FCC RADIO TEST REPORT

FCC ID	:	**UDX-60076027**
Equipment	:	**LTE & Wi-Fi Router**
Brand Name	:	**CISCO**
Model Name	:	**MX68CW-HW-NA**
Applicant	:	**Cisco Systems, Inc.** **170 West Tasman Drive, San Jose, CA 95134**
Standard	:	**FCC Part 15 Subpart C §15.247**

The product was received on Mar. 16, 2018 and testing was started from Apr. 12, 2018 and completed on Aug. 02, 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 INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Jones Tsai

Approved by: Jones Tsai

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

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History of this test report

Report No.	Version	Description	Issued Date
FR831635A	01	Initial issue of report	Sep. 05, 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 1.11 dB at 500.200 MHz
3.6	15.207	AC Conducted Emission	Pass	Under limit 21.11 dB at 19.795 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass	-

Reviewed by: Joseph Lin

Report Producer: Nancy Yang

1 General Description

1.1 Product Feature of Equipment Under Test

GSM/WCDMA/LTE, Wi-Fi 2.4GHz 802.11b/g/n/ac, and Wi-Fi 5GHz 802.11a/n/ac

Product Specification subjective to this standard	
Antenna Type	WWAN: Dipole Antenna WLAN: Dipole 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.**
	03CH10-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 (X 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.

CDD Mode

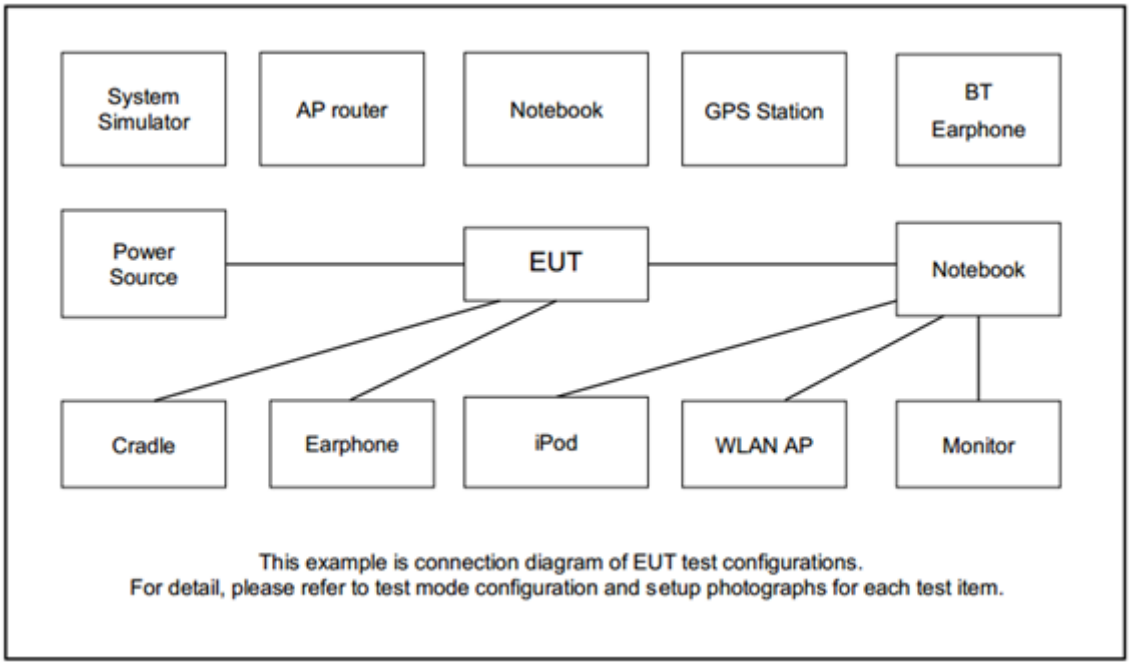
Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20 (Covered by HT20)	MCS0
802.11ac VHT40 (Covered by HT40)	MCS0

TXBF Mode (Power Only)

Modulation	Data Rate
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0

Test Cases	
AC Conducted Emission	Mode 1 :WLAN (2.4GHz) Link + RJ-45 (LAN) Link + RJ-45 (WAN) Link + USB Link + Adapter + POE

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.	Notebook	ASUS	P2430U	FCC DoC	AC I/P：Unshielded, 1.2m DC O/P：Shielded, 1.8m	Unshielded, 1.8 m
2.	Notebook	DELL	Latitude E3340	FCC DoC/ Contains FCC ID: PD97260NGU	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 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.	USB Flash Drive	Transcend	N/A	FCC DoC	N/A	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.

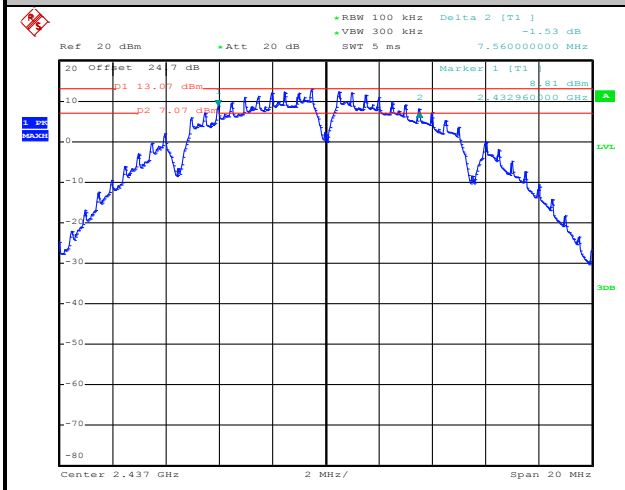
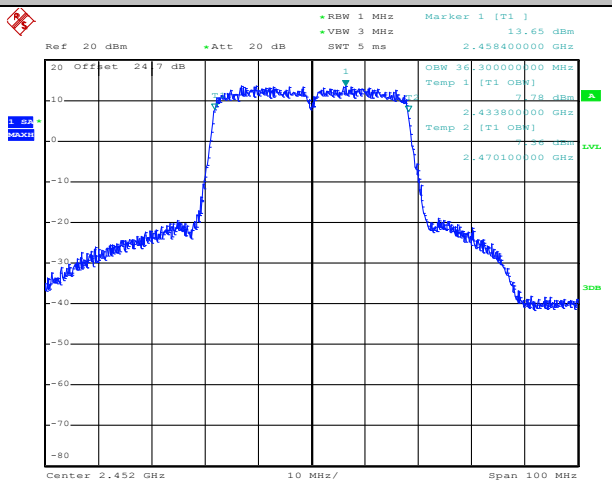
3.1.3 Test Procedures

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: 3.MAY.2018 04:43:25	Date: 3.MAY.2018 09:15:06

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.

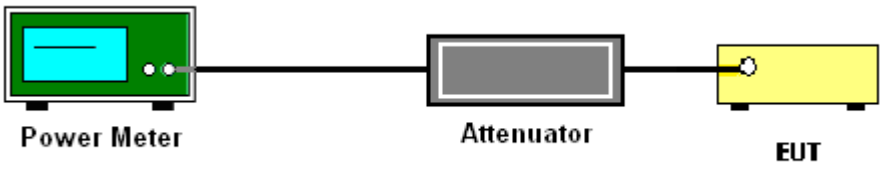
3.2.2 Measuring Instruments

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.

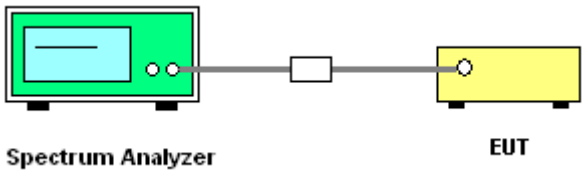
   If measurements performed using method (2) plus 10 log (N) exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

   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)

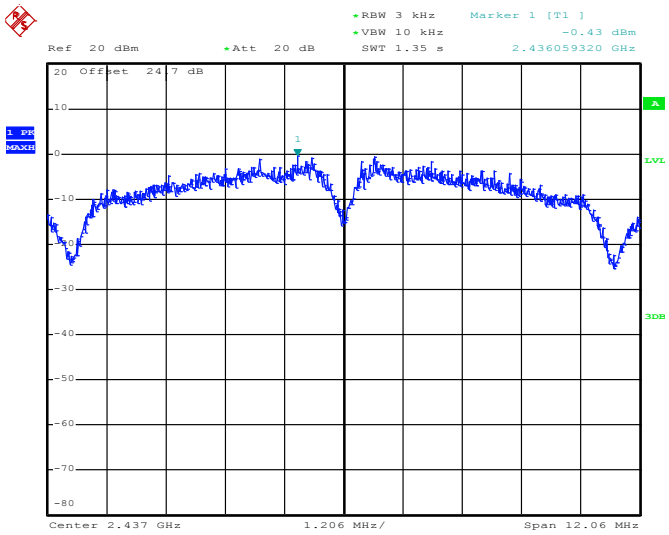
3.3.4 Test Setup



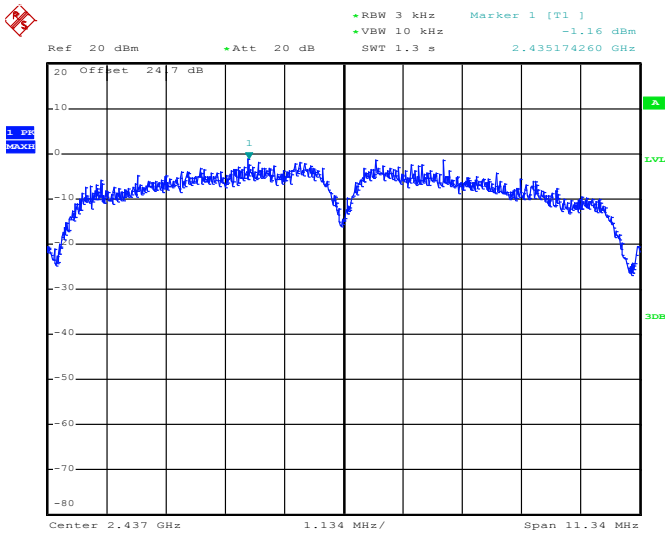
3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Worst Case Power Density (dBm/3kHz) for MIMO Ant. 1



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



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.

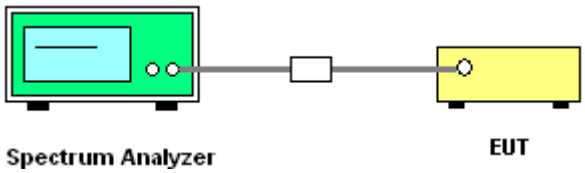
3.4.2 Measuring Instruments

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



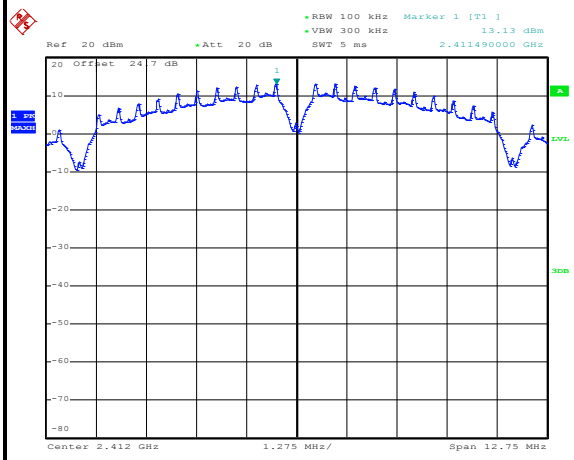
3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Engineer :	Allen Lin, Shiang Wang, and Shiming Liu	**Temperature :**	21~25℃
		Relative Humidity :	51~54%

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

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

100kHz PSD reference Level



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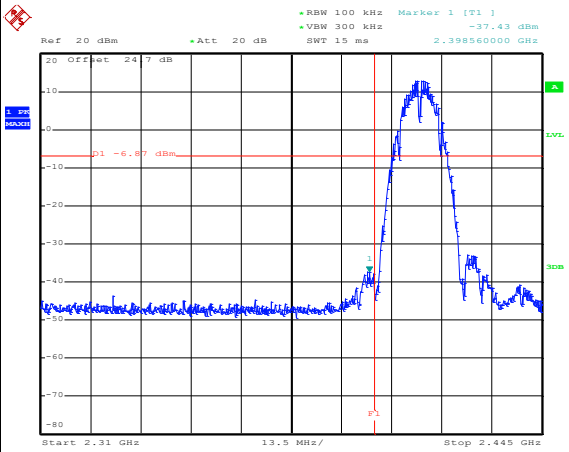
Channel Plot



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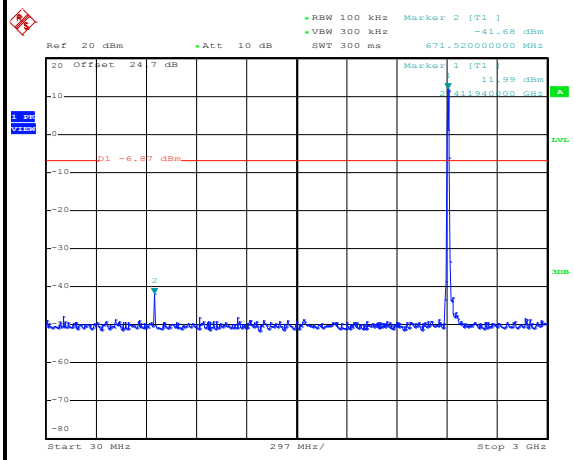
Spurious Emission 30MHz~3GHz



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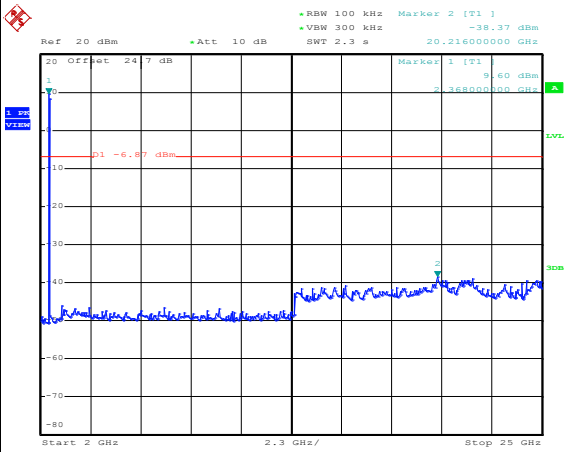
Spurious Emission 2GHz~25GHz



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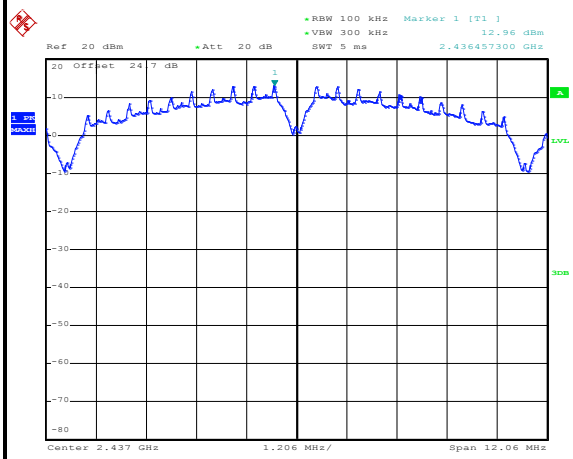
Test Mode :	802.11b	Test Channel :	06

100kHz PSD reference Level	Channel Plot
	
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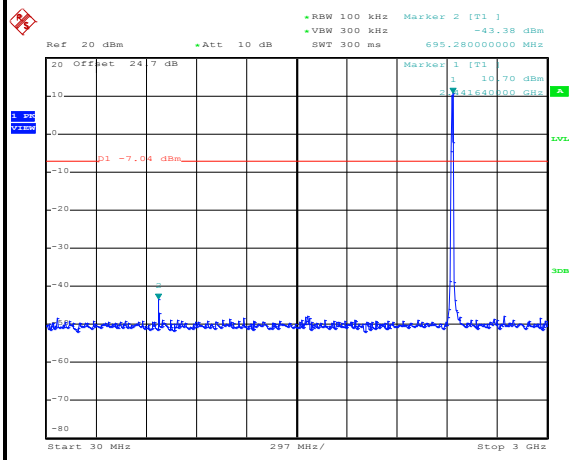
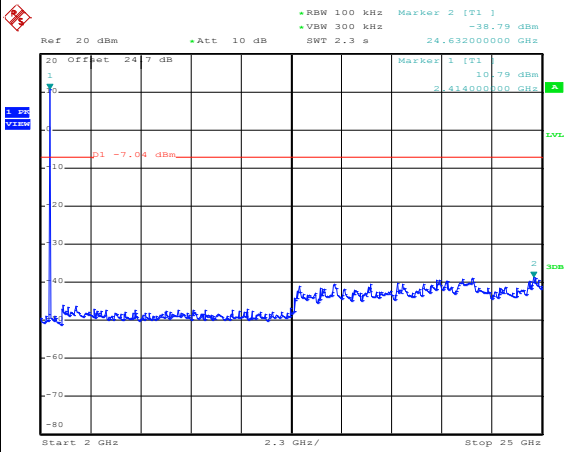
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	
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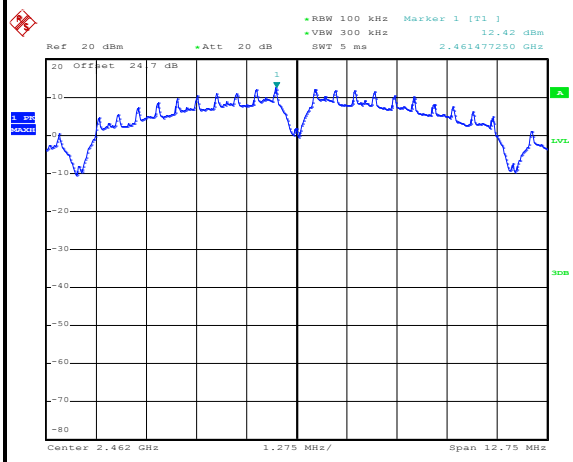
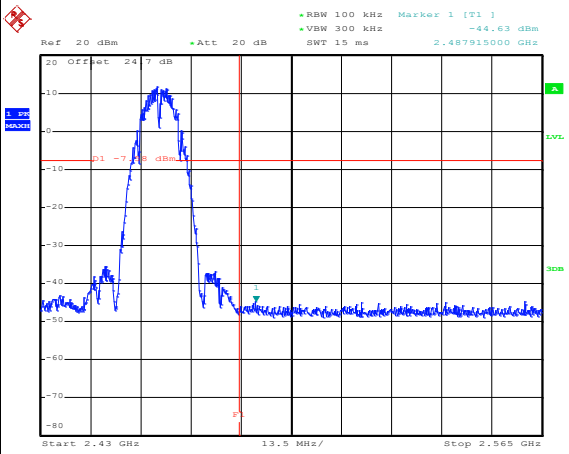
Test Mode :	802.11b	Test Channel :	11

100kHz PSD reference Level	Channel Plot
	
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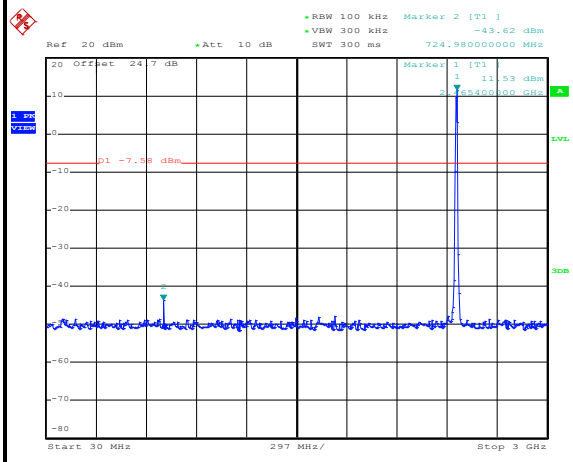
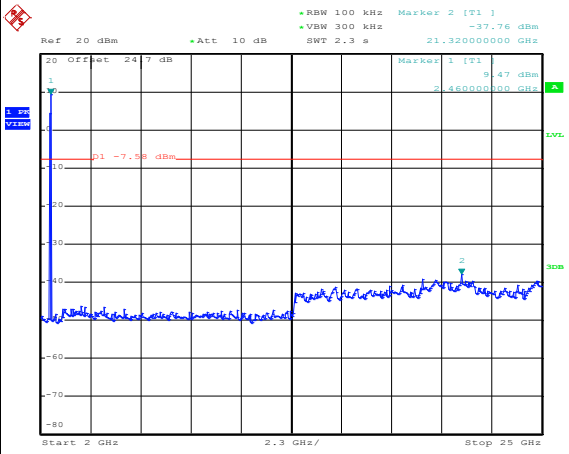
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
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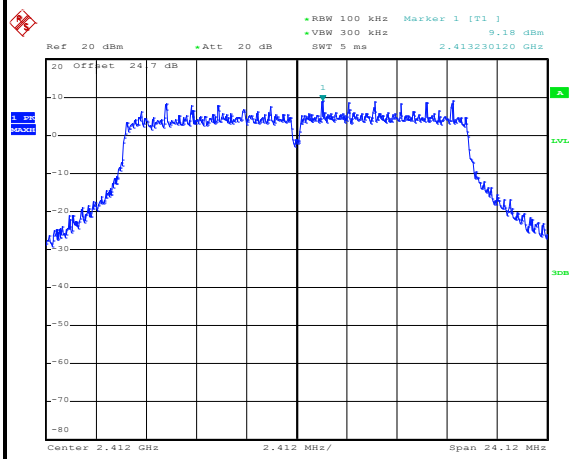
Test Mode :	802.11g	Test Channel :	01

100kHz PSD reference Level



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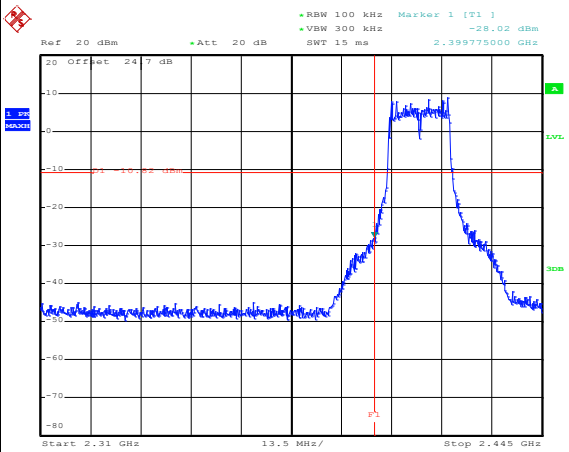
Channel Plot



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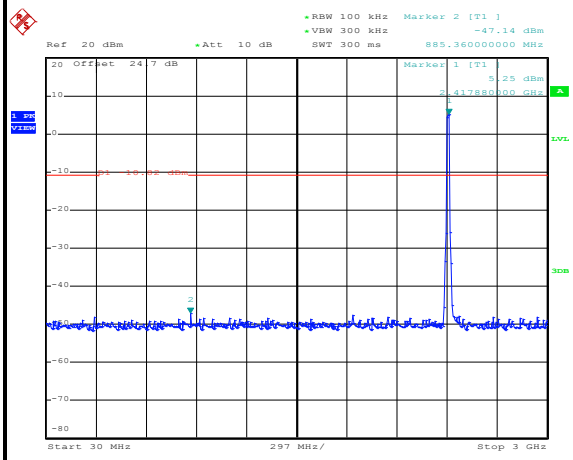
Spurious Emission 30MHz~3GHz



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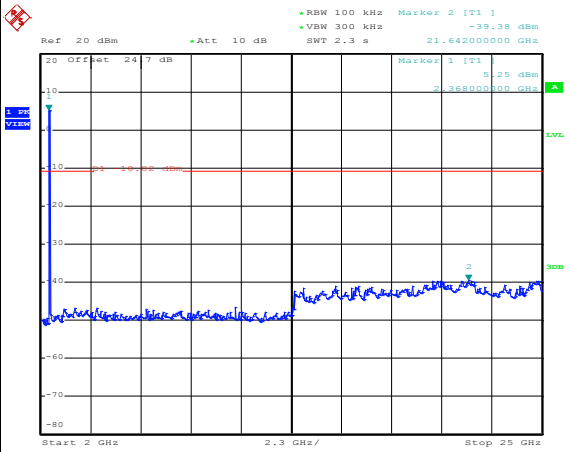
Spurious Emission 2GHz~25GHz



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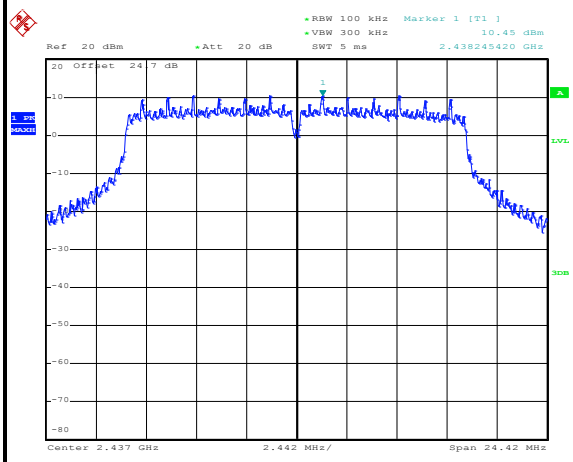
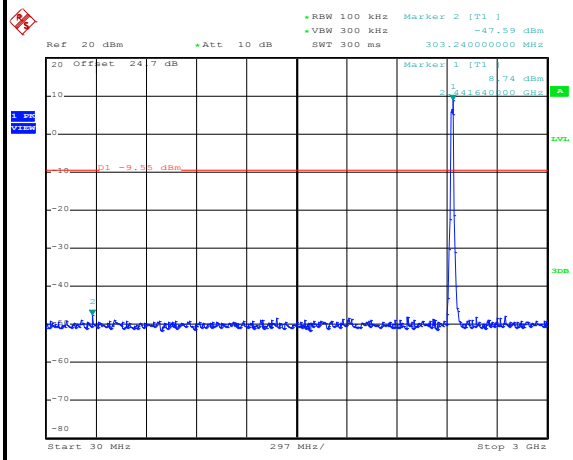
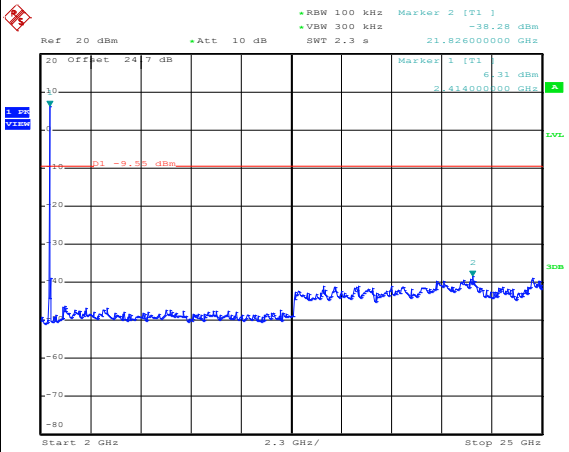
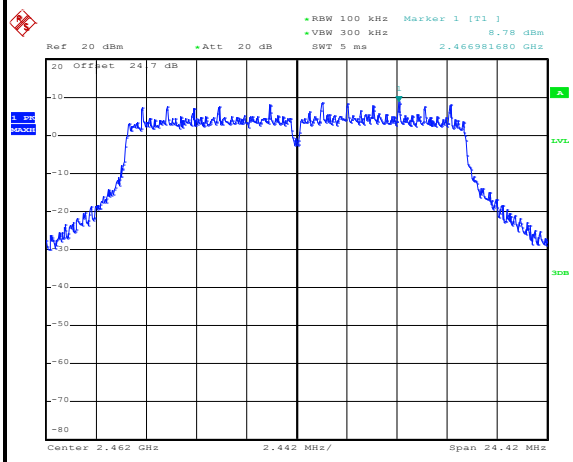
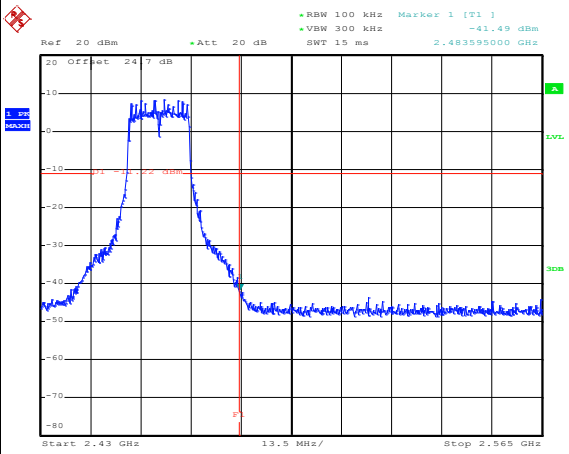
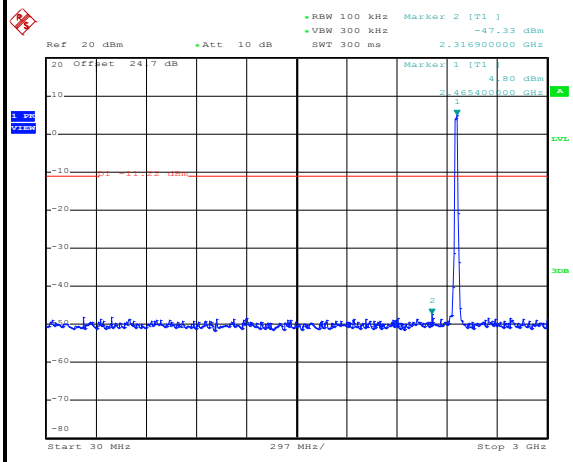
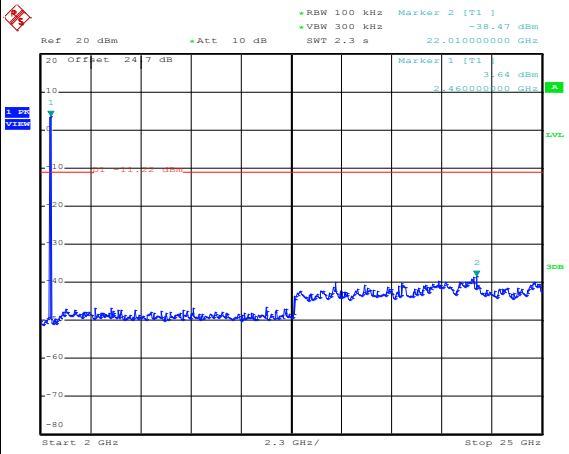
Test Mode :	802.11g	Test Channel :	06

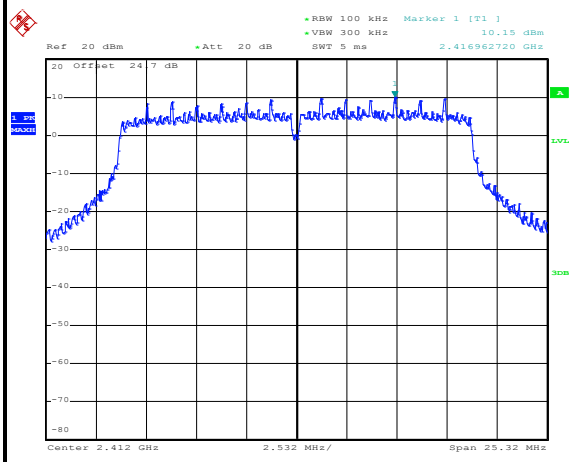
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

Test Mode :	802.11g	Test Channel :	11

100kHz PSD reference Level	Channel Plot
	
Date: 3.MAY.2018 05:55:22	Date: 3.MAY.2018 05:55:55
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 3.MAY.2018 05:56:30	Date: 3.MAY.2018 05:56:58

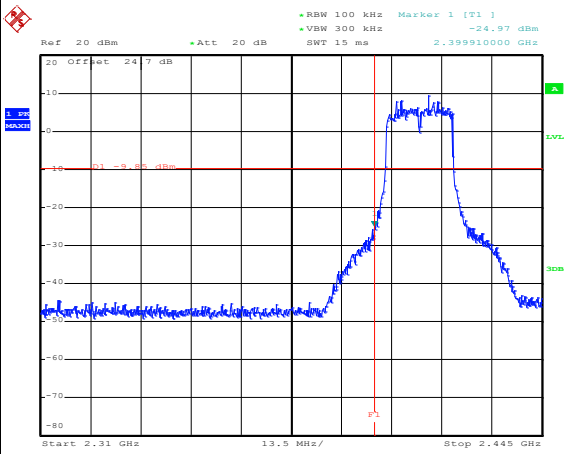
Test Mode :	802.11n HT20	Test Channel :	01

100kHz PSD reference Level



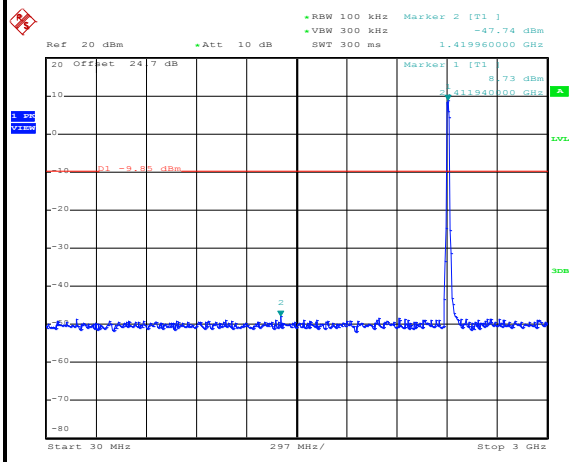
Date: 3.MAY.2018 06:20:59

Channel Plot



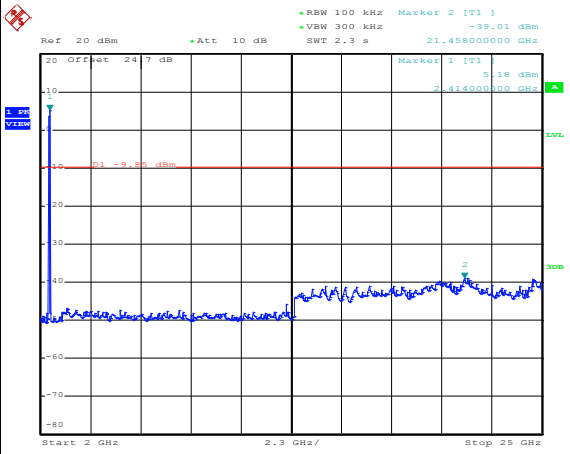
Date: 3.MAY.2018 06:21:21

Spurious Emission 30MHz~3GHz



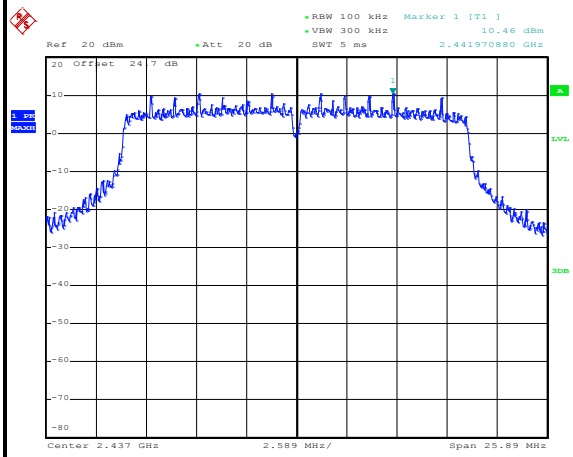
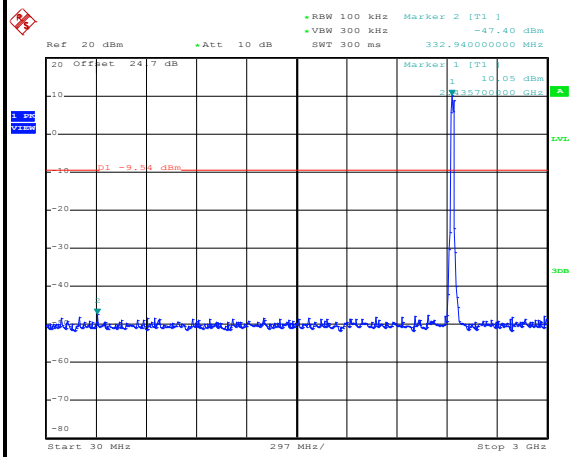
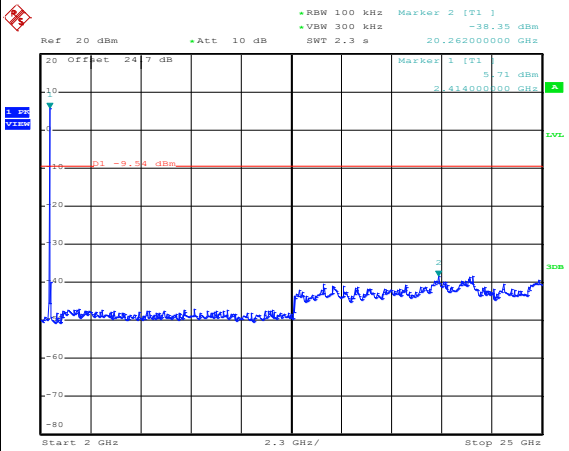
Date: 3.MAY.2018 06:21:52

Spurious Emission 2GHz~25GHz

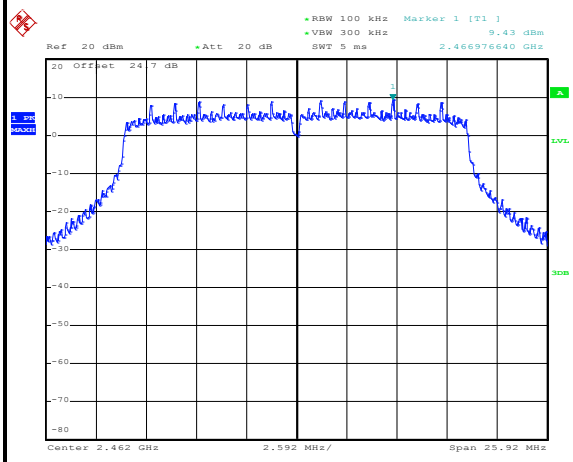
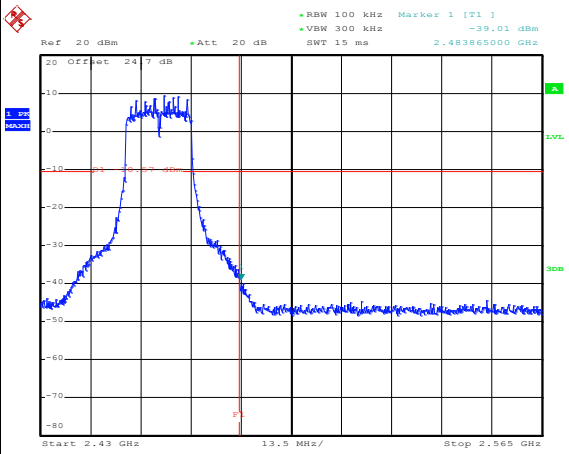
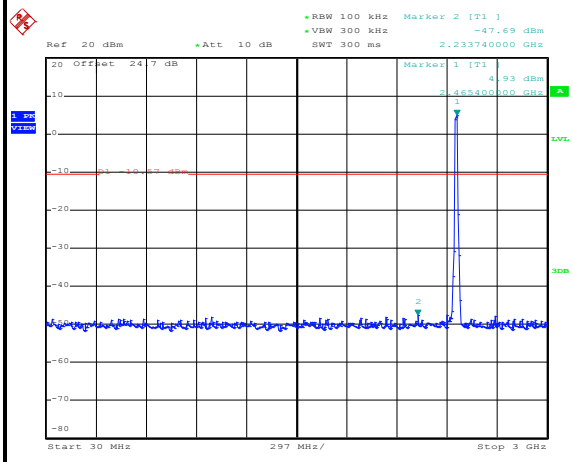
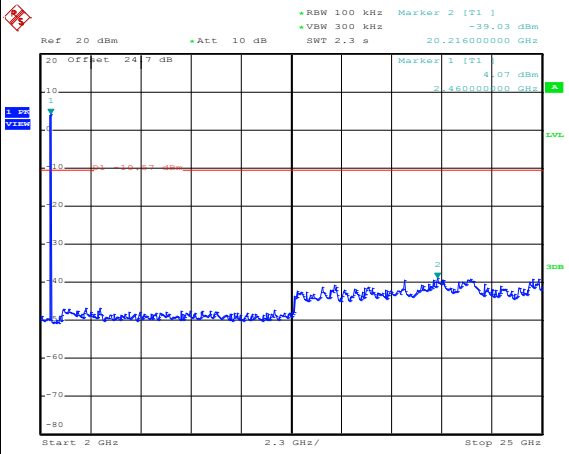


Date: 3.MAY.2018 06:22:26

Test Mode :	802.11n HT20	Test Channel :	06

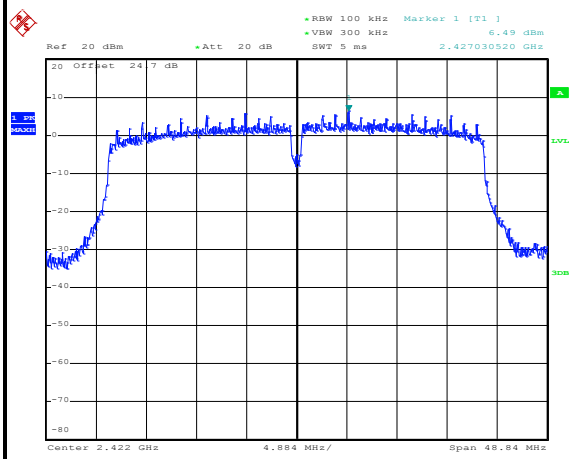
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

Test Mode :	802.11n HT20	Test Channel :	11

100kHz PSD reference Level	Channel Plot
	
Date: 3.MAY.2018 07:18:52	Date: 3.MAY.2018 07:21:08
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 3.MAY.2018 07:19:12	Date: 3.MAY.2018 07:19:44

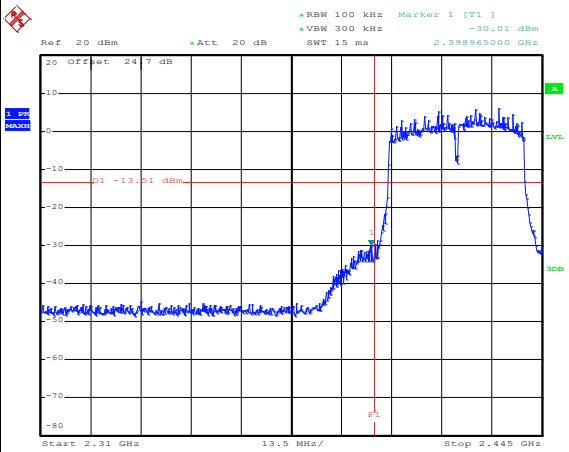
Test Mode :	802.11n HT40	Test Channel :	03

100kHz PSD reference Level



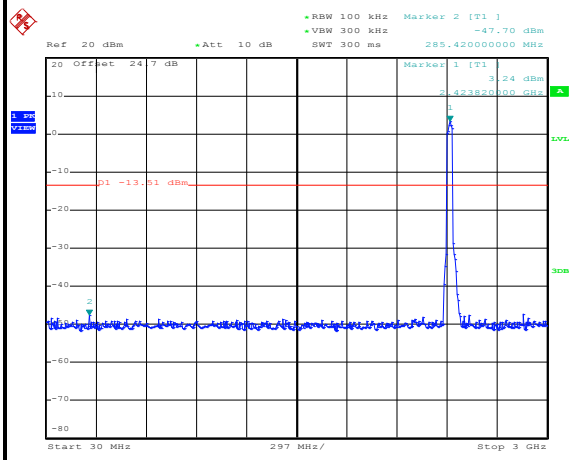
Date: 3.MAY.2018 08:47:09

Channel Plot



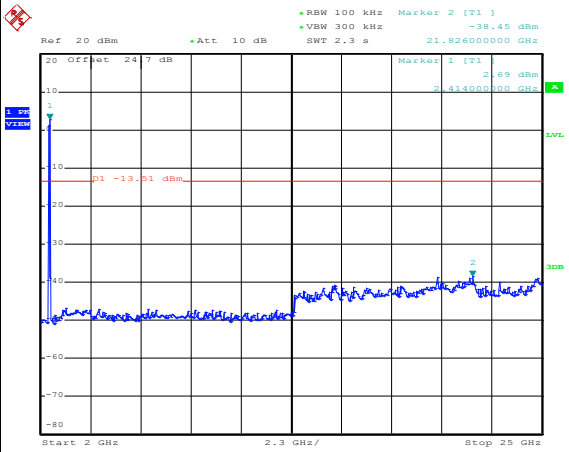
Date: 7.MAY.2018 16:51:26

Spurious Emission 30MHz~3GHz



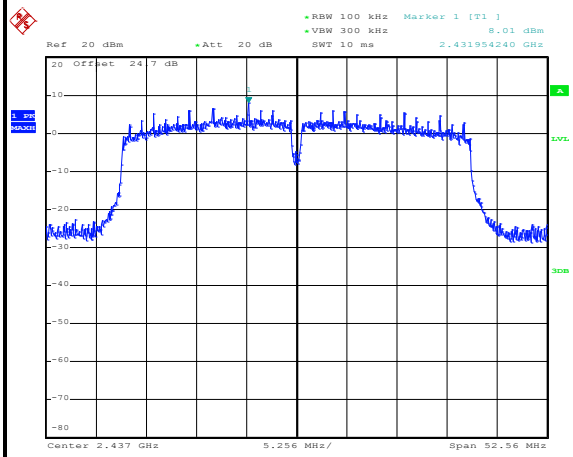
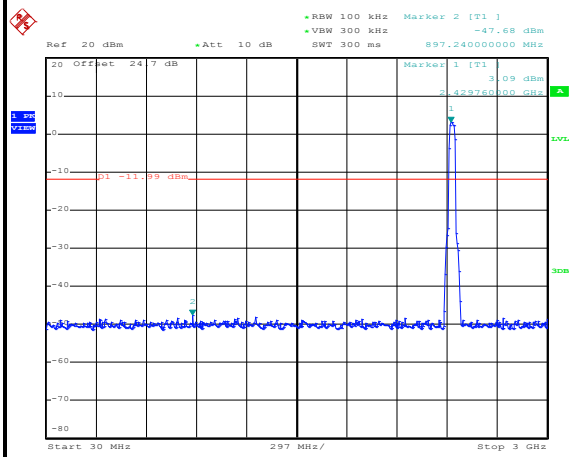
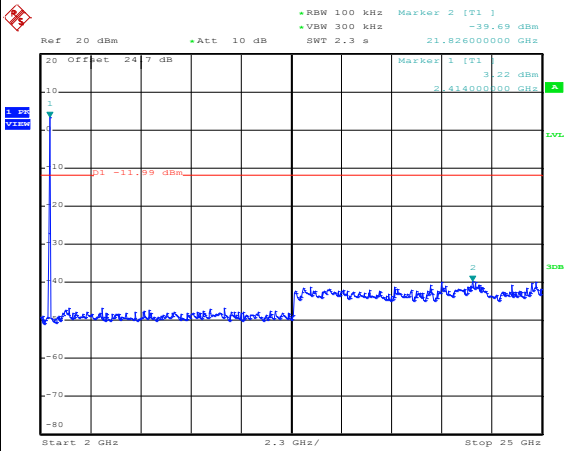
Date: 3.MAY.2018 08:51:42

Spurious Emission 2GHz~25GHz



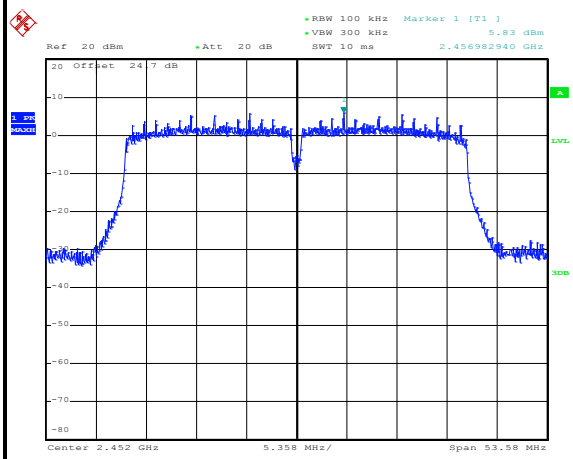
Date: 3.MAY.2018 08:52:05

Test Mode :	802.11n HT40	Test Channel :	06

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

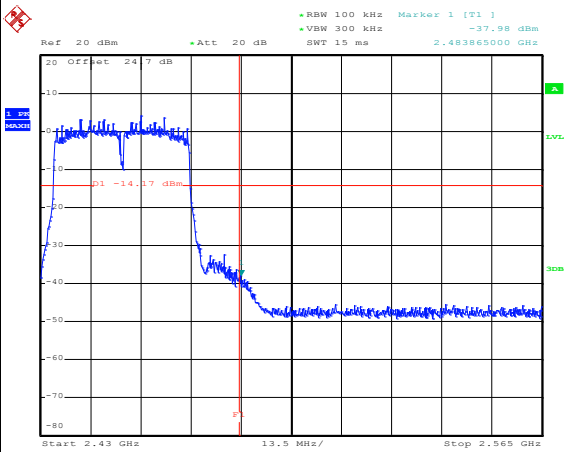
Test Mode :	802.11n HT40	Test Channel :	09

100kHz PSD reference Level



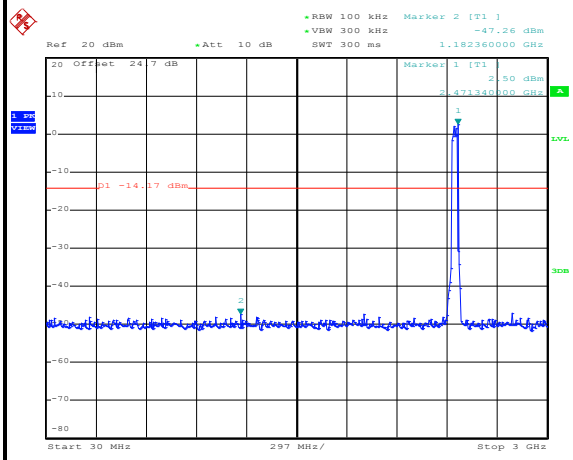
Date: 3.MAY.2018 09:13:29

Channel Plot



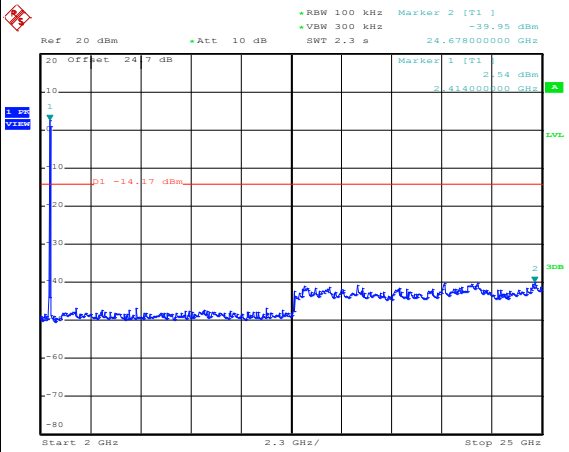
Date: 7.MAY.2018 17:16:16

Spurious Emission 30MHz~3GHz



Date: 7.MAY.2018 16:57:16

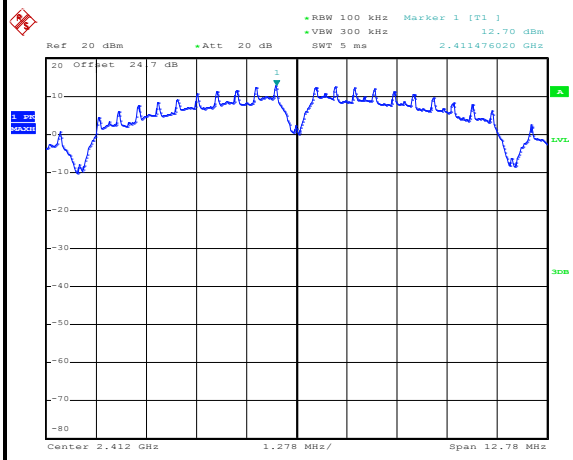
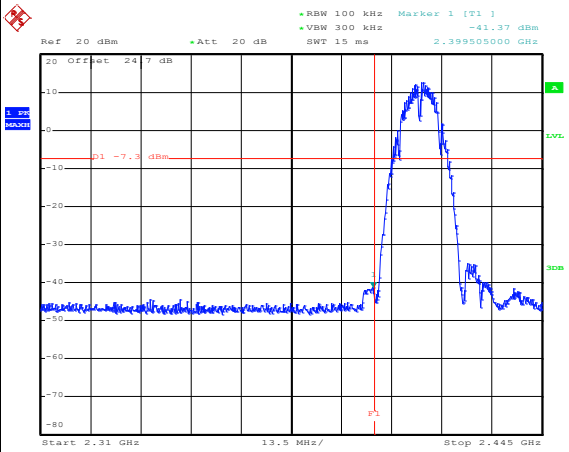
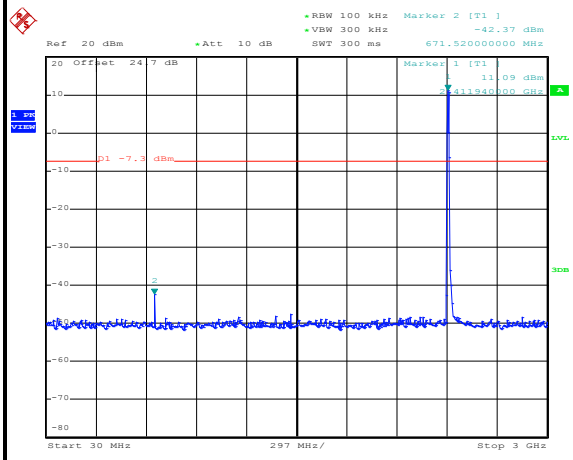
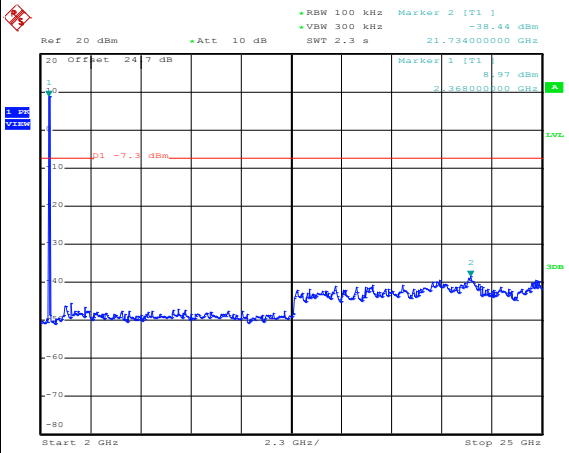
Spurious Emission 2GHz~25GHz



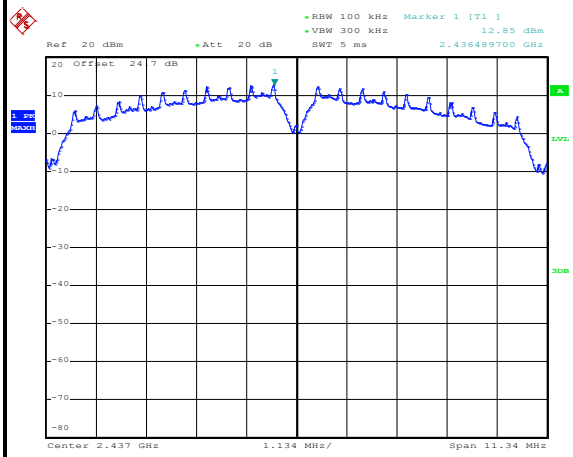
Date: 7.MAY.2018 16:58:21

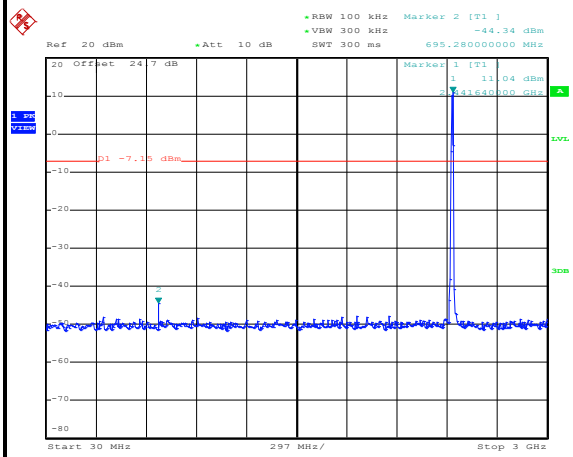
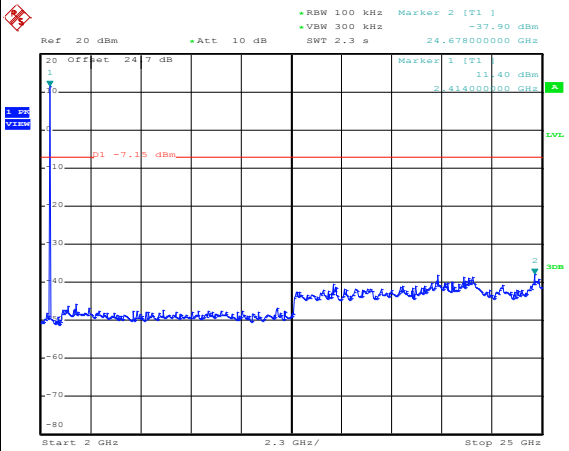
Number of TX = 2, Ant. 2 (Measured)

Test Mode :	802.11b	Test Channel :	01

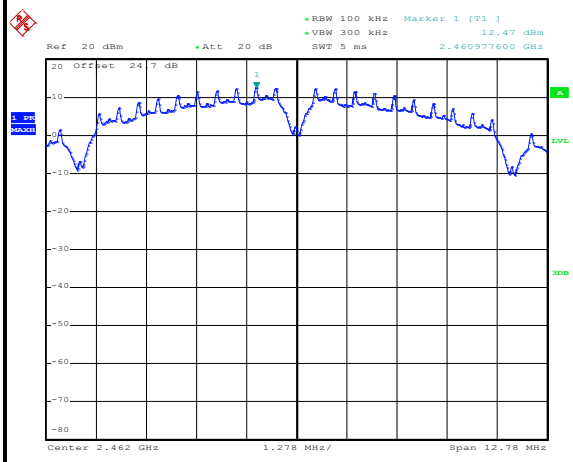
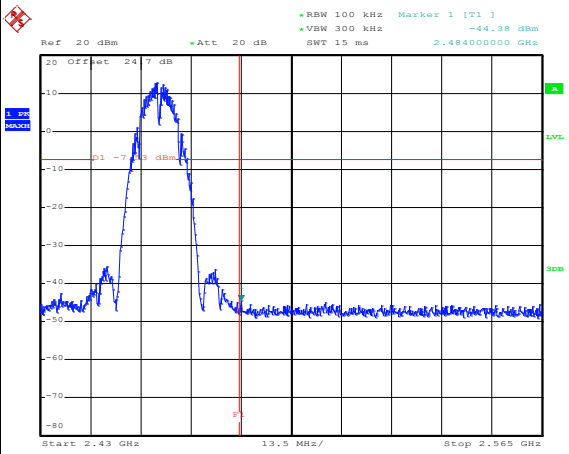
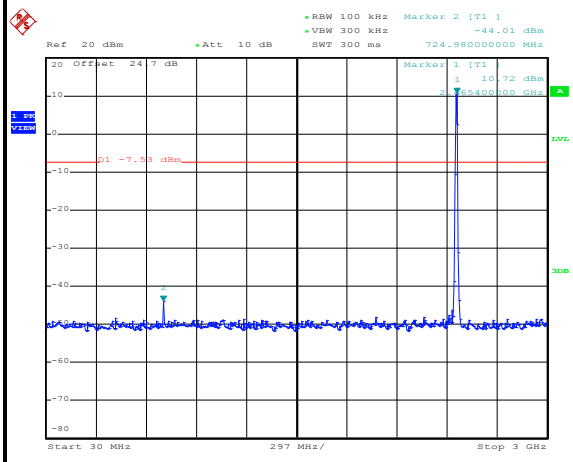
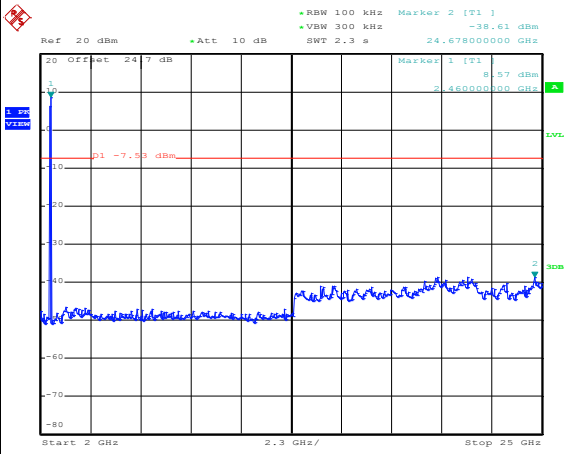
100kHz PSD reference Level	Channel Plot
	
Date: 3.MAY.2018 04:27:35	Date: 3.MAY.2018 04:28:22
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 3.MAY.2018 04:28:56	Date: 3.MAY.2018 04:29:15

Test Mode :	802.11b	Test Channel :	06

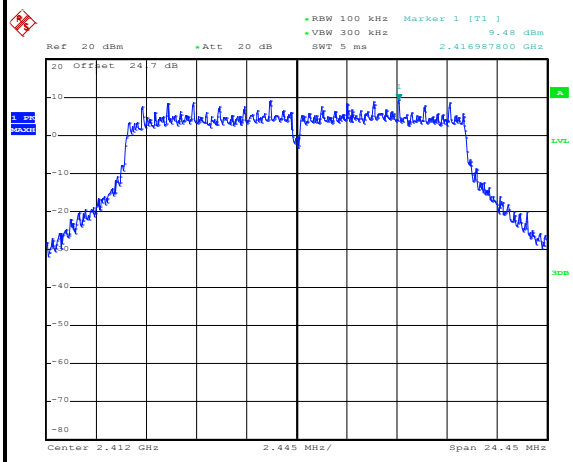
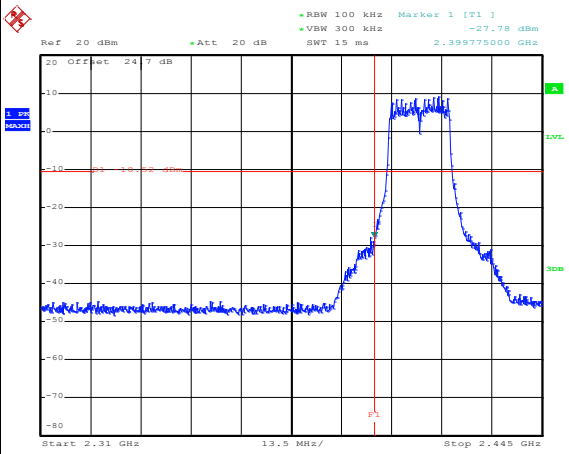
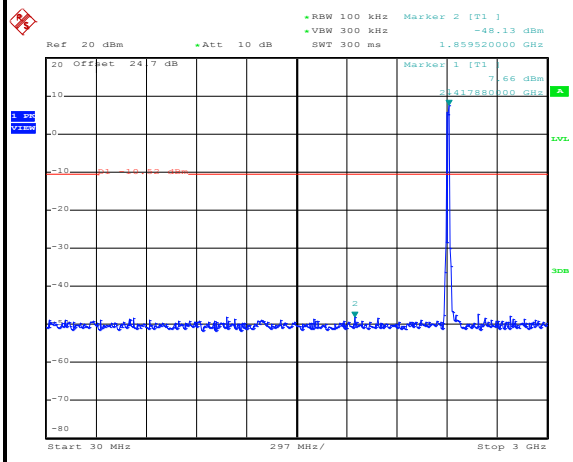
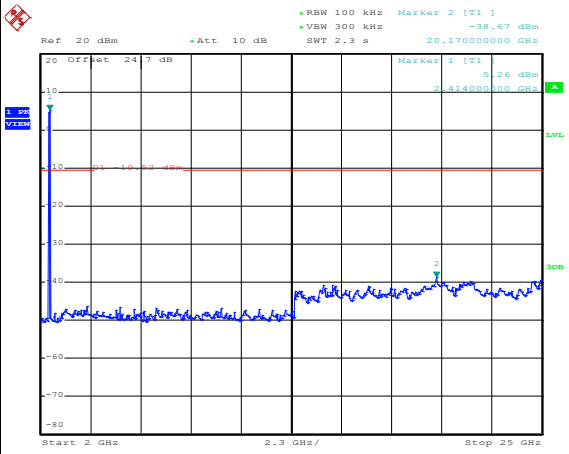
100kHz PSD reference Level	Channel Plot
	
Date: 3.MAY.2018 04:45:15	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	
Date: 3.MAY.2018 04:45:45	Date: 3.MAY.2018 04:46:06

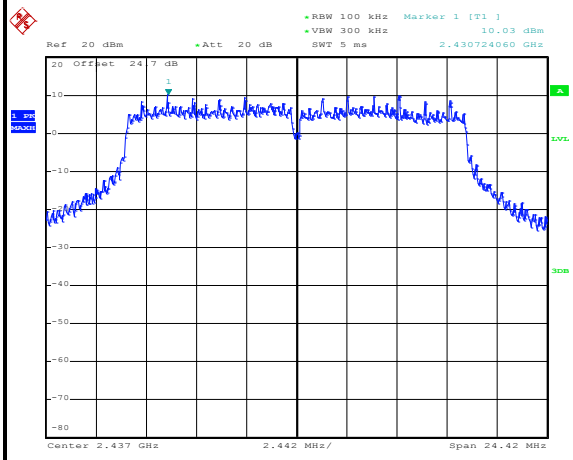
Test Mode :	802.11b	Test Channel :	11

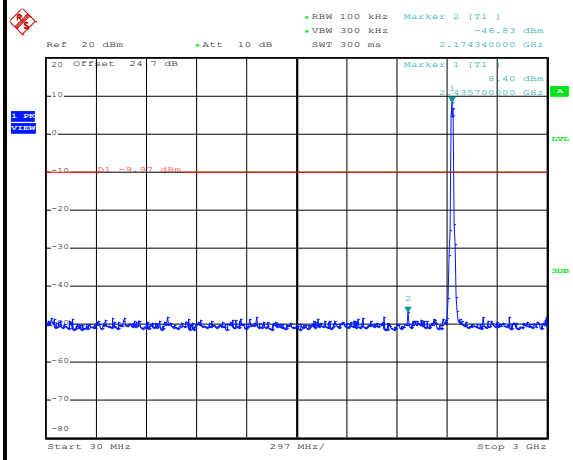
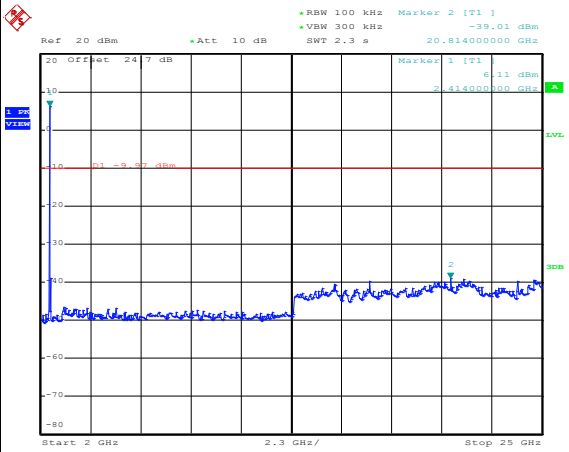
100kHz PSD reference Level	Channel Plot
	
Date: 3.MAY.2018 05:07:05	Date: 3.MAY.2018 05:11:13
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 3.MAY.2018 05:12:18	Date: 3.MAY.2018 05:12:38

Test Mode :	802.11g	Test Channel :	01

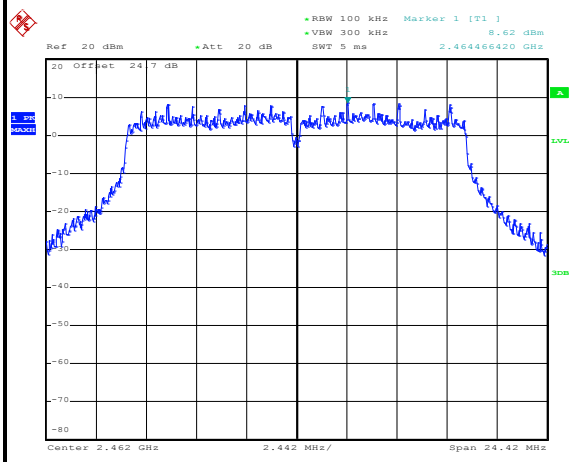
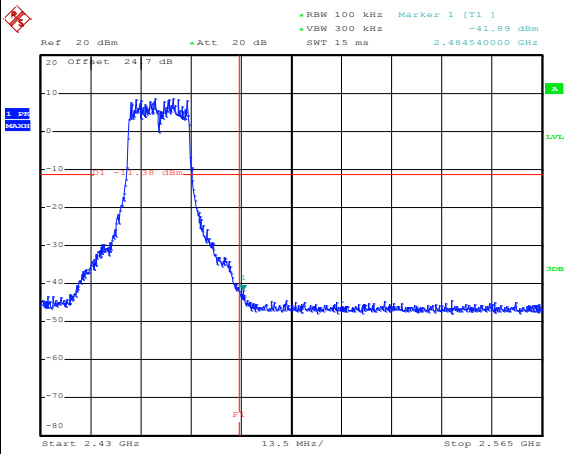
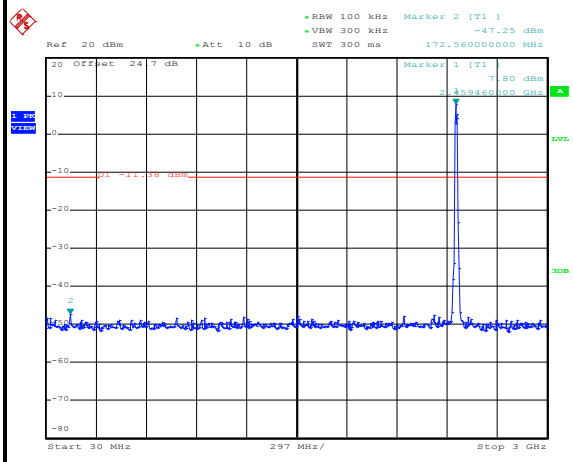
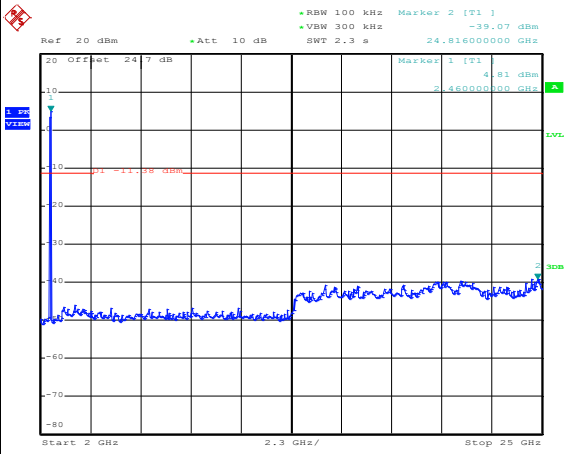
100kHz PSD reference Level	Channel Plot
	
Date: 3.MAY.2018 05:28:28	Date: 3.MAY.2018 05:29:20
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 3.MAY.2018 05:30:40	Date: 3.MAY.2018 05:31:03

Test Mode :	802.11g	Test Channel :	06

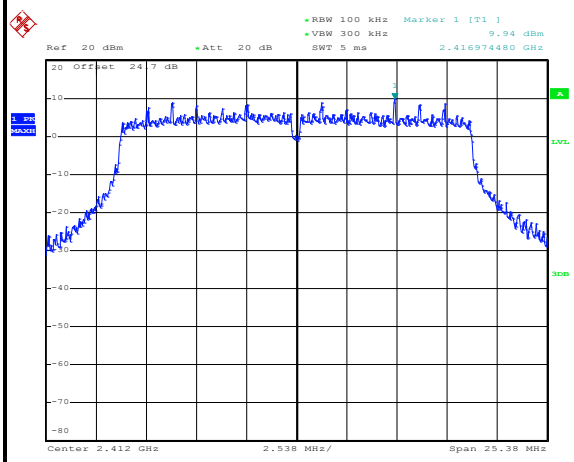
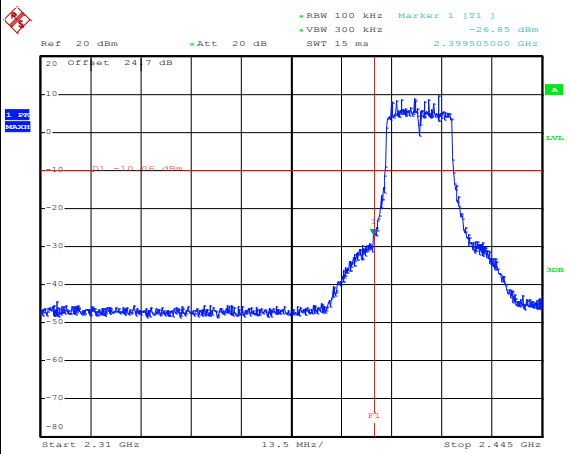
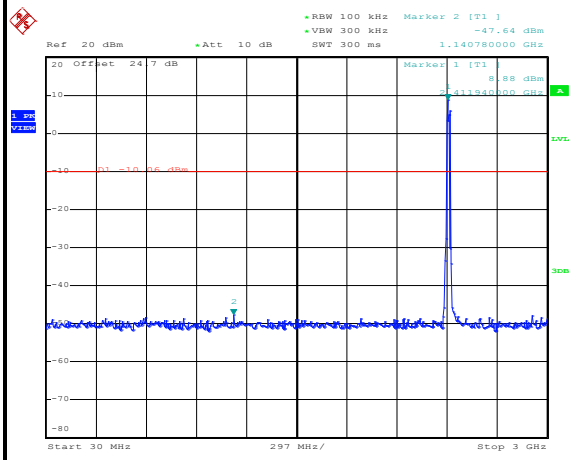
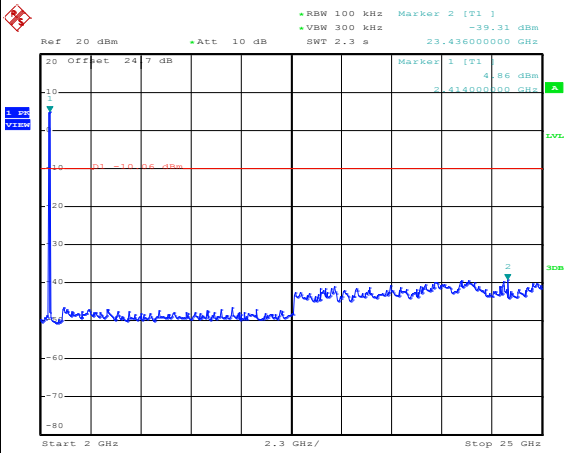
100kHz PSD reference Level	Channel Plot
 Date: 3.MAY.2018 05:46:37	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
 Date: 3.MAY.2018 05:48:23	 Date: 3.MAY.2018 05:49:38

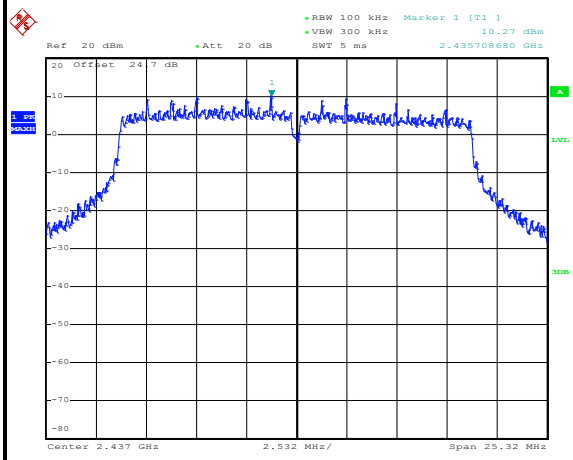
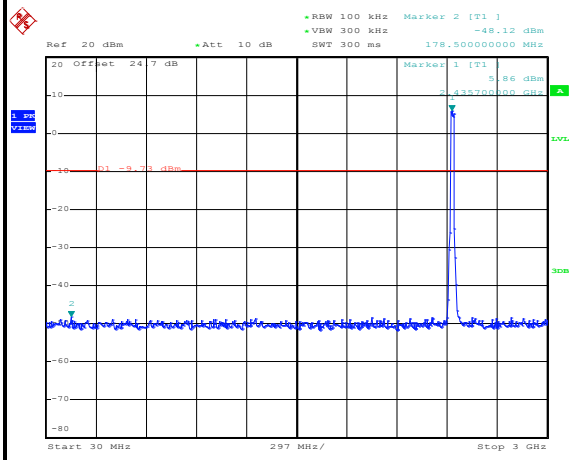
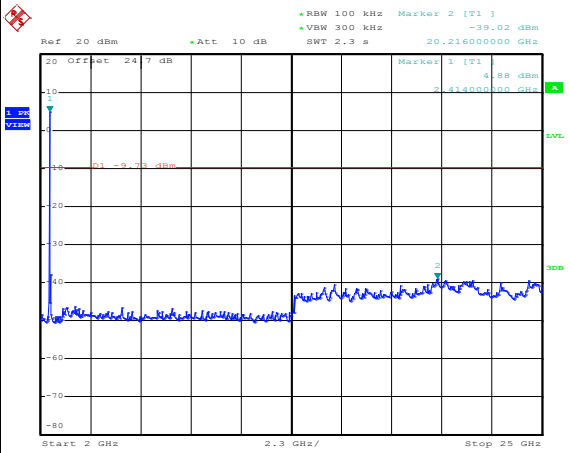
Test Mode :	802.11g	Test Channel :	11

100kHz PSD reference Level	Channel Plot
	
Date: 3.MAY.2018 06:12:25	Date: 3.MAY.2018 06:13:39
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 3.MAY.2018 06:14:20	Date: 3.MAY.2018 06:14:51

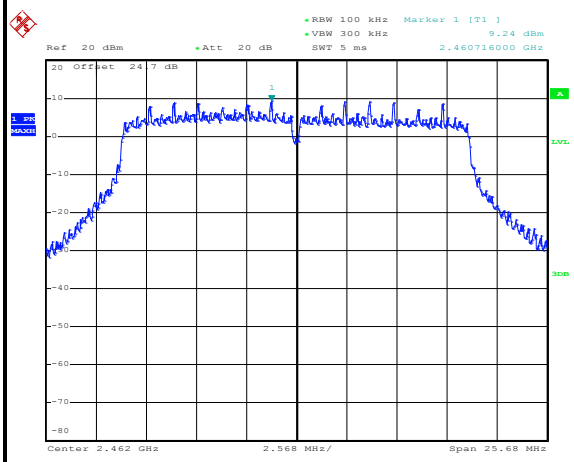
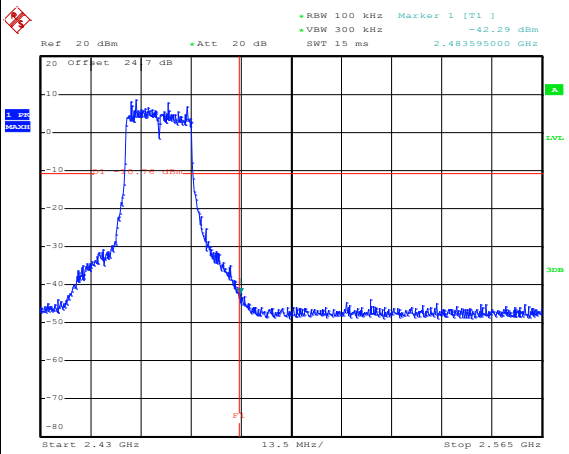
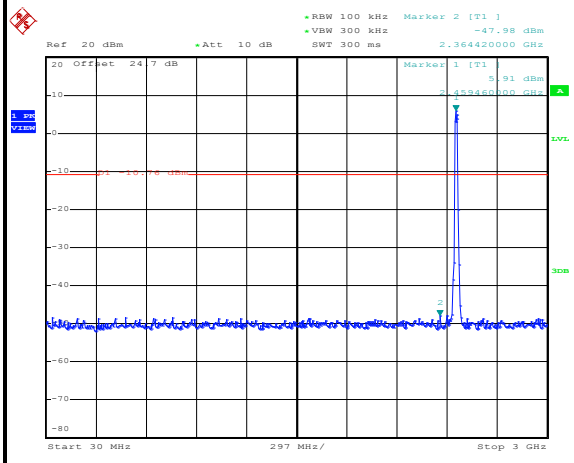
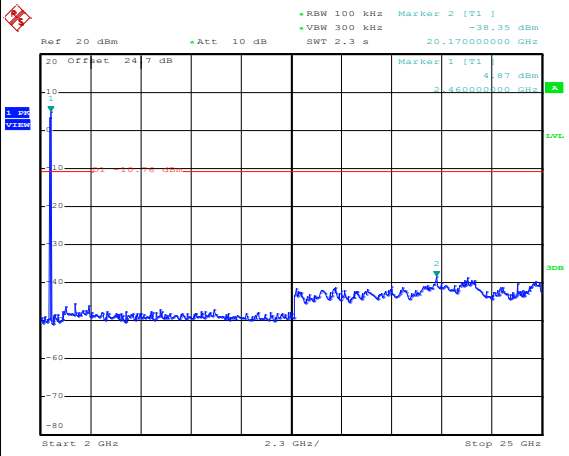
Test Mode :	802.11n HT20	Test Channel :	01

100kHz PSD reference Level	Channel Plot
	
Date: 3.MAY.2018 06:26:10	Date: 3.MAY.2018 06:27:05
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 3.MAY.2018 06:29:45	Date: 3.MAY.2018 06:30:14

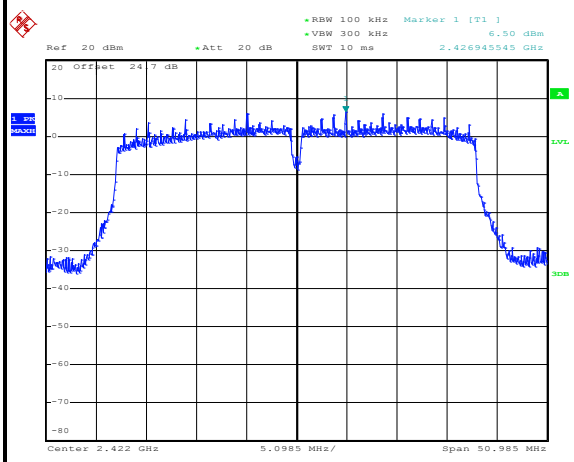
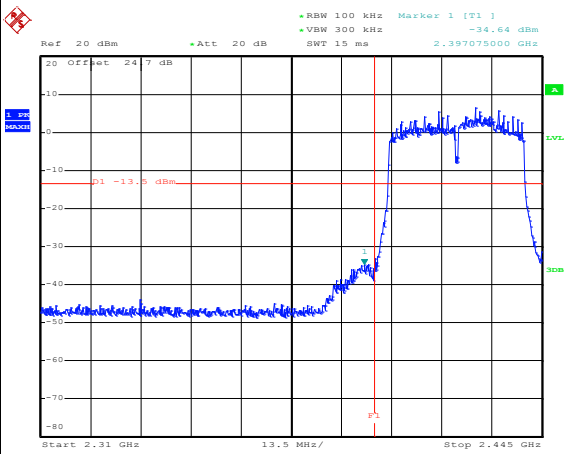
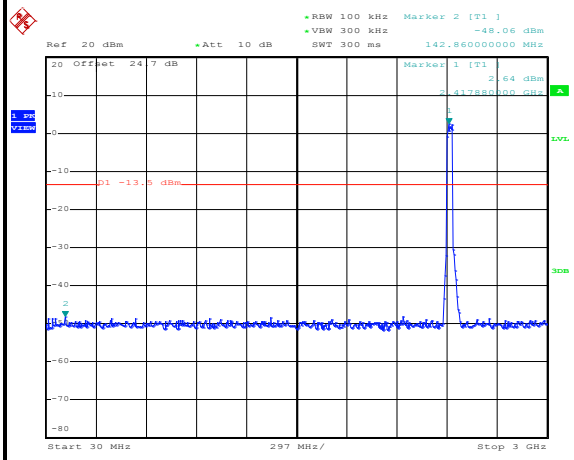
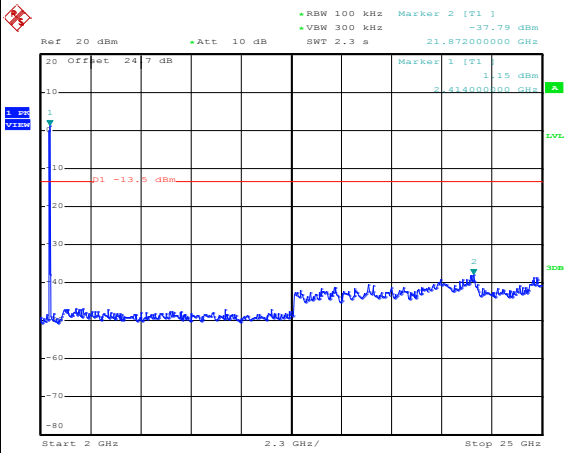
Test Mode :	802.11n HT20	Test Channel :	06

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

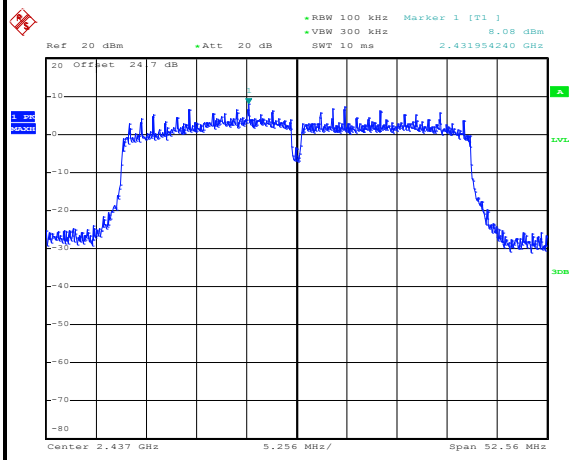
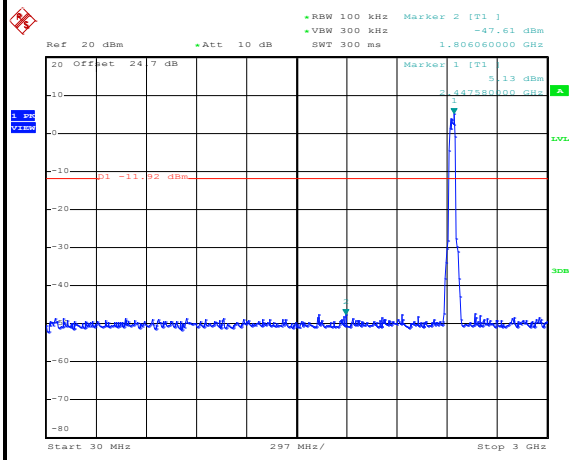
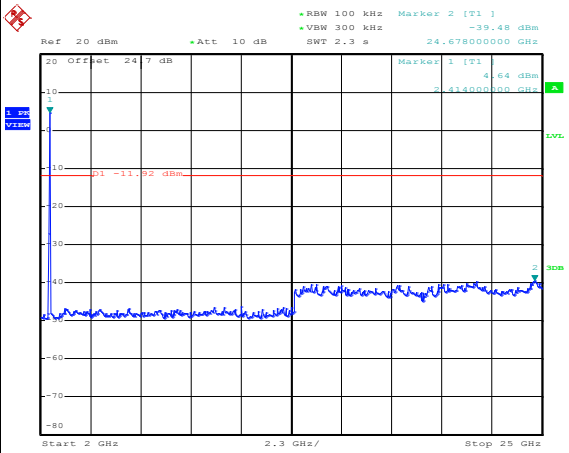
Test Mode :	802.11n HT20	Test Channel :	11

100kHz PSD reference Level	Channel Plot
	
Date: 3.MAY.2018 07:27:57	Date: 3.MAY.2018 07:29:17
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 3.MAY.2018 07:29:56	Date: 3.MAY.2018 07:30:25

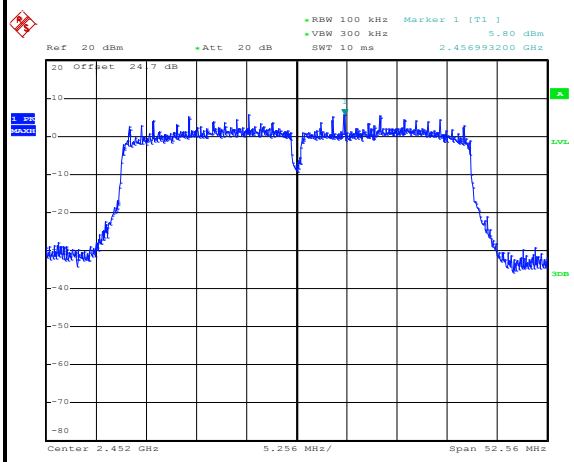
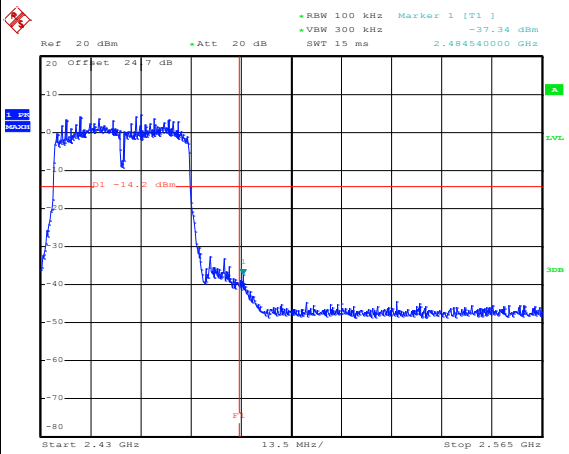
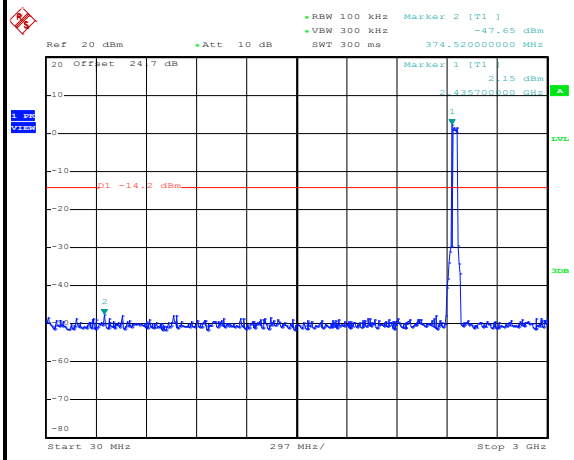
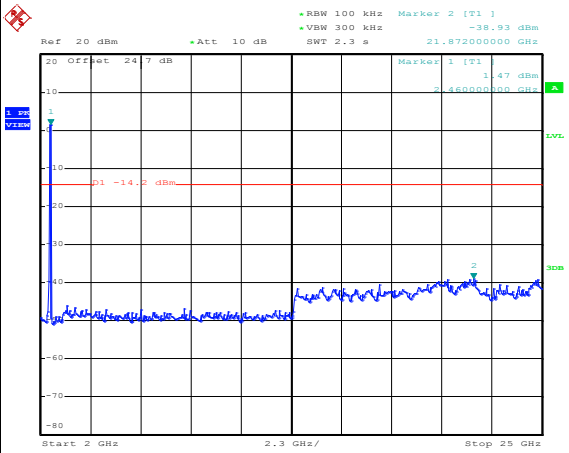
Test Mode :	802.11n HT40	Test Channel :	03

100kHz PSD reference Level	Channel Plot
	
Date: 3.MAY.2018 08:55:03	Date: 7.MAY.2018 16:52:28
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 3.MAY.2018 08:55:54	Date: 3.MAY.2018 08:56:18

Test Mode :	802.11n HT40	Test Channel :	06

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

Test Mode :	802.11n HT40	Test Channel :	09

100kHz PSD reference Level	Channel Plot
	
Date: 3.MAY.2018 09:16:38	Date: 7.MAY.2018 16:59:03
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 3.MAY.2018 09:17:21	Date: 3.MAY.2018 09:17:44

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

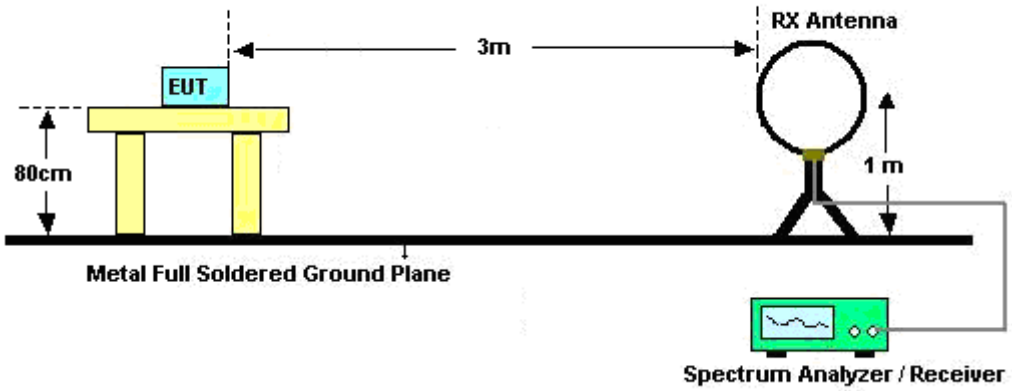
See list of measuring equipment of this test report.

3.5.3 Test Procedures

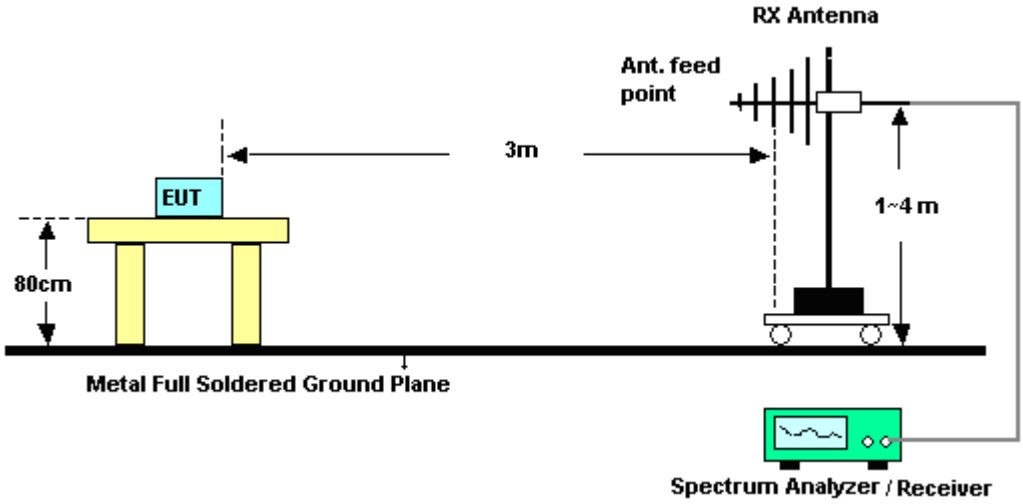
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test 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

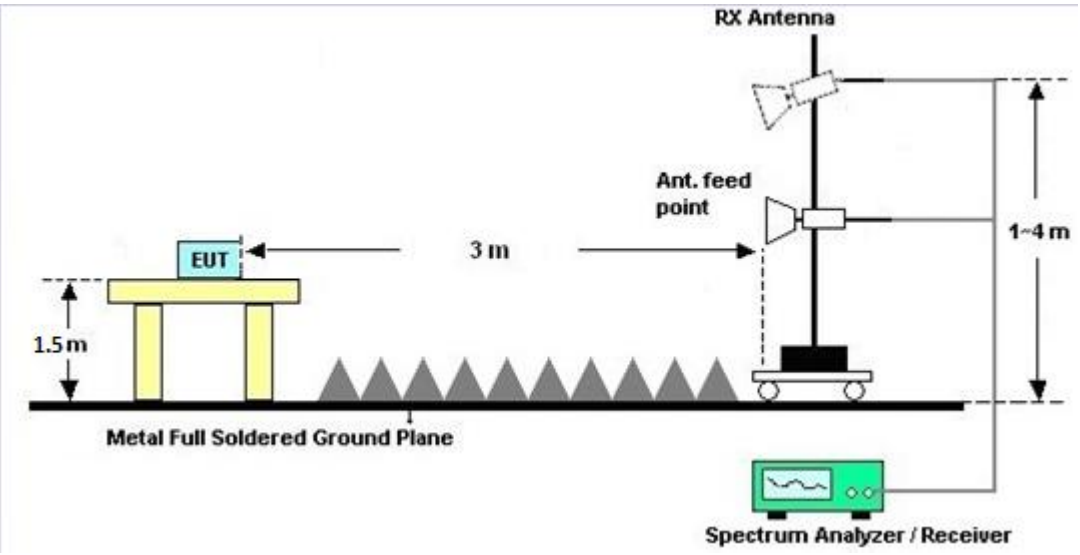
For radiated emissions below 30MHz



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.

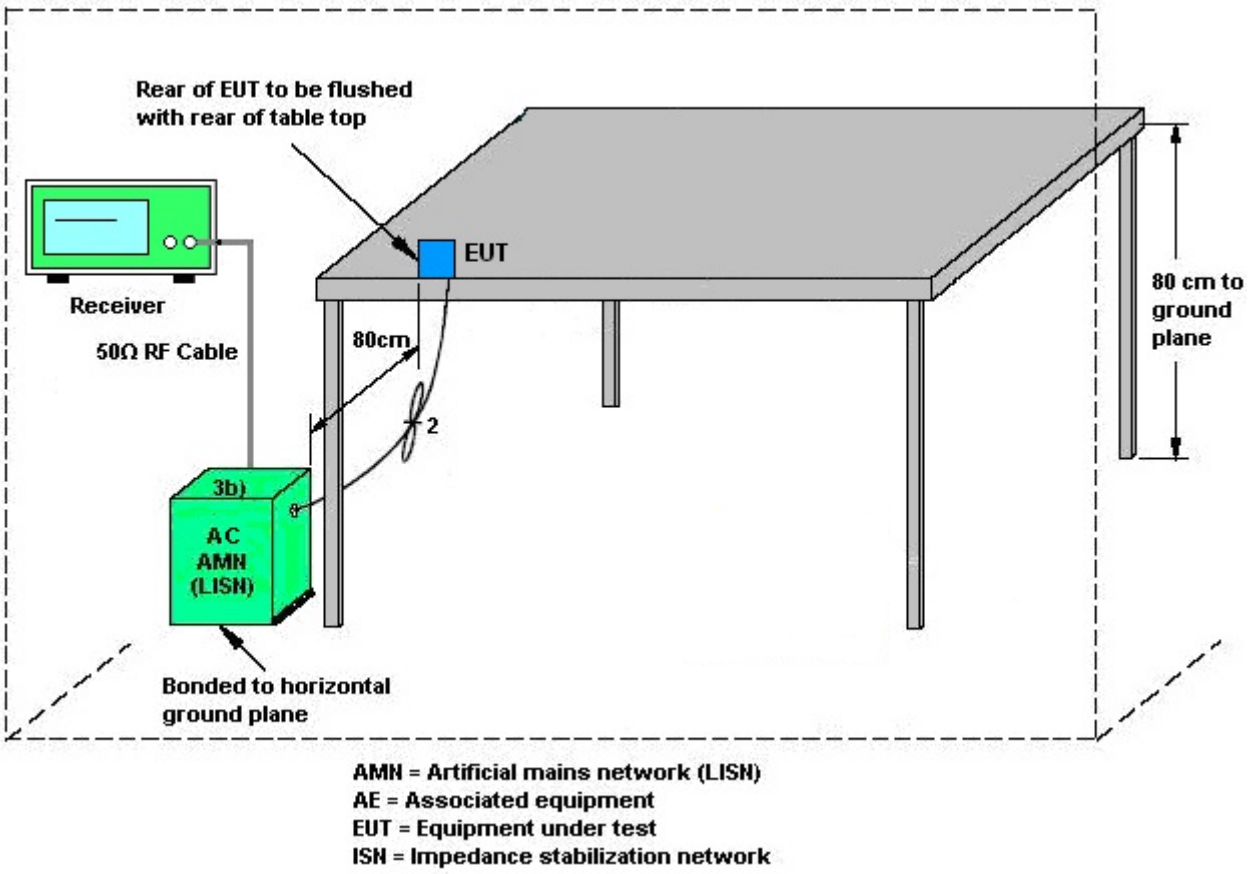
3.6.2 Measuring Instruments

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



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

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>

	Ant. 1 (dBi)	Ant. 2 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
2.4 GHz	2.63	-1.29	2.63	3.90	0.00	0.00

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

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

<TXBF Modes>

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

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

where

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

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

N_{ANT} = the total number of antennas

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

G_k is the gain in dBi of the kth antenna.

The EUT supports beamforming for 802.11ac modes.

The directional gain calculation is following F)2)e)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.

	Ant. 1 (dBi)	Ant. 2 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
2.4 GHz	2.63	-1.29	3.90	3.90	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	Apr. 28, 2018~ Aug. 02, 2018	Sep. 06, 2018	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	1207349	300MHz~40GHz	Sep. 07, 2017	Apr. 28, 2018~ Aug. 02, 2018	Sep. 06, 2018	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9kHz ~ 30GHz	Nov. 13, 2017	Apr. 28, 2018~ Aug. 02, 2018	Nov. 12, 2018	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC1300484	N/A	Mar. 01, 2018	Apr. 28, 2018~ Aug. 02, 2018	Feb. 28, 2019	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jul. 23, 2018	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	3.6GHz	Dec. 08, 2017	Jul. 23, 2018	Dec. 07, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 30, 2017	Jul. 23, 2018	Nov. 29, 2018	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Jul. 23, 2018	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 03, 2018	Jul. 23, 2018	Jan. 02, 2019	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 03, 2018	Jul. 23, 2018	Jan. 02, 2019	Conduction (CO05-HY)
Amplifier	SONOMA	310N	187311	9kHz~1GHz	Oct. 19, 2017	Apr. 12, 2018~ Jun. 06, 2018	Oct. 18, 2018	Radiation (03CH10-HY)
Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 18, 2017	Apr. 12, 2018~ Jun. 06, 2018	Jul. 17, 2018	Radiation (03CH10-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800N1D01N-06	35413&02	30MHz~1GHz	Dec. 18, 2017	Apr. 12, 2018~ Jun. 06, 2018	Dec. 17, 2018	Radiation (03CH10-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1325	1GHz ~ 18GHz	Sep. 27, 2017	Apr. 12, 2018~ Jun. 06, 2018	Sep. 26, 2018	Radiation (03CH10-HY)
Preamplifier	Keysight	83017A	MY53270078	1GHz~26.5GHz	Oct. 25, 2017	Apr. 12, 2018~ Jun. 06, 2018	Oct. 24, 2018	Radiation (03CH10-HY)
Preamplifier	Jet-Power	JPA00101800-30-10P	1601180002	1GHz~18GHz	Jul. 31, 2017	Apr. 12, 2018~ Jun. 06, 2018	Jul .30, 2018	Radiation (03CH10-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200485	10Hz ~ 44GHz	Oct. 31, 2017	Apr. 12, 2018~ Jun. 06, 2018	Oct. 30, 2018	Radiation (03CH10-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Apr. 12, 2018~ Jun. 06, 2018	N/A	Radiation (03CH10-HY)
Turn Table	EMEC	TT 2200	N/A	0~360 Degree	N/A	Apr. 12, 2018~ Jun. 06, 2018	N/A	Radiation (03CH10-HY)
Software	Audix	E3 6.2009-8-24	RK-001042	N/A	N/A	Apr. 12, 2018~ Jun. 06, 2018	N/A	Radiation (03CH10-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 23, 2017	Apr. 12, 2018~ Jun. 06, 2018	Nov. 22, 2018	Radiation (03CH10-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Filter	Woken	WHKX8-5872.5-6750-18000-40ST	SN3	6.75G High Pass	Sep. 18, 2017	Apr. 12, 2018~ Jun. 06, 2018	Sep. 17, 2018	Radiation (03CH10-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN2	3 GHz Highpass	Jul. 17 , 2017	Apr. 12, 2018~ Jun. 06, 2018	Jul. 16 , 2018	Radiation (03CH10-HY)
Filter	Wainwright	WLKS1200-12SS	SN2	1.2G Low Pass	Jul. 17, 2017	Apr. 12, 2018~ Jun. 06, 2018	Jul. 16, 2018	Radiation (03CH10-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971/4,MY28655/4	9K-30M	Jan. 02, 2018	Apr. 12, 2018~ Jun. 06, 2018	Jan. 01, 2019	Radiation (03CH10-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104 / 102	MY11692/4PE, MY11693/4PE, MY2855/2	30M-1G	Nov. 14, 2017	Apr. 12, 2018~ Jun. 06, 2018	Nov. 13, 2018	Radiation (03CH10-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104 / 102	MY11692/4PE, MY11693/4PE, MY2855/2	1G-18G	Nov. 14, 2017	Apr. 12, 2018~ Jun. 06, 2018	Nov. 13, 2018	Radiation (03CH10-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30M~40G	Oct. 17, 2017	Apr. 12, 2018~ Jun. 06, 2018	Oct. 16, 2018	Radiation (03CH10-HY)
EMI Test Receiver	Agilent	N9038A (MXE)	MY53290053	20Hz to 26.5GHz	Jan. 16, 2018	Apr. 12, 2018~ Jun. 06, 2018	Jan. 15, 2019	Radiation (03CH10-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 27, 2017	Apr. 12, 2018~ Jun. 06, 2018	Nov. 26, 2018	Radiation (03CH10-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))	**5.6**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.9**

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

<For CDD mode>

Test Engineer:	Allen Lin/Shiang Wang/Shiming Liu	Temperature:	21~25	°C
Test Date:	2018/4/28~2018/8/2	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	2	1	2412	13.30	13.30	8.50	8.52	0.50	Pass
11b	1Mbps	2	6	2437	13.10	13.15	8.04	7.56	0.50	Pass
11b	1Mbps	2	11	2462	13.25	13.25	8.50	8.52	0.50	Pass
11g	6Mbps	2	1	2412	17.25	17.20	16.08	16.30	0.50	Pass
11g	6Mbps	2	6	2437	17.20	17.25	16.28	16.28	0.50	Pass
11g	6Mbps	2	11	2462	17.25	17.20	16.28	16.28	0.50	Pass
HT20	MCS0	2	1	2412	18.35	18.30	16.88	16.92	0.50	Pass
HT20	MCS0	2	6	2437	18.30	18.30	17.26	16.88	0.50	Pass
HT20	MCS0	2	11	2462	18.25	18.30	17.28	17.12	0.50	Pass
HT40	MCS0	2	3	2422	36.00	36.10	32.56	33.99	0.50	Pass
HT40	MCS0	2	6	2437	36.20	36.20	35.04	35.04	0.50	Pass
HT40	MCS0	2	9	2452	36.30	36.20	35.72	35.04	0.50	Pass

Report Number : FR831635A

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	2	1	2412	21.43	22.00	24.73	30.00		2.63		27.36		36.00		Pass
11b	1Mbps	2	6	2437	21.95	22.07	25.02	30.00		2.63		27.65		36.00		Pass
11b	1Mbps	2	11	2462	21.53	22.05	24.81	30.00		2.63		27.44		36.00		Pass
11g	6Mbps	2	1	2412	23.20	23.80	26.52	30.00		2.63		29.15		36.00		Pass
11g	6Mbps	2	6	2437	24.05	24.53	27.31	30.00		2.63		29.94		36.00		Pass
11g	6Mbps	2	11	2462	22.92	23.72	26.35	30.00		2.63		28.98		36.00		Pass
HT20	MCS0	2	1	2412	23.59	24.01	26.82	30.00		2.63		29.45		36.00		Pass
HT20	MCS0	2	6	2437	24.31	24.42	27.38	30.00		2.63		30.01		36.00		Pass
HT20	MCS0	2	11	2462	23.31	23.83	26.59	30.00		2.63		29.22		36.00		Pass
HT40	MCS0	2	3	2422	23.52	23.85	26.70	30.00		2.63		29.33		36.00		Pass
HT40	MCS0	2	6	2437	24.17	24.56	27.38	30.00		2.63		30.01		36.00		Pass
HT40	MCS0	2	9	2452	22.50	23.36	25.96	30.00		2.63		28.59		36.00		Pass
VHT20	MCS0	2	1	2412	23.54	24.00	26.79	30.00		2.63		29.42		36.00		Pass
VHT20	MCS0	2	6	2437	24.17	24.38	27.29	30.00		2.63		29.92		36.00		Pass
VHT20	MCS0	2	11	2462	23.28	23.82	26.57	30.00		2.63		29.20		36.00		Pass
VHT40	MCS0	2	3	2422	23.48	23.80	26.65	30.00		2.63		29.28		36.00		Pass
VHT40	MCS0	2	6	2437	24.10	24.48	27.30	30.00		2.63		29.93		36.00		Pass
VHT40	MCS0	2	9	2452	22.49	23.35	25.95	30.00		2.63		28.58		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)			Setting	
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2
11b	1Mbps	2	1	2412	0.04	0.03	18.97	19.66	22.34	20.5	
11b	1Mbps	2	6	2437	0.04	0.03	19.62	19.78	22.71	20.5	
11b	1Mbps	2	11	2462	0.04	0.03	18.99	19.68	22.36	20.5	
11g	6Mbps	2	1	2412	0.17	0.17	17.68	17.84	20.77	19	
11g	6Mbps	2	6	2437	0.17	0.17	18.58	18.68	21.64	19.5	
11g	6Mbps	2	11	2462	0.17	0.17	17.02	17.45	20.25	18.5	
HT20	MCS0	2	1	2412	0.08	0.08	18.03	18.18	21.12	19.5	
HT20	MCS0	2	6	2437	0.08	0.08	18.28	18.38	21.34	19.5	
HT20	MCS0	2	11	2462	0.08	0.08	17.28	17.78	20.55	19	
HT40	MCS0	2	3	2422	0.18	0.14	17.73	17.54	20.65	18	
HT40	MCS0	2	6	2437	0.18	0.14	18.49	18.55	21.53	19	
HT40	MCS0	2	9	2452	0.18	0.14	16.20	16.54	19.38	17	
VHT20	MCS0	2	1	2412	0.08	0.05	18.02	18.16	21.10	19.5	
VHT20	MCS0	2	6	2437	0.08	0.05	18.26	18.33	21.31	19.5	
VHT20	MCS0	2	11	2462	0.08	0.05	17.27	17.73	20.52	19	
VHT40	MCS0	2	3	2422	0.14	0.18	17.72	17.53	20.64	18	
VHT40	MCS0	2	6	2437	0.14	0.18	18.46	18.53	21.51	19	
VHT40	MCS0	2	9	2452	0.14	0.18	16.17	16.53	19.36	17	

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	2	1	2412	-0.70	-1.26	2.31	3.90		8.00		Pass
11b	1Mbps	2	6	2437	-0.43	-1.16	2.58	3.90		8.00		Pass
11b	1Mbps	2	11	2462	-1.53	-1.99	1.48	3.90		8.00		Pass
11g	6Mbps	2	1	2412	-4.84	-5.87	-1.83	3.90		8.00		Pass
11g	6Mbps	2	6	2437	-4.34	-3.95	-0.94	3.90		8.00		Pass
11g	6Mbps	2	11	2462	-4.05	-5.99	-1.04	3.90		8.00		Pass
HT20	MCS0	2	1	2412	-5.67	-5.84	-2.66	3.90		8.00		Pass
HT20	MCS0	2	6	2437	-5.21	-5.52	-2.20	3.90		8.00		Pass
HT20	MCS0	2	11	2462	-6.78	-6.19	-3.18	3.90		8.00		Pass
HT40	MCS0	2	3	2422	-7.41	-8.18	-4.40	3.90		8.00		Pass
HT40	MCS0	2	6	2437	-8.24	-7.94	-4.93	3.90		8.00		Pass
HT40	MCS0	2	9	2452	-9.18	-9.36	-6.17	3.90		8.00		Pass

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

<For TXBF Mode>

Test Engineer:	Allen Lin/Shiang Wang/Shiming Liu	Temperature:	21~25	°C
Test Date:	2018/4/28~2018/8/2	Relative Humidity:	51~54	%

Report Number : FR831635A

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	
HT20	MCS0	2	1	2412	20.58	21.00	23.81	30.00		3.90		27.70		36.00		Pass
HT20	MCS0	2	6	2437	21.30	21.41	24.37	30.00		3.90		28.27		36.00		Pass
HT20	MCS0	2	11	2462	20.30	20.82	23.58	30.00		3.90		27.48		36.00		Pass
HT40	MCS0	2	3	2422	20.51	20.84	23.69	30.00		3.90		27.59		36.00		Pass
HT40	MCS0	2	6	2437	21.16	21.55	24.37	30.00		3.90		28.27		36.00		Pass
HT40	MCS0	2	9	2452	19.49	20.35	22.95	30.00		3.90		26.85		36.00		Pass
VHT20	MCS0	2	1	2412	20.53	20.99	23.78	30.00		3.90		27.68		36.00		Pass
VHT20	MCS0	2	6	2437	21.16	21.37	24.28	30.00		3.90		28.18		36.00		Pass
VHT20	MCS0	2	11	2462	20.27	20.81	23.56	30.00		3.90		27.46		36.00		Pass
VHT40	MCS0	2	3	2422	20.47	20.79	23.64	30.00		3.90		27.54		36.00		Pass
VHT40	MCS0	2	6	2437	21.09	21.47	24.29	30.00		3.90		28.19		36.00		Pass
VHT40	MCS0	2	9	2452	19.48	20.34	22.94	30.00		3.90		26.84		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)			Setting	
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2
HT20	MCS0	2	1	2412	0.08	0.08	15.02	15.17	18.11	16.5	
HT20	MCS0	2	6	2437	0.08	0.08	15.27	15.37	18.33	16.5	
HT20	MCS0	2	11	2462	0.08	0.08	14.27	14.77	17.54	16	
HT40	MCS0	2	3	2422	0.18	0.14	14.72	14.53	17.64	15	
HT40	MCS0	2	6	2437	0.18	0.14	15.48	15.54	18.52	16	
HT40	MCS0	2	9	2452	0.18	0.14	13.19	13.53	16.37	14	
VHT20	MCS0	2	1	2412	0.08	0.05	15.01	15.15	18.09	16.5	
VHT20	MCS0	2	6	2437	0.08	0.05	15.25	15.32	18.30	16.5	
VHT20	MCS0	2	11	2462	0.08	0.05	14.26	14.72	17.51	16	
VHT40	MCS0	2	3	2422	0.14	0.18	14.71	14.52	17.63	15	
VHT40	MCS0	2	6	2437	0.14	0.18	15.45	15.52	18.50	16	
VHT40	MCS0	2	9	2452	0.14	0.18	13.16	13.52	16.35	14	

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

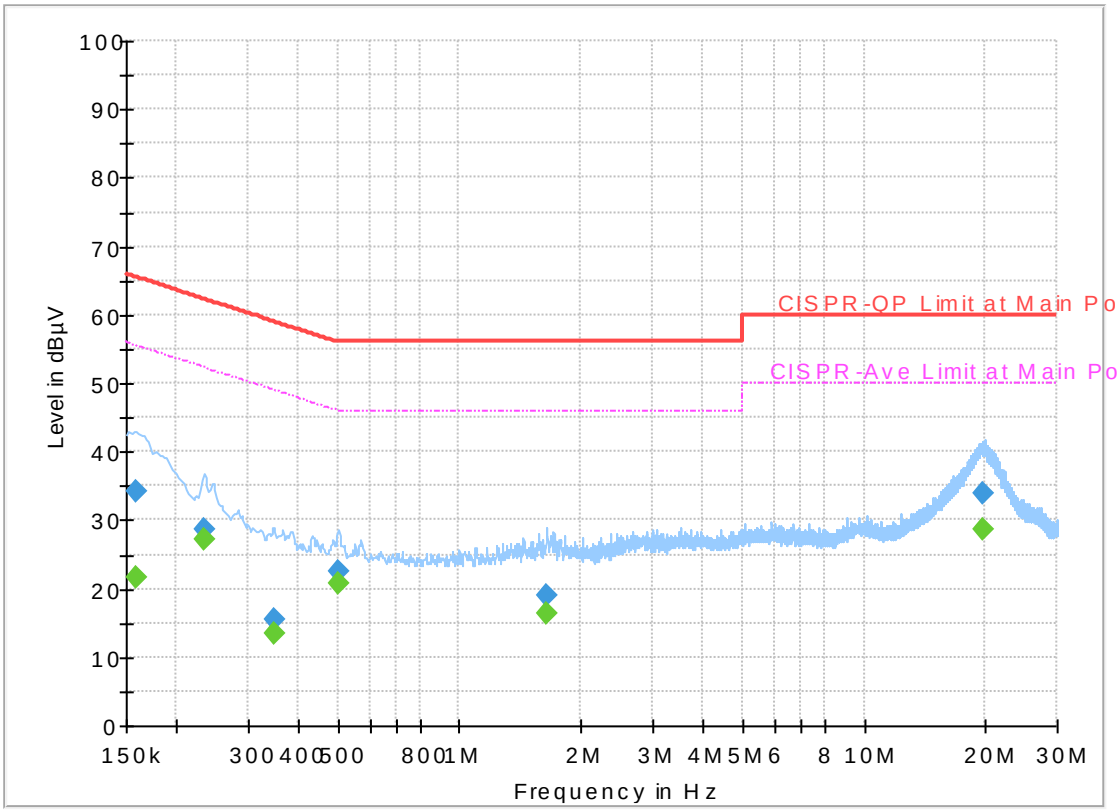
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Kai-Chun Chu	**Temperature :**	25~27℃
		Relative Humidity :	50~52%

EUT Information

Report NO :	831635
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line

Full Spectrum



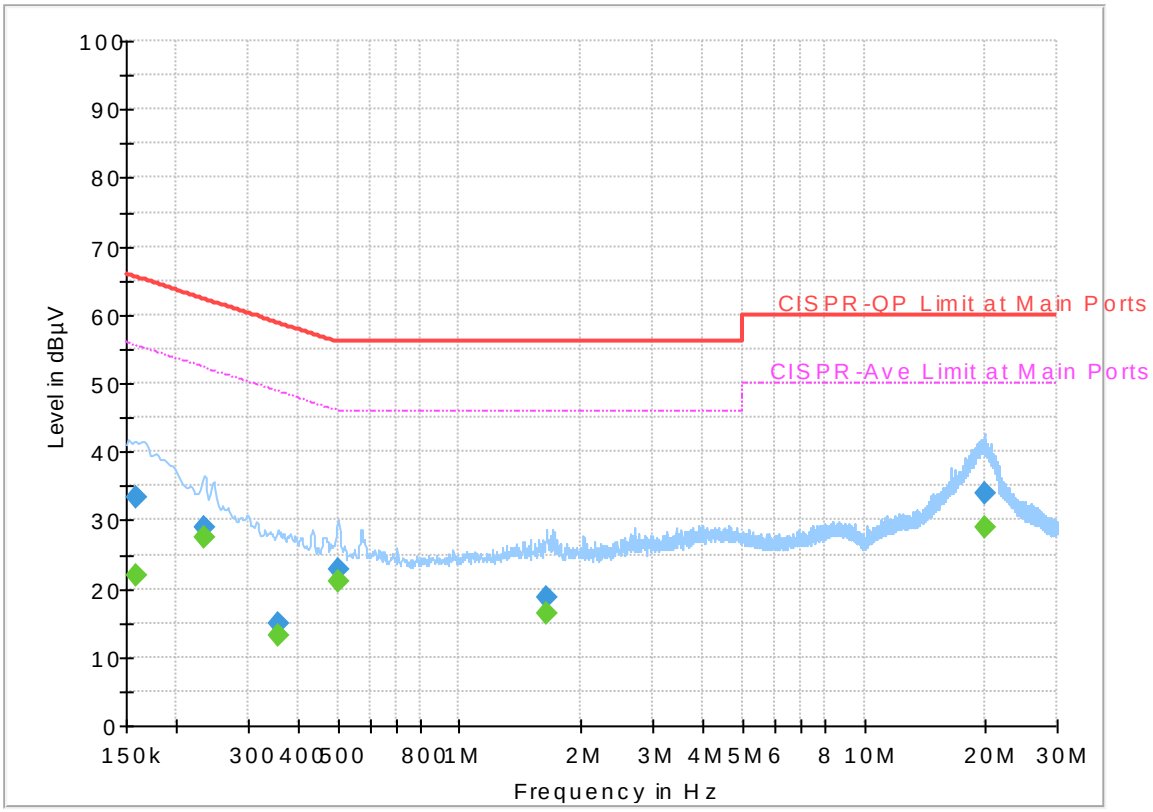
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.159000	---	21.54	55.52	33.98	L1	OFF	19.5
0.159000	34.28	---	65.52	31.24	L1	OFF	19.5
0.233250	---	27.20	52.33	25.13	L1	OFF	19.5
0.233250	28.58	---	62.33	33.75	L1	OFF	19.5
0.348000	---	13.55	49.01	35.46	L1	OFF	19.5
0.348000	15.44	---	59.01	43.57	L1	OFF	19.5
0.501000	---	20.77	46.00	25.23	L1	OFF	19.5
0.501000	22.52	---	56.00	33.48	L1	OFF	19.5
1.639500	---	16.29	46.00	29.71	L1	OFF	19.6
1.639500	18.97	---	56.00	37.03	L1	OFF	19.6
19.594500	---	28.74	50.00	21.26	L1	OFF	19.8
19.594500	33.84	---	60.00	26.16	L1	OFF	19.8

EUT Information

Report NO :	831635
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)
0.159000	---	21.88	55.52	33.64	N	OFF	19.5
0.159000	33.40	---	65.52	32.12	N	OFF	19.5
0.233250	---	27.57	52.33	24.76	N	OFF	19.5
0.233250	28.91	---	62.33	33.42	N	OFF	19.5
0.354750	---	13.02	48.85	35.83	N	OFF	19.5
0.354750	14.91	---	58.85	43.94	N	OFF	19.5
0.501000	---	21.18	46.00	24.82	N	OFF	19.5
0.501000	22.95	---	56.00	33.05	N	OFF	19.5
1.637250	---	16.35	46.00	29.65	N	OFF	19.6
1.637250	18.85	---	56.00	37.15	N	OFF	19.6
19.794750	---	28.89	50.00	21.11	N	OFF	19.9
19.794750	33.91	---	60.00	26.09	N	OFF	19.9

Appendix C. Radiated Spurious Emission

Test Engineer :	Daniel Lee and JC Liang	**Temperature :**	18 ~ 22°C
		Relative Humidity :	48 ~ 52%

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		2381.82	51.47	-22.53	74	42.2	27.06	15.37	33.16	274	296	P	H
		2388.015	40.65	-13.35	54	31.33	27.11	15.37	33.16	274	296	A	H
	*	2412	102.57	-	-	93.15	27.16	15.41	33.15	274	296	P	H
	*	2412	99.41	-	-	89.99	27.16	15.41	33.15	274	296	A	H
													H
													H
		2387.175	51.44	-22.56	74	42.12	27.11	15.37	33.16	306	215	P	V
		2388.54	41.02	-12.98	54	31.7	27.11	15.37	33.16	306	215	A	V
	*	2412	107.3	-	-	97.88	27.16	15.41	33.15	306	215	P	V
	*	2412	104.26	-	-	94.84	27.16	15.41	33.15	306	215	A	V
													V
													V
802.11b CH 06 2437MHz		2339.12	52	-22	74	42.9	26.97	15.3	33.17	109	67	P	H
		2389.94	41.13	-12.87	54	31.8	27.11	15.37	33.15	109	67	A	H
	*	2437	103.33	-	-	93.78	27.26	15.43	33.14	109	67	P	H
	*	2437	99.94	-	-	90.39	27.26	15.43	33.14	109	67	A	H
		2497.76	52.41	-21.59	74	42.63	27.4	15.48	33.1	109	67	P	H
		2483.97	41.67	-12.33	54	31.95	27.35	15.48	33.11	109	67	A	H
		2355.78	51.46	-22.54	74	42.3	27.01	15.32	33.17	377	184	P	V
		2389.94	41.55	-12.45	54	32.22	27.11	15.37	33.15	377	184	A	V
	*	2437	112.74	-	-	103.19	27.26	15.43	33.14	377	184	P	V
	*	2437	109.67	-	-	100.12	27.26	15.43	33.14	377	184	A	V
		2486	53.27	-20.73	74	43.55	27.35	15.48	33.11	377	184	P	V
		2483.52	43.32	-10.68	54	33.6	27.35	15.48	33.11	377	184	A	V

802.11b CH 11 2462MHz	*	2462	107.03	-	-	97.41	27.3	15.44	33.12	299	321	P	H
	*	2462	104.16	-	-	94.54	27.3	15.44	33.12	299	321	A	H
		2483.64	53.38	-20.62	74	43.66	27.35	15.48	33.11	299	321	P	H
		2483.52	44.14	-9.86	54	34.42	27.35	15.48	33.11	299	321	A	H
													H
													H
	*	2462	110.74	-	-	101.12	27.3	15.44	33.12	337	230	P	V
	*	2462	107.8	-	-	98.18	27.3	15.44	33.12	337	230	A	V
		2483.56	56.33	-17.67	74	46.61	27.35	15.48	33.11	337	230	P	V
		2483.52	45.94	-8.06	54	36.22	27.35	15.48	33.11	337	230	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	39.38	-34.62	74	60.66	31.19	8.9	61.37	100	0	P	H
													H
													H
													H
		4824	40.22	-33.78	74	61.5	31.19	8.9	61.37	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4874	42.21	-31.79	74	66.47	31.28	8.86	64.4	100	0	P	H
		7311	42.76	-31.24	74	61.61	36.18	10.52	65.55	100	0	P	H
													H
													H
		4874	43.71	-30.29	74	67.97	31.28	8.86	64.4	100	0	P	V
		7311	44.19	-29.81	74	63.04	36.18	10.52	65.55	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4924	39.27	-34.73	74	60.44	31.38	8.84	61.39	100	0	P	H
		7386	42.72	-31.28	74	57.51	36.37	10.44	61.6	100	0	P	H
													H
													H
		4924	38.93	-35.07	74	60.1	31.38	8.84	61.39	100	0	P	V
		7386	43.07	-30.93	74	57.86	36.37	10.44	61.6	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		2389.695	56.45	-17.55	74	47.13	27.11	15.37	33.16	128	97	P	H
		2390	45.75	-8.25	54	36.42	27.11	15.37	33.15	128	97	A	H
	*	2412	107.29	-	-	97.87	27.16	15.41	33.15	128	97	P	H
	*	2412	100.12	-	-	90.7	27.16	15.41	33.15	128	97	A	H
													H
													H
		2389.59	61.55	-12.45	74	52.23	27.11	15.37	33.16	400	213	P	V
		2389.905	51.41	-2.59	54	42.08	27.11	15.37	33.15	400	213	A	V
	*	2412	112.77	-	-	103.35	27.16	15.41	33.15	400	213	P	V
	*	2412	105.01	-	-	95.59	27.16	15.41	33.15	400	213	A	V
													V
													V
802.11g CH 06 2437MHz		2384.936	52.34	-21.66	74	43.07	27.06	15.37	33.16	142	70	P	H
		2381.896	41.92	-12.08	54	32.65	27.06	15.37	33.16	142	70	A	H
	*	2437	108.31	-	-	98.76	27.26	15.43	33.14	142	70	P	H
	*	2437	100.9	-	-	91.35	27.26	15.43	33.14	142	70	A	H
		2486.624	53.04	-20.96	74	43.32	27.35	15.48	33.11	142	70	P	H
		2484.336	42.61	-11.39	54	32.89	27.35	15.48	33.11	142	70	A	H
		2388.584	51.58	-22.42	74	42.26	27.11	15.37	33.16	379	187	P	V
		2389.192	42.3	-11.7	54	32.98	27.11	15.37	33.16	379	187	A	V
	*	2437	113.98	-	-	104.43	27.26	15.43	33.14	379	187	P	V
	*	2437	106.73	-	-	97.18	27.26	15.43	33.14	379	187	A	V
		2484.16	53.51	-20.49	74	43.79	27.35	15.48	33.11	379	187	P	V
		2485.04	44.04	-9.96	54	34.32	27.35	15.48	33.11	379	187	A	V

802.11g CH 11 2462MHz	*	2462	108.88	-	-	99.26	27.3	15.44	33.12	107	99	P	H
	*	2462	101.46	-	-	91.84	27.3	15.44	33.12	107	99	A	H
		2484.48	57.26	-16.74	74	47.54	27.35	15.48	33.11	107	99	P	H
		2483.84	47.75	-6.25	54	38.03	27.35	15.48	33.11	107	99	A	H
													H
													H
	*	2462	111.79	-	-	102.17	27.3	15.44	33.12	400	174	P	V
	*	2462	104.43	-	-	94.81	27.3	15.44	33.12	400	174	A	V
		2483.52	61.95	-12.05	74	52.23	27.35	15.48	33.11	400	174	P	V
		2483.56	52.86	-1.14	54	43.14	27.35	15.48	33.11	400	174	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	39.56	-34.44	74	60.84	31.19	8.9	61.37	100	0	P	H
													H
													H
													H
		4824	40.7	-33.3	74	61.98	31.19	8.9	61.37	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4874	39.74	-34.26	74	64	31.28	8.86	64.4	100	0	P	H
		7311	42.17	-31.83	74	61.02	36.18	10.52	65.55	100	0	P	H
													H
													H
		4874	40.41	-33.59	74	64.67	31.28	8.86	64.4	100	0	P	V
		7311	43.64	-30.36	74	62.49	36.18	10.52	65.55	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4924	39.8	-34.2	74	60.97	31.38	8.84	61.39	100	0	P	H
		7386	42.54	-31.46	74	57.33	36.37	10.44	61.6	100	0	P	H
													H
													H
		4924	39.08	-34.92	74	60.25	31.38	8.84	61.39	100	0	P	V
		7386	42.3	-31.7	74	57.09	36.37	10.44	61.6	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)
		2389.695	56.25	-17.75	74	46.93	27.11	15.37	33.16	124	98	P	H
		2389.8	46.4	-7.6	54	37.07	27.11	15.37	33.15	124	98	A	H
	*	2412	106.64	-	-	97.22	27.16	15.41	33.15	124	98	P	H
	*	2412	99.46	-	-	90.04	27.16	15.41	33.15	124	98	A	H
802.11n													H
HT20													H
CH 01		2389.17	62.36	-11.64	74	53.04	27.11	15.37	33.16	341	212	P	V
2412MHz		2390	51.65	-2.35	54	42.32	27.11	15.37	33.15	341	212	A	V
	*	2412	112.77	-	-	103.35	27.16	15.41	33.15	341	212	P	V
	*	2412	104.77	-	-	95.35	27.16	15.41	33.15	341	212	A	V
													V
													V
		2364.72	52.04	-21.96	74	42.85	27.01	15.34	33.16	106	60	P	H
		2388.28	41.85	-12.15	54	32.53	27.11	15.37	33.16	106	60	A	H
	*	2437	108.18	-	-	98.63	27.26	15.43	33.14	106	60	P	H
	*	2437	100.74	-	-	91.19	27.26	15.43	33.14	106	60	A	H
802.11n		2484.424	51.98	-22.02	74	42.26	27.35	15.48	33.11	106	60	P	H
HT20		2483.808	42.57	-11.43	54	32.85	27.35	15.48	33.11	106	60	A	H
CH 06		2389.192	51.73	-22.27	74	42.41	27.11	15.37	33.16	375	187	P	V
2437MHz		2389.8	42.25	-11.75	54	32.92	27.11	15.37	33.15	375	187	A	V
	*	2437	114.35	-	-	104.8	27.26	15.43	33.14	375	187	P	V
	*	2437	106.68	-	-	97.13	27.26	15.43	33.14	375	187	A	V
		2487.416	52.59	-21.41	74	42.87	27.35	15.48	33.11	375	187	P	V
		2483.72	43.35	-10.65	54	33.63	27.35	15.48	33.11	375	187	A	V

	*	2462	106.55	-	-	96.93	27.3	15.44	33.12	129	100	P	H
	*	2462	99.3	-	-	89.68	27.3	15.44	33.12	129	100	A	H
		2483.8	57.83	-16.17	74	48.11	27.35	15.48	33.11	129	100	P	H
		2483.52	47.57	-6.43	54	37.85	27.35	15.48	33.11	129	100	A	H
802.11n													H
HT20													H
CH 11	*	2462	112.94	-	-	103.32	27.3	15.44	33.12	379	133	P	V
2462MHz	*	2462	105.23	-	-	95.61	27.3	15.44	33.12	379	133	A	V
		2483.6	63.45	-10.55	74	53.73	27.35	15.48	33.11	379	133	P	V
		2483.52	52.72	-1.28	54	43	27.35	15.48	33.11	379	133	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	40.19	-33.81	74	61.47	31.19	8.9	61.37	100	0	P	H
													H
802.11n													H
HT20													H
CH 01		4824	41.06	-32.94	74	62.34	31.19	8.9	61.37	100	0	P	V
2412MHz													V
													V
													V
		4874	39.65	-34.35	74	63.91	31.28	8.86	64.4	100	0	P	H
		7311	42.96	-31.04	74	61.81	36.18	10.52	65.55	100	0	P	H
802.11n													H
HT20													H
CH 06		4874	40.16	-33.84	74	64.42	31.28	8.86	64.4	100	0	P	V
2437MHz		7311	43.59	-30.41	74	62.44	36.18	10.52	65.55	100	0	P	V
													V
													V
		4924	40.73	-33.27	74	61.9	31.38	8.84	61.39	100	0	P	H
		7386	46.48	-27.52	74	61.27	36.37	10.44	61.6	100	0	P	H
802.11n													H
HT20													H
CH 11		4924	39.6	-34.4	74	60.77	31.38	8.84	61.39	100	0	P	V
2462MHz		7386	53.61	-20.39	74	68.4	36.37	10.44	61.6	100	0	P	V
		7386	41.61	-12.39	54	56.4	36.37	10.44	61.6	100	0	A	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1+2	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)
		2389.94	56.71	-17.29	74	47.38	27.11	15.37	33.15	102	95	P	H
		2389.94	46.42	-7.58	54	37.09	27.11	15.37	33.15	102	95	A	H
	*	2422	106.05	-	-	96.57	27.21	15.41	33.14	102	95	P	H
	*	2422	97.8	-	-	88.32	27.21	15.41	33.14	102	95	A	H
802.11n		2485.72	53.38	-20.62	74	43.66	27.35	15.48	33.11	102	95	P	H
HT40		2484.95	43.8	-10.2	54	34.08	27.35	15.48	33.11	102	95	A	H
CH 03		2388.68	62.26	-11.74	74	52.94	27.11	15.37	33.16	384	136	P	V
2422MHz		2389.66	52.61	-1.39	54	43.29	27.11	15.37	33.16	384	136	A	V
	*	2422	111.52	-	-	102.04	27.21	15.41	33.14	384	136	P	V
	*	2422	104.01	-	-	94.53	27.21	15.41	33.14	384	136	A	V
		2483.76	57.38	-16.62	74	47.66	27.35	15.48	33.11	384	136	P	V
		2483.76	48.06	-5.94	54	38.34	27.35	15.48	33.11	384	136	A	V
		2389.648	56.45	-17.55	74	47.13	27.11	15.37	33.16	104	59	P	H
		2389.952	46.14	-7.86	54	36.81	27.11	15.37	33.15	104	59	A	H
	*	2437	106.2	-	-	96.65	27.26	15.43	33.14	104	59	P	H
	*	2437	98.07	-	-	88.52	27.26	15.43	33.14	104	59	A	H
802.11n		2483.632	60	-14	74	50.28	27.35	15.48	33.11	104	59	P	H
HT40		2483.808	50.59	-3.41	54	40.87	27.35	15.48	33.11	104	59	A	H
CH 06		2389.8	62.35	-11.65	74	53.02	27.11	15.37	33.15	377	188	P	V
2437MHz		2389.952	52.15	-1.85	54	42.82	27.11	15.37	33.15	377	188	A	V
	*	2437	111.51	-	-	101.96	27.26	15.43	33.14	377	188	P	V
	*	2437	103.98	-	-	94.43	27.26	15.43	33.14	377	188	A	V
		2485.832	62.15	-11.85	74	52.43	27.35	15.48	33.11	377	188	P	V
		2484.688	52.72	-1.28	54	43	27.35	15.48	33.11	377	188	A	V

		2380.28	51.91	-22.09	74	42.64	27.06	15.37	33.16	100	92	P	H
		2388.96	41.85	-12.15	54	32.53	27.11	15.37	33.16	100	92	A	H
	*	2452	106	-	-	96.42	27.26	15.44	33.12	100	92	P	H
	*	2452	97.41	-	-	87.83	27.26	15.44	33.12	100	92	A	H
802.11n		2483.97	57.59	-16.41	74	47.87	27.35	15.48	33.11	100	92	P	H
HT40		2483.52	49.27	-4.73	54	39.55	27.35	15.48	33.11	100	92	A	H
CH 09		2389.94	53.27	-20.73	74	43.94	27.11	15.37	33.15	380	134	P	V
2452MHz		2389.52	43.89	-10.11	54	34.57	27.11	15.37	33.16	380	134	A	V
	*	2452	110.19	-	-	100.61	27.26	15.44	33.12	380	134	P	V
	*	2452	101.5	-	-	91.92	27.26	15.44	33.12	380	134	A	V
		2483.62	60.91	-13.09	74	51.19	27.35	15.48	33.11	380	134	P	V
		2483.76	52.78	-1.22	54	43.06	27.35	15.48	33.11	380	134	A	V

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

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4844	39.55	-34.45	74	60.81	31.22	8.89	61.37	100	0	P	H
		7266	42.57	-31.43	74	57.5	36.11	10.56	61.6	100	0	P	H
802.11n													H
HT40													H
CH 03		4844	40.25	-33.75	74	61.51	31.22	8.89	61.37	100	0	P	V
2422MHz		7266	43.59	-30.41	74	58.52	36.11	10.56	61.6	100	0	P	V
													V
													V
		4874	40	-34	74	64.26	31.28	8.86	64.4	100	0	P	H
		7311	43.84	-30.16	74	62.69	36.18	10.52	65.55	100	0	P	H
802.11n													H
HT40													H
CH 06		4874	39.67	-34.33	74	63.93	31.28	8.86	64.4	100	0	P	V
2437MHz		7311	43.56	-30.44	74	62.41	36.18	10.52	65.55	100	0	P	V
													V
													V
		4904	39.28	-34.72	74	60.47	31.34	8.85	61.38	100	0	P	H
		7356	44.08	-29.92	74	58.92	36.3	10.46	61.6	100	0	P	H
802.11n													H
HT40													H
CH 09		4904	39.35	-34.65	74	60.54	31.34	8.85	61.38	100	0	P	V
2452MHz		7356	43.23	-30.77	74	58.07	36.3	10.46	61.6	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

Emission below 1GHz

2.4GHz WIFI 802.11g (LF)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1+2		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz 802.11g LF		125.04	31.2	-12.3	43.5	44.76	17.71	1.42	32.69	-	-	P	H
		173.64	22.51	-20.99	43.5	37.89	15.44	1.84	32.66	-	-	P	H
		250.05	26.15	-19.85	46	38.17	18.51	2.08	32.61	-	-	P	H
		374.9	43.51	-2.49	46	52.75	20.93	2.43	32.6	100	0	QP	H
		500.2	44.89	-1.11	46	50.82	23.86	2.85	32.64	100	325	QP	H
		699.7	39.45	-6.55	46	42.23	26.62	3.38	32.78	-	-	P	H
													H
													H
													H
													H
													H
													H
		48.36	24.08	-15.92	40	40.74	15.19	0.91	32.76	-	-	P	V
		98.31	31.61	-11.89	43.5	47.34	15.69	1.29	32.71	-	-	P	V
		173.64	22.34	-21.16	43.5	37.72	15.44	1.84	32.66	-	-	P	V
		374.9	40.71	-5.29	46	49.95	20.93	2.43	32.6	-	-	P	V
		500.2	42.83	-3.17	46	48.76	23.86	2.85	32.64	100	0	QP	V
		624.8	42.29	-3.71	46	45.88	26.01	3.21	32.81	-	-	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.	
1+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

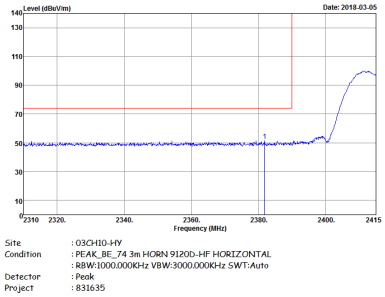
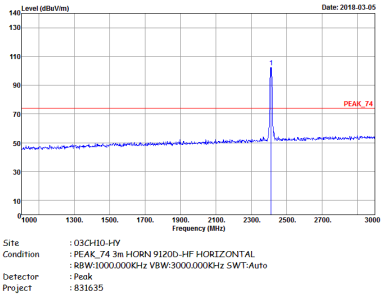
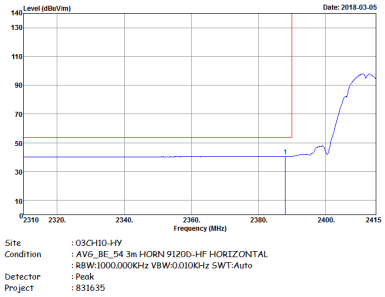
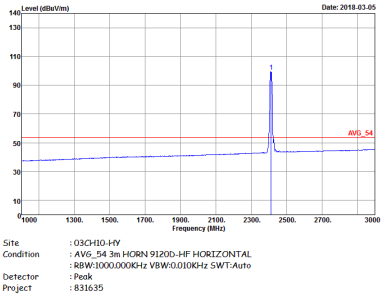
Test Engineer :	Daniel Lee and JC Liang	**Temperature :**	18 ~ 22°C
		Relative Humidity :	48 ~ 52%

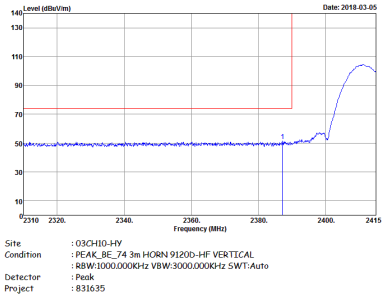
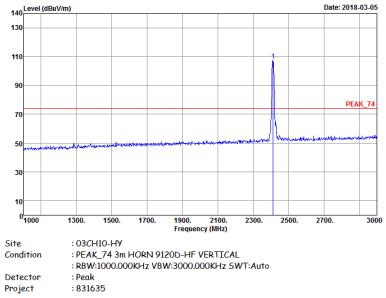
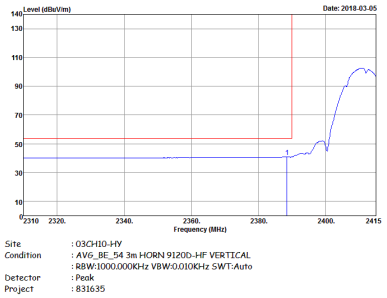
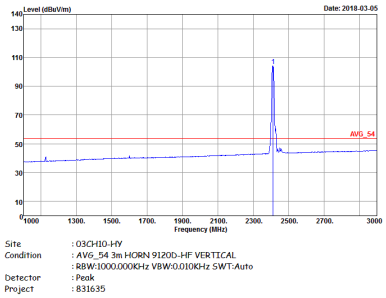
Note symbol

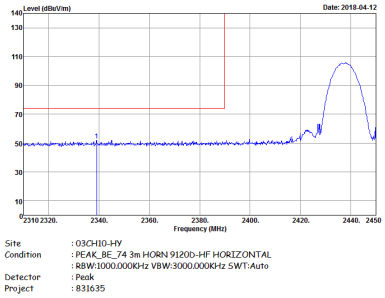
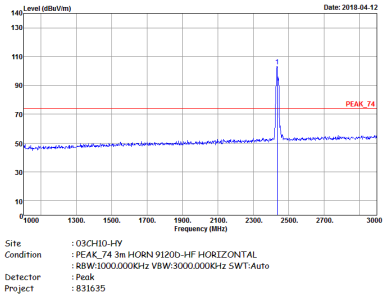
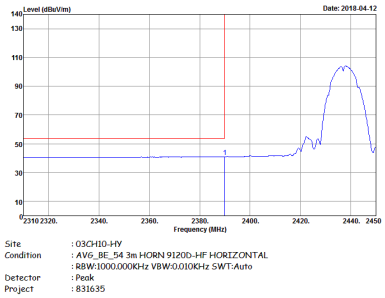
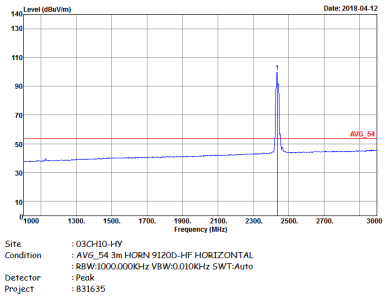
-L	**Low channel location**
-R	**High channel location**

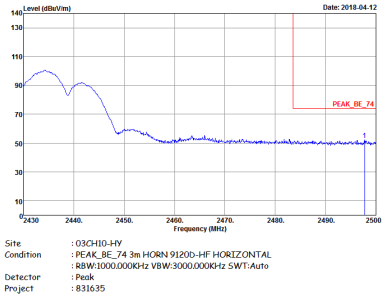
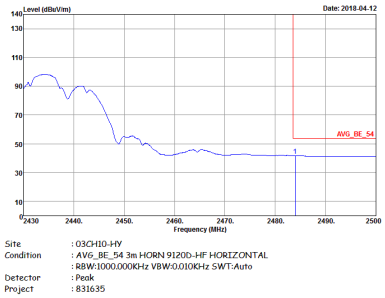
2.4GHz 2400~2483.5MHz

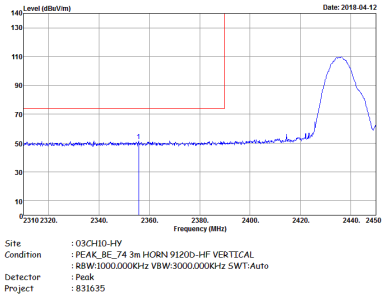
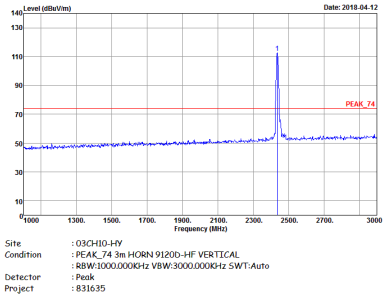
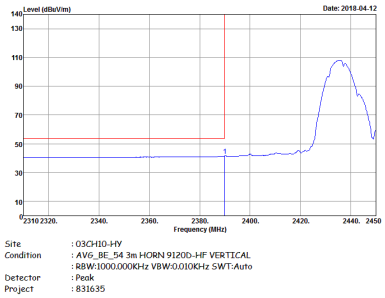
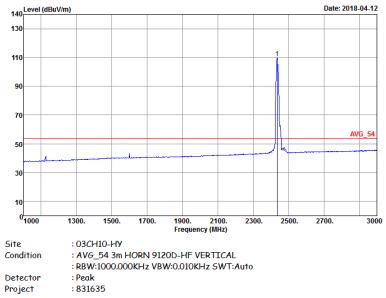
WIFI 802.11b (Band Edge @ 3m)

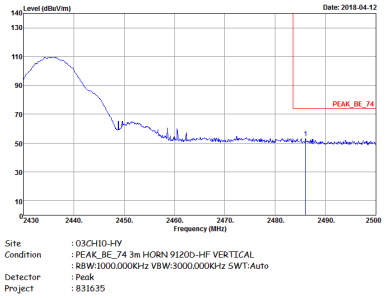
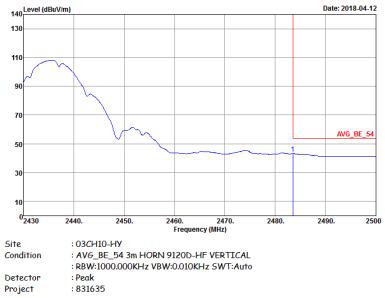
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.		

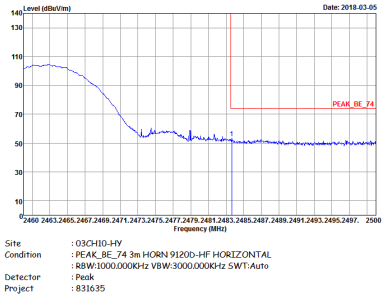
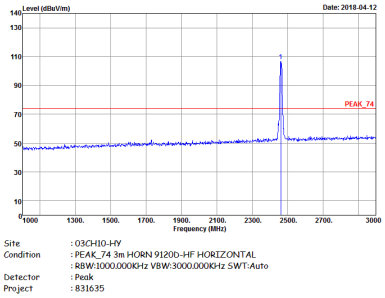
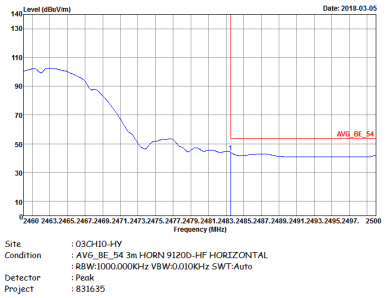
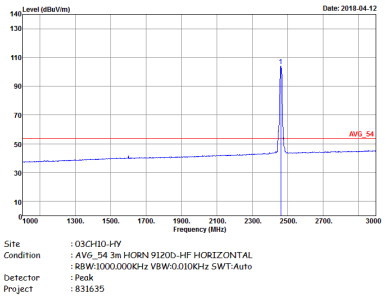
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1+2	Vertical	Fundamental
Peak		
Avg.		

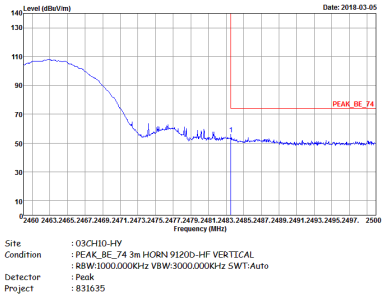
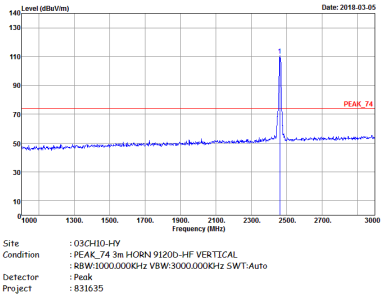
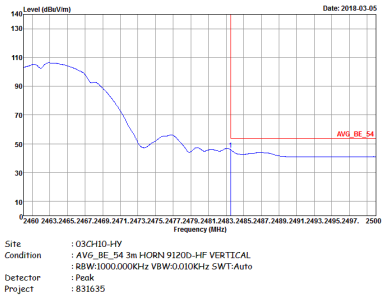
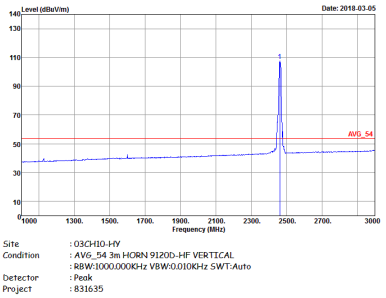
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1+2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1+2	Vertical	Fundamental
Peak		
Avg.		

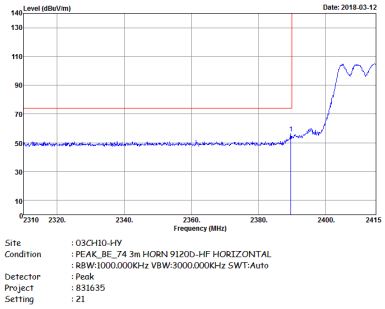
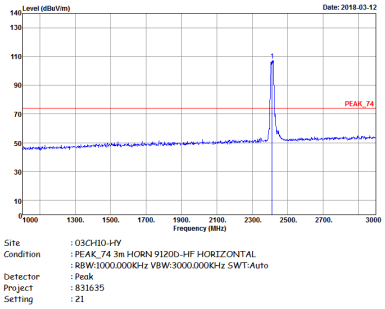
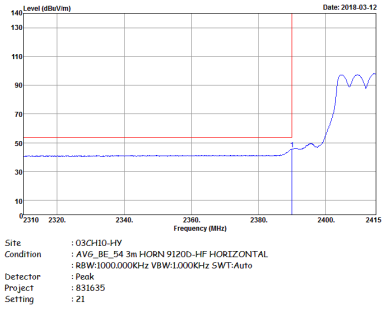
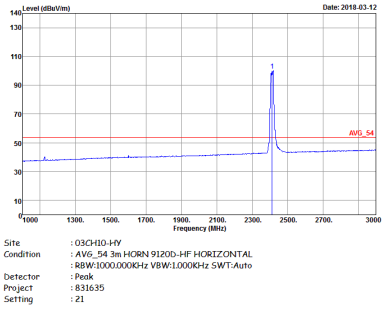
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1+2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

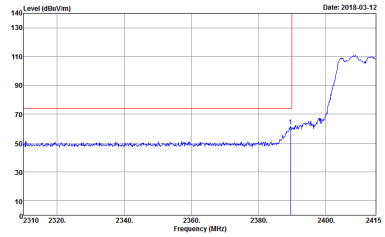
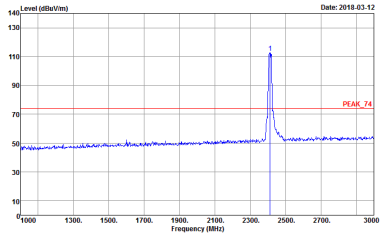
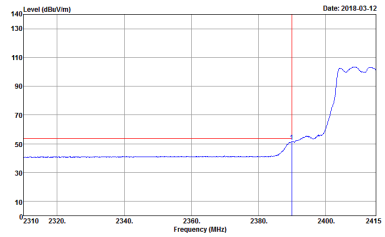
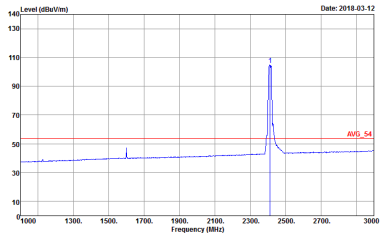
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH10-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635
Avg.	 Site : 03CH10-HY Condition : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 831635	 Site : 03CH10-HY Condition : AVG_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 831635

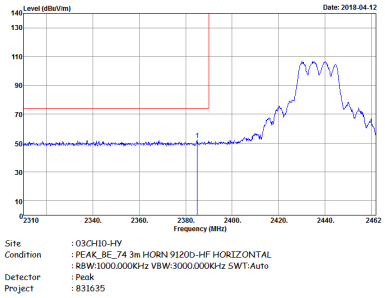
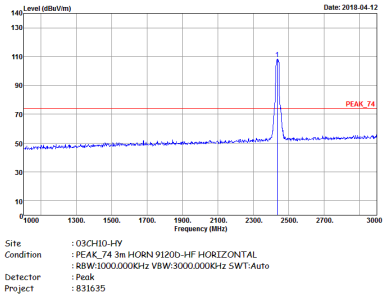
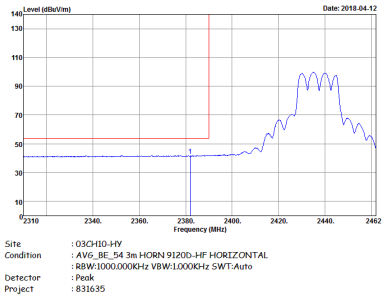
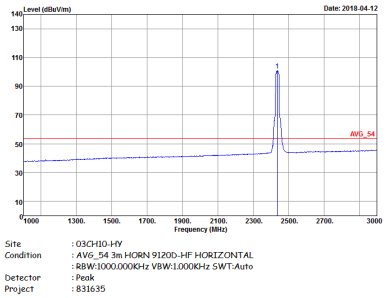
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH10-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635
Avg.	 Site : 03CH10-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 831635	 Site : 03CH10-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 831635

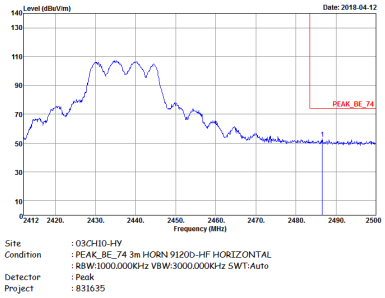
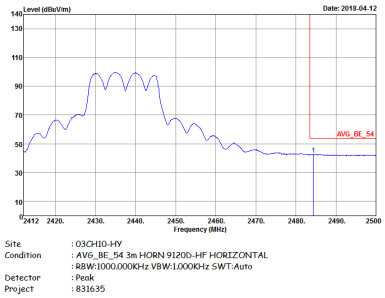
2.4GHz 2400~2483.5MHz

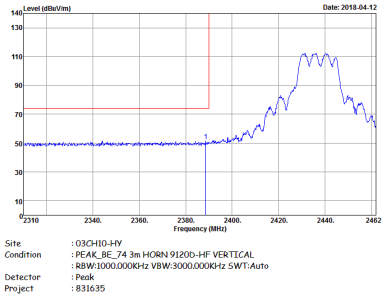
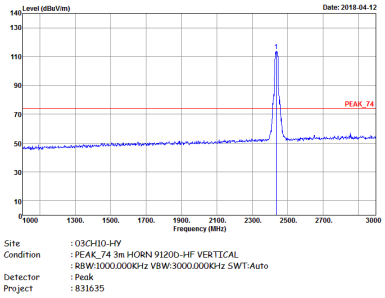
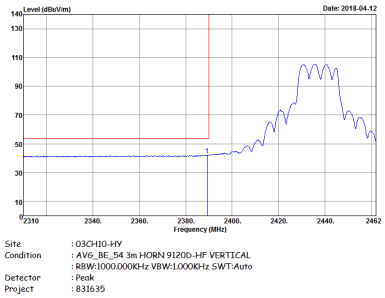
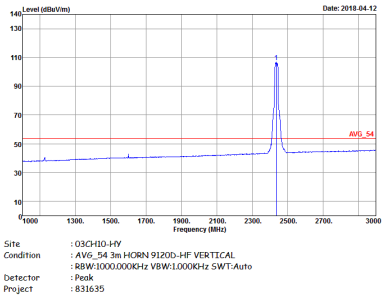
WIFI 802.11g (Band Edge @ 3m)

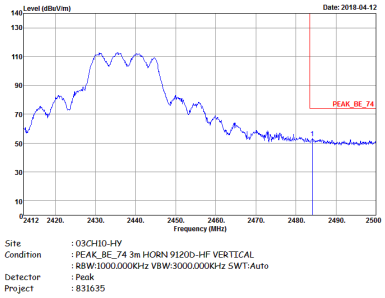
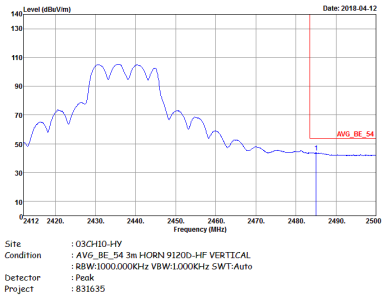
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.		

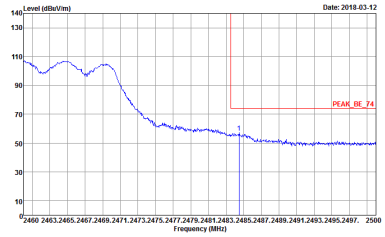
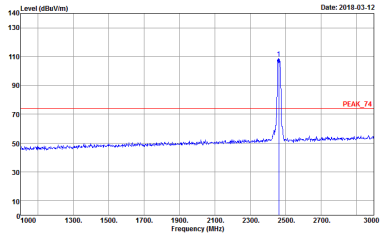
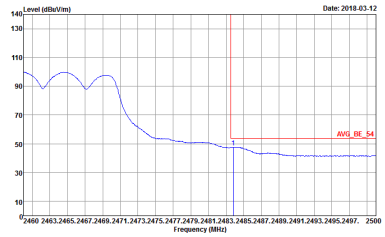
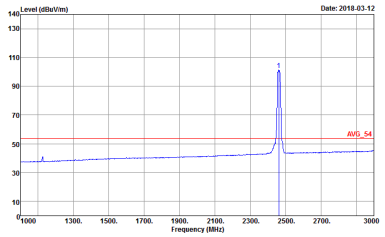
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH10-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21
Avg.	 Site : 03CH10-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21	 Site : 03CH10-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21

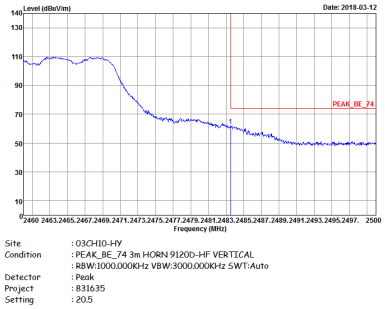
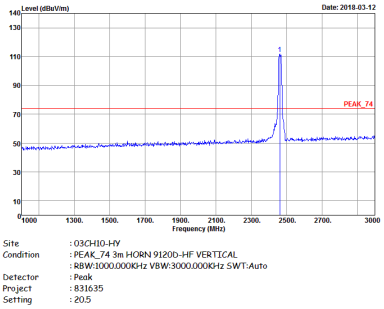
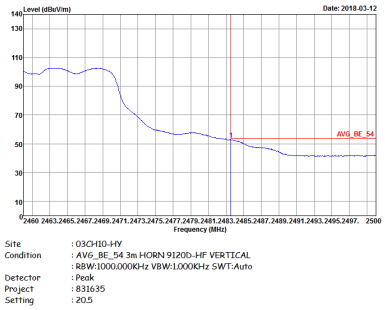
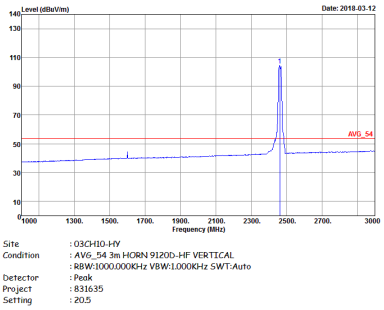
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1+2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1+2	Vertical	Fundamental
Peak		
Avg.		

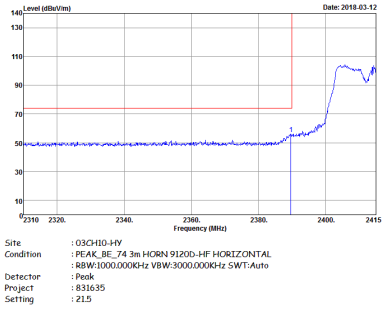
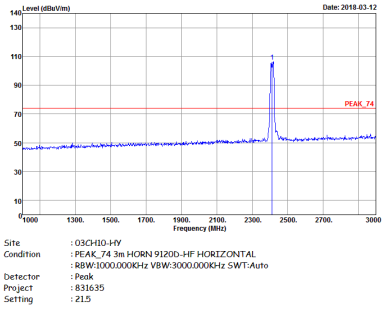
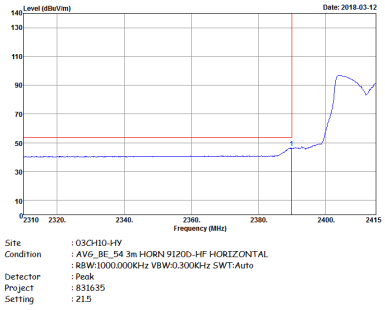
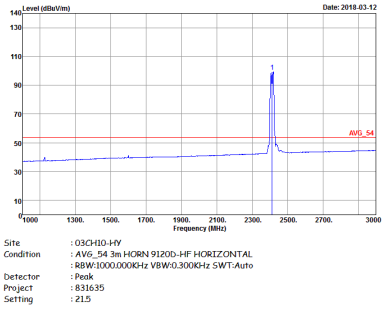
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1+2	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

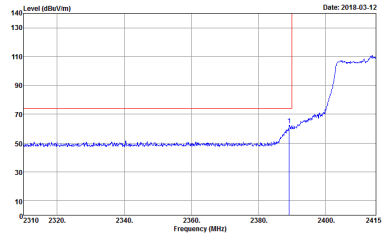
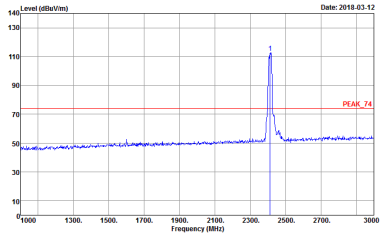
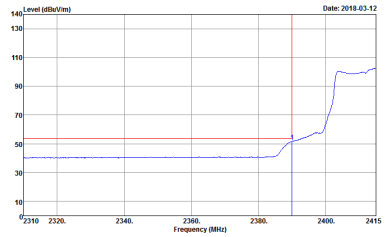
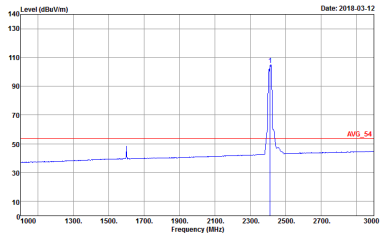
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH10-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 20.5	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 20.5
Avg.	 Site : 03CH10-HY Condition : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 20.5	 Site : 03CH10-HY Condition : AVG_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 20.5

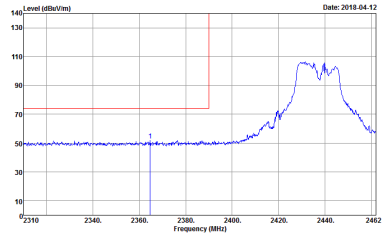
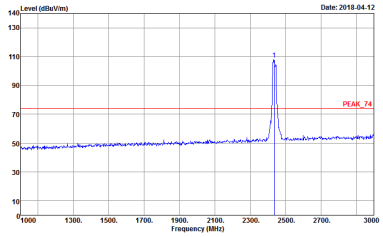
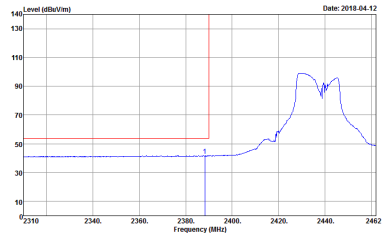
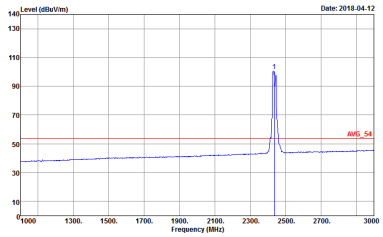
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH10-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 20.5	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 20.5
Avg.	 Site : 03CH10-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 20.5	 Site : 03CH10-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 20.5

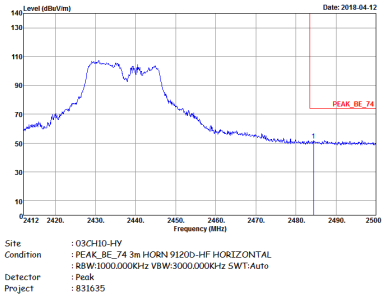
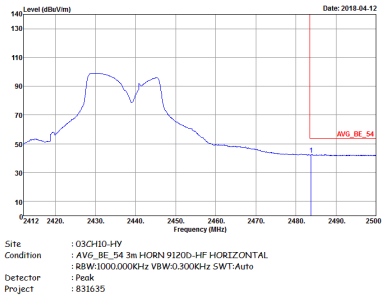
2.4GHz 2400~2483.5MHz

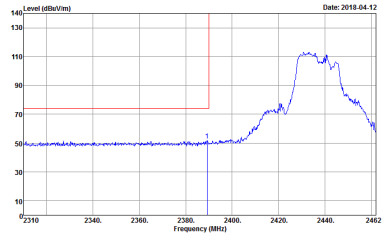
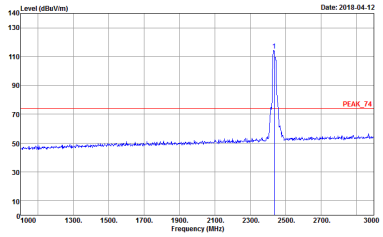
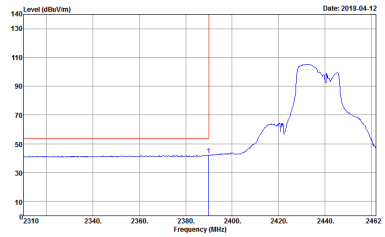
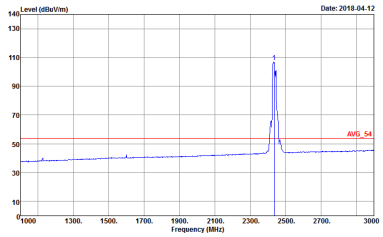
WIFI 802.11n HT20 (Band Edge @ 3m)

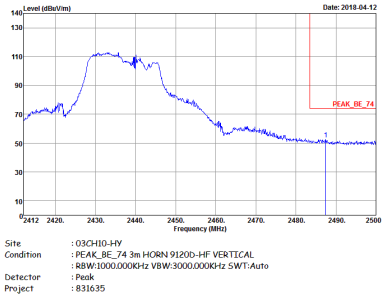
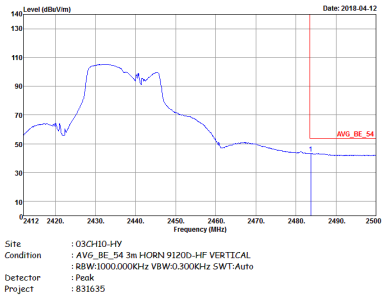
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.		

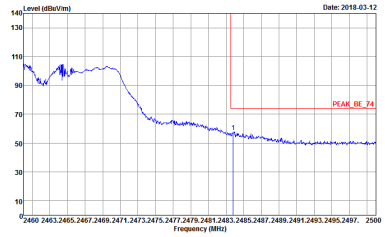
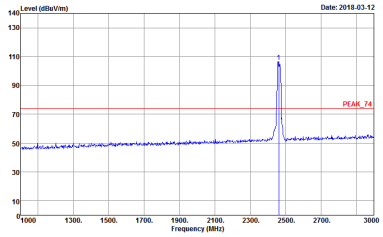
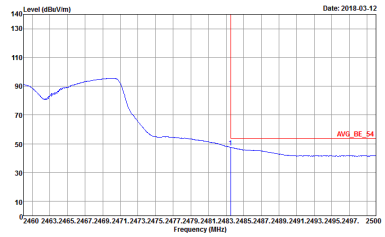
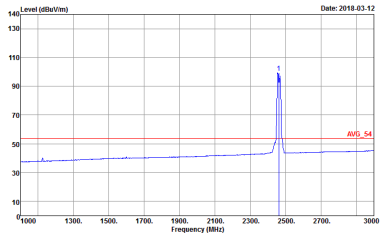
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH10-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21.5	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21.5
Avg.	 Site : 03CH10-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21.5	 Site : 03CH10-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21.5

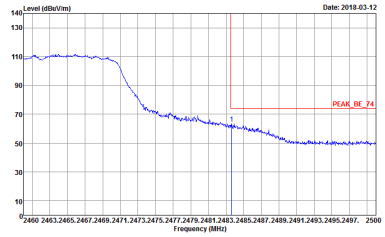
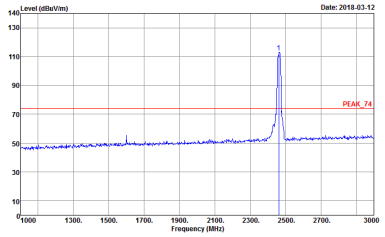
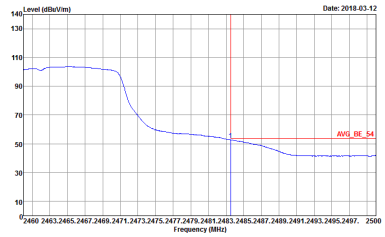
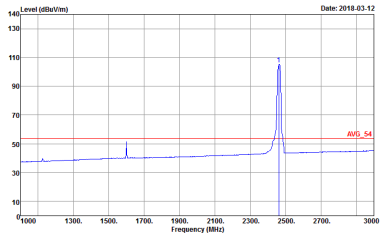
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH10-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635
Avg.	 Site : 03CH10-HY Condition : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Detector : Peak Project : 831635	 Site : 03CH10-HY Condition : AVG_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Detector : Peak Project : 831635

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1+2	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+2	Vertical	Fundamental
Peak	 Site : 03CH10-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635
Avg.	 Site : 03CH10-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Detector : Peak Project : 831635	 Site : 03CH10-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Detector : Peak Project : 831635

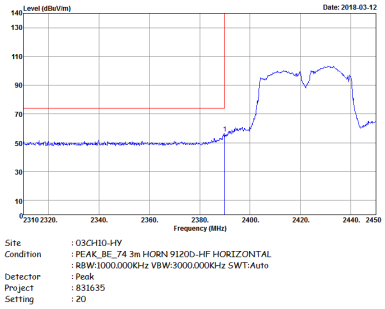
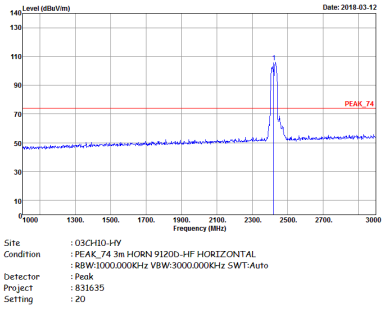
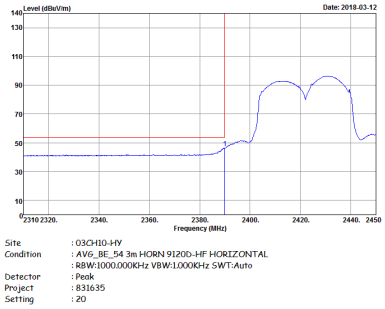
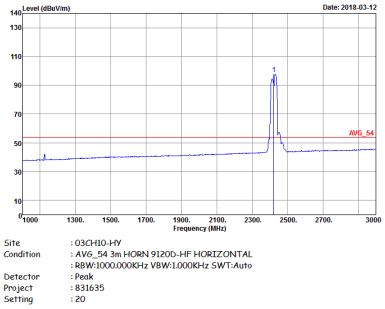
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1+2	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

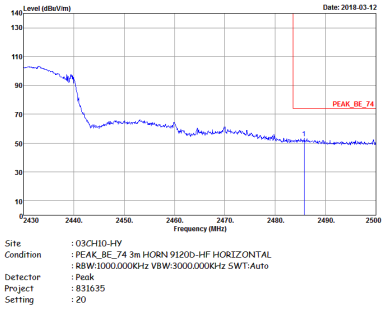
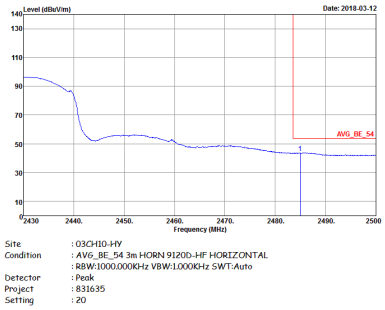
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH10-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21
Avg.	 Site : 03CH10-HY Condition : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21	 Site : 03CH10-HY Condition : AVG_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21

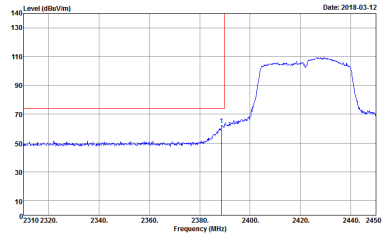
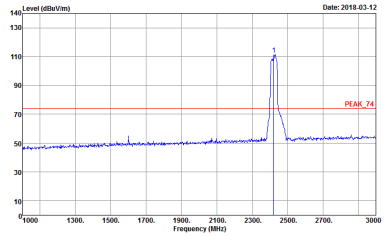
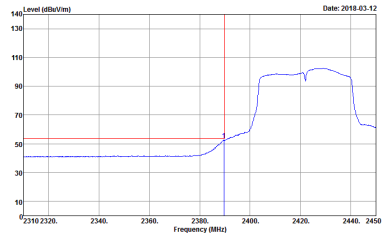
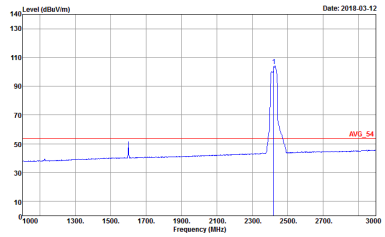
WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH10-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21
Avg.	 Site : 03CH10-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21	 Site : 03CH10-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:0.300KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21

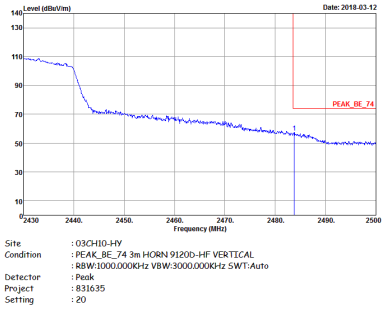
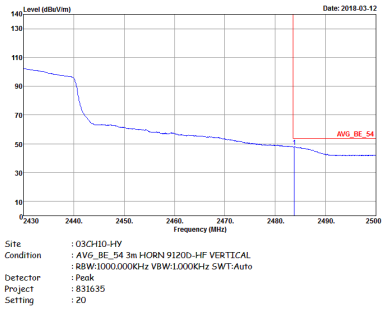
2.4GHz 2400~2483.5MHz

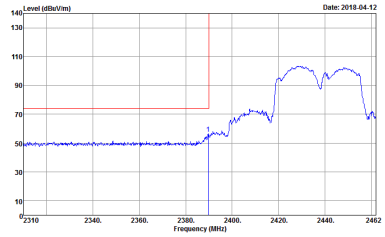
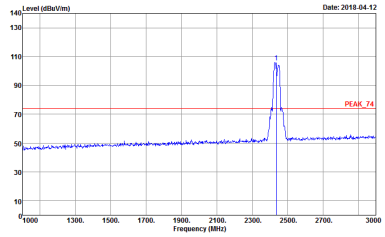
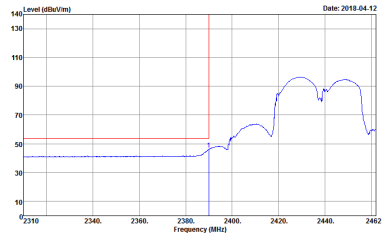
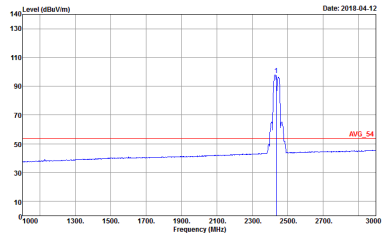
WIFI 802.11n HT40 (Band Edge @ 3m)

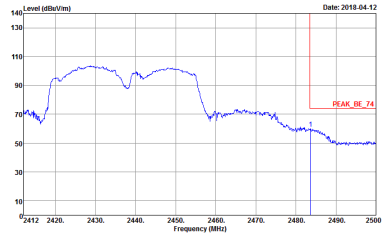
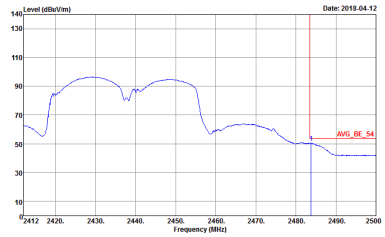
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH03 2422MHz - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

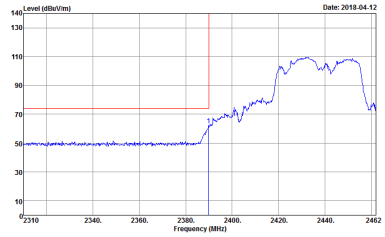
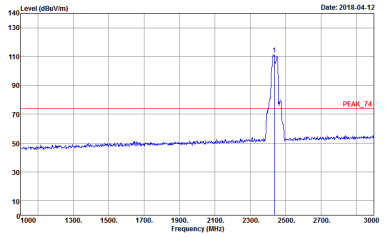
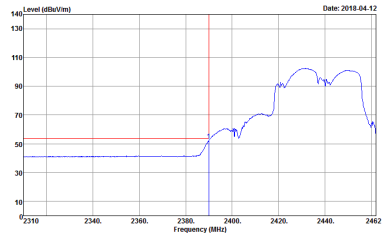
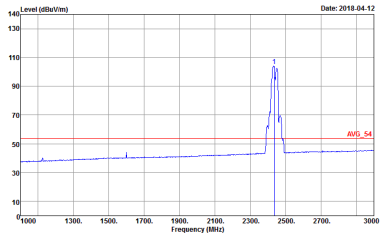
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH03 2422MHz - R	
1+2	Horizontal	Fundamental
Peak		Left Blank
Avg.		Left Blank

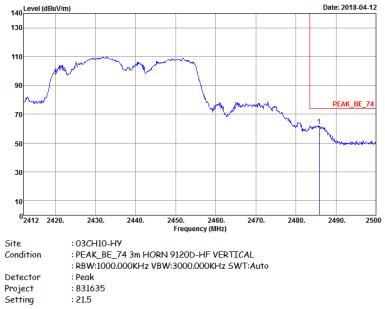
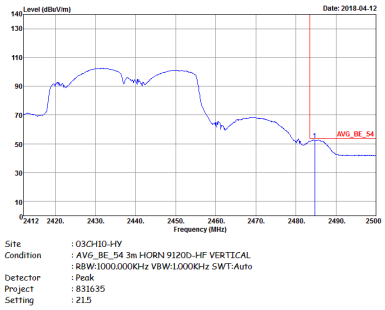
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH03 2422MHz - L	
1+2	Vertical	Fundamental
Peak		
Avg.		

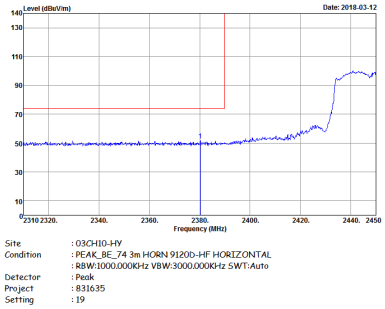
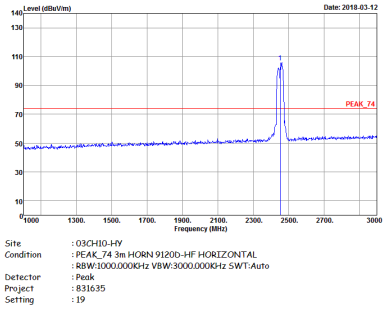
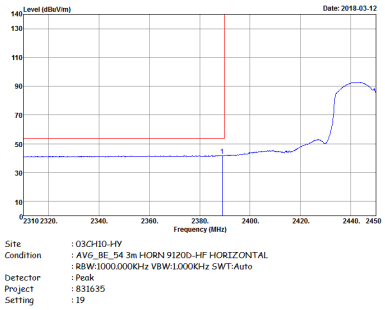
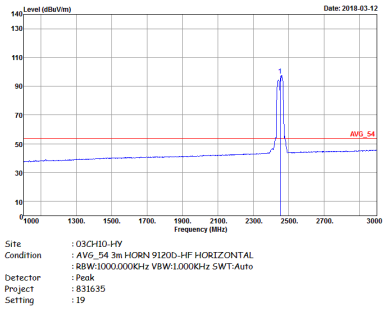
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH03 2422MHz - R	
1+2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

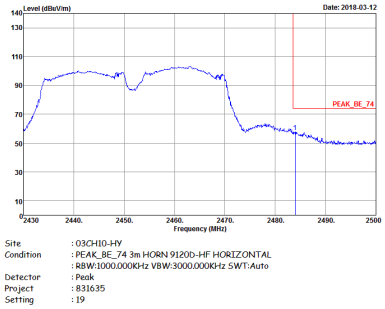
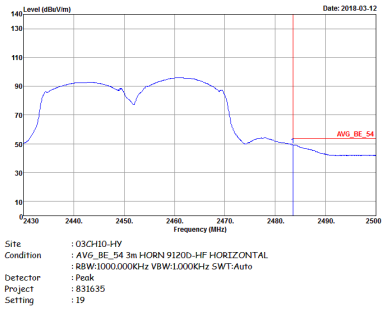
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH06 2437MHz - L	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH10-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21.5	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21.5
Avg.	 Site : 03CH10-HY Condition : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21.5	 Site : 03CH10-HY Condition : AVG_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21.5

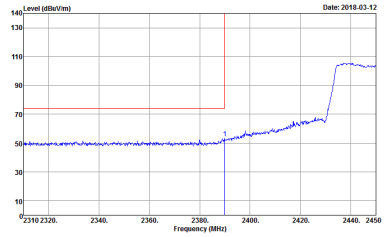
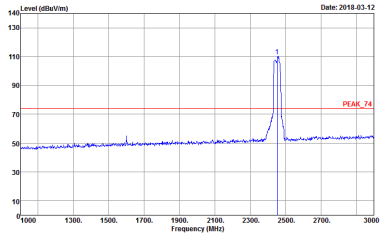
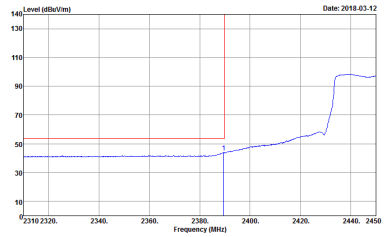
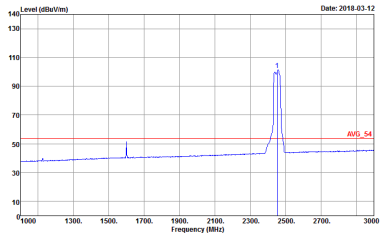
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH06 2437MHz - R	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH10-HV Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21.5	Left blank
Avg.	 Site : 03CH10-HV Condition : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21.5	Left blank

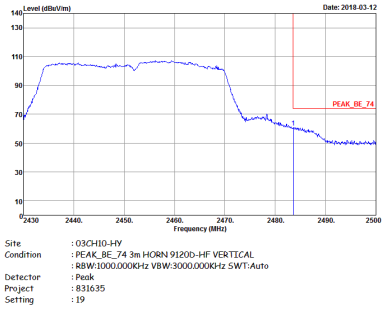
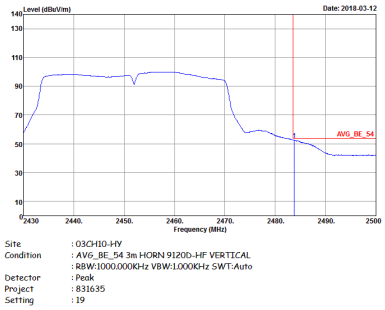
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH06 2437MHz - L	
1+2	Vertical	Fundamental
Peak	 Site : 03CH10-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21.5	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21.5
Avg.	 Site : 03CH10-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21.5	 Site : 03CH10-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 21.5

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH06 2437MHz - R	
1+2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

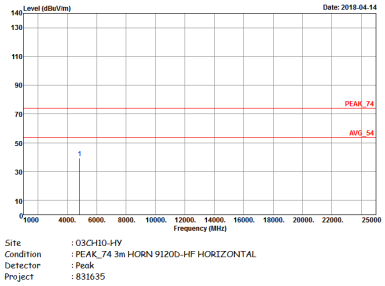
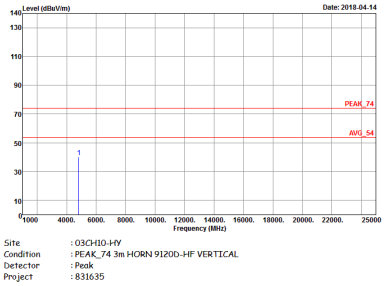
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - R	
1+2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

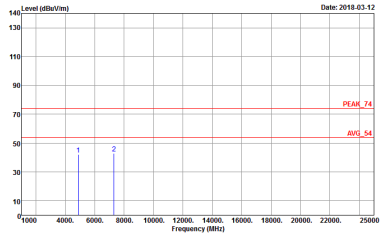
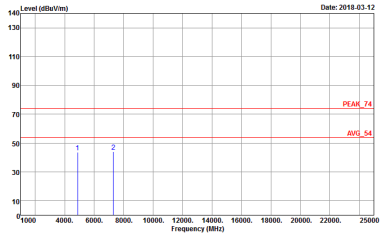
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - L	
1+2	Vertical	Fundamental
Peak	 Site : 03CH10-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 19	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 19
Avg.	 Site : 03CH10-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 19	 Site : 03CH10-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 831635 Setting : 19

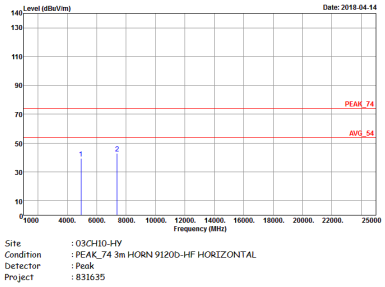
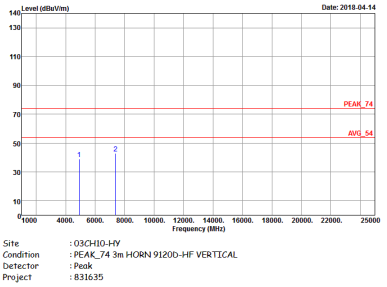
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - R	
1+2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

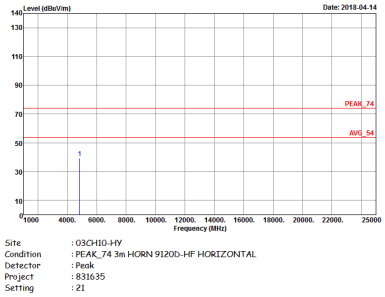
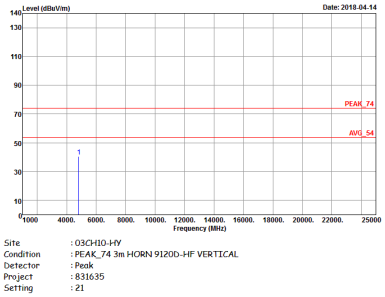
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1+2	Horizontal	Vertical
Peak Avg.		

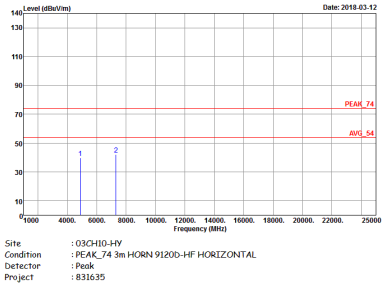
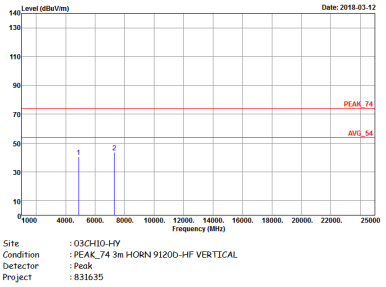
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL Detector : Peak Pretest : #FW181163 Model : MX65CW Mode : 11b_Tx_Ch06 Ant : 1+2 Setting : 22 Plane : X with Ant 90 Freq / Level / Over Limit / Limit Line / ReadAntenna Level / Cable Factor / Preamp Loss / A/Pos Factor / T/Pos / Remark MHz / dBuV/m / dB / dBuV/m / dBuV / dB/m / dB / dB / cm / deg 1 4874.00 42.21 -31.79 74.00 66.47 31.28 8.38 64.40 100 0 Peak 2 7311.00 42.76 -31.24 74.00 61.61 36.18 10.12 65.55 100 0 Peak	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL Detector : Peak Pretest : #FW181163 Model : MX65CW Mode : 11b_Tx_Ch06 Ant : 1+2 Setting : 22 Plane : X with Ant 90 Freq / Level / Over Limit / Limit Line / ReadAntenna Level / Cable Factor / Preamp Loss / A/Pos Factor / T/Pos / Remark MHz / dBuV/m / dB / dBuV/m / dBuV / dB/m / dB / dB / cm / deg 1 4874.00 43.71 -30.29 74.00 67.97 31.28 8.38 64.40 100 0 Peak 2 7311.00 44.19 -29.81 74.00 63.04 36.18 10.12 65.55 100 0 Peak

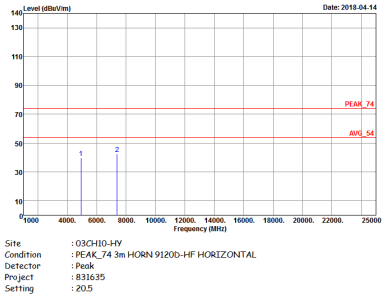
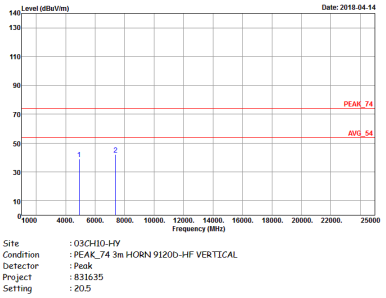
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 831635	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL Detector : Peak Project : 831635

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

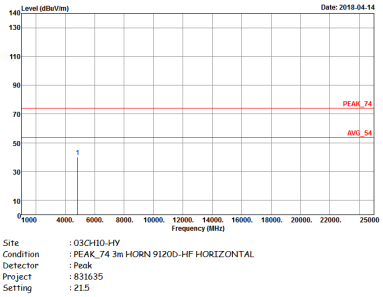
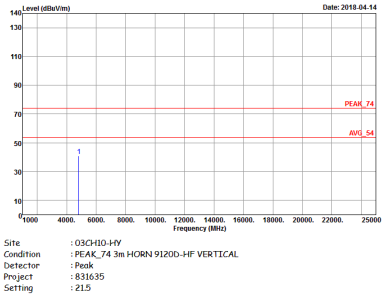
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1+2	Horizontal	Vertical
Peak Avg.		

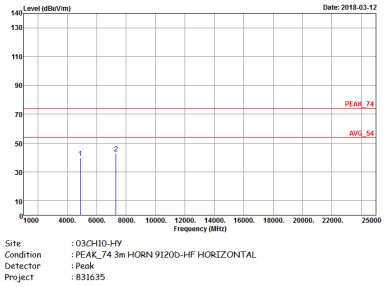
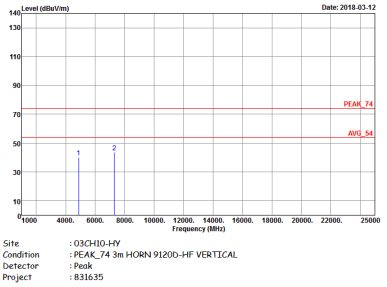
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 831635	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL Detector : Peak Project : 831635

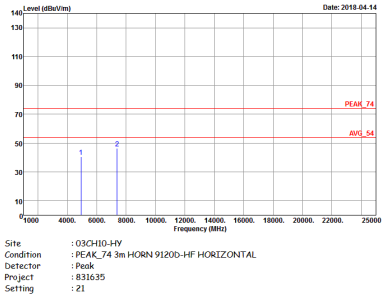
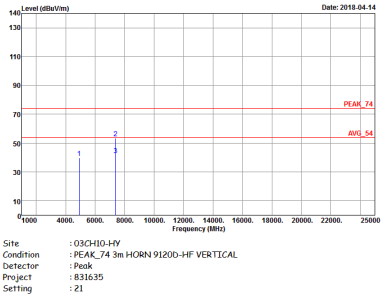
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1+2	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

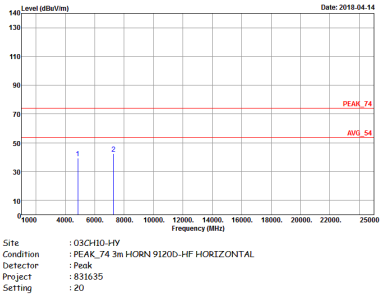
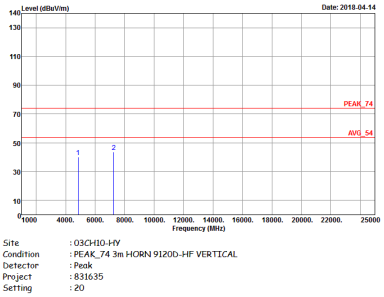
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1+2	Horizontal	Vertical
Peak Avg.		

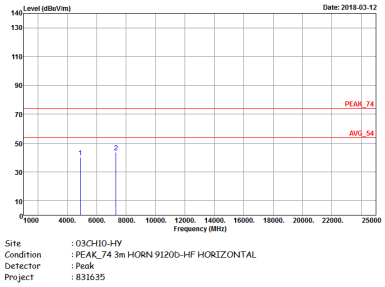
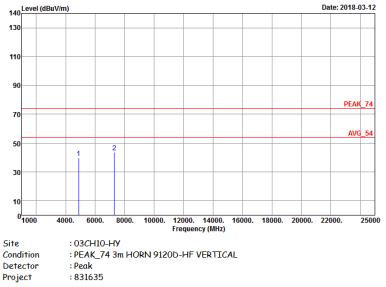
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 831635	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL Detector : Peak Project : 831635

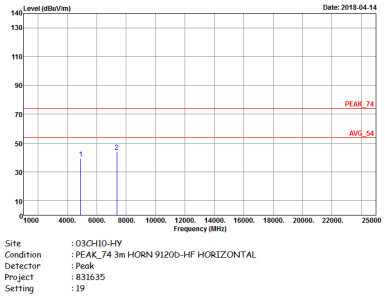
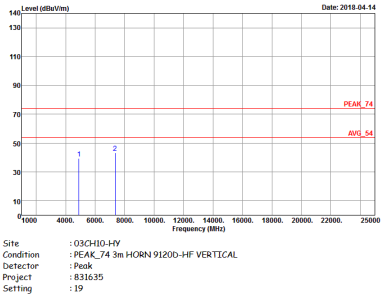
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1+2	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT40 CH03 2422MHz	
1+2	Horizontal	Vertical
Peak Avg.		

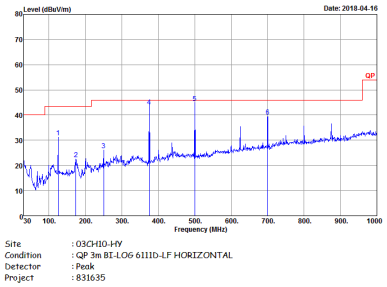
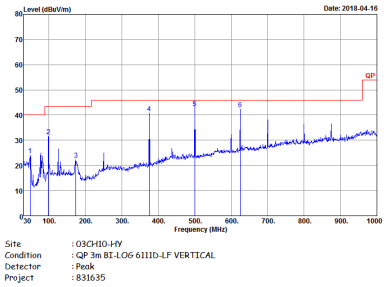
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT40 CH06 2437MHz	
1+2	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT40 CH09 2452MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 831635 Setting : 19	 Site : 03CH10-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL Detector : Peak Project : 831635 Setting : 19

2.4GHz 2400~2483.5MHz

Emission below 1GHz

2.4GHz WIFI 802.11g (LF)

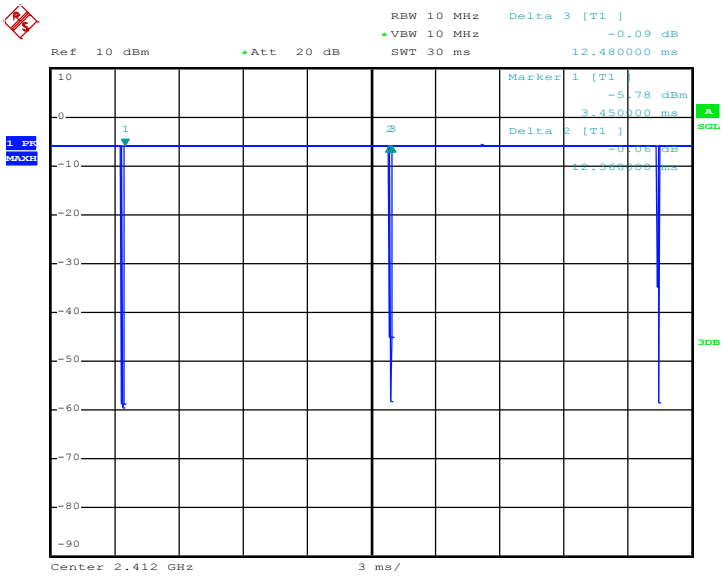
WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11g LF	
1+2	Horizontal	Vertical
QP / Peak		

Appendix E. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
1+2	802.11b for Ant. 1	99.04	-	-	10Hz	0.04
1+2	802.11b for Ant. 2	99.28	-	-	10Hz	0.03
1+2	802.11g for Ant. 1	96.08	2058	0.49	1kHz	0.17
1+2	802.11g for Ant. 2	96.09	2064	0.48	1kHz	0.17
1+2	2.4GHz 802.11n HT20 for Ant. 1	98.22	-	-	10Hz	0.08
1+2	2.4GHz 802.11n HT20 for Ant. 2	98.22	-	-	10Hz	0.08
1+2	2.4GHz 802.11n HT40 for Ant. 1	96.03	2420	0.41	1kHz	0.18
1+2	2.4GHz 802.11n HT40 for Ant. 2	96.80	2420	0.41	1kHz	0.14
1+2	2.4GHz 802.11ac20 for Ant. 1	98.23	-	-	10Hz	0.08
1+2	2.4GHz 802.11ac20 for Ant. 2	98.82	-	-	10Hz	0.05
1+2	2.4GHz 802.11ac40 for Ant. 1	96.83	2440	0.41	1kHz	0.14
1+2	2.4GHz 802.11ac40 for Ant. 2	96.05	2430	0.41	1kHz	0.18

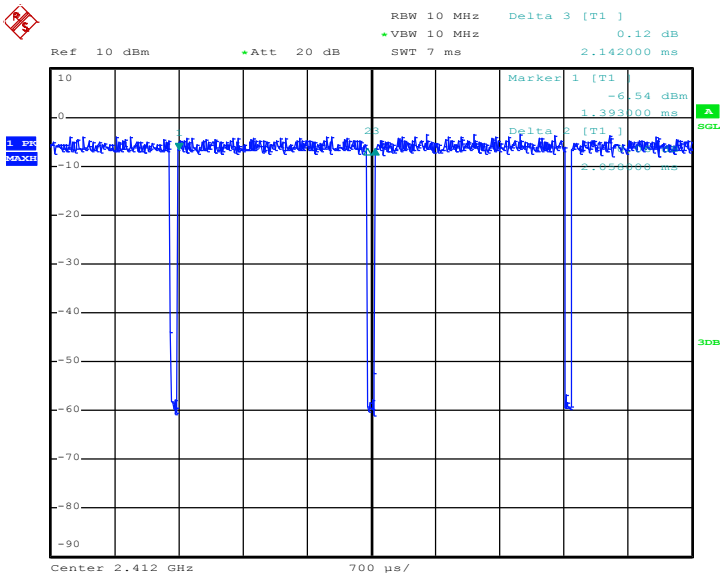
MIMO <Ant. 1>

802.11b



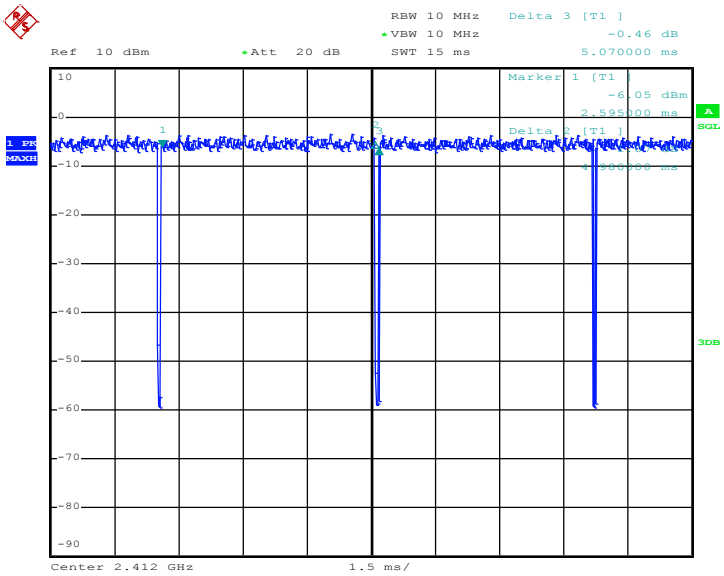
Date: 28.APR.2018 07:23:14

802.11g



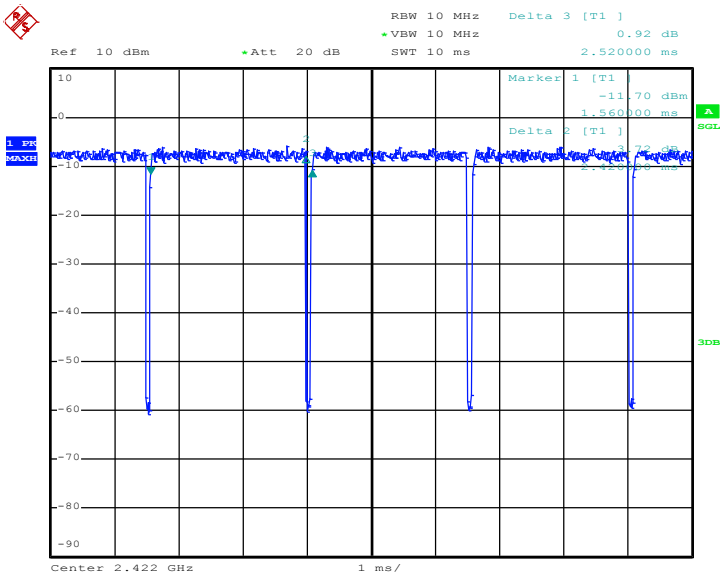
Date: 28.APR.2018 07:25:22

802.11n HT20



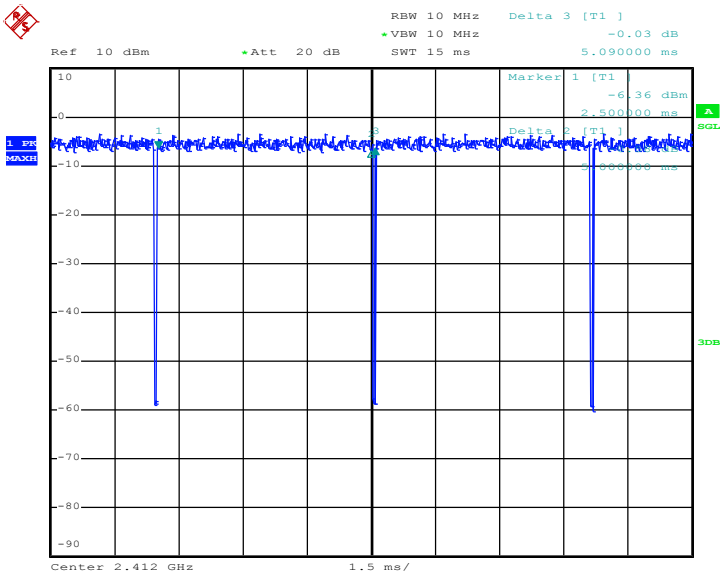
Date: 28.APR.2018 07:27:03

802.11n HT40



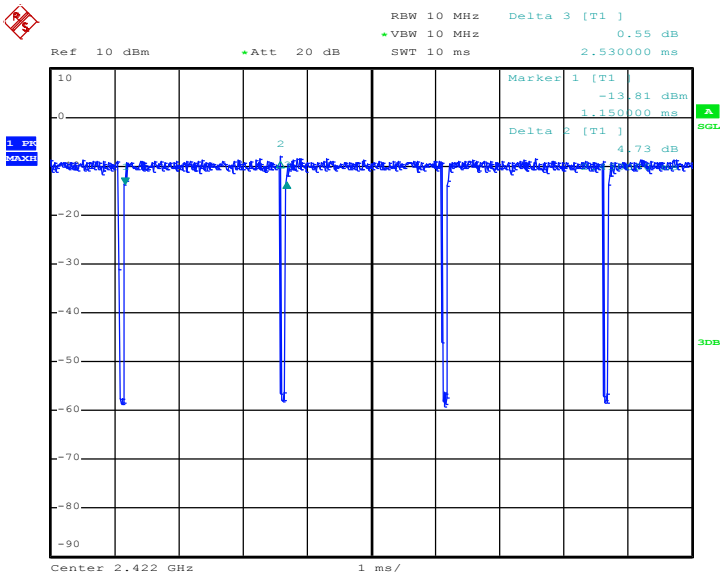
Date: 28.APR.2018 07:31:07

802.11ac VHT20



Date: 28.APR.2018 07:32:34

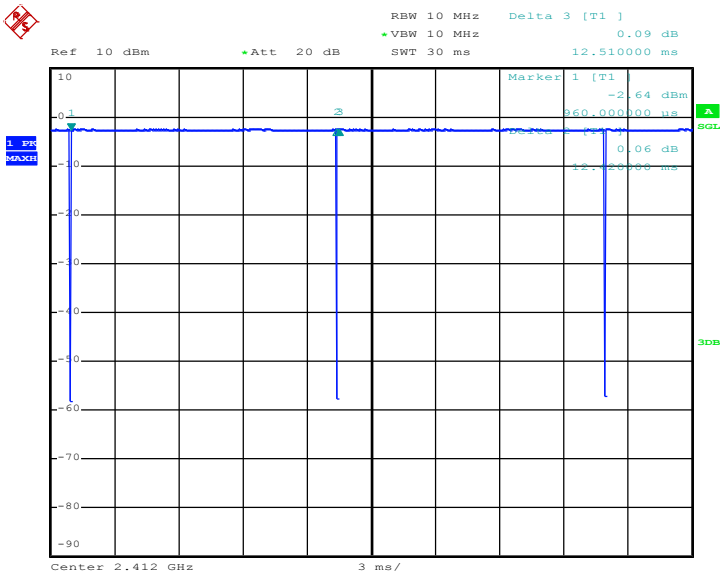
802.11ac VHT40



Date: 3.MAY.2018 15:56:40

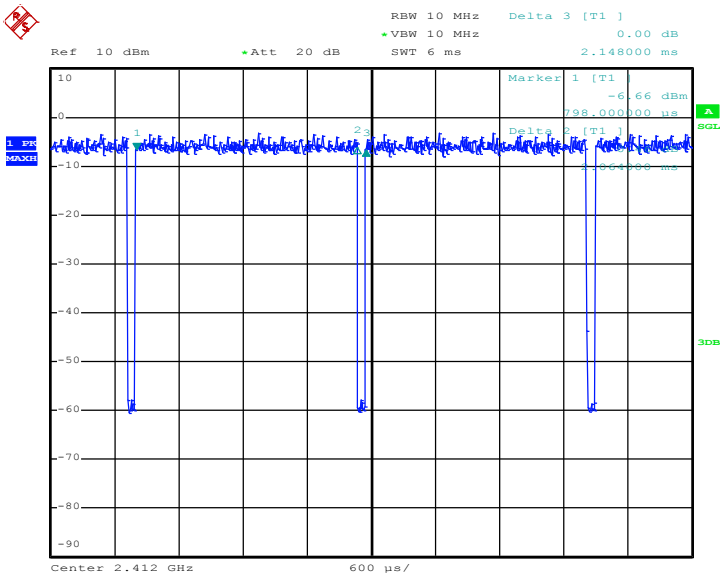
MIMO <Ant. 2>

802.11b



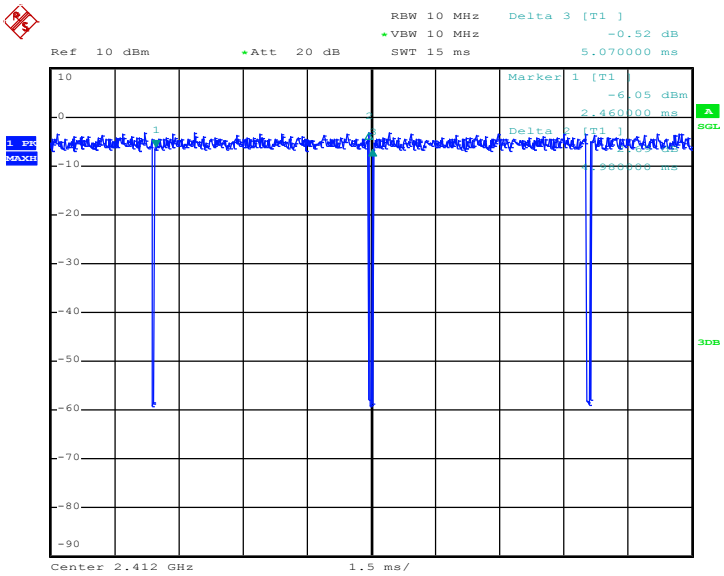
Date: 21.AUG.2018 19:05:06

802.11g



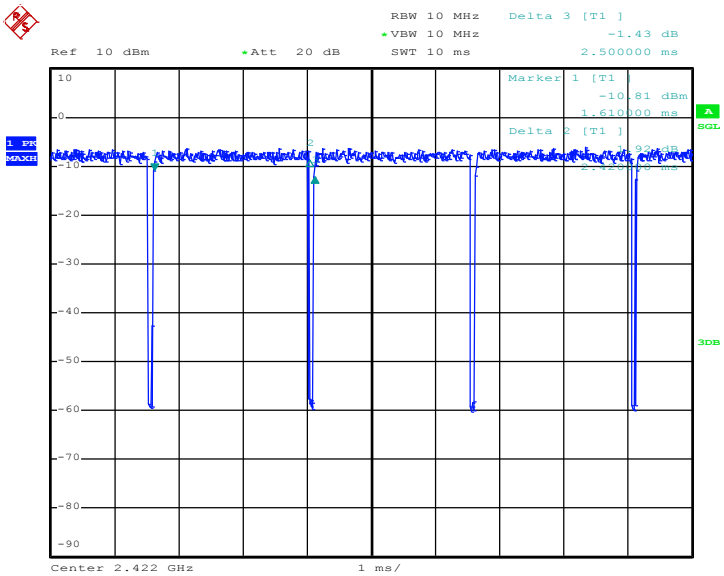
Date: 28.APR.2018 07:26:16

802.11n HT20



Date: 28.APR.2018 07:27:39

802.11n HT40



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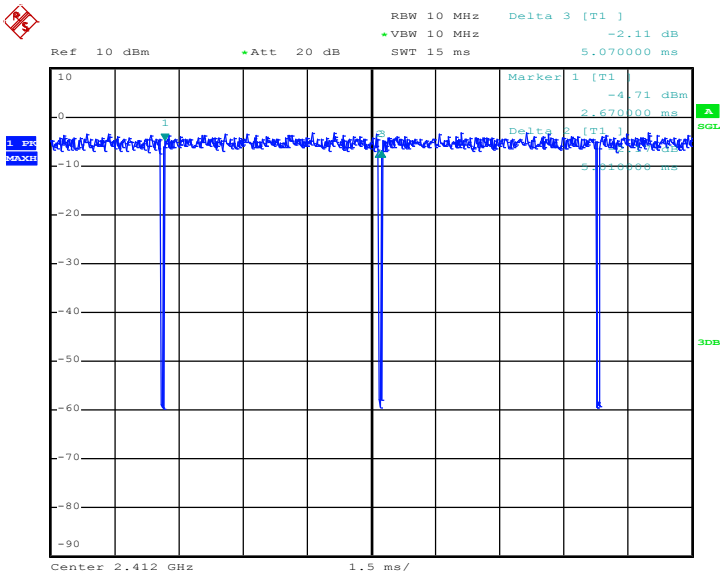
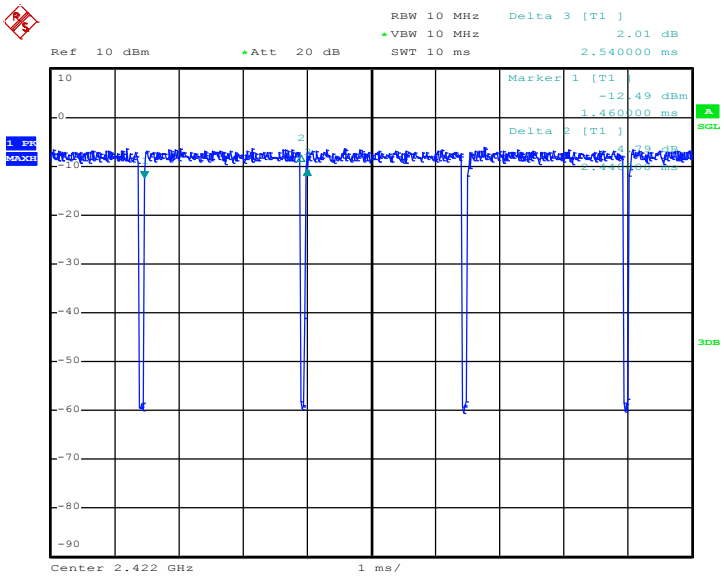
802.11ac VHT20



Date: 28.APR.2018 07:33:15

802.11ac VHT40



Date: 28.APR.2018 07:35:24