

FCC PART 15.247

TEST REPORT

For

Hangzhou Sky-Lighting CO., Ltd.

No.161 North Star-Bridge Road, Linping, Hangzhou, Zhejiang 311100, China

FCC ID: 2AVJP-A19TYWFRGBW9W

Report Type: Original Report	Product Name: LED lamp
Report Number:	RKSB240416001-00B
Report Date:	2024-10-12
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Kunshan). This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, or any agency of the U.S. Government.

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REPORT REVISION HISTORY

Number of Revisions	Report No.	Version	Issue Date	Description
0	RKSB240416001-00B	R1V1	2024-10-12	Initial Release

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	Hangzhou Sky-Lighting CO., Ltd.
Tested Model	QPA19-PA-WIFILIC-TY-RGBCW 9W(H23136)
Series Model	BY-MC-LB-223-WT, EAC2-1002-RGB
Model Difference:	Model name
Product Name	LED lamp
Power Supply	AC 120V
RF Function:	2.4G Wi-Fi; BLE
Maximum Output Power:	2.4G Wi-Fi: 802.11b: 25.60 dBm 802.11g: 21.90 dBm 802.11n20: 22.21 dBm BLE(1Mbps): 9.75 dBm
Operating Band/Frequency:	2.4G Wi-Fi: 2412~2462 MHz(802.11b/g/n20) BLE(1Mbps): 2402-2480 MHz
Channel Number:	2.4G Wi-Fi: 11(802.11b/g/n20) BLE: 40
Channel Separation:	2.4G Wi-Fi: 5 MHz BLE: 2 MHz
Modulation Type:	2.4G Wi-Fi: DSSS, OFDM BLE: GFSK
Antenna Type:	Wire Antenna
★Maximum Antenna Gain:	-9.86 dBi

Note: The Maximum Antenna Gain was declared by the manufacturer.

All measurement and test data in this report was gathered from production sample serial number: RKSB240416001-1 (Assigned by the BACL (Kunshan). The EUT supplied by the applicant was received on 2024-04-16.)

Objective

This report is prepared for *Hangzhou Sky-Lighting CO., Ltd.* in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commissions' rules.

The tests were performed in order to determine Compliant with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliant Testing of Unlicensed Wireless Devices and FCC 558074 D01 15.247 Meas Guidance v05r02.

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		3.19dB
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	9 kHz~150 kHz	3.8dB
	150 kHz~30 MHz	3.4dB
	30MHz~1GHz	6.11dB
	1GHz~6GHz	4.45dB
	6GHz~18GHz	5.23dB
	18GHz~40GHz	5.65dB
Occupied Bandwidth		0.5kHz
Temperature		1.0°C
Humidity		6%

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu Province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) is accredited in accordance with ISO/IEC 17025:2017 by NVLAP (Lab code: 600338-0), and the lab has been recognized as the FCC accredited lab under the KDB 974614 D01, the FCC Designation No. : CN5055.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

Channel List for BLE mode:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	14	2430	28	2458
1	2404	15	2432	29	2460
2	2406	16	2434	30	2462
3	2408	17	2436	31	2464
4	2410	18	2438	32	2466
5	2412	19	2440	33	2468
6	2414	20	2442	34	2470
7	2416	21	2444	35	2472
8	2418	22	2446	36	2474
9	2420	23	2448	37	2476
10	2422	24	2450	38	2478
11	2424	25	2452	39	2480
12	2426	26	2454	/	/
13	2428	27	2456	/	/

EUT was tested with channel 0, 19 and 39.

Channel List for Wi-Fi Mode:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437	/	/

For 802.11b, 802.11g and 802.11n-HT20 mode, EUT was tested with Channel 1, 6 and 11.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

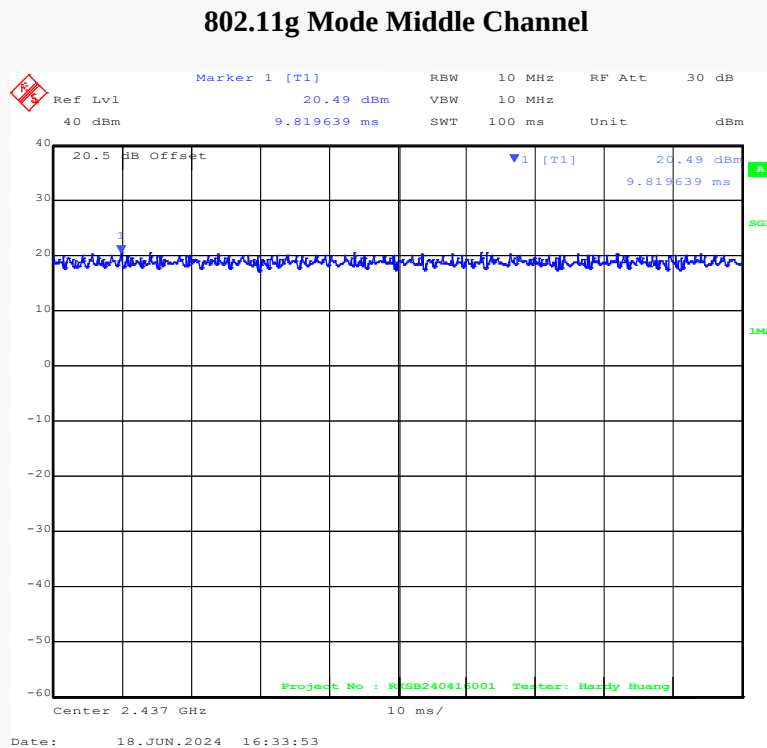
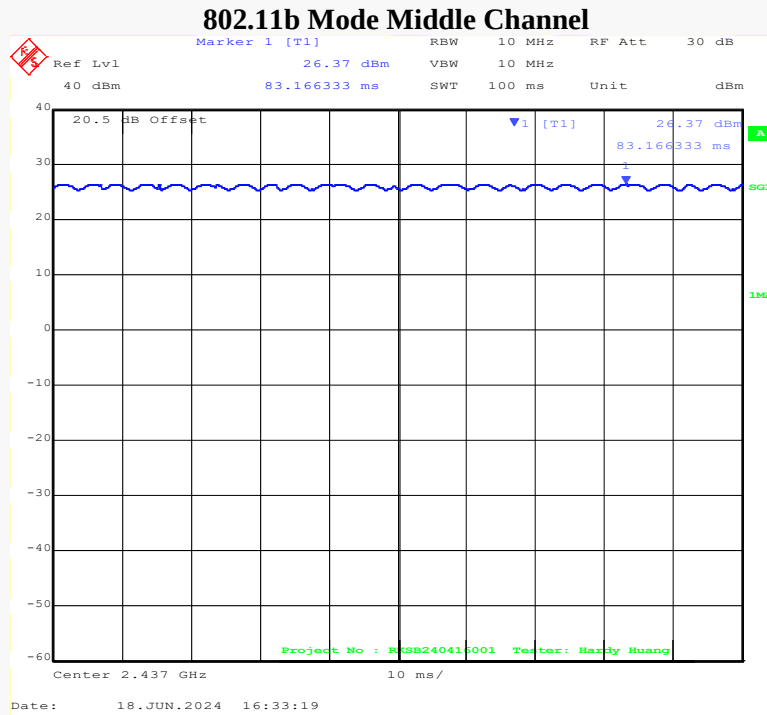
RF test software: Wifi Test Tool 1.7.2

Pre-scan with all the data rates, and the worst case was performed as below:

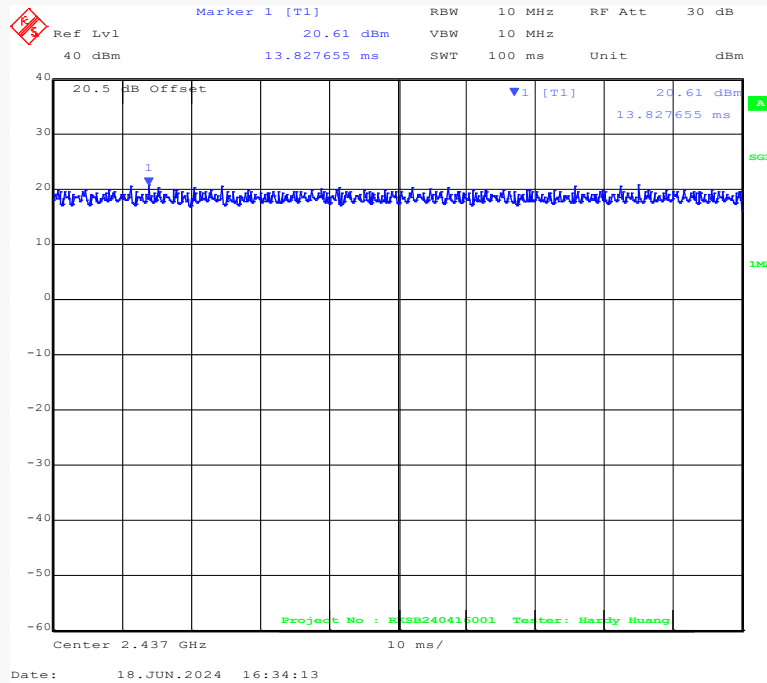
Mode	Data Rate	Channel (MHz)	★Power Level
802.11b	1 Mbps	2412	38
		2437	38
		2462	32
802.11g	6 Mbps	2412	38
		2437	38
		2462	38
802.11n-HT20	MCS0	2412	38
		2437	38
		2462	38
BLE(1Mbps)	1Mbps	2402	38
		2440	38
		2480	38

Note: The power level was declared by the applicant.

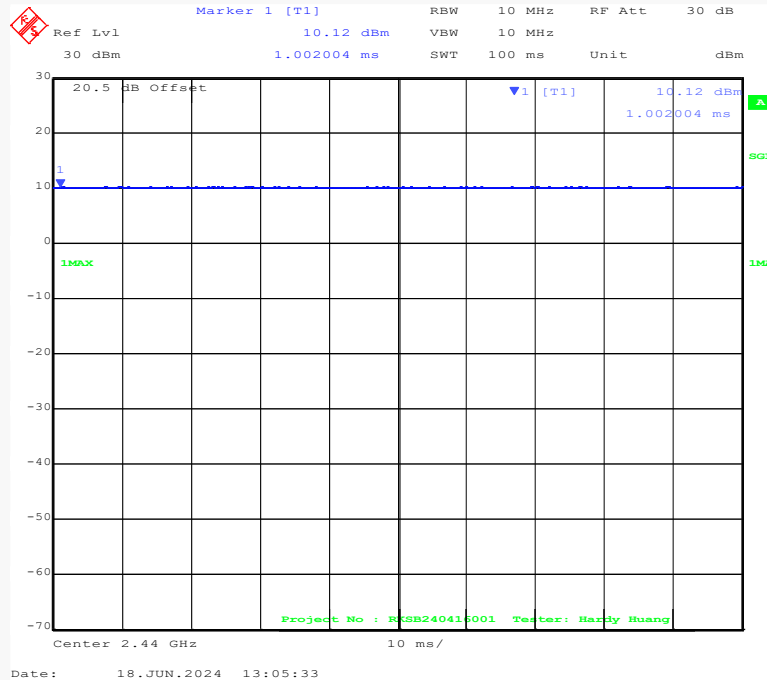
Duty Cycle:



802.11n-HT20 Mode Middle Channel



BLE(1Mbps) Mode Middle Channel



Mode	Duty Cycle (%)	Ton(ms)	Ton+off(ms)	10log(1/x)
802.11b	100	100	100	0
802.11g	100	100	100	0
802.11n-HT20	100	100	100	0
BLE(1Mbps)	100	100	100	0

Note: “x” means the Duty Cycle.

Support Equipment List and Details

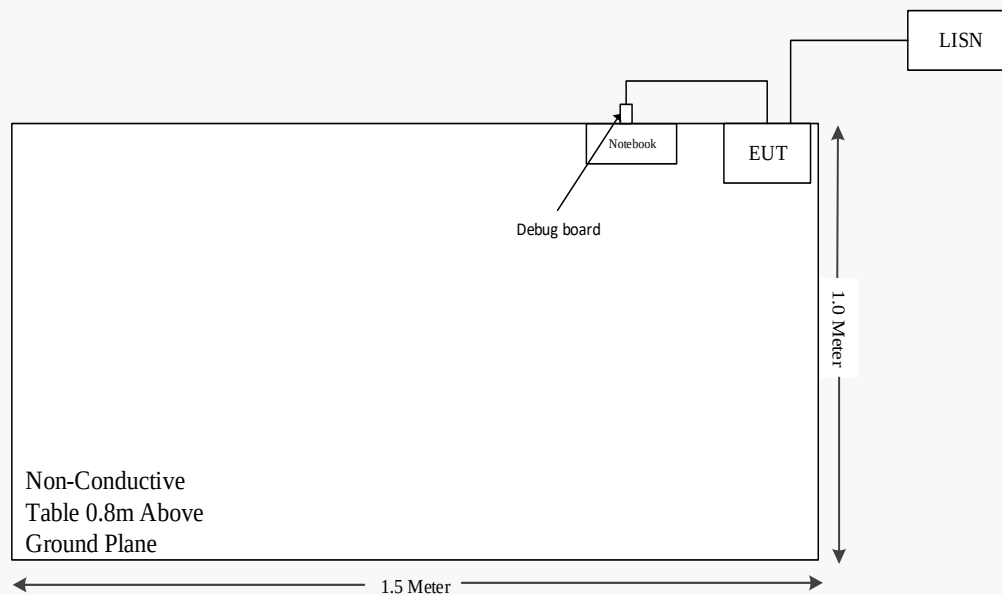
Manufacturer	Description	Model	Serial Number
DELL	Notebook	GX620	D65874152
/	Socket	/	/
/	Debug board	/	/

External I/O Cable

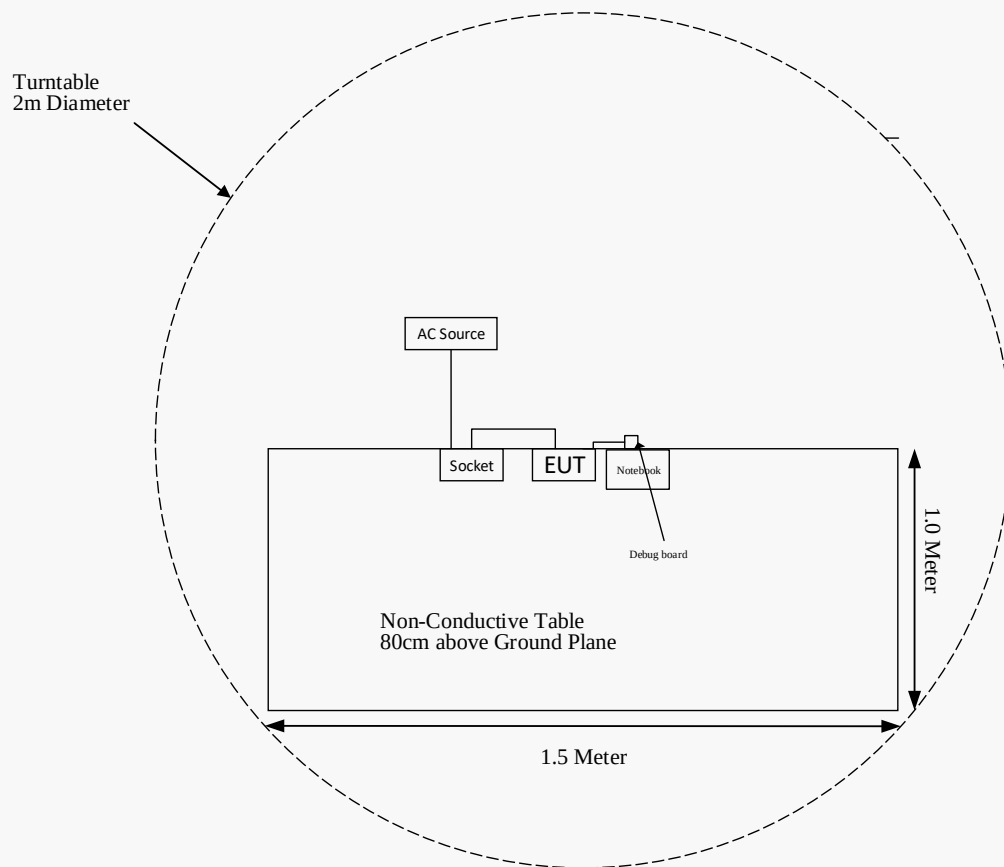
Cable Description	Length (m)	From Port	To Port
Data cable	0.1	EUT	Debug board
Power cable 1	1.0	EUT	LISN
Power cable 2	1.0	EUT	Socket
Power cable 3	1.0	Socket	AC Source

Block Diagram of Test Setup

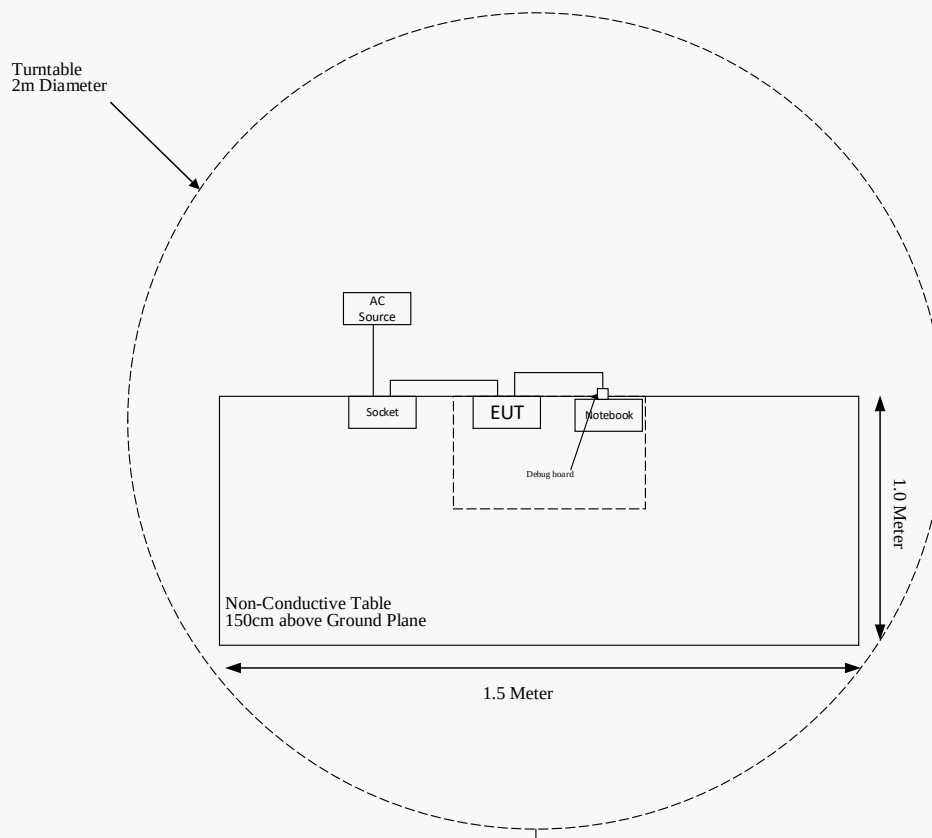
For Conducted Emissions:



For Radiated Emissions (Below 1 GHz):



For Radiated Emissions (Above 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1310 & §2.1091	MAXIMUM PERMISSIBLE EXPOSURE (MPE)	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 (a)	AC Line Conducted Emissions	Compliant
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliant
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliant
§15.247(b)(3)	Maximum Conducted Output Power	Compliant
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliant
§15.247(e)	Power Spectral Density	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test (Chamber #1)					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2024-04-23	2025-04-22
Sunol Sciences	Broadband Antenna	JB3	A090314-1	2023-11-11	2024-11-10
Narda	6dB Attenuator	773-6	10690812-2-1	2023-11-11	2024-11-10
ETS-LINDGREN	Loop Antenna	6512	108100	2023-11-09	2024-11-08
Sonoma Instrument	Pre-amplifier	310N	171205	2024-04-23	2025-04-22
Rohde & Schwarz	Auto Test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-8	008	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-9	009	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-10	010	2024-04-23	2025-04-22
Radiated Emission Test (Chamber #2)					
Rohde & Schwarz	EMI Test Receiver	ESU40	100207/040	2024-04-25	2025-04-24
ETS-LINDGREN	Horn Antenna	3115	9311-4159	2023-12-02	2024-12-01
ETS-LINDGREN	Horn Antenna	3116	2516	2023-12-08	2024-12-07
A.H.Systems, inc	Amplifier	PAM-0118P	512	2024-04-25	2025-04-24
SELECTOR	Amplifier	EM18G40G	060726	2024-04-25	2025-04-24
MICRO-TRONICS	Band Reject Filter	BRM50702	G024	2024-04-25	2025-04-24
Narda	Attenuator	10dB	010	2024-04-25	2025-04-24
Rohde & Schwarz	Auto test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-6	006	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-11	011	2024-04-25	2025-04-24
MICRO-COAX	Coaxial Cable	Cable-12	012	2024-04-25	2025-04-24
MICRO-COAX	Coaxial Cable	Cable-13	013	2024-04-25	2025-04-24
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSIQ26	100048	2024-04-24	2025-04-23
Narda	Attenuator	10dB	010	2024-04-25	2025-04-24
Anritsu	Power Sensor	MA24418A	12621	2024-04-23	2025-04-22
XHFDZ	RG178 Coaxial Cable	SMA-178	XHF-1102	Each time	N/A
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESR	101746	2024-04-23	2025-04-22
Rohde & Schwarz	LISN	ENV216	101115	2024-04-23	2025-04-22
Audix	Test Software	e3	V9	N/A	N/A
Rohde & Schwarz	Pulse limiter	ESH3-Z2	100552	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-15	015	2024-04-25	2025-04-24

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §1.1310 & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart §2.1091 and subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Calculated Data:

Mode	Frequency Range (MHz)	Antenna Gain		★Tune-up Output Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
BLE	2402~2480	-9.86	0.10	10.5	11.22	20	0.0002	1.0
2.4G Wi-Fi	2412~2462	-9.86	0.10	26.0	398.11	20	0.0079	1.0

Note:

1. For the above tune up power were declared by the manufacturer.
2. Wi-Fi and BLE cannot transmit simultaneously.

Result: The device meet FCC MPE at 20 cm distance.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. 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 provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine Compliant with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.
- c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has a Wire Antenna for 2.4G Wi-Fi & BLE, and the antenna gain is -9.86 dBi, which is permanently attached to the unit, fulfill the requirement of this section. Please refer to the EUT photos.

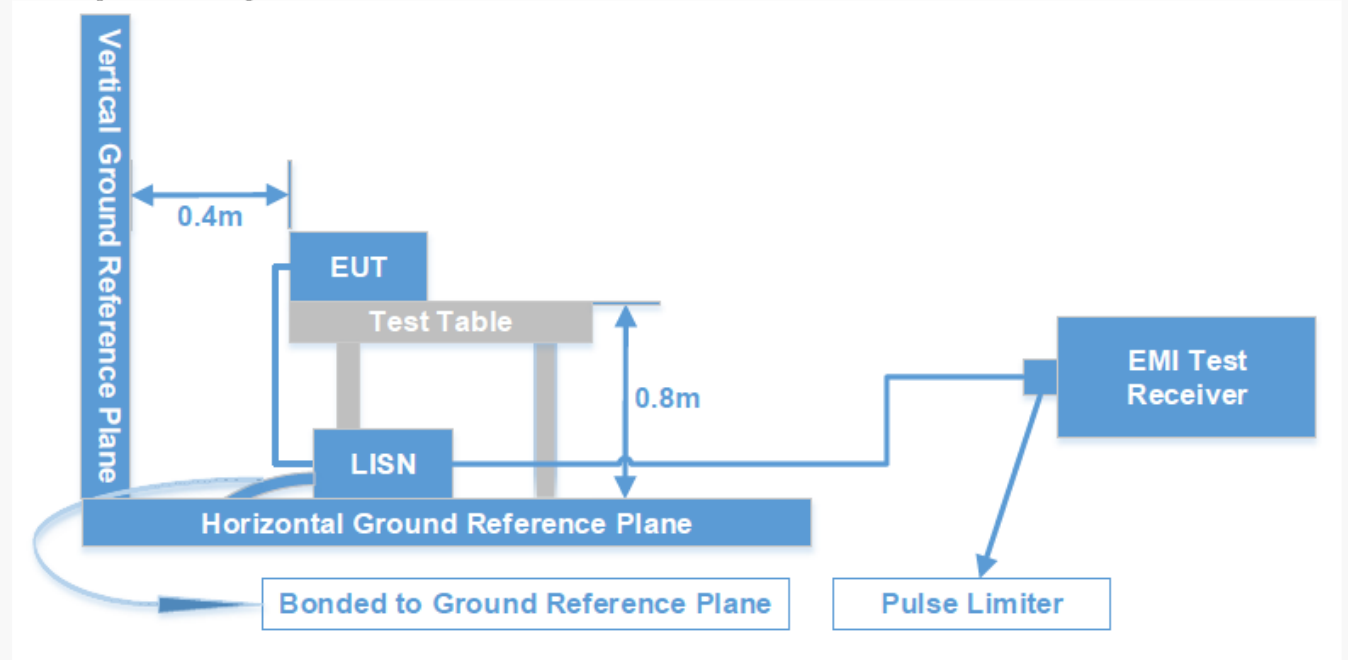
Result: Compliant.

FCC §15.207 (a) - AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a)

Test System Setup



The measurement procedure of EUT setup is according with ANSI C63.10-2013. The related limit was specified in FCC Part 15.207.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	VBW
150 kHz - 30 MHz	9 kHz	30 kHz

Test Procedure

ANSI C63.10-2013 clause 6.2

During the conducted emission test, the EUT was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

If the maximum peak value of the emissions is below the average limit, the QP value and average value measurement will not need to be performed and only record the maximum peak measured value to meet the requirements.

Level & Over Limit Calculation

The Level is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation from the Meter Reading. The basic equation is as follows:

Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)

Level (dBμV) = Read level (dBμV) + Factor (dB)

The “**Over Limit**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over Limit of 7 dB means the emission is 7 dB above the limit. The equation for Over Limit calculation is as follows:

Over Limit (dB) = Level (dBμV) - Limit (dBμV)

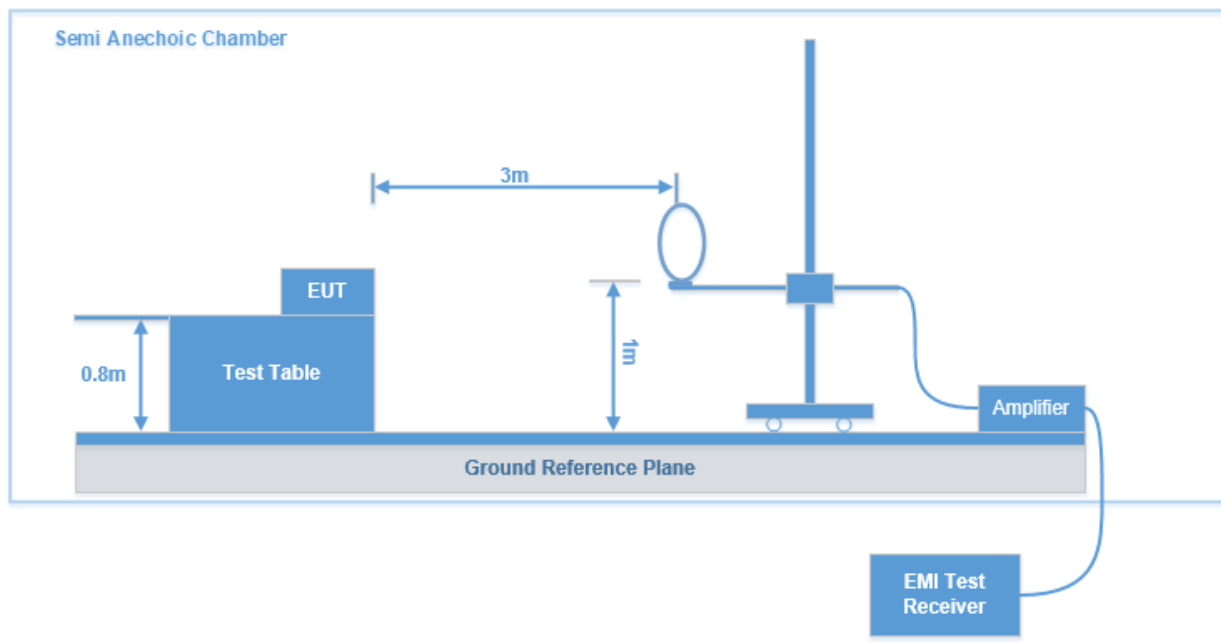
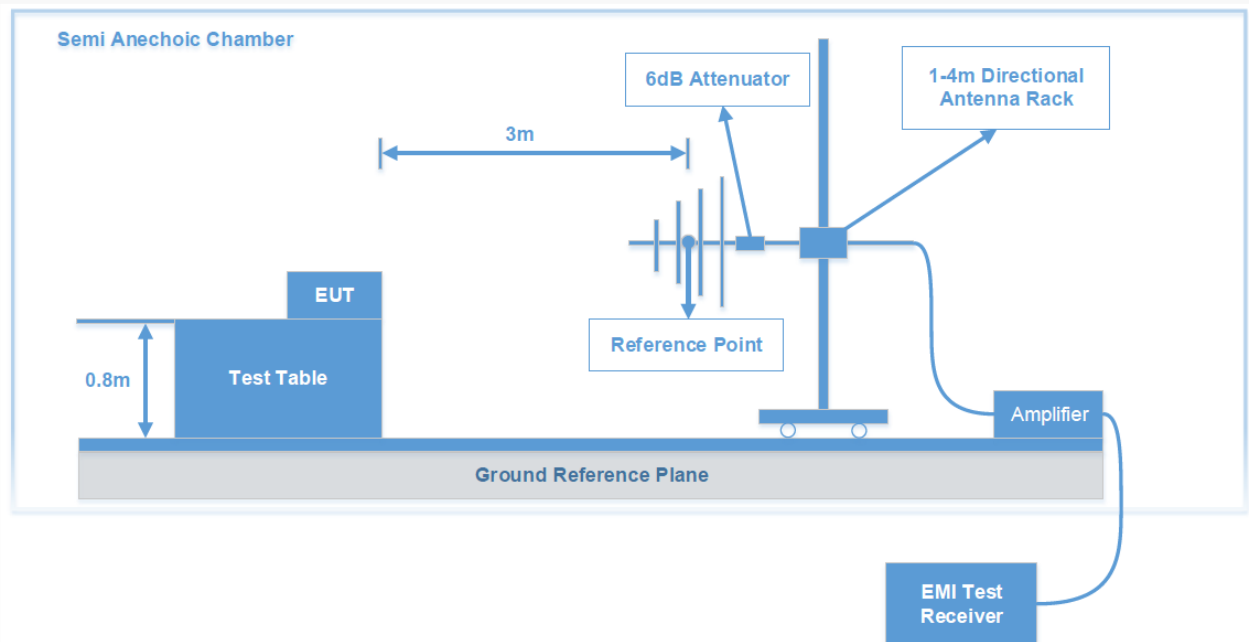
Test Results Summary

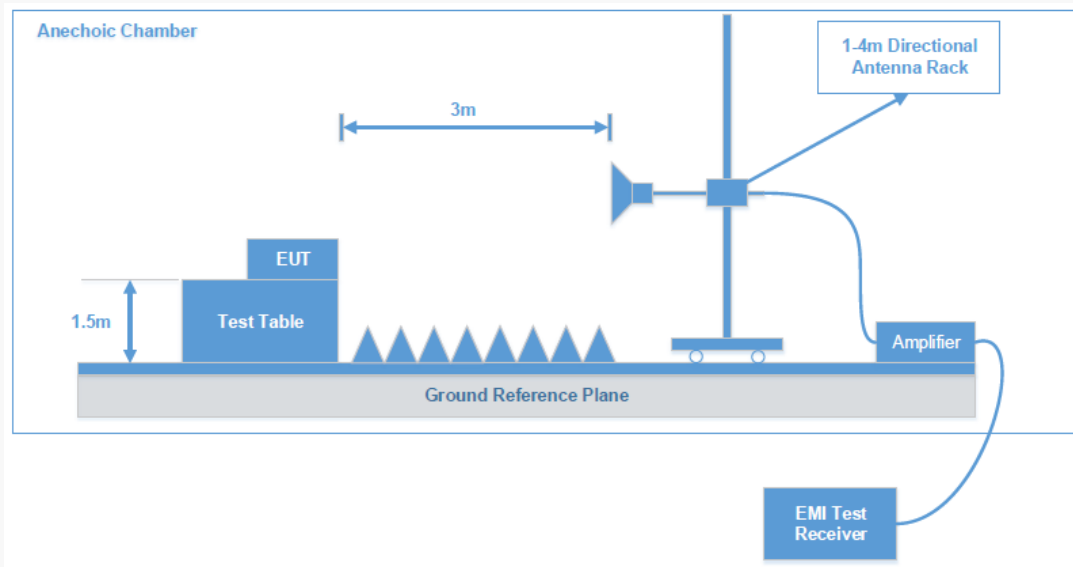
According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

Test Data: See Appendix

FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS**Applicable Standard**

FCC §15.247 (d); §15.209; §15.205;

Test System Setup**9kHz - 30MHz:****30 MHz - 1 GHz:**

Above 1GHz:

The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

EMI Test Receiver Setup

The system was investigated from 9 kHz to 25 GHz.

During the radiated emission test, the EMI test receiver setup was set with the following configurations:

Frequency Range	RBW	VBW	IF B/W	Measurement
9 kHz – 150 kHz	200 Hz	1 kHz	200 Hz	QP/Average
150 kHz – 30 MHz	9 kHz	30 kHz	9 kHz	QP/ Average
30 MHz – 1000 MHz	100 kHz	300 kHz	/	Peak
	/	/	120 kHz	QP
Above 1GHz	1MHz	3 MHz	/	Peak
	1MHz	3 MHz	/	Average

Test Procedure

According to ANSI C63.10-2013 clause 6.5, 6.6 and 6.7.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

If the measured peak level of the emissions that the measuring receiver reading level plus corrected factor is at least 6 dB below the QP emission limit, there's no need to record the measured QP level of the emissions in the report.

For 9 kHz-30MHz test, the lowest height of the magnetic antenna shall be 1 m above the ground and three antenna orientations (parallel, perpendicular, and ground-parallel) shall be measured.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude (dB μ V/m) = Meter Reading (dB μ V) + Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB)

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin (dB) = Limit (dB μ V/m) – Corrected Amplitude (dB μ V/m)

Note: The QuasiPeak (dB μ V/m), MaxPeak (dB μ V/m), Average (dB μ V/m) which shown in the data table are all Corrected Amplitude.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.247.

Test Data: See Appendix

FCC §15.247(A) (2) - 6 DB EMISSION BANDWIDTH

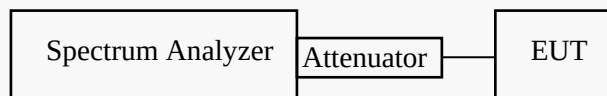
Applicable Standard

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test Procedure

According to ANSI C63.10-2013 sub-clause 11.8.1

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 * \text{RBW}$.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



Test Data: See Appendix

FCC §15.247(B) (3) - MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

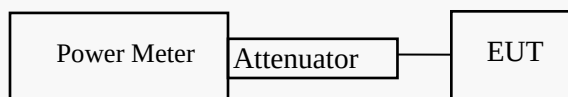
According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, Compliant with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Test Procedure

According to ANSI C63.10-2013 sub-clause 11.9.1.3

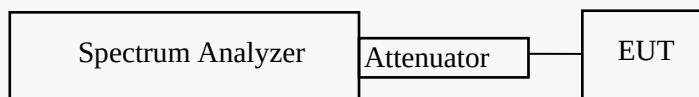
The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
3. Add a correction factor to the display.



For BLE:

1. Set the RBW $\geq$ DTS bandwidth.
2. Set VBW $\geq 3 * \text{RBW}$.
3. Set span $\geq 3 * \text{RBW}$
4. Sweep time = auto couple.
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use peak marker function to determine the peak amplitude level.



Test Data: See Appendix

FCC §15.247(D) – 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE

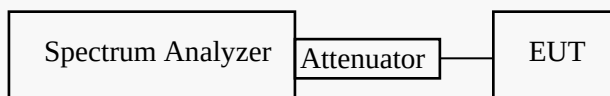
Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates Compliant with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Procedure

According to ANSI C63.10-2013 sub-clause 6.10.

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.



Test Data: See Appendix

FCC §15.247(E) - POWER SPECTRAL DENSITY

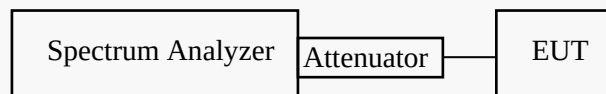
Applicable Standard

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test Procedure

According to ANSI C63.10-2013 sub-clause 11.10.2

1. Set the RBW to: $3\text{kHz} \leq \text{RBW} \leq 100\text{ kHz}$.
2. Set the VBW $\geq 3 \times \text{RBW}$.
3. Set the span to 1.5 times the DTS bandwidth.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the maximum amplitude level within the RBW.
9. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.



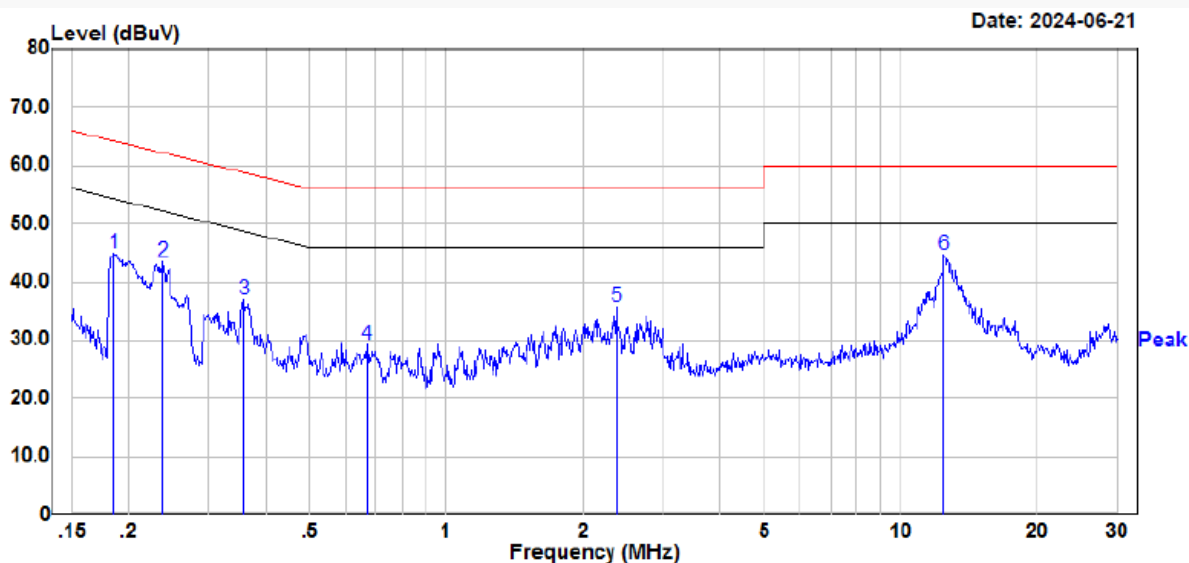
Test Data: See Appendix

Appendix - TEST DATA

Environmental Conditions & Test Information

Test Item:	AC LINE CONDUCTED EMISSIONS	RADIATED EMISSIONS		
		9 kHz-1 GHz	1 GHz - 18 GHz	18 GHz -25 GHz
Test Date:	2024-06-21	2024-06-18	2024-06-24	2024-06-24
Temperature:	25.9 °C	23.1 °C	23.3 °C	23.3 °C
Relative Humidity:	65 %	49 %	52 %	52 %
ATM Pressure:	100.2 kPa	100.7 kPa	100.6 kPa	100.6 kPa
Test Result:	Pass	Pass	Pass	Pass
Test Engineer:	Joe Zhang	Leah Li	Hugh Wu	Hugh Wu

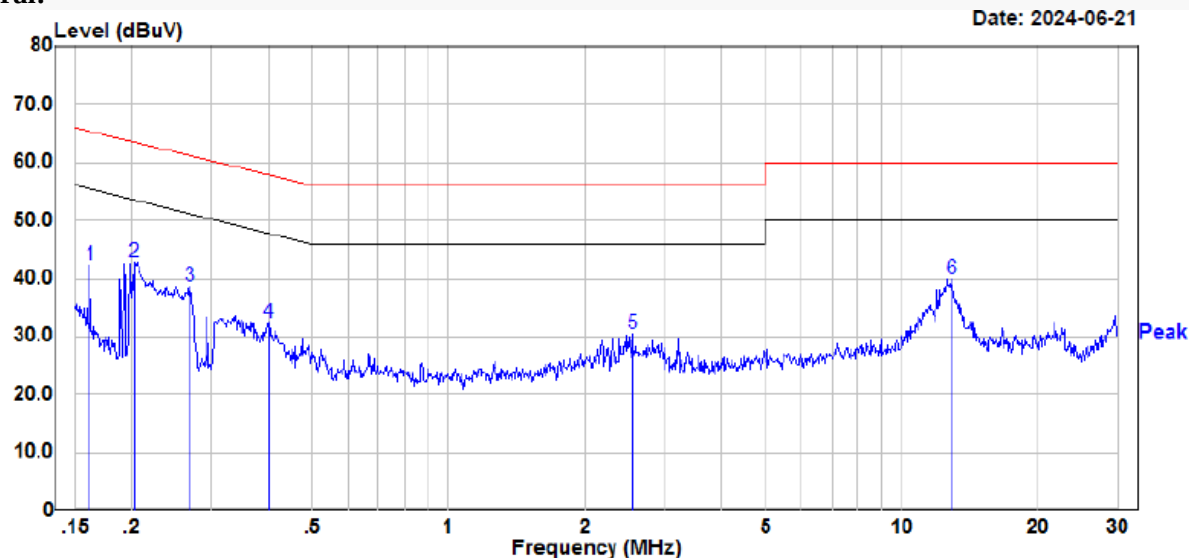
Test Item:	6 DB EMISSION BANDWIDTH	OCCUPIED BANDWIDTH	POWER SPECTRAL DENSITY	TRANSMITTER OUTPUT POWER MEASUREMENT	OUT OF BAND EMISSIONS	DUTY CYCLE
Test Date:	2024-06-18					
Temperature:	23.1 °C					
Relative Humidity:	49 %					
ATM Pressure:	100.7 kPa					
Test Result:	Pass					
Test Engineer:	Hardy Huang					

AC LINE CONDUCTED EMISSIONS**For Wi-Fi Mode:***EUT operation mode: Transmitting in maximum output power mode 802.11b mode Middle channel***Line:**

Site : CE
Condition : limit\FCC PART 15.207
: DET:Peak
Project No. : RKSB240416001
Model : QPA19-WIFILIC-TY-RGBCW 9W(H23136)
Phase : L
Voltage : 120V/60Hz
Mode : WIFI Transmitting
Test Equipment : ENV216,ESR
Temperature : 25.9℃
Humidity : 65%
Atmospheric pressure: 100.2kPa
Test Engineer : Joe Zhang

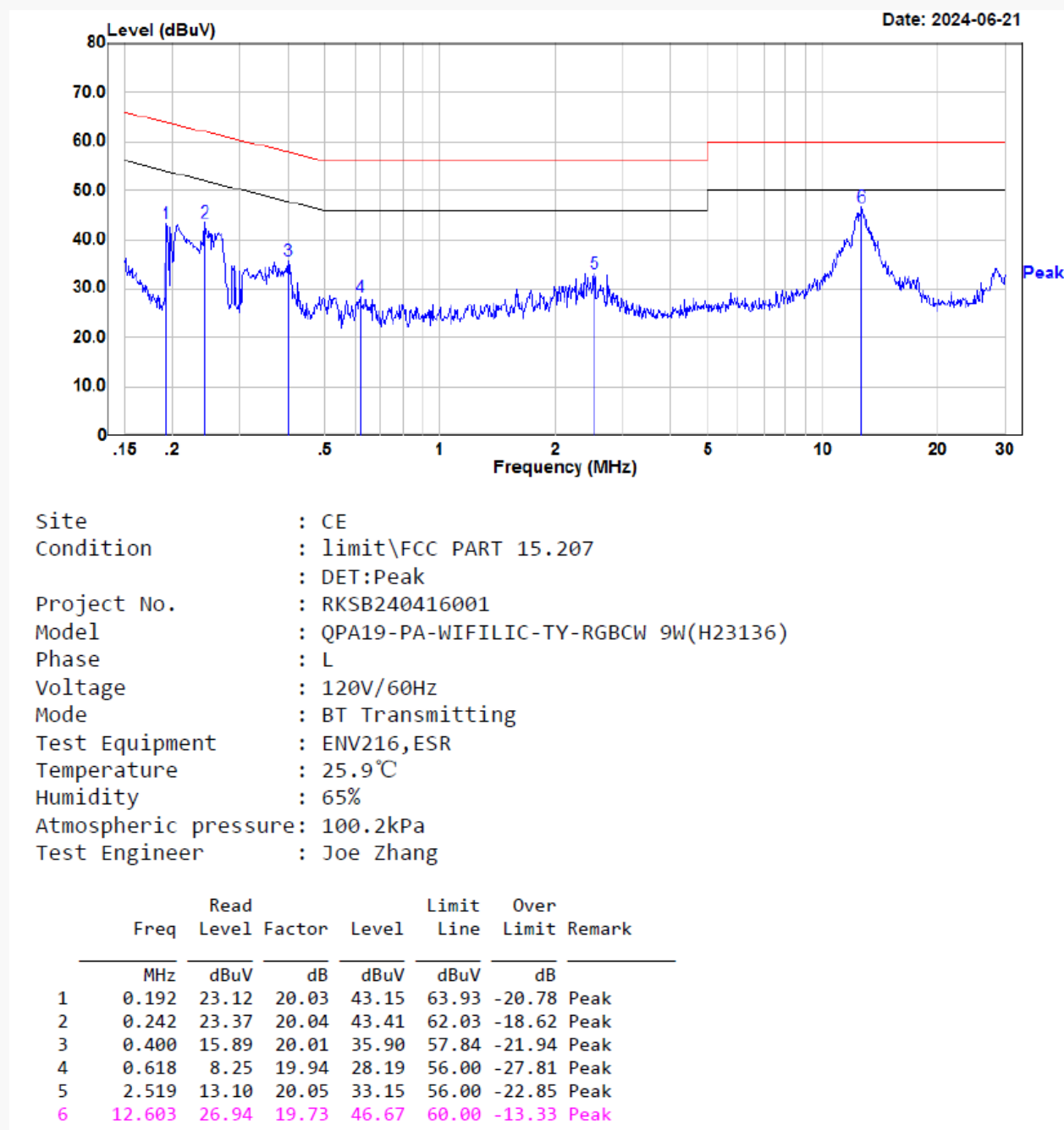
	Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit Remark
	MHz	dBuV	dB	dBuV	dBuV	dB
1	0.185	24.96	20.02	44.98	64.26	-19.28 Peak
2	0.237	23.50	20.04	43.54	62.19	-18.65 Peak
3	0.359	16.86	20.02	36.88	58.76	-21.88 Peak
4	0.669	9.27	19.94	29.21	56.00	-26.79 Peak
5	2.373	15.78	20.04	35.82	56.00	-20.18 Peak
6	12.416	24.89	19.74	44.63	60.00	-15.37 Peak

Neutral:

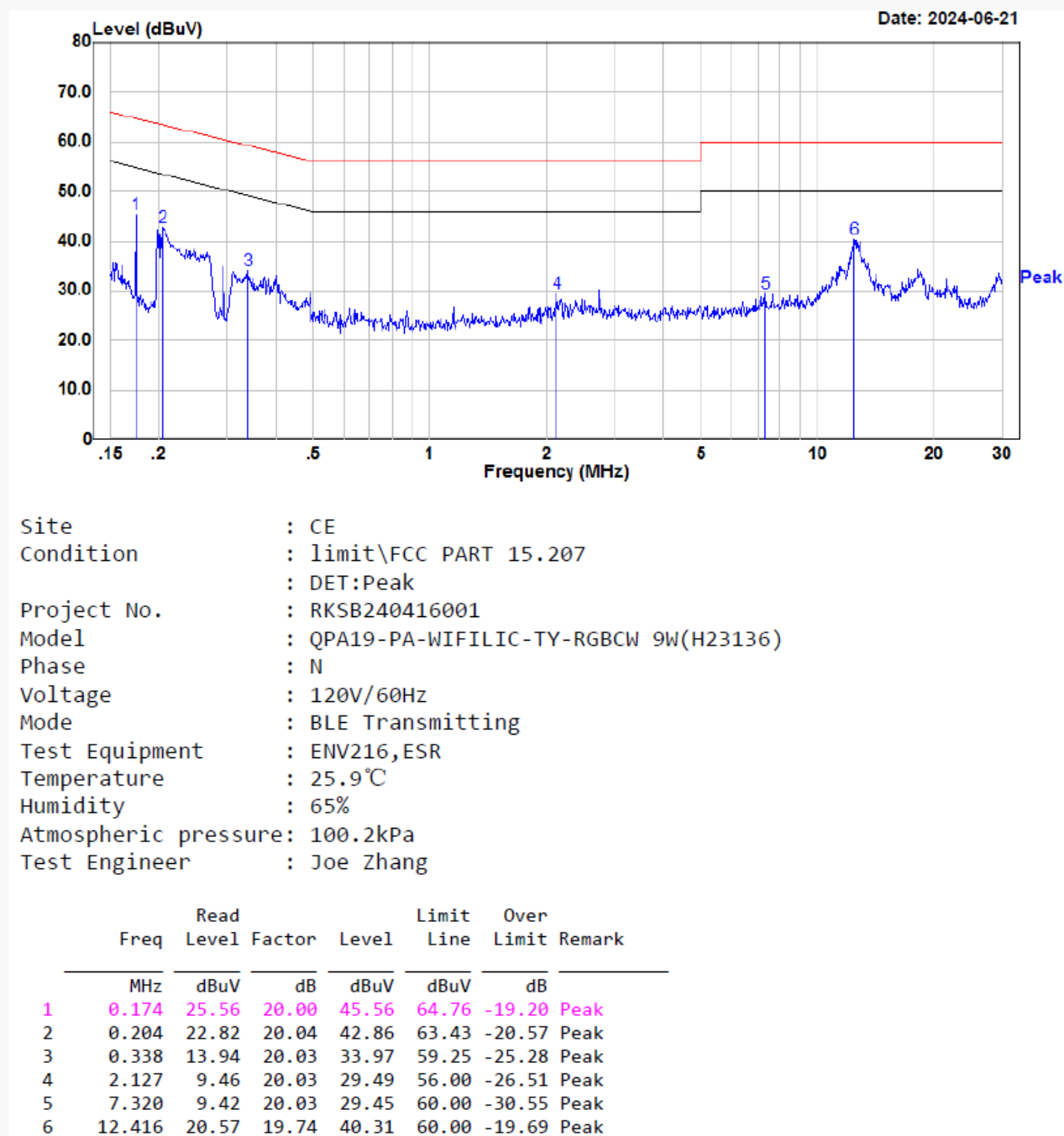


Site : CE
Condition : limit\FCC PART 15.207
: DET:Peak
Project No. : RKSB240416001
Model : QPA19-PA-WIFILIC-TY-RGBCW 9W(H23136)
Phase : N
Voltage : 120V/60Hz
Mode : WIFI Transmitting
Test Equipment : ENV216,ESR
Temperature : 25.9°C
Humidity : 65%
Atmospheric pressure: 100.2kPa
Test Engineer : Joe Zhang

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.162	22.41	19.98	42.39	65.38	-22.99	Peak
2	0.202	22.69	20.04	42.73	63.52	-20.79	Peak
3	0.267	18.67	20.03	38.70	61.20	-22.50	Peak
4	0.400	12.40	20.01	32.41	57.84	-25.43	Peak
5	2.545	10.51	20.05	30.56	56.00	-25.44	Peak
6	12.857	20.15	19.71	39.86	60.00	-20.14	Peak

For BLE Mode:*EUT operation mode: Transmitting in maximum output power mode Low channel***Line**

Neutral



SPURIOUS EMISSIONS

Test Result: Compliant

EUT operation mode: Transmitting

After pre-scan in the X, Y and Z axes of orientation, the worst case in the X axes of orientation is below:

9 kHz-30MHz:

For Wi-Fi Mode:

Transmitting in maximum output power mode 802.11b mode middle channel

The amplitude of spurious emissions attenuated more than 20 dB below the limit was not be recorded.

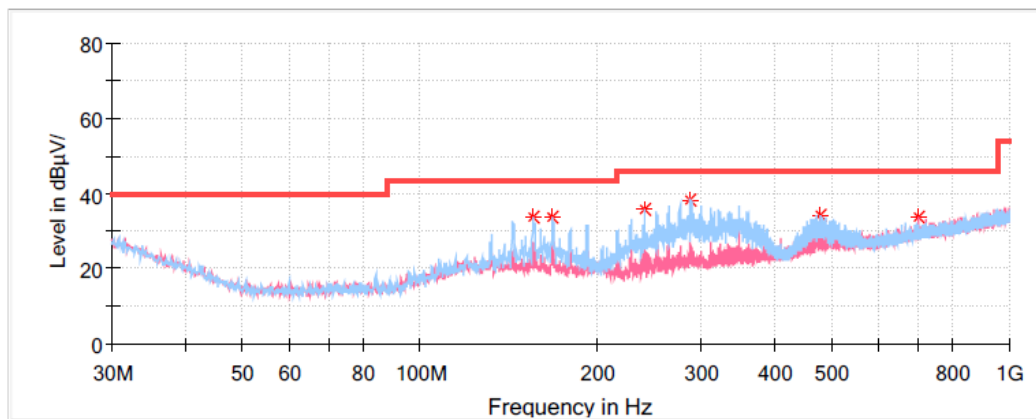
For BLE Mode:

Transmitting in maximum output power mode BLE 1M mode low channel

The amplitude of spurious emissions attenuated more than 20 dB below the limit was not be recorded.

For Wi-Fi Mode:**30 MHz - 1GHz (802.11b mode is worst case) :****Low channel: 2412MHz****Common Information**

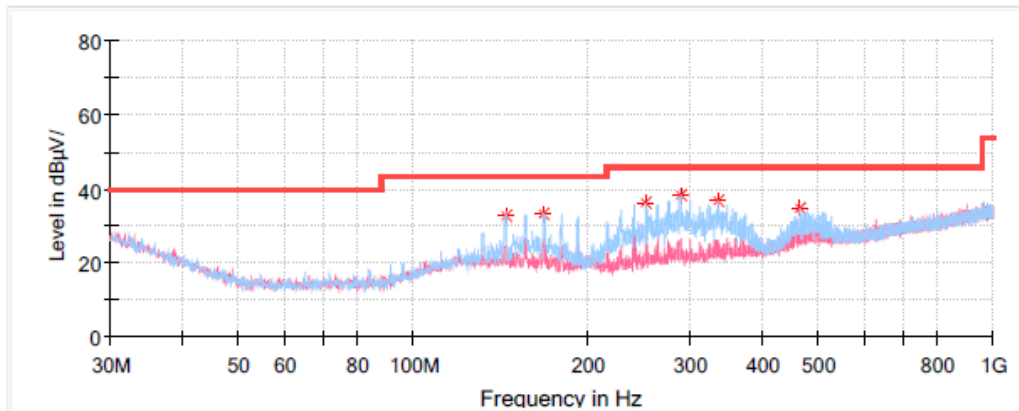
Project No:	RKSB240416001
EUT Model:	QPA19-PA-WIFILIC-TY-RGBCW 9W(H23136)
Test Mode:	2.4G WIFI Transmitting
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Equipment:	ESCI, JB3, 310N
Temperature:	23.1°C
Humidity:	49%
Barometric Pressure:	100.7kPa
Test Engineer:	Leah Li
Test Date:	2024/6/18

**Critical_Freqs**

Frequency (MHz)	MaxPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
155.857500	33.74	43.50	9.76	H	-12.0
167.861250	33.53	43.50	9.97	H	-12.5
240.005000	35.90	46.00	10.10	H	-12.6
288.141250	38.30	46.00	7.70	H	-10.6
476.442500	34.03	46.00	11.97	H	-6.0
701.482500	33.74	46.00	12.26	V	-1.9

Middle channel: 2437MHz**Common Information**

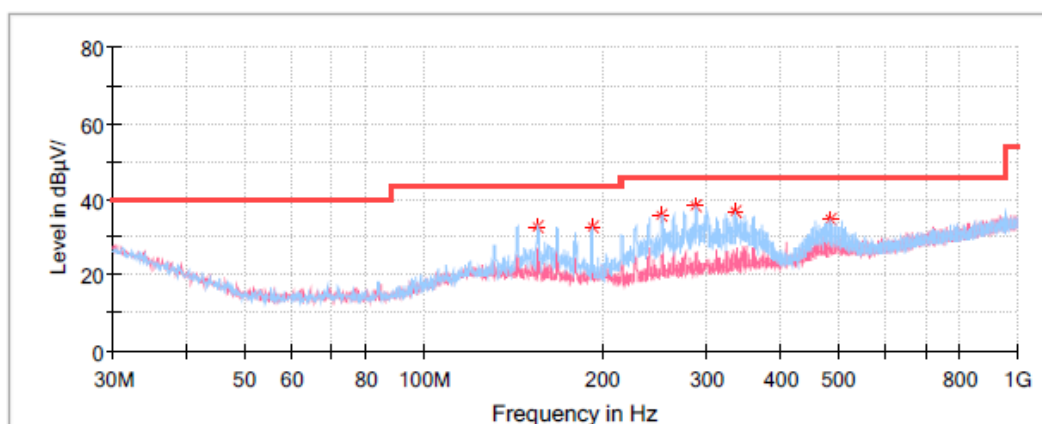
Project No: RKS240416001
EUT Model: QPA19-PA-WIFILIC-TY-RGBCW 9W(H23136)
Test Mode: 2.4G WIFI Transmitting
Standard: FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Equipment: ESCI, JB3, 310N
Temperature: 23.1 °C
Humidity: 49%
Barometric Pressure: 100.7kPa
Test Engineer: Leah Li
Test Date: 2024/6/18

**Critical Freqs**

Frequency (MHz)	MaxPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
144.096250	32.75	43.50	10.75	H	-11.6
168.103750	33.07	43.50	10.43	H	-12.5
252.251250	36.39	46.00	9.61	H	-12.2
288.383750	38.43	46.00	7.57	H	-10.6
335.913750	36.77	46.00	9.23	H	-9.6
464.560000	34.54	46.00	11.46	H	-6.3

High Channel: 2462MHz**Common Information**

Project No: RKSB240416001
EUT Model: QPA19-PA-WIFILIC-TY-RGBCW 9W(H23136)
Test Mode: 2.4G WIFI Transmitting
Standard: FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Equipment: ESCI, JB3, 310N
Temperature: 23.1°C
Humidity: 49%
Barometric Pressure: 100.7kPa
Test Engineer: Leah Li
Test Date: 2024/6/18

**Critical_Freqs**

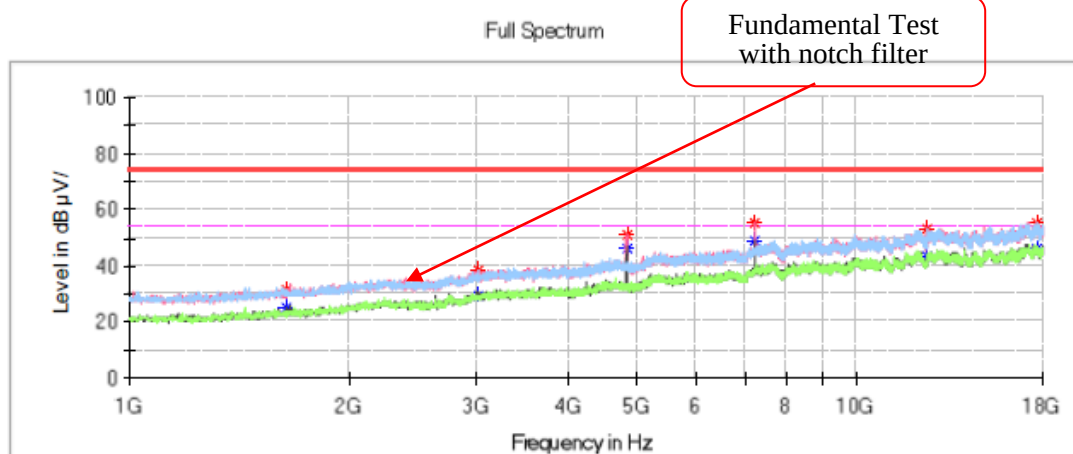
Frequency (MHz)	MaxPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
156.100000	32.73	43.50	10.77	H	-12.0
192.232500	32.90	43.50	10.60	H	-12.5
252.251250	35.73	46.00	10.27	H	-12.2
287.777500	38.08	46.00	7.92	H	-10.6
335.550000	36.56	46.00	9.44	H	-9.6
483.717500	34.89	46.00	11.11	H	-5.8

1GHz-18GHz:
802.11b Mode:

Low Channel: 2412MHz

Common Information

Project No.: RKSB240416001
 Test Mode: 2.4G WIFI 802.11b Mode Low channel
 Standard: FCC Part 15.247 & FCC 15.205 & FCC 15.209
 Test Engineer: Hugh Wu

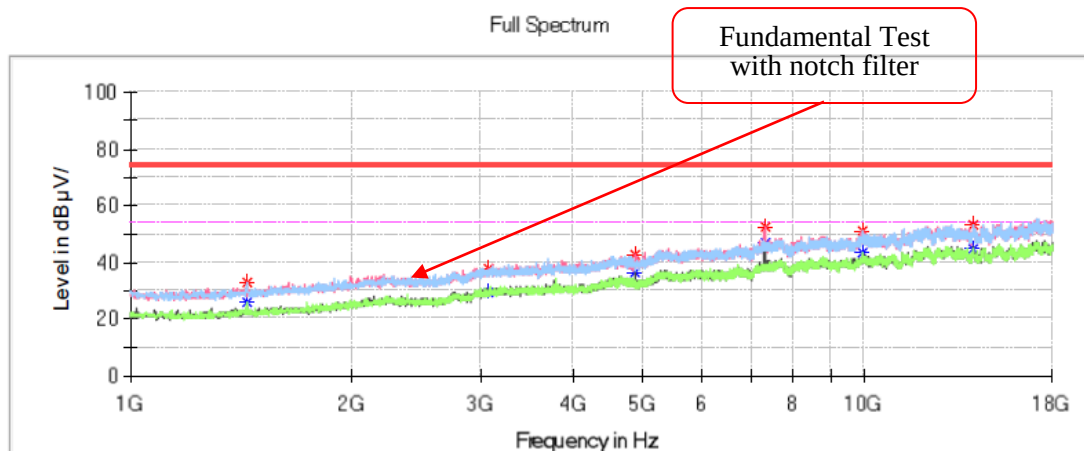


Critical Freqs

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1640.900000	31.17	---	74.00	42.83	H	-13.9
1640.900000	---	25.00	54.00	29.00	H	-13.9
3016.200000	---	29.03	54.00	24.97	H	-8.4
3016.200000	38.57	---	74.00	35.43	H	-8.4
4818.200000	50.77	---	74.00	23.23	V	-3.1
4818.200000	---	46.07	54.00	7.93	V	-3.1
7244.100000	---	48.97	54.00	5.03	V	3.2
7244.100000	55.11	---	74.00	18.89	V	3.2
12497.100000	---	43.53	54.00	10.47	H	9.7
12497.100000	53.43	---	74.00	20.57	H	9.7
17620.900000	---	46.10	54.00	7.90	H	11.6
17620.900000	55.52	---	74.00	18.48	H	11.6

Middle Channel: 2437MHz**Common Information**

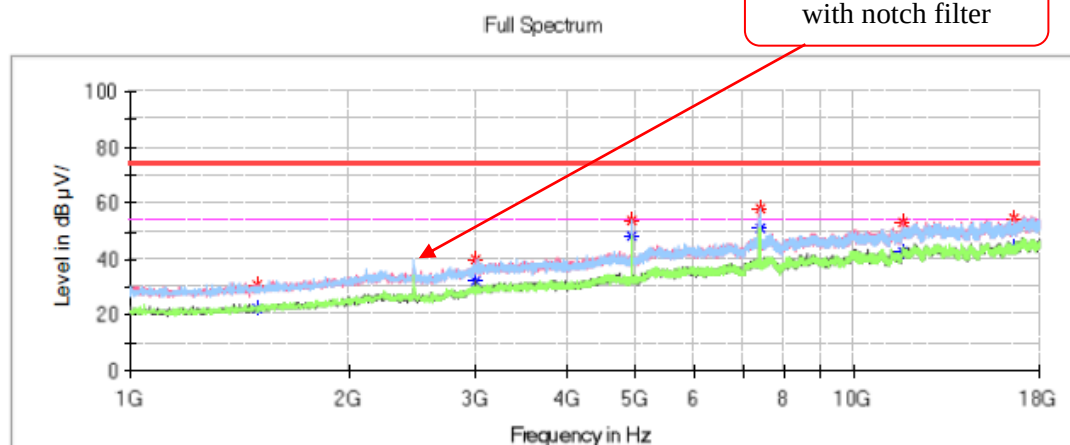
Project No.: RKSB240416001
 Test Mode: 2.4G WIFI 802.11b Mode Middle channel
 Standard: FCC Part 15.247 & FCC 15.205 & FCC 15.209
 Test Engineer: Hugh Wu

**Critical_Freqs**

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1438.600000	---	26.13	54.00	27.87	H	-14.8
1438.600000	32.57	---	74.00	41.43	H	-14.8
3063.800000	---	29.59	54.00	24.41	V	-8.2
3063.800000	37.96	---	74.00	36.04	V	-8.2
4867.500000	---	36.38	54.00	17.62	V	-2.9
4867.500000	42.31	---	74.00	31.69	V	-2.9
7318.900000	---	46.72	54.00	7.28	V	3.4
7318.900000	52.64	---	74.00	21.36	V	3.4
9933.500000	---	43.06	54.00	10.94	H	6.8
9933.500000	50.89	---	74.00	23.11	H	6.8
14016.900000	---	44.95	54.00	9.05	H	9.8
14016.900000	53.32	---	74.00	20.68	H	9.8

High Channel: 2462MHz**Common Information**

Project No.: RKSB240416001
 Test Mode: 2.4G WIFI 802.11b Mode High channel
 Standard: FCC Part 15.247 & FCC 15.205 & FCC 15.209
 Test Engineer: Hugh Wu

**Critical Freqs**

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1499.800000	30.90	---	74.00	43.10	V	-14.7
1499.800000	---	22.08	54.00	31.92	V	-14.7
2999.200000	39.81	---	74.00	34.19	V	-8.4
2999.200000	---	31.87	54.00	22.13	V	-8.4
4923.600000	54.02	---	74.00	19.98	V	-2.7
4923.600000	---	47.97	54.00	6.03	V	-2.7
7393.700000	57.99	---	74.00	16.01	H	3.6
7393.700000	---	51.10	54.00	2.90	H	3.6
11652.200000	53.28	---	74.00	20.72	H	8.9
11652.200000	---	42.68	54.00	11.32	H	8.9
16609.400000	---	44.37	54.00	9.63	V	11.1
16609.400000	54.69	---	74.00	19.31	V	11.1

802.11g Mode:**Low Channel: 2412MHz****Common Information**

Project No.:

RKSB240416001

Test Mode:

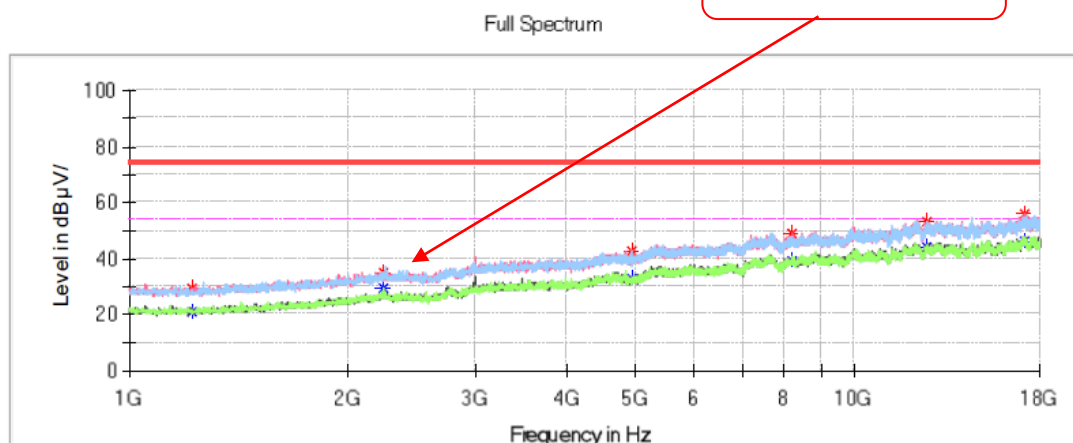
2.4G WIFI 802.11g Mode Low channel

Standard:

FCC Part 15.247 & FCC 15.205 & FCC 15.209

Test Engineer:

Hugh Wu

Fundamental Test
with notch filter**Critical_Freqs**

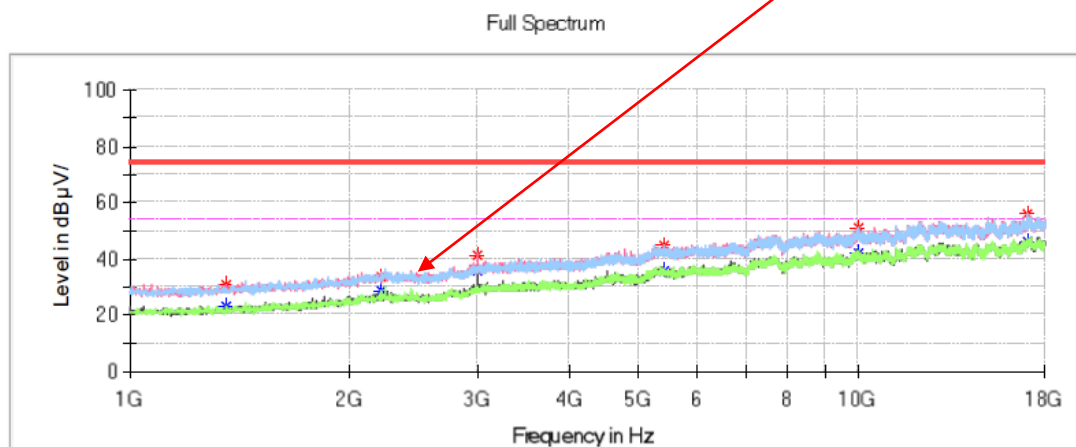
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1222.700000	---	21.28	54.00	32.72	V	-15.1
1222.700000	29.59	---	74.00	44.41	V	-15.1
2239.300000	35.13	---	74.00	38.87	V	-11.0
2239.300000	---	29.60	54.00	24.40	V	-11.0
4910.000000	---	32.69	54.00	21.31	H	-2.8
4910.000000	42.77	---	74.00	31.23	H	-2.8
8179.100000	---	38.87	54.00	15.13	V	4.5
8179.100000	48.86	---	74.00	25.14	V	4.5
12560.000000	---	44.18	54.00	9.82	H	9.7
12560.000000	53.00	---	74.00	21.00	H	9.7
17160.200000	---	45.88	54.00	8.12	V	12.0
17160.200000	56.12	---	74.00	17.88	V	12.0

Middle Channel: 2437MHz**Common Information**

Project No.:
Test Mode:
Standard:
Test Engineer:

RKSB240416001
2.4G WIFI 802.11g Mode Middle channel with notch filter
FCC Part 15.247 & FCC 15.205 & FCC 15.209
Hugh Wu

Fundamental Test
with notch filter

**Critical_Freqs**

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1355.300000	---	22.74	54.00	31.26	V	-14.9
1355.300000	30.50	---	74.00	43.50	V	-14.9
2205.300000	33.74	---	74.00	40.26	H	-11.1
2205.300000	---	28.55	54.00	25.45	H	-11.1
2994.100000	---	35.37	54.00	18.63	V	-8.5
2994.100000	41.28	---	74.00	32.72	V	-8.5
5403.000000	---	35.66	54.00	18.34	V	-0.7
5403.000000	44.52	---	74.00	29.48	V	-0.7
10010.000000	---	41.91	54.00	12.09	V	7.1
10010.000000	51.09	---	74.00	22.91	V	7.1
17044.600000	---	46.34	54.00	7.66	H	12.2
17044.600000	56.18	---	74.00	17.82	H	12.2

High Channel: 2462MHz**Common Information**

Project No.:

RKS240416001

Test Mode:

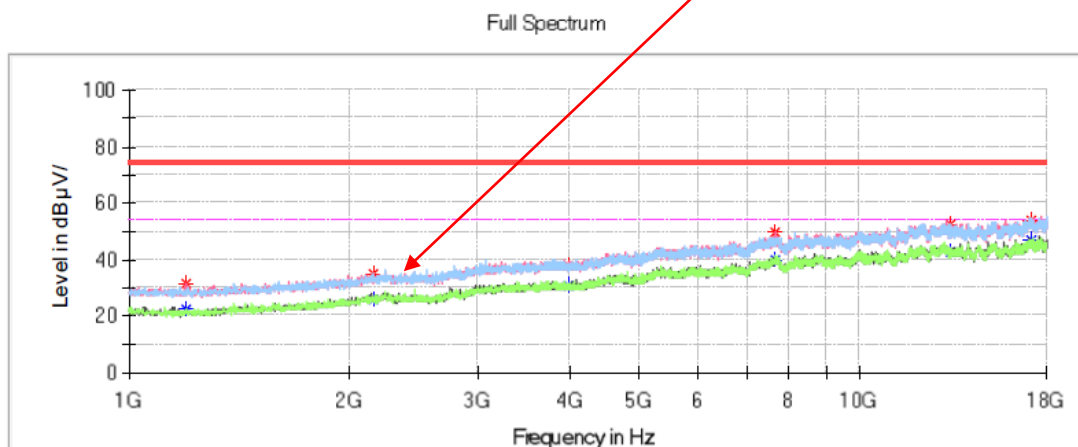
2.4G WIFI 802.11g Mode High channel

Standard:

FCC Part 15.247 & FCC 15.205 & FCC 15.209

Test Engineer:

Hugh Wu

Fundamental Test
with notch filter**Critical_Freqs**

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1193.800000	---	22.21	54.00	31.79	H	-15.2
1193.800000	31.17	---	74.00	42.83	H	-15.2
2156.000000	---	25.85	54.00	28.15	H	-11.2
2156.000000	34.66	---	74.00	39.34	H	-11.2
3995.400000	---	30.43	54.00	23.57	H	-5.9
3995.400000	38.11	---	74.00	35.89	H	-5.9
7630.000000	---	39.83	54.00	14.17	V	3.9
7630.000000	49.34	---	74.00	24.66	V	3.9
13274.000000	---	42.97	54.00	11.03	H	9.6
13274.000000	52.16	---	74.00	21.84	H	9.6
17076.900000	---	46.68	54.00	7.32	V	12.2
17076.900000	54.17	---	74.00	19.83	V	12.2

802.11n-HT20 Mode :

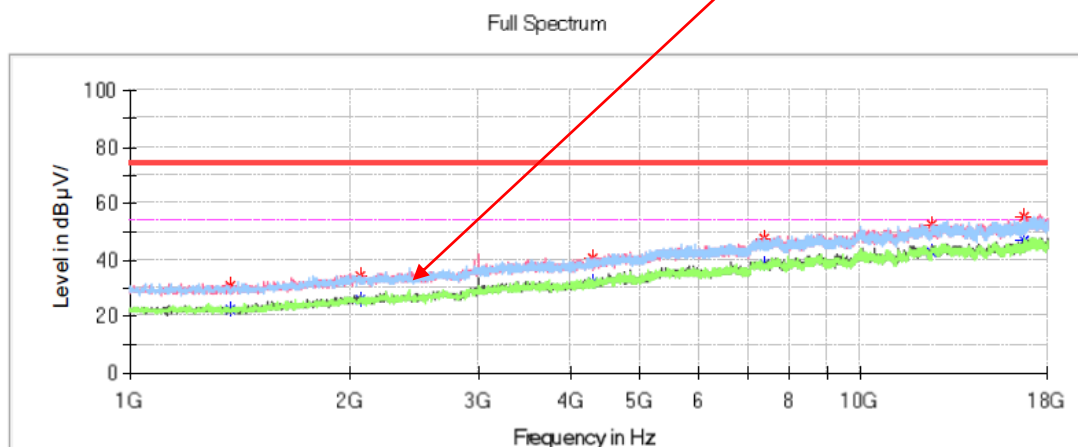
Low Channel: 2412MHz

Common Information

Project No.:
Test Mode:
Standard:
Test Engineer:

RKS240416001
2.4G WIFI 802.11n20 Mode Low channel
FCC Part 15.247 & FCC 15.205 & FCC 15.209
Hugh Wu

Fundamental Test
without notch filter

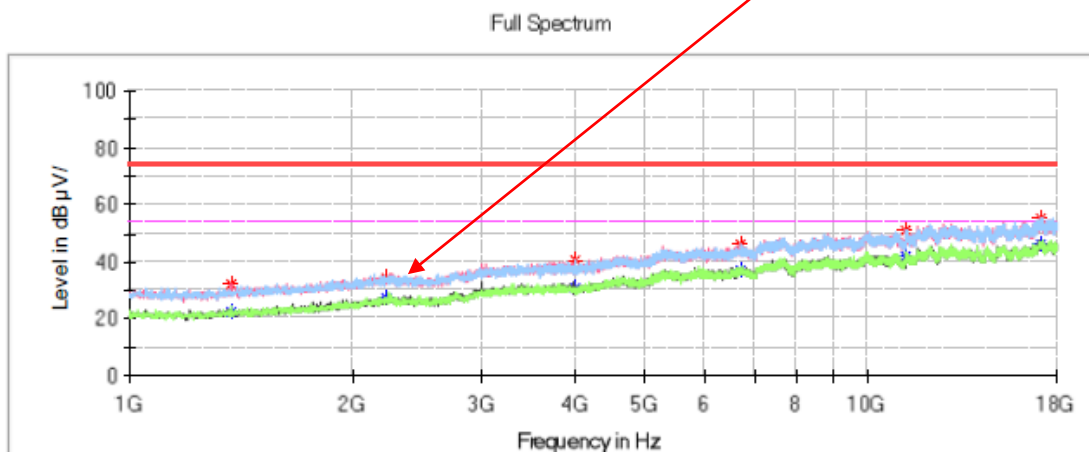
**Critical_Freqs**

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1368.900000	---	22.39	54.00	31.61	V	-14.9
1368.900000	30.90	---	74.00	43.10	V	-14.9
2069.300000	---	25.80	54.00	28.20	H	-11.5
2069.300000	34.40	---	74.00	39.60	H	-11.5
4301.400000	---	31.85	54.00	22.15	V	-4.9
4301.400000	40.56	---	74.00	33.44	V	-4.9
7354.600000	---	38.17	54.00	15.83	H	3.5
7354.600000	47.79	---	74.00	26.21	H	3.5
12473.300000	---	42.72	54.00	11.28	V	9.6
12473.300000	52.61	---	74.00	21.39	V	9.6
16750.500000	---	46.83	54.00	7.17	H	11.5
16750.500000	55.58	---	74.00	18.42	H	11.5

Middle Channel: 2437MHz**Common Information**

Project No.: RKSB240416001
Test Mode: 2.4G WIFI 802.11n20 Mode Middle channel
Standard: FCC Part 15.247 & FCC 15.205 & FCC 15.209
Test Engineer: Hugh Wu

Fundamental Test
with notch filter

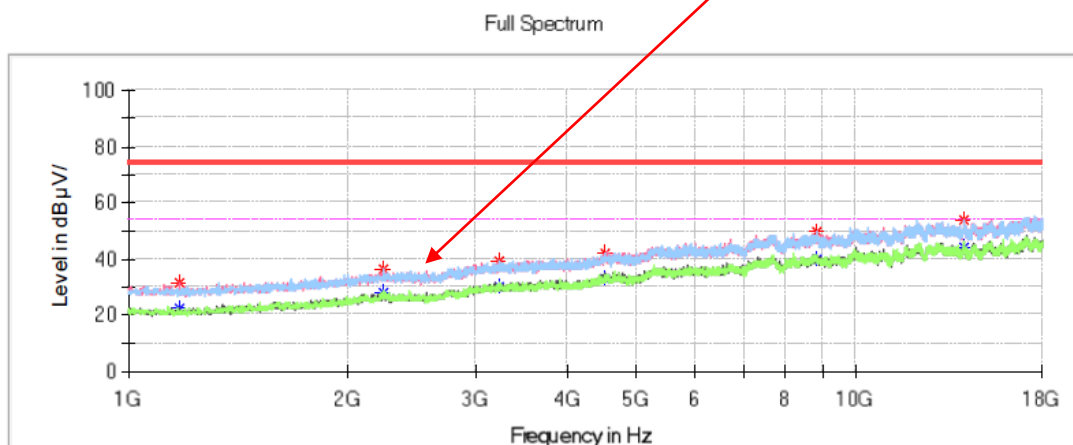
**Critical Freqs**

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1368.900000	---	22.35	54.00	31.65	V	-14.9
1368.900000	32.47	---	74.00	41.53	V	-14.9
2220.600000	---	27.13	54.00	26.87	H	-11.0
2220.600000	34.43	---	74.00	39.57	H	-11.0
4009.000000	---	30.94	54.00	23.06	H	-5.9
4009.000000	40.66	---	74.00	33.34	H	-5.9
6700.100000	---	37.29	54.00	16.71	H	1.4
6700.100000	46.50	---	74.00	27.50	H	1.4
11201.700000	---	41.98	54.00	12.02	H	7.9
11201.700000	51.32	---	74.00	22.68	H	7.9
17097.300000	---	45.97	54.00	8.03	H	12.1
17097.300000	55.29	---	74.00	18.71	H	12.1

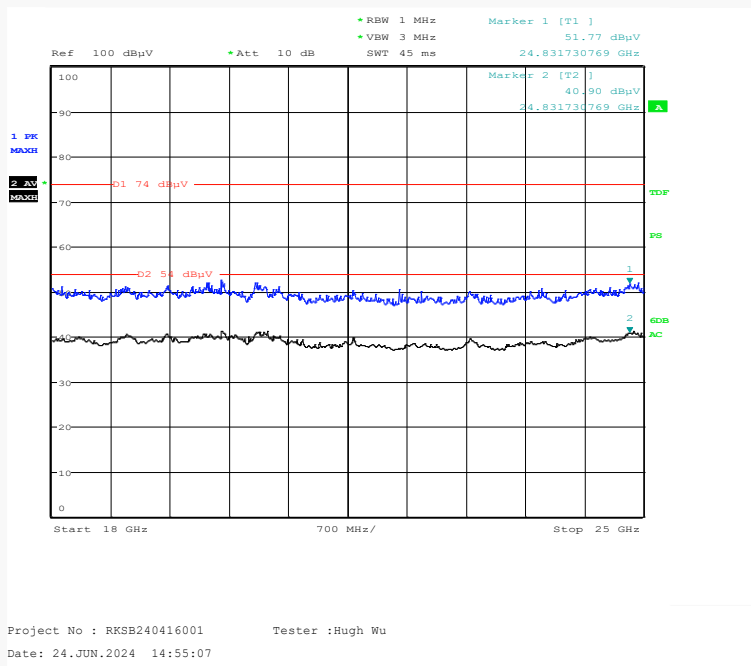
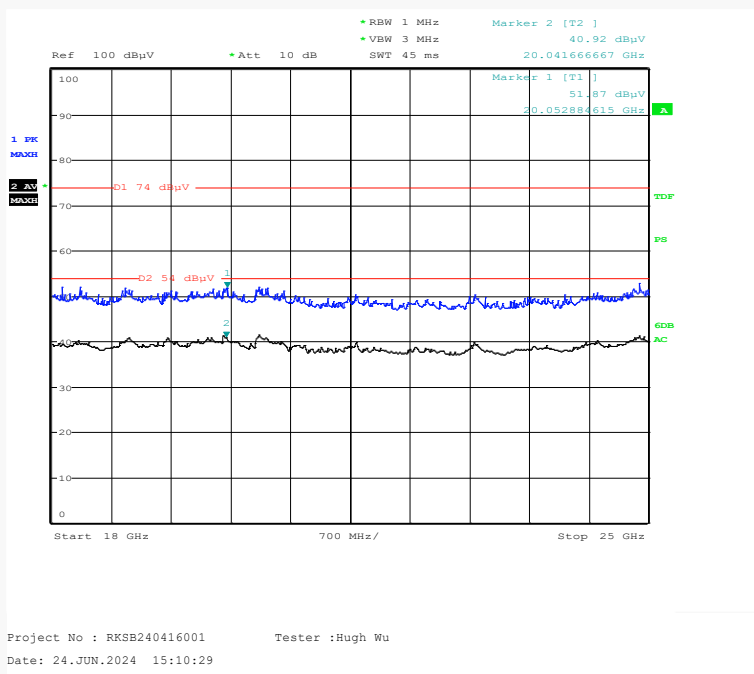
High Channel: 2462MHz**Common Information**

Project No.: RKSB240416001
 Test Mode: 2.4G WIFI 802.11n20 Mode High channel
 Standard: FCC Part 15.247 & FCC 15.205 & FCC 15.209
 Test Engineer: Hugh Wu

Fundamental Test
with notch filter

**Critical_Freqs**

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1173.400000	---	22.40	54.00	31.60	V	-15.2
1173.400000	31.60	---	74.00	42.40	V	-15.2
2239.300000	---	28.04	54.00	25.96	V	-11.0
2239.300000	36.18	---	74.00	37.82	V	-11.0
3221.900000	---	30.38	54.00	23.62	V	-7.5
3221.900000	39.19	---	74.00	34.81	V	-7.5
4513.900000	---	33.17	54.00	20.83	H	-4.2
4513.900000	41.64	---	74.00	32.36	H	-4.2
8838.700000	---	39.57	54.00	14.43	H	5.4
8838.700000	49.64	---	74.00	24.36	H	5.4
14023.700000	---	43.87	54.00	10.13	H	9.8
14023.700000	53.51	---	74.00	20.49	H	9.8

18GHz-25GHz:**Transmitting in 802.11b mode middle channel is worst case****Horizontal****Vertical**

Note: The test distance is 3m. The limit is 74dBμV/m(Peak) and 54dBμV/m(Average).

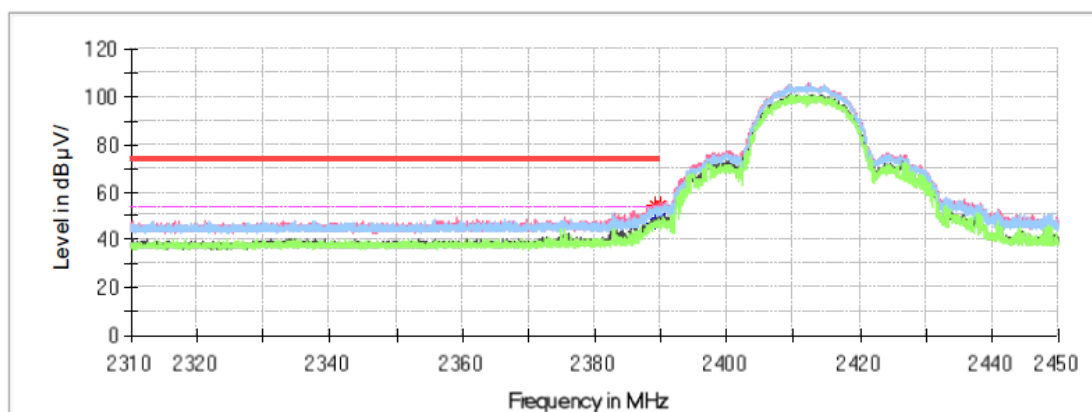
Band Edge:
802.11b Mode:

Low Channel

Common Information

Project No.: RKSB240416001
Test Mode: 2.4G WIFI 802.11b Mode Low channel
Standard: FCC Part 15.247 & FCC 15.205 & FCC 15.209
Test Engineer: Hugh Wu

Full Spectrum



Critical_Freqs

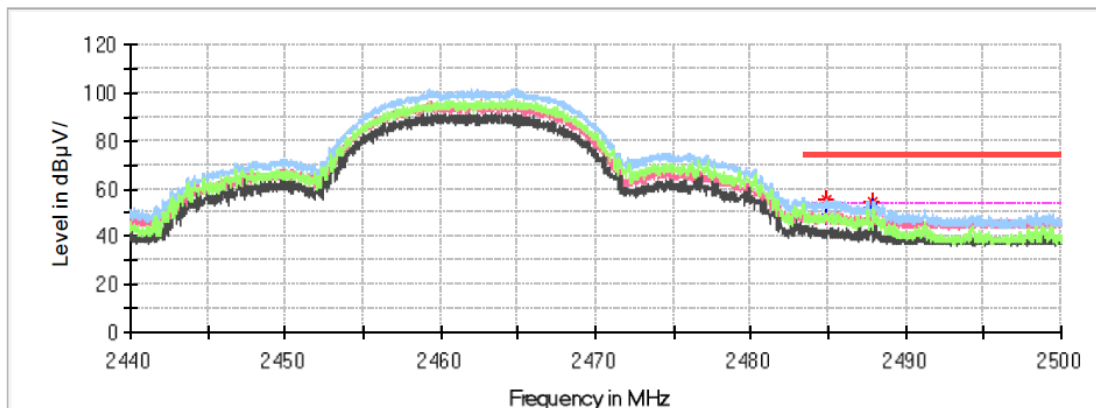
Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2388.988000	---	46.75	54.00	7.25	V	-0.6
2388.988000	54.70	---	74.00	19.30	V	-0.6
2389.954000	---	49.89	54.00	4.11	V	-0.6
2389.954000	54.65	---	74.00	19.35	V	-0.6

High Channel

Common Information

Project No.: RKSB240416001
Test Mode: 2.4G WIFI 802.11b Mode High channel
Standard: FCC Part 15.247 & FCC 15.205 & FCC 15.209
Test Engineer: Hugh Wu

Full Spectrum



Critical_Freqs

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2484.874000	55.52	---	74.00	18.48	H	-0.3
2484.874000	---	47.59	54.00	6.41	H	-0.3
2487.868000	54.38	---	74.00	19.62	H	-0.2
2487.868000	---	51.68	54.00	2.32	H	-0.2

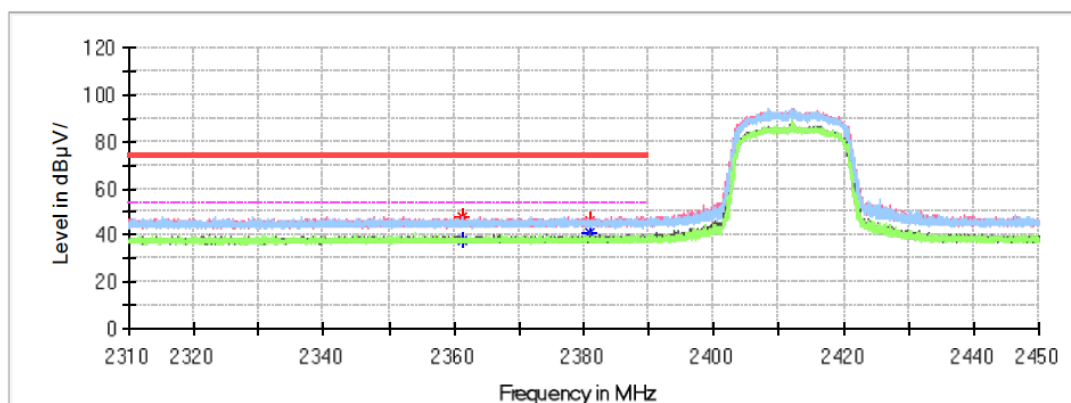
802.11g Mode :

Low Channel

Common Information

Project No.: RKSB240416001
Test Mode: 2.4G WIFI 802.11g Mode Low channel
Standard: FCC Part 15.247 & FCC 15.205 & FCC 15.209
Test Engineer: Hugh Wu

Full Spectrum



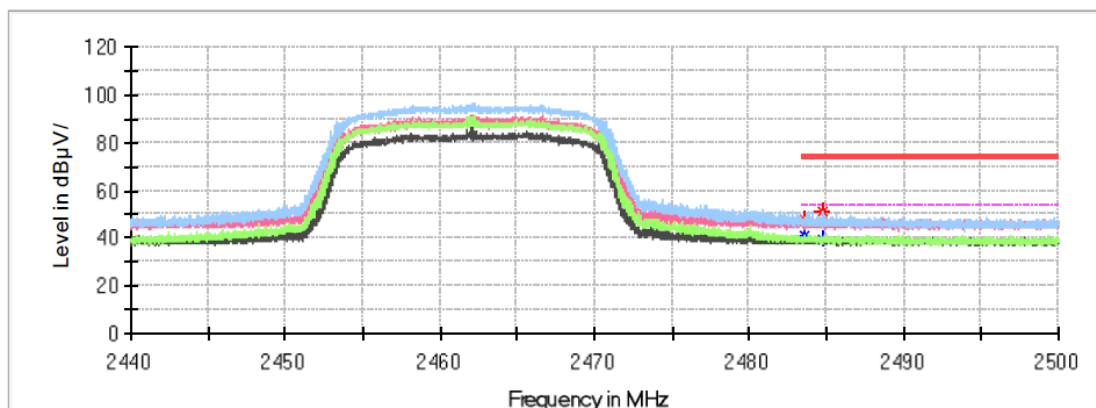
Critical_Freqs

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2361.422000	---	37.81	54.00	16.19	V	-0.7
2361.422000	48.05	---	74.00	25.95	V	-0.7
2380.770000	---	40.94	54.00	13.06	V	-0.6
2380.770000	46.30	---	74.00	27.70	V	-0.6

High Channel**Common Information**

Project No.: RKSB240416001
Test Mode: 2.4G WIFI 802.11g Mode High channel
Standard: FCC Part 15.247 & FCC 15.205 & FCC 15.209
Test Engineer: Hugh Wu

Full Spectrum

**Critical Freqs**

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2483.542000	---	41.40	54.00	12.60	H	-0.3
2483.542000	47.80	---	74.00	26.20	H	-0.3
2484.802000	---	39.78	54.00	14.22	H	-0.3
2484.802000	51.01	---	74.00	22.99	H	-0.3

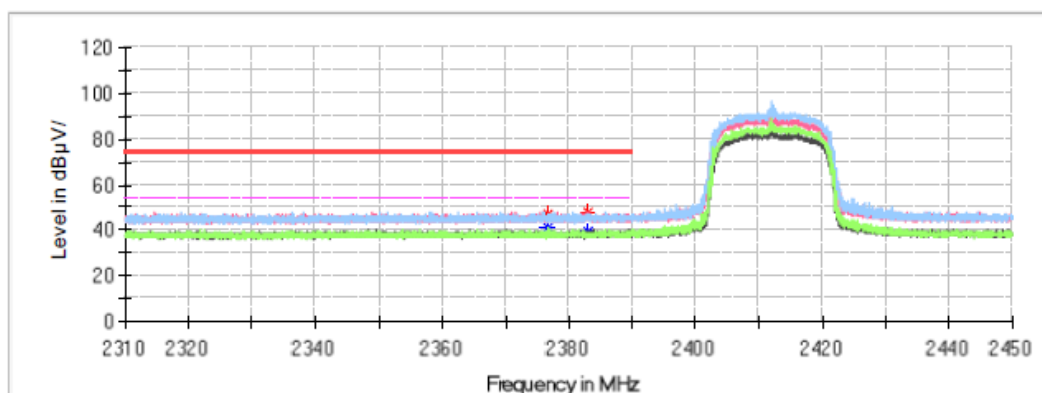
802.11n-HT20 Mode:

Low Channel

Common Information

Project No.: RKSB240416001
Test Mode: 2.4G WIFI 802.11n20 Mode Low channel
Standard: FCC Part 15.247 & FCC 15.205 & FCC 15.209
Test Engineer: Hugh Wu

Full Spectrum



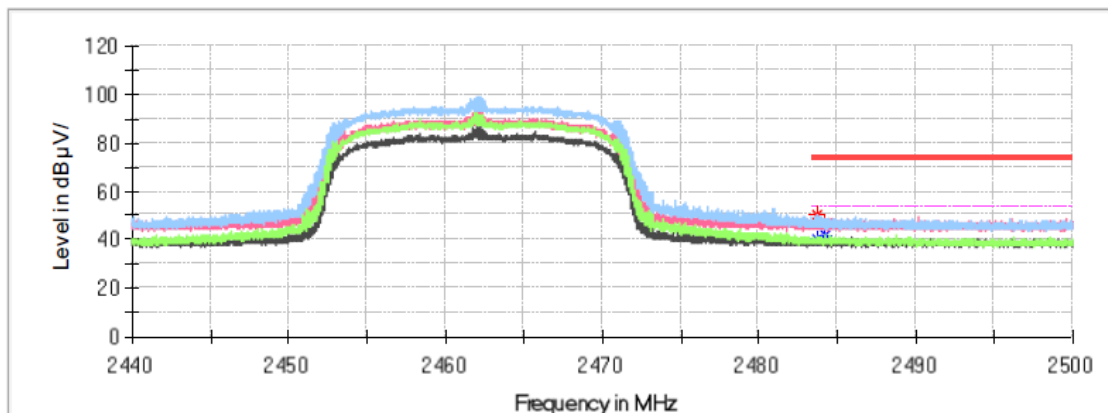
Critical_Freqs

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2376.752000	---	40.75	54.00	13.25	H	-0.6
2376.752000	46.67	---	74.00	27.33	H	-0.6
2383.024000	---	39.24	54.00	14.76	V	-0.6
2383.024000	47.99	---	74.00	26.01	V	-0.6

High Channel**Common Information**

Project No.: RKSB240416001
Test Mode: 2.4G WIFI 802.11n20 Mode High channel
Standard: FCC Part 15.247 & FCC 15.205 & FCC 15.209
Test Engineer: Hugh Wu

Full Spectrum

**Critical_Freqs**

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2483.770000	---	40.10	54.00	13.90	H	-0.3
2483.770000	50.34	---	74.00	23.66	H	-0.3
2484.280000	47.12	---	74.00	26.88	H	-0.3
2484.280000	---	42.00	54.00	12.00	H	-0.3

For BLE Mode:
30MHz-1GHz

Low Channel: 2402MHz

Common Information

Project No:

EUT Model:

Test Mode:

Standard:

Test Equipment:

Temperature:

Humidity:

Barometric Pressure:

Test Engineer:

Test Date:

RKSB240416001

QPA19-PA-WIFILIC-TY-RGBCW 9W(H23136)

BT Transmitting

FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209

ESCI, JB3, 310N

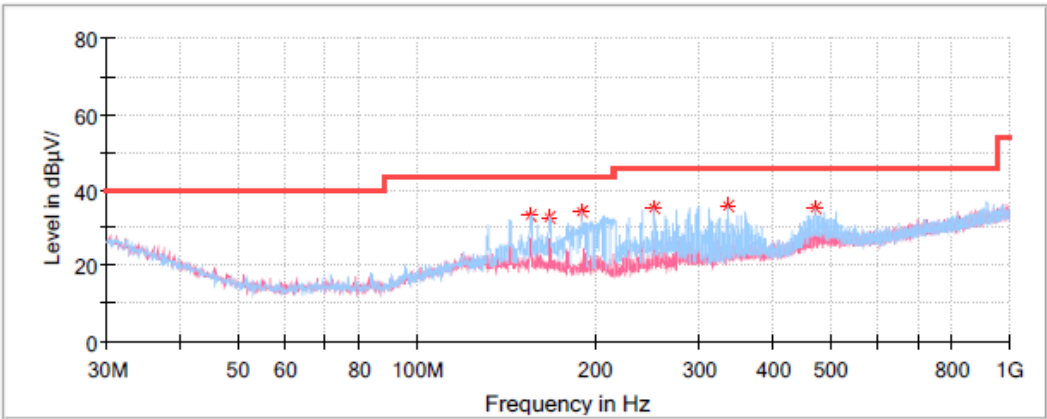
23.1℃

49%

100.7kPa

Leah Li

2024/6/18

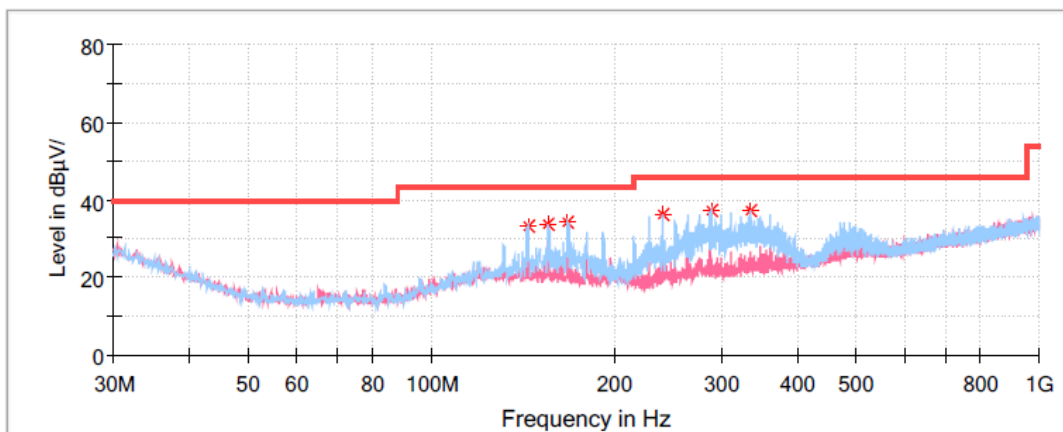


Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
155.736250	33.29	43.50	10.21	H	-12.0
167.740000	32.92	43.50	10.58	H	-12.5
189.928750	34.45	43.50	9.05	H	-12.6
252.008750	35.14	46.00	10.86	H	-12.2
336.156250	35.83	46.00	10.17	H	-9.6
471.835000	35.44	46.00	10.56	H	-6.1

Middle Channel: 2440MHz**Common Information**

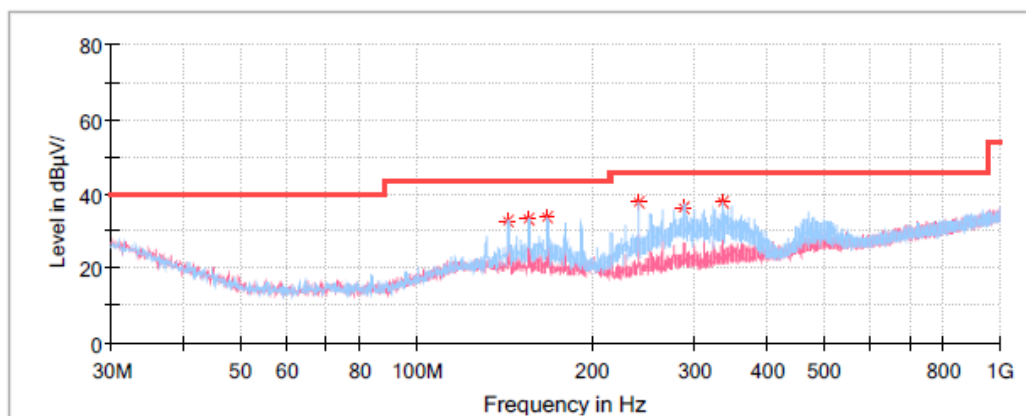
Project No: RKSB240416001
EUT Model: QPA19-PA-WIFILIC-TY-RGBCW 9W(H23136)
Test Mode: BT Transmitting
Standard: FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Equipment: ESCI, JB3, 310N
Temperature: 23.1°C
Humidity: 49%
Barometric Pressure: 100.7kPa
Test Engineer: Leah Li
Test Date: 2024/6/18

**Critical_Freqs**

Frequency (MHz)	MaxPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
144.096250	33.04	43.50	10.46	H	-11.6
155.978750	33.49	43.50	10.01	H	-12.0
167.861250	34.22	43.50	9.28	H	-12.5
240.005000	36.40	46.00	9.60	H	-12.6
288.262500	37.19	46.00	8.81	H	-10.6
336.156250	37.18	46.00	8.82	H	-9.6

High Channel: 2480MHz**Common Information**

Project No: RKS240416001
EUT Model: QPA19-PA-WIFILIC-TY-RGBCW 9W(H23136)
Test Mode: BT Transmitting
Standard: FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Equipment: ESCI, JB3, 310N
Temperature: 23.1°C
Humidity: 49%
Barometric Pressure: 100.7kPa
Test Engineer: Leah Li
Test Date: 2024/6/18

**Critical_Freqs**

Frequency (MHz)	MaxPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
143.975000	32.91	43.50	10.59	H	-11.6
156.100000	33.02	43.50	10.48	H	-12.0
167.861250	33.69	43.50	9.81	H	-12.5
240.005000	37.55	46.00	8.45	H	-12.6
288.020000	36.48	46.00	9.52	H	-10.6
336.035000	37.92	46.00	8.08	H	-9.6

1GHz-18GHz:

Low Channel: 2402MHz

Common Information

Project No.:

RKSB240416001

Test Mode:

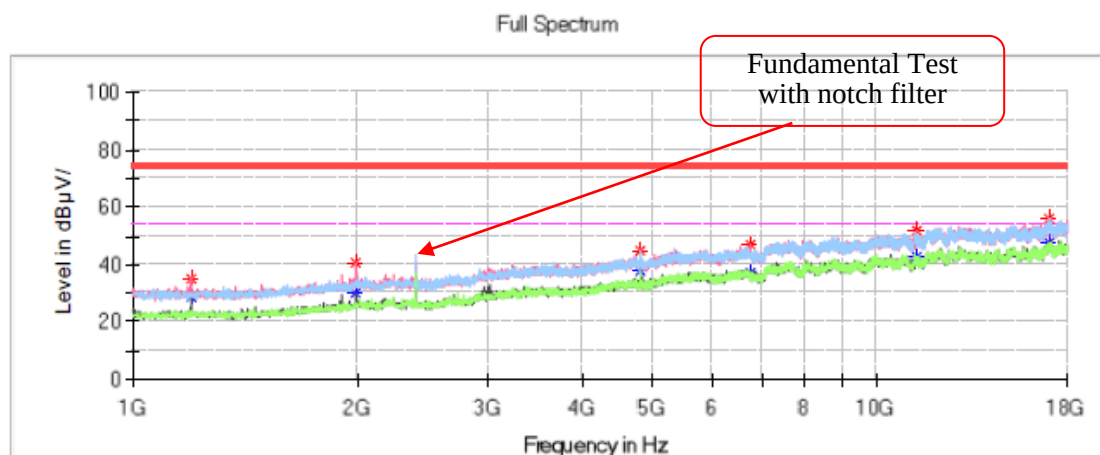
BLE Low Channel

Standard:

FCC Part 15.247 & FCC 15.205 & FCC 15.209

Test Engineer:

Hugh Wu

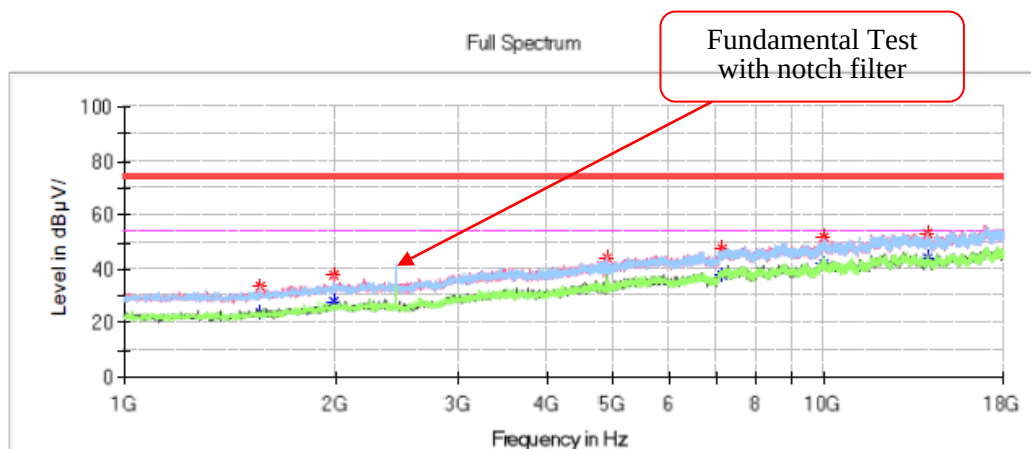


Critical_Freqs

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1197.200000	---	28.49	54.00	25.51	V	-15.2
1197.200000	35.09	---	74.00	38.91	V	-15.2
1992.800000	---	30.06	54.00	23.94	V	-11.8
1992.800000	40.32	---	74.00	33.68	V	-11.8
4802.900000	---	38.06	54.00	15.94	H	-3.2
4802.900000	44.63	---	74.00	29.37	H	-3.2
6739.200000	---	36.75	54.00	17.25	V	1.5
6739.200000	46.55	---	74.00	27.45	V	1.5
11271.400000	---	42.51	54.00	11.49	H	8.1
11271.400000	51.81	---	74.00	22.19	H	8.1
17036.100000	---	47.39	54.00	6.61	H	12.2
17036.100000	56.26	---	74.00	17.74	H	12.2

Middle Channel: 2440MHz**Common Information**

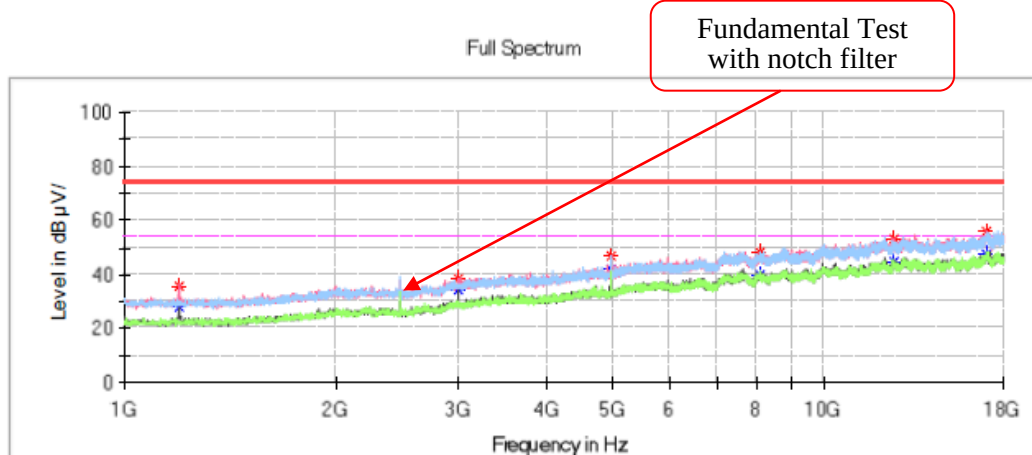
Project No.: RKSB240416001
 Test Mode: BLE Middle Channel
 Standard: FCC Part 15.247 & FCC 15.205 & FCC 15.209
 Test Engineer: Hugh Wu

**Critical Freqs**

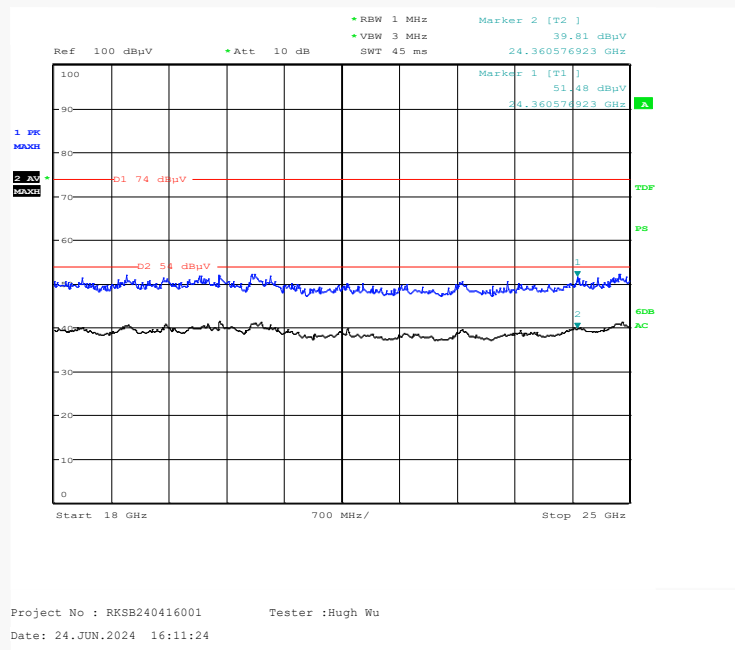
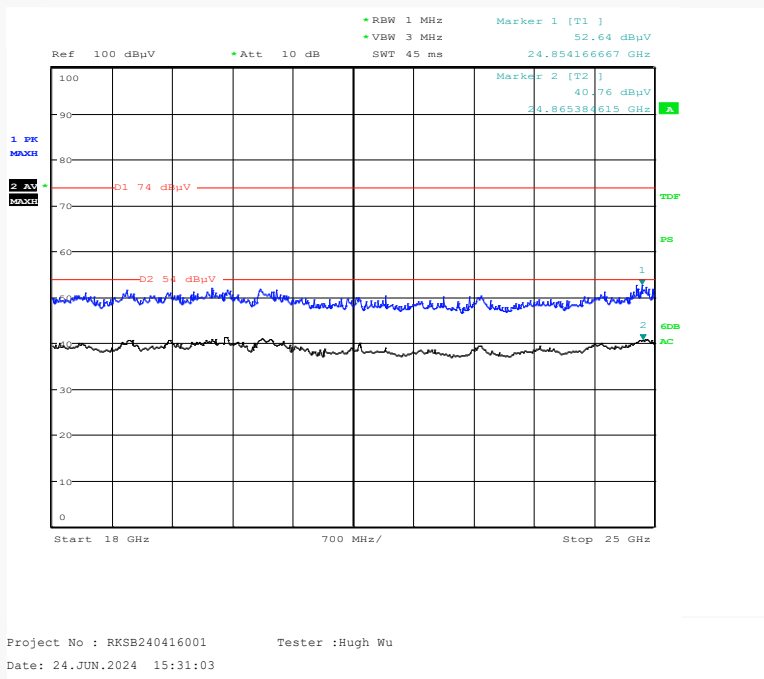
Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1559.300000	---	23.61	54.00	30.39	H	-14.4
1559.300000	33.31	---	74.00	40.69	H	-14.4
1994.500000	---	28.30	54.00	25.70	V	-11.8
1994.500000	37.99	---	74.00	36.01	V	-11.8
4879.400000	43.79	---	74.00	30.21	V	-2.9
4879.400000	---	40.43	54.00	13.57	V	-2.9
7138.700000	---	37.95	54.00	16.05	V	3.0
7138.700000	47.31	---	74.00	26.69	V	3.0
9998.100000	---	41.62	54.00	12.38	V	7.0
9998.100000	51.67	---	74.00	22.33	V	7.0
14015.200000	---	43.91	54.00	10.09	V	9.8
14015.200000	52.99	---	74.00	21.01	V	9.8

High Channel: 2480MHz**Common Information**

Project No.: RKSB240416001
 Test Mode: BLE High Channel
 Standard: FCC Part 15.247 & FCC 15.205 & FCC 15.209
 Test Engineer: Hugh Wu

**Critical Freqs**

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1193.800000	---	27.84	54.00	26.16	V	-15.2
1193.800000	35.94	---	74.00	38.06	V	-15.2
2997.500000	---	34.10	54.00	19.90	V	-8.4
2997.500000	38.30	---	74.00	35.70	V	-8.4
4959.300000	---	42.00	54.00	12.00	V	-2.6
4959.300000	46.83	---	74.00	27.17	V	-2.6
8106.000000	---	39.68	54.00	14.32	H	4.2
8106.000000	48.40	---	74.00	25.60	H	4.2
12575.300000	---	44.91	54.00	9.09	V	9.7
12575.300000	52.81	---	74.00	21.19	V	9.7
17046.300000	---	47.38	54.00	6.62	V	12.2
17046.300000	56.28	---	74.00	17.72	V	12.2

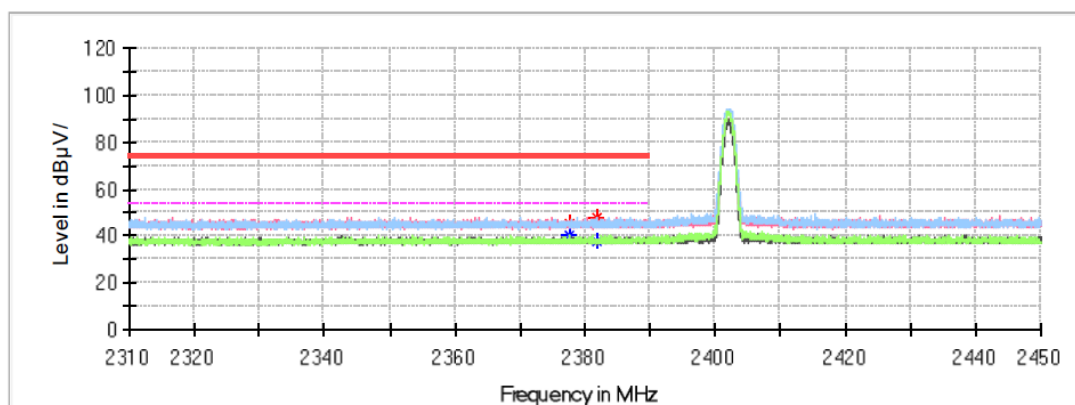
18GHz-25GHz:
Low channel worst
Horizontal:**Vertical:**

Note: The test distance is 3m. The limit is 74dBμV/m(Peak) and 54dBμV/m(Average).

Band Edge:**Low Channel****Common Information**

Project No.: RKSB240416001
Test Mode: BLE Low Channel
Standard: FCC Part 15.247 & FCC 15.205 & FCC 15.209
Test Engineer: Hugh Wu

Full Spectrum

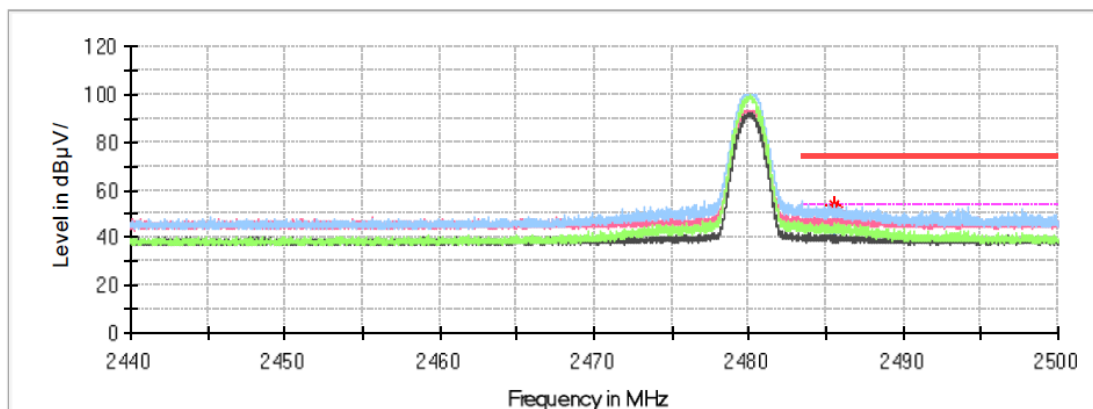
**Critical_Freqs**

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Poi	Corr. (dB/m)
2377.648000	---	40.50	54.00	13.50	H	-0.6
2377.648000	45.53	---	74.00	28.47	H	-0.6
2381.918000	---	37.61	54.00	16.39	H	-0.6
2381.918000	48.25	---	74.00	25.75	H	-0.6

High Channel**Common Information**

Project No.: RKSB240416001
Test Mode: BLE High Channel
Standard: FCC Part 15.247 & FCC 15.205 & FCC 15.209
Test Engineer: Hugh Wu

Full Spectrum

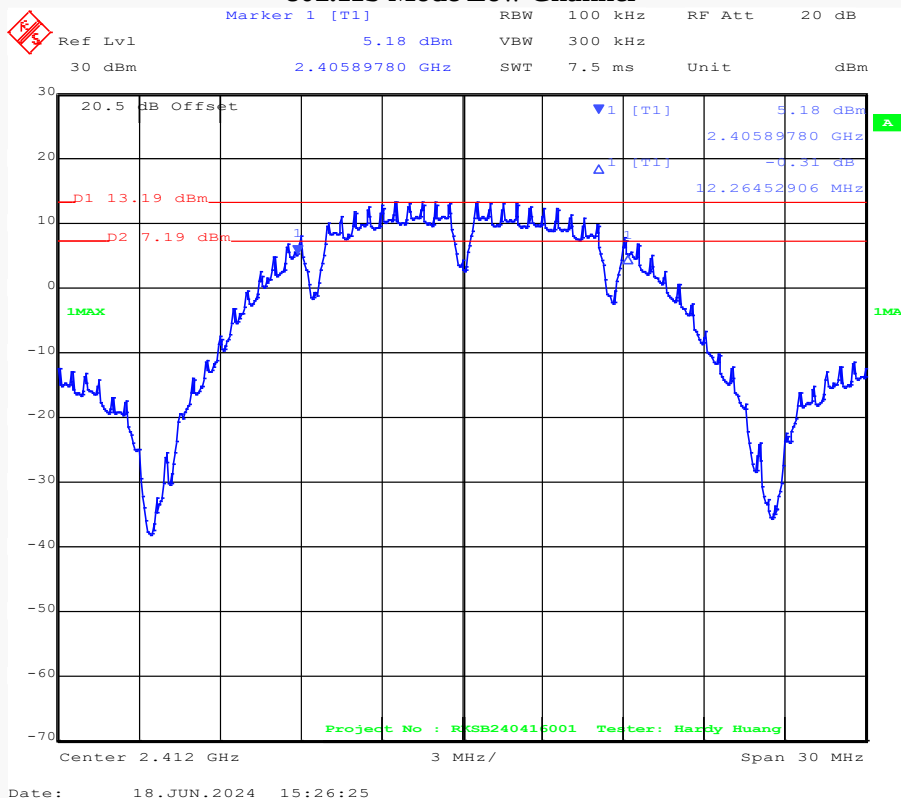
**Critical_Freqs**

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2485.546000	54.10	---	74.00	19.90	H	-0.2
2485.546000	---	43.95	54.00	10.05	H	-0.2
2485.822000	51.15	---	74.00	22.85	H	-0.2
2485.822000	---	46.15	54.00	7.85	H	-0.2

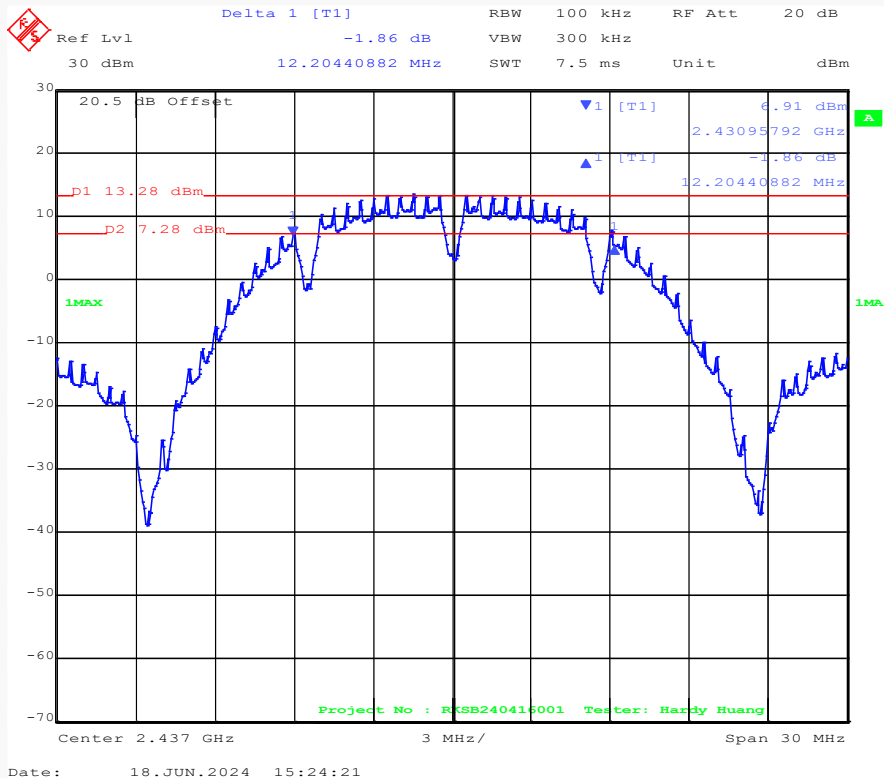
6 dB EMISSION BANDWIDTH**Test Result:** Compliant.*EUT operation mode: Transmitting***For Wi-Fi Mode:**

Test Mode	Channel (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
802.11b	2412	12.265	0.5	PASS
	2437	12.204	0.5	PASS
	2462	12.144	0.5	PASS
802.11g	2412	15.271	0.5	PASS
	2437	15.210	0.5	PASS
	2462	15.271	0.5	PASS
802.11n-HT20	2412	11.483	0.5	PASS
	2437	12.625	0.5	PASS
	2462	11.423	0.5	PASS

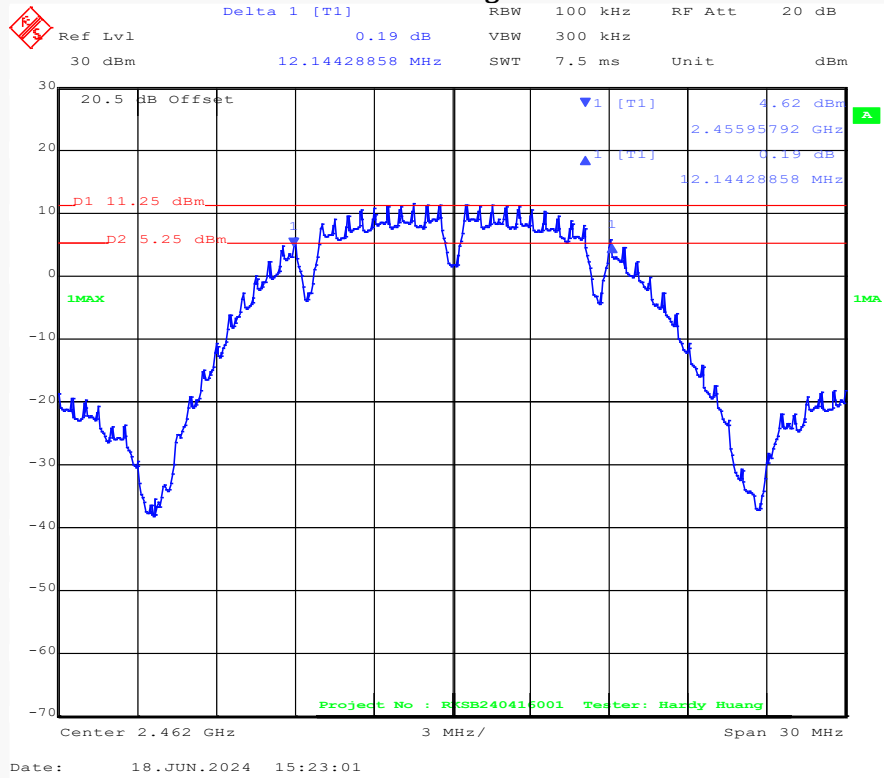
802.11b Mode Low Channel



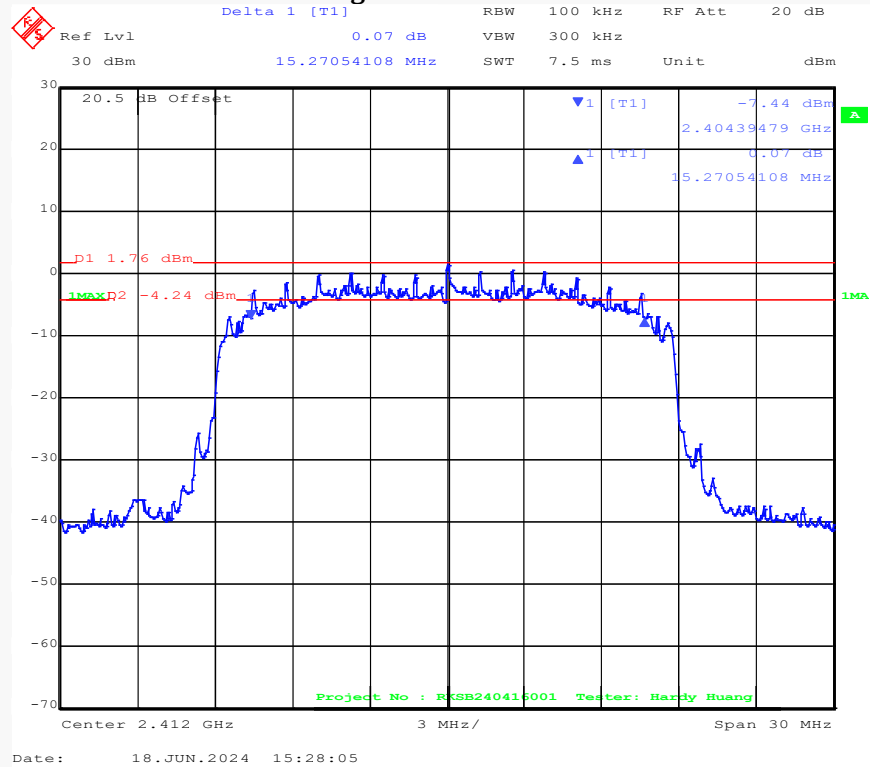
802.11b Mode Middle Channel



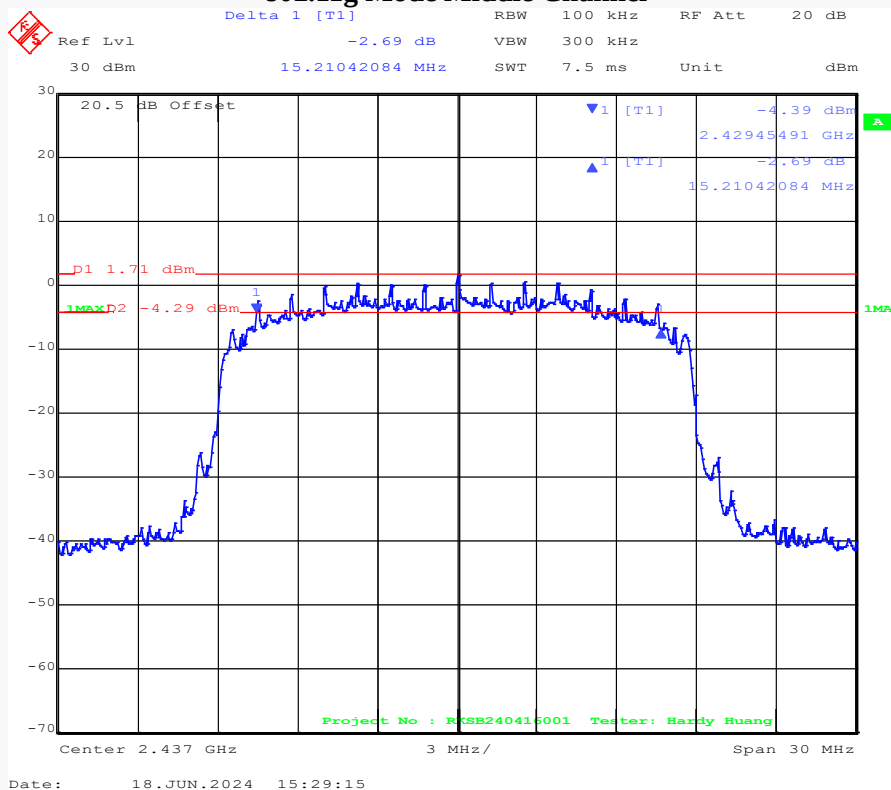
802.11b Mode High Channel



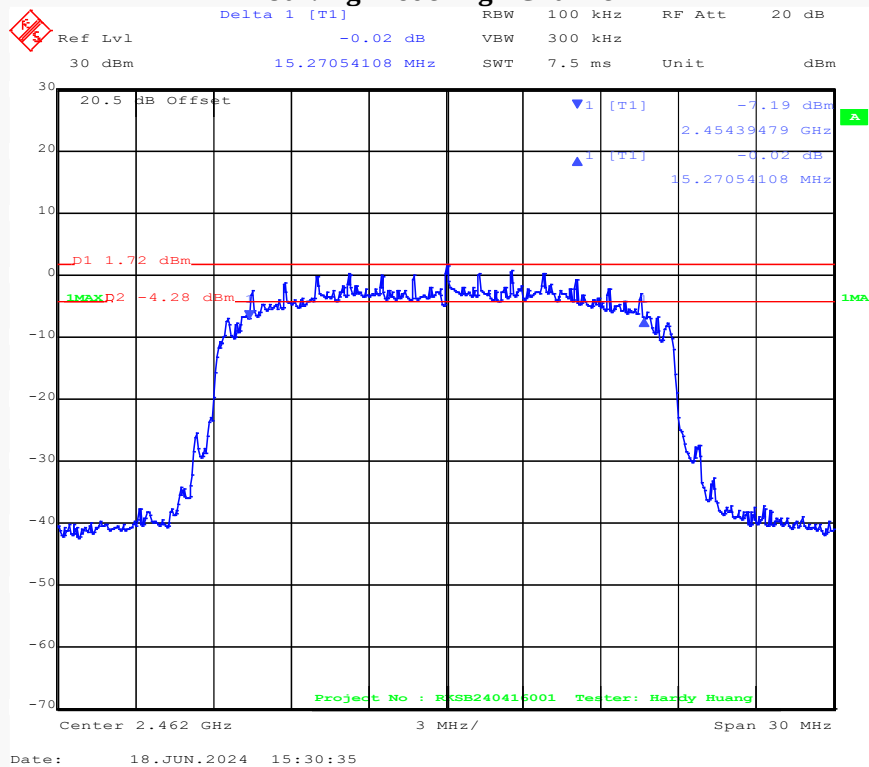
802.11g Mode Low Channel



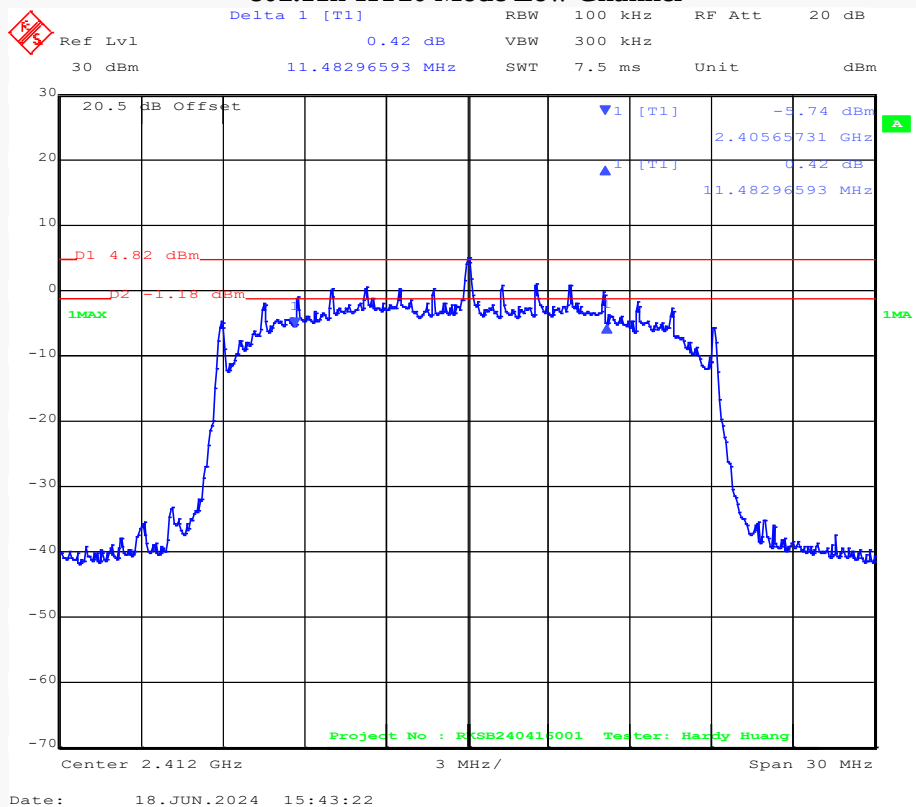
802.11g Mode Middle Channel



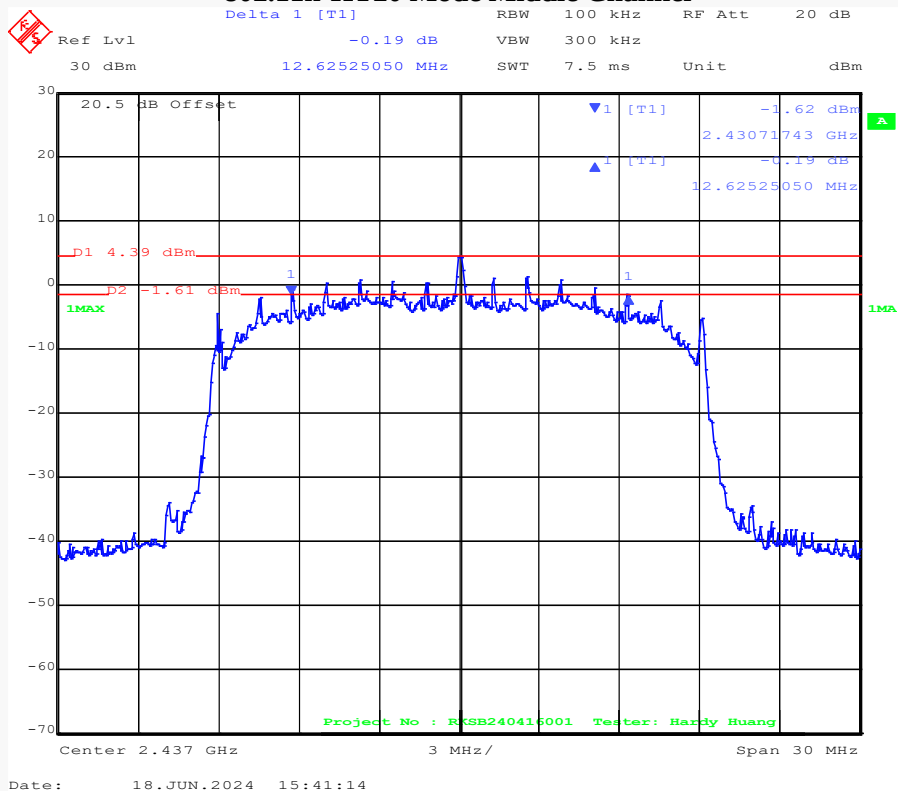
802.11g Mode High Channel



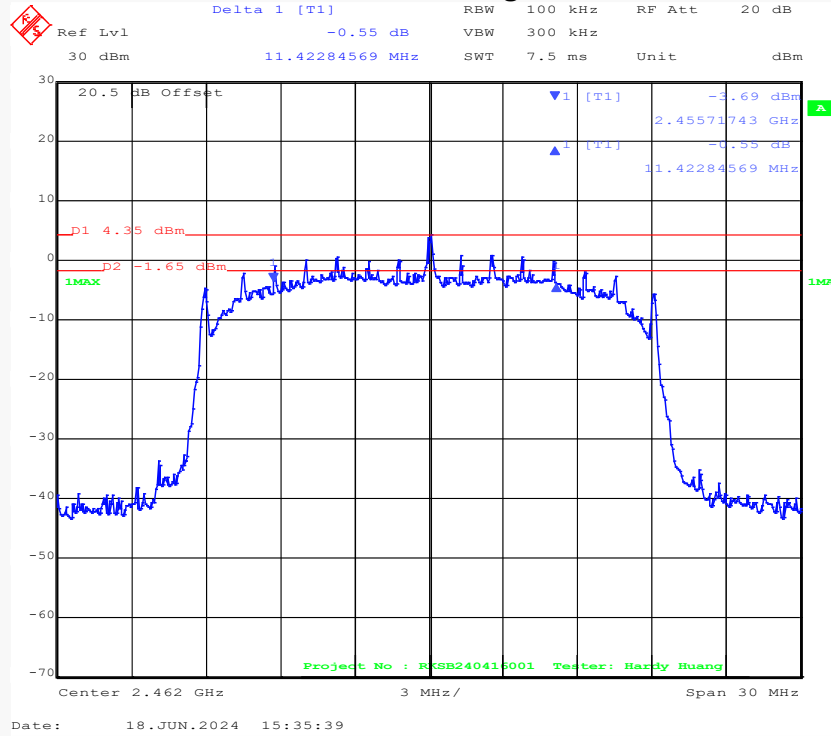
802.11n-HT20 Mode Low Channel



802.11n-HT20 Mode Middle Channel



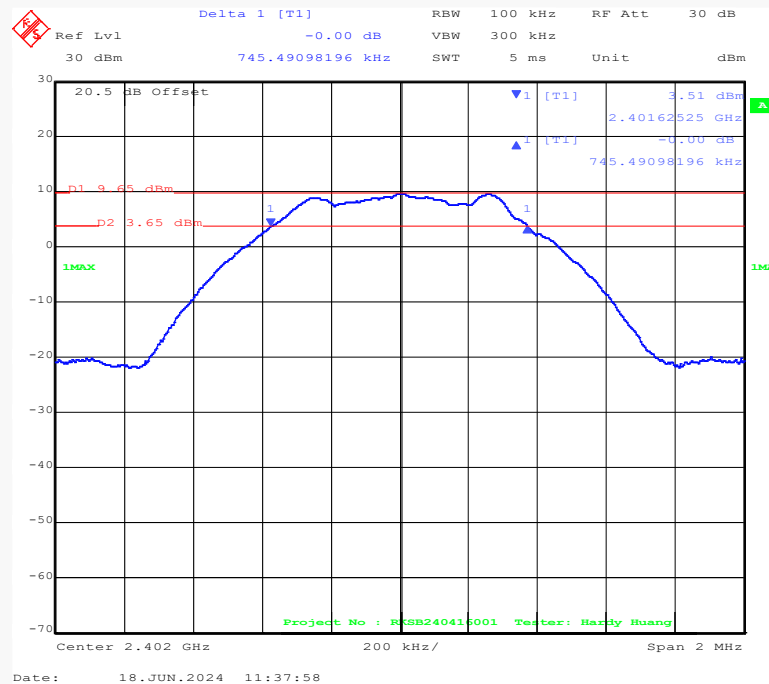
802.11n-HT20 Mode High Channel



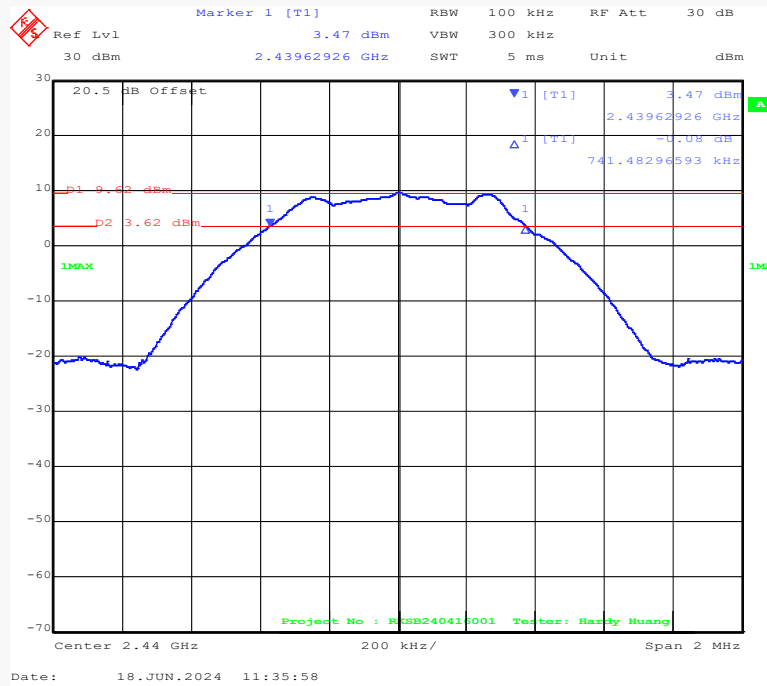
For BLE Mode:

Mode	Value (MHz)	Limit (MHz)	Result
Low	0.745	0.5	Pass
Middle	0.741	0.5	Pass
High	0.749	0.5	Pass

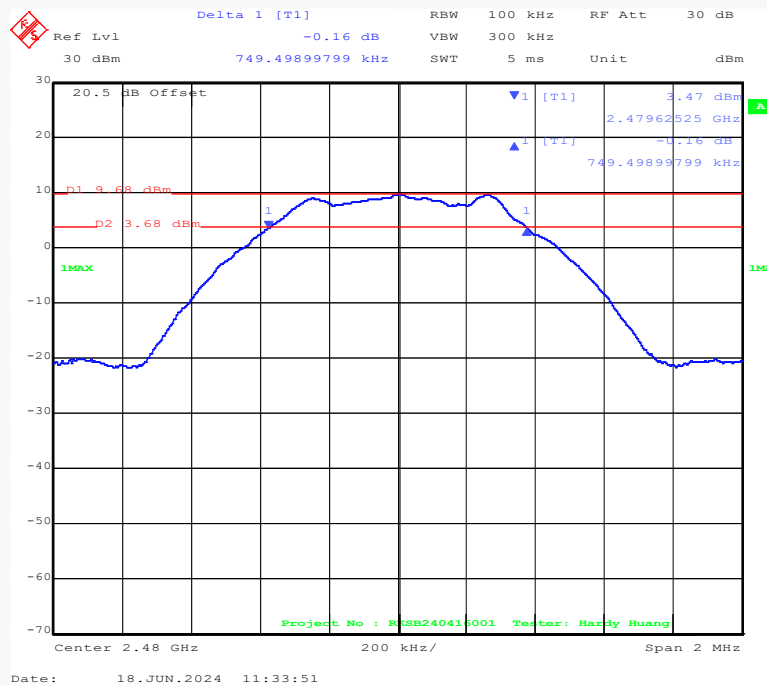
Low Channel



Middle Channel



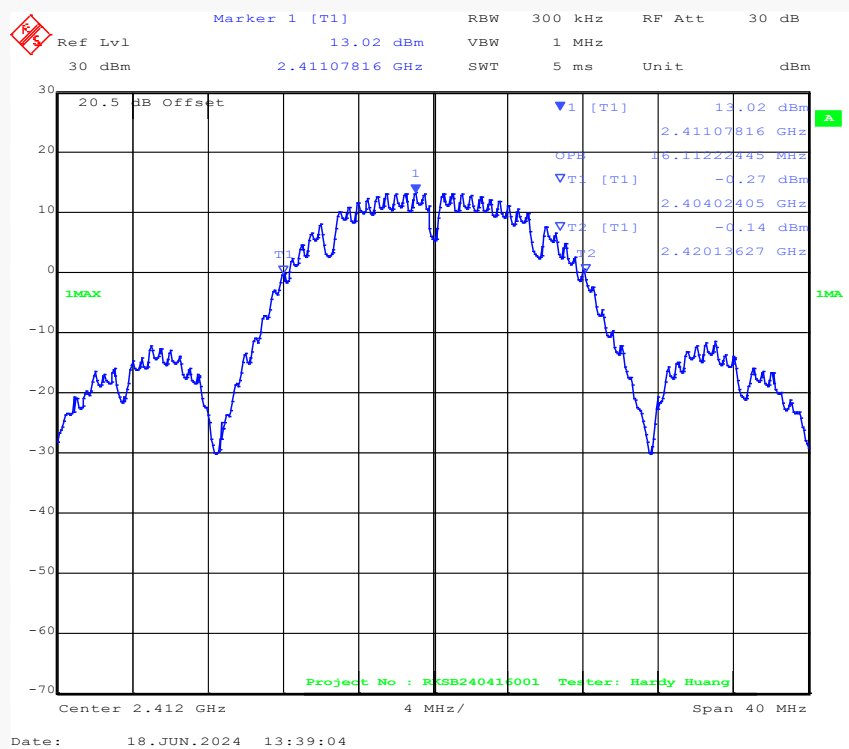
High Channel



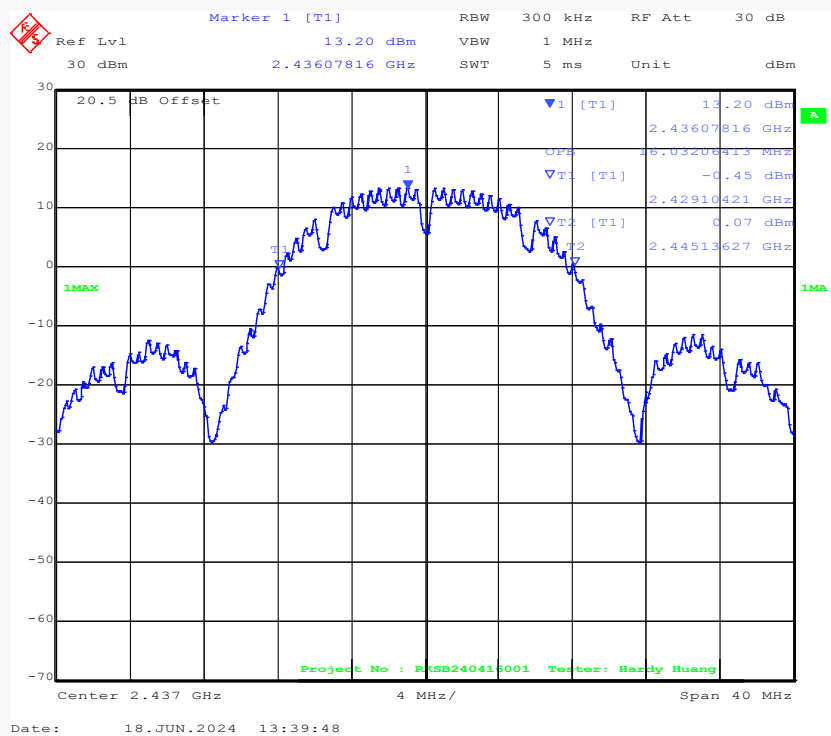
OCCUPIED BANDWIDTH*EUT operation mode: Transmitting***For Wi-Fi Mode:**

Test Mode	Channel (MHz)	99% Occupied Bandwidth (MHz)
802.11b	2412	16.112
	2437	16.032
	2462	15.230
802.11g	2412	17.315
	2437	17.395
	2462	17.475
802.11n-HT20	2412	18.277
	2437	18.277
	2462	18.277

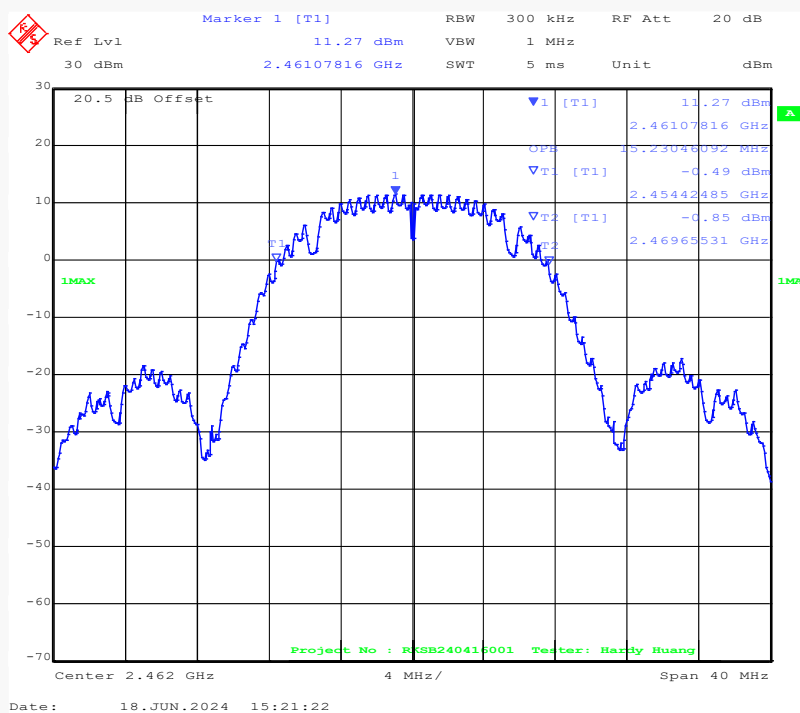
802.11b Mode Low Channel



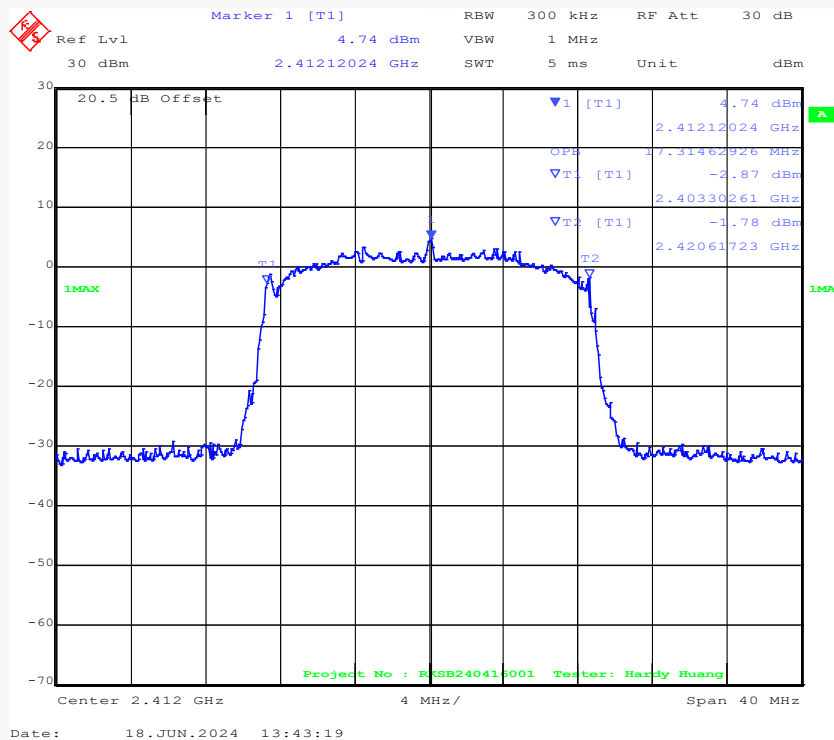
802.11b Mode Middle Channel



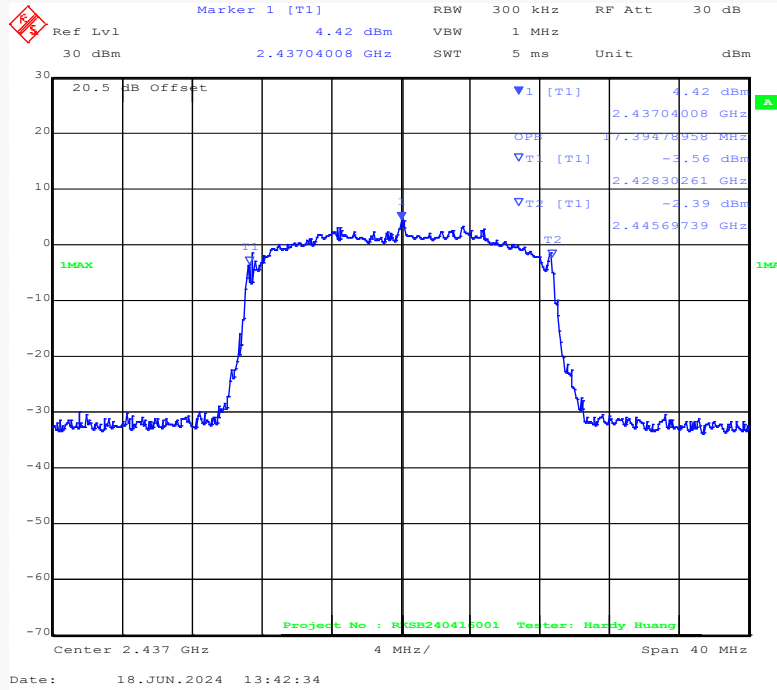
802.11b Mode High Channel



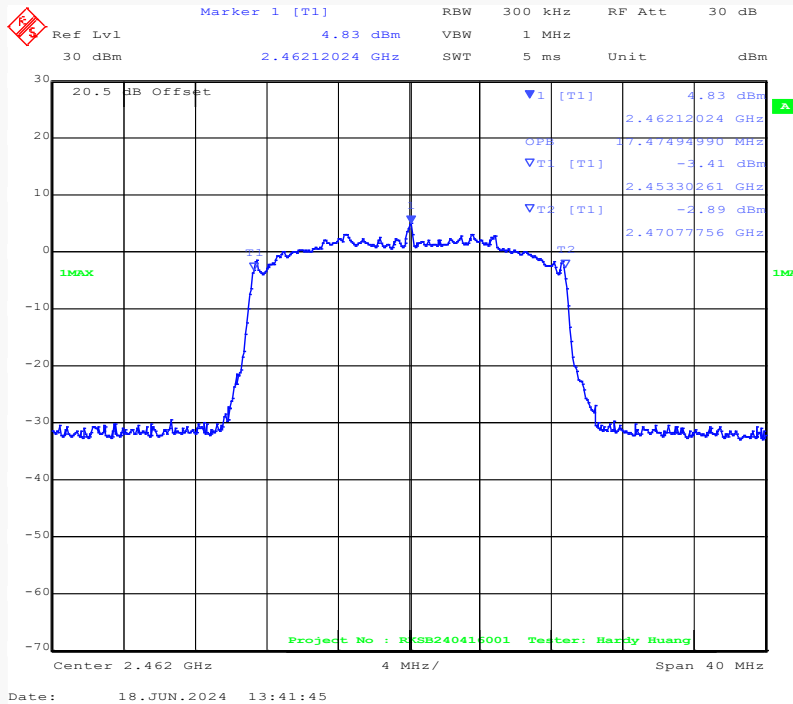
802.11g Mode Low Channel



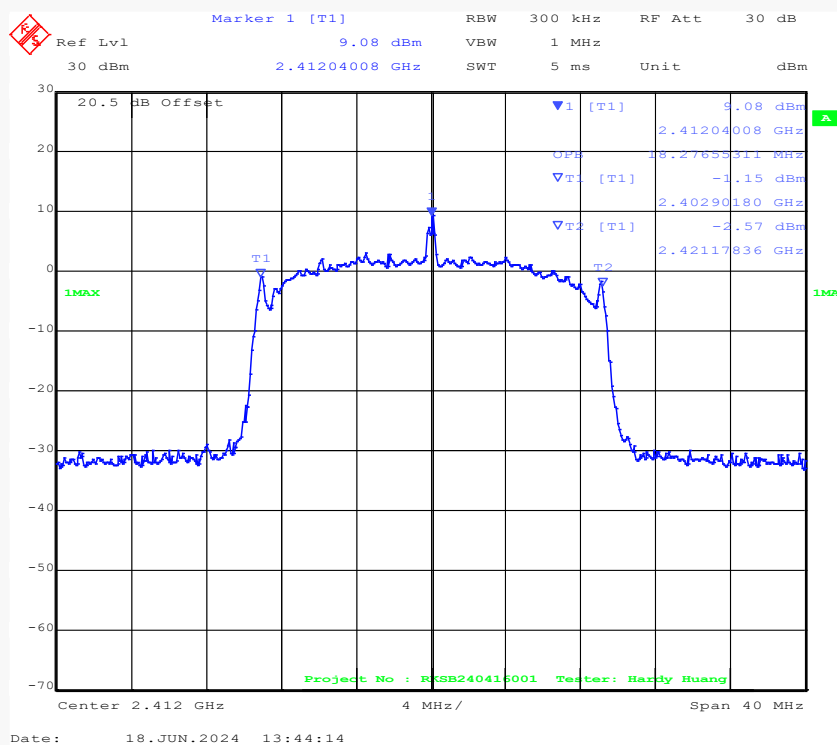
802.11g Mode Middle Channel



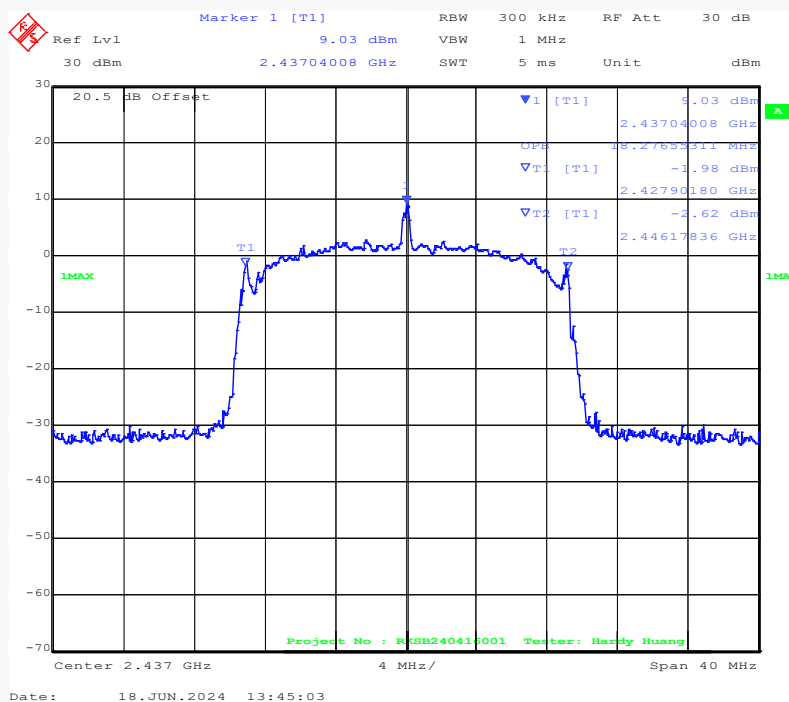
802.11g Mode High Channel



802.11n-HT20 Mode Low Channel



802.11n-HT20 Mode Middle Channel



Ref Lvl 30 dBm
 30 dBm
 Marker 1 [T1]
 9.05 dBm
 2.46204008 GHz
 RBW 300 kHz
 VBW 1 MHz
 SWT 5 ms
 RF Att 30 dB
 Unit dBm

20.5 dB Offset
 T1
 T2
 1MAX
 1M

▼1 [T1] 9.05 dBm
 2.46204008 GHz
 OPB 18.27655311 MHz
 ▼T1 [T1] -1.92 dBm
 2.45290180 GHz
 ▼T2 [T1] -1.95 dBm
 2.47117836 GHz

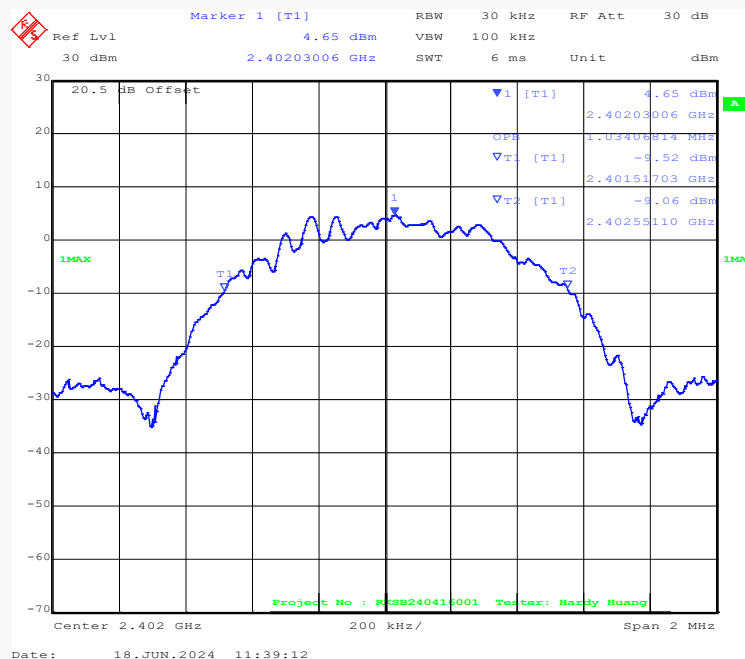
Project No : RKS240416001 Tester: Hardy Huang

Center 2.462 GHz 4 MHz/ Span 40 MHz

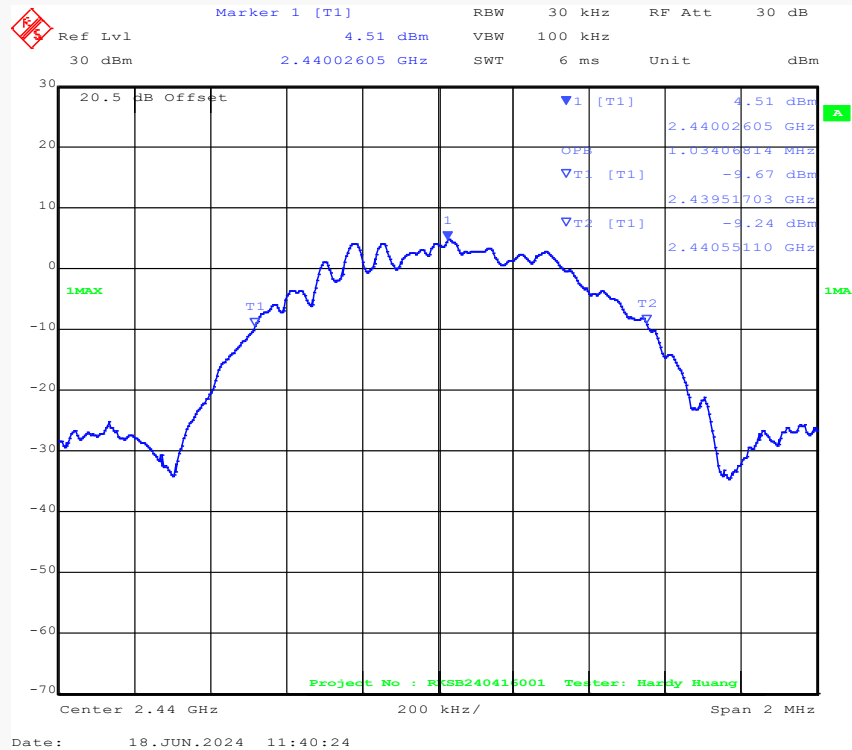
Date: 18 JUN 2024 13:45:56

For BLE Mode:

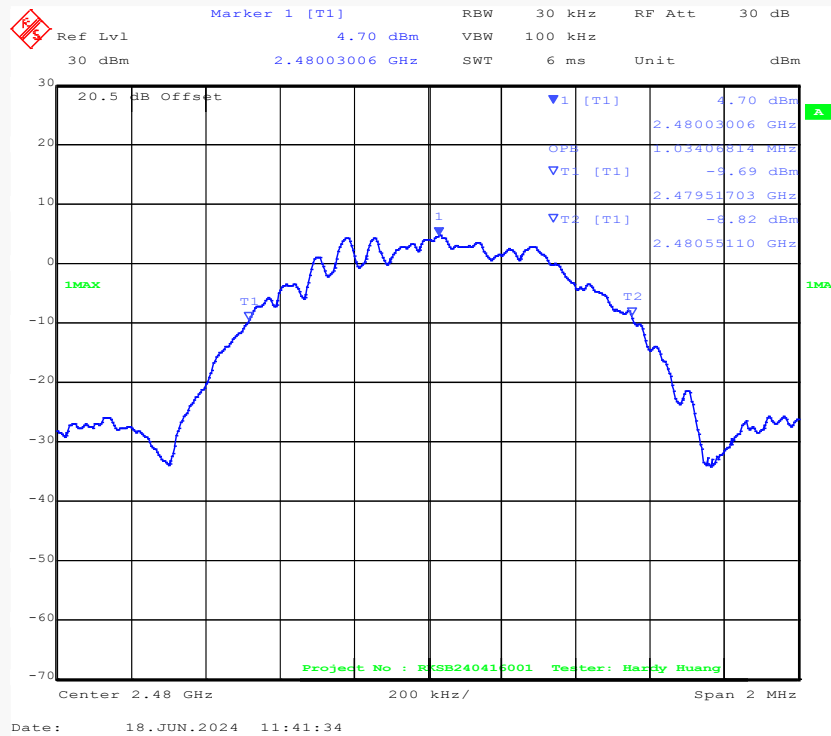
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
Low	2402	1.034
Middle	2440	1.034
High	2480	1.034

Low Channel

Middle Channel



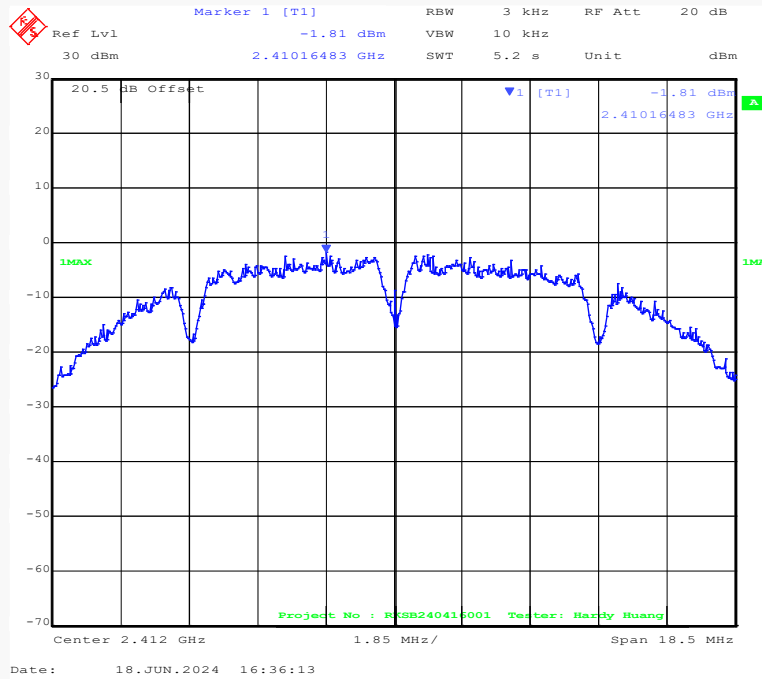
High Channel



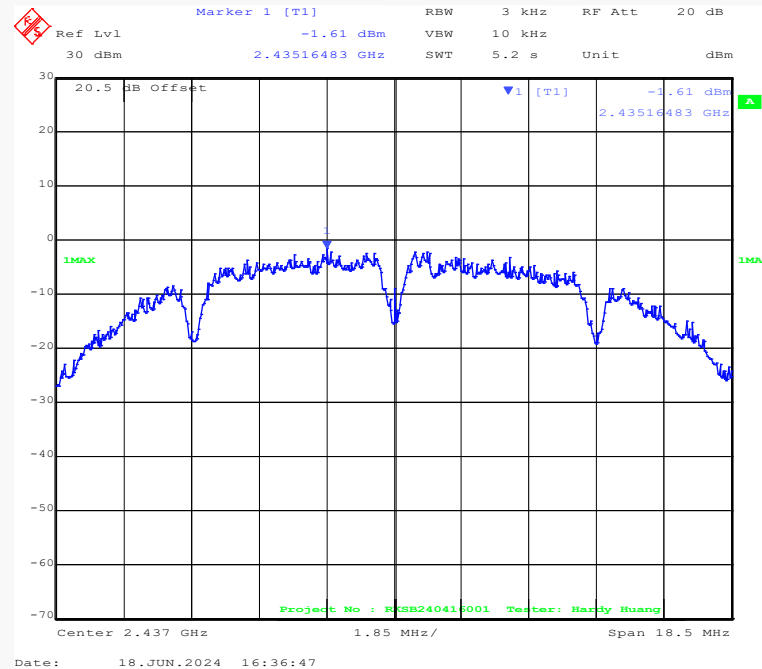
POWER SPECTRAL DENSITY**Test Result:** Compliant.*EUT operation mode: Transmitting***For Wi-Fi Mode:**

Test Mode	Channel (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
802.11b	2412	-1.81	≤ 8.00	PASS
	2437	-1.61	≤ 8.00	PASS
	2462	-4.67	≤ 8.00	PASS
802.11g	2412	-13.52	≤ 8.00	PASS
	2437	-12.61	≤ 8.00	PASS
	2462	-13.46	≤ 8.00	PASS
802.11n-HT20	2412	-10.8	≤ 8.00	PASS
	2437	-12.07	≤ 8.00	PASS
	2462	-10.86	≤ 8.00	PASS

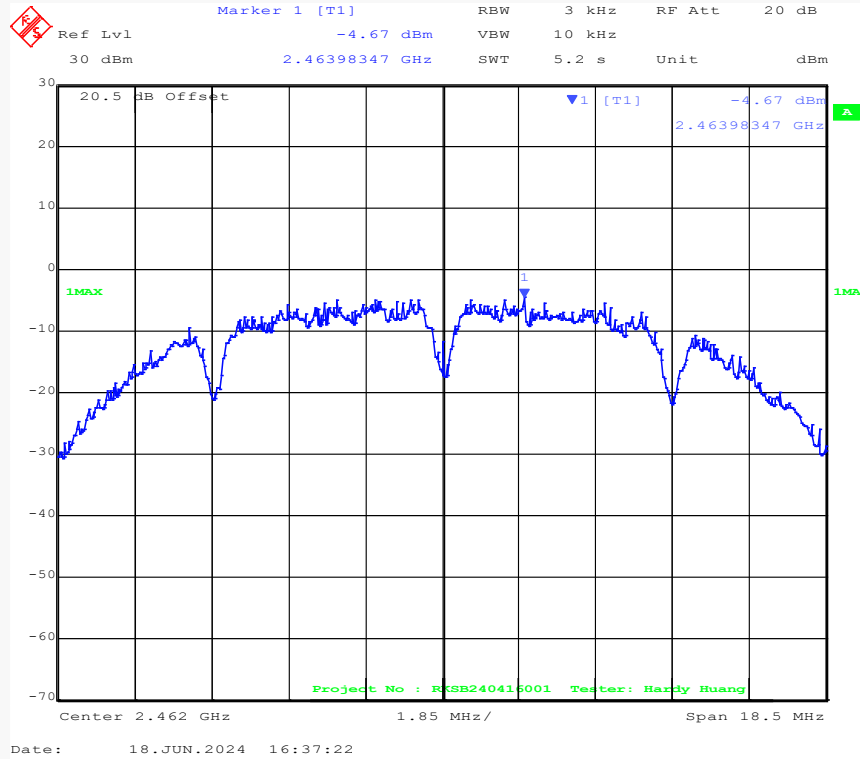
802.11b Low Channel



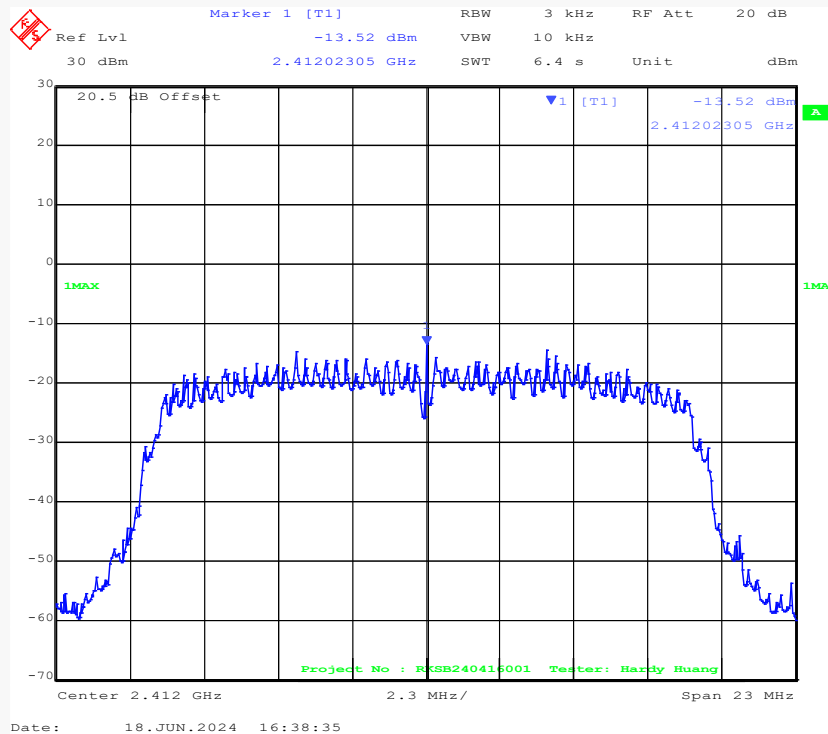
802.11b Middle Channel



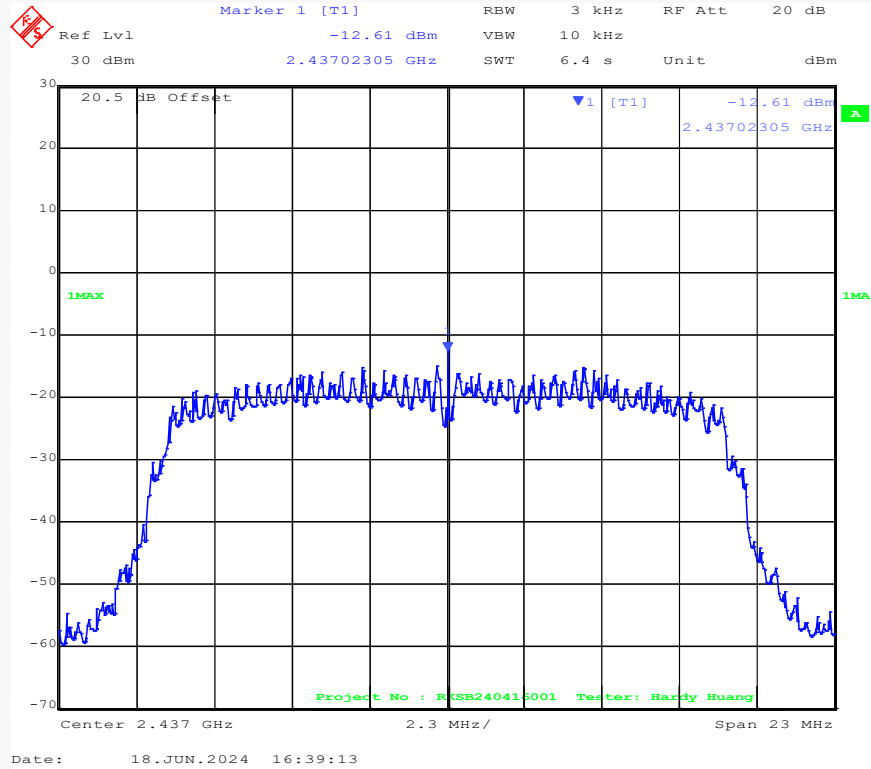
802.11b High Channel



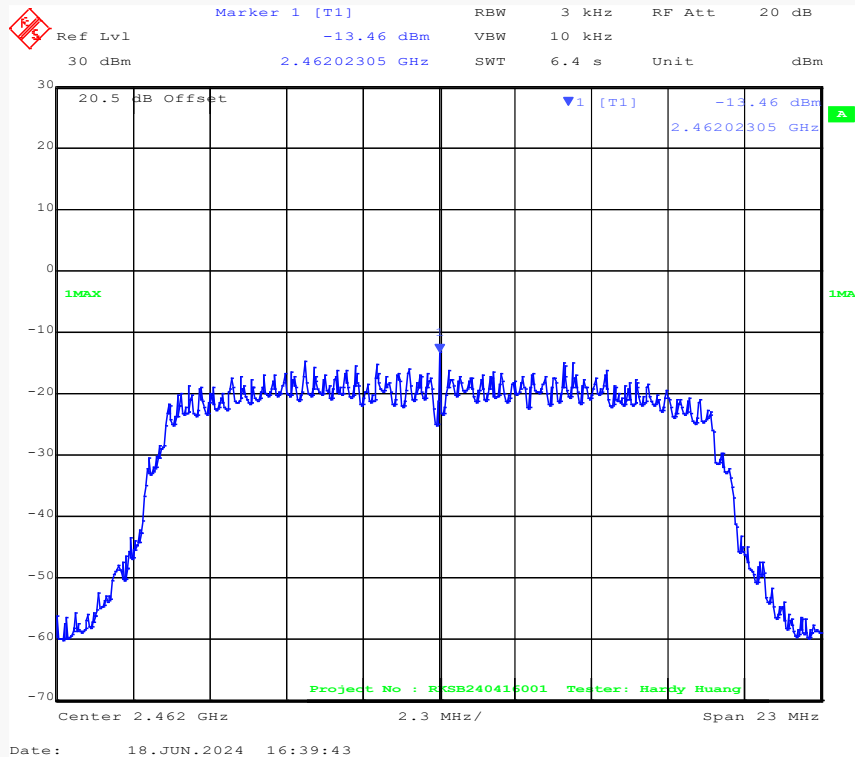
802.11g Low Channel



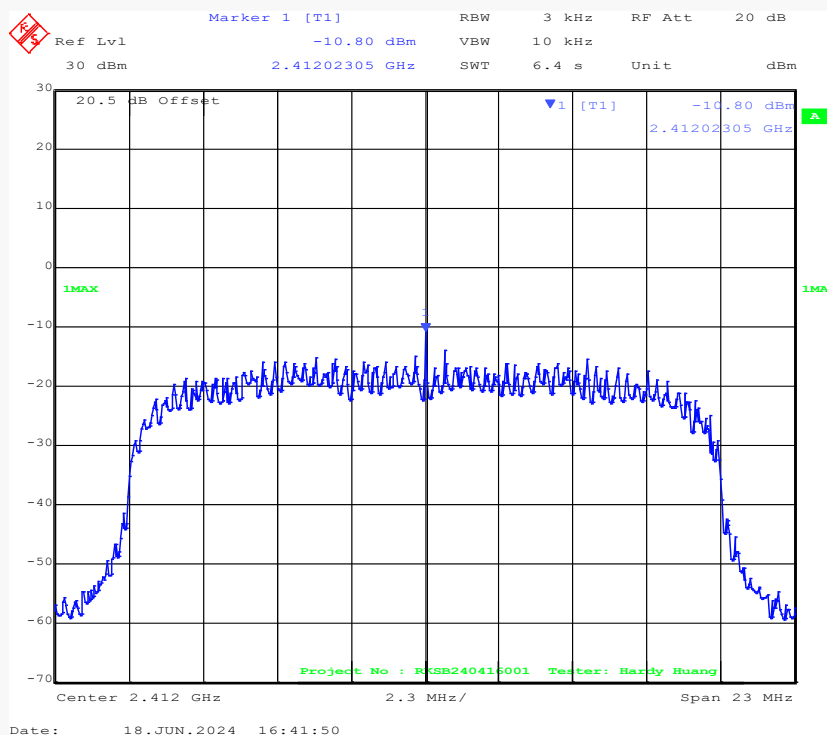
802.11g Middle Channel



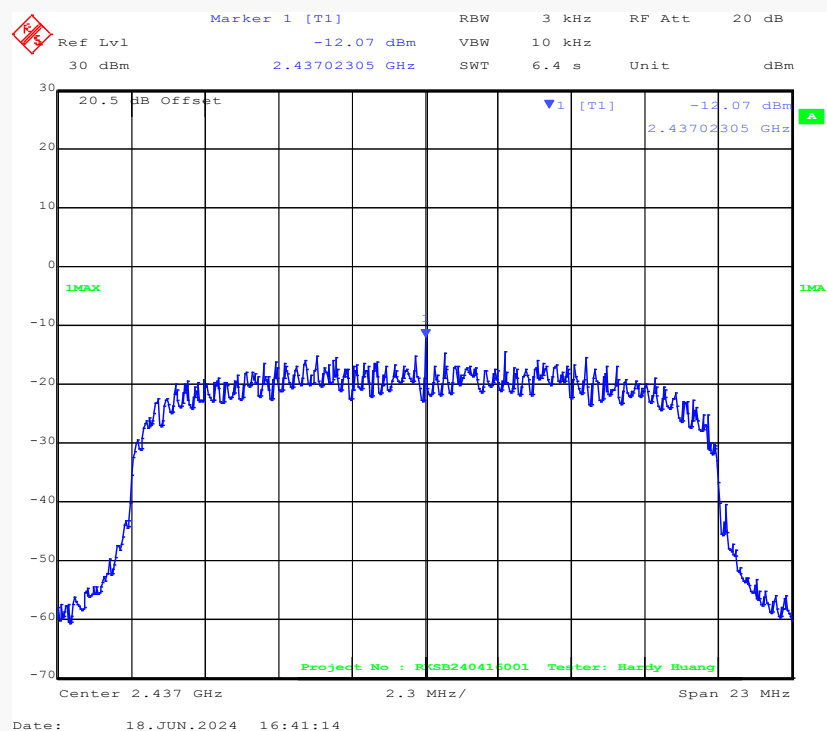
802.11g High Channel



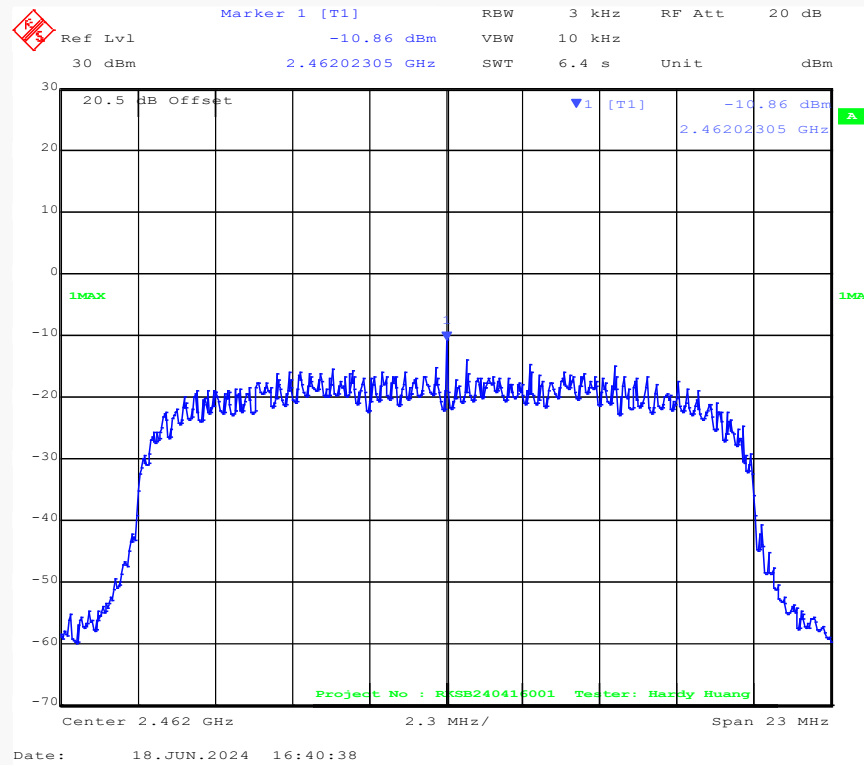
802.11n-HT20 Low Channel



802.11n-HT20 Middle Channel



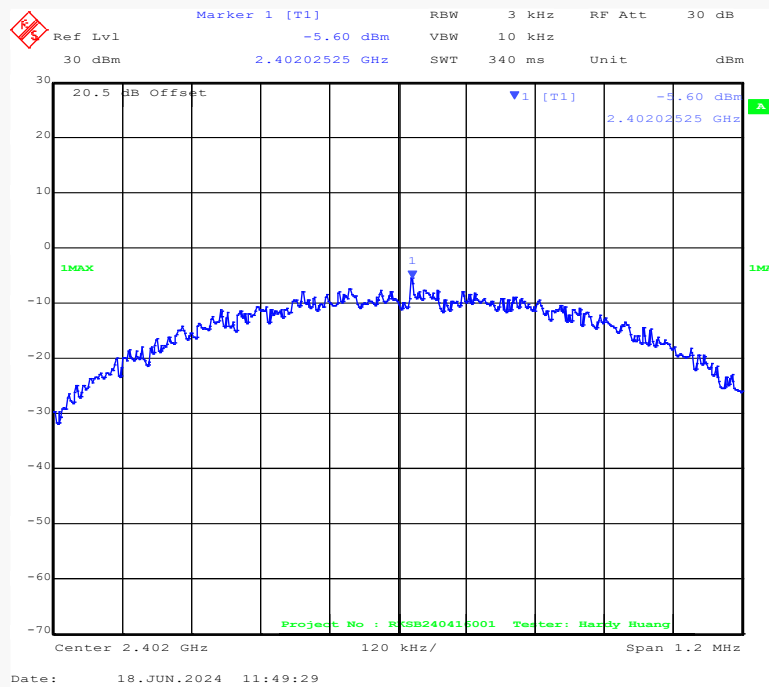
802.11n-HT20 High Channel



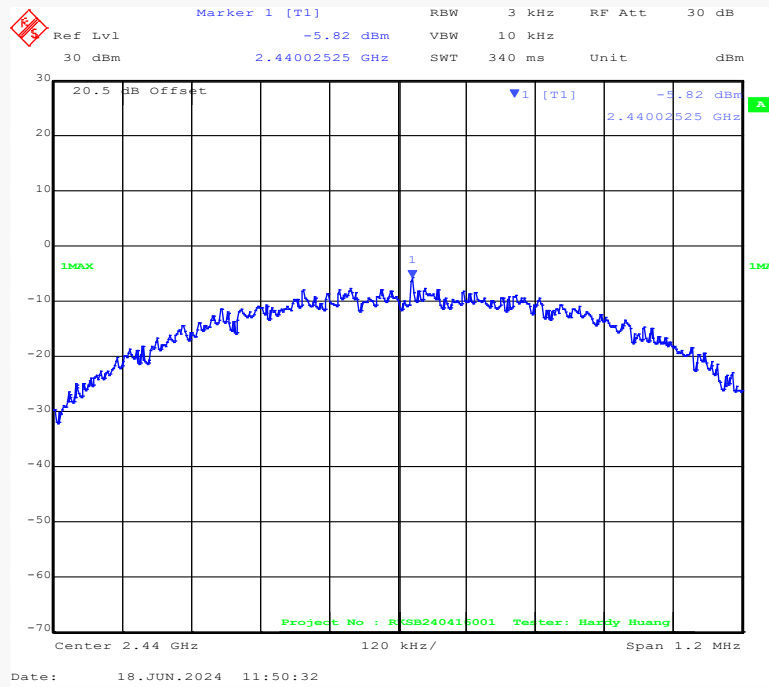
For BLE Mode:

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
Low	2402	-5.60	≤8
Middle	2440	-5.82	≤8
High	2480	-5.72	≤8

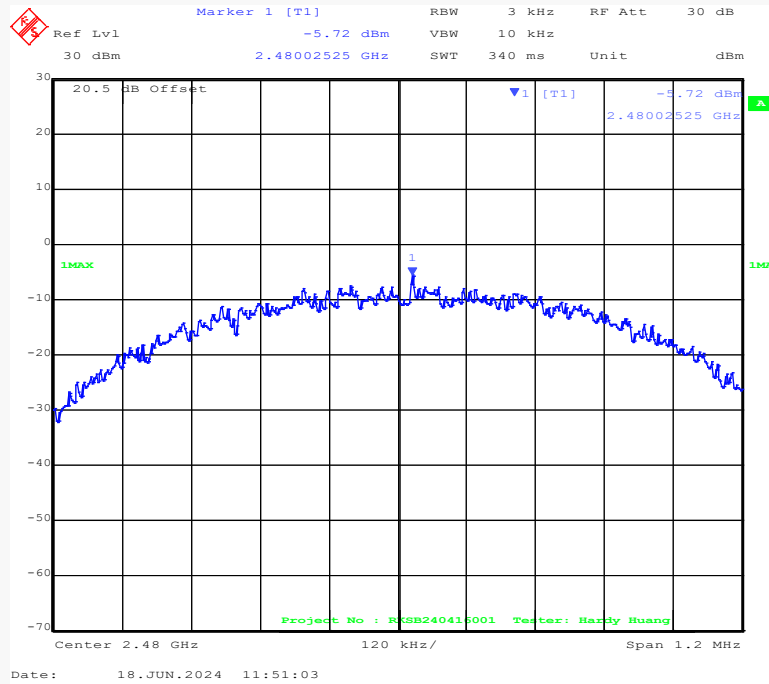
Low Channel



Middle Channel



High Channel

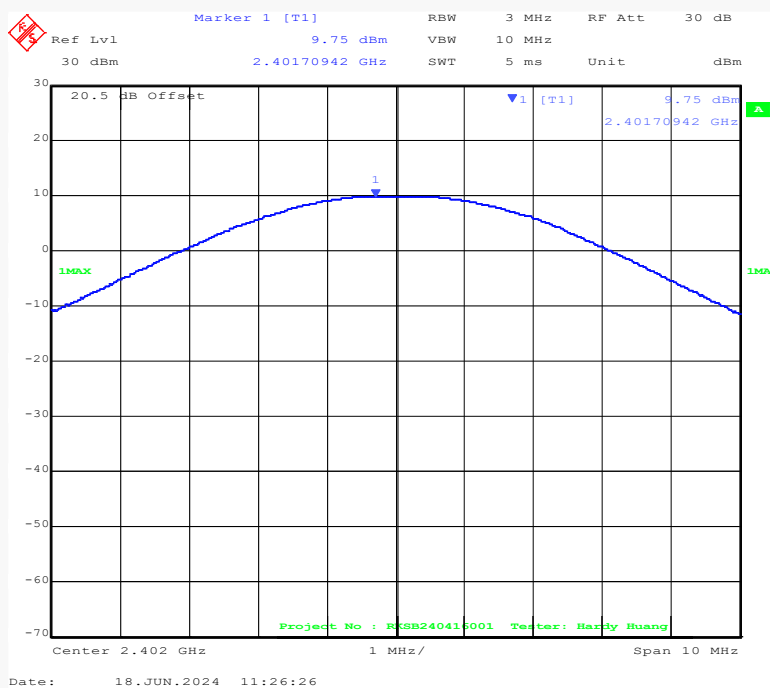


TRANSMITTER OUTPUT POWER MEASUREMENT**2.4G Wi-Fi:**

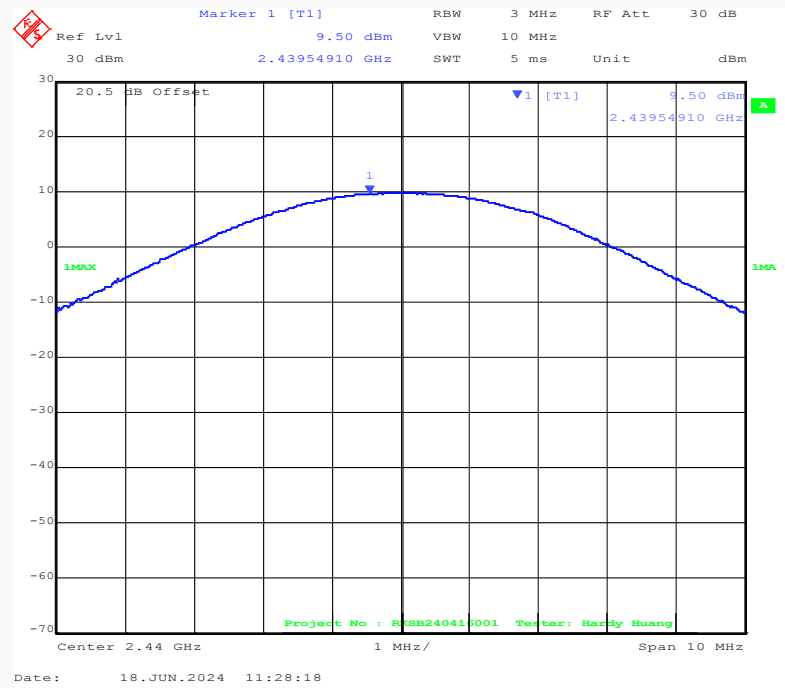
Test Mode	Channel (MHz)	Peak Output Power (dBm)	Limit (dBm)	Result
802.11b	2412	25.36	≤30.00	PASS
	2437	25.60	≤30.00	PASS
	2462	23.80	≤30.00	PASS
802.11g	2412	21.90	≤30.00	PASS
	2437	21.67	≤30.00	PASS
	2462	21.48	≤30.00	PASS
802.11n-HT20	2412	22.21	≤30.00	PASS
	2437	21.99	≤30.00	PASS
	2462	21.72	≤30.00	PASS

BLE Mode:

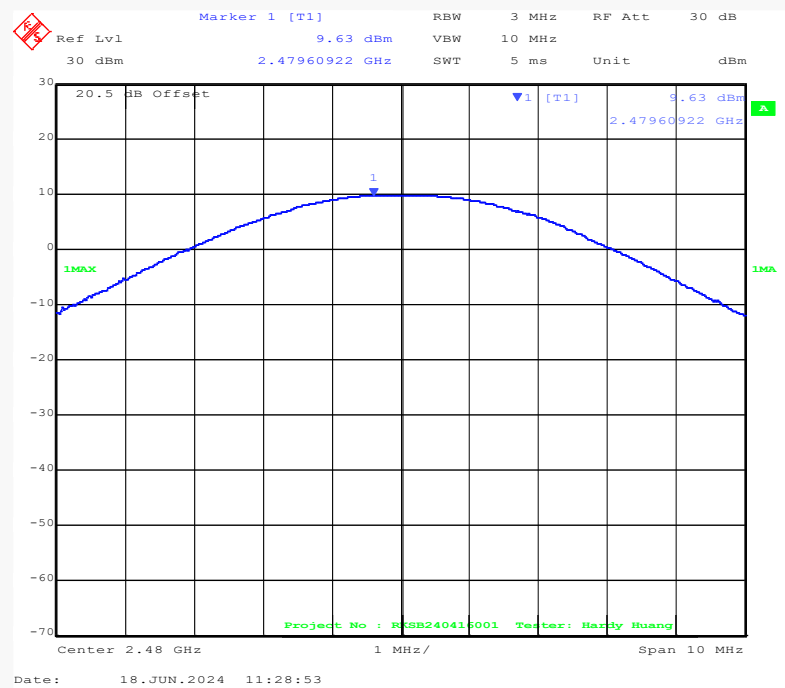
Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Peak Output Power Limit (dBm)
Low	2402	9.75	≤30
Middle	2440	9.50	≤30
High	2480	9.63	≤30

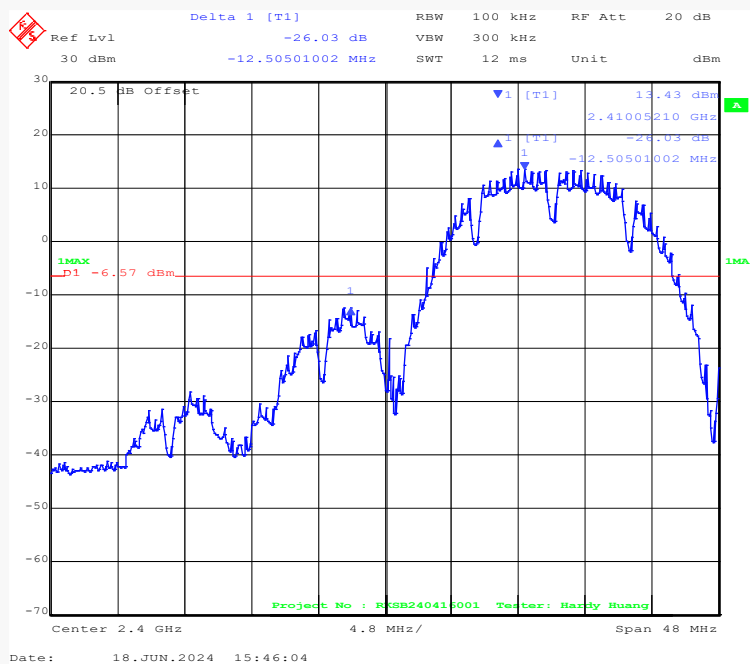
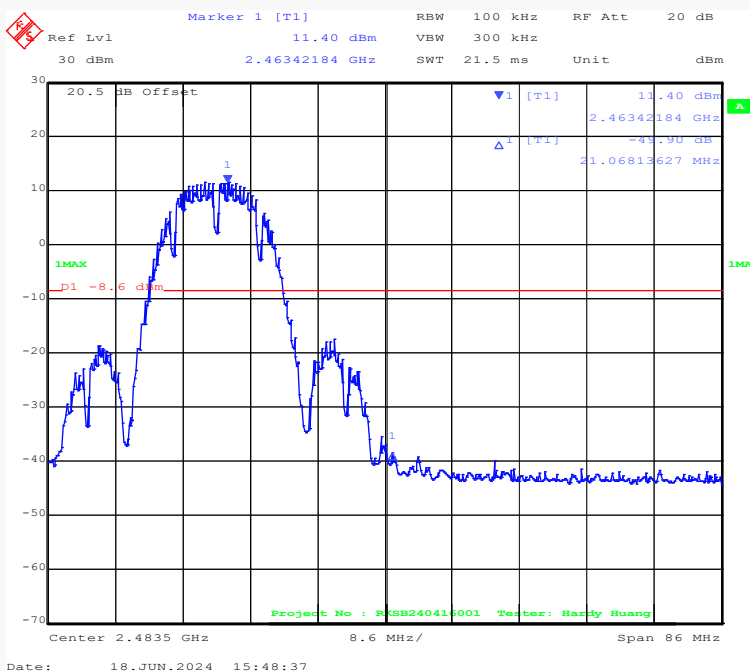
Low Channel

Middle Channel



High Channel



OUT OF BAND EMISSIONS*EUT operation mode: Transmitting***For Wi-Fi Mode:****802.11b Mode Left Side****802.11b Mode Right Side**

Delta 1 [T1]

Ref Lvl 30 dBm

RBW 100 kHz

VBW 300 kHz

SWT 12 ms

RF Att 20 dB

Unit dBm

20.5 dB Offset

1.55 dBm

2.41207214 GHz

-37.40 dB

-12.12024048 MHz

1 [T1]

1MAX

D1 -18.45 dBm

1MAX

Project No : R05B240416001 Tester: Harry Huang

Center 2.4 GHz

4.8 MHz/

Span 48 MHz

Date: 18.JUN.2024 15:50:53

Ref Lvl 30 dBm

Marker 1 [T1] 1.49 dBm

2.46204309 GHz

RBW 100 kHz

VBW 300 kHz

SWT 21.5 ms

Unit dBm

20.5 dB Offset

1 [T1] 1.49 dBm

2.46204309 GHz

1 [T1] -45.17 dB

28.47895792 MHz

1MAX

P1 -18.51 dBm

1

Project No : RKSB240415001 Tester: Hardy Huang

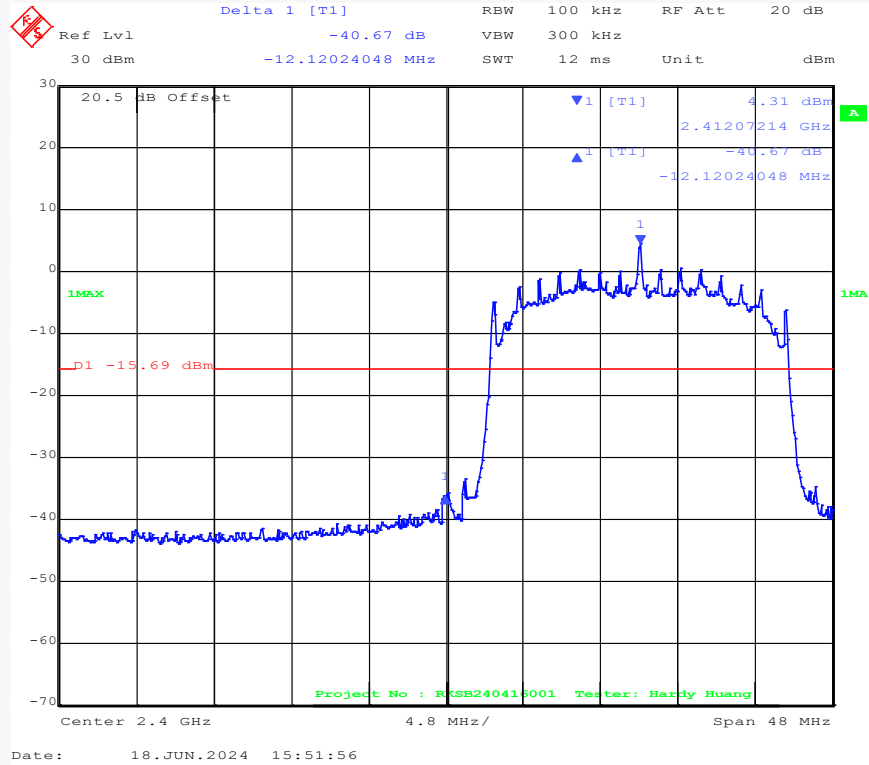
Center 2.4835 GHz

8.6 MHz/

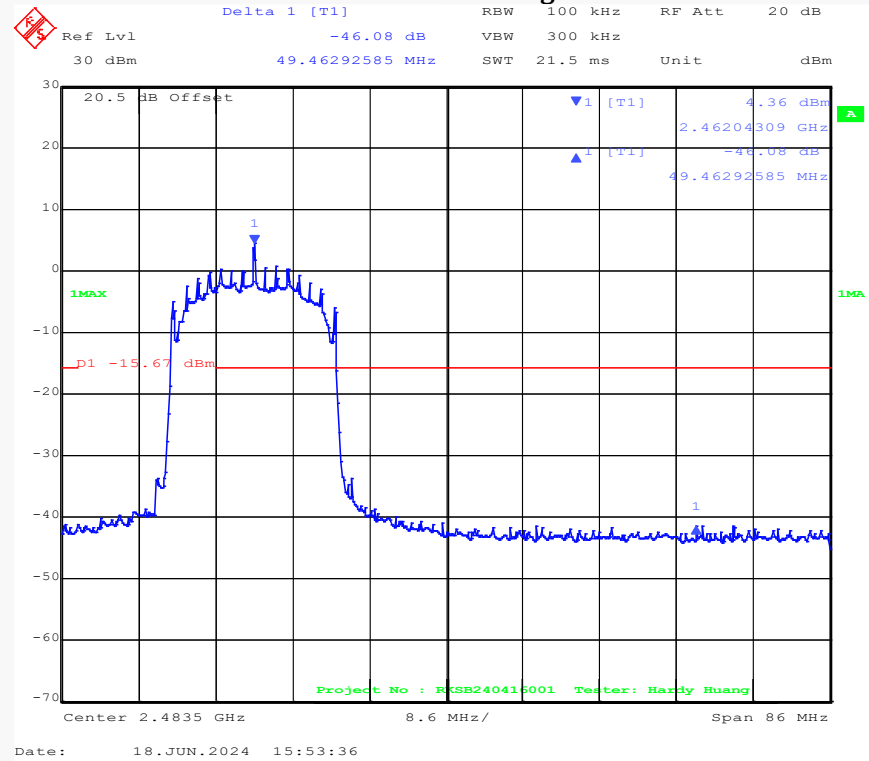
Span 86 MHz

Date: 18.JUN.2024 15:49:49

802.11n-HT20 Mode Left Side

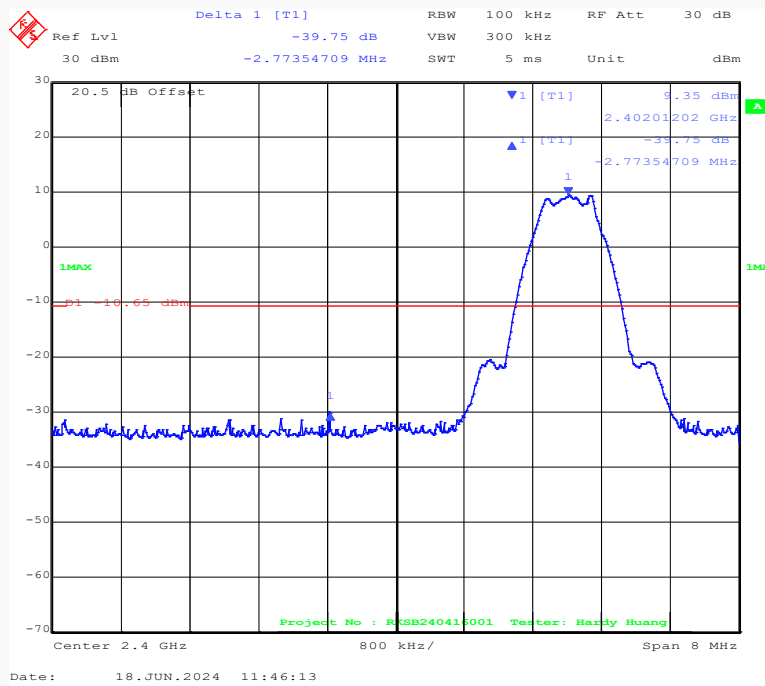


802.11n-HT20 Mode Right Side

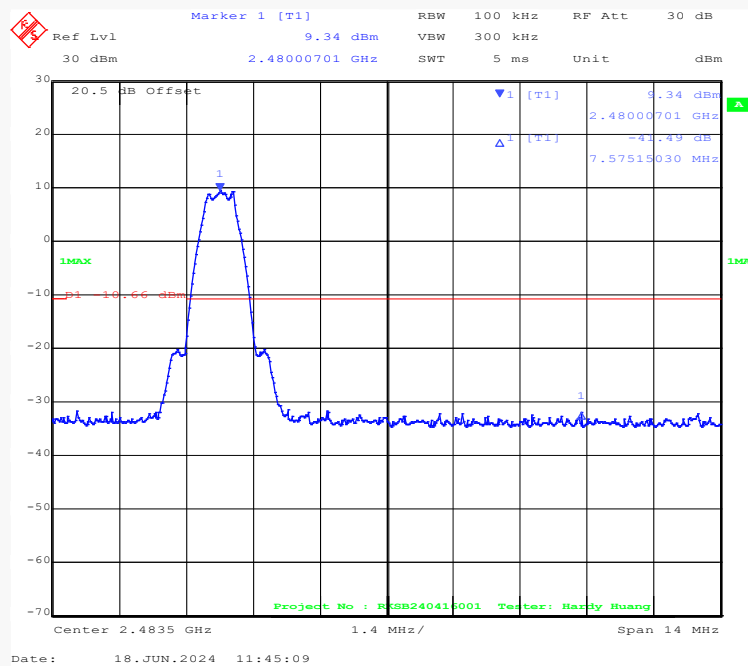


BLE 1Mbps:

Left Side



Right Side



EUT PHOTOGRAPHS

Please refer to the attachment EXHIBIT A - EUT EXTERNAL PHOTOGRAPHS and EXHIBIT B - EUT INTERNAL PHOTOGRAPHS.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment EXHIBIT C - TEST SETUP PHOTOGRAPHS.

Declarations

1. The laboratory is not responsible for the authenticity of any information provided by the applicant. Information from the applicant that may affect test results is marked with “★”.
2. The test data was only valid for the test sample(s).
3. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.
4. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
5. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor $k=2$ with the 95.45% confidence interval.

******* END OF REPORT *******