55.88	11.38	L1	OFF	19.5
0.152250	56.00	---	65.88	9.88	L1	OFF	19.5
0.188250	---	31.39	54.11	22.72	L1	OFF	19.5
0.188250	41.77	---	64.11	22.34	L1	OFF	19.5
0.224250	---	34.98	52.66	17.68	L1	OFF	19.5
0.224250	42.14	---	62.66	20.52	L1	OFF	19.5
0.269250	---	28.35	51.14	22.79	L1	OFF	19.5
0.269250	38.16	---	61.14	22.98	L1	OFF	19.5
0.303000	---	27.52	50.16	22.64	L1	OFF	19.5
0.303000	37.02	---	60.16	23.14	L1	OFF	19.5
0.345750	---	25.47	49.06	23.59	L1	OFF	19.5
0.345750	35.02	---	59.06	24.04	L1	OFF	19.5
0.388500	---	24.36	48.10	23.74	L1	OFF	19.5
0.388500	33.36	---	58.10	24.74	L1	OFF	19.5
0.431250	---	26.03	47.23	21.20	L1	OFF	19.5
0.431250	32.52	---	57.23	24.71	L1	OFF	19.5
13.560000	---	34.33	50.00	15.67	L1	OFF	20.0
13.560000	42.95	---	60.00	17.05	L1	OFF	20.0

EUT Information

Report NO :	852405
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Neutral

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	43.35	55.88	12.53	N	OFF	19.5
0.152250	55.14	---	65.88	10.74	N	OFF	19.5
0.188250	---	32.77	54.11	21.34	N	OFF	19.5
0.188250	42.21	---	64.11	21.90	N	OFF	19.5
0.231000	---	38.23	52.41	14.18	N	OFF	19.5
0.231000	43.72	---	62.41	18.69	N	OFF	19.5
0.267000	---	25.52	51.21	25.69	N	OFF	19.5
0.267000	38.02	---	61.21	23.19	N	OFF	19.5
0.309750	---	29.74	49.98	20.24	N	OFF	19.5
0.309750	37.73	---	59.98	22.25	N	OFF	19.5
0.426750	---	25.42	47.32	21.90	N	OFF	19.5
0.426750	32.43	---	57.32	24.89	N	OFF	19.5
0.548250	---	24.15	46.00	21.85	N	OFF	19.5
0.548250	29.93	---	56.00	26.07	N	OFF	19.5
13.560000	---	32.40	50.00	17.60	N	OFF	20.1
13.560000	44.00	---	60.00	16.00	N	OFF	20.1

Appendix C. Radiated Spurious Emission

Test Engineer :	Bill Chang, Kyle Jhuang, and Lance Chiang	Temperature :	22~26°C
		Relative Humidity :	52~56%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2387.07	53.51	-20.49	74	41.29	27.31	15.77	30.86	229	335	P	H
		2387.28	44.2	-9.8	54	31.98	27.31	15.77	30.86	229	335	A	H
	*	2412	106.28	-	-	93.96	27.36	15.81	30.85	229	335	P	H
	*	2412	103.35	-	-	91.03	27.36	15.81	30.85	229	335	A	H
													H
													H
		2389.38	53.11	-20.89	74	40.89	27.31	15.77	30.86	368	276	P	V
		2387.385	43.36	-10.64	54	31.14	27.31	15.77	30.86	368	276	A	V
	*	2412	105.07	-	-	92.75	27.36	15.81	30.85	368	276	P	V
	*	2412	101.97	-	-	89.65	27.36	15.81	30.85	368	276	A	V
													V
													V
802.11b CH 06 2437MHz		2359.98	53.53	-20.47	74	41.47	27.21	15.73	30.88	248	337	P	H
		2389.94	43.04	-10.96	54	30.81	27.31	15.77	30.85	248	337	A	H
	*	2437	105.88	-	-	93.42	27.46	15.84	30.84	248	337	P	H
	*	2437	102.75	-	-	90.29	27.46	15.84	30.84	248	337	A	H
		2485.51	53.41	-20.59	74	40.77	27.55	15.91	30.82	248	337	P	H
		2483.9	43.03	-10.97	54	30.39	27.55	15.91	30.82	248	337	A	H
		2343.6	53.18	-20.82	74	41.18	27.17	15.71	30.88	326	279	P	V
		2389.94	42.8	-11.2	54	30.57	27.31	15.77	30.85	326	279	A	V
	*	2437	104.05	-	-	91.59	27.46	15.84	30.84	326	279	P	V
	*	2437	100.85	-	-	88.39	27.46	15.84	30.84	326	279	A	V
		2499.3	53.02	-20.98	74	40.3	27.6	15.93	30.81	326	279	P	V
		2484.25	42.8	-11.2	54	30.16	27.55	15.91	30.82	326	279	A	V

802.11b CH 11 2462MHz	*	2462	105.06	-	-	92.51	27.5	15.88	30.83	350	327	P	H
	*	2462	101.95	-	-	89.4	27.5	15.88	30.83	350	327	A	H
		2491.08	53.66	-20.34	74	40.96	27.6	15.92	30.82	350	327	P	H
		2487.48	43.34	-10.66	54	30.7	27.55	15.91	30.82	350	327	A	H
													H
													H
	*	2462	104.38	-	-	91.83	27.5	15.88	30.83	376	269	P	V
	*	2462	100.79	-	-	88.24	27.5	15.88	30.83	376	269	A	V
		2498.68	53.56	-20.44	74	40.84	27.6	15.93	30.81	376	269	P	V
		2487.16	43.07	-10.93	54	30.43	27.55	15.91	30.82	376	269	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	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	37.83	-36.17	74	56.54	31.36	8.5	58.57	100	0	P	H
													H
													H
													H
		4824	37.21	-36.79	74	55.92	31.36	8.5	58.57	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4874	38.89	-35.11	74	57.33	31.46	8.19	58.55	100	0	P	H
		7311	43.08	-30.92	74	54.56	36.08	10.78	58.83	100	0	P	H
													H
													H
		4874	37.42	-36.58	74	55.86	31.46	8.65	58.55	100	0	P	V
		7311	42.73	-31.27	74	54.21	36.08	11.27	58.83	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4924	38.6	-35.4	74	56.77	31.56	8.8	58.53	100	0	P	H
		7386	43.33	-30.67	74	54.52	36.27	11.28	58.74	100	0	P	H
													H
													H
		4924	36.68	-37.32	74	54.85	31.56	8.8	58.53	100	0	P	V
		7386	43.58	-30.42	74	54.77	36.27	11.28	58.74	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		2389.695	60.97	-13.03	74	48.75	27.31	15.77	30.86	200	329	P	H
		2390	51.39	-2.61	54	39.15	27.31	15.78	30.85	200	329	A	H
	*	2412	107.22	-	-	94.9	27.36	15.81	30.85	200	329	P	H
	*	2412	99.06	-	-	86.74	27.36	15.81	30.85	200	329	A	H
													H
													H
		2389.905	60.78	-13.22	74	48.55	27.31	15.77	30.85	242	279	P	V
		2390	50.4	-3.6	54	38.16	27.31	15.78	30.85	242	279	A	V
	*	2412	105.18	-	-	92.86	27.36	15.81	30.85	242	279	P	V
	*	2412	98.05	-	-	85.73	27.36	15.81	30.85	242	279	A	V
													V
													V
802.11g CH 06 2437MHz		2383.22	53.01	-20.99	74	40.85	27.26	15.76	30.86	226	225	P	H
		2389.94	43.26	-10.74	54	31.03	27.31	15.77	30.85	226	225	A	H
	*	2437	105.73	-	-	93.27	27.46	15.84	30.84	226	225	P	H
	*	2437	98.24	-	-	85.78	27.46	15.84	30.84	226	225	A	H
		2495.87	52.59	-21.41	74	39.88	27.6	15.92	30.81	226	225	P	H
		2483.55	42.86	-11.14	54	30.22	27.55	15.91	30.82	226	225	A	H
		2373.7	52.89	-21.11	74	40.74	27.26	15.75	30.86	265	246	P	V
		2389.94	42.98	-11.02	54	30.75	27.31	15.77	30.85	265	246	A	V
	*	2437	104.64	-	-	92.18	27.46	15.84	30.84	265	246	P	V
	*	2437	97.14	-	-	84.68	27.46	15.84	30.84	265	246	A	V
		2487.12	53.67	-20.33	74	41.03	27.55	15.91	30.82	265	246	P	V
		2483.5	42.75	-11.25	54	30.11	27.55	15.91	30.82	265	246	A	V

802.11g CH 11 2462MHz	*	2462	107.54	-	-	94.99	27.5	15.88	30.83	399	145	P	H
	*	2462	99.34	-	-	86.79	27.5	15.88	30.83	399	145	A	H
		2483.52	61.58	-12.42	74	48.94	27.55	15.91	30.82	399	145	P	H
		2483.52	50.1	-3.9	54	37.46	27.55	15.91	30.82	399	145	A	H
													H
													H
	*	2462	104.78	-	-	92.23	27.5	15.88	30.83	301	265	P	V
	*	2462	97.45	-	-	84.9	27.5	15.88	30.83	301	265	A	V
		2484.44	59.2	-14.8	74	46.56	27.55	15.91	30.82	301	265	P	V
		2483.52	47.37	-6.63	54	34.73	27.55	15.91	30.82	301	265	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	36.35	-37.65	74	55.06	31.36	8.5	58.57	100	0	P	H
													H
													H
													H
		4824	36.75	-37.25	74	55.46	31.36	8.5	58.57	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4874	38.11	-35.89	74	56.55	31.46	8.65	58.55	100	0	P	H
		7311	43.07	-30.93	74	54.55	36.08	11.27	58.83	100	0	P	H
													H
													H
		4874	37.47	-36.53	74	55.91	31.46	8.65	58.55	100	0	P	V
		7311	42.95	-31.05	74	54.43	36.08	11.27	58.83	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4924	37.45	-36.55	74	55.62	31.56	8.8	58.53	100	0	P	H
		7386	43.32	-30.68	74	54.51	36.27	11.28	58.74	100	0	P	H
													H
													H
		4924	37.56	-36.44	74	55.73	31.56	8.8	58.53	100	0	P	V
		7386	42.58	-31.42	74	53.77	36.27	11.28	58.74	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	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		2389.695	61.68	-12.32	74	49.46	27.31	15.77	30.86	227	335	P	H
		2390	51.48	-2.52	54	39.24	27.31	15.78	30.85	227	335	A	H
	*	2412	105.11	-	-	92.79	27.36	15.81	30.85	227	335	P	H
	*	2412	97.04	-	-	84.72	27.36	15.81	30.85	227	335	A	H
802.11n													H
HT20													H
CH 01		2389.905	61.63	-12.37	74	49.4	27.31	15.77	30.85	330	275	P	V
2412MHz		2390	51.45	-2.55	54	39.21	27.31	15.78	30.85	330	275	A	V
	*	2412	105.21	-	-	92.89	27.36	15.81	30.85	330	275	P	V
	*	2412	97.54	-	-	85.22	27.36	15.81	30.85	330	275	A	V
													V
													V
		2376.78	53.34	-20.66	74	41.18	27.26	15.76	30.86	256	338	P	H
		2389.38	44.34	-9.66	54	32.12	27.31	15.77	30.86	256	338	A	H
	*	2437	106.73	-	-	94.27	27.46	15.84	30.84	256	338	P	H
	*	2437	99.2	-	-	86.74	27.46	15.84	30.84	256	338	A	H
802.11n		2485.58	53.9	-20.1	74	41.26	27.55	15.91	30.82	256	338	P	H
HT20		2483.83	43.82	-10.18	54	31.18	27.55	15.91	30.82	256	338	A	H
CH 06		2387.14	52.99	-21.01	74	40.77	27.31	15.77	30.86	363	278	P	V
2437MHz		2389.94	43.91	-10.09	54	31.68	27.31	15.77	30.85	363	278	A	V
	*	2437	104.96	-	-	92.5	27.46	15.84	30.84	363	278	P	V
	*	2437	97.78	-	-	85.32	27.46	15.84	30.84	363	278	A	V
		2490.13	53.25	-20.75	74	40.55	27.6	15.92	30.82	363	278	P	V
		2487.4	43.68	-10.32	54	31.04	27.55	15.91	30.82	363	278	A	V

	*	2462	106.73	-	-	94.18	27.5	15.88	30.83	224	335	P	H
	*	2462	98.63	-	-	86.08	27.5	15.88	30.83	224	335	A	H
		2483.76	61.48	-12.52	74	48.84	27.55	15.91	30.82	224	335	P	H
		2483.52	51.77	-2.23	54	39.13	27.55	15.91	30.82	224	335	A	H
802.11n													H
HT20													H
CH 11	*	2462	104.88	-	-	92.33	27.5	15.88	30.83	343	271	P	V
2462MHz	*	2462	96.97	-	-	84.42	27.5	15.88	30.83	343	271	A	V
		2484.56	61.22	-12.78	74	48.58	27.55	15.91	30.82	343	271	P	V
		2483.6	50.87	-3.13	54	38.23	27.55	15.91	30.82	343	271	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	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4824	36.43	-37.57	74	55.14	31.36	8.5	58.57	100	0	P	H
													H
802.11n													H
HT20													H
CH 01		4824	36.79	-37.21	74	55.5	31.36	8.5	58.57	100	0	P	V
2412MHz													V
													V
													V
		4874	37.27	-36.73	74	55.71	31.46	8.65	58.55	100	0	P	H
		7311	42.87	-31.13	74	54.35	36.08	11.27	58.83	100	0	P	H
802.11n													H
HT20													H
CH 06		4874	37.16	-36.84	74	55.6	31.46	8.65	58.55	100	0	P	V
2437MHz		7311	42.33	-31.67	74	53.81	36.08	11.27	58.83	100	0	P	V
													V
													V
		4924	36.85	-37.15	74	55.02	31.56	8.8	58.53	100	0	P	H
		7386	43.64	-30.36	74	54.83	36.27	11.28	58.74	100	0	P	H
802.11n													H
HT20													H
CH 11		4924	37.47	-36.53	74	55.64	31.56	8.8	58.53	100	0	P	V
2462MHz		7386	42.94	-31.06	74	54.13	36.27	11.28	58.74	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
		96.42	38.07	-5.43	43.5	53.75	15.59	1.3	32.57	100	0	P	H
		153.93	33.79	-9.71	43.5	47.83	16.89	1.62	32.55			P	H
		168.78	30.23	-13.27	43.5	45.18	15.85	1.75	32.55			P	H
		374.9	27.2	-18.8	46	35.98	21.35	2.4	32.53			P	H
		382.6	26.23	-19.77	46	34.71	21.62	2.43	32.53			P	H
		738.2	30.66	-15.34	46	31.76	27.99	3.3	32.39			P	H
													H
													H
													H
													H
2.4GHz													H
802.11n													H
HT20		76.71	28.98	-11.02	40	47.27	13.15	1.15	32.59	100	0	P	V
LF		95.61	31.47	-12.03	43.5	47.27	15.48	1.29	32.57			P	V
		153.12	28.43	-15.07	43.5	42.41	16.95	1.62	32.55			P	V
		478.5	24.4	-21.6	46	30.42	23.85	2.68	32.55			P	V
		832	31.99	-14.01	46	31.5	28.95	3.59	32.05			P	V
		895.7	32.3	-13.7	46	30.95	29.35	3.72	31.72			P	V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against limit line.

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2389.485	53.94	-20.06	74	41.72	27.31	15.77	30.86	386	332	P	H
		2389.065	42.81	-11.19	54	30.59	27.31	15.77	30.86	386	332	A	H
	*	2412	103.44	-	-	91.12	27.36	15.81	30.85	386	332	P	H
	*	2412	100.36	-	-	88.04	27.36	15.81	30.85	386	332	A	H
													H
													H
		2373.42	53.48	-20.52	74	41.33	27.26	15.75	30.86	295	35	P	V
		2388.96	42.56	-11.44	54	30.34	27.31	15.77	30.86	295	35	A	V
	*	2412	100.43	-	-	88.11	27.36	15.81	30.85	295	35	P	V
	*	2412	97.23	-	-	84.91	27.36	15.81	30.85	295	35	A	V
													V
													V
802.11b CH 06 2437MHz		2362.22	52.88	-21.12	74	40.82	27.21	15.73	30.88	379	339	P	H
		2389.8	42.46	-11.54	54	30.23	27.31	15.77	30.85	379	339	A	H
	*	2437	104.16	-	-	91.7	27.46	15.84	30.84	379	339	P	H
	*	2437	101.05	-	-	88.59	27.46	15.84	30.84	379	339	A	H
		2492.93	53.48	-20.52	74	40.77	27.6	15.92	30.81	379	339	P	H
		2483.9	42.77	-11.23	54	30.13	27.55	15.91	30.82	379	339	A	H
		2345.7	52.87	-21.13	74	40.87	27.17	15.71	30.88	290	34	P	V
		2389.94	42.46	-11.54	54	30.23	27.31	15.77	30.85	290	34	A	V
	*	2437	100.22	-	-	87.76	27.46	15.84	30.84	290	34	P	V
	*	2437	97.11	-	-	84.65	27.46	15.84	30.84	290	34	A	V
		2498.6	52.98	-21.02	74	40.26	27.6	15.93	30.81	290	34	P	V
		2496.01	42.77	-11.23	54	30.06	27.6	15.92	30.81	290	34	A	V

802.11b CH 11 2462MHz	*	2462	103.31	-	-	90.76	27.5	15.88	30.83	372	341	P	H
	*	2462	100.07	-	-	87.52	27.5	15.88	30.83	372	341	A	H
		2497.96	53.78	-20.22	74	41.06	27.6	15.93	30.81	372	341	P	H
		2483.72	42.91	-11.09	54	30.27	27.55	15.91	30.82	372	341	A	H
													H
													H
	*	2462	100.15	-	-	87.6	27.5	15.88	30.83	282	34	P	V
	*	2462	97	-	-	84.45	27.5	15.88	30.83	282	34	A	V
		2496.56	53.58	-20.42	74	40.86	27.6	15.93	30.81	282	34	P	V
		2483.52	42.8	-11.2	54	30.16	27.55	15.91	30.82	282	34	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. 2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	36.69	-37.31	74	55.4	31.36	8.5	58.57	100	0	P	H
													H
													H
													H
		4824	37.14	-36.86	74	55.85	31.36	8.5	58.57	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4874	37.6	-36.4	74	56.04	31.46	8.65	58.55	100	0	P	H
		7311	42.95	-31.05	74	54.43	36.08	11.27	58.83	100	0	P	H
													H
													H
		4874	37.58	-36.42	74	56.02	31.46	8.65	58.55	100	0	P	V
		7311	42.74	-31.26	74	54.22	36.08	11.27	58.83	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4924	37.34	-36.66	74	55.51	31.56	8.8	58.53	100	0	P	H
		7386	43.44	-30.56	74	54.63	36.27	11.28	58.74	100	0	P	H
													H
													H
		4924	37.24	-36.76	74	55.41	31.56	8.8	58.53	100	0	P	V
		7386	43.56	-30.44	74	54.75	36.27	11.28	58.74	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 2	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		2389.17	53.9	-20.1	74	41.68	27.31	15.77	30.86	309	339	P	H
		2390	44.42	-9.58	54	32.18	27.31	15.78	30.85	309	339	A	H
	*	2412	104.57	-	-	92.25	27.36	15.81	30.85	309	339	P	H
	*	2412	96.69	-	-	84.37	27.36	15.81	30.85	309	339	A	H
													H
													H
		2343.81	53.21	-20.79	74	41.21	27.17	15.71	30.88	294	34	P	V
		2390	43.52	-10.48	54	31.28	27.31	15.78	30.85	294	34	A	V
	*	2412	100.54	-	-	88.22	27.36	15.81	30.85	294	34	P	V
	*	2412	93.01	-	-	80.69	27.36	15.81	30.85	294	34	A	V
													V
													V
802.11g CH 06 2437MHz		2365.72	53.09	-20.91	74	41	27.21	15.74	30.86	378	339	P	H
		2389.94	42.7	-11.3	54	30.47	27.31	15.77	30.85	378	339	A	H
	*	2437	105.68	-	-	93.22	27.46	15.84	30.84	378	339	P	H
	*	2437	98.26	-	-	85.8	27.46	15.84	30.84	378	339	A	H
		2490.76	53.81	-20.19	74	41.11	27.6	15.92	30.82	378	339	P	H
		2483.55	43.07	-10.93	54	30.43	27.55	15.91	30.82	378	339	A	H
		2359.42	53.29	-20.71	74	41.23	27.21	15.73	30.88	289	35	P	V
		2389.8	42.6	-11.4	54	30.37	27.31	15.77	30.85	289	35	A	V
	*	2437	102.04	-	-	89.58	27.46	15.84	30.84	289	35	P	V
	*	2437	94.41	-	-	81.95	27.46	15.84	30.84	289	35	A	V
		2493.98	53.11	-20.89	74	40.4	27.6	15.92	30.81	289	35	P	V
		2483.55	42.91	-11.09	54	30.27	27.55	15.91	30.82	289	35	A	V

802.11g CH 11 2462MHz	*	2462	104.74	-	-	92.19	27.5	15.88	30.83	366	323	P	H
	*	2462	97.16	-	-	84.61	27.5	15.88	30.83	366	323	A	H
		2483.56	56.5	-17.5	74	43.86	27.55	15.91	30.82	366	323	P	H
		2483.52	47.69	-6.31	54	35.05	27.55	15.91	30.82	366	323	A	H
													H
													H
	*	2462	101.03	-	-	88.48	27.5	15.88	30.83	282	32	P	V
	*	2462	93.54	-	-	80.99	27.5	15.88	30.83	282	32	A	V
		2484.28	55.42	-18.58	74	42.78	27.55	15.91	30.82	282	32	P	V
		2483.52	45.57	-8.43	54	32.93	27.55	15.91	30.82	282	32	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. 2	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	36.69	-37.31	74	55.4	31.36	8.5	58.57	100	0	P	H
													H
													H
													H
		4824	36.61	-37.39	74	55.32	31.36	8.5	58.57	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4874	37.69	-36.31	74	56.13	31.46	8.65	58.55	100	0	P	H
		7311	43.42	-30.58	74	54.9	36.08	11.27	58.83	100	0	P	H
													H
													H
		4874	37.28	-36.72	74	55.72	31.46	8.65	58.55	100	0	P	V
		7311	42.99	-31.01	74	54.47	36.08	11.27	58.83	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4924	37.42	-36.58	74	55.59	31.56	8.8	58.53	100	0	P	H
		7386	43.11	-30.89	74	54.3	36.27	11.28	58.74	100	0	P	H
													H
													H
		4924	38	-36	74	56.17	31.56	8.8	58.53	100	0	P	V
		7386	42.9	-31.1	74	54.09	36.27	11.28	58.74	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. 2	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		2390	55.2	-18.8	74	42.96	27.31	15.78	30.85	384	332	P	H
		2390	46.63	-7.37	54	34.39	27.31	15.78	30.85	384	332	A	H
	*	2412	105.26	-	-	92.94	27.36	15.81	30.85	384	332	P	H
	*	2412	97.74	-	-	85.42	27.36	15.81	30.85	384	332	A	H
802.11n													H
HT20													H
CH 01		2389.485	53.75	-20.25	74	41.53	27.31	15.77	30.86	298	35	P	V
2412MHz		2390	45.31	-8.69	54	33.07	27.31	15.78	30.85	298	35	A	V
	*	2412	102.2	-	-	89.88	27.36	15.81	30.85	298	35	P	V
	*	2412	94.48	-	-	82.16	27.36	15.81	30.85	298	35	A	V
													V
													V
		2346.82	53.45	-20.55	74	41.45	27.17	15.71	30.88	379	340	P	H
		2378.46	43.29	-10.71	54	31.13	27.26	15.76	30.86	379	340	A	H
	*	2437	105.33	-	-	92.87	27.46	15.84	30.84	379	340	P	H
	*	2437	97.95	-	-	85.49	27.46	15.84	30.84	379	340	A	H
802.11n		2488.17	53.19	-20.81	74	40.5	27.6	15.91	30.82	379	340	P	H
HT20		2486.63	43.77	-10.23	54	31.13	27.55	15.91	30.82	379	340	A	H
CH 06		2353.68	53.31	-20.69	74	41.26	27.21	15.72	30.88	287	34	P	V
2437MHz		2385.6	43.17	-10.83	54	30.95	27.31	15.77	30.86	287	34	A	V
	*	2437	101.25	-	-	88.79	27.46	15.84	30.84	287	34	P	V
	*	2437	94.08	-	-	81.62	27.46	15.84	30.84	287	34	A	V
		2493.42	55.1	-18.9	74	42.39	27.6	15.92	30.81	287	34	P	V
		2497.9	43.62	-10.38	54	30.9	27.6	15.93	30.81	287	34	A	V

	*	2462	105.36	-	-	92.81	27.5	15.88	30.83	368	341	P	H
	*	2462	97.47	-	-	84.92	27.5	15.88	30.83	368	341	A	H
		2483.52	59.91	-14.09	74	47.27	27.55	15.91	30.82	368	341	P	H
		2483.52	49.55	-4.45	54	36.91	27.55	15.91	30.82	368	341	A	H
802.11n													H
HT20													H
CH 11	*	2462	101.85	-	-	89.3	27.5	15.88	30.83	282	35	P	V
2462MHz	*	2462	94.24	-	-	81.69	27.5	15.88	30.83	282	35	A	V
		2483.56	56.2	-17.8	74	43.56	27.55	15.91	30.82	282	35	P	V
		2483.68	47.09	-6.91	54	34.45	27.55	15.91	30.82	282	35	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. 2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4824	36.7	-37.3	74	55.41	31.36	8.5	58.57	100	0	P	H
													H
802.11n													H
HT20													H
CH 01		4824	36.48	-37.52	74	55.19	31.36	8.5	58.57	100	0	P	V
2412MHz													V
													V
													V
		4874	37.37	-36.63	74	55.81	31.46	8.65	58.55	100	0	P	H
		7311	42.58	-31.42	74	54.06	36.08	11.27	58.83	100	0	P	H
802.11n													H
HT20													H
CH 06		4874	37.09	-36.91	74	55.53	31.46	8.65	58.55	100	0	P	V
2437MHz		7311	42.65	-31.35	74	54.13	36.08	11.27	58.83	100	0	P	V
													V
													V
		4924	37.95	-36.05	74	56.12	31.56	8.8	58.53	100	0	P	H
		7386	43.24	-30.76	74	54.43	36.27	11.28	58.74	100	0	P	H
802.11n													H
HT20													H
CH 11		4924	37.32	-36.68	74	55.49	31.56	8.8	58.53	100	0	P	V
2462MHz		7386	43.5	-30.5	74	54.69	36.27	11.28	58.74	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
		96.42	38.6	-4.9	43.5	54.28	15.59	1.3	32.57	100	0	P	H
		155.28	31.49	-12.01	43.5	45.59	16.81	1.64	32.55	-	-	P	H
		245.73	28.67	-17.33	46	40.4	18.8	2.01	32.54	-	-	P	H
		721.4	37.87	-8.13	46	39.39	27.63	3.28	32.43	-	-	P	H
		895.7	36.45	-9.55	46	35.1	29.35	3.72	31.72	-	-	P	H
		953.1	34.23	-11.77	46	30.53	31.05	3.9	31.25	-	-	P	H
													H
													H
													H
													H
2.4GHz													H
802.11n													H
HT20		77.25	29.17	-10.83	40	47.39	13.22	1.15	32.59	-	-	P	V
LF		95.61	34.62	-8.88	43.5	50.42	15.48	1.29	32.57	100	0	P	V
		246.27	28.17	-17.83	46	39.87	18.82	2.02	32.54	-	-	P	V
		720.7	30.35	-15.65	46	31.89	27.62	3.27	32.43	-	-	P	V
		834.8	32	-14	46	31.37	29.07	3.6	32.04	-	-	P	V
		961.5	33.37	-20.63	54	29.51	31.12	3.92	31.18	-	-	P	V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against limit line.

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2359.77	53.37	-20.63	74	41.31	27.21	15.73	30.88	248	313	P	H
		2389.695	42.72	-11.28	54	30.5	27.31	15.77	30.86	248	313	A	H
	*	2412	105.21	-	-	92.89	27.36	15.81	30.85	248	313	P	H
	*	2412	102.4	-	-	90.08	27.36	15.81	30.85	248	313	A	H
													H
													H
		2375.415	53.63	-20.37	74	41.48	27.26	15.75	30.86	303	262	P	V
		2389.17	42.59	-11.41	54	30.37	27.31	15.77	30.86	303	262	A	V
	*	2412	101.72	-	-	89.4	27.36	15.81	30.85	303	262	P	V
	*	2412	99.01	-	-	86.69	27.36	15.81	30.85	303	262	A	V
													V
													V
802.11b CH 06 2437MHz		2327.5	53.55	-20.45	74	41.64	27.12	15.68	30.89	245	315	P	H
		2389.94	42.64	-11.36	54	30.41	27.31	15.77	30.85	245	315	A	H
	*	2437	104.79	-	-	92.33	27.46	15.84	30.84	245	315	P	H
	*	2437	101.8	-	-	89.34	27.46	15.84	30.84	245	315	A	H
		2484.39	53.92	-20.08	74	41.28	27.55	15.91	30.82	245	315	P	H
		2483.97	43.07	-10.93	54	30.43	27.55	15.91	30.82	245	315	A	H
		2371.88	53.03	-20.97	74	40.88	27.26	15.75	30.86	289	245	P	V
		2389.94	42.47	-11.53	54	30.24	27.31	15.77	30.85	289	245	A	V
	*	2437	99.65	-	-	87.19	27.46	15.84	30.84	289	245	P	V
	*	2437	96.69	-	-	84.23	27.46	15.84	30.84	289	245	A	V
		2492.16	53.3	-20.7	74	40.59	27.6	15.92	30.81	289	245	P	V
		2484.04	42.81	-11.19	54	30.17	27.55	15.91	30.82	289	245	A	V

802.11b CH 11 2462MHz	*	2462	103.92	-	-	91.37	27.5	15.88	30.83	237	314	P	H
	*	2462	100.97	-	-	88.42	27.5	15.88	30.83	237	314	A	H
		2499.48	54.01	-19.99	74	41.29	27.6	15.93	30.81	237	314	P	H
		2484	42.96	-11.04	54	30.32	27.55	15.91	30.82	237	314	A	H
													H
													H
	*	2462	99.9	-	-	87.35	27.5	15.88	30.83	216	85	P	V
	*	2462	96.79	-	-	84.24	27.5	15.88	30.83	216	85	A	V
		2499.32	53.86	-20.14	74	41.14	27.6	15.93	30.81	216	85	P	V
		2499.12	42.76	-11.24	54	30.04	27.6	15.93	30.81	216	85	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	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	37.85	-36.15	74	56.56	31.36	8.5	58.57	100	0	P	H
													H
													H
													H
		4824	36.18	-37.82	74	54.89	31.36	8.5	58.57	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4874	38.58	-35.42	74	57.02	31.46	8.65	58.55	100	0	P	H
		7311	44.47	-29.53	74	55.95	36.08	11.27	58.83	100	0	P	H
													H
													H
		4874	38.03	-35.97	74	56.47	31.46	8.65	58.55	100	0	P	V
		7311	42.51	-31.49	74	53.99	36.08	11.27	58.83	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4924	37.26	-36.74	74	55.43	31.56	8.8	58.53	100	0	P	H
		7386	42.9	-31.1	74	54.09	36.27	11.28	58.74	100	0	P	H
													H
													H
		4924	37.39	-36.61	74	55.56	31.56	8.8	58.53	100	0	P	V
		7386	43.23	-30.77	74	54.42	36.27	11.28	58.74	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		2389.905	57.84	-16.16	74	45.61	27.31	15.77	30.85	247	314	P	H
		2389.695	47.4	-6.6	54	35.18	27.31	15.77	30.86	247	314	A	H
	*	2412	108.98	-	-	96.66	27.36	15.81	30.85	247	314	P	H
	*	2412	101.56	-	-	89.24	27.36	15.81	30.85	247	314	A	H
													H
													H
		2389.905	56.94	-17.06	74	44.71	27.31	15.77	30.85	262	261	P	V
		2390	46.53	-7.47	54	34.29	27.31	15.78	30.85	262	261	A	V
	*	2412	105.98	-	-	93.66	27.36	15.81	30.85	262	261	P	V
	*	2412	98.85	-	-	86.53	27.36	15.81	30.85	262	261	A	V
													V
													V
802.11g CH 06 2437MHz		2389.38	54.01	-19.99	74	41.79	27.31	15.77	30.86	243	316	P	H
		2389.94	43.58	-10.42	54	31.35	27.31	15.77	30.85	243	316	A	H
	*	2437	108.68	-	-	96.22	27.46	15.84	30.84	243	316	P	H
	*	2437	101.23	-	-	88.77	27.46	15.84	30.84	243	316	A	H
		2485.79	53.25	-20.75	74	40.61	27.55	15.91	30.82	243	316	P	H
		2483.83	43.41	-10.59	54	30.77	27.55	15.91	30.82	243	316	A	H
		2332.82	53.28	-20.72	74	41.36	27.12	15.69	30.89	284	260	P	V
		2389.94	43.48	-10.52	54	31.25	27.31	15.77	30.85	284	260	A	V
	*	2437	105.5	-	-	93.04	27.46	15.84	30.84	284	260	P	V
	*	2437	97.75	-	-	85.29	27.46	15.84	30.84	284	260	A	V
		2486.91	52.92	-21.08	74	40.28	27.55	15.91	30.82	284	260	P	V
		2483.83	42.99	-11.01	54	30.35	27.55	15.91	30.82	284	260	A	V

802.11g CH 11 2462MHz	*	2462	108.64	-	-	96.09	27.5	15.88	30.83	238	312	P	H
	*	2462	101.74	-	-	89.19	27.5	15.88	30.83	238	312	A	H
		2484.56	56.91	-17.09	74	44.27	27.55	15.91	30.82	238	312	P	H
		2483.52	45.6	-8.4	54	32.96	27.55	15.91	30.82	238	312	A	H
													H
													H
	*	2462	105.75	-	-	93.2	27.5	15.88	30.83	291	263	P	V
	*	2462	97.84	-	-	85.29	27.5	15.88	30.83	291	263	A	V
		2483.88	54.81	-19.19	74	42.17	27.55	15.91	30.82	291	263	P	V
		2483.52	44.65	-9.35	54	32.01	27.55	15.91	30.82	291	263	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	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	36.81	-37.19	74	55.52	31.36	8.5	58.57	100	0	P	H
													H
													H
													H
		4824	36.67	-37.33	74	55.38	31.36	8.5	58.57	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4874	37.33	-36.67	74	55.77	31.46	8.65	58.55	100	0	P	H
		7311	43.16	-30.84	74	54.64	36.08	11.27	58.83	100	0	P	H
													H
													H
		4874	36.97	-37.03	74	55.41	31.46	8.65	58.55	100	0	P	V
		7311	43.14	-30.86	74	54.62	36.08	11.27	58.83	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4924	37.82	-36.18	74	55.99	31.56	8.8	58.53	100	0	P	H
		7386	42.97	-31.03	74	54.16	36.27	11.28	58.74	100	0	P	H
													H
													H
		4924	37.62	-36.38	74	55.79	31.56	8.8	58.53	100	0	P	V
		7386	42.97	-31.03	74	54.16	36.27	11.28	58.74	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	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		2389.905	60.86	-13.14	74	48.63	27.31	15.77	30.85	246	313	P	H
		2390	51.29	-2.71	54	39.05	27.31	15.78	30.85	246	313	A	H
	*	2412	108.94	-	-	96.62	27.36	15.81	30.85	246	313	P	H
	*	2412	101.7	-	-	89.38	27.36	15.81	30.85	246	313	A	H
802.11n													H
HT20													H
CH 01		2389.8	59.58	-14.42	74	47.35	27.31	15.77	30.85	306	262	P	V
2412MHz		2390	50.34	-3.66	54	38.1	27.31	15.78	30.85	306	262	A	V
	*	2412	107.49	-	-	95.17	27.36	15.81	30.85	306	262	P	V
	*	2412	99.42	-	-	87.1	27.36	15.81	30.85	306	262	A	V
													V
													V
		2389.8	54.46	-19.54	74	42.23	27.31	15.77	30.85	246	310	P	H
		2389.94	43.73	-10.27	54	31.5	27.31	15.77	30.85	246	310	A	H
	*	2437	107.27	-	-	94.81	27.46	15.84	30.84	246	310	P	H
	*	2437	99.7	-	-	87.24	27.46	15.84	30.84	246	310	A	H
802.11n		2492.65	53.55	-20.45	74	40.84	27.6	15.92	30.81	246	310	P	H
HT20		2487.12	43.93	-10.07	54	31.29	27.55	15.91	30.82	246	310	A	H
CH 06		2361.52	53.27	-20.73	74	41.21	27.21	15.73	30.88	298	261	P	V
2437MHz		2389.8	43.64	-10.36	54	31.41	27.31	15.77	30.85	298	261	A	V
	*	2437	103.62	-	-	91.16	27.46	15.84	30.84	298	261	P	V
	*	2437	96.35	-	-	83.89	27.46	15.84	30.84	298	261	A	V
		2498.25	53.8	-20.2	74	41.08	27.6	15.93	30.81	298	261	P	V
		2484.11	43.8	-10.2	54	31.16	27.55	15.91	30.82	298	261	A	V

	*	2462	106.74	-	-	94.19	27.5	15.88	30.83	240	314	P	H
	*	2462	98.93	-	-	86.38	27.5	15.88	30.83	240	314	A	H
		2483.56	56.82	-17.18	74	44.18	27.55	15.91	30.82	240	314	P	H
		2483.8	47.08	-6.92	54	34.44	27.55	15.91	30.82	240	314	A	H
802.11n													H
HT20													H
CH 11	*	2462	103.36	-	-	90.81	27.5	15.88	30.83	301	262	P	V
2462MHz	*	2462	96.48	-	-	83.93	27.5	15.88	30.83	301	262	A	V
		2484.6	55.57	-18.43	74	42.93	27.55	15.91	30.82	301	262	P	V
		2483.6	45.75	-8.25	54	33.11	27.55	15.91	30.82	301	262	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	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4824	38.43	-35.57	74	57.14	31.36	8.5	58.57	100	0	P	H
													H
802.11n													H
HT20													H
CH 01		4824	36.53	-37.47	74	55.24	31.36	8.5	58.57	100	0	P	V
2412MHz													V
													V
													V
		4874	36.65	-37.35	74	55.09	31.46	8.65	58.55	100	0	P	H
		7311	42.25	-31.75	74	53.73	36.08	11.27	58.83	100	0	P	H
802.11n													H
HT20													H
CH 06		4874	37.72	-36.28	74	56.16	31.46	8.65	58.55	100	0	P	V
2437MHz		7311	42.38	-31.62	74	53.86	36.08	11.27	58.83	100	0	P	V
													V
													V
		4924	37.48	-36.52	74	55.65	31.56	8.8	58.53	100	0	P	H
		7386	43.28	-30.72	74	54.47	36.27	11.28	58.74	100	0	P	H
802.11n													H
HT20													H
CH 11		4924	37.45	-36.55	74	55.62	31.56	8.8	58.53	100	0	P	V
2462MHz		7386	43.97	-30.03	74	55.16	36.27	11.28	58.74	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
		109.11	39.4	-4.1	43.5	53.9	16.74	1.33	32.57	100	0	P	H
		160.68	31.99	-11.51	43.5	46.32	16.54	1.68	32.55	-	-	P	H
		251.4	29.44	-16.56	46	40.98	18.94	2.05	32.53	-	-	P	H
		381.9	27.77	-18.23	46	36.3	21.58	2.42	32.53	-	-	P	H
		832	33.01	-12.99	46	32.52	28.95	3.59	32.05	-	-	P	H
		964.3	33.62	-20.38	54	29.81	31.04	3.93	31.16	-	-	P	H
													H
													H
													H
													H
2.4GHz													H
802.11n													H
HT20		108.3	39.21	-4.29	43.5	53.76	16.69	1.33	32.57	100	0	P	V
LF		155.01	27.39	-16.11	43.5	41.48	16.82	1.64	32.55	-	-	P	V
		251.4	27.19	-18.81	46	38.73	18.94	2.05	32.53	-	-	P	V
		735.4	30.61	-15.39	46	31.79	27.93	3.29	32.4	-	-	P	V
		832	37.52	-8.48	46	37.03	28.95	3.59	32.05	-	-	P	V
		968.5	33.9	-20.1	54	30.16	30.91	3.95	31.12	-	-	P	V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against limit line.

Note symbol

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

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

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

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =

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

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

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

Appendix D. Radiated Spurious Emission Plots

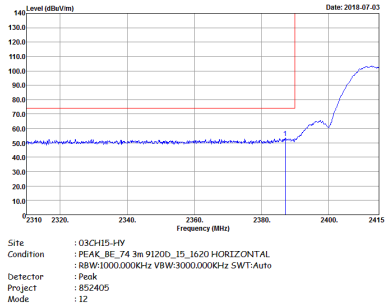
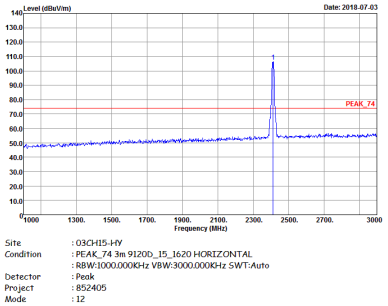
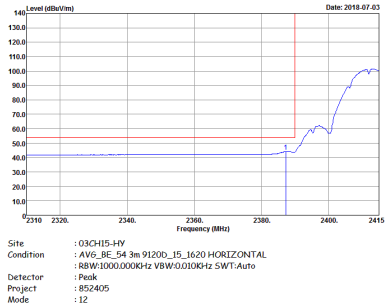
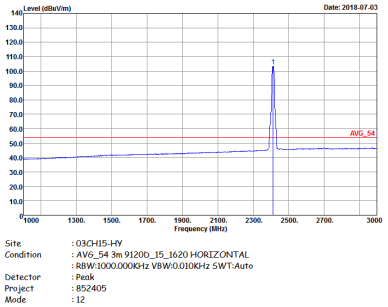
Test Engineer :	Bill Chang, Karl Jhuang, and Lance Chiang	**Temperature :**	22~26°C
		Relative Humidity :	52~56%

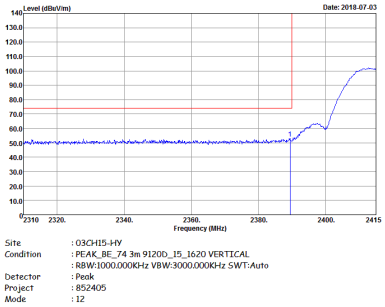
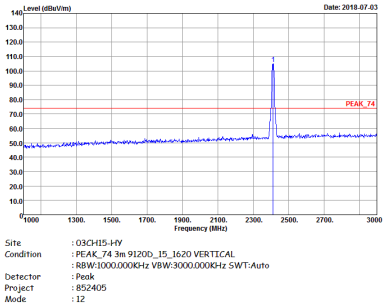
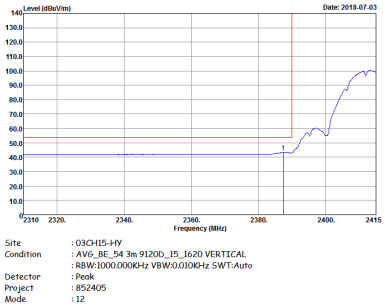
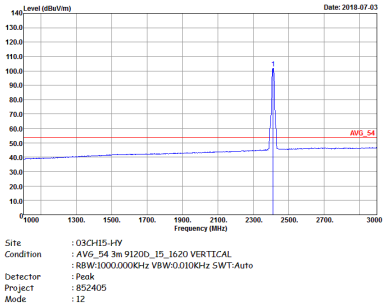
Note symbol

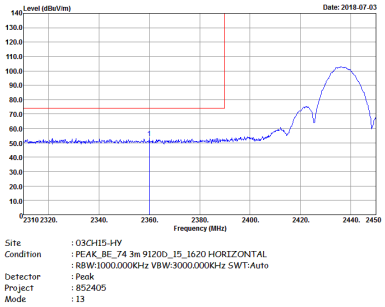
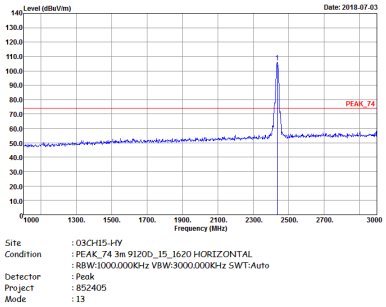
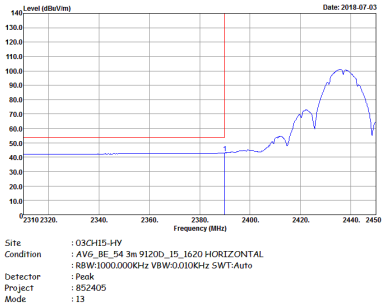
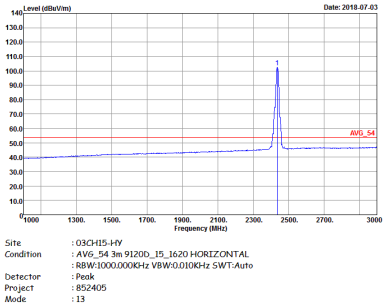
-L	**Low channel location**
-R	**High channel location**

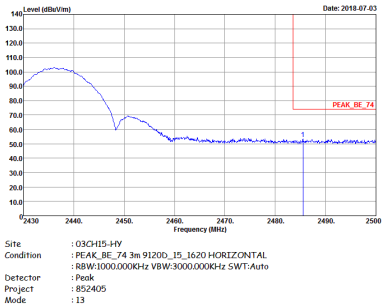
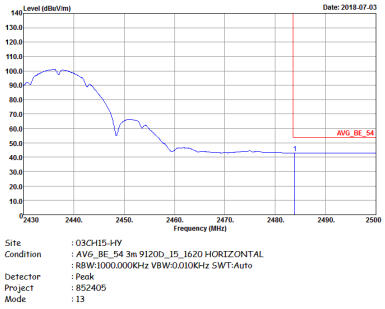
2.4GHz 2400~2483.5MHz

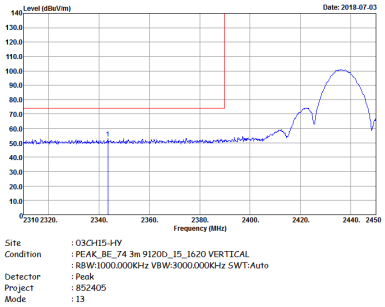
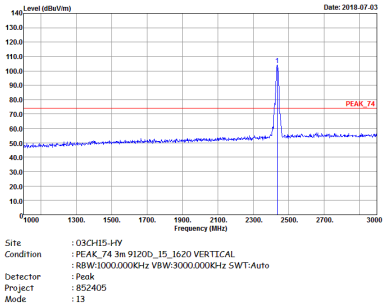
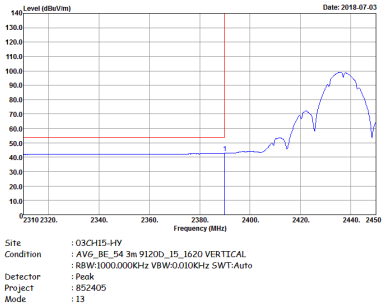
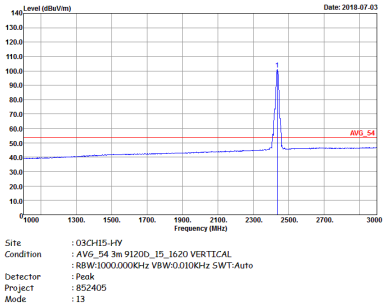
WIFI 802.11b (Band Edge @ 3m)

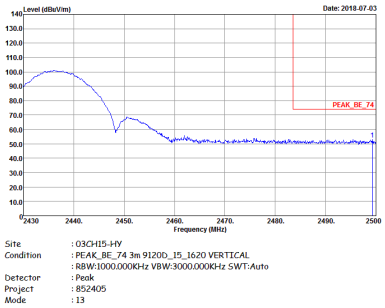
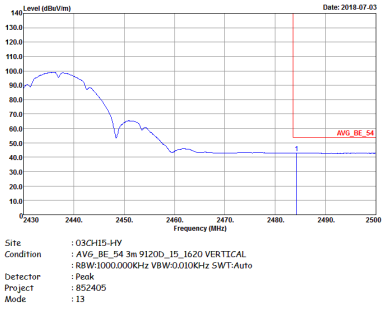
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

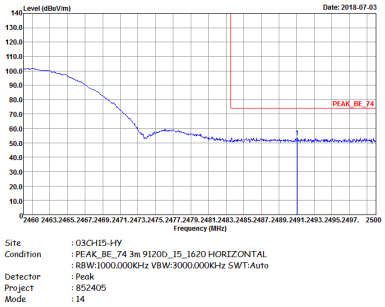
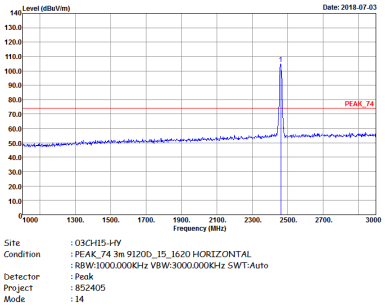
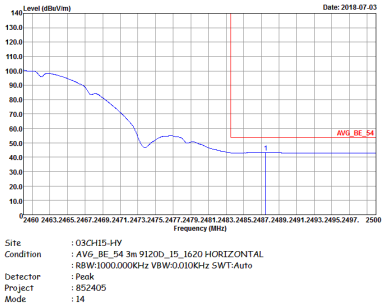
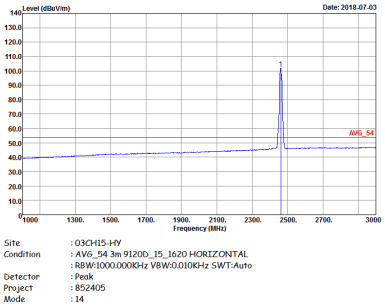
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Vertical	Fundamental
Peak		
Avg.		

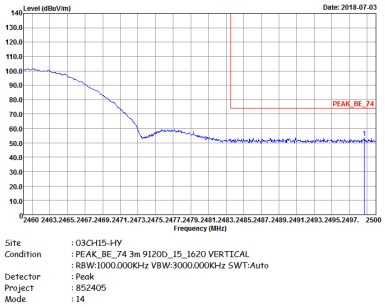
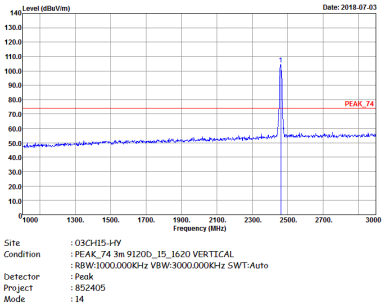
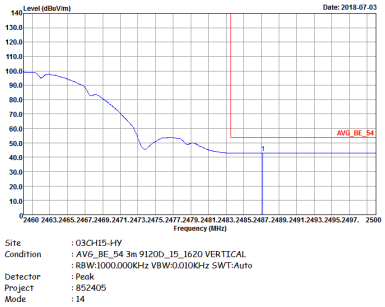
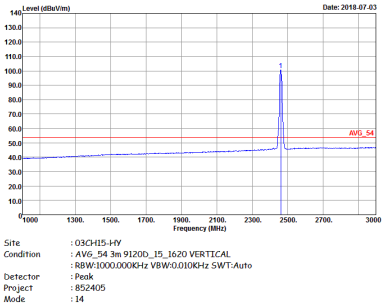
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		

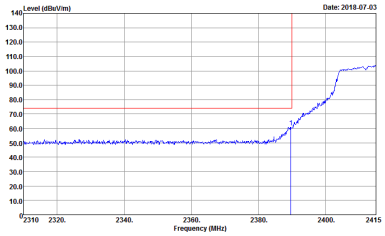
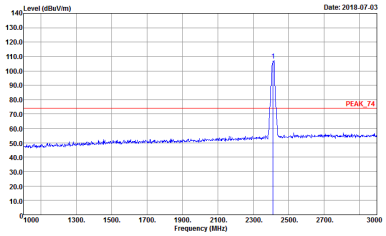
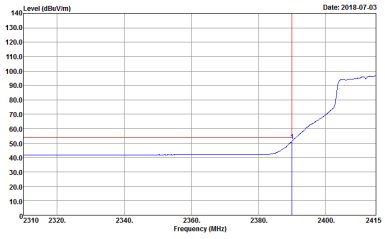
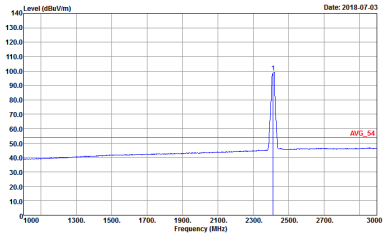
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

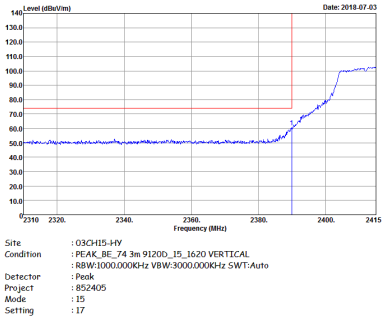
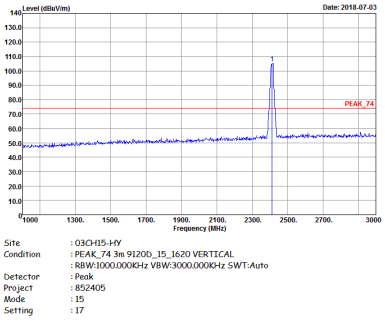
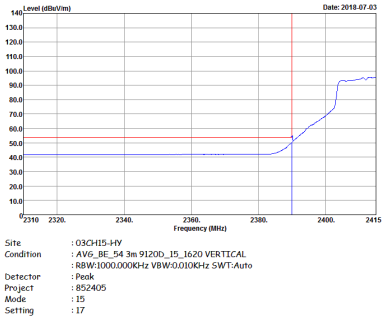
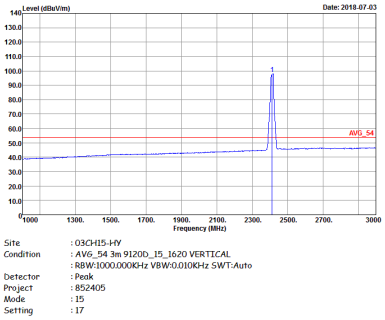
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 9120D_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 14	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 14
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 9120D_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 852405 Mode : 14	 Site : 03CH15-HY Condition : AVG_54 3m 9120D_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 852405 Mode : 14

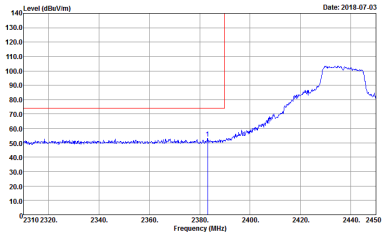
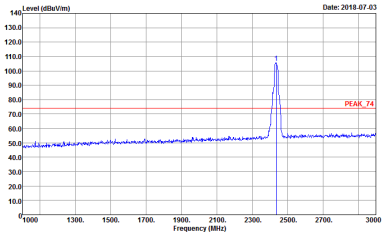
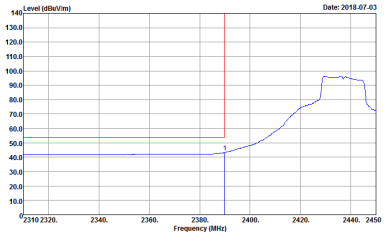
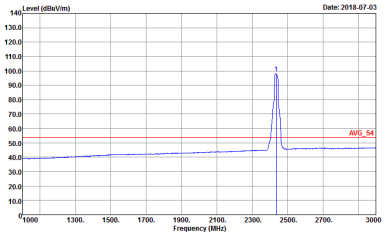
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 9120D_15_1620 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 14	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 14
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 9120D_15_1620 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 852405 Mode : 14	 Site : 03CH15-HY Condition : AVG_54 3m 9120D_15_1620 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 852405 Mode : 14

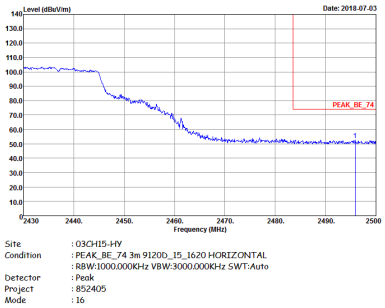
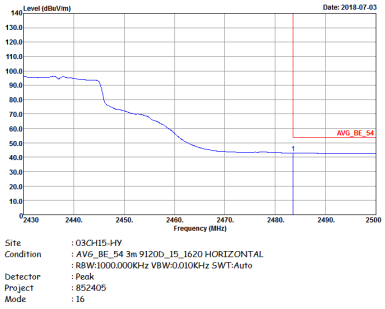
2.4GHz 2400~2483.5MHz

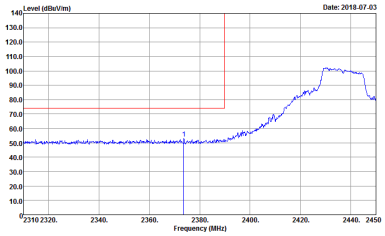
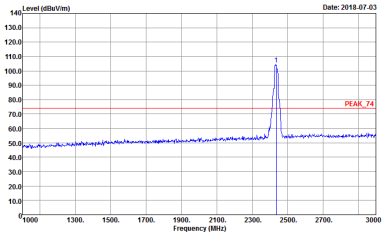
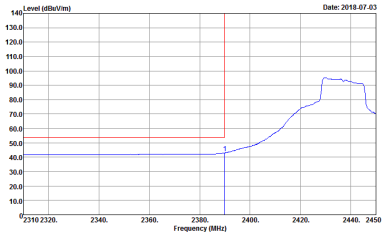
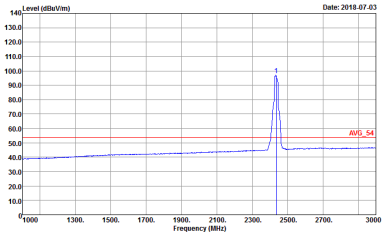
WIFI 802.11g (Band Edge @ 3m)

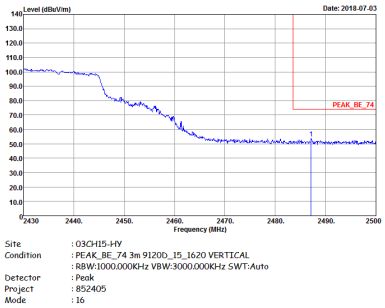
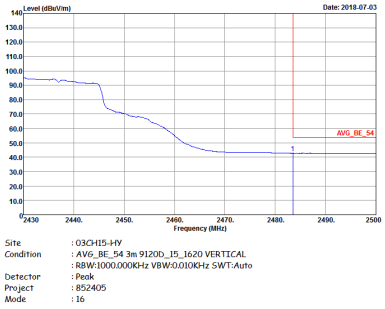
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

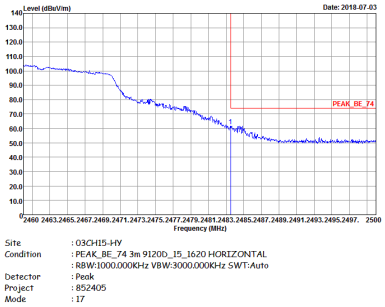
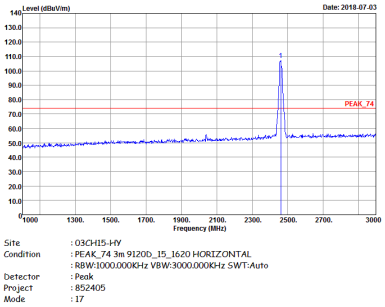
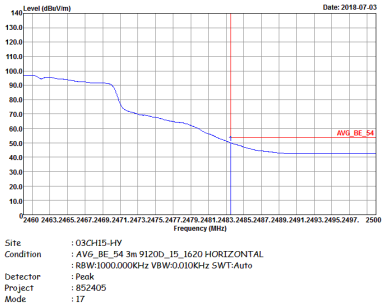
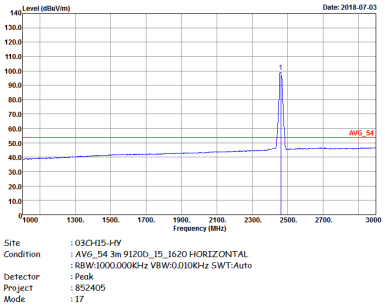
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Vertical	Fundamental
Peak		
Avg.		

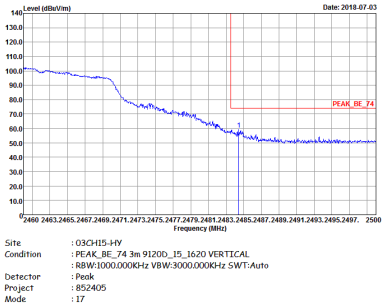
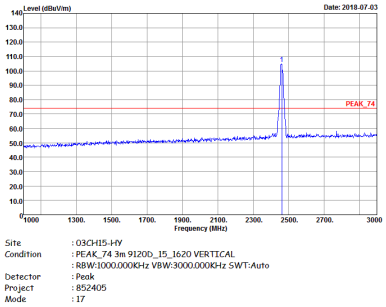
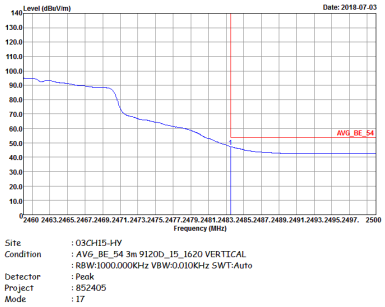
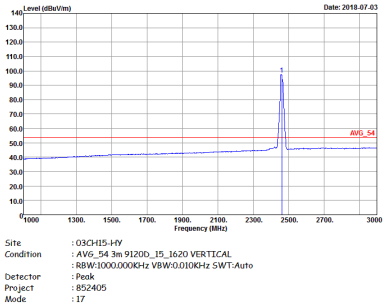
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 9120D_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 16	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 16
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 9120D_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 852405 Mode : 16	 Site : 03CH15-HY Condition : AVG_54 3m 9120D_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 852405 Mode : 16

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 9120D_15_1620 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 16	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 16
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 9120D_15_1620 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 852405 Mode : 16	 Site : 03CH15-HY Condition : AVG_54 3m 9120D_15_1620 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 852405 Mode : 16

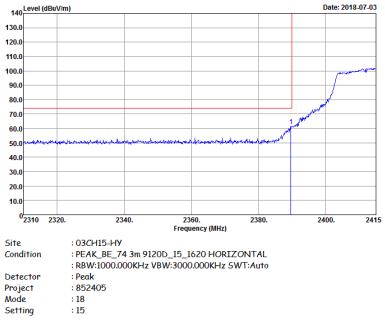
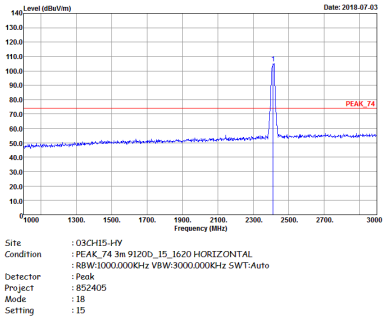
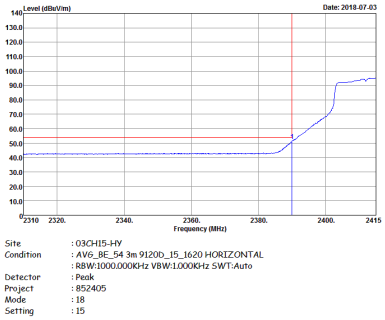
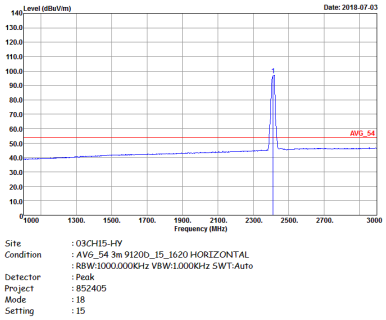
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

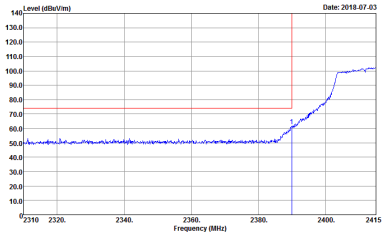
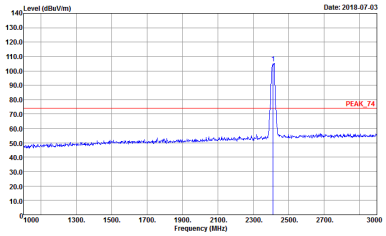
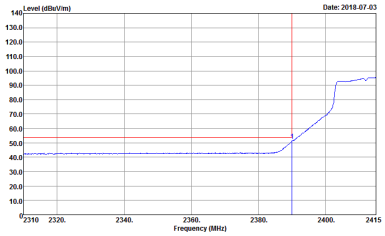
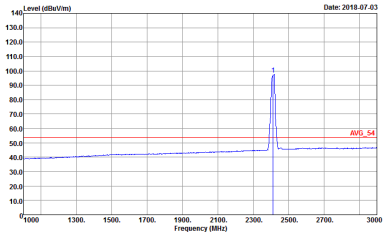
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 9120D_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 17	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 17
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 9120D_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 852405 Mode : 17	 Site : 03CH15-HY Condition : AVG_54 3m 9120D_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 852405 Mode : 17

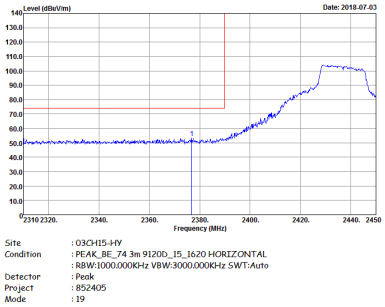
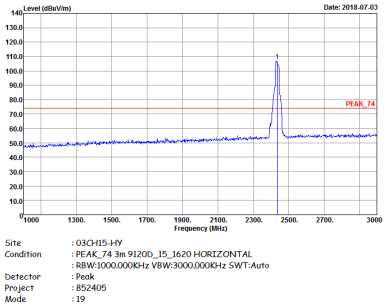
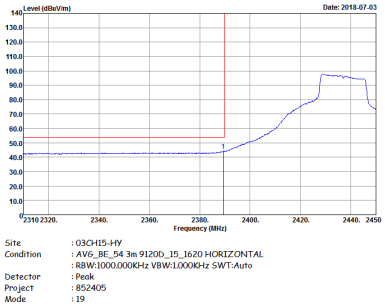
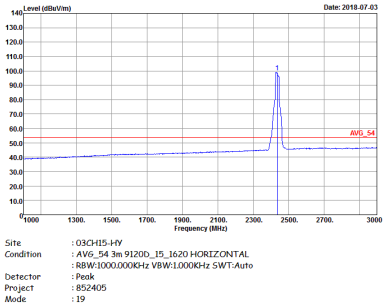
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Vertical	Fundamental
Peak		
Avg.		

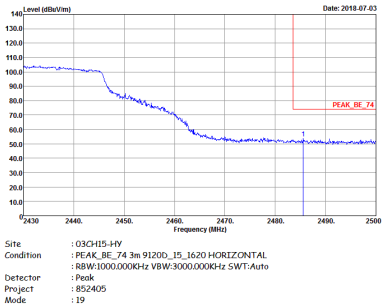
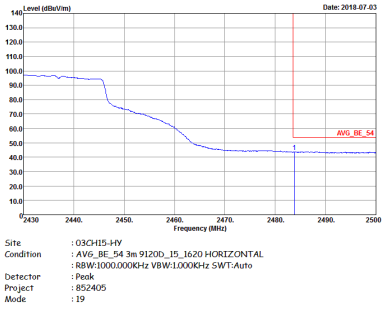
2.4GHz 2400~2483.5MHz

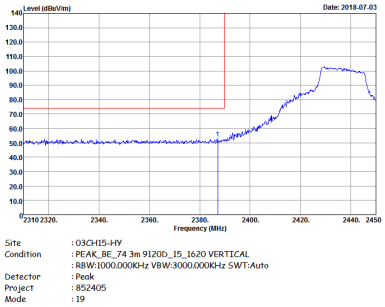
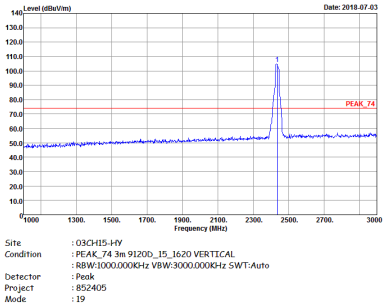
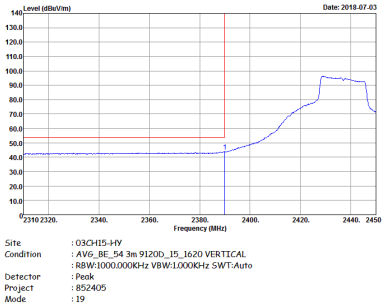
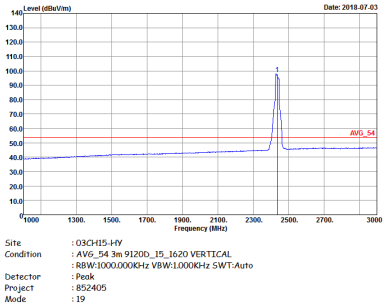
WIFI 802.11n HT20 (Band Edge @ 3m)

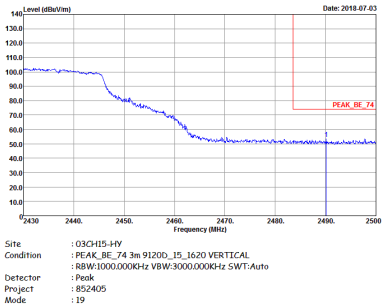
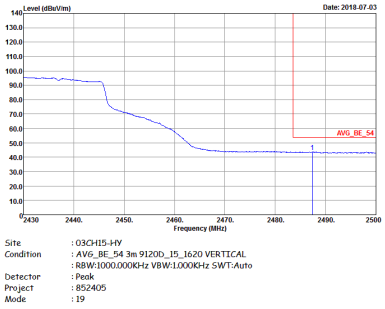
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

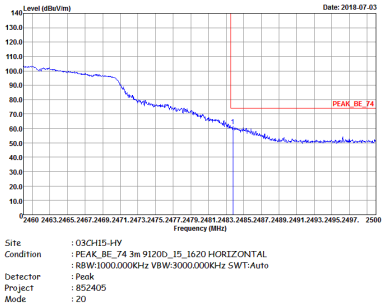
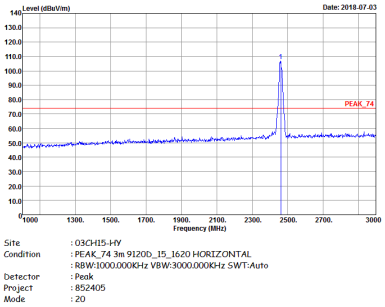
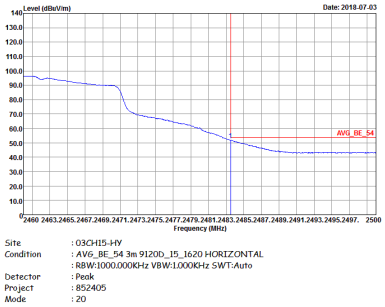
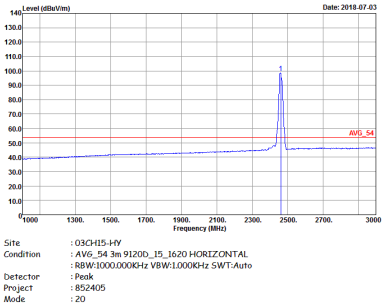
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 9120D_15_1620 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 18 Setting : 15	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 18 Setting : 15
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 9120D_15_1620 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 18 Setting : 15	 Site : 03CH15-HY Condition : AVG_54 3m 9120D_15_1620 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 18 Setting : 15

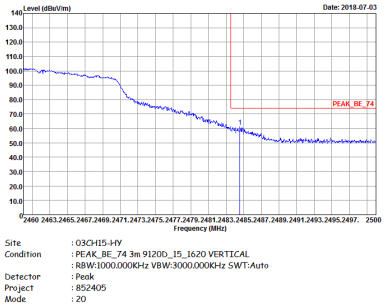
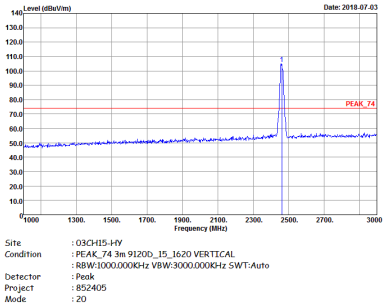
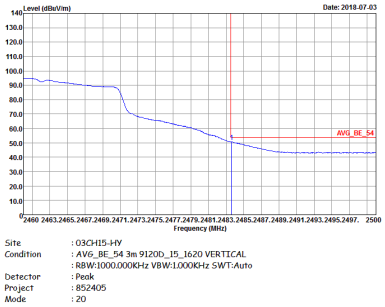
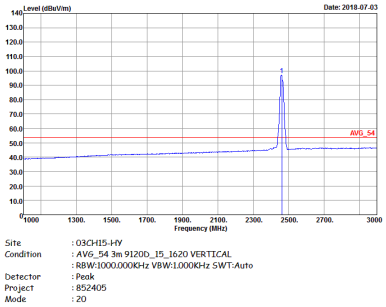
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		

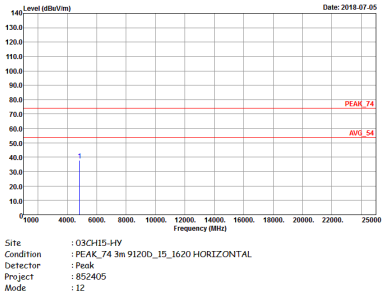
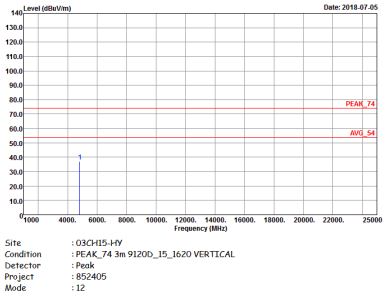
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

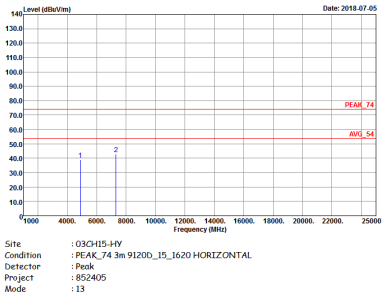
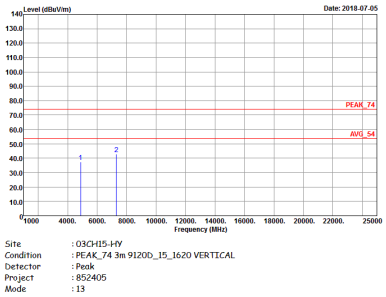
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 9120D_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 20	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 20
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 9120D_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 20	 Site : 03CH15-HY Condition : AVG_54 3m 9120D_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 852405 Mode : 20

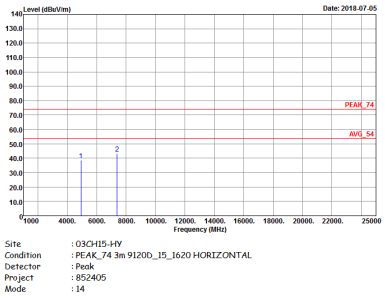
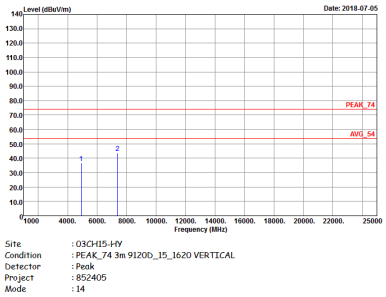
WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Vertical	Fundamental
Peak		
Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

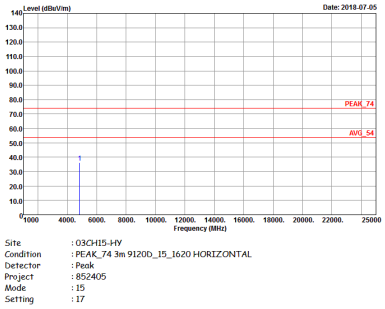
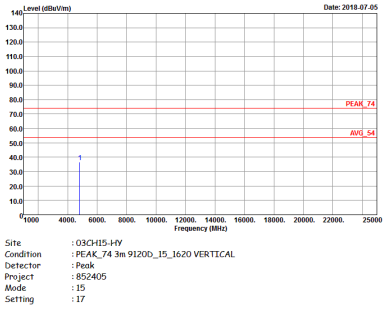
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

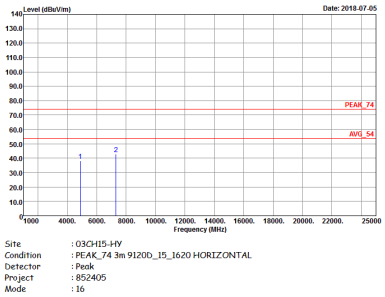
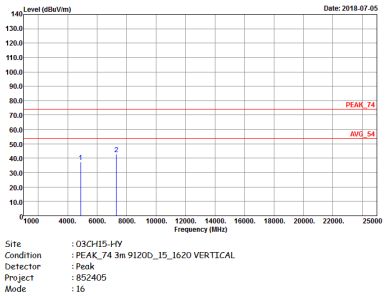
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.		

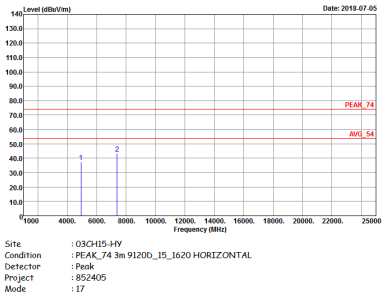
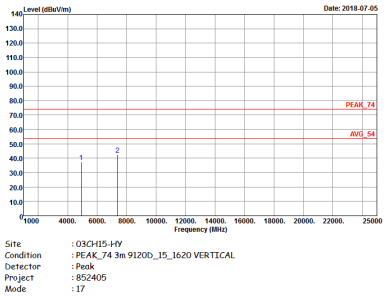
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

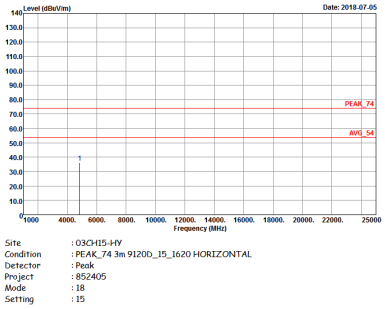
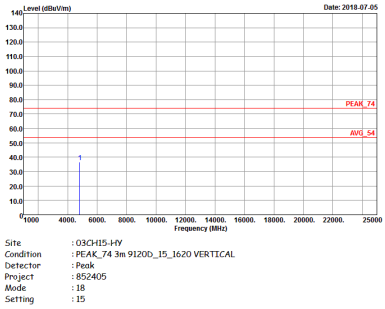
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

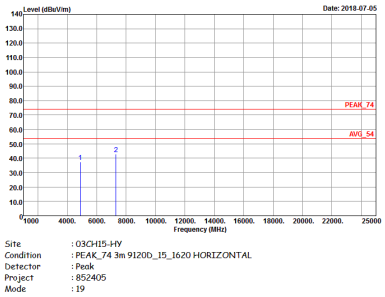
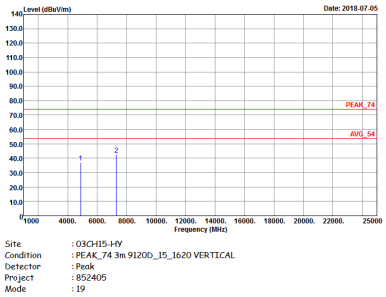
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.		

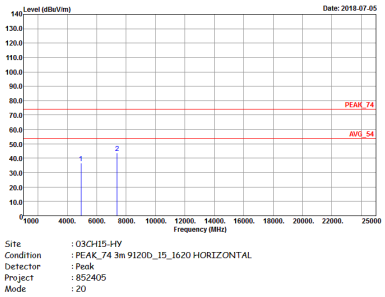
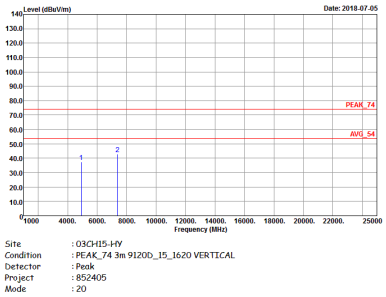
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (LF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11n HT20 LF	
1	Horizontal	Vertical
QP / Peak