



FCC RF Test Report

APPLICANT : Espressif Systems (Shanghai) Co.,Ltd.
EQUIPMENT : 2.4GHz Wi-Fi & BT IoT Module
BRAND NAME : ESPRESSIF
MODEL NAME : ESP32-S3-WROOM-1U
FCC ID : 2AC7Z-ESPS3WROOM1U
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System
TEST DATE(S) : Mar. 04, 2022 ~ Mar. 10, 2022

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Reviewed by: Jason Jia / Supervisor

Alex Wang

Approved by: Alex Wang / Manager



Sporton International Inc. (Kunshan)

No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR1D1609B	Rev. 01	Initial issue of report	Mar. 28, 2022

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	99% Bandwidth	-	Report Only	-
3.2	15.247(b)	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 1.11 dB at 2389.950 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 8.23 dB at 0.153 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	15.203 & 15.247(b)	Pass	-

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits.

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.

1 General Description

1.1 Applicant

Espressif Systems (Shanghai) Co.,Ltd.

Suite 204, Block 2, 690 Bibo Road, Zhang Jiang Hi-Tech Park, Shanghai, China

1.2 Manufacturer

Espressif Systems (Shanghai) Co.,Ltd.

Suite 204, Block 2, 690 Bibo Road, Zhang Jiang Hi-Tech Park, Shanghai, China

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	2.4GHz Wi-Fi & BT IoT Module
Brand Name	ESPRESSIF
Model Name	ESP32-S3-WROOM-1U
FCC ID	2AC7Z-ESPS3WROOM1U
HW Version	V1.4
SW Version	v1.1.3.4
EUT Stage	Production Unit

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz
Maximum (Peak) Output Power to antenna	802.11b : 18.41dBm (0.0693 W) 802.11g : 25.11dBm (0.3243 W) 802.11n HT20 : 24.55dBm (0.2851 W) 802.11n HT40 : 24.10dBm (0.2570 W)
99% Occupied Bandwidth	802.11b : 13.24MHz 802.11g : 18.33MHz 802.11n HT20 : 18.98MHz 802.11n HT40 : 34.97MHz
Antenna Type / Gain	IPEX Antenna type with gain 2.33dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 Modification of EUT

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

1.6 Testing Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CO01-KS 03CH07-KS TH01-KS	CN1257	314309

1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH07-KS	AUDIX	E3	6.2009-8-24al
2.	CO01-KS	AUDIX	E3	6.2009-8-24

1.8 Applicable Standards

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

- 47 CFR Part 15 Subpart C §15.247
- FCC KDB 558074 D01 15.247 Meas Guidance v05r02
- ANSI C63.10-2013

Remark:

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

2 Test Configuration of Equipment Under Test

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

2.1 Carrier Frequency and Channel

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

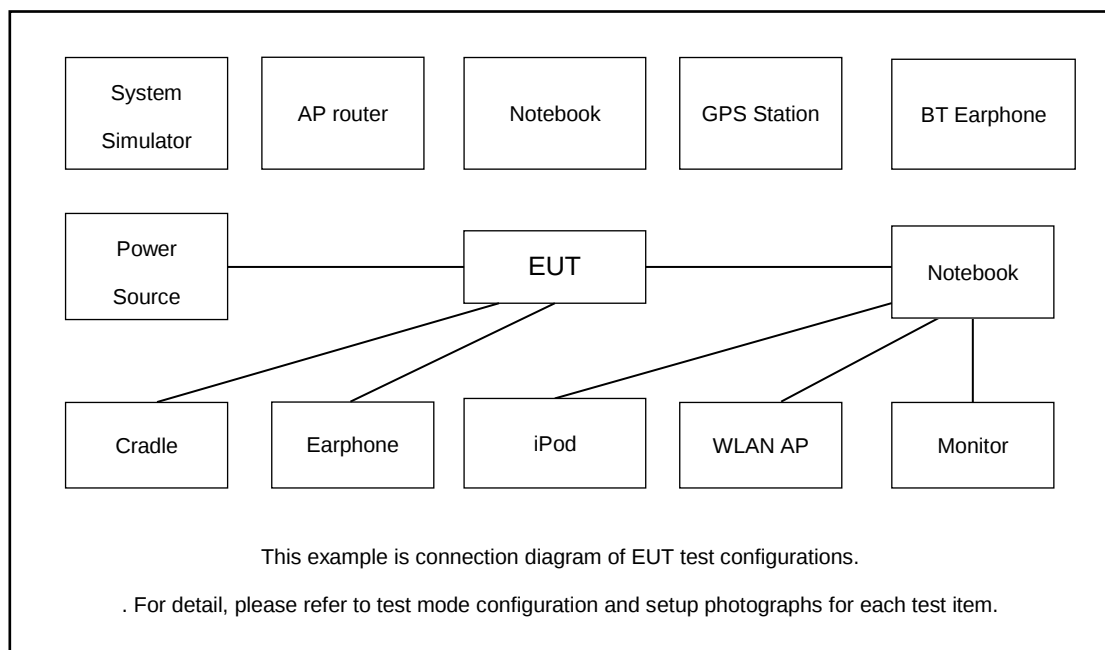
2.2 Test Mode

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

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

Test Cases	
AC Conducted Emission	Mode 1 :WLAN TX +NB Charging

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	D-link	DIR-655	KA21R655B1	N/A	Unshielded,1.8m
2.	Notebook	Lenovo	V130-15IKB005	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
3.	hard disk	N/A	N/A	N/A	N/A	N/A
4.	Antenna	N/A	N/A	N/A	N/A	N/A
5.	Test Jig	N/A	N/A	N/A	N/A	N/A

2.5 EUT Operation Test Setup

For WLAN test items, an engineering test program was provided and enabled to make EUT continuous transmit.

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 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.

Offset = RF cable loss.

Following shows an offset computation example with cable loss 5.50dB.

$$\begin{aligned}
 \text{Offset (dB)} &= \text{RF cable loss (dB)}. \\
 &= 5.50(\text{dB})
 \end{aligned}$$

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

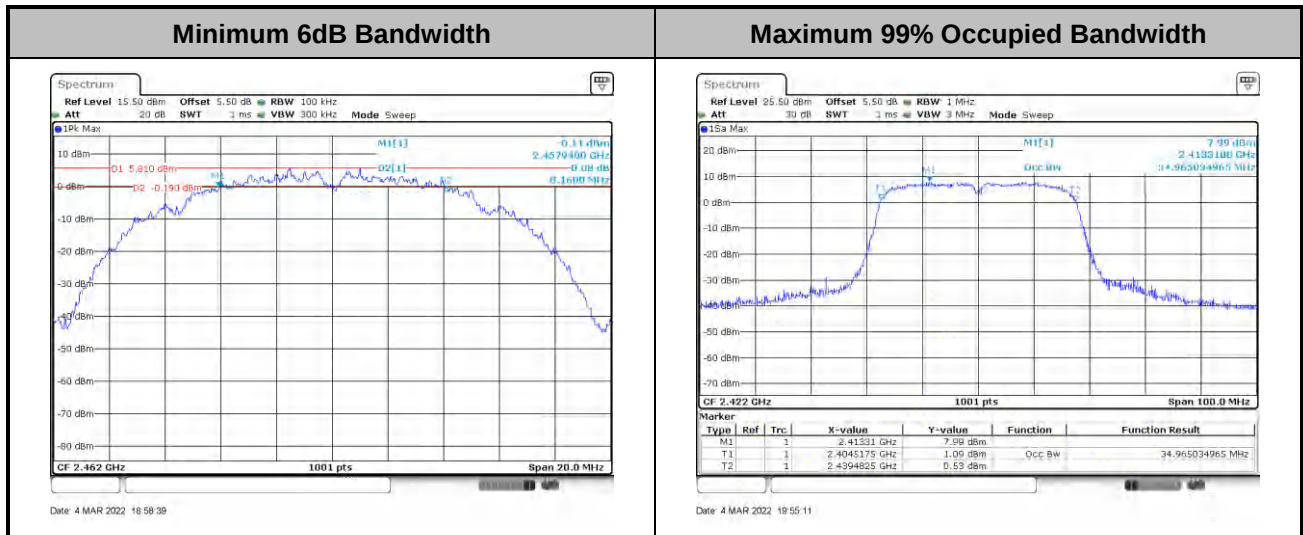
1. The testing follows ANSI C63.10-2013 clause 11.8
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 1MHz and set the Video bandwidth (VBW) = 3MHz.
6. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.



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

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

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 clause 11.9.1.3 PKPM1 Peak power meter or ANSI C63.10-2013 clause 11.9.2.3.1 Method AVGPM method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Please refer to Appendix A.

3.2.6 Test Result of Average Output Power (Reporting Only)

Please refer to Appendix A.



3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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

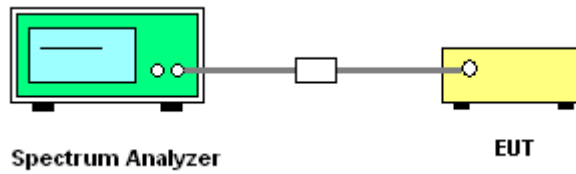
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

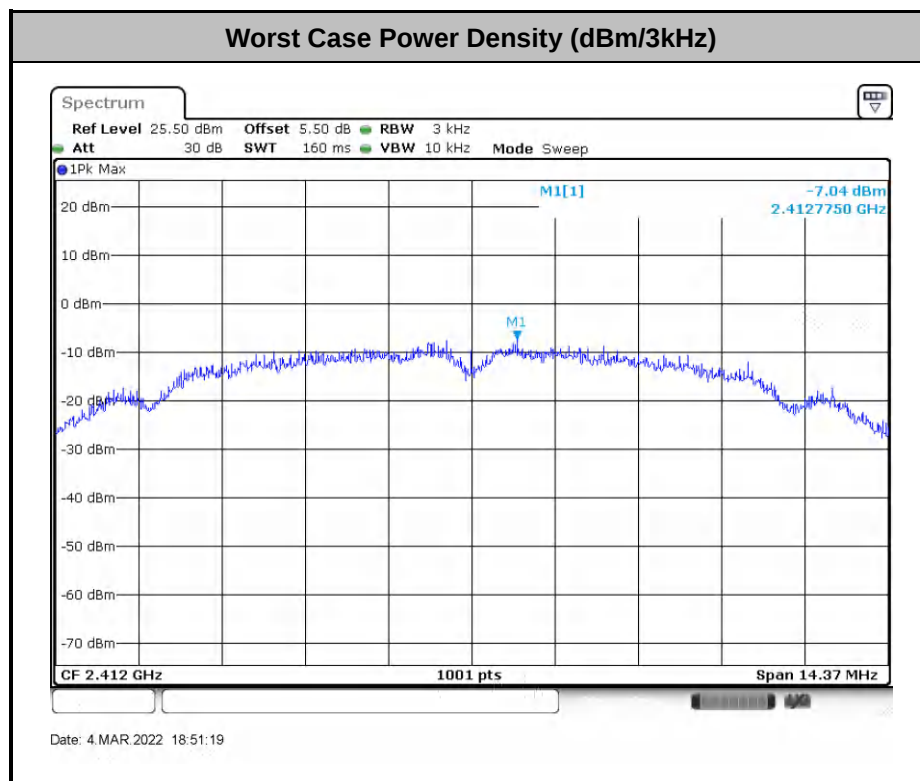
1. The testing follows Measurement Procedure of ANSI C63.10-2013 clause 11.10.2 Method PKPSD.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the 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.

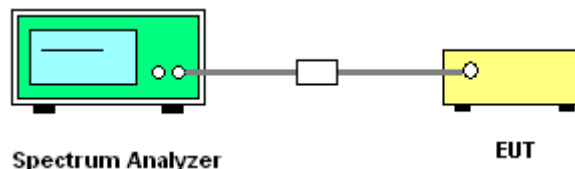
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 11.13
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



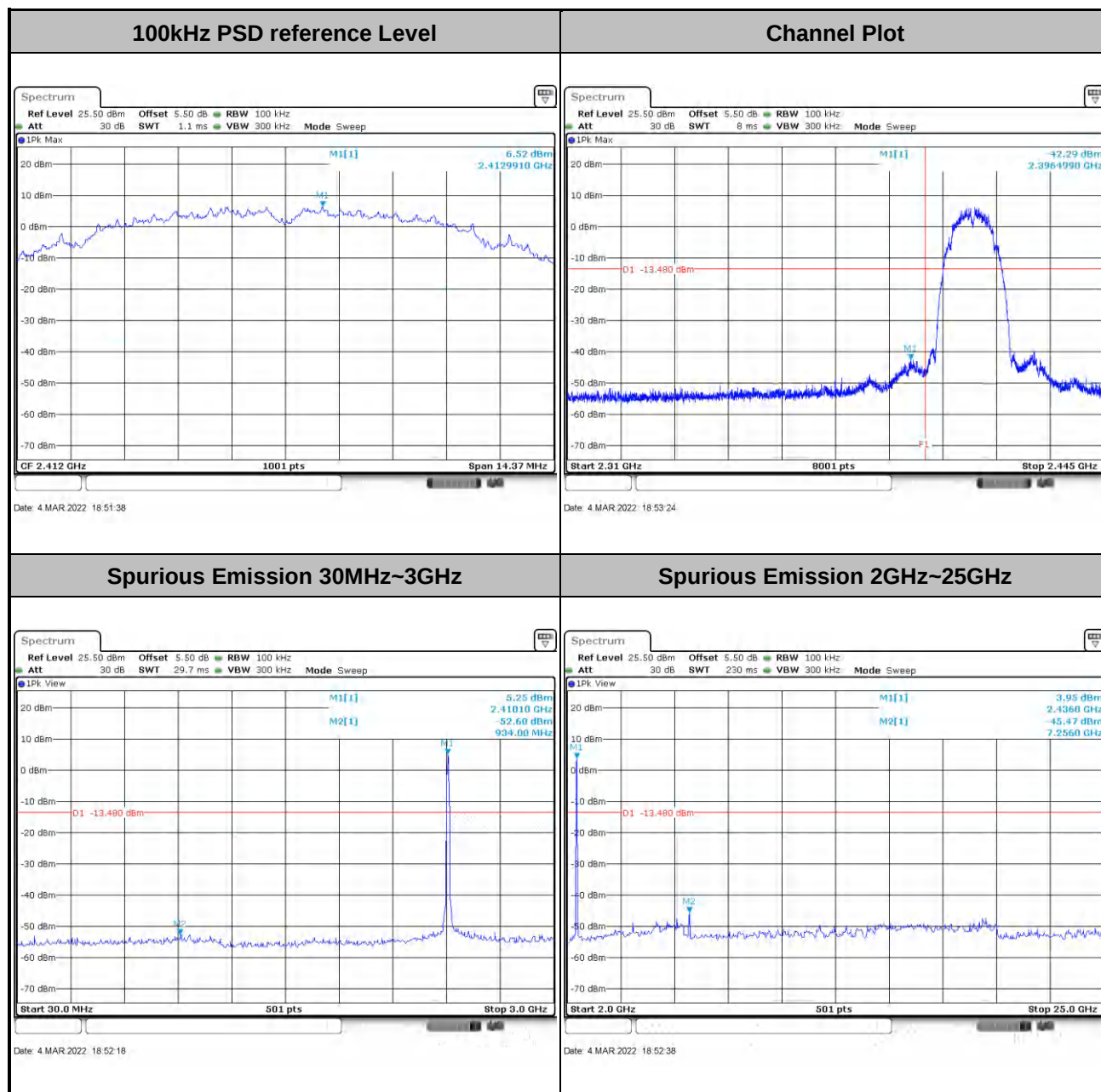


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Engineer :	Jacob Zhang	Temperature :	21~25
		Relative Humidity :	51~54%

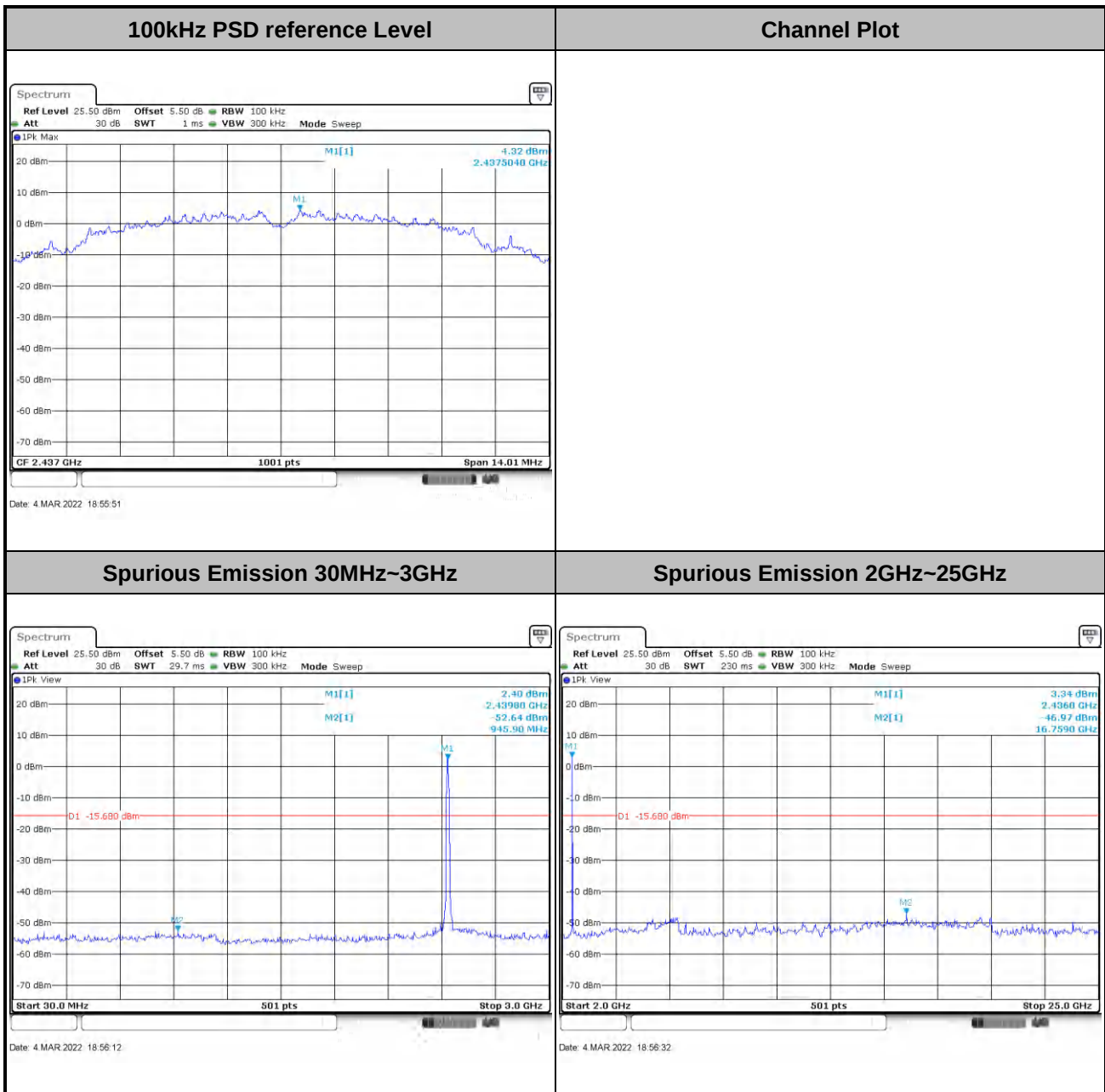
Number of TX = 1, Ant. 1 (Measured)

Test Mode :	802.11b	Test Channel :	01
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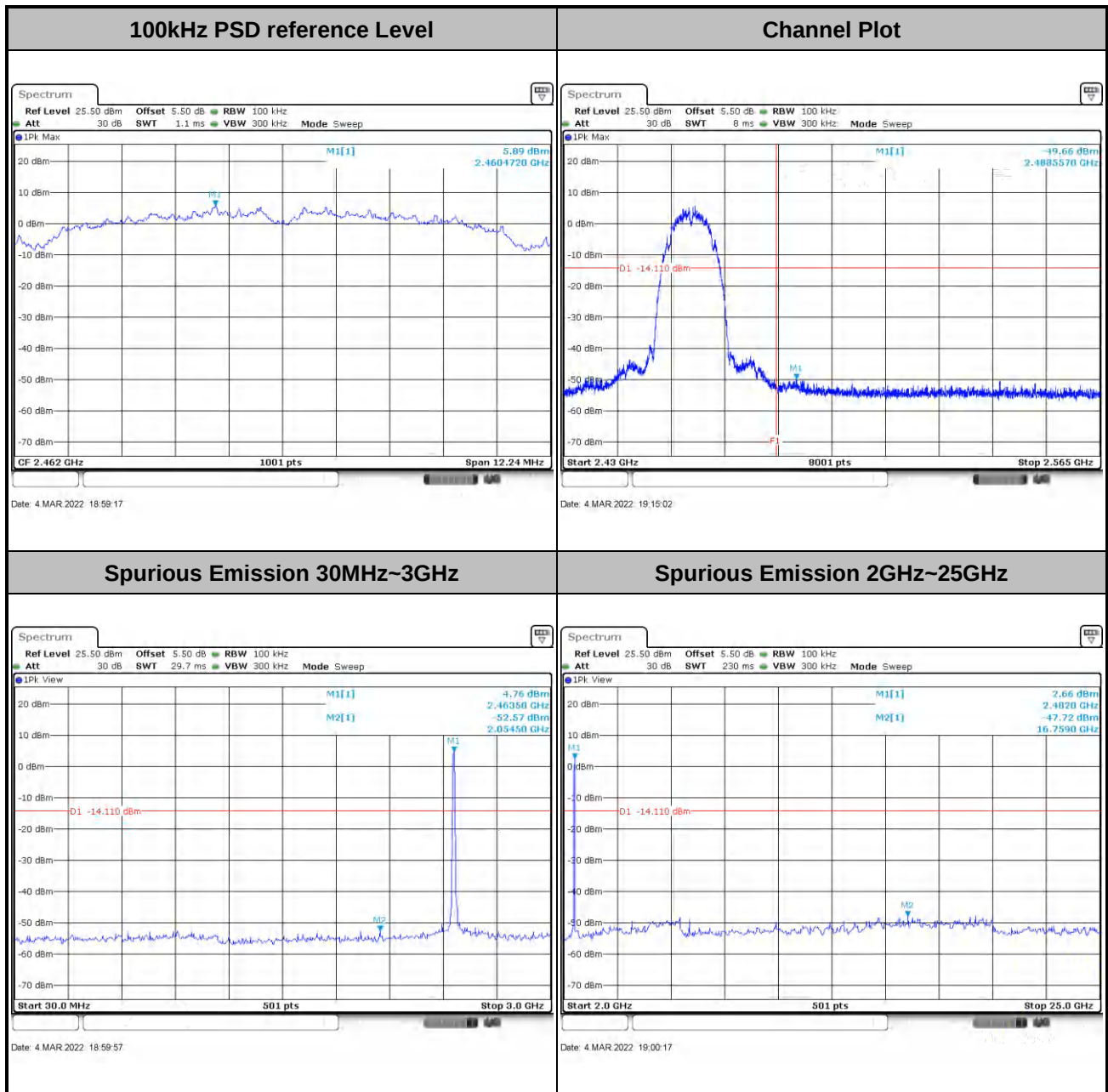


Test Mode :	802.11b	Test Channel :	06
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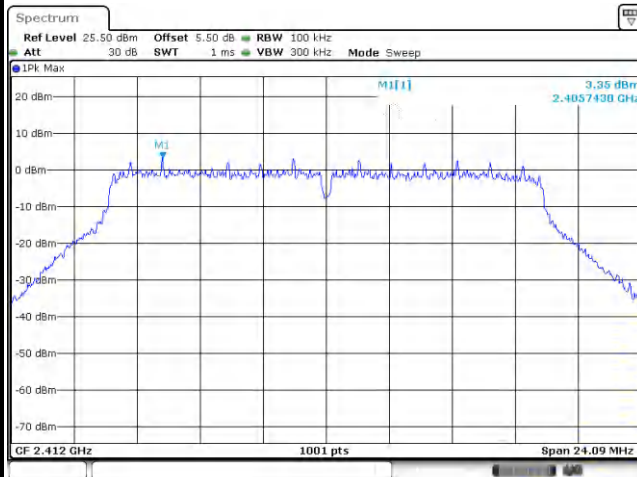
Test Mode :	802.11b	Test Channel :	11
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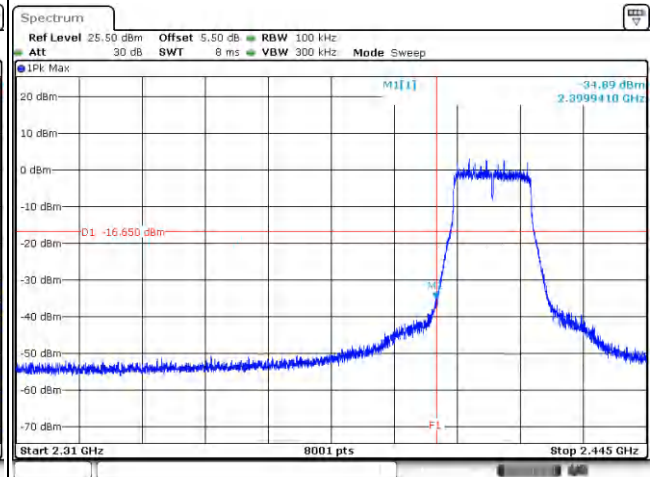


Test Mode :	802.11g	Test Channel :	01
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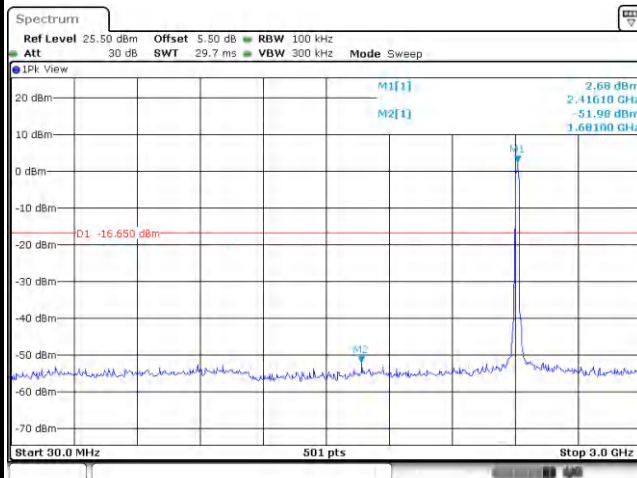
100kHz PSD reference Level



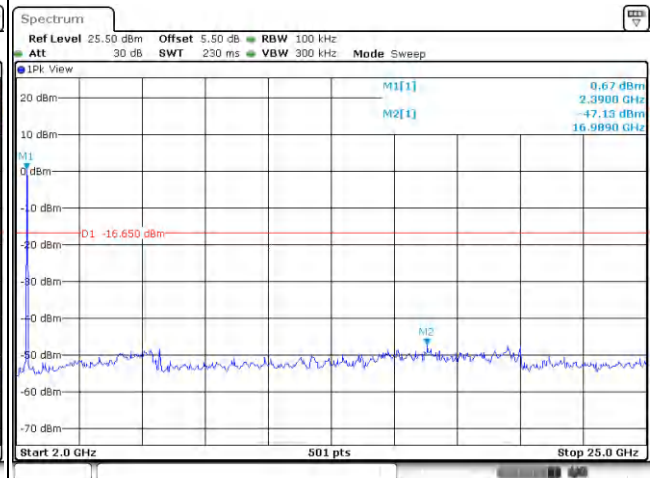
Channel Plot



Spurious Emission 30MHz~3GHz

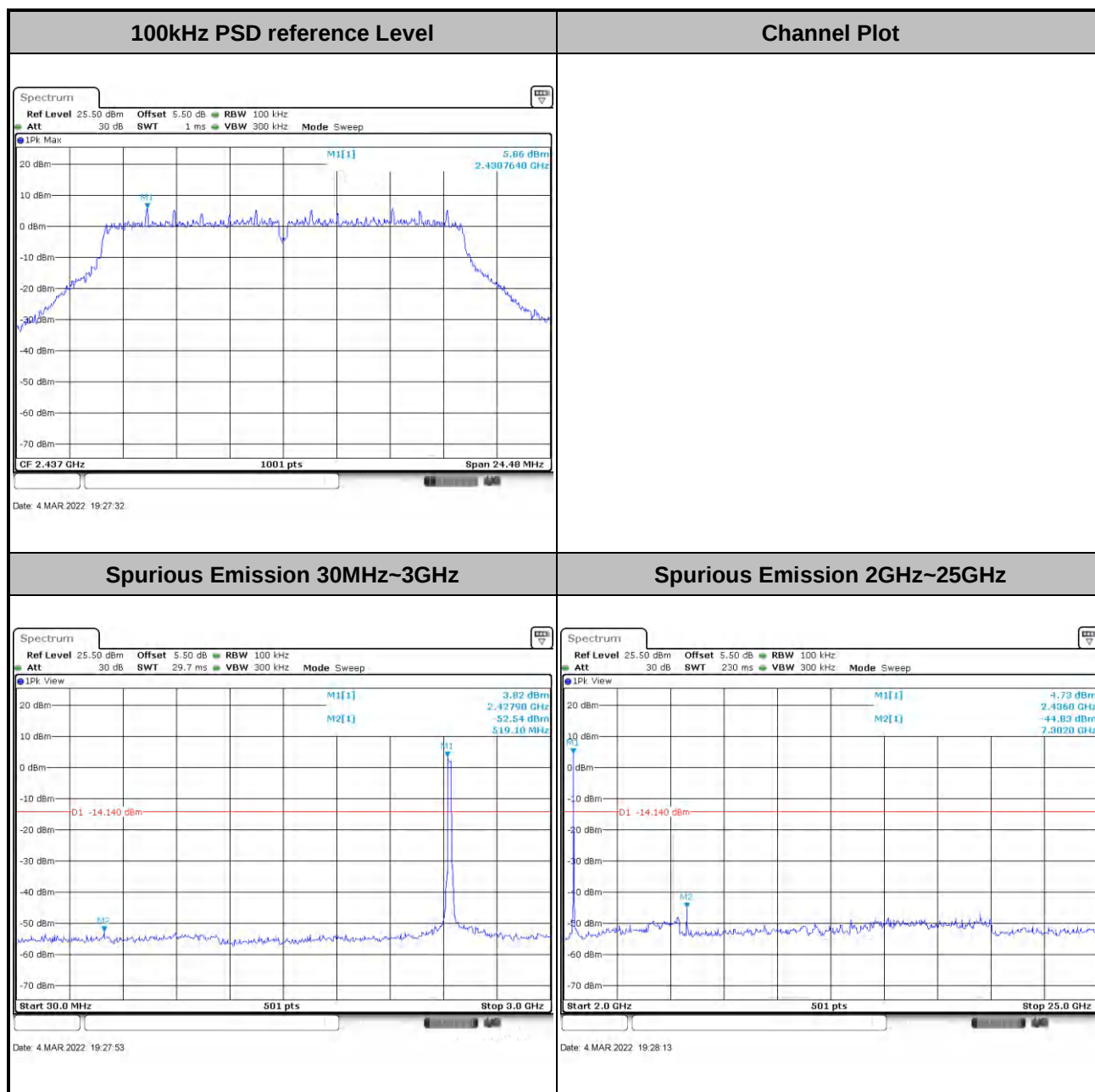


Spurious Emission 2GHz~25GHz



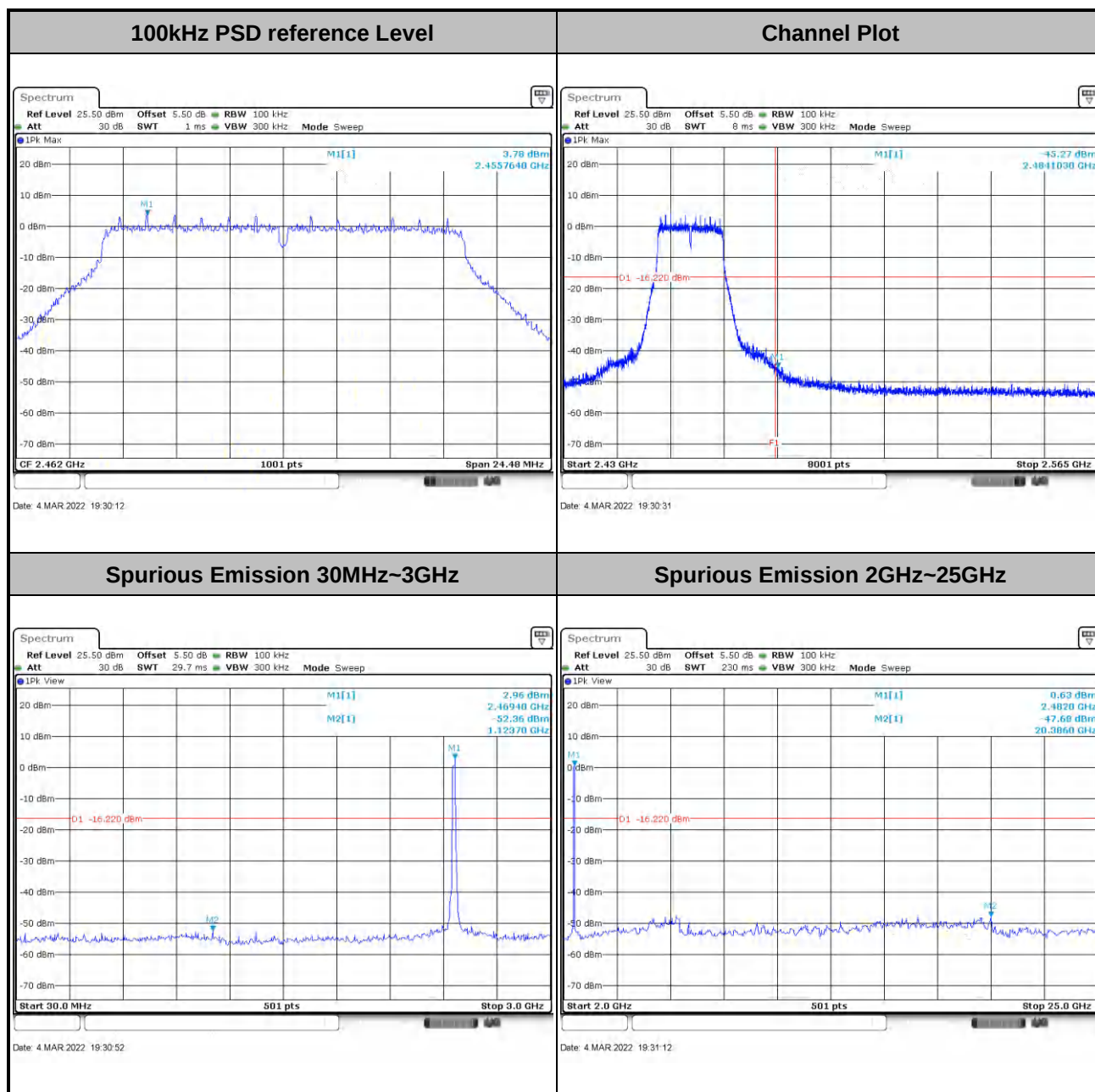


Test Mode :	802.11g	Test Channel :	06
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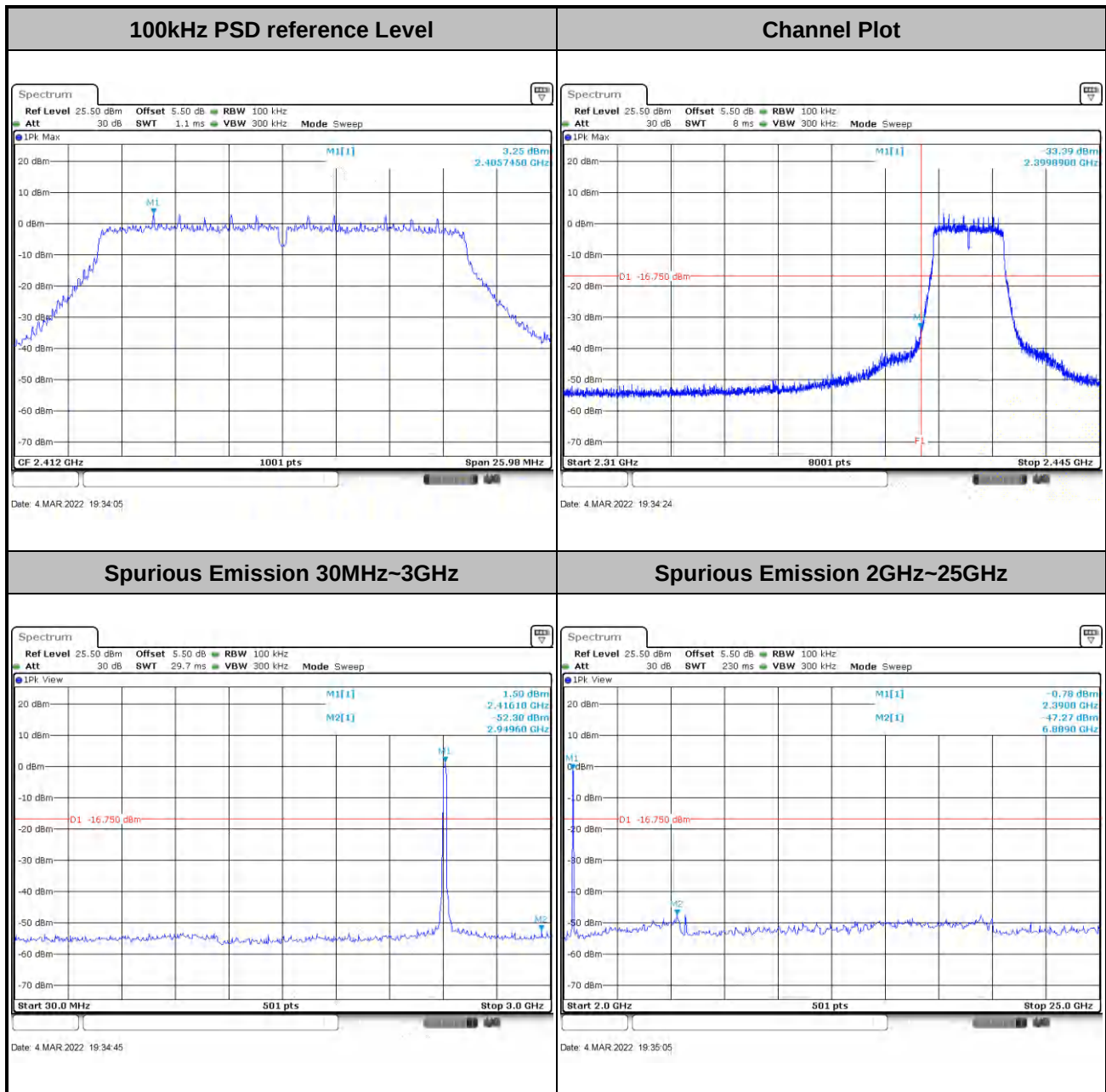


Test Mode :	802.11g	Test Channel :	11
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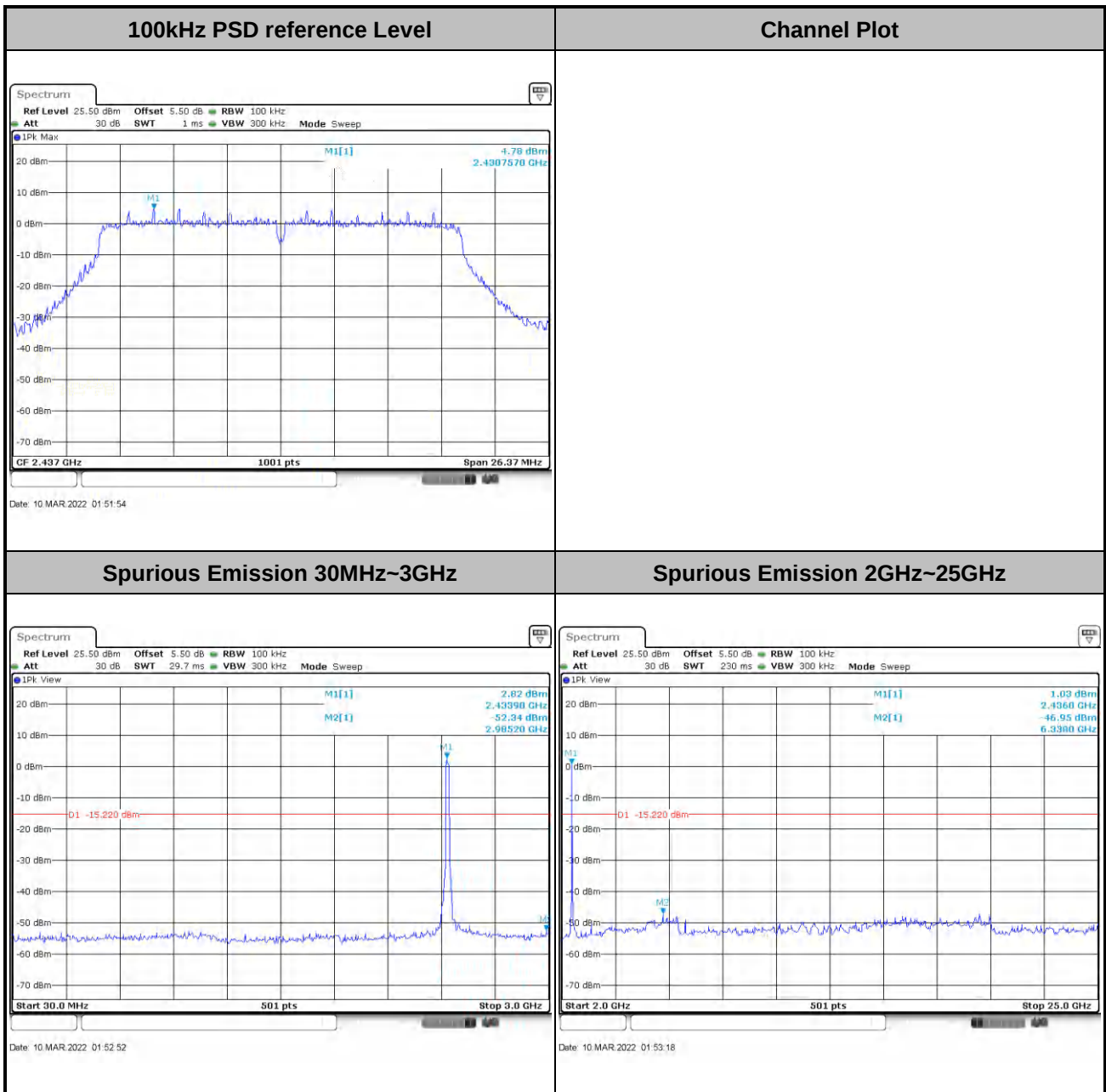


Test Mode :	802.11n HT20	Test Channel :	01
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Test Mode :	802.11n HT20	Test Channel :	06
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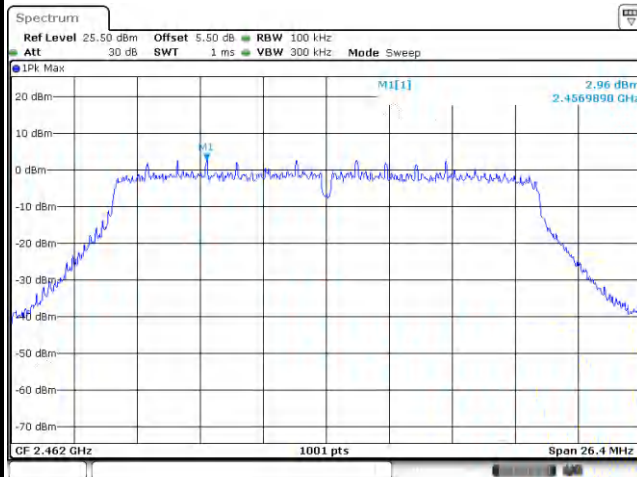




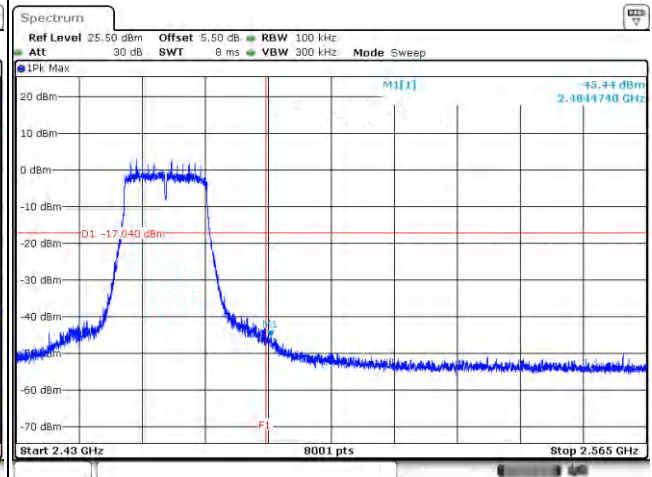
Test Mode : 802.11n HT20

Test Channel : 11

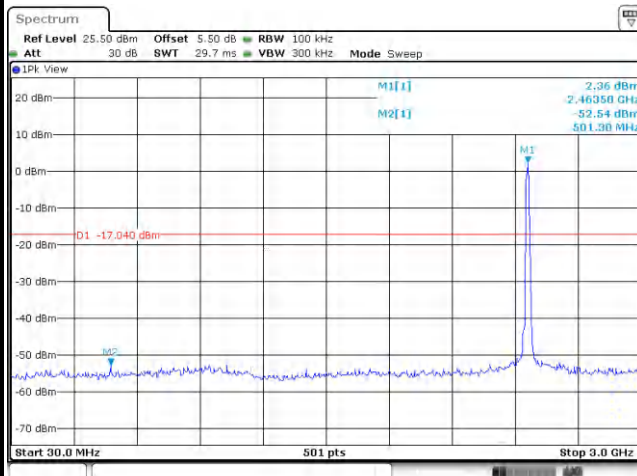
100kHz PSD reference Level



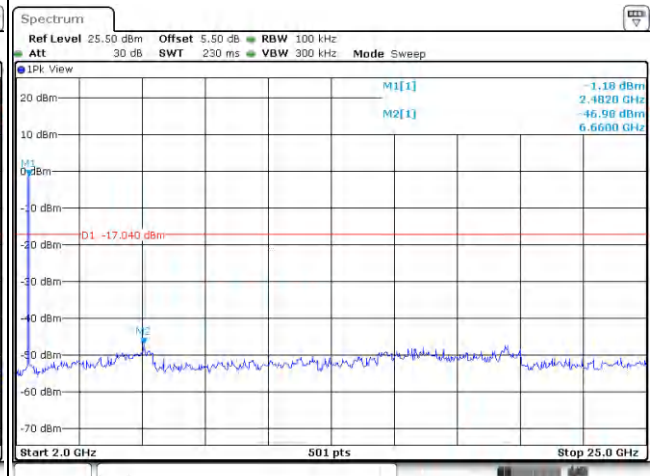
Channel Plot



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz

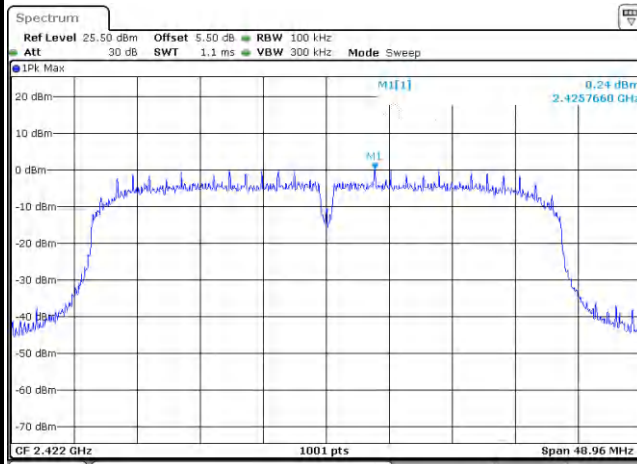




Test Mode : 802.11n HT40

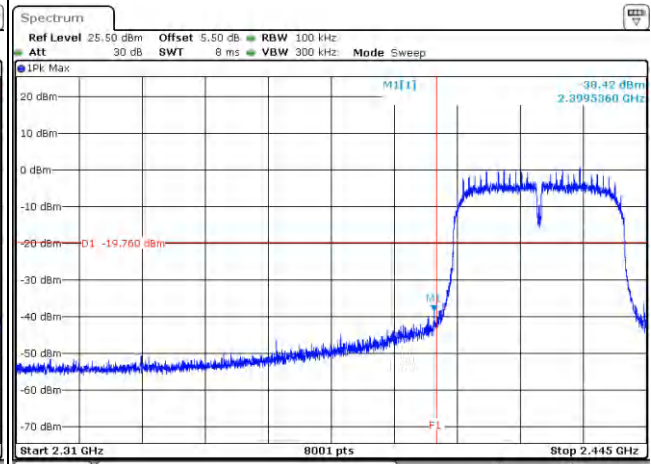
Test Channel : 03

100kHz PSD reference Level



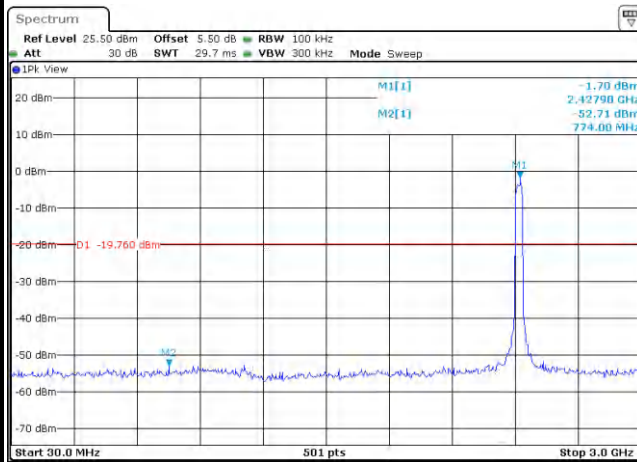
Date: 4 MAR 2022 19:54:02

Channel Plot



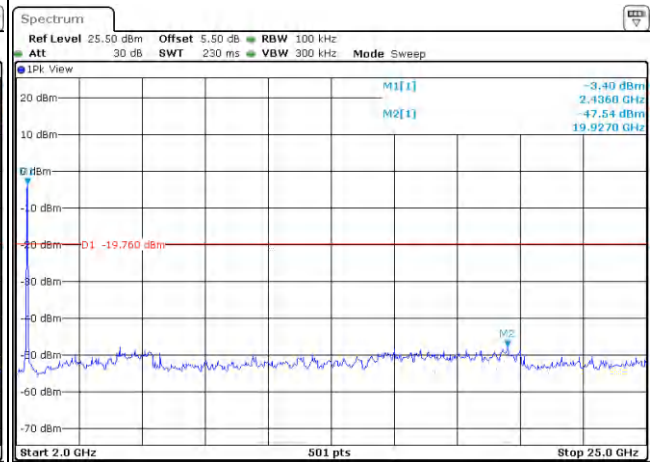
Date: 4 MAR 2022 19:54:21

Spurious Emission 30MHz~3GHz



Date: 4 MAR 2022 19:54:42

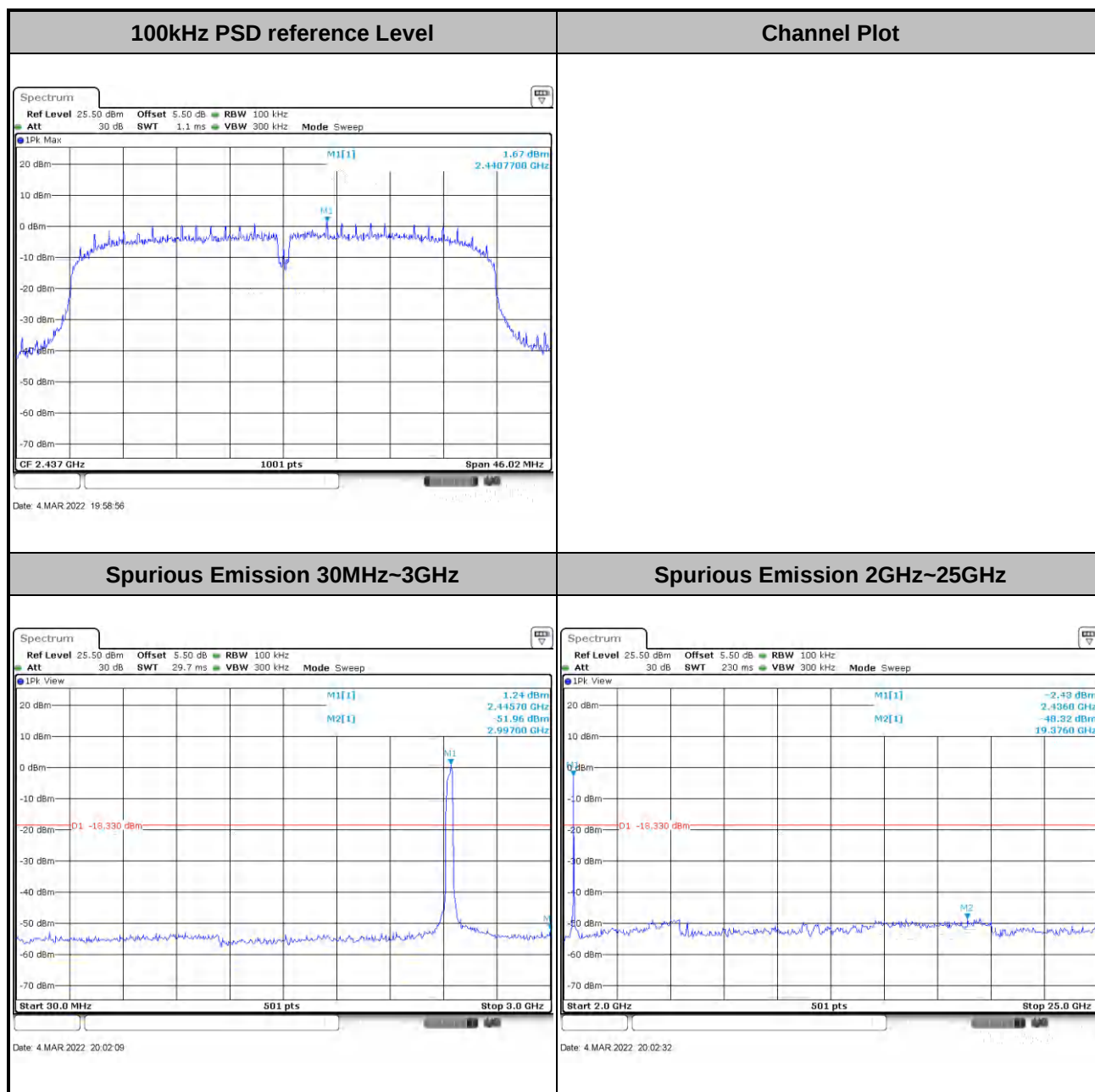
Spurious Emission 2GHz~25GHz



Date: 4 MAR 2022 19:55:03

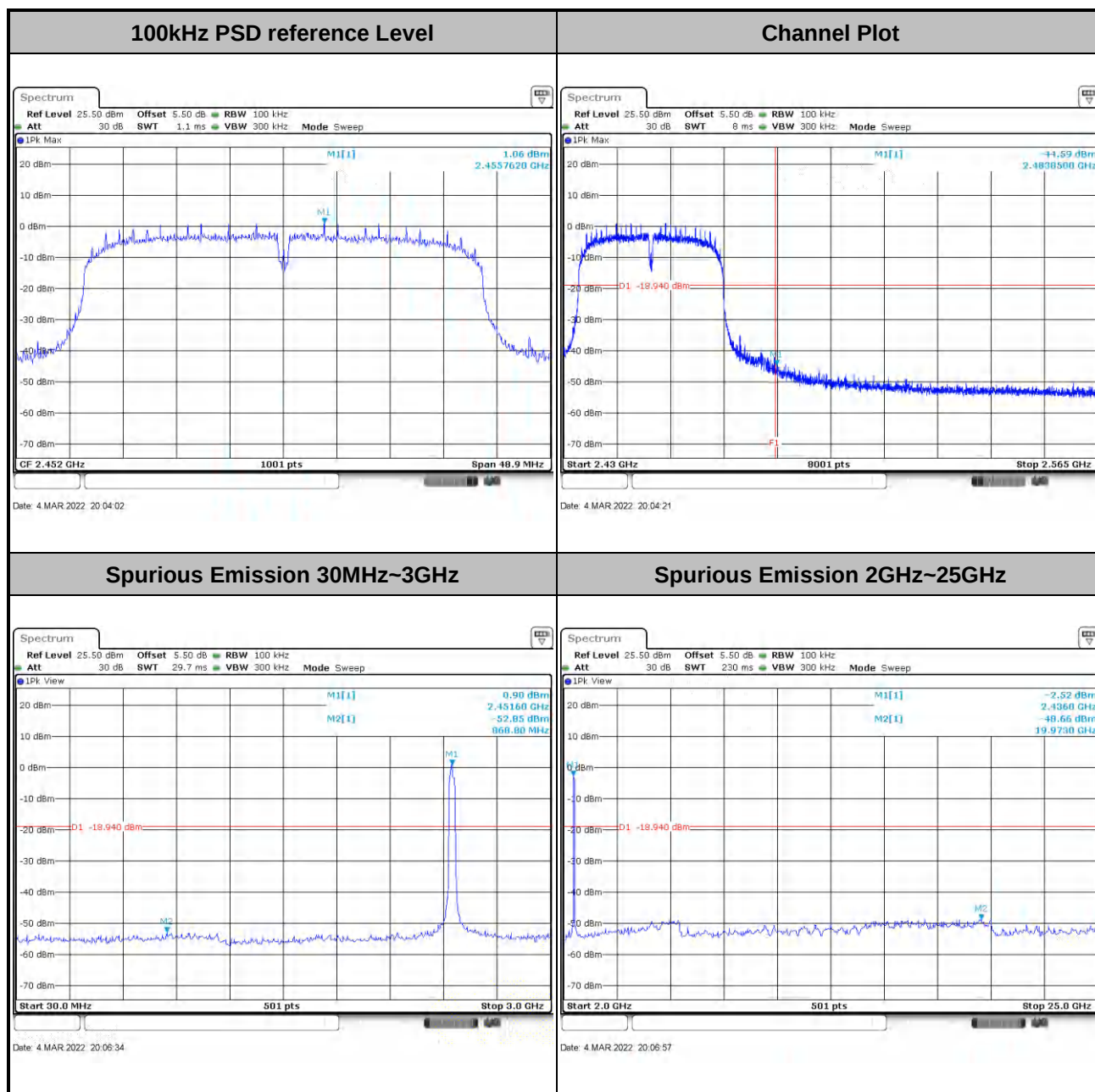


Test Mode :	802.11n HT40	Test Channel :	06
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Test Mode :	802.11n HT40	Test Channel :	09
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3.5 Radiated Band Edges and Spurious Emission Measurement

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

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

3.5.3 Test Procedures

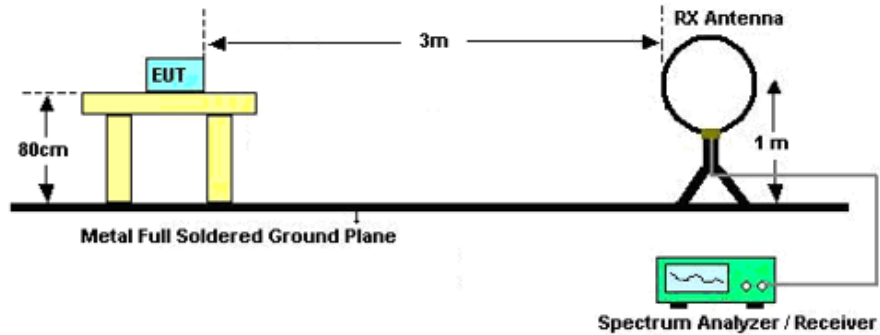
1. The testing follows ANSI C63.10-2013 clause 11.11 & 11.12
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better 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 peak 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:

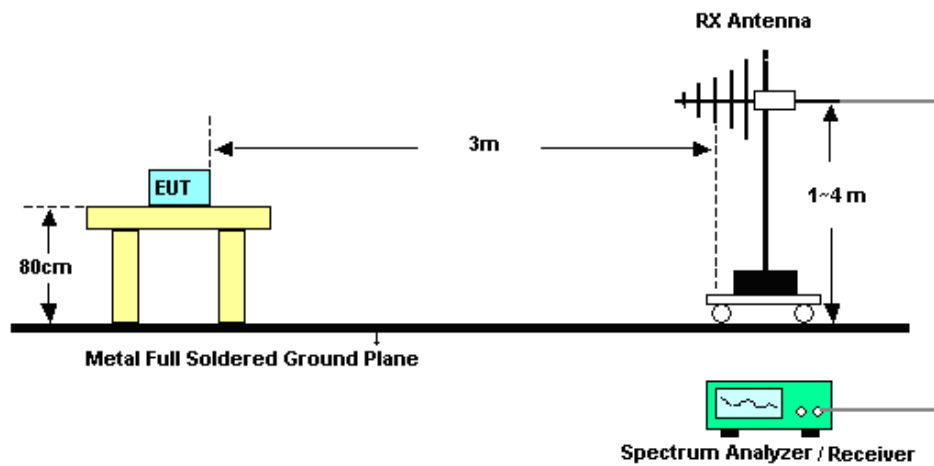
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

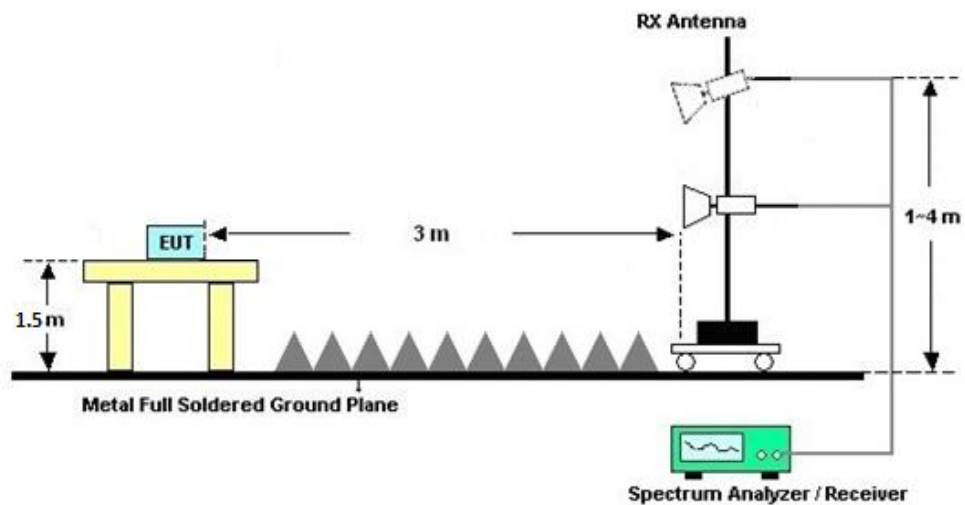
For radiated emissions below 30MHz



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 semi-Anechoic chamber, and the result came out very similar.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C&D.

3.5.7 Duty Cycle

Please refer to Appendix E.

3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic or 40GHz, whichever is lower)

Please refer to Appendix C&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.

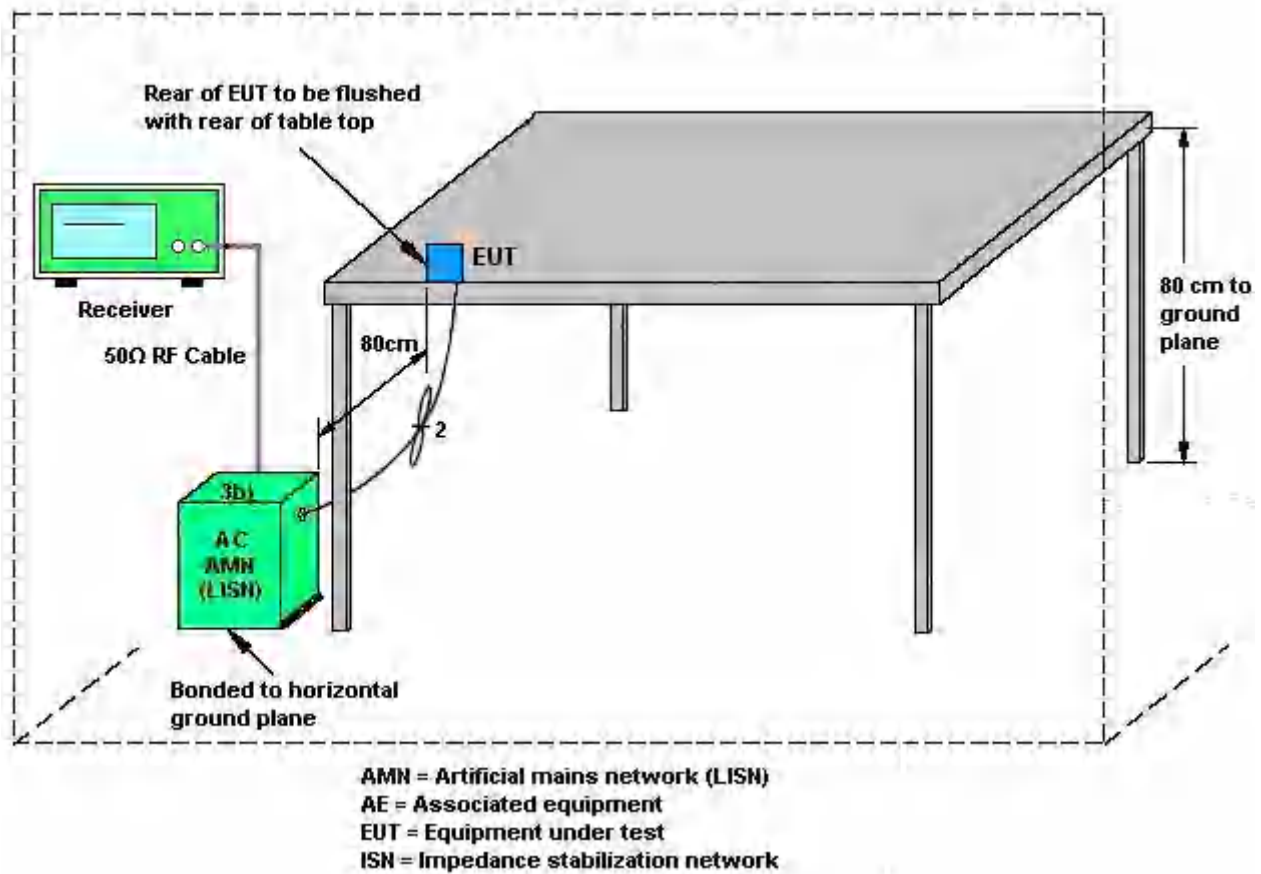
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

1. The EUT was placed 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

Non-standard antenna connector 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
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 14, 2021	Mar. 04, 2022~ Mar. 10, 2022	Oct. 13, 2022	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 05, 2022	Mar. 04, 2022~ Mar. 10, 2022	Jan. 04, 2023	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 05, 2022	Mar. 04, 2022~ Mar. 10, 2022	Jan. 04, 2023	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz;Max 30dBm	Oct. 16, 2021	Mar. 10, 2022	Oct. 15, 2022	Radiation (03CH07-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55370528	10Hz~44G,MAX 30dB	Oct. 16, 2021	Mar. 10, 2022	Oct. 15, 2022	Radiation (03CH07-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 30, 2021	Mar. 10, 2022	Oct. 29, 2022	Radiation (03CH07-KS)
Bilog Antenna	TeseQ	CBL6111D	44483	30MHz~1GHz	Dec. 22, 2021	Mar. 10, 2022	Dec. 21, 2022	Radiation (03CH07-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 30, 2021	Mar. 10, 2022	Oct. 29, 2022	Radiation (03CH07-KS)
high gain Amplifier	MITEQ	AMF-7D-001 01800-30-10 P	2025788	1Ghz~18Ghz	Jul. 30, 2021	Mar. 10, 2022	Jul. 29, 2023	Radiation (03CH07-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2022	Mar. 10, 2022	Jan. 04, 2023	Radiation (03CH07-KS)
Amplifier	SONOMA	310N	187289	9KHz~1GHz	Apr. 13, 2021	Mar. 10, 2022	Apr. 12, 2022	Radiation (03CH07-KS)
Amplifier	Keysight	83017A	MY53270316	500MHz~26.5GHz	Oct. 16, 2021	Mar. 10, 2022	Oct. 15, 2022	Radiation (03CH07-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 05, 2022	Mar. 10, 2022	Jan. 04, 2023	Radiation (03CH07-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Mar. 10, 2022	NCR	Radiation (03CH07-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Mar. 10, 2022	NCR	Radiation (03CH07-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Mar. 10, 2022	NCR	Radiation (03CH07-KS)
EMI Receiver	R&S	ESC17	100768	9kHz~7GHz;	Apr. 21, 2021	Mar. 05, 2022	Apr. 20, 2022	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 14, 2021	Mar. 05, 2022	Oct. 13, 2022	Conduction (CO01-KS)
AC LISN	R&S	ENV216	100334	9kHz~30MHz	Oct. 14, 2021	Mar. 05, 2022	Oct. 13, 2022	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP00000811	AC 0V~300V, 45Hz~1000Hz	Oct. 14, 2021	Mar. 05, 2022	Oct. 13, 2022	Conduction (CO01-KS)

NCR: No Calibration Required

5 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. All the measurement uncertainty value were shown with a coverage $K=2$ to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.94dB
---	--------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.0dB
---	-------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.0dB
---	-------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.0dB
---	-------

----- THE END -----



Appendix A. Conducted Test Results

A1. Conducted Test Results

Test Engineer:	Jacob Zhang	Temperature:	21~25	°C
Test Date:	2022/3/4~2022/3/10	Relative Humidity:	51~54	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band Single Antenna										
Mod.	Data Rate	N _{TX}	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	13.24	-	9.58	-	0.50	Pass
11b	1Mbps	1	6	2437	13.19	-	9.34	-	0.50	Pass
11b	1Mbps	1	11	2462	13.19	-	8.16	-	0.50	Pass
11g	6Mbps	1	1	2412	18.33	-	16.06	-	0.50	Pass
11g	6Mbps	1	6	2437	18.23	-	16.32	-	0.50	Pass
11g	6Mbps	1	11	2462	18.28	-	16.32	-	0.50	Pass
HT20	MCS0	1	1	2412	18.98	-	17.32	-	0.50	Pass
HT20	MCS0	1	6	2437	18.88	-	17.18	-	0.50	Pass
HT20	MCS0	1	11	2462	18.98	-	17.60	-	0.50	Pass
HT40	MCS0	1	3	2422	34.97	-	32.64	-	0.50	Pass
HT40	MCS0	1	6	2437	34.77	-	30.68	-	0.50	Pass
HT40	MCS0	1	9	2452	34.77	-	32.60	-	0.50	Pass

TEST RESULTS DATA
Peak Output Power

2.4GHz Band Single Antenna																
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	18.41	-		30.00	-	2.33	-	20.74	-	36.00	-	Pass
11b	1Mbps	1	6	2437	15.73	-		30.00	-	2.33	-	18.06	-	36.00	-	Pass
11b	1Mbps	1	11	2462	16.93	-		30.00	-	2.33	-	19.26	-	36.00	-	Pass
11g	6Mbps	1	1	2412	23.28	-		30.00	-	2.33	-	25.61	-	36.00	-	Pass
11g	6Mbps	1	6	2437	25.11	-		30.00	-	2.33	-	27.44	-	36.00	-	Pass
11g	6Mbps	1	11	2462	23.78	-		30.00	-	2.33	-	26.11	-	36.00	-	Pass
HT20	MCS0	1	1	2412	23.44	-		30.00	-	2.33	-	25.77	-	36.00	-	Pass
HT20	MCS0	1	6	2437	24.55	-		30.00	-	2.33	-	26.88	-	36.00	-	Pass
HT20	MCS0	1	11	2462	23.45	-		30.00	-	2.33	-	25.78	-	36.00	-	Pass
HT40	MCS0	1	3	2422	23.31	-		30.00	-	2.33	-	25.64	-	36.00	-	Pass
HT40	MCS0	1	6	2437	24.10	-		30.00	-	2.33	-	26.43	-	36.00	-	Pass
HT40	MCS0	1	9	2452	24.02	-		30.00	-	2.33	-	26.35	-	36.00	-	Pass

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

TEST RESULTS DATA
Average Output Power

2.4GHz Band Single Antenna																
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Average Conducted Power with duty factor (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	15.41	-		30.00	-	2.33	-	17.74	-	36.00	-	Pass
11b	1Mbps	1	6	2437	12.82	-		30.00	-	2.33	-	15.15	-	36.00	-	Pass
11b	1Mbps	1	11	2462	13.93	-		30.00	-	2.33	-	16.26	-	36.00	-	Pass
11g	6Mbps	1	1	2412	14.53	-		30.00	-	2.33	-	16.86	-	36.00	-	Pass
11g	6Mbps	1	6	2437	17.24	-		30.00	-	2.33	-	19.57	-	36.00	-	Pass
11g	6Mbps	1	11	2462	14.85	-		30.00	-	2.33	-	17.18	-	36.00	-	Pass
HT20	MCS0	1	1	2412	14.58	-		30.00	-	2.33	-	16.91	-	36.00	-	Pass
HT20	MCS0	1	6	2437	16.28	-		30.00	-	2.33	-	18.61	-	36.00	-	Pass
HT20	MCS0	1	11	2462	14.45	-		30.00	-	2.33	-	16.78	-	36.00	-	Pass
HT40	MCS0	1	3	2422	13.98	-		30.00	-	2.33	-	16.31	-	36.00	-	Pass
HT40	MCS0	1	6	2437	14.69	-		30.00	-	2.33	-	17.02	-	36.00	-	Pass
HT40	MCS0	1	9	2452	14.57	-		30.00	-	2.33	-	16.90	-	36.00	-	Pass

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

TEST RESULTS DATA
Peak Power Spectral Density

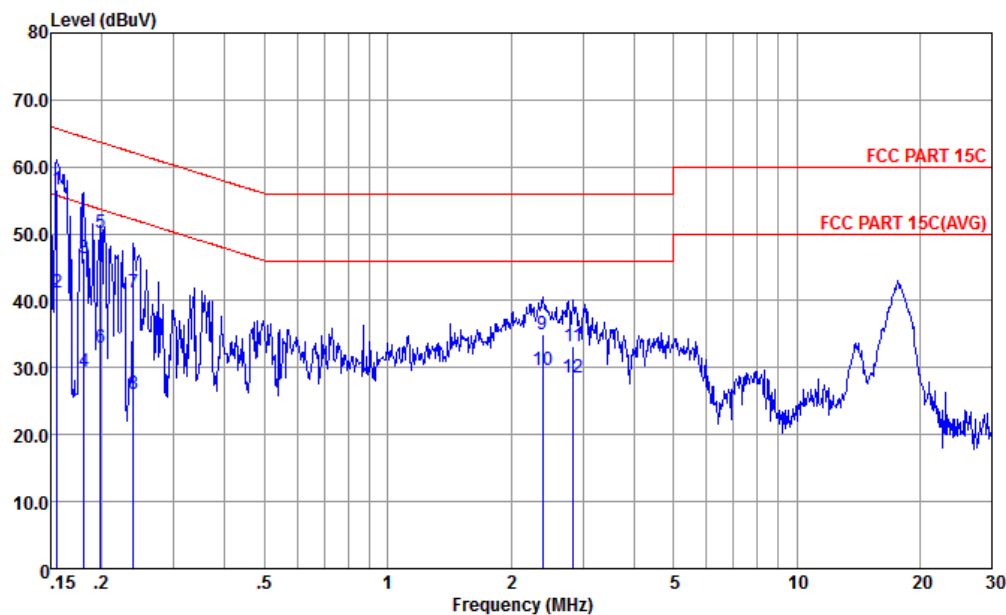
2.4GHz Band Single Antenna												
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)			DG (dBi)		Peak PSD Limit (dBm/3kHz)		Pass/Fail
					Ant1	Ant2	Worse + 3.01	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	1	1	2412	-7.04	-		2.33	-	8.00	-	Pass
11b	1Mbps	1	6	2437	-9.04	-		2.33	-	8.00	-	Pass
11b	1Mbps	1	11	2462	-7.80	-		2.33	-	8.00	-	Pass
11g	6Mbps	1	1	2412	-10.45	-		2.33	-	8.00	-	Pass
11g	6Mbps	1	6	2437	-8.66	-		2.33	-	8.00	-	Pass
11g	6Mbps	1	11	2462	-10.53	-		2.33	-	8.00	-	Pass
HT20	MCS0	1	1	2412	-10.26	-		2.33	-	8.00	-	Pass
HT20	MCS0	1	6	2437	-8.70	-		2.33	-	8.00	-	Pass
HT20	MCS0	1	11	2462	-10.44	-		2.33	-	8.00	-	Pass
HT40	MCS0	1	3	2422	-13.20	-		2.33	-	8.00	-	Pass
HT40	MCS0	1	6	2437	-11.81	-		2.33	-	8.00	-	Pass
HT40	MCS0	1	9	2452	-12.16	-		2.33	-	8.00	-	Pass

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



Appendix B. AC Conducted Emission Test Results

Test Engineer :	Amos Zhang	Temperature :	25.3~26.2°C
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

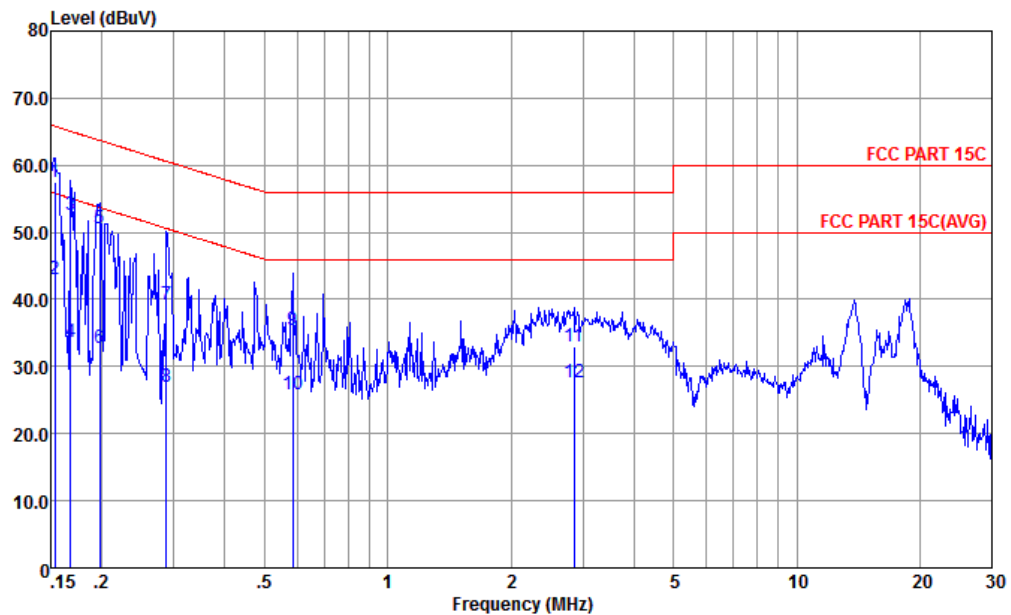


Site : CO01-KS
Condition : FCC PART 15C LISN-060105-N NEUTRAL

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 *	0.156	56.67	-9.02	65.69	46.09	0.11	10.47	QP
2	0.156	41.17	-14.52	55.69	30.59	0.11	10.47	Average
3	0.181	46.41	-18.05	64.46	35.91	0.10	10.40	QP
4	0.181	29.31	-25.15	54.46	18.81	0.10	10.40	Average
5	0.199	50.07	-13.60	63.67	39.60	0.10	10.37	QP
6	0.199	33.07	-20.60	53.67	22.60	0.10	10.37	Average
7	0.239	41.24	-20.89	62.13	30.80	0.10	10.34	QP
8	0.239	26.04	-26.09	52.13	15.60	0.10	10.34	Average
9	2.396	34.98	-21.02	56.00	24.61	0.14	10.23	QP
10	2.396	29.68	-16.32	46.00	19.31	0.14	10.23	Average
11	2.839	33.19	-22.81	56.00	22.80	0.15	10.24	QP
12	2.839	28.59	-17.41	46.00	18.20	0.15	10.24	Average



Test Engineer :	Amos Zhang	Temperature :	25.3~26.2°C
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : FCC PART 15C LISN-060105-L LINE

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1 *	0.153	57.59	-8.23	65.82	47.10	0.02	10.47	QP
2	0.153	43.09	-12.73	55.82	32.60	0.02	10.47	Average
3	0.168	52.56	-12.52	65.08	42.10	0.03	10.43	QP
4	0.168	33.66	-21.42	55.08	23.20	0.03	10.43	Average
5	0.198	50.61	-13.10	63.71	40.20	0.04	10.37	QP
6	0.198	32.71	-21.00	53.71	22.30	0.04	10.37	Average
7	0.288	39.18	-21.41	60.59	28.80	0.07	10.31	QP
8	0.288	26.98	-23.61	50.59	16.60	0.07	10.31	Average
9	0.585	35.54	-20.46	56.00	25.20	0.10	10.24	QP
10	0.585	25.94	-20.06	46.00	15.60	0.10	10.24	Average
11	2.854	32.99	-23.01	56.00	22.60	0.15	10.24	QP
12	2.854	27.59	-18.41	46.00	17.20	0.15	10.24	Average

Note:

1. Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
2. Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)



Appendix C. Radiated Spurious Emission

Test Engineer :	Henry LI	Temperature :	22~23°C
		Relative Humidity :	41~42%

Channel	Power setting
11b CH01	17
11b CH06	28
11b CH11	26
11g CH01	18
11g CH06	5
11g CH11	18
11n20 CH01	14
11n20 CH06	5
11n20 CH11	17
11n40 CH03	13
11n40 CH06	8
11n40 CH09	12



2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2386.18	59.26	-14.74	74	56.14	32.88	7.1	36.86	269	110	P	H
		2386.05	49.48	-4.52	54	46.36	32.88	7.1	36.86	269	110	A	H
	*	2412	115.31	-	-	112.13	32.9	7.13	36.85	269	110	P	H
	*	2412	106.61	-	-	103.43	32.9	7.13	36.85	269	110	A	H
		2385.27	53.83	-20.17	74	50.74	32.86	7.1	36.87	391	161	P	V
		2386.18	44.27	-9.73	54	41.15	32.88	7.1	36.86	391	161	A	V
	*	2412	106.11	-	-	102.93	32.9	7.13	36.85	391	161	P	V
	*	2410	98.63	-	-	95.45	32.9	7.13	36.85	391	161	A	V
802.11b CH 11 2462MHz		2484.46	57.61	-16.39	74	54.2	32.98	7.25	36.82	292	115	P	H
		2487.64	47.61	-6.39	54	44.17	33	7.25	36.81	292	115	A	H
	*	2462	112.67	-	-	109.32	32.96	7.22	36.83	292	115	P	H
	*	2464	105	-	-	101.65	32.96	7.22	36.83	292	115	A	H
		2488.3	51.94	-22.06	74	48.5	33	7.25	36.81	295	227	P	V
		2487.64	41.02	-12.98	54	37.58	33	7.25	36.81	295	227	A	V
	*	2462	104.8	-	-	101.45	32.96	7.22	36.83	295	227	P	V
	*	2464	96.82	-	-	93.47	32.96	7.22	36.83	295	227	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4830	55.84	-18.16	74	76.77	34.2	10.25	65.38	106	119	P	H
		4830	52.25	-1.75	54	73.18	34.2	10.25	65.38	106	119	A	H
		4830	52.29	-21.71	74	73.22	34.2	10.25	65.38	338	111	P	V
		4830	48.66	-5.34	54	69.59	34.2	10.25	65.38	338	111	A	V
802.11b CH 06 2437MHz		4875	55.7	-18.3	74	76.6	34.23	10.29	65.42	100	121	P	H
		4875	52.37	-1.63	54	73.27	34.23	10.29	65.42	100	121	A	H
		7305	43.09	-30.91	74	60.42	35.86	12.72	65.91	300	0	P	H
		4875	51.1	-22.9	74	72	34.23	10.29	65.42	328	253	P	V
		4875	48.69	-5.31	54	69.59	34.23	10.29	65.42	328	253	A	V
		7305	43.23	-30.77	74	60.56	35.86	12.72	65.91	100	0	P	V
802.11b CH 11 2462MHz		4920	55.85	-18.15	74	76.7	34.26	10.34	65.45	100	219	P	H
		4920	52.3	-1.7	54	73.15	34.26	10.34	65.45	100	219	A	H
		7380	42.8	-31.2	74	60.3	35.88	12.73	66.11	300	0	P	H
		4920	51.2	-22.8	74	72.05	34.26	10.34	65.45	285	169	P	V
		4920	49.4	-4.6	54	70.25	34.26	10.34	65.45	285	169	A	V
		7380	42.46	-31.54	74	59.96	35.88	12.73	66.11	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		2389.3	67.56	-6.44	74	64.44	32.88	7.1	36.86	132	83	P	H
		2389.95	52.89	-1.11	54	49.77	32.88	7.1	36.86	132	83	A	H
	*	2406	111.53	-	-	108.35	32.9	7.13	36.85	132	83	P	H
	*	2406	103.46	-	-	100.28	32.9	7.13	36.85	132	83	A	H
		2389.95	61.98	-12.02	74	58.86	32.88	7.1	36.86	344	340	P	V
		2389.95	45.39	-8.61	54	42.27	32.88	7.1	36.86	344	340	A	V
	*	2408	105.56	-	-	102.38	32.9	7.13	36.85	344	340	P	V
	*	2406	97.63	-	-	94.45	32.9	7.13	36.85	344	340	A	V
802.11g CH 11 2462MHz		2483.5	70.6	-3.4	74	67.19	32.98	7.25	36.82	128	79	P	H
		2483.5	52.72	-1.28	54	49.31	32.98	7.25	36.82	128	79	A	H
	*	2462	111.95	-	-	108.6	32.96	7.22	36.83	128	79	P	H
	*	2460	103.72	-	-	100.37	32.96	7.22	36.83	128	79	A	H
		2483.5	61.73	-12.27	74	58.32	32.98	7.25	36.82	381	309	P	V
		2483.5	45.08	-8.92	54	41.67	32.98	7.25	36.82	381	309	A	V
	*	2468	102.66	-	-	99.31	32.96	7.22	36.83	381	309	P	V
	*	2468	94.27	-	-	90.92	32.96	7.22	36.83	381	309	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4830	54.92	-19.08	74	75.85	34.2	10.25	65.38	107	77	P	H
		4830	44.88	-9.12	54	65.81	34.2	10.25	65.38	107	77	A	H
		4830	48.68	-25.32	74	69.61	34.2	10.25	65.38	100	0	P	V
802.11g CH 06 2437MHz		4875	61.86	-12.14	74	82.76	34.23	10.29	65.42	115	43	P	H
		4875	50.6	-3.4	54	71.5	34.23	10.29	65.42	115	43	A	H
		7305	50.03	-23.97	74	70.36	35.86	12.72	65.91	300	0	P	H
		9750	49.65	-39.75	89.40	64.9	36.81	14.99	67.05	300	0	P	H
		4875	58.77	-15.23	74	79.67	34.23	10.29	65.42	385	21	P	V
		4875	48.99	-5.01	54	69.89	34.23	10.29	65.42	385	21	A	V
		7320	50.57	-23.43	74	67.94	35.87	12.72	65.96	100	0	P	V
		9735	50.53	-33.6	84.13	65.79	36.79	14.98	67.03	100	0	P	V
802.11g CH 11 2462MHz		4920	57.29	-16.71	74	78.14	34.26	10.34	65.45	138	44	P	H
		4920	47.1	-6.9	54	67.95	34.26	10.34	65.45	138	44	A	H
		7380	47.35	-26.65	74	64.85	35.88	12.73	66.11	300	0	P	H
		4920	57.93	-16.07	74	78.78	34.26	10.34	65.45	400	22	P	V
		4920	48.2	-5.8	54	69.05	34.26	10.34	65.45	400	22	A	V
		7380	45.23	-28.77	74	62.73	35.88	12.73	66.11	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		2389.56	67.77	-6.23	74	64.65	32.88	7.1	36.86	132	100	P	H
		2389.95	52.77	-1.23	54	49.65	32.88	7.1	36.86	132	100	A	H
	*	2408	111.57	-	-	108.39	32.9	7.13	36.85	132	100	P	H
	*	2408	103.69	-	-	100.51	32.9	7.13	36.85	132	100	A	H
		2385.01	57.9	-16.1	74	54.81	32.86	7.1	36.87	302	67	P	V
		2389.95	42.14	-11.86	54	39.02	32.88	7.1	36.86	302	67	A	V
	*	2418	102.38	-	-	99.17	32.9	7.16	36.85	302	67	P	V
	*	2418	94.67	-	-	91.46	32.9	7.16	36.85	302	67	A	V
802.11n HT20 CH 11 2462MHz		2483.56	67.95	-6.05	74	64.54	32.98	7.25	36.82	382	295	P	H
		2483.5	52.33	-1.67	54	48.92	32.98	7.25	36.82	382	295	A	H
	*	2460	111.29	-	-	107.94	32.96	7.22	36.83	382	295	P	H
	*	2460	103.16	-	-	99.81	32.96	7.22	36.83	382	295	A	H
		2483.86	54.81	-19.19	74	51.4	32.98	7.25	36.82	381	5	P	V
		2483.5	41.53	-12.47	54	38.12	32.98	7.25	36.82	381	5	A	V
	*	2456	104.77	-	-	101.42	32.96	7.22	36.83	381	5	P	V
	*	2456	96.98	-	-	93.63	32.96	7.22	36.83	381	5	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		4830	55.75	-18.25	74	76.68	34.2	10.25	65.38	100	76	P	H
		4830	44.24	-9.76	54	65.17	34.2	10.25	65.38	100	76	A	H
		4830	47.37	-26.63	74	68.3	34.2	10.25	65.38	100	0	P	V
		4830	47.37	-26.63	74	68.3	34.2	10.25	65.38	100	0	P	V
802.11n HT20 CH 06 2437MHz		4875	60.83	-13.17	74	81.73	34.23	10.29	65.42	148	51	P	H
		4875	50.52	-3.48	54	71.42	34.23	10.29	65.42	148	51	A	H
		7305	49.46	-24.54	74	66.79	35.86	12.72	65.91	300	0	P	H
		9750	47.85	-41.9	89.75	63.1	36.81	14.99	67.05	300	0	P	H
		4875	60.17	-13.83	74	81.07	34.23	10.29	65.42	341	27	P	V
		4875	49.79	-4.21	54	70.69	34.23	10.29	65.42	341	27	A	V
		7305	47.91	-26.09	74	65.24	35.86	12.72	65.91	100	0	P	V
		9750	49	-33.62	82.62	64.25	36.81	14.99	67.05	100	0	P	V
802.11n HT20 CH 11 2462MHz		4920	59.65	-14.35	74	80.5	34.26	10.34	65.45	100	125	P	H
		4920	49.19	-4.81	54	70.04	34.26	10.34	65.45	100	125	A	H
		7380	43.38	-30.62	74	60.88	35.88	12.73	66.11	300	0	P	H
		4920	49.62	-24.38	74	70.47	34.26	10.34	65.45	100	0	P	V
		7380	43.18	-30.82	74	60.68	35.88	12.73	66.11	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1	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 HT40 CH 03 2422MHz		2388.91	67.62	-6.38	74	64.5	32.88	7.1	36.86	127	84	P	H
		2389.95	52.66	-1.34	54	49.54	32.88	7.1	36.86	127	84	A	H
		2484.04	55.14	-18.86	74	51.73	32.98	7.25	36.82	127	84	P	H
		2483.56	44.1	-9.9	54	40.69	32.98	7.25	36.82	127	84	A	H
	*	2430	108.92	-	-	105.69	32.92	7.16	36.85	127	84	P	H
	*	2424	100.54	-	-	97.31	32.92	7.16	36.85	127	84	A	H
		2388.91	56.89	-17.11	74	53.77	32.88	7.1	36.86	387	4	P	V
		2389.82	43.67	-10.33	54	40.55	32.88	7.1	36.86	387	4	A	V
		2484.82	50.81	-23.19	74	47.4	32.98	7.25	36.82	387	4	P	V
		2491.42	39.51	-14.49	54	36.07	33	7.25	36.81	387	4	A	V
	*	2428	102.47	-	-	99.24	32.92	7.16	36.85	387	4	P	V
	*	2432	94.68	-	-	91.45	32.92	7.16	36.85	387	4	A	V
802.11n HT40 CH 06 2437MHz		2389.82	67.6	-6.4	74	64.48	32.88	7.1	36.86	129	98	P	H
		2389.95	52.46	-1.54	54	49.34	32.88	7.1	36.86	129	98	A	H
		2483.86	66.01	-7.99	74	62.6	32.98	7.25	36.82	129	98	P	H
		2483.5	50.97	-3.03	54	47.56	32.98	7.25	36.82	129	98	A	H
	*	2434	110.17	-	-	106.94	32.92	7.16	36.85	129	98	P	H
	*	2436	101.96	-	-	98.7	32.92	7.19	36.85	129	98	A	H
		2385.4	58.9	-15.1	74	55.81	32.86	7.1	36.87	378	5	P	V
		2388.78	43.83	-10.17	54	40.71	32.88	7.1	36.86	378	5	A	V
		2484.76	56.59	-17.41	74	53.18	32.98	7.25	36.82	378	5	P	V
		2483.5	42.22	-11.78	54	38.81	32.98	7.25	36.82	378	5	A	V
	*	2446	105.88	-	-	102.59	32.94	7.19	36.84	378	5	P	V
	*	2438	97.44	-	-	94.15	32.94	7.19	36.84	378	5	A	V



802.11n HT40 CH 09 2452MHz		2364.99	53.52	-20.48	74	50.5	32.83	7.07	36.88	332	96	P	H
		2389.95	42.28	-11.72	54	39.16	32.88	7.1	36.86	332	96	A	H
		2483.68	70	-4	74	66.59	32.98	7.25	36.82	332	96	P	H
		2483.5	52.22	-1.78	54	48.81	32.98	7.25	36.82	332	96	A	H
	*	2456	108.98	-	-	105.63	32.96	7.22	36.83	332	96	P	H
	*	2456	100.48	-	-	97.13	32.96	7.22	36.83	332	96	A	H
		2387.61	50.09	-23.91	74	46.97	32.88	7.1	36.86	380	4	P	V
		2389.82	38.99	-15.01	54	35.87	32.88	7.1	36.86	380	4	A	V
		2483.62	61.03	-12.97	74	57.62	32.98	7.25	36.82	380	4	P	V
		2483.5	43.56	-10.44	54	40.15	32.98	7.25	36.82	380	4	A	V
	*	2448	103.45	-	-	100.16	32.94	7.19	36.84	380	4	P	V
	*	2450	95.19	-	-	91.9	32.94	7.19	36.84	380	4	A	V
	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1	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 HT40 CH 03 2422MHz		4845	48.84	-25.16	74	69.77	34.21	10.25	65.39	300	0	P	H
		7260	43	-31	74	60.19	35.85	12.72	65.76	300	0	P	H
		4845	48.35	-25.65	74	69.28	34.21	10.25	65.39	100	0	P	V
		7260	42.58	-31.42	74	59.77	35.85	12.72	65.76	100	0	P	V
802.11n HT40 CH 06 2437MHz		4875	56.14	-17.86	74	77.04	34.23	10.29	65.42	100	285	P	H
		4875	45.67	-8.33	54	66.57	34.23	10.29	65.42	100	285	A	H
		7305	44.13	-29.87	74	61.46	35.86	12.72	65.91	300	0	P	H
		4890	55.86	-18.14	74	76.73	34.24	10.32	65.43	386	29	P	V
		4890	45.54	-8.46	54	66.41	34.24	10.32	65.43	386	29	A	V
		7305	44.5	-29.5	74	61.83	35.86	12.72	65.91	100	0	P	V
802.11n HT40 CH 09 2452MHz		4905	54.74	-19.26	74	75.59	34.25	10.34	65.44	154	45	P	H
		4905	44.27	-9.73	54	65.12	34.25	10.34	65.44	154	45	A	H
		7356	43.09	-30.91	74	60.55	35.87	12.73	66.06	300	0	P	H
		4905	54.99	-19.01	74	75.84	34.25	10.34	65.44	356	30	P	V
		4905	44	-10	54	64.85	34.25	10.34	65.44	356	30	A	V
		7350	42.91	-31.09	74	60.38	35.87	12.72	66.06	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

Emission below 1GHz

2.4GHz WIFI 802.11g (LF)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz 802.11g LF		239.52	16.76	-29.24	46	28.76	18.74	2.36	33.1	-	-	P	H
		320.03	19.22	-26.78	46	28.72	20.68	2.72	32.9	-	-	P	H
		444.19	22.78	-23.22	46	28.77	23.5	3.22	32.71	-	-	P	H
		502.39	26.05	-19.95	46	30.86	24.55	3.43	32.79	-	-	P	H
		600.36	26.35	-19.65	46	29.61	25.5	3.74	32.5	-	-	P	H
		803.09	29.22	-16.78	46	30.48	26.92	4.33	32.51	-	-	P	H
		166.77	15.14	-28.36	43.5	28.97	17.1	1.97	32.9	-	-	P	V
		239.52	18.8	-27.2	46	30.8	18.74	2.36	33.1	-	-	P	V
		299.66	20.05	-25.95	46	30.11	20.2	2.64	32.9	-	-	P	V
		393.75	21.89	-24.11	46	29.12	22.55	3.03	32.81	-	-	P	V
		551.86	24.41	-21.59	46	27.54	25.88	3.59	32.6	-	-	P	V
		780.78	27.86	-18.14	46	29.42	26.75	4.27	32.58	-	-	P	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

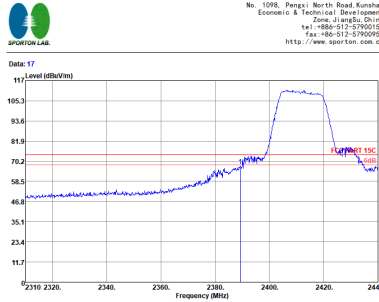
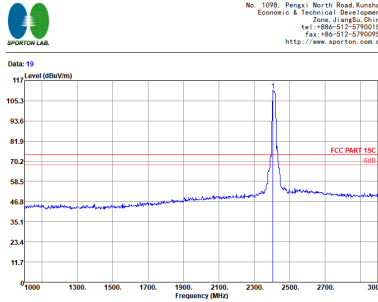
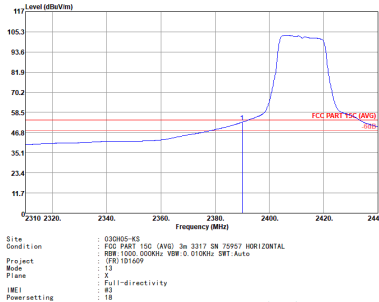
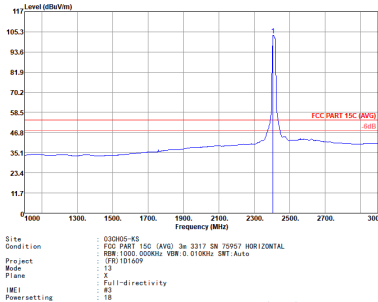
Note symbol

-L	Low channel location
-R	High channel location

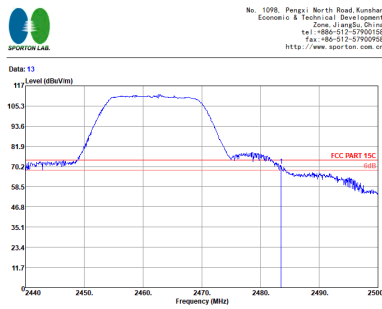
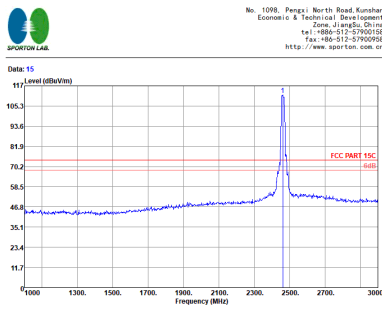
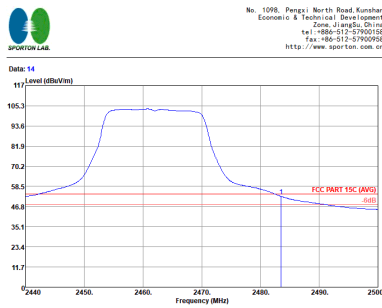
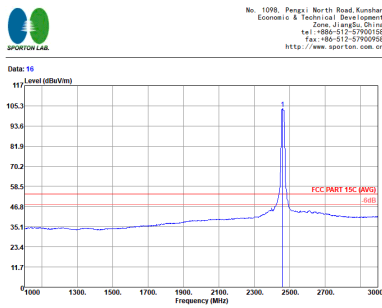


2.4GHz 2400~2483.5MHz

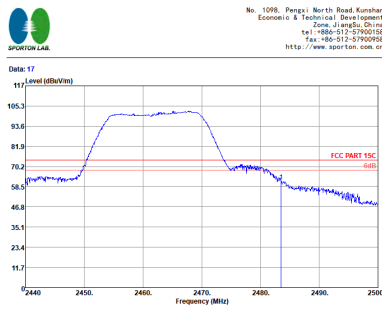
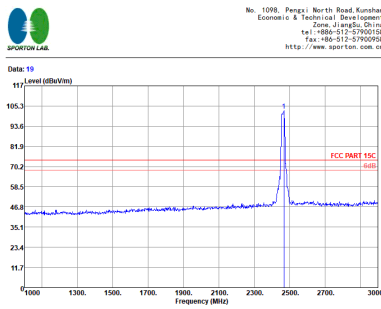
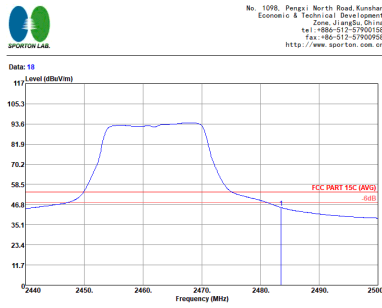
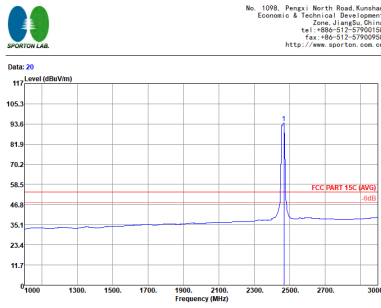
WIFI 802.11g (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m																																																													
ANT	802.11g CH01 2412MHz																																																													
1	Horizontal	Fundamental																																																												
Peak	 No. 1098, Pengxi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900158 fax: +86-512-57900958 http://www.sporton.com.cn Site : 030805-KS Condition : FCC PART 15C 3m 3317 SN 75957 HORIZONTAL Project : RRM 1000.000KHz VSW 3.000.000KHz SRT Auto Mode : (FR) 101609 Plane : X Full-directivity Power setting : 18 Power setting : 18 <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pow</th><th>T/Pow</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBm/Vm</th><th>dB</th><th>dBm/Vm</th><th>dBm/Vm</th><th>dB</th><th>dB</th><th>dB</th><th>on</th><th>deg</th></tr><tr><td>1 2389.30</td><td>67.56</td><td>-6.44</td><td>74.00</td><td>64.44</td><td>32.88</td><td>7.10</td><td>36.86</td><td>132</td><td>83 Peak</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pow	T/Pow	Remark	Pol/Phas	MHz	dBm/Vm	dB	dBm/Vm	dBm/Vm	dB	dB	dB	on	deg	1 2389.30	67.56	-6.44	74.00	64.44	32.88	7.10	36.86	132	83 Peak	 No. 1098, Pengxi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900158 fax: +86-512-57900958 http://www.sporton.com.cn Site : 030805-KS Condition : FCC PART 15C 3m 3317 SN 75957 HORIZONTAL Project : RRM 1000.000KHz VSW 3.000.000KHz SRT Auto Mode : (FR) 101609 Plane : X Full-directivity Power setting : 18 Power setting : 18 <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pow</th><th>T/Pow</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBm/Vm</th><th>dB</th><th>dBm/Vm</th><th>dBm/Vm</th><th>dB</th><th>dB</th><th>dB</th><th>on</th><th>deg</th></tr><tr><td>1 * 2406.00</td><td>111.53</td><td>37.53</td><td>74.00</td><td>108.35</td><td>32.90</td><td>7.13</td><td>36.85</td><td>132</td><td>83 Peak</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable Preamp	A/Pow	T/Pow	Remark	Pol/Phas	MHz	dBm/Vm	dB	dBm/Vm	dBm/Vm	dB	dB	dB	on	deg	1 * 2406.00	111.53	37.53	74.00	108.35	32.90	7.13	36.85	132	83 Peak
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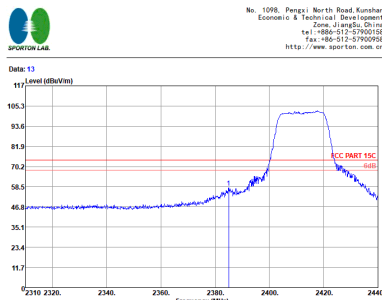
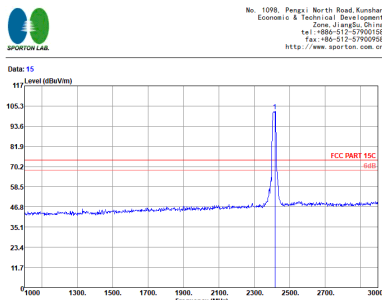
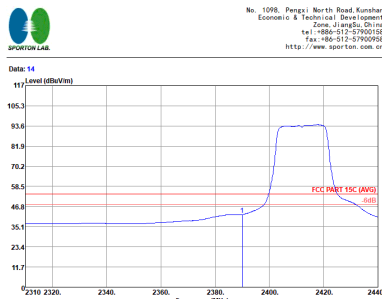
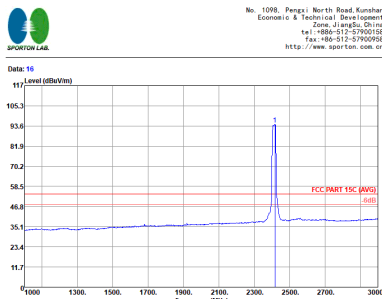


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m																																																																																																																																						
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Peak	 No. 1098, Pengxi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900158 fax: +86-512-57900958 http://www.sporton.com.cn Date: 13 Level (dBm/100Hz) 117 105.3 93.6 81.9 70.2 58.5 46.8 35.1 23.4 11.7 2440 2450 2460 2470 2480 2490 2500 Frequency (MHz) FCC PART 15C 64dB Site : 030805-KS Condition : FCC PART 15C 3m 3317 SN 75957 HORIZONTAL Project : R88-1000, 0000Hz VBR-3000, 0000Hz SRT-Auto Bode : (FR)1D1609 Plane : 15 Full-directivity : X Power setting : 18 IMEI : 83 <table><tr><th>IMEI</th><th>Power setting</th><th>Over Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>Level</th><th>Limit</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th>dB</th><th>dB</th><th>on</th><th>deg</th><th></th></tr><tr><td>1 1</td><td>2483.50</td><td>70.60</td><td>-3.40</td><td>74.00</td><td>67.19</td><td>32.98</td><td>7.25</td><td>36.82</td><td>128</td><td>79 Peak</td><td>HORIZONTAL</td></tr></table>  No. 1098, Pengxi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900158 fax: +86-512-57900958 http://www.sporton.com.cn Date: 15 Level (dBm/100Hz) 117 105.3 93.6 81.9 70.2 58.5 46.8 35.1 23.4 11.7 1000 1300 1600 1900 2200 2500 2700 3000 Frequency (MHz) FCC PART 15C 64dB Site : 030805-KS Condition : FCC PART 15C 3m 3317 SN 75957 HORIZONTAL Project : R88-1000, 0000Hz VBR-3000, 0000Hz SRT-Auto Bode : (FR)1D1609 Plane : 15 Full-directivity : X Power setting : 18 IMEI : 83 <table><tr><th>IMEI</th><th>Power setting</th><th>Over Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>Level</th><th>Limit</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th>dB</th><th>dB</th><th>on</th><th>deg</th><th></th></tr><tr><td>1 *</td><td>2462.00</td><td>111.95</td><td>37.95</td><td>74.00</td><td>108.60</td><td>32.96</td><td>7.22</td><td>36.83</td><td>128</td><td>79 Peak</td><td>HORIZONTAL</td></tr></table>	IMEI	Power setting	Over Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	Level	Limit	Line	Level	Factor	Loss	dB	dB	on	deg		1 1	2483.50	70.60	-3.40	74.00	67.19	32.98	7.25	36.82	128	79 Peak	HORIZONTAL	IMEI	Power setting	Over Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phas	MHz	Level	Limit	Line	Level	Factor	Loss	dB	dB	on	deg		1 *	2462.00	111.95	37.95	74.00	108.60	32.96	7.22	36.83	128	79 Peak	HORIZONTAL	Avg.	 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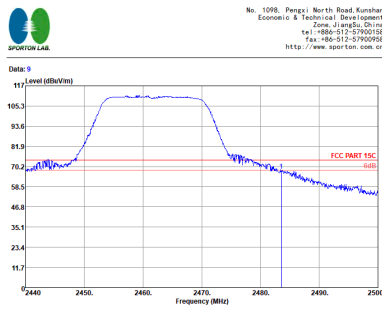
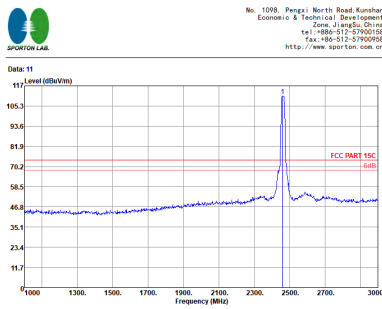
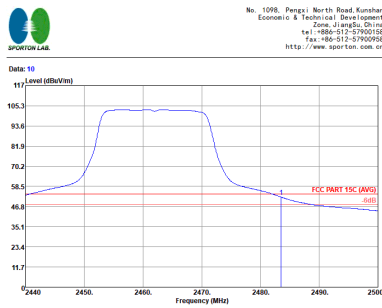
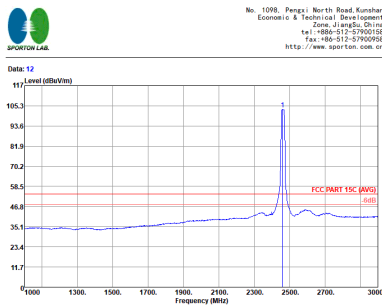


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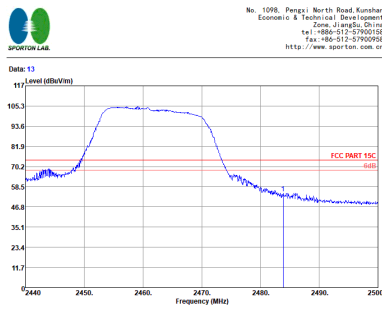
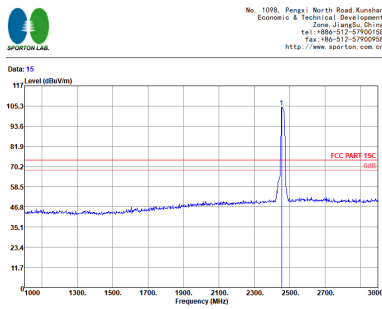
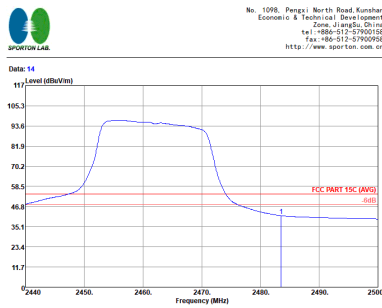
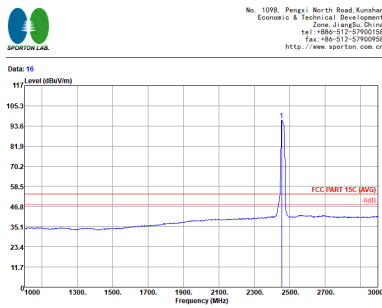


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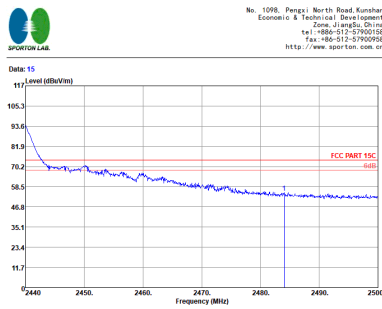
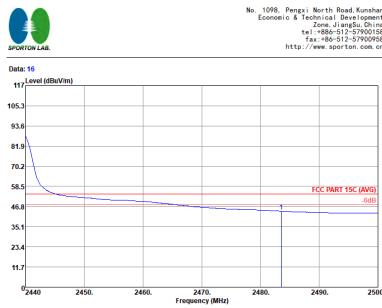


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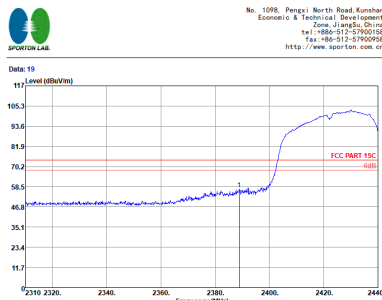
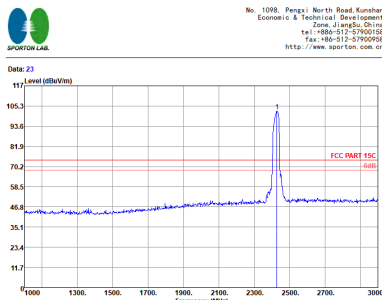
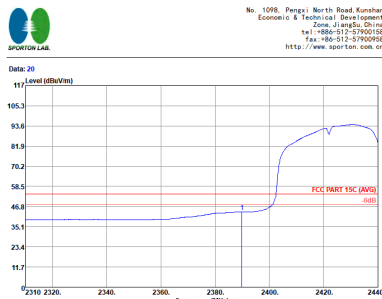
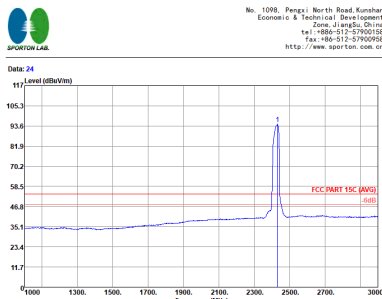


WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m																																																																							
ANT	802.11n HT20 CH11 2462MHz																																																																							
1	Vertical	Fundamental																																																																						
Peak	 No. 1098, Pengzi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900158 fax: +86-512-57900958 http://www.sporton.com.cn Site : 030H05-K5 Condition : FCC PART 15C 3m 3317.5N 75957 VERTICAL Project : RSM-1000.000KHz VBR-3000.000KHz SRT-Auto Mode : (FR)1D1609 Plane : 18 Full-directivity : X Power setting : 17 IMEI : 85 <table><tr><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Level Factor</th><th>Loss Factor</th><th></th><th></th><th></th></tr><tr><th>MHz</th><th>dBm/100m</th><th>dB</th><th>dBm/100m</th><th>dBm/100m</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1 2483.86</td><td>54.81</td><td>-19.19</td><td>74.00</td><td>51.40</td><td>32.98</td><td>7.25</td><td>36.82</td><td>381</td><td>5 Peak</td><td>VERTICAL</td></tr></table>  No. 1098, Pengzi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900158 fax: +86-512-57900958 http://www.sporton.com.cn Site : 030H05-K5 Condition : FCC PART 15C 3m 3317.5N 75957 VERTICAL Project : RSM-1000.000KHz VBR-3000.000KHz SRT-Auto Mode : (FR)1D1609 Plane : 18 Full-directivity : X Power setting : 17 IMEI : 85 <table><tr><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Level Factor</th><th>Loss Factor</th><th></th><th></th><th></th></tr><tr><th>MHz</th><th>dBm/100m</th><th>dB</th><th>dBm/100m</th><th>dBm/100m</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1 * 2462.00</td><td>104.77</td><td>30.77</td><td>74.00</td><td>101.42</td><td>32.96</td><td>7.22</td><td>36.83</td><td>381</td><td>5 Peak</td><td>VERTICAL</td></tr></table>	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phase	Freq	Level	Line	Level Factor	Loss Factor				MHz	dBm/100m	dB	dBm/100m	dBm/100m	dB	cm	deg	1 2483.86	54.81	-19.19	74.00	51.40	32.98	7.25	36.82	381	5 Peak	VERTICAL	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phase	Freq	Level	Line	Level Factor	Loss Factor				MHz	dBm/100m	dB	dBm/100m	dBm/100m	dB	cm	deg	1 * 2462.00	104.77	30.77	74.00	101.42	32.96	7.22	36.83	381	5 Peak	VERTICAL	
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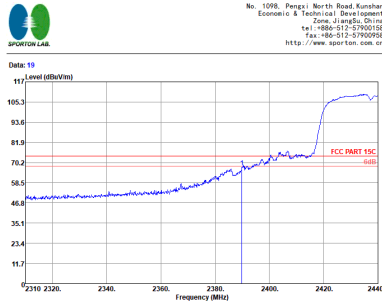
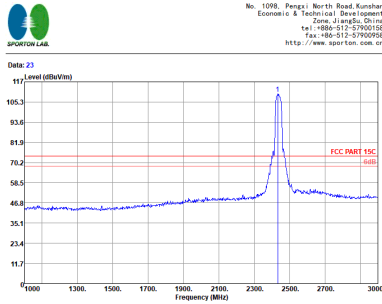
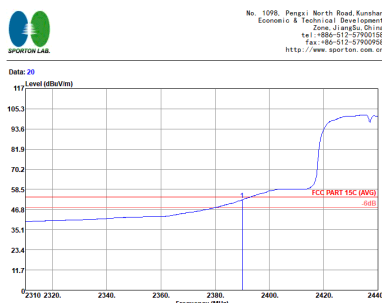
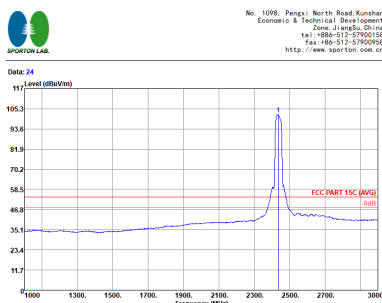


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m																																	
ANT	802.11n HT40 CH03 2422MHz - R																																	
1	Horizontal	Fundamental																																
Peak	 No. 1098, Pengzi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-37900158 fax: +86-512-37900058 http://www.sporton.com.cn SPORTON LAB. Date: 15 Level (dBm/100MHz) Frequency (MHz) FCC PART 15C (dBm) Site : 032005-KS Condition : FCC PART 15C 3m 3317 SN 75957 HORIZONTAL Project : RRM 1000.000KHz VSW:3000.000KHz SWT:Auto Bode : (FR)1D1609 Plane : Z Polar : Full-directivity IMEI : 85 PowerSetting : 13 <table><thead><tr><th>Freq</th><th>Level</th><th>Limit</th><th>Line</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>MHz</th><th>dBm/100MHz</th><th>dBm/100MHz</th><th>dBm/100MHz</th><th>dBm/100MHz</th><th>dBm/100MHz</th><th>dBm/100MHz</th><th>deg</th><th>deg</th><th></th></tr></thead><tbody><tr><td>1</td><td>2484.04</td><td>55.14</td><td>-18.86</td><td>74.00</td><td>51.73</td><td>32.98</td><td>7.25</td><td>36.82</td><td>127</td><td>84 Peak</td><td>HORIZONTAL</td></tr></tbody></table>	Freq	Level	Limit	Line	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phase	MHz	dBm/100MHz	dBm/100MHz	dBm/100MHz	dBm/100MHz	dBm/100MHz	dBm/100MHz	deg	deg		1	2484.04	55.14	-18.86	74.00	51.73	32.98	7.25	36.82	127	84 Peak	HORIZONTAL	Left Blank
Freq	Level	Limit	Line	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phase																									
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Avg.	 No. 1098, Pengzi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-37900158 fax: +86-512-37900058 http://www.sporton.com.cn SPORTON LAB. Date: 16 Level (dBm/100MHz) Frequency (MHz) FCC PART 15C (Ave) (dBm) Site : 032005-KS Condition : FCC PART 15C (Ave) 3m 3317 SN 75957 HORIZONTAL Project : RRM 1000.000KHz VSW:0.01000KHz SWT:Auto Bode : (FR)1D1609 Plane : Z Polar : Full-directivity IMEI : 85 PowerSetting : 13 <table><thead><tr><th>Freq</th><th>Level</th><th>Limit</th><th>Line</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>MHz</th><th>dBm/100MHz</th><th>dBm/100MHz</th><th>dBm/100MHz</th><th>dBm/100MHz</th><th>dBm/100MHz</th><th>dBm/100MHz</th><th>deg</th><th>deg</th><th></th></tr></thead><tbody><tr><td>1</td><td>2483.56</td><td>44.10</td><td>-9.90</td><td>54.00</td><td>40.69</td><td>32.98</td><td>7.25</td><td>36.82</td><td>127</td><td>84 Average</td><td>HORIZONTAL</td></tr></tbody></table>	Freq	Level	Limit	Line	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phase	MHz	dBm/100MHz	dBm/100MHz	dBm/100MHz	dBm/100MHz	dBm/100MHz	dBm/100MHz	deg	deg		1	2483.56	44.10	-9.90	54.00	40.69	32.98	7.25	36.82	127	84 Average	HORIZONTAL	Left Blank
Freq	Level	Limit	Line	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phase																									
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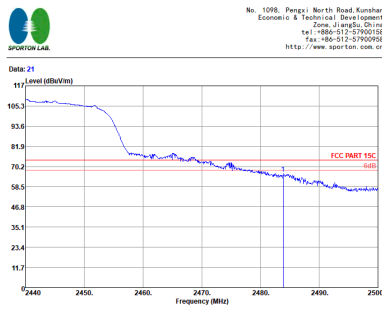
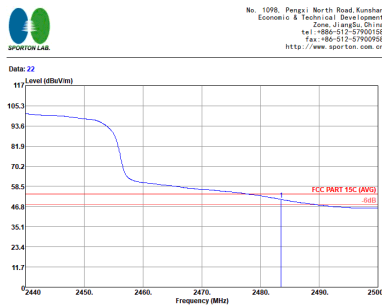


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m																																																																									
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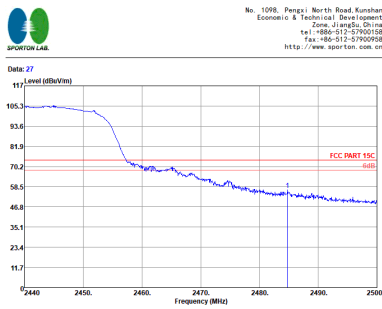
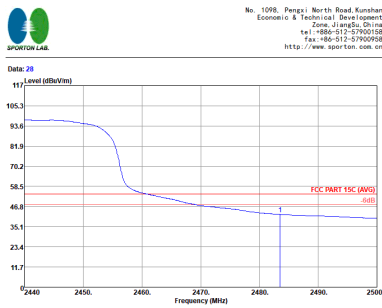


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Peak	 No. 1098, Pengzi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900158 fax: +86-512-57900058 http://www.sporton.com.cn SPORTON LAB. Date: 21 Level (dBm/100MHz) Frequency (MHz) FCC PART 15C (dBm) Site : 032005-KS Condition : FCC PART 15C 3m 3317 SN 75957 HORIZONTAL Project : RRM 1000.000KHz VSW:3000.000KHz SWT:Auto Model : (F) 1D1609 Plane : 20 Polarization : X Full-directivity : Full-directivity Power setting : 8 Power setting : 8 <table><thead><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>MHz</th><th>dBm/100MHz</th><th>dB</th><th>dBm/100MHz</th><th>dBm/100MHz</th><th>dB</th><th>dB</th><th>dB</th><th>dB</th><th>deg</th><th></th></tr></thead><tbody><tr><td>1</td><td>2437.86</td><td>66.01</td><td>-7.99</td><td>74.00</td><td>62.60</td><td>32.98</td><td>7.25</td><td>36.82</td><td>129</td><td>98 Peak</td><td>HORIZONTAL</td></tr></tbody></table>	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phase	MHz	dBm/100MHz	dB	dBm/100MHz	dBm/100MHz	dB	dB	dB	dB	deg		1	2437.86	66.01	-7.99	74.00	62.60	32.98	7.25	36.82	129	98 Peak	HORIZONTAL	Left blank
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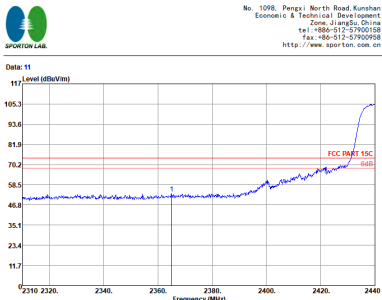
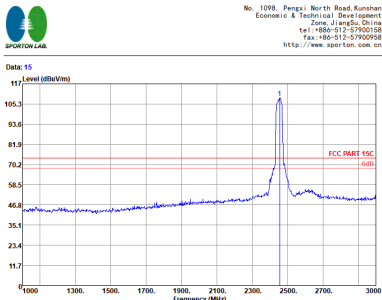
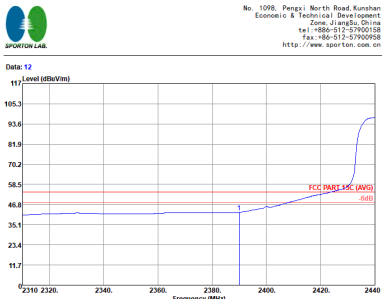
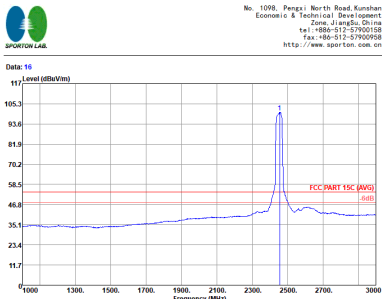


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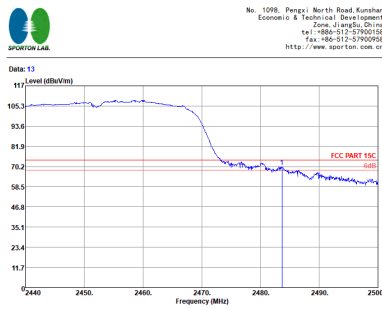
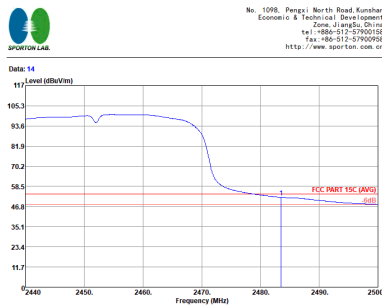


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ANT	802.11n HT40 CH06 2437MHz - R																																								
1	Horizontal	Fundamental																																							
Peak	 No. 1098, Pengzi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900108 fax: +86-512-57900058 http://www.sporton.com.cn SPORTON LAB Date: 27 Level (dBm/100kHz) Frequency (MHz) FCC PART 15C (dBm) Site : 032005-KS Condition : FCC PART 15C 3m 3317 SN 75957 VERTICAL Project : RRM 1000.000KHz VSW:3000.000KHz SWT:Auto Mode : (F) 1D1609 Plane : 20 Polarization : X Full-directivity : Full-directivity IMEI : 85 Power setting : 8 <table><thead><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>MHz</th><th>dBm/100kHz</th><th>dB</th><th>dBm/100kHz</th><th>dBm/100kHz</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th><th></th><th></th><th></th><th></th></tr></thead><tbody><tr><td>1</td><td>2484.76</td><td>56.59</td><td>-17.41</td><td>74.00</td><td>53.18</td><td>32.98</td><td>7.25</td><td>36.82</td><td>378</td><td>5</td><td>Peak</td><td>VERTICAL</td></tr></tbody></table>	Freq	Level	Over	Limit	Line	Level	Factor	Loss	Factor	A/Pos	T/Pos	Remark	Pol/Phase	MHz	dBm/100kHz	dB	dBm/100kHz	dBm/100kHz	dB	dB	cm	deg					1	2484.76	56.59	-17.41	74.00	53.18	32.98	7.25	36.82	378	5	Peak	VERTICAL	Left blank
	Freq	Level	Over	Limit	Line	Level	Factor	Loss	Factor	A/Pos	T/Pos	Remark	Pol/Phase																												
MHz	dBm/100kHz	dB	dBm/100kHz	dBm/100kHz	dB	dB	cm	deg																																	
1	2484.76	56.59	-17.41	74.00	53.18	32.98	7.25	36.82	378	5	Peak	VERTICAL																													
Avg.	 No. 1098, Pengzi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900108 fax: +86-512-57900058 http://www.sporton.com.cn SPORTON LAB Date: 28 Level (dBm/100kHz) Frequency (MHz) FCC PART 15C (Ave) (dBm) Site : 032005-KS Condition : FCC PART 15C (Ave) 3m 3317 SN 75957 VERTICAL Project : RRM 1000.000KHz VSW:3000.000KHz SWT:Auto Mode : (F) 1D1609 Plane : 20 Polarization : X Full-directivity : Full-directivity IMEI : 85 Power setting : 8 <table><thead><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>MHz</th><th>dBm/100kHz</th><th>dB</th><th>dBm/100kHz</th><th>dBm/100kHz</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th><th></th><th></th><th></th><th></th></tr></thead><tbody><tr><td>1</td><td>2483.50</td><td>42.22</td><td>-11.78</td><td>54.00</td><td>38.81</td><td>32.98</td><td>7.25</td><td>36.82</td><td>378</td><td>5</td><td>Average</td><td>VERTICAL</td></tr></tbody></table>	Freq	Level	Over	Limit	Line	Level	Factor	Loss	Factor	A/Pos	T/Pos	Remark	Pol/Phase	MHz	dBm/100kHz	dB	dBm/100kHz	dBm/100kHz	dB	dB	cm	deg					1	2483.50	42.22	-11.78	54.00	38.81	32.98	7.25	36.82	378	5	Average	VERTICAL	Left blank
	Freq	Level	Over	Limit	Line	Level	Factor	Loss	Factor	A/Pos	T/Pos	Remark	Pol/Phase																												
MHz	dBm/100kHz	dB	dBm/100kHz	dBm/100kHz	dB	dB	cm	deg																																	
1	2483.50	42.22	-11.78	54.00	38.81	32.98	7.25	36.82	378	5	Average	VERTICAL																													

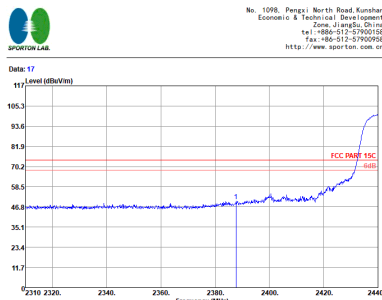
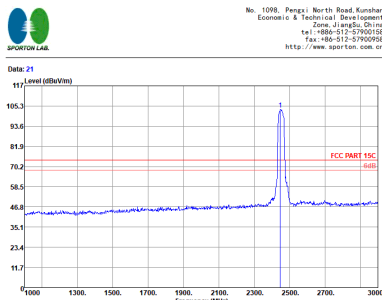
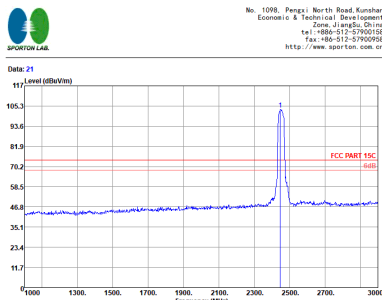
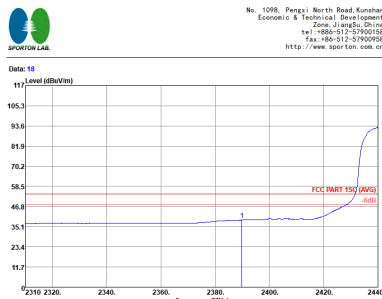
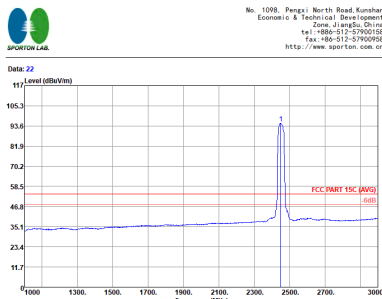
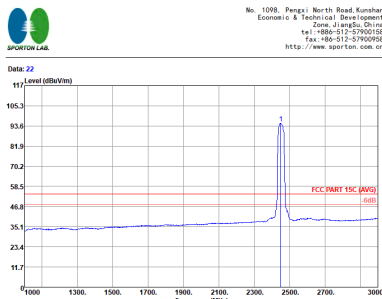


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - L	
1	Horizontal	Fundamental
Peak	The plot shows the peak signal level across the frequency range from 2310 to 2440 MHz. A sharp peak is visible at approximately 2452 MHz, reaching a level of about 105.3 dBm. The FCC PART 15C limit is indicated at 70.2 dBm. Site : 030805-KS Condition : FCC PART 15C 3m 3317 SN 75957 HORIZONTAL Project : RSM-1000.000kHz VBR-3000.000kHz SRT-Auto Bode : (FR)1D1609 Plane : 21 Full-directivity : X Power setting : 12 Over Limit : 12 ReadAntenna : 43 Cable Preamp : 43 A/Pos : 0 deg T/Pos : 0 deg Remark : 96 Peak Pol/Phas : HORIZONTAL	The plot shows the peak signal level across the frequency range from 1000 to 3000 MHz. A sharp peak is visible at approximately 2452 MHz, reaching a level of about 105.3 dBm. The FCC PART 15C limit is indicated at 70.2 dBm. Site : 030805-KS Condition : FCC PART 15C 3m 3317 SN 75957 HORIZONTAL Project : RSM-1000.000kHz VBR-3000.000kHz SRT-Auto Bode : (FR)1D1609 Plane : 21 Full-directivity : X Power setting : 12 Over Limit : 12 ReadAntenna : 43 Cable Preamp : 43 A/Pos : 0 deg T/Pos : 0 deg Remark : 96 Peak Pol/Phas : HORIZONTAL
Avg.	The plot shows the average signal level across the frequency range from 2310 to 2440 MHz. A sharp peak is visible at approximately 2452 MHz, reaching a level of about 105.3 dBm. The FCC PART 15C (AVG) limit is indicated at 70.2 dBm. Site : 030805-KS Condition : FCC PART 15C (AVG) 3m 3317 SN 75957 HORIZONTAL Project : RSM-1000.000kHz VBR-3000.000kHz SRT-Auto Bode : (FR)1D1609 Plane : 21 Full-directivity : X Power setting : 12 Over Limit : 12 ReadAntenna : 43 Cable Preamp : 43 A/Pos : 0 deg T/Pos : 0 deg Remark : 96 Average Pol/Phas : HORIZONTAL	The plot shows the average signal level across the frequency range from 1000 to 3000 MHz. A sharp peak is visible at approximately 2452 MHz, reaching a level of about 105.3 dBm. The FCC PART 15C (AVG) limit is indicated at 70.2 dBm. Site : 030805-KS Condition : FCC PART 15C (AVG) 3m 3317 SN 75957 HORIZONTAL Project : RSM-1000.000kHz VBR-3000.000kHz SRT-Auto Bode : (FR)1D1609 Plane : 21 Full-directivity : X Power setting : 12 Over Limit : 12 ReadAntenna : 43 Cable Preamp : 43 A/Pos : 0 deg T/Pos : 0 deg Remark : 96 Average Pol/Phas : HORIZONTAL

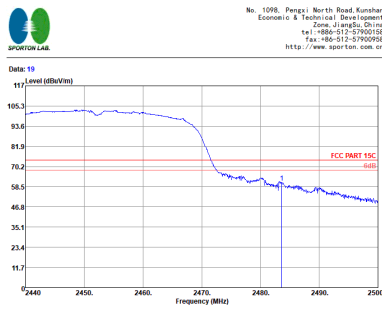
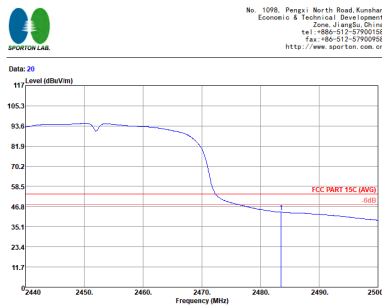


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m																																	
ANT	802.11n HT40 CH09 2452MHz - R																																	
1	Horizontal	Fundamental																																
Peak	 No. 1098, Pengzi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900158 fax: +86-512-57900958 http://www.sporton.com.cn Date: 13 Site: 030H05-KS Condition: FCC PART 15C 3m 3317 SN 75957 HORIZONTAL Project: RRM 1000, 000KHz VSW: 3000, 000KHz SW: Auto Bode: (F) 1D1609 Plane: Z Full-directivity: 2 Power setting: 12 IMEI: 85 <table><tr><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Level Factor</th><th>Loss Factor</th><th></th><th></th><th></th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1 1 2483.68</td><td>70.00</td><td>-4.00</td><td>74.00</td><td>66.99</td><td>32.98</td><td>7.25 36.82 332</td><td>90 Peak HORIZONTAL</td></tr></table>	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phase	Freq	Level	Line	Level Factor	Loss Factor				MHz	dBuV/m	dB	dBuV/m	dB	dB	cm	deg	1 1 2483.68	70.00	-4.00	74.00	66.99	32.98	7.25 36.82 332	90 Peak HORIZONTAL	Left blank
	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phase																										
Freq	Level	Line	Level Factor	Loss Factor																														
MHz	dBuV/m	dB	dBuV/m	dB	dB	cm	deg																											
1 1 2483.68	70.00	-4.00	74.00	66.99	32.98	7.25 36.82 332	90 Peak HORIZONTAL																											
Avg.	 No. 1098, Pengzi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900158 fax: +86-512-57900958 http://www.sporton.com.cn Date: 14 Site: 030H05-KS Condition: FCC PART 15C (Ave) 3m 3317 SN 75957 HORIZONTAL Project: RRM 1000, 000KHz VSW: 0, 0100KHz SW: Auto Bode: (F) 1D1609 Plane: Z Full-directivity: 2 Power setting: 12 IMEI: 85 <table><tr><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Level Factor</th><th>Loss Factor</th><th></th><th></th><th></th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1 1 2483.50</td><td>52.22</td><td>-1.78</td><td>54.00</td><td>48.81</td><td>32.98</td><td>7.25 36.82 332</td><td>90 Average HORIZONTAL</td></tr></table>	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phase	Freq	Level	Line	Level Factor	Loss Factor				MHz	dBuV/m	dB	dBuV/m	dB	dB	cm	deg	1 1 2483.50	52.22	-1.78	54.00	48.81	32.98	7.25 36.82 332	90 Average HORIZONTAL	Left blank
	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phase																										
Freq	Level	Line	Level Factor	Loss Factor																														
MHz	dBuV/m	dB	dBuV/m	dB	dB	cm	deg																											
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WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m																									
ANT	802.11n HT40 CH09 2452MHz - L																									
1	Vertical	Fundamental																								
Peak	 No. 1098, Pengzi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900158 fax: +86-512-57900958 http://www.sporton.com.cn Site : 030805-KS Condition : FCC PART 15C 3m 3317 SN 75957 VERTICAL Project : RSM-1000.000kHz VBR-3000.000kHz SRT-Auto Bode : (FR)1D1609 Plane : 21 Full-directivity : 2 Power setting : 12 Over Limit : 12 ReadAntenna : 45 Cable Preamp : 12 Loss Factor : 12 A/Pos : 4 Peak T/Pos : 380 Remark : Pol/Phas : VERTICAL <table><tr><th>1</th><th>2387.41</th><th>50.09</th><th>-23.91</th><th>74.00</th><th>46.97</th><th>32.88</th><th>7.10</th><th>36.86</th><th>380</th><th>4 Peak</th><th>VERTICAL</th></tr></table> <td>  No. 1098, Pengzi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900158 fax: +86-512-57900958 http://www.sporton.com.cn Site : 030805-KS Condition : FCC PART 15C 3m 3317 SN 75957 VERTICAL Project : RSM-1000.000kHz VBR-3000.000kHz SRT-Auto Bode : (FR)1D1609 Plane : 21 Full-directivity : 2 Power setting : 12 Over Limit : 12 ReadAntenna : 45 Cable Preamp : 12 Loss Factor : 12 A/Pos : 4 Peak T/Pos : 380 Remark : Pol/Phas : VERTICAL <table><tr><th>1</th><th>2448.00</th><th>103.45</th><th>29.45</th><th>74.00</th><th>100.16</th><th>32.94</th><th>7.19</th><th>36.84</th><th>380</th><th>4 Peak</th><th>VERTICAL</th></tr></table> </td>	1	2387.41	50.09	-23.91	74.00	46.97	32.88	7.10	36.86	380	4 Peak	VERTICAL	 No. 1098, Pengzi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900158 fax: +86-512-57900958 http://www.sporton.com.cn Site : 030805-KS Condition : FCC PART 15C 3m 3317 SN 75957 VERTICAL Project : RSM-1000.000kHz VBR-3000.000kHz SRT-Auto Bode : (FR)1D1609 Plane : 21 Full-directivity : 2 Power setting : 12 Over Limit : 12 ReadAntenna : 45 Cable Preamp : 12 Loss Factor : 12 A/Pos : 4 Peak T/Pos : 380 Remark : Pol/Phas : VERTICAL <table><tr><th>1</th><th>2448.00</th><th>103.45</th><th>29.45</th><th>74.00</th><th>100.16</th><th>32.94</th><th>7.19</th><th>36.84</th><th>380</th><th>4 Peak</th><th>VERTICAL</th></tr></table>	1	2448.00	103.45	29.45	74.00	100.16	32.94	7.19	36.84	380	4 Peak	VERTICAL
1	2387.41	50.09	-23.91	74.00	46.97	32.88	7.10	36.86	380	4 Peak	VERTICAL															
1	2448.00	103.45	29.45	74.00	100.16	32.94	7.19	36.84	380	4 Peak	VERTICAL															
Avg.	 No. 1098, Pengzi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900158 fax: +86-512-57900958 http://www.sporton.com.cn Site : 030805-KS Condition : FCC PART 15C (AVG) 3m 3317 SN 75957 VERTICAL Project : RSM-1000.000kHz VBR-3000.000kHz SRT-Auto Bode : (FR)1D1609 Plane : 21 Full-directivity : 2 Power setting : 12 Over Limit : 12 ReadAntenna : 45 Cable Preamp : 12 Loss Factor : 12 A/Pos : 4 Average T/Pos : 380 Remark : Pol/Phas : VERTICAL <table><tr><th>1</th><th>2389.82</th><th>38.99</th><th>-15.01</th><th>54.00</th><th>35.87</th><th>32.88</th><th>7.10</th><th>36.86</th><th>380</th><th>4 Average</th><th>VERTICAL</th></tr></table> <td>  No. 1098, Pengzi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900158 fax: +86-512-57900958 http://www.sporton.com.cn Site : 030805-KS Condition : FCC PART 15C (AVG) 3m 3317 SN 75957 VERTICAL Project : RSM-1000.000kHz VBR-3000.000kHz SRT-Auto Bode : (FR)1D1609 Plane : 21 Full-directivity : 2 Power setting : 12 Over Limit : 12 ReadAntenna : 45 Cable Preamp : 12 Loss Factor : 12 A/Pos : 4 Average T/Pos : 380 Remark : Pol/Phas : VERTICAL <table><tr><th>1</th><th>2450.00</th><th>95.19</th><th>41.19</th><th>54.00</th><th>91.90</th><th>32.94</th><th>7.19</th><th>36.84</th><th>380</th><th>4 Average</th><th>VERTICAL</th></tr></table> </td>	1	2389.82	38.99	-15.01	54.00	35.87	32.88	7.10	36.86	380	4 Average	VERTICAL	 No. 1098, Pengzi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900158 fax: +86-512-57900958 http://www.sporton.com.cn Site : 030805-KS Condition : FCC PART 15C (AVG) 3m 3317 SN 75957 VERTICAL Project : RSM-1000.000kHz VBR-3000.000kHz SRT-Auto Bode : (FR)1D1609 Plane : 21 Full-directivity : 2 Power setting : 12 Over Limit : 12 ReadAntenna : 45 Cable Preamp : 12 Loss Factor : 12 A/Pos : 4 Average T/Pos : 380 Remark : Pol/Phas : VERTICAL <table><tr><th>1</th><th>2450.00</th><th>95.19</th><th>41.19</th><th>54.00</th><th>91.90</th><th>32.94</th><th>7.19</th><th>36.84</th><th>380</th><th>4 Average</th><th>VERTICAL</th></tr></table>	1	2450.00	95.19	41.19	54.00	91.90	32.94	7.19	36.84	380	4 Average	VERTICAL
1	2389.82	38.99	-15.01	54.00	35.87	32.88	7.10	36.86	380	4 Average	VERTICAL															
1	2450.00	95.19	41.19	54.00	91.90	32.94	7.19	36.84	380	4 Average	VERTICAL															

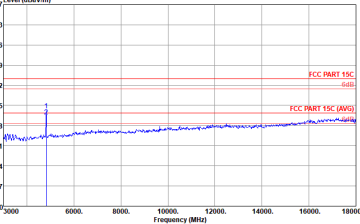
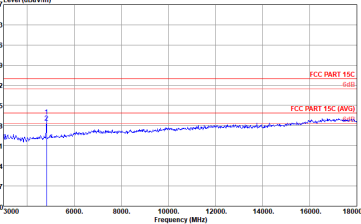


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m																																		
ANT	802.11n HT40 CH09 2452MHz - R																																		
1	Vertical	Fundamental																																	
Peak	 Site : 030905-KS Condition : FCC PART 15C 3m 3317 SN 75957 VERTICAL Project : RRM 1000.000KHz VSW:3000.000KHz SWT:Auto Bode : (FBI)1D1609 Plane : Z Polar : Full-directivity IMEI : 85 PowerSetting : 12 <table><tr><th>Freq</th><th>Level</th><th>Limit</th><th>Line</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>on</th><th>deg</th><th></th></tr><tr><td>1</td><td>2483.62</td><td>61.03</td><td>-12.97</td><td>74.00</td><td>57.62</td><td>32.98</td><td>7.25</td><td>36.82</td><td>380</td><td>4 Peak VERTICAL</td></tr></table>	Freq	Level	Limit	Line	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phase	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	on	deg		1	2483.62	61.03	-12.97	74.00	57.62	32.98	7.25	36.82	380	4 Peak VERTICAL	Left blank
Freq	Level	Limit	Line	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phase																									
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	on	deg																										
1	2483.62	61.03	-12.97	74.00	57.62	32.98	7.25	36.82	380	4 Peak VERTICAL																									
Avg.	 Site : 030905-KS Condition : FCC PART 15C (Ave) 3m 3317 SN 75957 VERTICAL Project : RRM 1000.000KHz VSW:3000.000KHz SWT:Auto Bode : (FBI)1D1609 Plane : Z Polar : Full-directivity IMEI : 85 PowerSetting : 12 <table><tr><th>Freq</th><th>Level</th><th>Limit</th><th>Line</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>on</th><th>deg</th><th></th></tr><tr><td>1</td><td>2483.50</td><td>43.56</td><td>-10.44</td><td>54.00</td><td>40.15</td><td>32.98</td><td>7.25</td><td>36.82</td><td>380</td><td>4 Average VERTICAL</td></tr></table>	Freq	Level	Limit	Line	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phase	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	on	deg		1	2483.50	43.56	-10.44	54.00	40.15	32.98	7.25	36.82	380	4 Average VERTICAL	Left blank
Freq	Level	Limit	Line	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phase																									
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	on	deg																										
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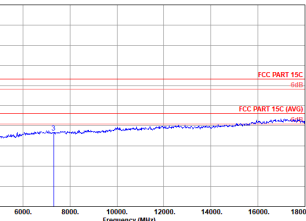
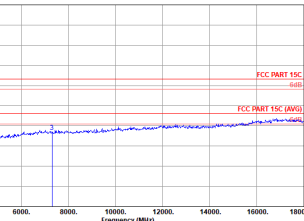


2.4GHz 2400~2483.5MHz

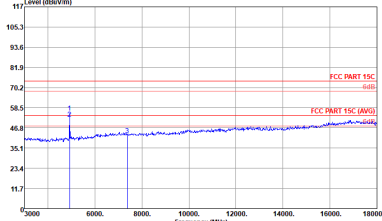
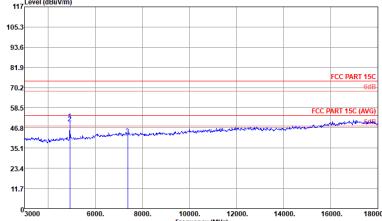
WIFI 802.11b (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m																																																																																	
ANT	802.11b CH01 2412MHz																																																																																	
1	Horizontal	Vertical																																																																																
Peak Avg.	 No. 1098, Pengji North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China Tel: +86-512-57900158 Fax: +86-512-57900958 http://www.sporton.com.cn Data: 15  Site : 03D05-KS Condition : FCC PART 15C 3m 3317.5M 75957 HORIZONTAL Project : RRM 1000.000KHz VSW 3000.000KHz SRT Auto Mode : FPO 101609 Plane : X Full-directivity : 63 Power setting : 17 Over Limit : 17 <table><tr><th>Freq</th><th>Level</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pow</th><th>T/Pow</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBm/100K</th><th>dBm/100K</th><th>dBm/100K</th><th>dBm/100K</th><th>dBm/100K</th><th>dBm/100K</th><th>dBm/100K</th><th>dBm/100K</th><th>dBm/100K</th></tr><tr><td>1 4830.00</td><td>55.84</td><td>-18.16</td><td>74.00</td><td>76.77</td><td>34.20</td><td>10.25</td><td>65.38</td><td>106</td><td>119 Peak HORIZONTAL</td></tr><tr><td>2 1 4830.00</td><td>52.25</td><td>-1.75</td><td>54.00</td><td>73.18</td><td>34.20</td><td>10.25</td><td>65.38</td><td>106</td><td>119 Average HORIZONTAL</td></tr></table>	Freq	Level	Limit	ReadAntenna	Cable	Preamp	A/Pow	T/Pow	Remark	Pol/Phas	MHz	dBm/100K	dBm/100K	dBm/100K	dBm/100K	dBm/100K	dBm/100K	dBm/100K	dBm/100K	dBm/100K	1 4830.00	55.84	-18.16	74.00	76.77	34.20	10.25	65.38	106	119 Peak HORIZONTAL	2 1 4830.00	52.25	-1.75	54.00	73.18	34.20	10.25	65.38	106	119 Average HORIZONTAL	 No. 1098, Pengji North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China Tel: +86-512-57900158 Fax: +86-512-57900958 http://www.sporton.com.cn Data: 16  Site : 03D05-KS Condition : FCC PART 15C 3m 3317.5M 75957 VERTICAL Project : RRM 1000.000KHz VSW 3000.000KHz SRT Auto Mode : FPO 101609 Plane : X Full-directivity : 63 Power setting : 17 Over Limit : 17 <table><tr><th>Freq</th><th>Level</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pow</th><th>T/Pow</th><th>Remark</th><th>Pol/Phas</th></tr><tr><th>MHz</th><th>dBm/100K</th><th>dBm/100K</th><th>dBm/100K</th><th>dBm/100K</th><th>dBm/100K</th><th>dBm/100K</th><th>dBm/100K</th><th>dBm/100K</th><th>dBm/100K</th></tr><tr><td>1 4830.00</td><td>52.29</td><td>-71.71</td><td>74.00</td><td>73.22</td><td>34.20</td><td>10.25</td><td>65.38</td><td>338</td><td>111 Peak VERTICAL</td></tr><tr><td>2 1 4830.00</td><td>48.66</td><td>-5.34</td><td>54.00</td><td>69.59</td><td>34.20</td><td>10.25</td><td>65.38</td><td>338</td><td>111 Average VERTICAL</td></tr></table>	Freq	Level	Limit	ReadAntenna	Cable	Preamp	A/Pow	T/Pow	Remark	Pol/Phas	MHz	dBm/100K	dBm/100K	dBm/100K	dBm/100K	dBm/100K	dBm/100K	dBm/100K	dBm/100K	dBm/100K	1 4830.00	52.29	-71.71	74.00	73.22	34.20	10.25	65.38	338	111 Peak VERTICAL	2 1 4830.00	48.66	-5.34	54.00	69.59	34.20	10.25	65.38	338	111 Average VERTICAL
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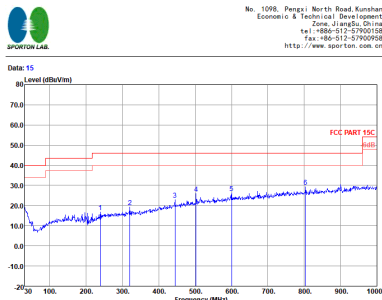
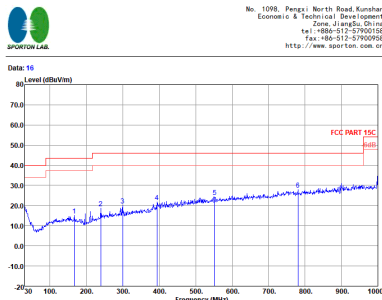
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m																																																																																																						
ANT	802.11b CH06 2437MHz																																																																																																						
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Peak	 No. 1098, Pengzi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China Tel: +86-0512-57900158 Fax: +86-0512-57900058 http://www.sporton.com.cn SPORTON LAB. Date: 13  Site : 030905-K5 Condition : FCC PART 15C 3m 3317.5M 75957 HORIZONTAL Project : RSM-1000.000KHz VBR-3000.000KHz SRT-Auto Bode : FFS101609 Plane : 11 Plane : Full-directivity IMEI : Power setting : 26 <table><thead><tr><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>cn</th><th>deg</th></tr></thead><tbody><tr><td>1</td><td>4875.00</td><td>55.70</td><td>-18.30</td><td>74.00</td><td>34.23</td><td>10.29</td><td>65.42</td><td>100</td><td>121 Peak HORIZONTAL</td></tr><tr><td>2</td><td>4875.00</td><td>52.37</td><td>-11.63</td><td>54.00</td><td>73.27</td><td>34.23</td><td>10.29</td><td>65.42</td><td>100</td><td>121 Average HORIZONTAL</td></tr><tr><td>3</td><td>7305.00</td><td>43.09</td><td>-30.91</td><td>74.00</td><td>60.42</td><td>35.86</td><td>12.72</td><td>60.91</td><td>300</td><td>0 Peak HORIZONTAL</td></tr></tbody></table>	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phase	Freq	Level	Line	Level	Factor	Loss	Factor	cn	deg	1	4875.00	55.70	-18.30	74.00	34.23	10.29	65.42	100	121 Peak HORIZONTAL	2	4875.00	52.37	-11.63	54.00	73.27	34.23	10.29	65.42	100	121 Average HORIZONTAL	3	7305.00	43.09	-30.91	74.00	60.42	35.86	12.72	60.91	300	0 Peak HORIZONTAL	 No. 1098, Pengzi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China Tel: +86-0512-57900158 Fax: +86-0512-57900058 http://www.sporton.com.cn SPORTON LAB. Date: 14  Site : 030905-K5 Condition : FCC PART 15C 3m 3317.5M 75957 VERTICAL Project : RSM-1000.000KHz VBR-3000.000KHz SRT-Auto Bode : FFS101609 Plane : 11 Plane : Full-directivity IMEI : Power setting : 26 <table><thead><tr><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>cn</th><th>deg</th></tr></thead><tbody><tr><td>1</td><td>4875.00</td><td>51.10</td><td>-22.90</td><td>74.00</td><td>72.00</td><td>34.23</td><td>10.29</td><td>65.42</td><td>328</td><td>253 Peak VERTICAL</td></tr><tr><td>2</td><td>4875.00</td><td>48.69</td><td>-15.31</td><td>54.00</td><td>69.59</td><td>34.23</td><td>10.29</td><td>65.42</td><td>328</td><td>253 Average VERTICAL</td></tr><tr><td>3</td><td>7305.00</td><td>43.23</td><td>-30.77</td><td>74.00</td><td>60.56</td><td>35.86</td><td>12.72</td><td>60.91</td><td>100</td><td>0 Peak VERTICAL</td></tr></tbody></table>	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phase	Freq	Level	Line	Level	Factor	Loss	Factor	cn	deg	1	4875.00	51.10	-22.90	74.00	72.00	34.23	10.29	65.42	328	253 Peak VERTICAL	2	4875.00	48.69	-15.31	54.00	69.59	34.23	10.29	65.42	328	253 Average VERTICAL	3	7305.00	43.23	-30.77	74.00	60.56	35.86	12.72	60.91	100	0 Peak VERTICAL
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WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m																																																																																																					
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Peak Avg.	SPORTON LAB. No. 1098, Pengxi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900158 fax: +86-512-57900158 http://www.sporton.com.cn Date: 17 Level (dBuV/m)  Site : 030905-K5 Condition : FCC PART 15C 3m 3317.5M 75957 HORIZONTAL Project : R86-1000.000KHz VBR-3000.000KHz SRT-Auto Bode : FCC 151609B Plane : 12 Polar : Full-directivity IMEI : 85 Power setting : 26 <table><tr><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Level</th><th>Factor</th><th>cm</th><th>deg</th><th></th><th></th></tr><tr><td>1</td><td>4920.00</td><td>55.85</td><td>-18.15</td><td>74.00</td><td>34.26</td><td>10.34</td><td>65.45</td><td>100</td><td>219 Peak HORIZONTAL</td></tr><tr><td>2</td><td>4920.00</td><td>62.90</td><td>-11.70</td><td>54.00</td><td>73.15</td><td>34.26</td><td>10.34</td><td>65.45</td><td>100</td><td>219 Average HORIZONTAL</td></tr><tr><td>3</td><td>7380.00</td><td>42.80</td><td>-31.20</td><td>74.00</td><td>60.30</td><td>35.88</td><td>12.73</td><td>66.11</td><td>300</td><td>0 Peak HORIZONTAL</td></tr></table> SPORTON LAB. No. 1098, Pengxi North Road, Kunshan Economic & Technical Development Zone, Jiangsu, China tel: +86-512-57900158 fax: +86-512-57900158 http://www.sporton.com.cn Date: 18 Level (dBuV/m)  Site : 030905-K5 Condition : FCC PART 15C 3m 3317.5M 75957 VERTICAL Project : R86-1000.000KHz VBR-3000.000KHz SRT-Auto Bode : FCC 151609B Plane : 12 Polar : Full-directivity IMEI : 85 Power setting : 26 <table><tr><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Level</th><th>Factor</th><th>cm</th><th>deg</th><th></th><th></th></tr><tr><td>1</td><td>4920.00</td><td>51.20</td><td>-22.80</td><td>74.00</td><td>72.05</td><td>34.26</td><td>10.34</td><td>65.45</td><td>285</td><td>169 Peak VERTICAL</td></tr><tr><td>2</td><td>4920.00</td><td>49.40</td><td>-4.60</td><td>54.00</td><td>70.25</td><td>34.26</td><td>10.34</td><td>65.45</td><td>285</td><td>169 Average VERTICAL</td></tr><tr><td>3</td><td>7380.00</td><td>42.46</td><td>-31.54</td><td>74.00</td><td>59.16</td><td>35.88</td><td>12.73</td><td>66.11</td><td>100</td><td>0 Peak VERTICAL</td></tr></table>	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phase	Freq	Level	Line	Level	Factor	cm	deg			1	4920.00	55.85	-18.15	74.00	34.26	10.34	65.45	100	219 Peak HORIZONTAL	2	4920.00	62.90	-11.70	54.00	73.15	34.26	10.34	65.45	100	219 Average HORIZONTAL	3	7380.00	42.80	-31.20	74.00	60.30	35.88	12.73	66.11	300	0 Peak HORIZONTAL	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phase	Freq	Level	Line	Level	Factor	cm	deg			1	4920.00	51.20	-22.80	74.00	72.05	34.26	10.34	65.45	285	169 Peak VERTICAL	2	4920.00	49.40	-4.60	54.00	70.25	34.26	10.34	65.45	285	169 Average VERTICAL	3	7380.00	42.46	-31.54	74.00	59.16	35.88	12.73	66.11	100	0 Peak VERTICAL
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Emission below 1GHz
2.4GHz WIFI 802.11g (LF)

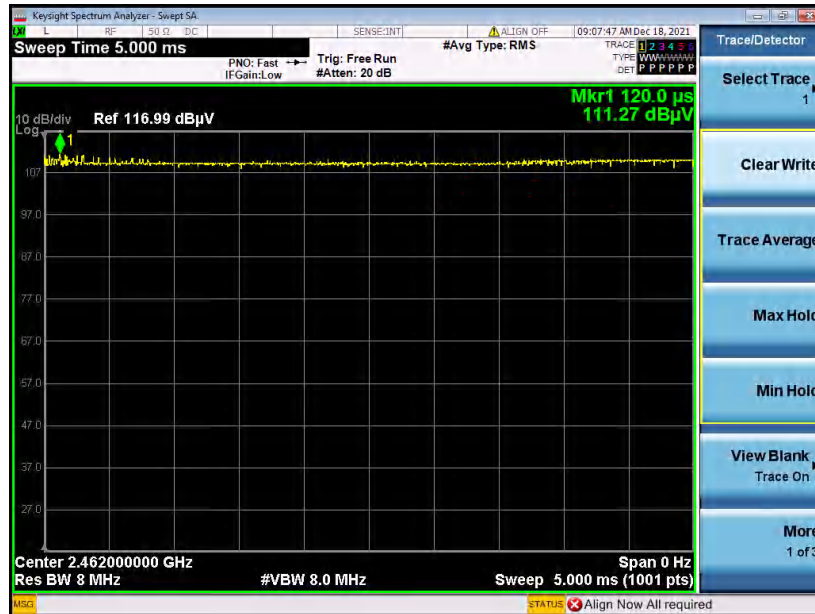
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QP / Peak	 Site : 030907-KS Condition : FCC PART 15C 3m CBLA1110 SMC3188 HORIZONTAL Project : RSM 100.000000 VSW 300.000000 SRT Auto Mode : 13 Plane : 1 Flare : Full-directivity IME1 : 83 <table><tr><th>MEQ</th><th>Level</th><th>Over Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>dBm/100kHz</th><th>dBm/100kHz</th><th>dBm/100kHz</th><th>dBm/100kHz</th><th>dBm/100kHz</th><th>dBm/100kHz</th><th>dBm/100kHz</th><th>dBm/100kHz</th><th>dBm/100kHz</th></tr><tr><td>1</td><td>239.52</td><td>16.76</td><td>-29.24</td><td>46.00</td><td>28.76</td><td>18.74</td><td>2.36</td><td>33.10</td><td>Peak HORIZONTAL</td></tr><tr><td>2</td><td>320.03</td><td>19.22</td><td>-26.78</td><td>46.00</td><td>28.72</td><td>20.68</td><td>2.22</td><td>32.90</td><td>Peak HORIZONTAL</td></tr><tr><td>3</td><td>444.19</td><td>22.78</td><td>-23.22</td><td>46.00</td><td>28.77</td><td>23.50</td><td>3.22</td><td>32.71</td><td>Peak HORIZONTAL</td></tr><tr><td>4</td><td>502.39</td><td>26.50</td><td>-19.50</td><td>46.00</td><td>30.86</td><td>24.55</td><td>4.31</td><td>32.79</td><td>Peak HORIZONTAL</td></tr><tr><td>5</td><td>600.36</td><td>26.35</td><td>-19.65</td><td>46.00</td><td>29.61</td><td>25.50</td><td>3.74</td><td>32.50</td><td>Peak HORIZONTAL</td></tr><tr><td>6</td><td>803.09</td><td>29.22</td><td>-16.78</td><td>46.00</td><td>30.48</td><td>26.72</td><td>4.33</td><td>32.51</td><td>Peak HORIZONTAL</td></tr></table>  Site : 030907-KS Condition : FCC PART 15C 3m CBLA1110 SMC3188 VERTICAL Project : RSM 100.000000 VSW 300.000000 SRT Auto Mode : 13 Plane : 1 Flare : Full-directivity IME1 : 83 <table><tr><th>MEQ</th><th>Level</th><th>Over Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th>dBm/100kHz</th><th>dBm/100kHz</th><th>dBm/100kHz</th><th>dBm/100kHz</th><th>dBm/100kHz</th><th>dBm/100kHz</th><th>dBm/100kHz</th><th>dBm/100kHz</th><th>dBm/100kHz</th></tr><tr><td>1</td><td>166.77</td><td>15.14</td><td>-28.36</td><td>43.50</td><td>28.97</td><td>17.10</td><td>1.97</td><td>32.90</td><td>Peak VERTICAL</td></tr><tr><td>2</td><td>239.52</td><td>18.80</td><td>-27.20</td><td>46.00</td><td>30.80</td><td>18.74</td><td>2.36</td><td>33.10</td><td>Peak VERTICAL</td></tr><tr><td>3</td><td>299.66</td><td>20.00</td><td>-24.99</td><td>46.00</td><td>30.11</td><td>20.30</td><td>2.64</td><td>32.90</td><td>Peak VERTICAL</td></tr><tr><td>4</td><td>393.75</td><td>21.89</td><td>-24.11</td><td>46.00</td><td>29.12</td><td>22.55</td><td>3.03</td><td>32.81</td><td>Peak VERTICAL</td></tr><tr><td>5</td><td>551.86</td><td>24.41</td><td>-21.59</td><td>46.00</td><td>27.54</td><td>25.88</td><td>3.59</td><td>32.60</td><td>Peak VERTICAL</td></tr><tr><td>6</td><td>780.19</td><td>27.86</td><td>-18.14</td><td>46.00</td><td>29.42</td><td>26.75</td><td>4.27</td><td>32.58</td><td>Peak VERTICAL</td></tr></table>	MEQ	Level	Over Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phase	dBm/100kHz	dBm/100kHz	dBm/100kHz	dBm/100kHz	dBm/100kHz	dBm/100kHz	dBm/100kHz	dBm/100kHz	dBm/100kHz	1	239.52	16.76	-29.24	46.00	28.76	18.74	2.36	33.10	Peak HORIZONTAL	2	320.03	19.22	-26.78	46.00	28.72	20.68	2.22	32.90	Peak HORIZONTAL	3	444.19	22.78	-23.22	46.00	28.77	23.50	3.22	32.71	Peak HORIZONTAL	4	502.39	26.50	-19.50	46.00	30.86	24.55	4.31	32.79	Peak HORIZONTAL	5	600.36	26.35	-19.65	46.00	29.61	25.50	3.74	32.50	Peak HORIZONTAL	6	803.09	29.22	-16.78	46.00	30.48	26.72	4.33	32.51	Peak HORIZONTAL	MEQ	Level	Over Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Pol/Phase	dBm/100kHz	dBm/100kHz	dBm/100kHz	dBm/100kHz	dBm/100kHz	dBm/100kHz	dBm/100kHz	dBm/100kHz	dBm/100kHz	1	166.77	15.14	-28.36	43.50	28.97	17.10	1.97	32.90	Peak VERTICAL	2	239.52	18.80	-27.20	46.00	30.80	18.74	2.36	33.10	Peak VERTICAL	3	299.66	20.00	-24.99	46.00	30.11	20.30	2.64	32.90	Peak VERTICAL	4	393.75	21.89	-24.11	46.00	29.12	22.55	3.03	32.81	Peak VERTICAL	5	551.86	24.41	-21.59	46.00	27.54	25.88	3.59	32.60	Peak VERTICAL	6	780.19	27.86	-18.14	46.00	29.42	26.75	4.27	32.58	Peak VERTICAL
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Appendix E. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	100	-	-	10Hz
802.11g	100	-	-	10Hz
802.11n HT20	100	-	-	10Hz
802.11n HT40	100	-	-	10Hz



802.11b

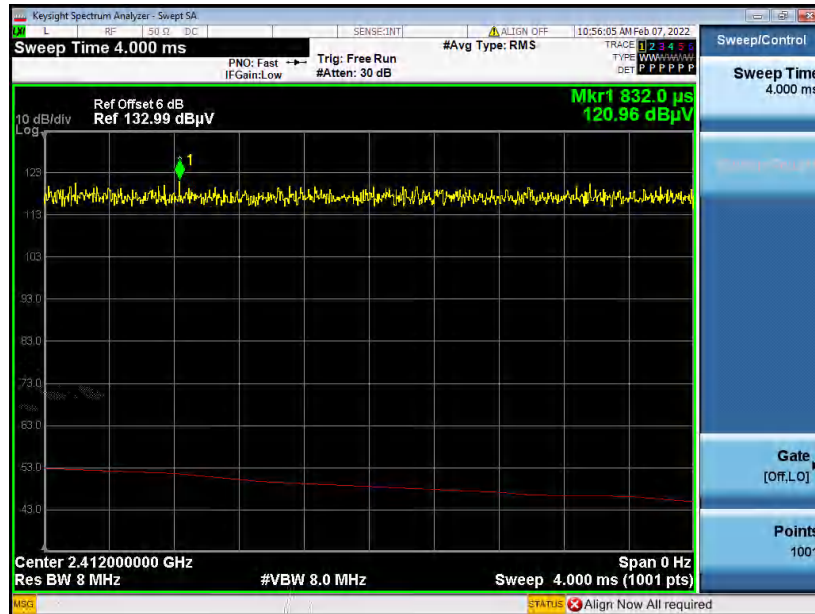


802.11g





802.11n HT20



802.11n HT40

