



FCC RADIO TEST REPORT

FCC ID : B32E280BTWFDB
Equipment : Point of Sales Terminal
Brand Name : Verifone
Model Name : e280 DB
Applicant : Verifone, Inc.
88 West Plumeria Drive, San Jose, CA 95134, United States
Manufacturer : Verifone, Inc.
Standard : FCC Part 15 Subpart C §15.247

The product was received on Oct. 12, 2019 and testing was started from Oct. 12, 2019 and completed on Nov. 28, 2019. We, SPORTON INTERNATIONAL INC., EMC & Wireless Communications Laboratory, 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.

Louis Wu

Approved by: Louis Wu

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



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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 5.29 dB at 2390.000 MHz
3.6	15.207	AC Conducted Emission	Pass	Under limit 10.63 dB at 13.487 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass	-

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Wii Chang**Report Producer: Celery Wei**



1 General Description

1.1 Product Feature of Equipment Under Test

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

Product Specification subjective to this standard	
Antenna Type	WLAN: Stamping Antenna Bluetooth: Stamping Antenna RFID: Loop Antenna

Specification of Accessory		
AC Adapter	Brand Name	Verifone
	Manufacturer	Phihong
	Model Name	PSAA05A-050QL6V
	Power Rating	Input:100-240Vac, 50-60Hz 0.2A Output: 5V/1A
	Power Cord	N/A
Battery	Brand Name	Verifone
	Model Name	BPK087-700
USB Cable	Brand Name	Verifone
	Model Name	N/A

1.2 Modification of EUT

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



1.3 Testing Location

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory	
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.	
	TH05HY	CO05-HY

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory	
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.	
	03CH12-HY	

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

FCC designation No.: TW1190 and TW0007

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 v05r02
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01.
- ♦ 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 (Z plane) were recorded in this report.

- b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

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

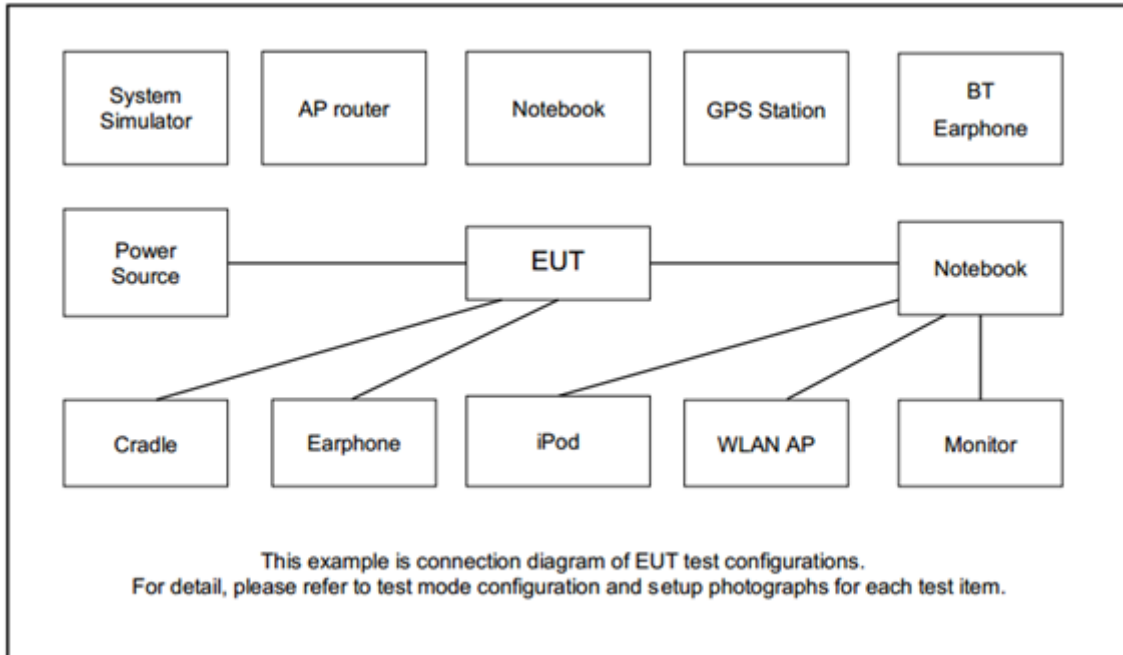
2.2 Test Mode

Final test modes are considering the modulation and worse data rates as below table.

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

Test Cases	
AC Conducted Emission	Mode 1: Bluetooth Link + WLAN (2.4GHz) Link + MSR + Smart Card + LED + Buzzer/Speaker + Display + RFID On + USB Cable (Charging from Adapter)

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.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
2.	MSR Card	N/A	N/A	N/A	N/A	N/A
3.	Smart Card	N/A	N/A	N/A	N/A	N/A
4.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

2.5 EUT Operation Test Setup

The RF test items, utility “Tera Term (V.4.83)” 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.

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\ &= 4.2 + 10 = 14.2 \text{ (dB)} \end{aligned}$$

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 11.8.1 (6dB BW).
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) $\geq 3 * RBW$.
6. Measure and record the results in the test report.

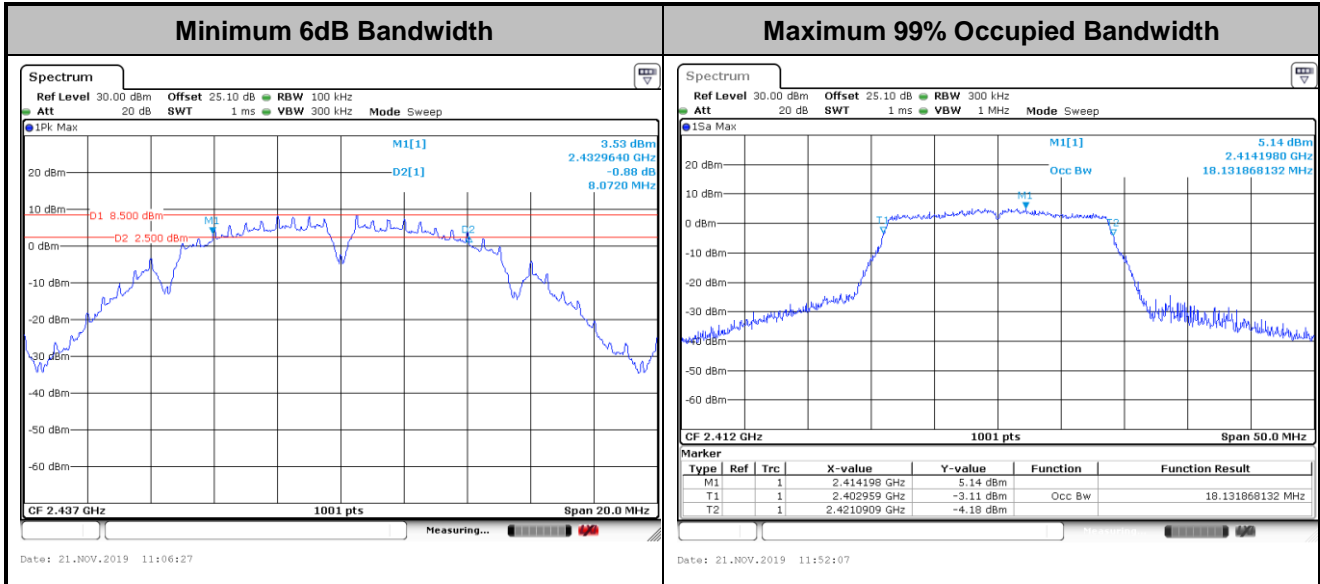
3.1.4 Test Setup





3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.



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.

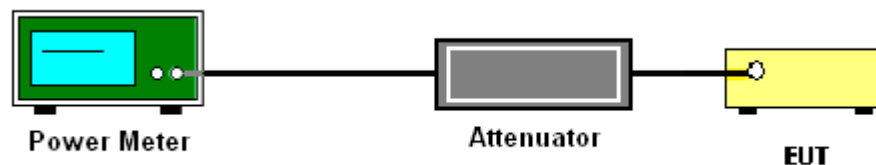
3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

3.2.3 Test Procedures

1. For Peak Power, the testing follows ANSI C63.10 Section 11.9.1.3 PKPM1
2. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
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.

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 the ANSI C63.10 Section 11.10.2 Method PKPSD.
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.

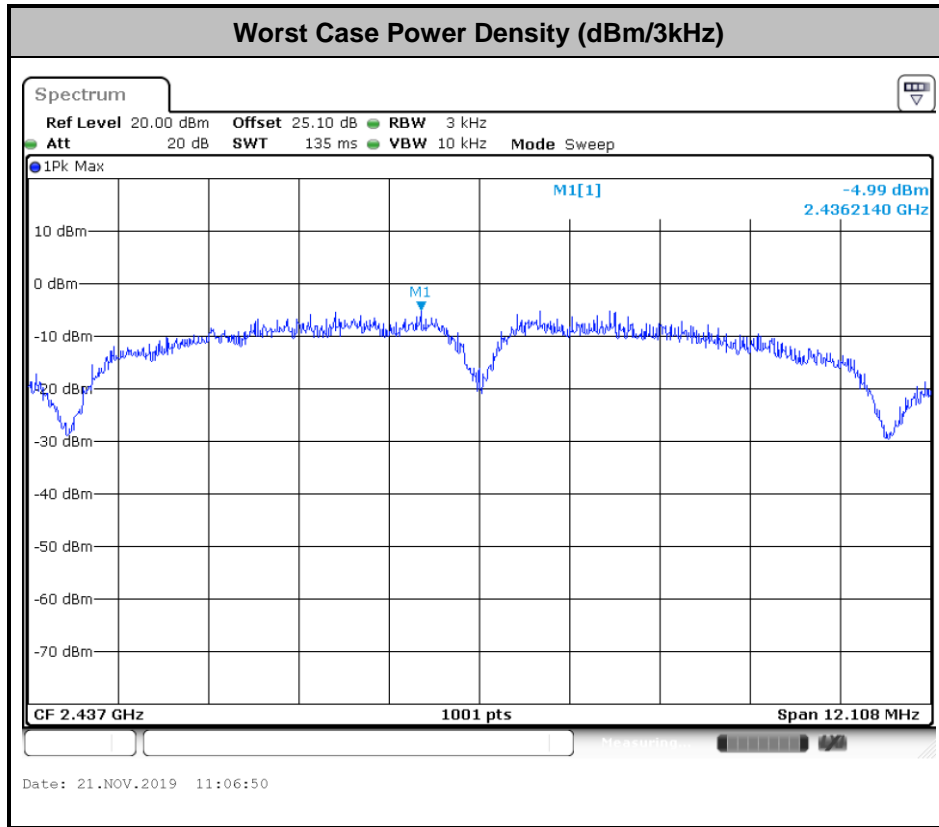
3.3.4 Test Setup





3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



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.

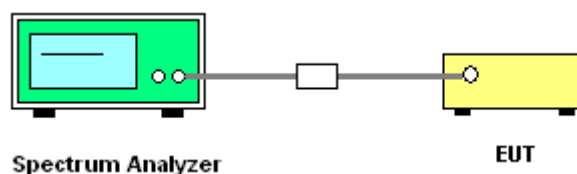
3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

3.4.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.11.3 Emission level measurement.
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

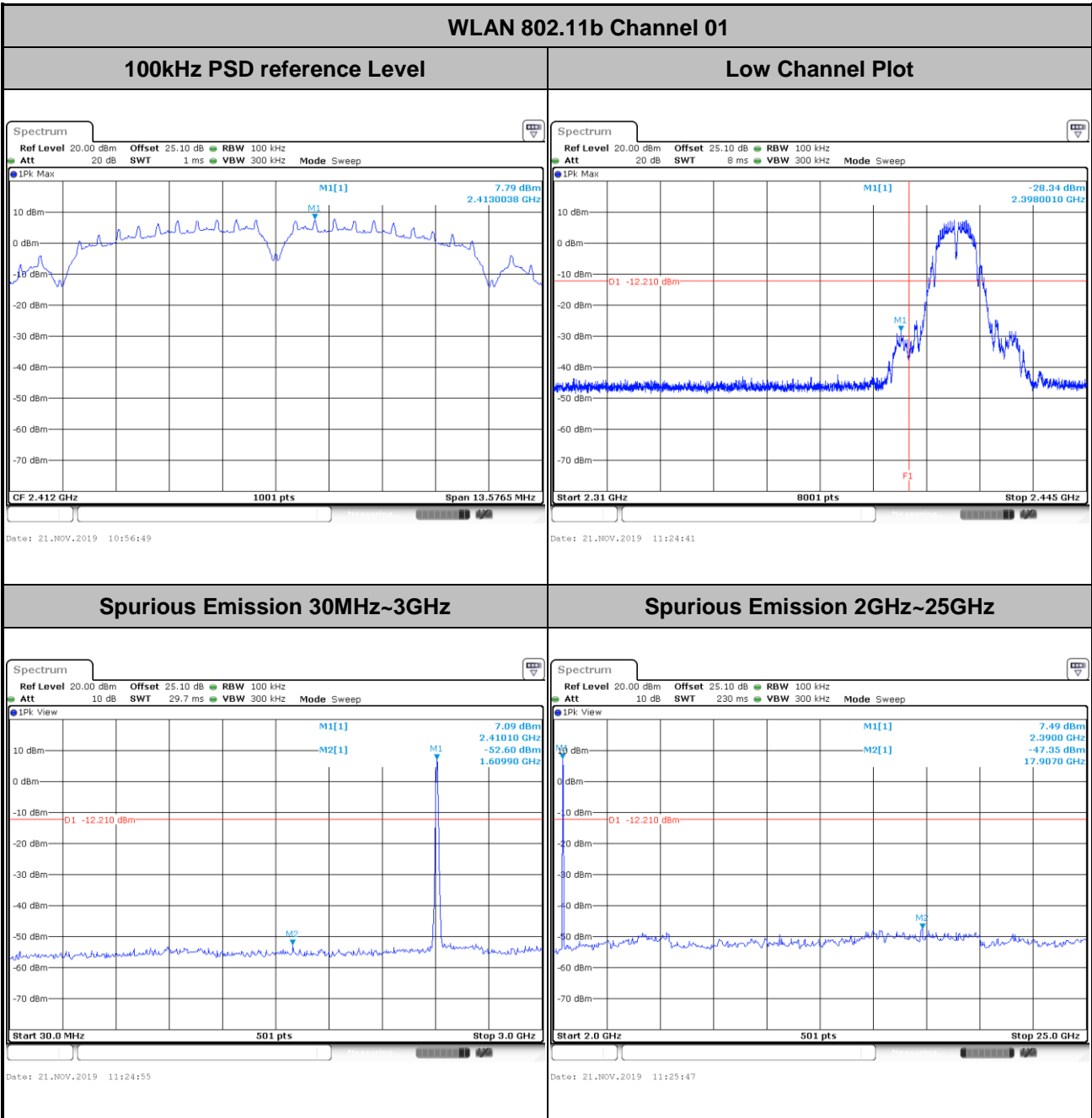




3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Engineer : Derek Hsu	Temperature :	21~25°C
	Relative Humidity :	51~54%

Test Mode :	802.11b	Test Channel :	01
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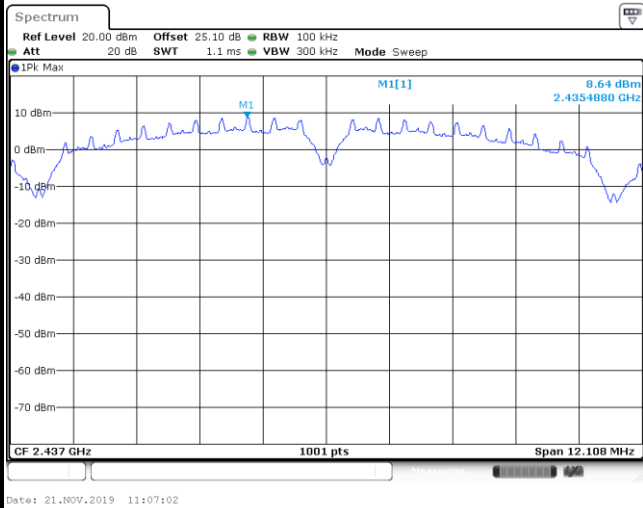


Test Mode :	802.11b	Test Channel :	06
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WLAN 802.11b Channel 06

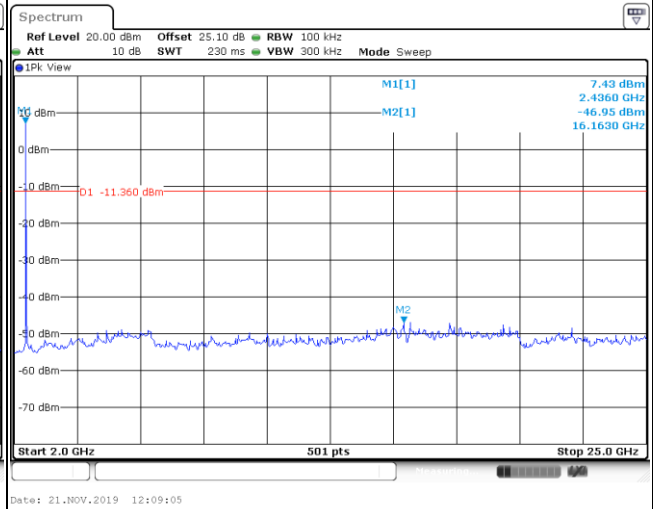
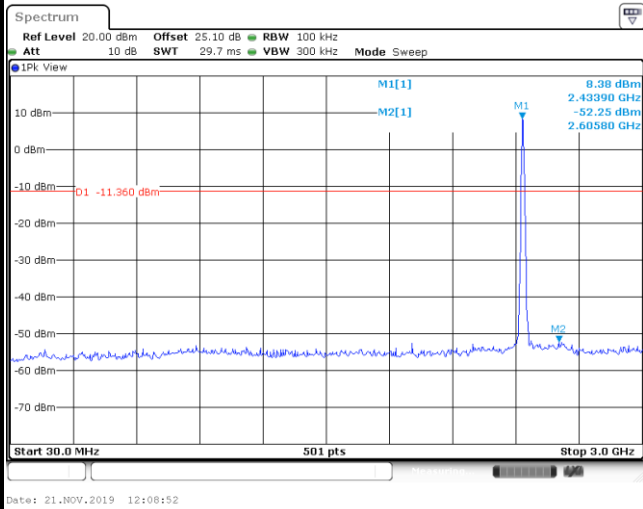
100kHz PSD reference Level

Mid Channel Plot



Spurious Emission 30MHz~3GHz

Spurious Emission 2GHz~25GHz

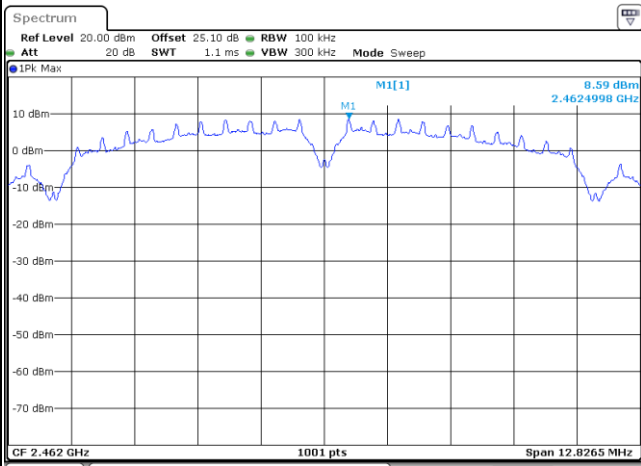




Test Mode :	802.11b	Test Channel :	11
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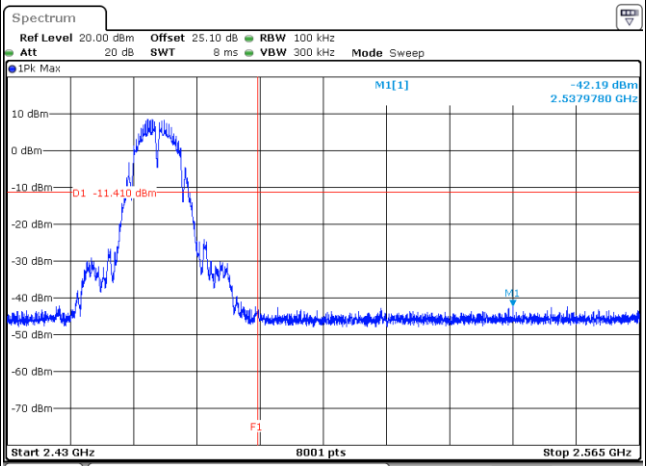
WLAN 802.11b Channel 11

100kHz PSD reference Level



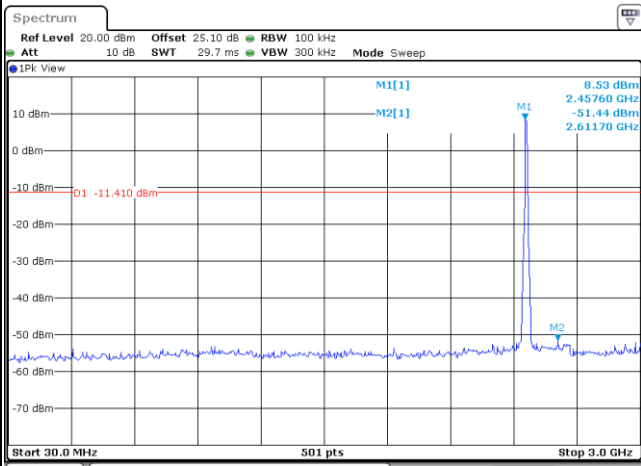
Date: 21.NOV.2019 11:10:19

High Channel Plot



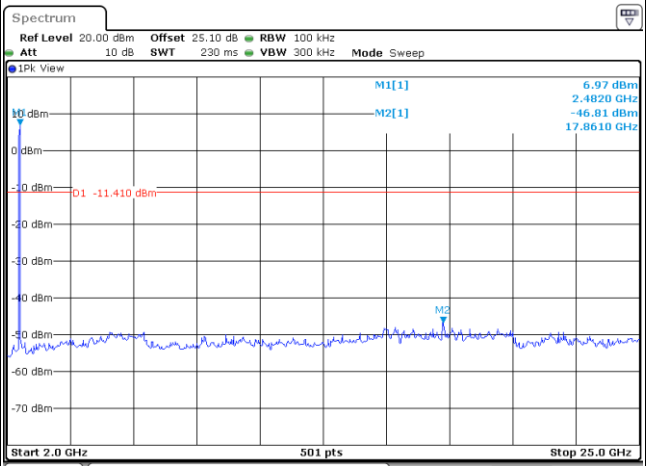
Date: 21.NOV.2019 11:28:58

Spurious Emission 30MHz~3GHz



Date: 21.NOV.2019 11:33:17

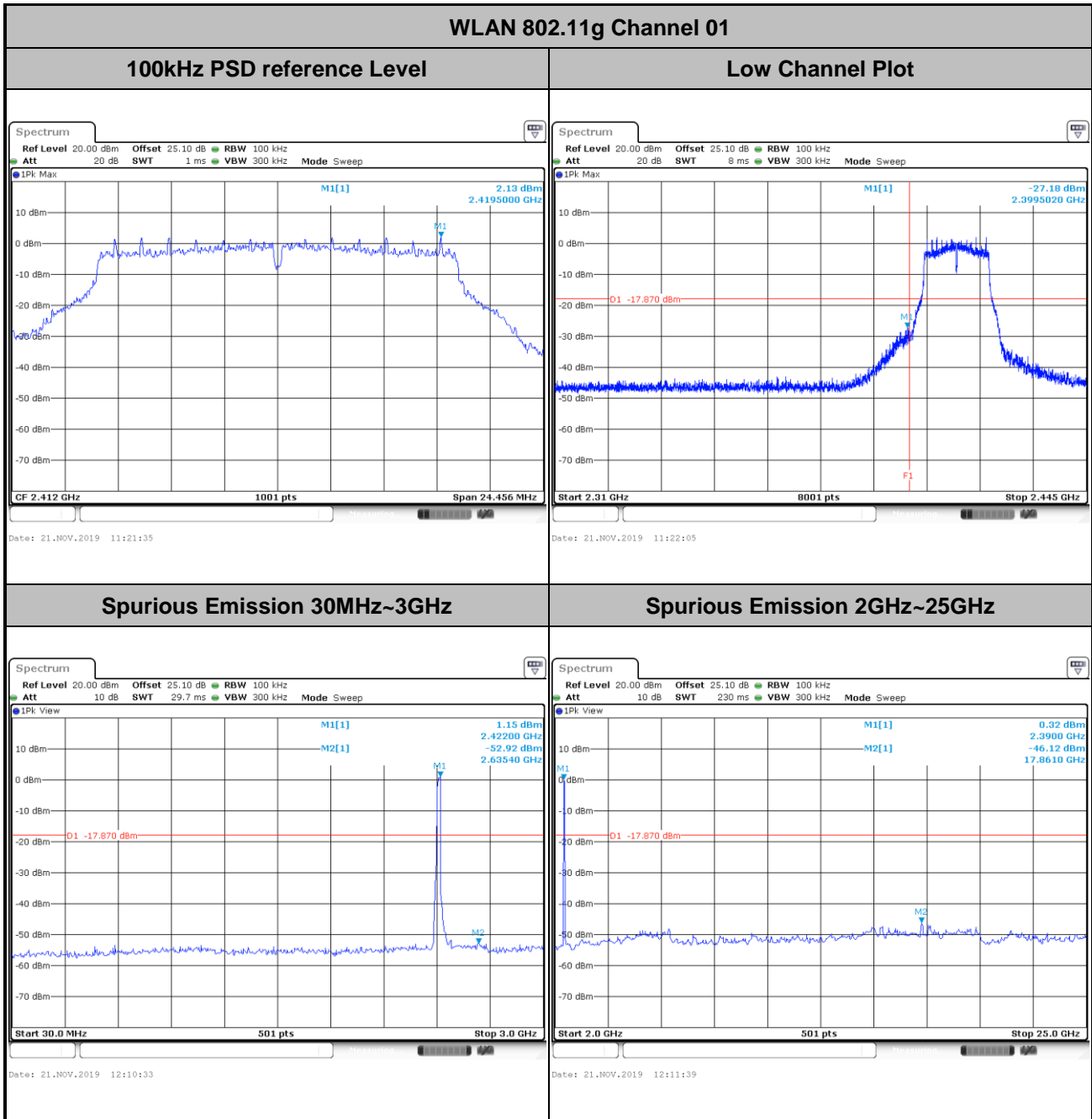
Spurious Emission 2GHz~25GHz



Date: 21.NOV.2019 11:35:04



Test Mode :	802.11g	Test Channel :	01
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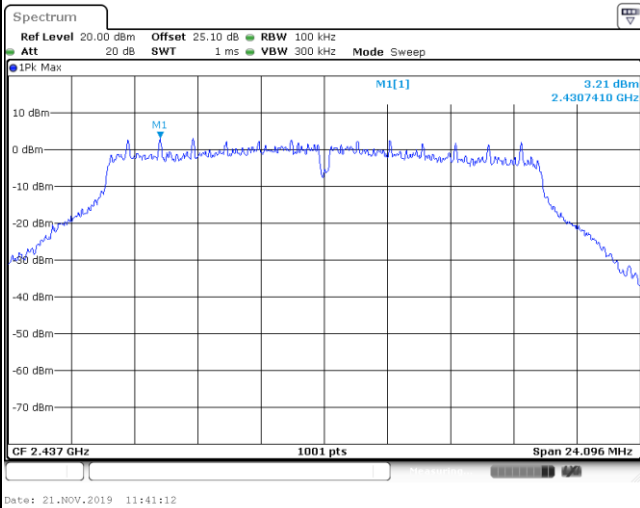


Test Mode :	802.11g	Test Channel :	06
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WLAN 802.11g Channel 06

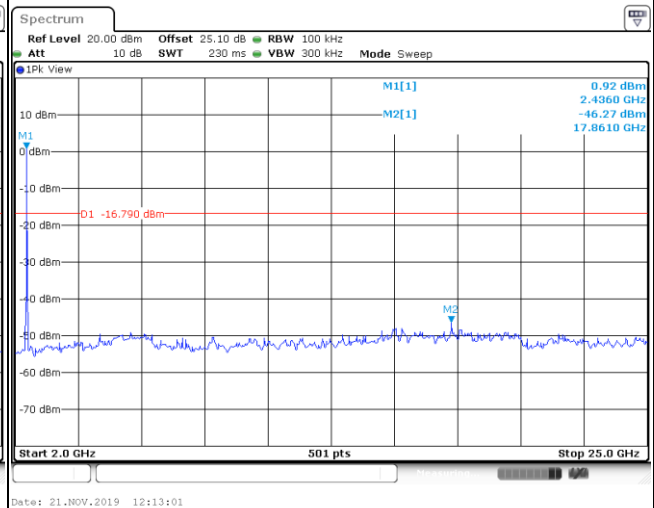
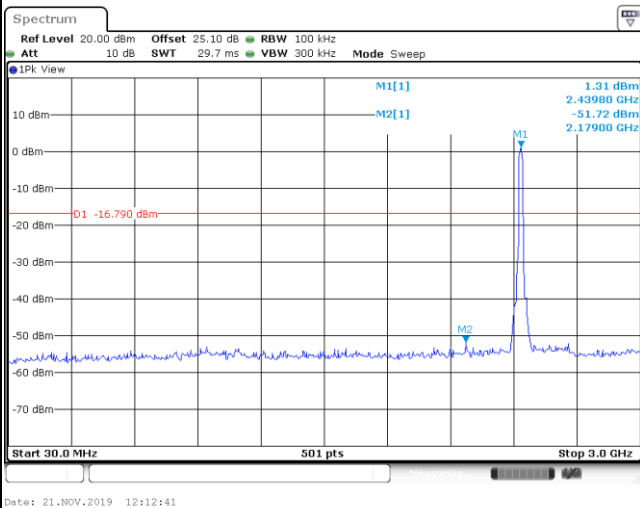
100kHz PSD reference Level

Mid Channel Plot



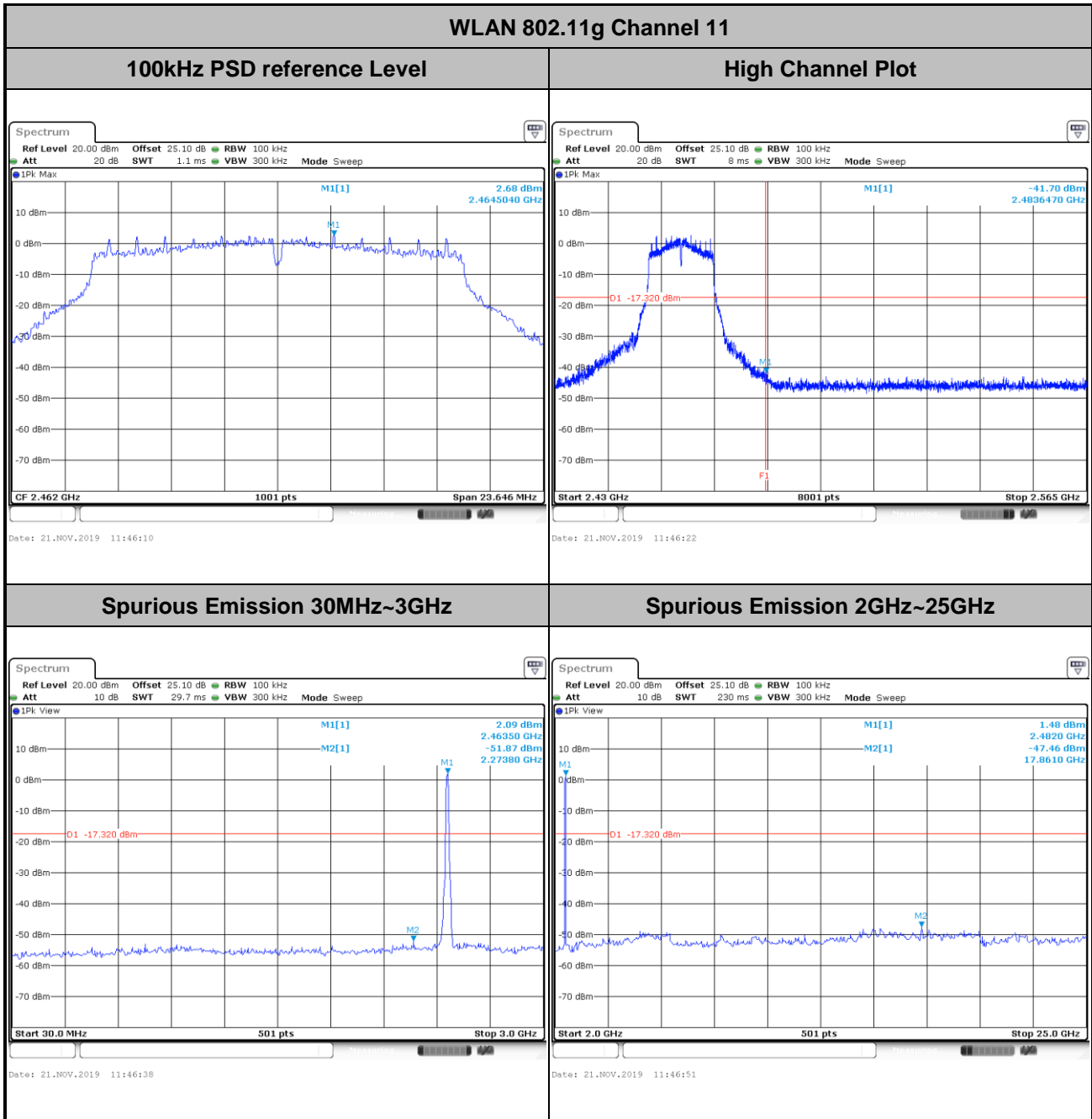
Spurious Emission 30MHz~3GHz

Spurious Emission 2GHz~25GHz



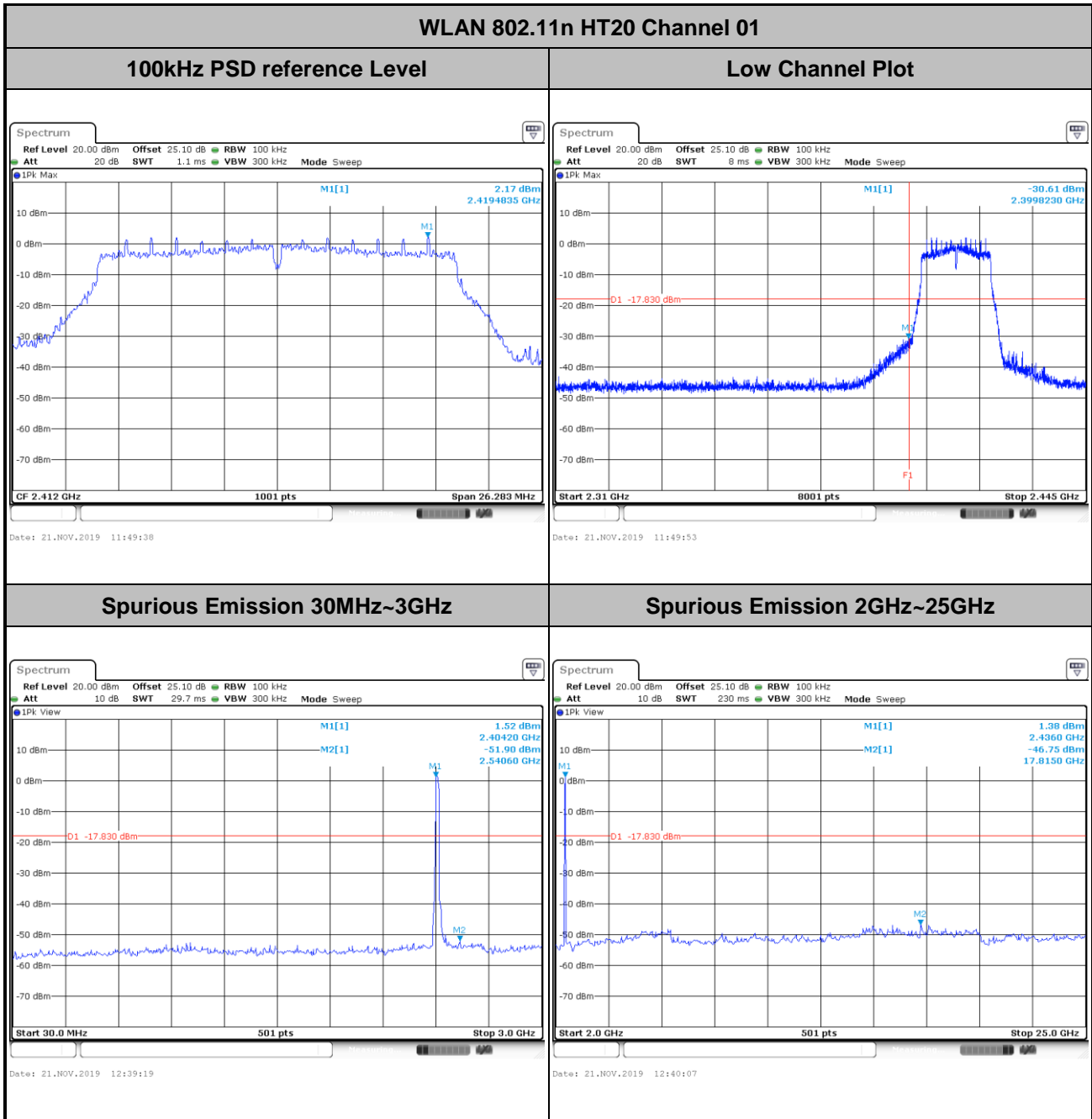


Test Mode :	802.11g	Test Channel :	11
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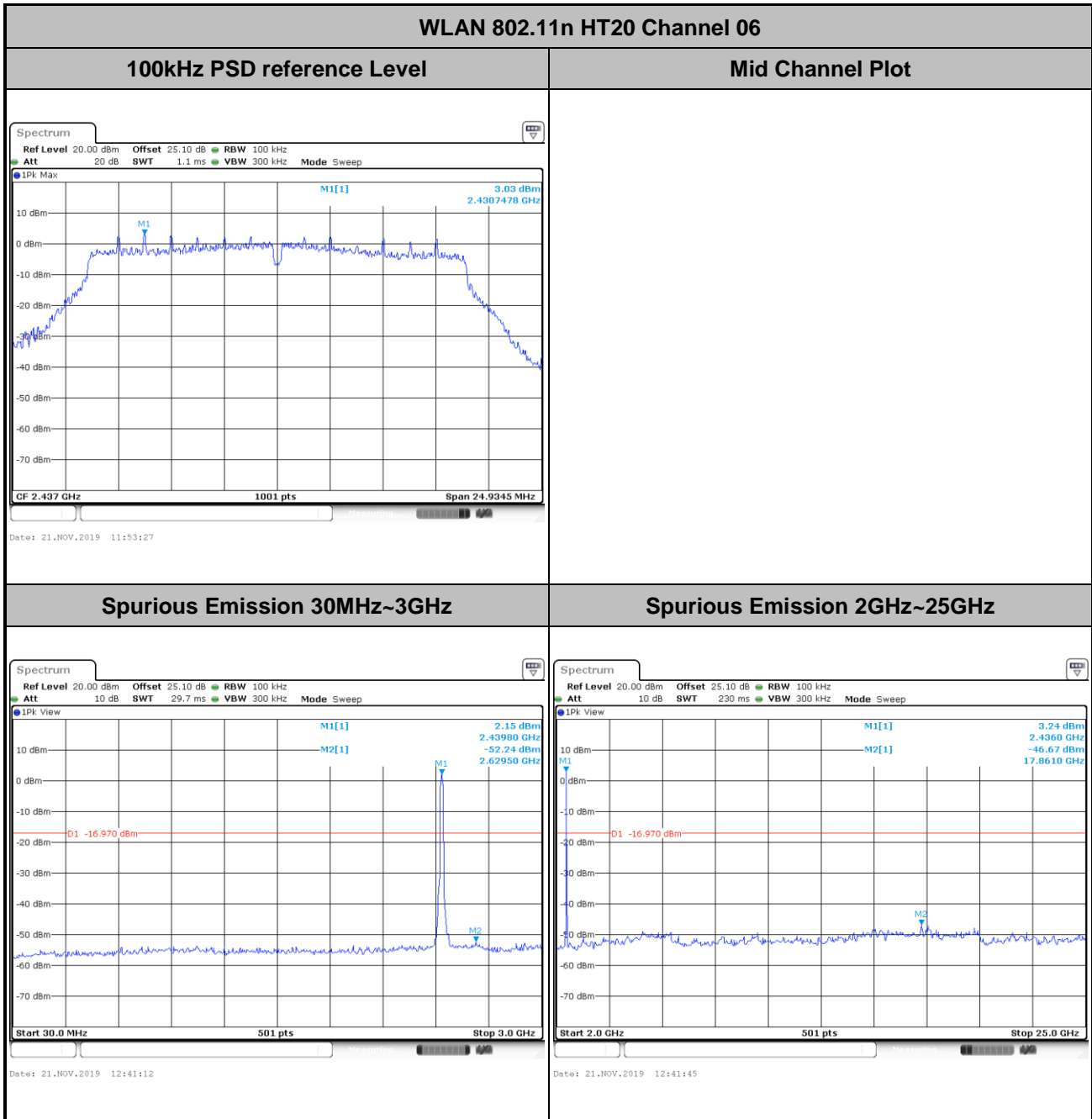


Test Mode :	802.11n HT20	Test Channel :	01
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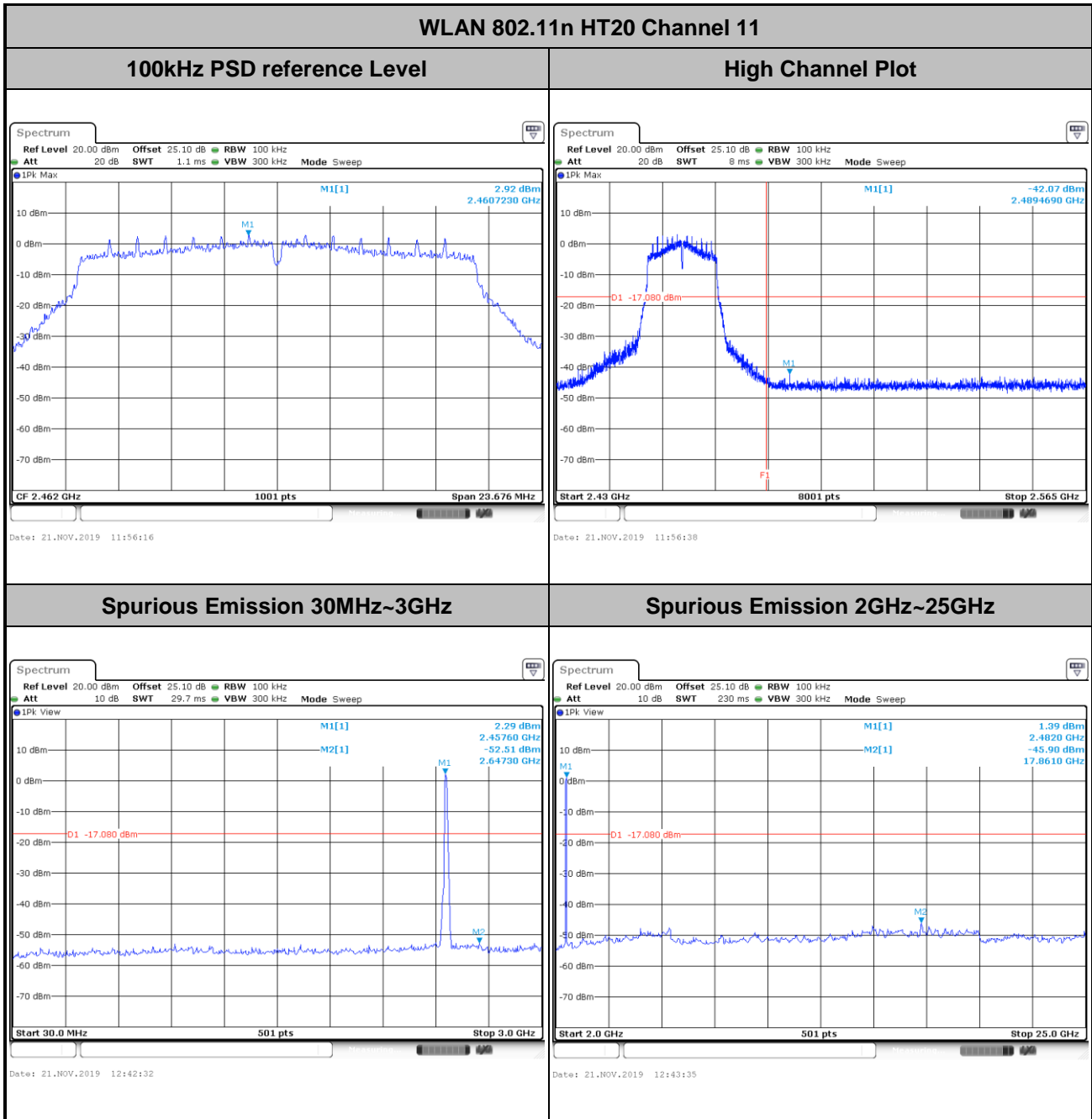


Test Mode :	802.11n HT20	Test Channel :	06
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Test Mode :	802.11n HT20	Test Channel :	11
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3.5 Radiated Band Edges and Spurious Emission Measurement

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.

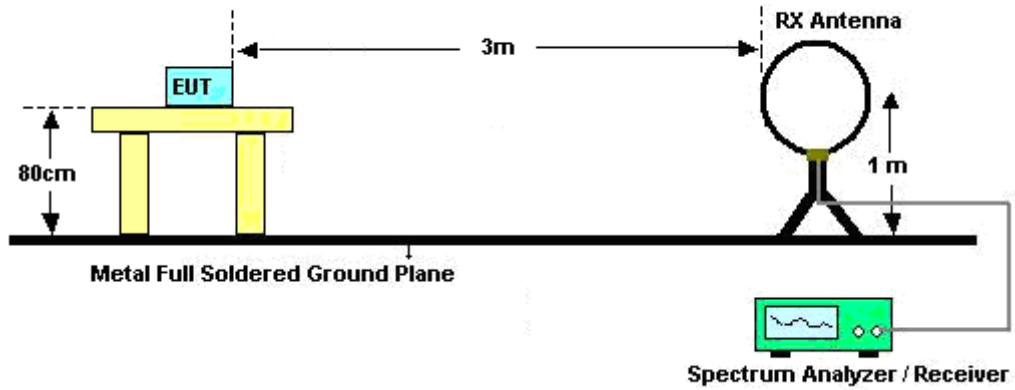


3.5.3 Test Procedures

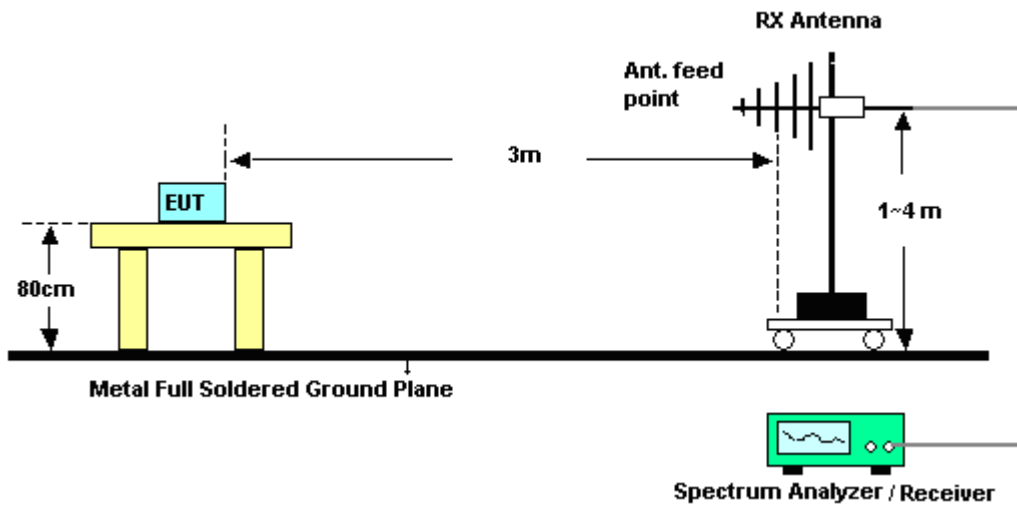
1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the 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; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
 - $VBW = 10$ Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

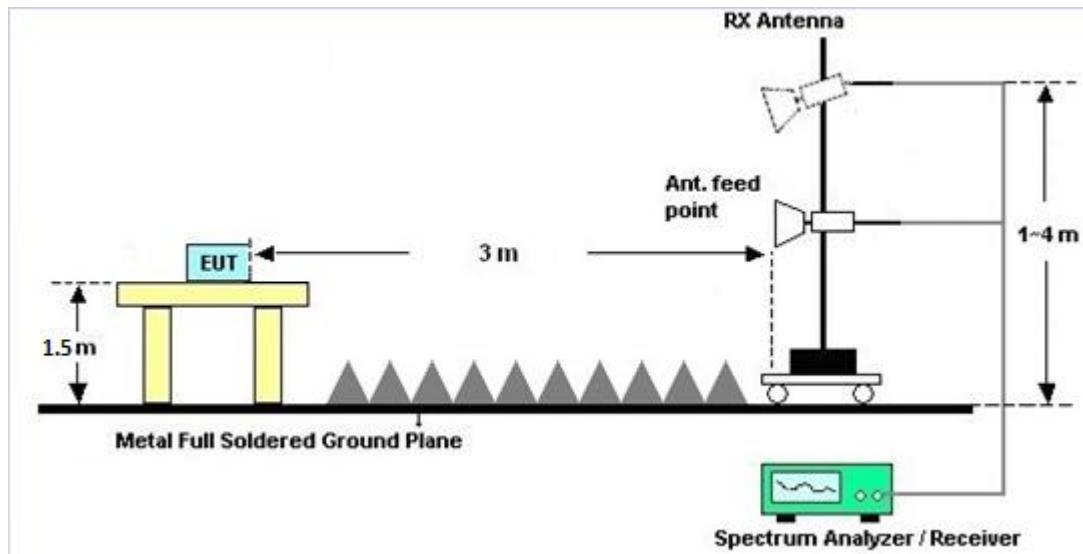
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, 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 (dB μ V)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

For terminal test result, the testing follows FCC KDB 174176.

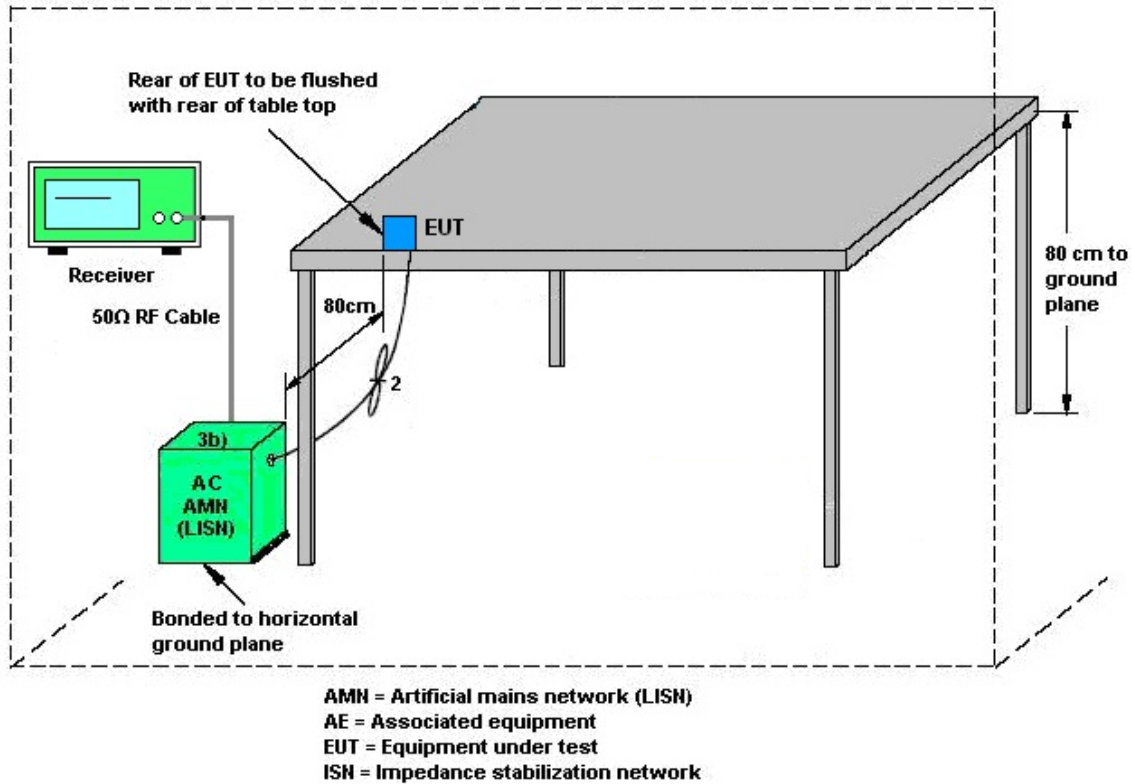
3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

3.6.3 Test Procedures

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

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



3.7 Antenna Requirements

3.7.1 Standard Applicable

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

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H2	41410069	N/A	Jun. 17, 2019	Nov. 14, 2019~ Nov. 22, 2019	Jun. 16, 2020	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054S NO10	10MHz~6GHz	Dec. 19, 2018	Nov. 14, 2019~ Nov. 22, 2019	Dec. 18, 2019	Conducted (TH05-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Oct. 03, 2019	Nov. 14, 2019~ Nov. 22, 2019	Oct. 02, 2020	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	0846202	300MHz~40GHz	Oct. 03, 2019	Nov. 14, 2019~ Nov. 22, 2019	Oct. 02, 2020	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz~40GHz	Jul. 15, 2019	Nov. 14, 2019~ Nov. 22, 2019	Jul. 14, 2020	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC120838 2	N/A	Mar. 27, 2019	Nov. 14, 2019~ Nov. 22, 2019	Mar. 26, 2020	Conducted (TH05-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	37059&01	30MHz~1GHz	Oct. 12, 2019	Oct. 12, 2019~ Nov. 18, 2019	Oct. 11, 2020	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120D	9120D-132 8	1GHz ~ 18GHz	Nov. 09, 2018	Oct. 12, 2019~ Nov. 18, 2019	Nov. 08, 2019	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120D	9120D-020 37	1GHz ~ 18GHz	Oct. 28, 2019	Nov. 07, 2019~ Nov. 18, 2019	Oct. 27, 2020	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 584	18GHz ~ 40GHz	Dec. 05, 2018	Oct. 12, 2019~ Nov. 18, 2019	Dec. 04, 2019	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 25, 2019	Oct. 12, 2019~ Nov. 18, 2019	Mar. 24, 2020	Radiation (03CH12-HY)
Preamplifier	Agilent	8449B	3008A023 75	1GHz~26.5GHz	May 27, 2019	Oct. 12, 2019~ Nov. 18, 2019	May 26, 2020	Radiation (03CH12-HY)
Preamplifier	Jet-Power	JPA0118-55-3 03K	171000180 0054002	1GHz~18GHz	Aug. 06, 2019	Oct. 12, 2019~ Nov. 18, 2019	Aug. 05, 2020	Radiation (03CH12-HY)
Preamplifier	Jet-Power	JPA00101800 -30-10P	160111800 02	1GHz~18GHz	Aug. 01, 2019	Oct. 12, 2019~ Nov. 18, 2019	Jul. 31, 2020	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 06, 2018	Oct. 12, 2019~ Nov. 18, 2019	Dec. 05, 2019	Radiation (03CH12-HY)
Spectrum Analyzer	Keysight	N9010A	MY553705 26	10Hz~44GHz	Mar. 19, 2019	Oct. 12, 2019~ Nov. 18, 2019	Mar. 18, 2020	Radiation (03CH12-HY)
Hygrometer	TECPEL	DTM-303B	TP161243	N/A	Jun. 17, 2019	Oct. 12, 2019~ Nov. 18, 2019	Jun. 16, 2020	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-1 2SS	SN1	1.2 GHz Lowpass	Mar. 22, 2019	Oct. 12, 2019~ Nov. 18, 2019	Mar. 21, 2020	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-270 0-3000-18000 -60ST	SN2	3GHz High Pass	Jul. 15, 2019	Oct. 12, 2019~ Nov. 18, 2019	Jul. 14, 2020	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30M~40GHz	Feb. 26, 2019	Oct. 12, 2019~ Nov. 18, 2019	Feb. 25, 2020	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30M~40GHz	Feb. 26, 2019	Oct. 12, 2019~ Nov. 18, 2019	Feb. 25, 2020	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Oct. 12, 2019~ Nov. 18, 2019	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500- B	N/A	1m~4m	N/A	Oct. 12, 2019~ Nov. 18, 2019	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Oct. 12, 2019~ Nov. 18, 2019	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-00098 9	N/A	N/A	Oct. 12, 2019~ Nov. 18, 2019	N/A	Radiation (03CH12-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Nov. 28, 2019	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 15, 2019	Nov. 28, 2019	Nov. 14, 2020	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Mar. 19, 2019	Nov. 28, 2019	Mar. 18, 2020	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 20, 2019	Nov. 28, 2019	Nov. 19, 2020	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Nov. 28, 2019	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Dec. 31, 2018	Nov. 28, 2019	Dec. 30, 2019	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Dec. 31, 2018	Nov. 28, 2019	Dec. 30, 2019	Conduction (CO05-HY)



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.2
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.2
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.7
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Derek Hsu	Temperature:	21~25	°C
Test Date:	2019/11/14~2019/11/22	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
					Ant1	Ant2	Ant1	Ant2		
11b	1Mbps	1	1	2412	12.34	-	9.05	-	0.50	Pass
11b	1Mbps	1	6	2437	12.24	-	8.07	-	0.50	Pass
11b	1Mbps	1	11	2462	12.19	-	8.55	-	0.50	Pass
11g	6Mbps	1	1	2412	17.18	-	16.30	-	0.50	Pass
11g	6Mbps	1	6	2437	17.13	-	16.06	-	0.50	Pass
11g	6Mbps	1	11	2462	16.78	-	15.76	-	0.50	Pass
HT20	MCS0	1	1	2412	18.13	-	17.52	-	0.50	Pass
HT20	MCS0	1	6	2437	18.08	-	16.62	-	0.50	Pass
HT20	MCS0	1	11	2462	17.88	-	15.78	-	0.50	Pass

TEST RESULTS DATA
Peak Output Power

2.4GHz Band																
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Peak Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	1	1	2412	19.21	-	-	30.00	-	0.67	-	19.88	-	36.00	-	Pass
11b	1Mbps	1	6	2437	19.91	-	-	30.00	-	0.67	-	20.58	-	36.00	-	Pass
11b	1Mbps	1	11	2462	19.88	-	-	30.00	-	0.67	-	20.55	-	36.00	-	Pass
11g	6Mbps	1	1	2412	23.40	-	-	30.00	-	0.67	-	24.07	-	36.00	-	Pass
11g	6Mbps	1	6	2437	23.91	-	-	30.00	-	0.67	-	24.58	-	36.00	-	Pass
11g	6Mbps	1	11	2462	23.90	-	-	30.00	-	0.67	-	24.57	-	36.00	-	Pass
HT20	MCS0	1	1	2412	23.50	-	-	30.00	-	0.67	-	24.17	-	36.00	-	Pass
HT20	MCS0	1	6	2437	24.11	-	-	30.00	-	0.67	-	24.78	-	36.00	-	Pass
HT20	MCS0	1	11	2462	24.04	-	-	30.00	-	0.67	-	24.71	-	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)	Average Conducted Power (dBm)			DG (dBi)		EIRP Power (dBm)	
					Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2
11b	1Mbps	1	1	2412	16.70	-	-	0.67	-	17.37	-
11b	1Mbps	1	6	2437	17.30	-		0.67	-	17.97	-
11b	1Mbps	1	11	2462	17.20	-		0.67	-	17.87	-
11g	6Mbps	1	1	2412	14.10	-		0.67	-	14.77	-
11g	6Mbps	1	6	2437	14.90	-		0.67	-	15.57	-
11g	6Mbps	1	11	2462	14.50	-		0.67	-	15.17	-
HT20	MCS0	1	1	2412	13.60	-		0.67	-	14.27	-
HT20	MCS0	1	6	2437	14.30	-		0.67	-	14.97	-
HT20	MCS0	1	11	2462	14.20	-		0.67	-	14.87	-

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
					Ant1	Ant2	Worse + 3.01	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	1	1	2412	-5.67	-	-	0.67	-	8.00	-	Pass
11b	1Mbps	1	6	2437	-4.99	-	-	0.67	-	8.00	-	Pass
11b	1Mbps	1	11	2462	-5.07	-	-	0.67	-	8.00	-	Pass
11g	6Mbps	1	1	2412	-10.60	-	-	0.67	-	8.00	-	Pass
11g	6Mbps	1	6	2437	-9.60	-	-	0.67	-	8.00	-	Pass
11g	6Mbps	1	11	2462	-9.48	-	-	0.67	-	8.00	-	Pass
HT20	MCS0	1	1	2412	-10.87	-	-	0.67	-	8.00	-	Pass
HT20	MCS0	1	6	2437	-10.35	-	-	0.67	-	8.00	-	Pass
HT20	MCS0	1	11	2462	-10.25	-	-	0.67	-	8.00	-	Pass

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



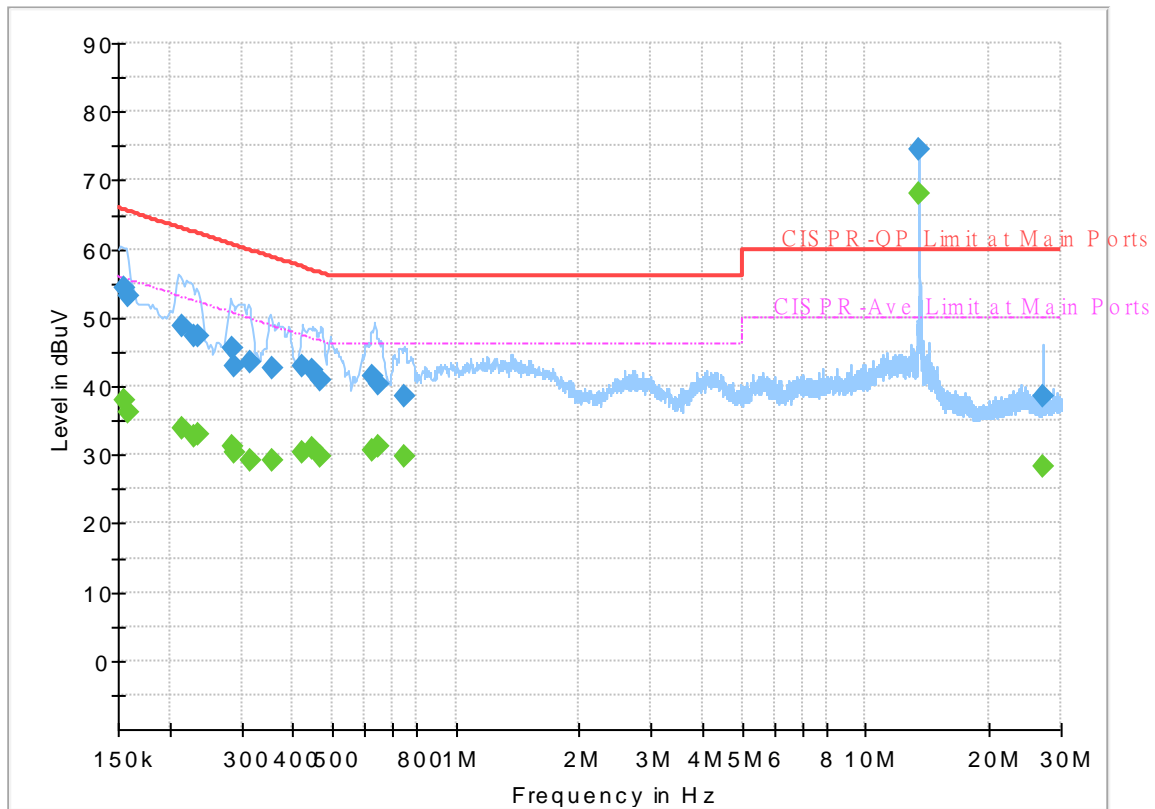
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Jimmy Chang	Temperature :	24.9~26.1°C
		Relative Humidity :	48~55%

Original

Report NO : 832801-05
 Test Mode : Mode 1
 Test Voltage : 120Vac/60Hz
 Phase : Line

Full Spectrum



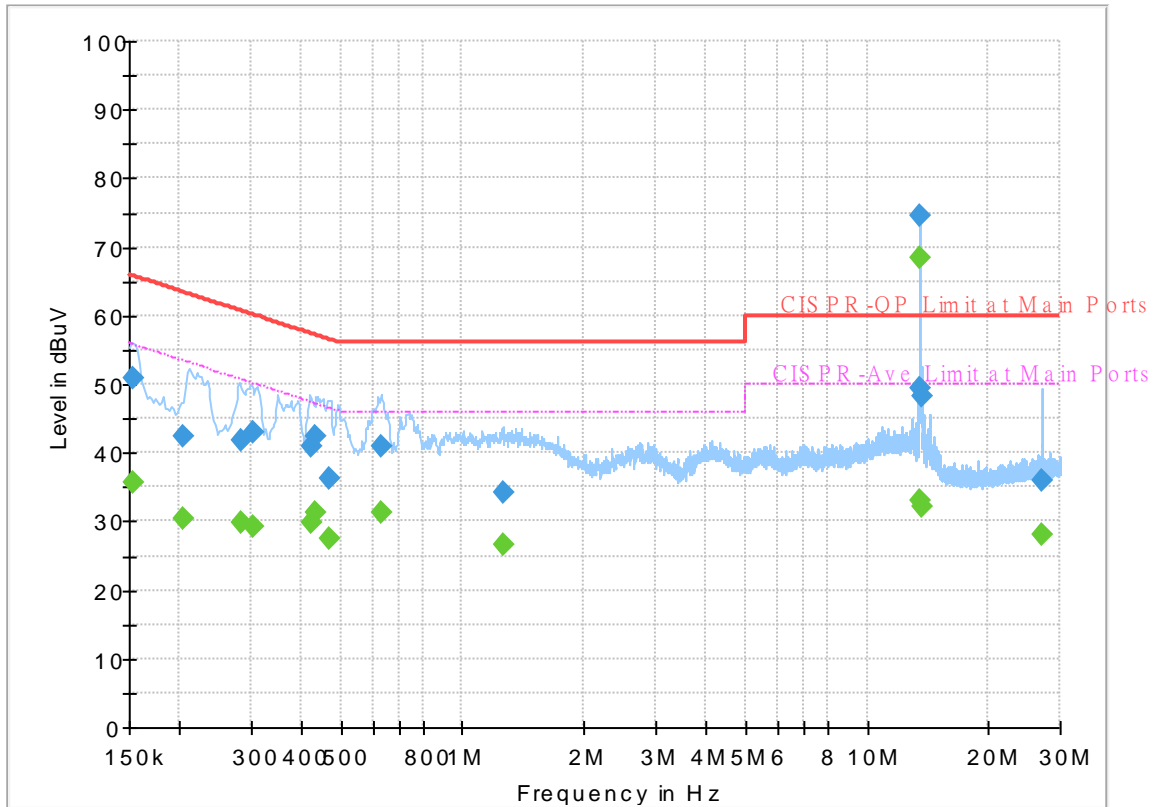
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.154500	54.23	---	65.75	11.52	L1	OFF	19.5
0.154500	---	37.81	55.75	17.94	L1	OFF	19.5
0.158640	53.18	---	65.54	12.36	L1	OFF	19.5
0.158640	---	36.20	55.54	19.34	L1	OFF	19.5
0.215250	---	33.79	53.00	19.21	L1	OFF	19.5
0.215250	48.86	---	63.00	14.14	L1	OFF	19.5
0.228750	---	32.83	52.50	19.67	L1	OFF	19.5
0.228750	47.17	---	62.50	15.33	L1	OFF	19.5
0.233970	---	32.97	52.31	19.34	L1	OFF	19.5
0.233970	47.19	---	62.31	15.12	L1	OFF	19.5
0.285000	---	31.18	50.67	19.49	L1	OFF	19.5
0.285000	45.51	---	60.67	15.16	L1	OFF	19.5
0.289500	---	30.29	50.54	20.25	L1	OFF	19.5
0.289500	42.91	---	60.54	17.63	L1	OFF	19.5
0.316500	---	29.33	49.80	20.47	L1	OFF	19.5
0.316500	43.57	---	59.80	16.23	L1	OFF	19.5
0.357000	---	29.11	48.80	19.69	L1	OFF	19.5
0.357000	42.74	---	58.80	16.06	L1	OFF	19.5
0.422970	---	30.46	47.39	16.93	L1	OFF	19.5
0.422970	42.89	---	57.39	14.50	L1	OFF	19.5
0.448170	---	31.02	46.91	15.89	L1	OFF	19.5

0.448170	42.32	---	56.91	14.59	L1	OFF	19.5
0.467250	---	29.85	46.56	16.71	L1	OFF	19.5
0.467250	40.86	---	56.56	15.70	L1	OFF	19.5
0.627000	---	30.60	46.00	15.40	L1	OFF	19.5
0.627000	41.47	---	56.00	14.53	L1	OFF	19.5
0.649500	---	31.21	46.00	14.79	L1	OFF	19.5
0.649500	40.22	---	56.00	15.78	L1	OFF	19.5
0.750750	---	29.77	46.00	16.23	L1	OFF	19.5
0.750750	38.58	---	56.00	17.42	L1	OFF	19.5
13.560000	---	68.13	50.00	-18.13	L1	OFF	20.0
13.560000	74.44	---	60.00	-14.44	L1	OFF	20.0
27.114810	---	28.40	50.00	21.60	L1	OFF	20.3
27.114810	38.62	---	60.00	21.38	L1	OFF	20.3

Report NO : 832801-05
 Test Mode : Mode 1
 Test Voltage : 120Vac/60Hz
 Phase : Neutral

Full Spectrum



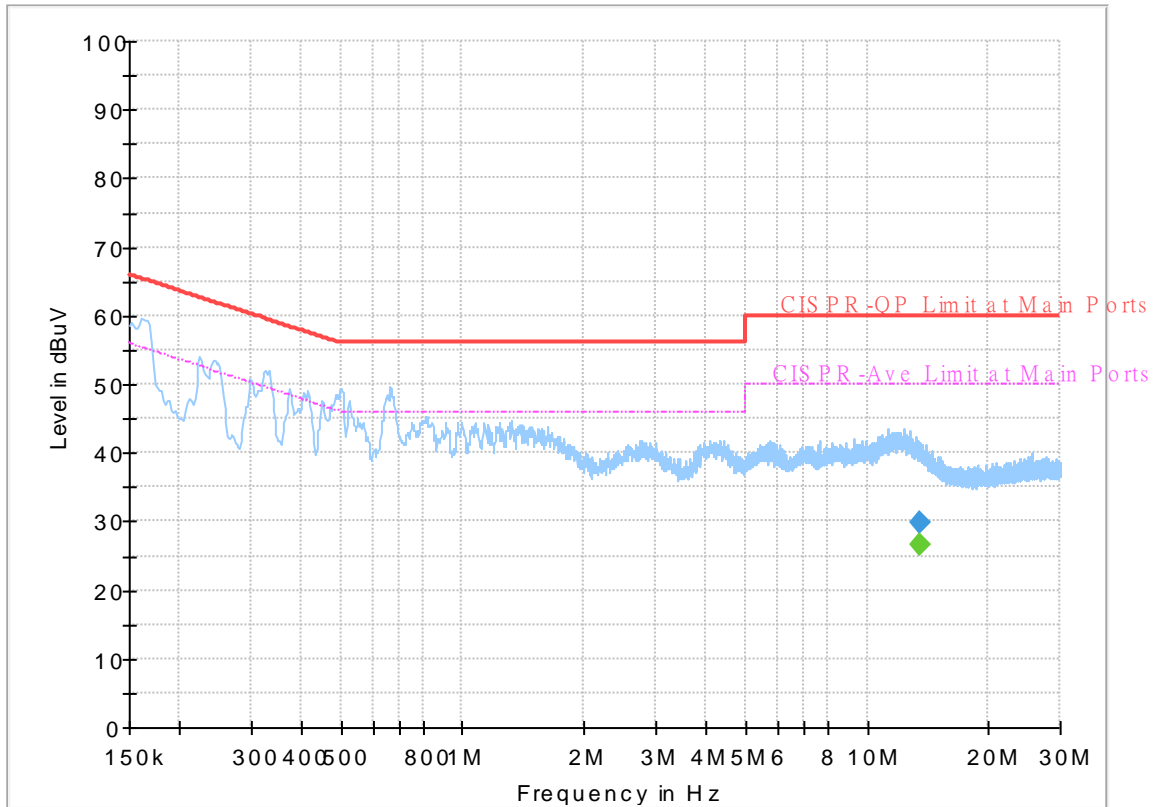
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152970	---	35.65	55.84	20.19	N	OFF	19.5
0.152970	50.89	---	65.84	14.95	N	OFF	19.5
0.204000	---	30.40	53.45	23.05	N	OFF	19.5
0.204000	42.26	---	63.45	21.19	N	OFF	19.5
0.283740	---	29.86	50.71	20.85	N	OFF	19.5
0.283740	41.77	---	60.71	18.94	N	OFF	19.5
0.305250	---	29.11	50.10	20.99	N	OFF	19.5
0.305250	43.04	---	60.10	17.06	N	OFF	19.5
0.424500	---	29.75	47.36	17.61	N	OFF	19.5
0.424500	40.90	---	57.36	16.46	N	OFF	19.5
0.433500	---	31.16	47.19	16.03	N	OFF	19.5
0.433500	42.33	---	57.19	14.86	N	OFF	19.5
0.471210	---	27.42	46.49	19.07	N	OFF	19.6
0.471210	36.18	---	56.49	20.31	N	OFF	19.6
0.629430	---	31.17	46.00	14.83	N	OFF	19.6
0.629430	41.03	---	56.00	14.97	N	OFF	19.6
1.261500	---	26.68	46.00	19.32	N	OFF	19.6
1.261500	34.22	---	56.00	21.78	N	OFF	19.6
13.487100	---	33.11	50.00	16.89	N	OFF	20.1
13.487100	49.37	---	60.00	10.63	N	OFF	20.1
13.560000	---	68.31	50.00	-18.31	N	OFF	20.1
13.560000	74.63	---	60.00	-14.63	N	OFF	20.1
13.629750	---	32.12	50.00	17.88	N	OFF	20.1
13.629750	48.30	---	60.00	11.70	N	OFF	20.1
27.114000	---	28.01	50.00	21.99	N	OFF	20.5
27.114000	36.03	---	60.00	23.97	N	OFF	20.5

Terminal

Report NO : 832801-05
 Test Mode : Mode 1
 Test Voltage : 120Vac/60Hz
 Phase : Line

Full Spectrum

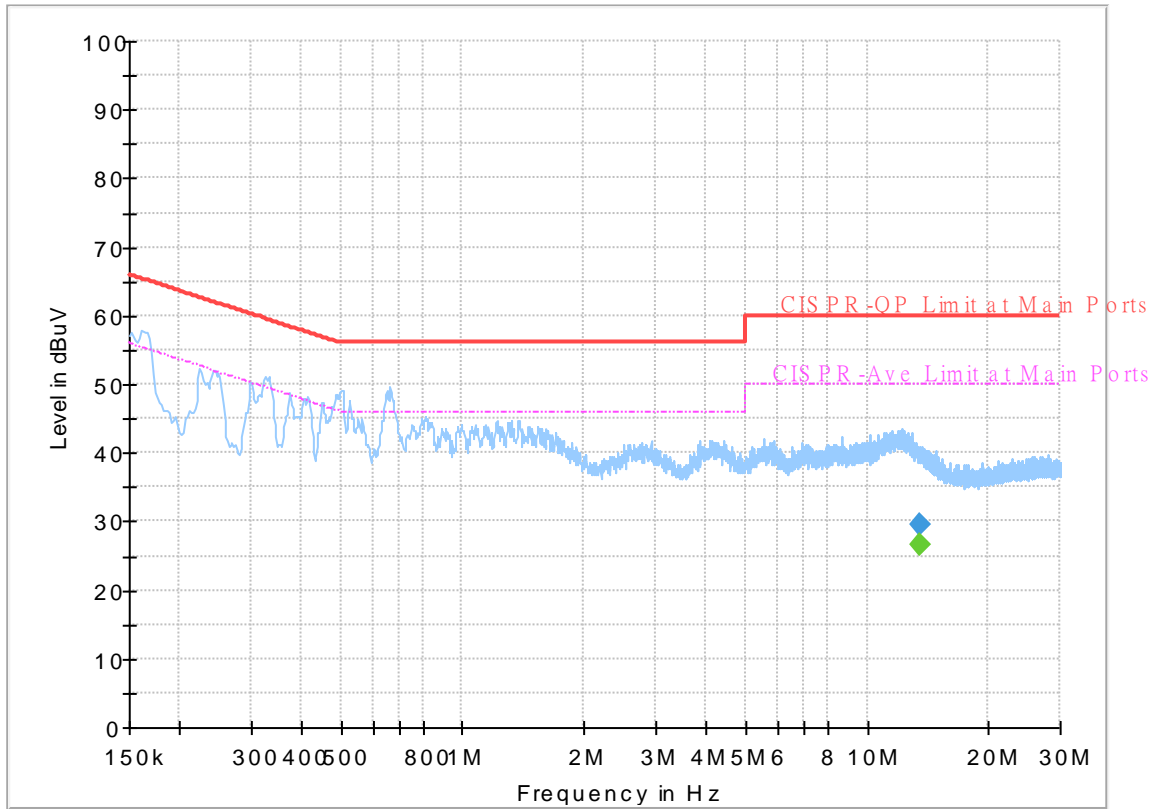


Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
13.560000	---	26.52	50.00	23.48	L1	OFF	20.0
13.560000	29.90	---	60.00	30.10	L1	OFF	20.0

Report NO : 832801-05
 Test Mode : Mode 1
 Test Voltage : 120Vac/60Hz
 Phase : Neutral

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
13.560000	---	26.48	50.00	23.52	N	OFF	20.1
13.560000	29.58	---	60.00	30.42	N	OFF	20.1



Appendix C. Radiated Spurious Emission

Test Engineer :	Jack Cheng, Lance Chiang, and Chuan Chu	Temperature :	19.2~26.8°C
		Relative Humidity :	53.5~69.0%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	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		2389.8	55.69	-18.31	74	44.7	27.52	16.63	33.16	159	302	P	H	
		2390	45.64	-8.36	54	34.65	27.52	16.63	33.16	159	302	A	H	
	*	2412	104.57	-	-	93.62	27.48	16.65	33.18	159	302	P	H	
	*	2412	101.54	-	-	90.59	27.48	16.65	33.18	159	302	A	H	
													H	
														H
			2327.43	55	-19	74	43.84	27.69	16.55	33.08	100	69	P	V
			2390	45.71	-8.29	54	34.72	27.52	16.63	33.16	100	69	A	V
	*		2412	106.95	-	-	96	27.48	16.65	33.18	100	69	P	V
	*		2412	103.91	-	-	92.96	27.48	16.65	33.18	100	69	A	V
														V
														V
802.11b CH 06 2437MHz		2336.18	55.63	-18.37	74	44.5	27.66	16.56	33.09	182	304	P	H	
		2312.24	44.12	-9.88	54	32.9	27.75	16.53	33.06	182	304	A	H	
	*	2437	105.06	-	-	94.17	27.43	16.67	33.21	182	304	P	H	
	*	2437	102.01	-	-	91.12	27.43	16.67	33.21	182	304	A	H	
			2496.71	54.37	-19.63	74	43.63	27.31	16.72	33.29	182	304	P	H
			2483.83	43.95	-10.05	54	33.18	27.33	16.71	33.27	182	304	A	H
			2348.36	54.92	-19.08	74	43.84	27.61	16.58	33.11	160	360	P	V
			2310.98	44.13	-9.87	54	32.9	27.76	16.53	33.06	160	360	A	V
	*		2437	106.77	-	-	95.88	27.43	16.67	33.21	160	360	P	V
	*		2437	103.69	-	-	92.8	27.43	16.67	33.21	160	360	A	V
			2486.28	54.61	-19.39	74	43.84	27.33	16.71	33.27	160	360	P	V
			2483.55	43.99	-10.01	54	33.22	27.33	16.71	33.27	160	360	A	V



802.11b CH 11 2462MHz	*	2462	105.12	-	-	94.29	27.38	16.69	33.24	152	303	P	H
	*	2462	102.14	-	-	91.31	27.38	16.69	33.24	152	303	A	H
		2483.52	55.81	-18.19	74	45.04	27.33	16.71	33.27	152	303	P	H
		2483.52	46.58	-7.42	54	35.81	27.33	16.71	33.27	152	303	A	H
													H
													H
	*	2462	106.84	-	-	96.01	27.38	16.69	33.24	103	359	P	V
	*	2462	103.84	-	-	93.01	27.38	16.69	33.24	103	359	A	V
		2483.52	55.71	-18.29	74	44.94	27.33	16.71	33.27	103	359	P	V
		2483.52	46.96	-7.04	54	36.19	27.33	16.71	33.27	103	359	A	V
													V
													V
Remark	<ol style="list-style-type: none"> 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	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	39.86	-34.14	74	59.59	31.1	10.07	60.9	100	0	P	H	
													H	
													H	
													H	
		4824	40.53	-33.47	74	60.26	31.1	10.07	60.9	100	0	P	V	
														V
														V
802.11b CH 06 2437MHz		4874	39.42	-34.58	74	59.09	31.1	10.08	60.85	100	0	P	H	
		7311	45.19	-28.81	74	57.27	36.34	12.5	60.92	100	0	P	H	
													H	
													H	
		4874	38.99	-35.01	74	58.66	31.1	10.08	60.85	100	0	P	V	
		7311	44.94	-29.06	74	57.02	36.34	12.5	60.92	100	0	P	V	
														V
802.11b CH 11 2462MHz		4924	40.53	-33.47	74	60.11	31.15	10.07	60.8	100	0	P	H	
		7386	45.02	-28.98	74	56.92	36.43	12.58	60.91	100	0	P	H	
													H	
													H	
		4924	40.59	-33.41	74	60.17	31.15	10.07	60.8	100	0	P	V	
		7386	45.09	-28.91	74	56.99	36.43	12.58	60.91	100	0	P	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	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11g CH 01 2412MHz		2389.905	61.63	-12.37	74	50.64	27.52	16.63	33.16	184	304	P	H	
		2390	48.44	-5.56	54	37.45	27.52	16.63	33.16	184	304	A	H	
	*	2412	103.89	-	-	92.94	27.48	16.65	33.18	184	304	P	H	
	*	2412	96.16	-	-	85.21	27.48	16.65	33.18	184	304	A	H	
													H	
													H	
			2390	62.27	-11.73	74	51.28	27.52	16.63	33.16	100	92	P	V
			2390	48.61	-5.39	54	37.62	27.52	16.63	33.16	100	92	A	V
	*		2412	106.43	-	-	95.48	27.48	16.65	33.18	100	92	P	V
	*		2412	98.74	-	-	87.79	27.48	16.65	33.18	100	92	A	V
														V
														V
802.11g CH 06 2437MHz		2345.42	56.25	-17.75	74	45.16	27.62	16.57	33.1	183	302	P	H	
		2335.76	44.98	-9.02	54	33.85	27.66	16.56	33.09	183	302	A	H	
	*	2437	104.96	-	-	94.07	27.43	16.67	33.21	183	302	P	H	
	*	2437	97.26	-	-	86.37	27.43	16.67	33.21	183	302	A	H	
			2499.96	55.06	-18.94	74	44.33	27.3	16.72	33.29	183	302	P	H
			2484.12	44.83	-9.17	54	34.06	27.33	16.71	33.27	183	302	A	H
			2388.96	55.28	-18.72	74	44.29	27.52	16.63	33.16	158	360	P	V
			2314.48	45.02	-8.98	54	33.81	27.74	16.54	33.07	158	360	A	V
	*		2437	106.96	-	-	96.07	27.43	16.67	33.21	158	360	P	V
	*		2437	98.92	-	-	88.03	27.43	16.67	33.21	158	360	A	V
			2491.8	55.35	-18.65	74	44.59	27.32	16.72	33.28	158	360	P	V
			2490.36	44.79	-9.21	54	34.03	27.32	16.72	33.28	158	360	A	V



802.11g CH 11 2462MHz	*	2462	105.05	-	-	94.22	27.38	16.69	33.24	154	303	P	H
	*	2462	97.43	-	-	86.6	27.38	16.69	33.24	154	303	A	H
		2483.8	60.47	-13.53	74	49.7	27.33	16.71	33.27	154	303	P	H
		2483.6	47.35	-6.65	54	36.58	27.33	16.71	33.27	154	303	A	H
													H
													H
	*	2462	107.57	-	-	96.74	27.38	16.69	33.24	103	1	P	V
	*	2462	99.08	-	-	88.25	27.38	16.69	33.24	103	1	A	V
		2483.92	61.18	-12.82	74	50.41	27.33	16.71	33.27	103	1	P	V
		2483.56	48.04	-5.96	54	37.27	27.33	16.71	33.27	103	1	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	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	39.12	-34.88	74	58.85	31.1	10.07	60.9	100	0	P	H
													H
													H
													H
		4824	38.69	-35.31	74	58.42	31.1	10.07	60.9	100	0	P	V
													V
													V
802.11g CH 06 2437MHz		4874	39.07	-34.93	74	58.74	31.1	10.08	60.85	100	0	P	H
		7311	46.27	-27.73	74	58.35	36.34	12.5	60.92	100	0	P	H
													H
													H
		4874	38.35	-35.65	74	58.02	31.1	10.08	60.85	100	0	P	V
		7311	44.9	-29.1	74	56.98	36.34	12.5	60.92	100	0	P	V
													V
802.11g CH 11 2462MHz		4924	39.48	-34.52	74	59.06	31.15	10.07	60.8	100	0	P	H
		7386	45.54	-28.46	74	57.44	36.43	12.58	60.91	100	0	P	H
													H
													H
		4924	39.12	-34.88	74	58.7	31.15	10.07	60.8	100	0	P	V
		7386	44.99	-29.01	74	56.89	36.43	12.58	60.91	100	0	P	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	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)	
802.11n HT20 CH 01 2412MHz		2389.59	62.43	-11.57	74	51.44	27.52	16.63	33.16	163	302	P	H	
		2390	48.51	-5.49	54	37.52	27.52	16.63	33.16	163	302	A	H	
	*	2412	103.54	-	-	92.59	27.48	16.65	33.18	163	302	P	H	
	*	2412	95.88	-	-	84.93	27.48	16.65	33.18	163	302	A	H	
													H	
														H
			2389.905	62.03	-11.97	74	51.04	27.52	16.63	33.16	100	65	P	V
			2390	48.71	-5.29	54	37.72	27.52	16.63	33.16	100	65	A	V
		*	2412	105.47	-	-	94.52	27.48	16.65	33.18	100	65	P	V
		*	2412	98.01	-	-	87.06	27.48	16.65	33.18	100	65	A	V
													V	
													V	
802.11n HT20 CH 06 2437MHz		2338	55	-19	74	43.88	27.65	16.57	33.1	181	302	P	H	
		2334.5	45.14	-8.86	54	34.01	27.66	16.56	33.09	181	302	A	H	
		*	2437	104.17	-	-	93.28	27.43	16.67	33.21	181	302	P	H
		*	2437	96.42	-	-	85.53	27.43	16.67	33.21	181	302	A	H
			2484.6	55.24	-18.76	74	44.47	27.33	16.71	33.27	181	302	P	H
			2498.88	44.77	-9.23	54	34.04	27.3	16.72	33.29	181	302	A	H
			2319.1	55.67	-18.33	74	44.48	27.72	16.54	33.07	158	360	P	V
			2311.54	45.04	-8.96	54	33.82	27.75	16.53	33.06	158	360	A	V
		*	2437	105.74	-	-	94.85	27.43	16.67	33.21	158	360	P	V
		*	2437	97.9	-	-	87.01	27.43	16.67	33.21	158	360	A	V
		2499.12	55.82	-18.18	74	45.09	27.3	16.72	33.29	158	360	P	V	
		2483.88	44.87	-9.13	54	34.1	27.33	16.71	33.27	158	360	A	V	



802.11n HT20 CH 11 2462MHz	*	2462	104.32	-	-	93.49	27.38	16.69	33.24	152	304	P	H
	*	2462	96.74	-	-	85.91	27.38	16.69	33.24	152	304	A	H
		2483.76	59.75	-14.25	74	48.98	27.33	16.71	33.27	152	304	P	H
		2483.56	47.25	-6.75	54	36.48	27.33	16.71	33.27	152	304	A	H
													H
													H
	*	2462	106	-	-	95.17	27.38	16.69	33.24	102	360	P	V
	*	2462	98.54	-	-	87.71	27.38	16.69	33.24	102	360	A	V
		2483.56	64.6	-9.4	74	53.83	27.33	16.71	33.27	102	360	P	V
		2483.72	47.89	-6.11	54	37.12	27.33	16.71	33.27	102	360	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	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)	
802.11n HT20 CH 01 2412MHz		4824	39.11	-34.89	74	58.84	31.1	10.07	60.9	100	0	P	H	
													H	
													H	
													H	
		4824	39.49	-34.51	74	59.22	31.1	10.07	60.9	100	0	P	V	
														V
														V
802.11n HT20 CH 06 2437MHz		4874	39.27	-34.73	74	58.94	31.1	10.08	60.85	100	0	P	H	
		7311	45.02	-28.98	74	57.1	36.34	12.5	60.92	100	0	P	H	
													H	
													H	
		4874	39.92	-34.08	74	59.59	31.1	10.08	60.85	100	0	P	V	
		7311	44.95	-29.05	74	57.03	36.34	12.5	60.92	100	0	P	V	
														V
802.11n HT20 CH 11 2462MHz		4924	39.66	-34.34	74	59.24	31.15	10.07	60.8	100	0	P	H	
		7386	44.84	-29.16	74	56.74	36.43	12.58	60.91	100	0	P	H	
													H	
													H	
		4924	39.84	-34.16	74	59.42	31.15	10.07	60.8	100	0	P	V	
		7386	44.84	-29.16	74	56.74	36.43	12.58	60.91	100	0	P	V	
														V
Remark	1. No other spurious found.													
	2. All results are PASS against Peak and Average limit line.													



Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
2.4GHz 802.11n HT20 LF		30	24.33	-15.67	40	29.36	24.31	0.84	30.18	-	-	P	H	
		105.66	28.36	-15.14	43.5	40.84	16.43	1.51	30.42	-	-	P	H	
		207.51	34.91	-8.59	43.5	48.2	15.02	2	30.31	100	0	P	H	
		294.81	31.93	-14.07	46	40.65	19.03	2.4	30.15	-	-	P	H	
		513.06	33.37	-12.63	46	35.79	24.01	3.33	29.76	-	-	P	H	
		675.05	34.9	-11.1	46	34.3	26.37	3.78	29.55	-	-	P	H	
														H
														H
														H
														H
														H
			34.85	26.8	-13.2	40	33.98	22.17	0.9	30.25	-	-	P	V
			169.68	26.23	-17.27	43.5	39.14	15.61	1.83	30.35	-	-	P	V
			207.51	32.87	-10.63	43.5	46.16	15.02	2	30.31	100	0	P	V
			294.81	26.62	-19.38	46	35.34	19.03	2.4	30.15	-	-	P	V
			425.76	30.62	-15.38	46	34.84	22.74	2.97	29.93	-	-	P	V
			729.37	34.17	-11.83	46	32.14	27.5	3.98	29.45	-	-	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	Peak or Average
H/V	Horizontal or Vertical



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

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

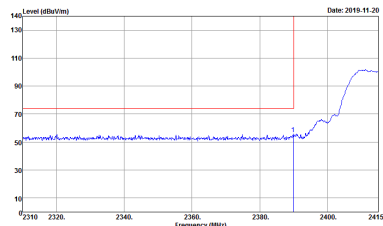
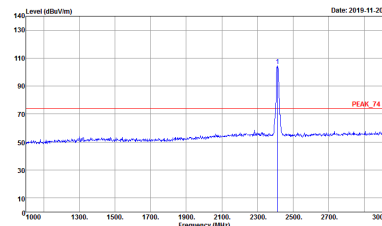
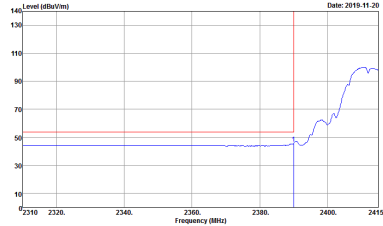
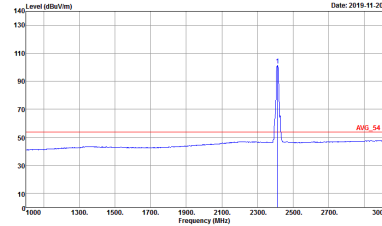
Test Engineer :	Jack Cheng , Lance Chiang, and Chuan Chu	Temperature :	19.2~26.8°C
		Relative Humidity :	53.5~69.0%

Note symbol

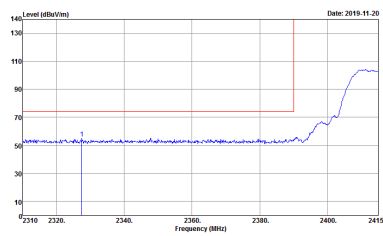
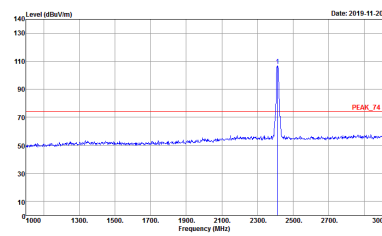
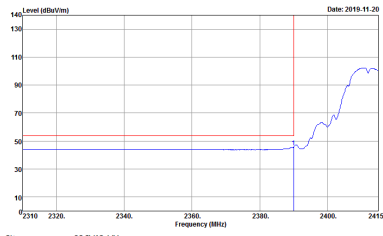
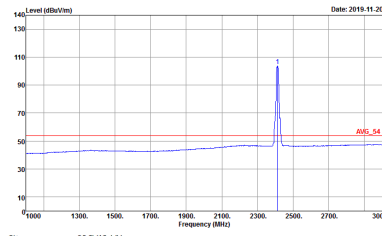
-L	Low channel location
-R	High channel location



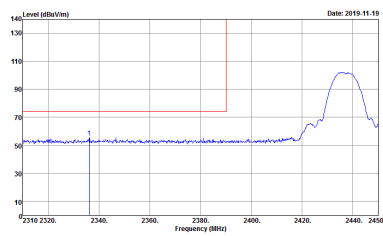
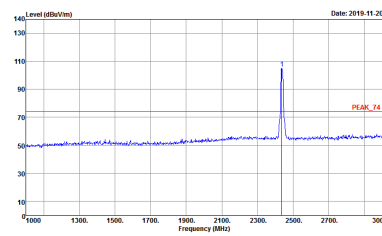
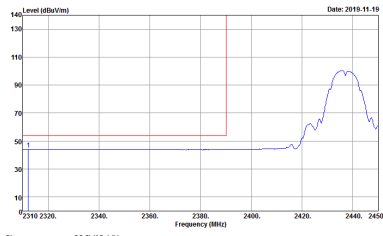
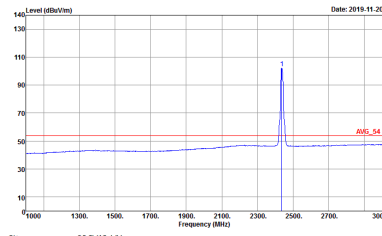
2.4GHz 2400~2483.5MHz
WIFI 802.11b (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11b CH01 2412MHz	
	Horizontal	Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL RBW:1000.0000kHz VBW:3000.0000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL RBW:1000.0000kHz VBW:3000.0000kHz SWT:Auto Detector : Peak Project : 832801-05</p>
Avg.	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL RBW:1000.0000kHz VBW:0.0100kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL RBW:1000.0000kHz VBW:0.0100kHz SWT:Auto Detector : Peak Project : 832801-05</p>

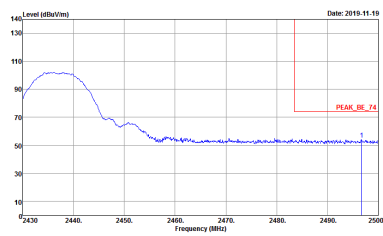
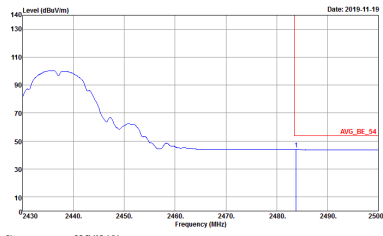


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
802.11b CH01 2412MHz		
Vertical		Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>
Avg.	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : AVG_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832801-05</p>

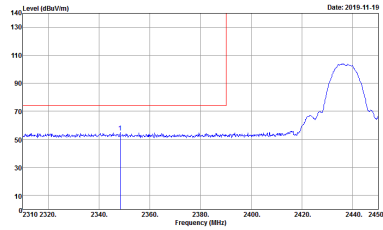
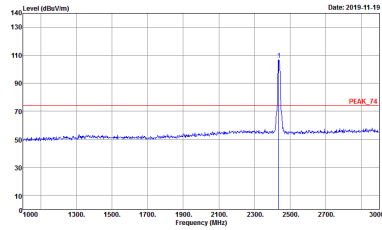
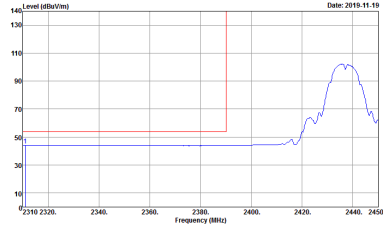
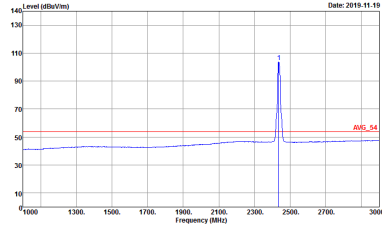


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11b CH06 2437MHz - L	
	Horizontal	Fundamental
<p>Peak</p>	 <p>Date: 2019-11-19</p> <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>
<p>Avg.</p>	 <p>Date: 2019-11-19</p> <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : AVG_F4 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832801-05</p>

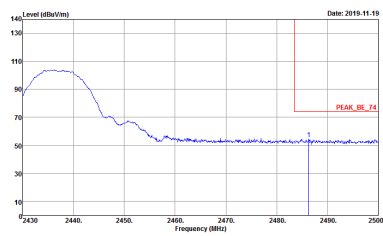
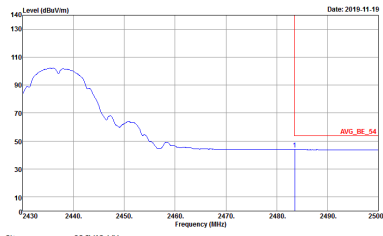


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11b CH06 2437MHz - R	
	Horizontal	Fundamental
<p>Peak</p>	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	<p>Left blank</p>
<p>Avg.</p>	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832801-05</p>	<p>Left blank</p>

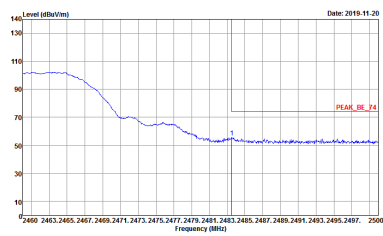
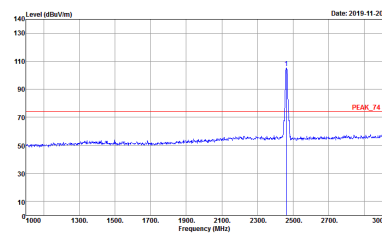
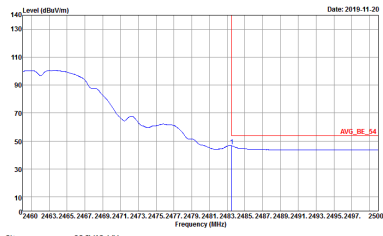
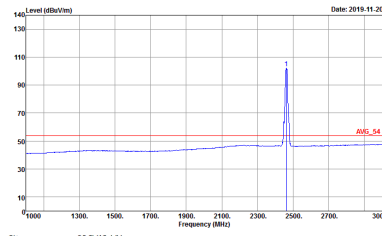


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11b CH06 2437MHz - L	
	Vertical	Fundamental
<p>Peak</p>	 <p>Date: 2019-11-19</p> <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Date: 2019-11-19</p> <p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>
<p>Avg.</p>	 <p>Date: 2019-11-19</p> <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Date: 2019-11-19</p> <p>Site : 03CH12-HY Condition : AVG_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832801-05</p>

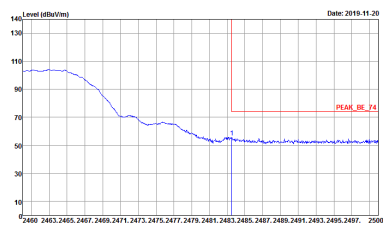
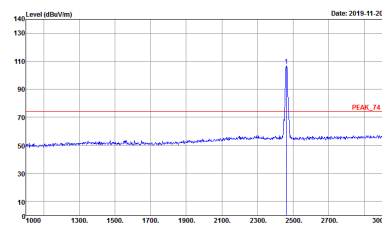
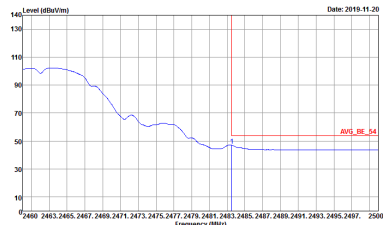
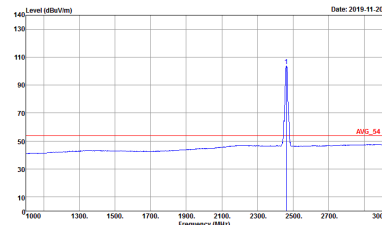


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11b CH06 2437MHz - R	
	Vertical	Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 832801-05</p>	Left blank
Avg.	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 832801-05</p>	Left blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11b CH11 2462MHz	
	Horizontal	Fundamental
<p>Peak</p>	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>
<p>Avg.</p>	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto Detector : Peak Project : 832801-05</p>



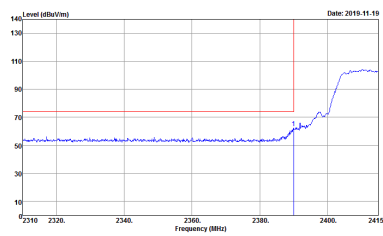
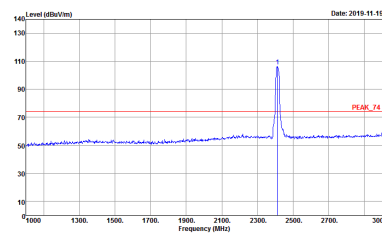
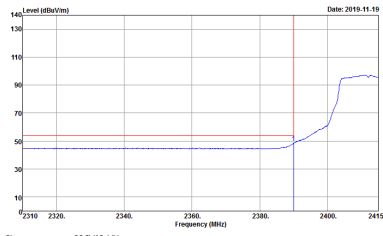
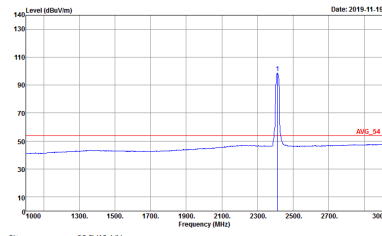
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
802.11b CH11 2462MHz		
Vertical		Fundamental
Peak	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 832801-05</p>	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 832801-05</p>
	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 832801-05</p>	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 832801-05</p>
Avg.		



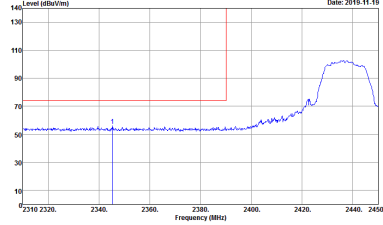
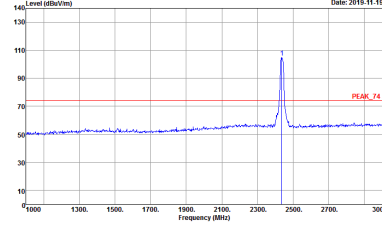
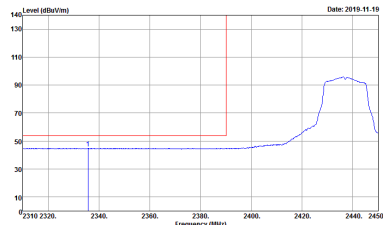
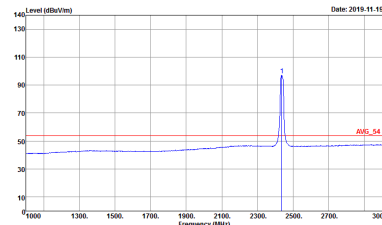
2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11g CH01 2412MHz	
	Horizontal	Fundamental
Peak	<p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL RBW:1000.0000kHz VBW:3000.0000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	<p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL RBW:1000.0000kHz VBW:3000.0000kHz SWT:Auto Detector : Peak Project : 832801-05</p>
Avg.	<p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL RBW:1000.0000kHz VBW:1.0000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	<p>Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL RBW:1000.0000kHz VBW:1.0000kHz SWT:Auto Detector : Peak Project : 832801-05</p>

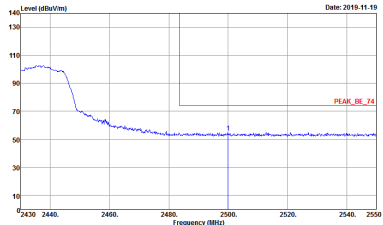
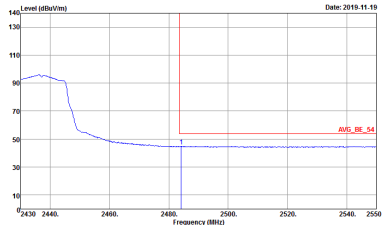


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11g CH01 2412MHz	
	Vertical	Fundamental
<p>Peak</p>	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>
<p>Avg.</p>	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : AVG_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>

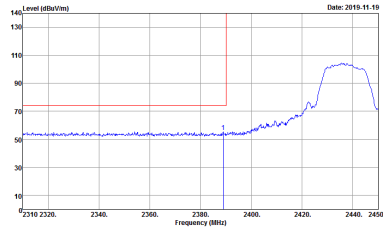
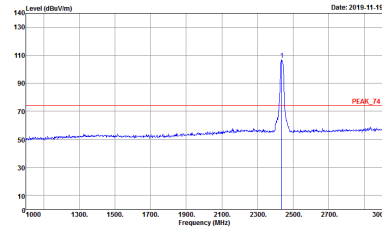
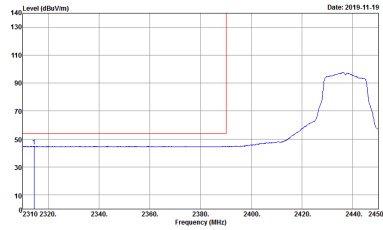
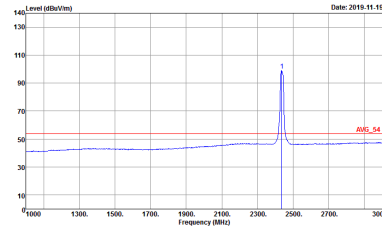


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
802.11g CH06 2437MHz - L		
Horizontal		Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>
Avg.	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : AVG_F4 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>

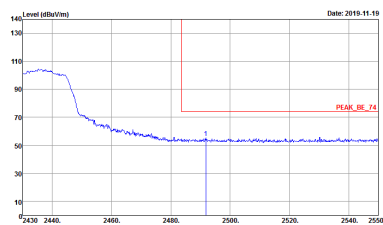
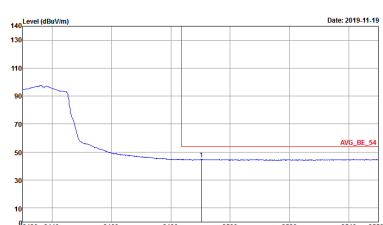


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11g CH06 2437MHz - R	
	Horizontal	Fundamental
Peak	 <p>Site : 03CH2-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 832801-05</p>	Left blank
Avg.	 <p>Site : 03CH2-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 832801-05</p>	Left blank

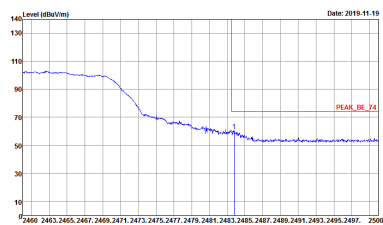
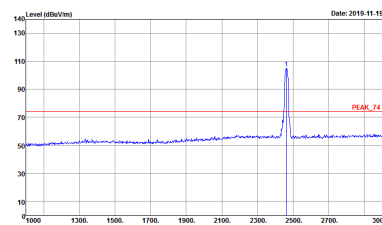
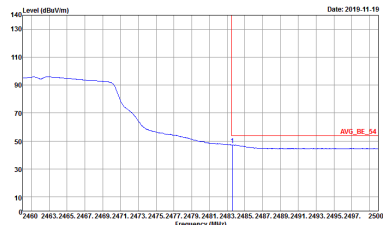
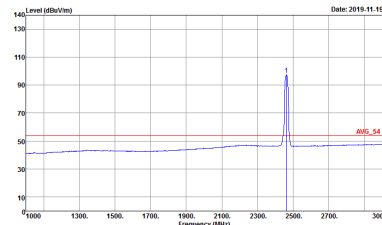


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11g CH06 2437MHz - L	
	Vertical	Fundamental
<p>Peak</p>	 <p>Site : 03CH2-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH2-HY Condition : PEAK_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>
<p>Avg.</p>	 <p>Site : 03CH2-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH2-HY Condition : AVG_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>

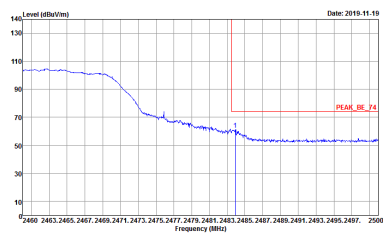
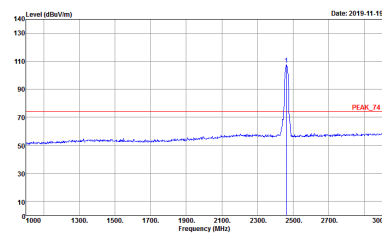
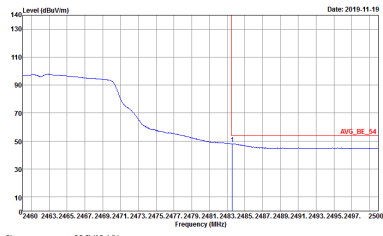
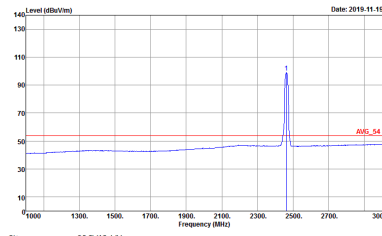


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11g CH06 2437MHz - R	
	Vertical	Fundamental
Peak	 <p>Site : 03CH2-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 832801-05</p>	Left Blank
Avg.	 <p>Site : 03CH2-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 832801-05</p>	Left Blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
802.11g CH11 2462MHz		
Horizontal		Fundamental
Peak	 <p>Date: 2019-11-19</p> <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Date: 2019-11-19</p> <p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>
Avg.	 <p>Date: 2019-11-19</p> <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Date: 2019-11-19</p> <p>Site : 03CH12-HY Condition : AVG_F4 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>

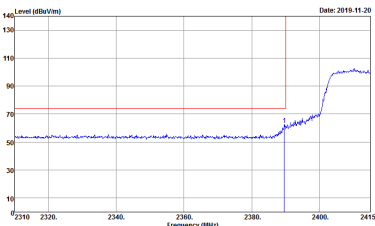
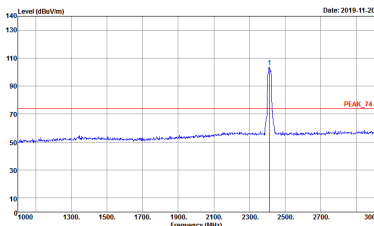
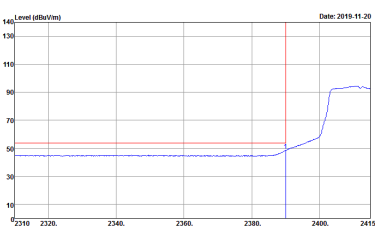
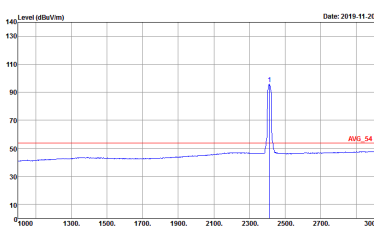


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
802.11g CH11 2462MHz		
Vertical		Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>
Avg.	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>

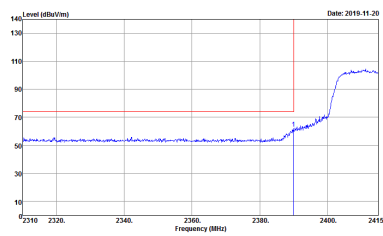
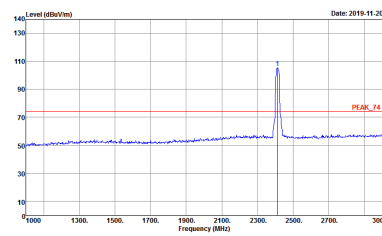
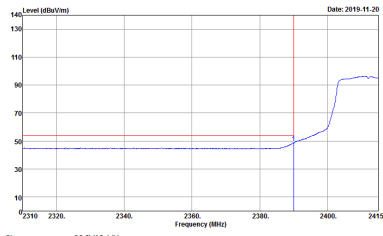
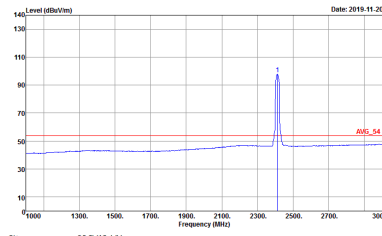


2.4GHz 2400~2483.5MHz

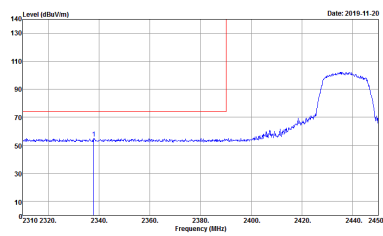
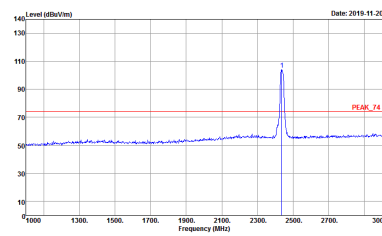
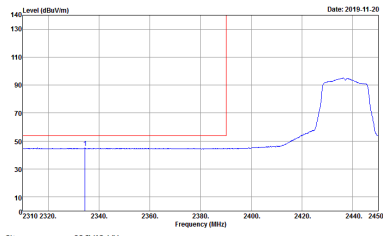
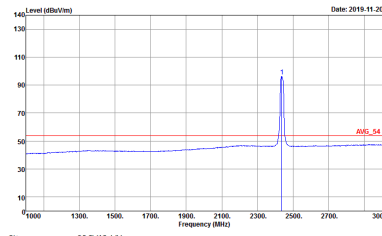
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT20 CH01 2412MHz	
	Horizontal	Fundamental
Peak	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.0000kHz VBW:3000.0000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.0000kHz VBW:3000.0000kHz SWT:Auto Detector : Peak Project : 832801-05</p>
Avg.	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.0000kHz VBW:1.0000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.0000kHz VBW:1.0000kHz SWT:Auto Detector : Peak Project : 832801-05</p>

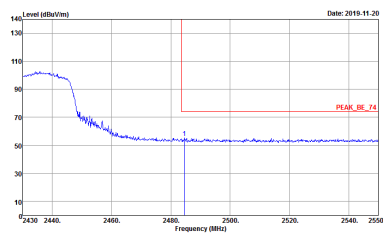
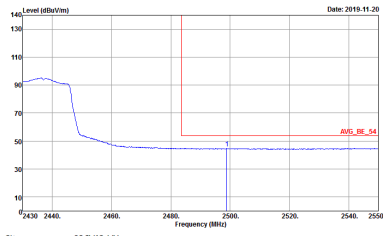


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT20 CH01 2412MHz	
	Vertical	Fundamental
<p>Peak</p>	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>
<p>Avg.</p>	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : AVG_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>

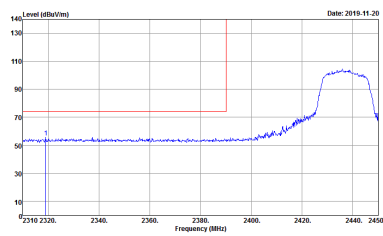
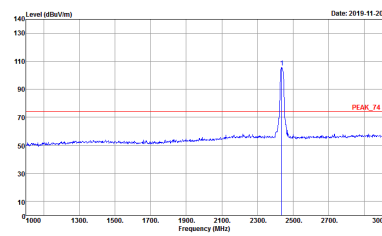
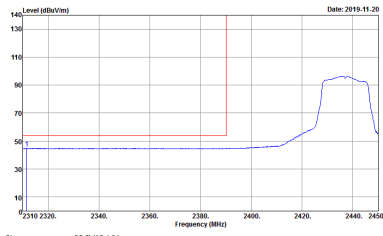
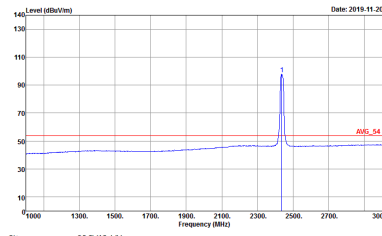


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT20 CH06 2437MHz - L	
	Horizontal	Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>
Avg.	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : AVG_F4 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>

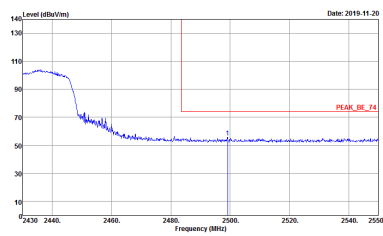
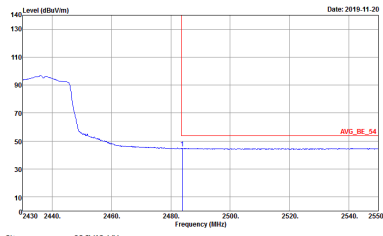


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
802.11n HT20 CH06 2437MHz - R		
Horizontal		Fundamental
Peak	 <p>Site : 03CH2-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 832801-05</p>	Left blank
Avg.	 <p>Site : 03CH2-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 832801-05</p>	Left blank

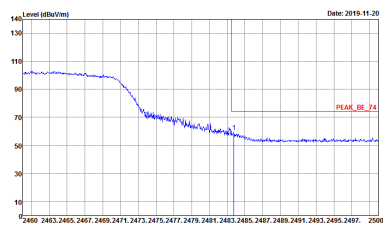
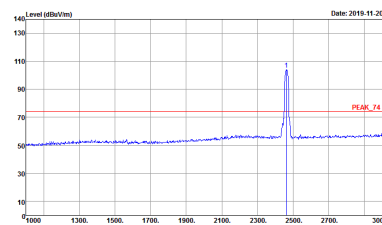
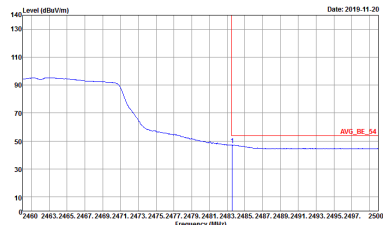
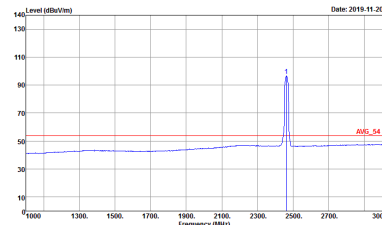


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT20 CH06 2437MHz - L	
	Vertical	Fundamental
Peak	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>
Avg.	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : AVG_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	802.11n HT20 CH06 2437MHz - R	
	Vertical	Fundamental
<p>Peak</p>	 <p>Site : 03CH2-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	<p>Left Blank</p>
<p>Avg.</p>	 <p>Site : 03CH2-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	<p>Left Blank</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
802.11n HT20 CH11 2462MHz		
Horizontal		Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>
Avg.	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 HORIZONTAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>



WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
	802.11n HT20 CH11 2462MHz	
	Vertical	Fundamental
<p>Peak</p>	<p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	<p>Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>
<p>Avg.</p>	<p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>	<p>Site : 03CH12-HY Condition : AVG_F4 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:1.000kHz SWT:Auto Detector : Peak Project : 832801-05</p>

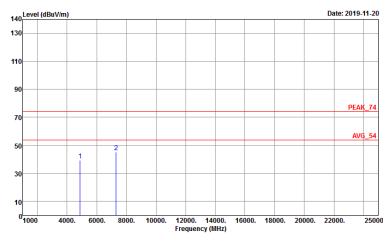
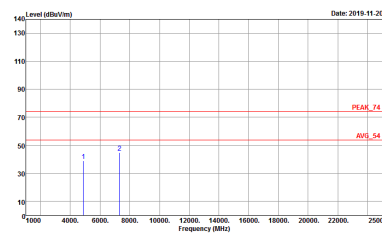


2.4GHz 2400~2483.5MHz

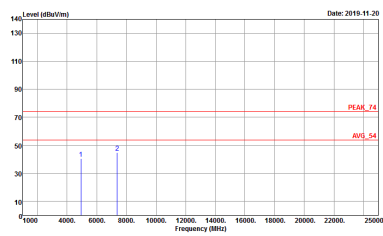
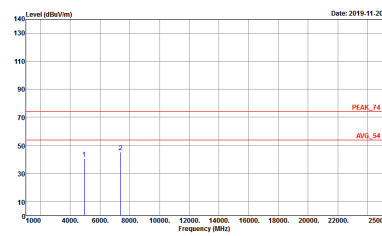
WIFI 802.11b (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	802.11b CH01 2412MHz	
	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832801-05</p>	<p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 832801-05</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	802.11b CH06 2437MHz	
	Horizontal	Vertical
<p>Peak</p> <p>Avg.</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 832801-05</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	802.11b CH11 2462MHz	
	Horizontal	Vertical
<p>Peak</p> <p>Avg.</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 832801-05</p>

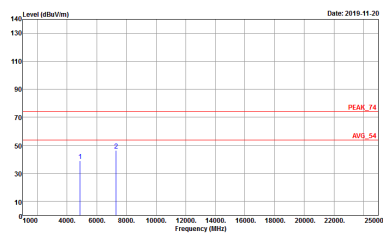
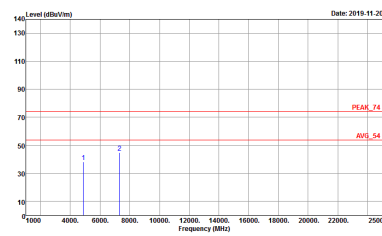


2.4GHz 2400~2483.5MHz

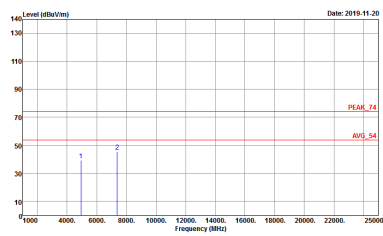
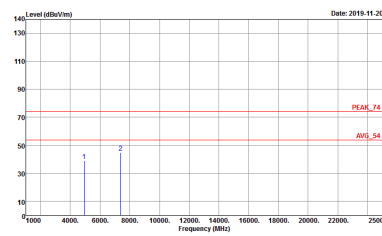
WIFI 802.11g (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	802.11g CH01 2412MHz	
	Horizontal	Vertical
<p>Peak</p> <p>Avg.</p>	<p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832801-05</p>	<p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 832801-05</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	802.11g CH06 2437MHz	
	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 832801-05</p>

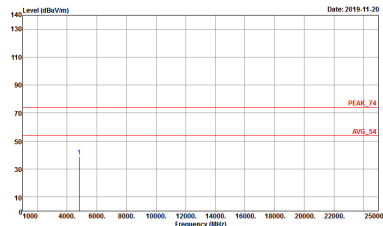
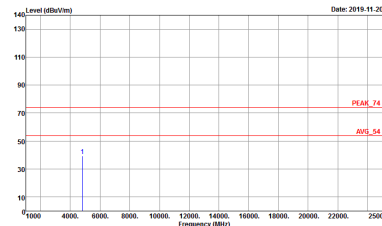


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	802.11g CH11 2462MHz	
	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 832801-05</p>

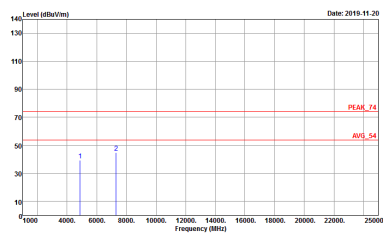
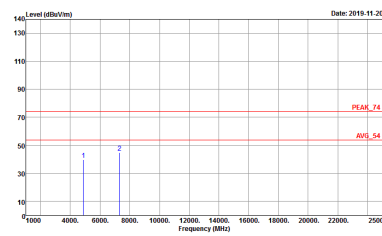


2.4GHz 2400~2483.5MHz

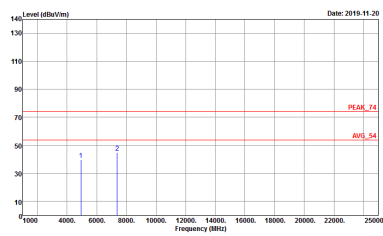
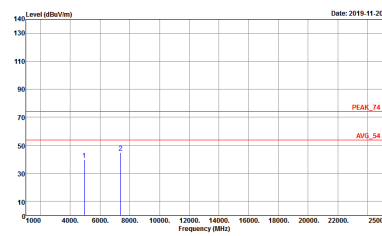
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	802.11n HT20 CH01 2412MHz	
	Horizontal	Vertical
<p>Peak</p> <p>Avg.</p>	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832801-05</p>	 <p>Date: 2019-11-20</p> <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 832801-05</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	802.11n HT20 CH06 2437MHz	
	Horizontal	Vertical
<p>Peak</p> <p>Avg.</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 832801-05</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	802.11n HT20 CH11 2462MHz	
	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 832801-05</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 832801-05</p>



Emission below 1GHz
2.4GHz WIFI 802.11n HT20 (LF)

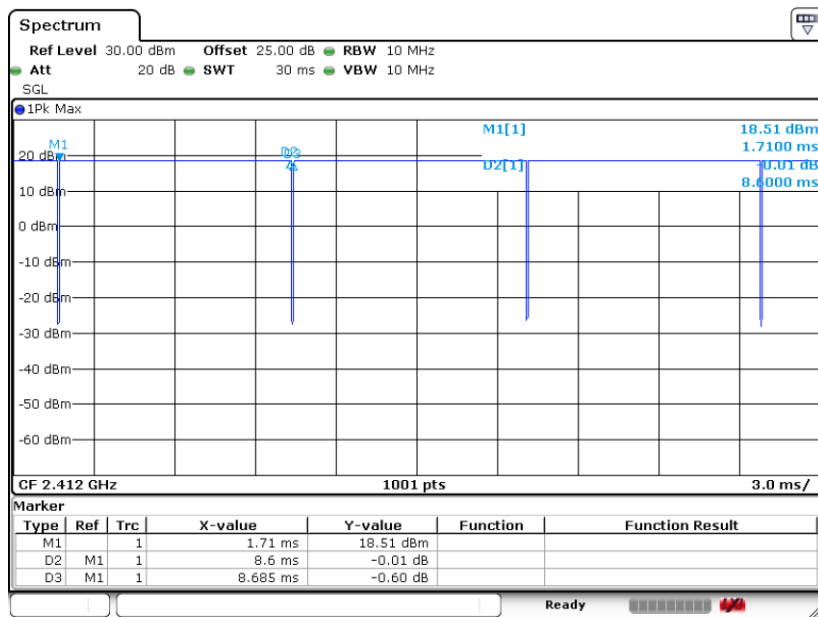
WIFI	2.4GHz 2400~2483.5MHz	
	802.11n HT20 LF	
	Horizontal	Vertical
QP / Peak	<p>Site : 03GH12-HY Condition : QP 3m BIL06_6111D_37059 HORIZONTAL Detector : Peak Project : 832801-05</p>	<p>Site : 03GH12-HY Condition : QP 3m BIL05_6111D_37059 VERTICAL Detector : Peak Project : 832801-05</p>



Appendix E. Duty Cycle Plots

Band	Duty Cycle (%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor (dB)
802.11b	99.02	-	-	10Hz	0.04
802.11g	92.83	1425.00	0.70	1kHz	0.32
2.4GHz 802.11n HT20	93.06	1340.00	0.75	1kHz	0.31

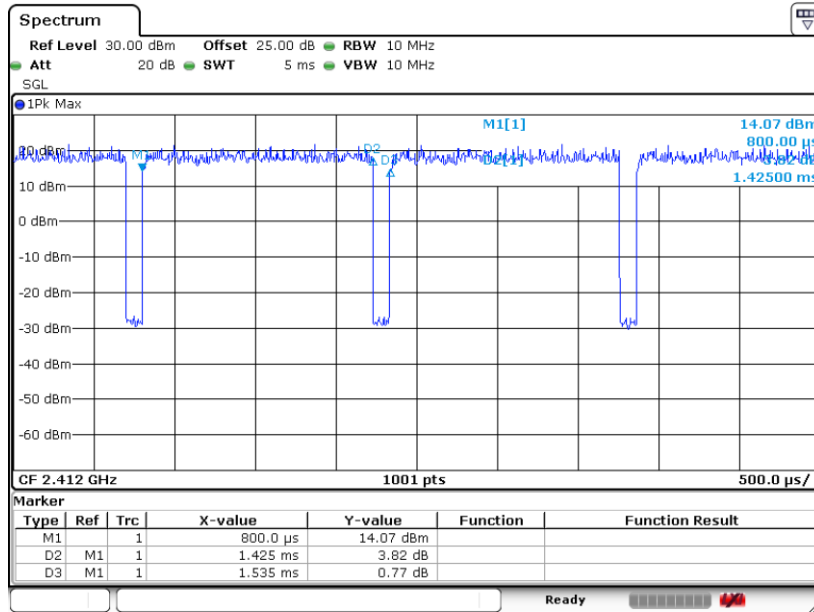
802.11b



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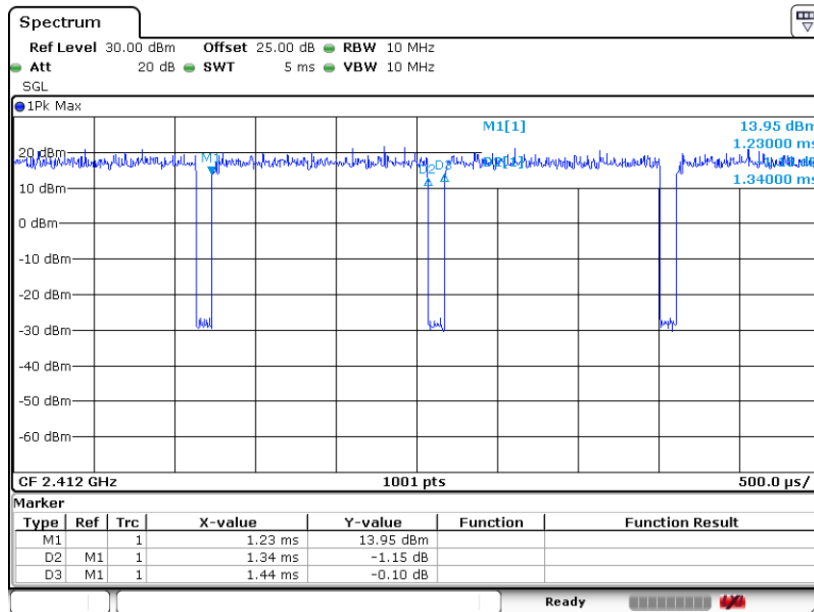


802.11g



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802.11n HT20



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