

FCC PART 15.247

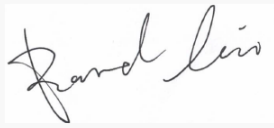
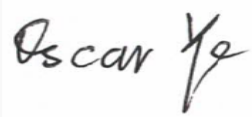
TEST REPORT

For

ACSL Ltd.

Hulic Kasai Rinkai Bldg. 2F, 3-6-4 Rinkaicho, Edogawa-ku, Tokyo, Japan 134-0086

FCC ID: 2A8JK-GS5US-FALCON

Report Type: Original Report	Product Name: Smart Controller
Report Number: <u>RSHA240424001-00B</u>	
Report Date: <u>2024-07-30</u>	
Reviewed By: <u>Bard Liu</u>	
Approved By: <u>Oscar Ye</u>	
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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	RSHA240424001-00B	R1V1	2024-07-30	Initial Release

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	ACSL Ltd.
Manufacturer:	Aerora North America, Inc.
Tested Model:	TENSO-F3
Product Name:	Smart Controller
Power Supply:	DC 3.7V
RF Function:	2.4G Wi-Fi; BLE
Operating Band/Frequency:	2.4G Wi-Fi: 2412~2462 MHz(802.11b/g/n20), 2422~2452 MHz(802.11n40) BLE(1Mbps): 2402-2480 MHz
Maximum Peak Output Power:	2.4G Wi-Fi: 802.11b: 17.25 dBm 802.11g: 20.47 dBm 802.11n20: 20.55 dBm 802.11n40: 19.02 dBm BLE(1Mbps): -1.77 dBm
Channel Number:	2.4G Wi-Fi: 11(802.11b/g/n20), 7(802.11n40) 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:	2.4G Wi-Fi /BLE: FPC Antenna
★Maximum Antenna Gain:	2.4G Wi-Fi /BLE: 0.9 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: RSHA240424001-1 (Assigned by the BACL (Kunshan). The EUT supplied by the applicant was received on 2024-04-24.)

Objective

This report is prepared for ACSL 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.

For 802.11n-HT40 mode, EUT was tested with Channel 3, 6 and 9.

Equipment Modifications

No modification was made to the EUT tested.

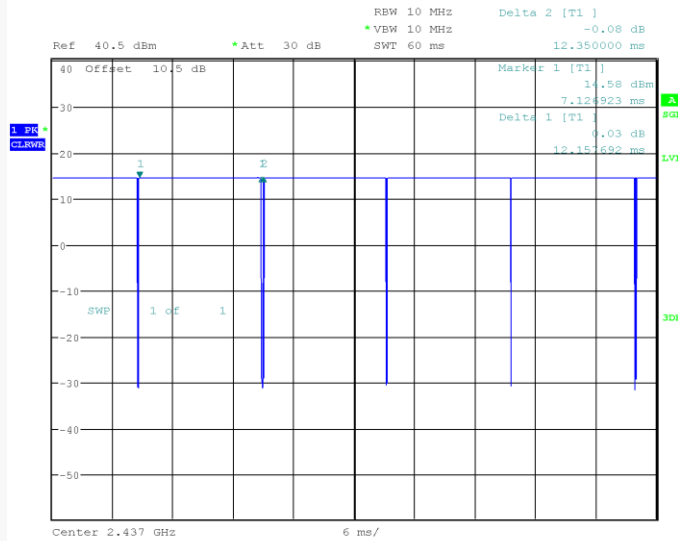
EUT Exercise Software

“QRCT3” used to test.

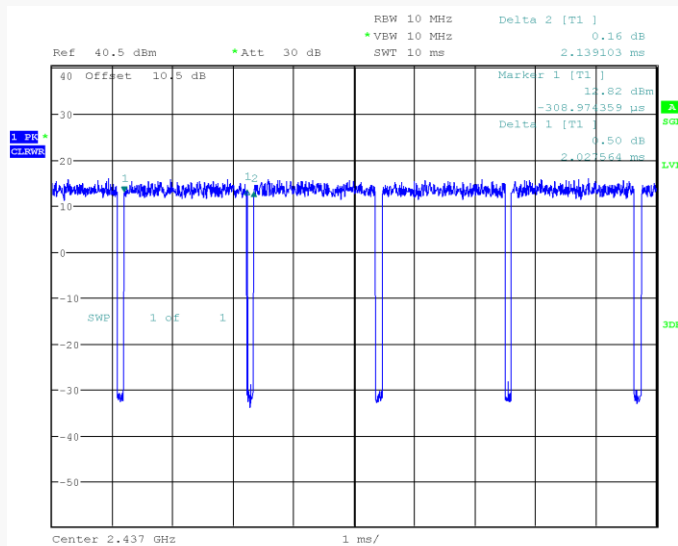
Pre-scan with all the data rates, and the worst case was performed as below:

Mode	Data Rate	★Power Level
802.11b	1 Mbps	15
802.11g	6 Mbps	12
802.11n-HT20	MCS0	15
802.11n-HT40	MCS0	12
BLE(1Mbps)	1Mbps	Default

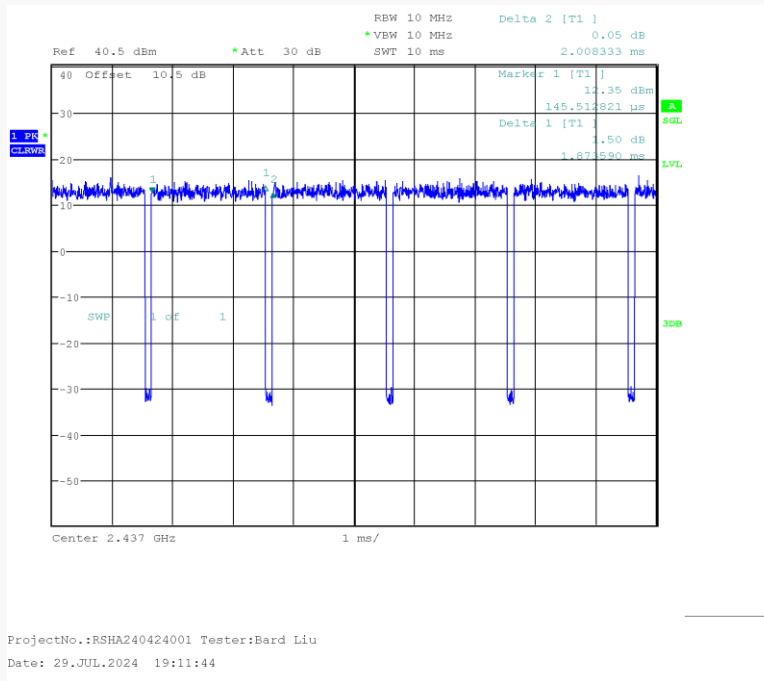
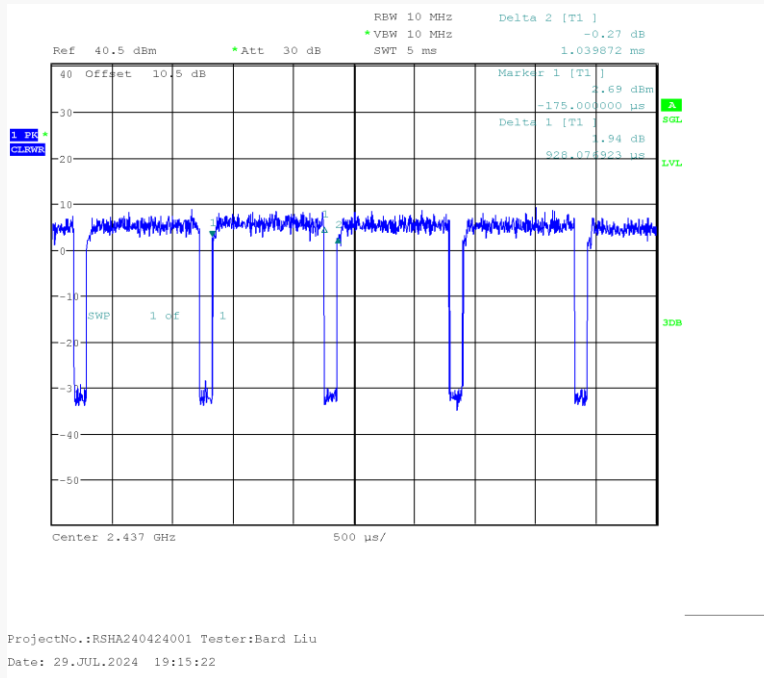
Note: The power level was declared by the applicant.

Duty Cycle:**802.11b Mode Middle Channel**

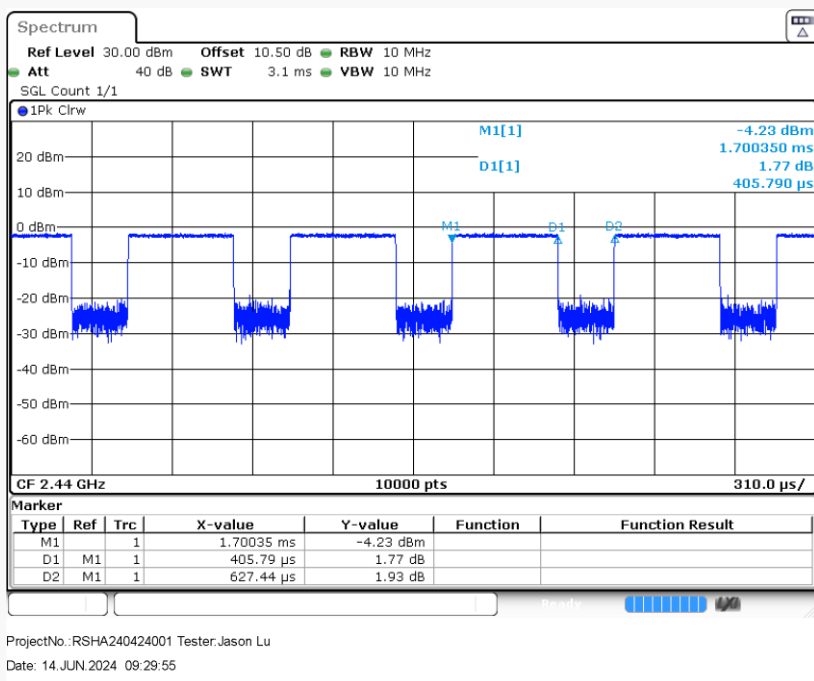
ProjectNo.:RSHA240424001 Tester:Bard Liu
Date: 29.JUL.2024 19:03:06

802.11g Mode Middle Channel

ProjectNo.:RSHA240424001 Tester:Bard Liu
Date: 29.JUL.2024 19:09:02

802.11n-HT20 Mode Middle Channel**802.11n-HT40 Mode Middle Channel**

BLE Middle Channel



Mode	Duty Cycle (%)	Ton(ms)	Ton+off(ms)	10log(1/x)
802.11b	98.45	12.158	12.35	0.07
802.11g	94.81	2.028	2.139	0.23
802.11n-HT20	93.33	1.874	2.008	0.3
802.11n-HT40	89.23	0.928	1.040	0.49
BLE	64.75	0.406	0.627	1.89

Note: “x” means the Duty Cycle.

Support Equipment List and Details

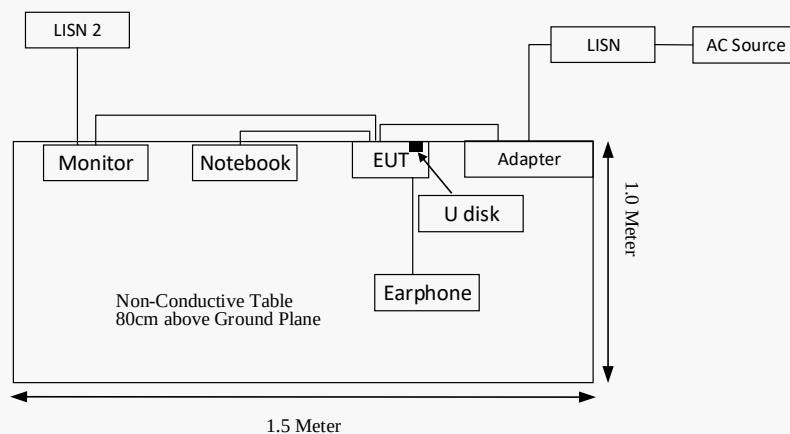
Manufacturer	Description	Model	Serial Number
XIAOMI	Monitor	P24FBA-RA	50715/313100001953
Lenovo	NOTEBOOK	LJJ6K3U	9DD96DBA
Lenovo	USB flash disk	T180	0A1266865200521
Unknown	Earphone	Unknown	Unknown

External I/O Cable

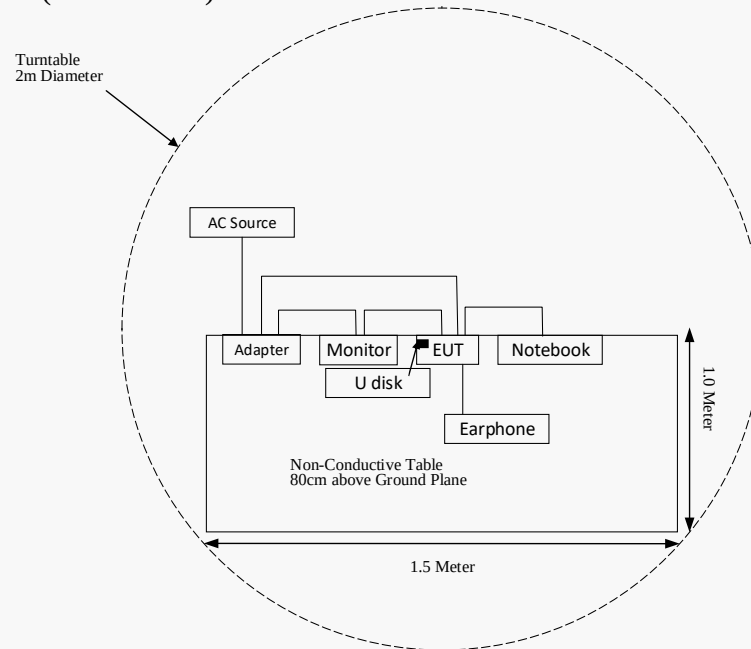
Cable Description	Length (m)	From Port	To
Power Cable	1.0	LISN/AC Source	Adapter
USB Cable	1.0	Adapter	EUT
RJ45	1.0	Notebook	EUT
HDMI Cable	2.0	Monitor	EUT

Block Diagram of Test Setup

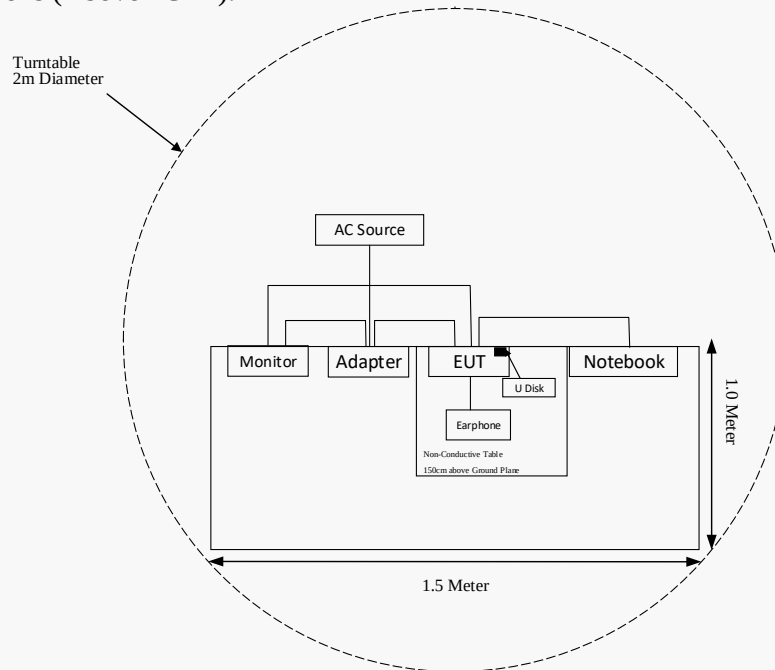
For Conducted Emissions:



For Radiated Emissions (Below 1GHz):



For Radiated Emissions (Above 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§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	2023-08-05	2024-08-04
Narda	Attenuator	10dB	010	2023-08-15	2024-08-14
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	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-12	012	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-13	013	2024-04-23	2025-04-22
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSU26	200103	2024-04-24	2025-04-23
Narda	Attenuator	10dB	010	2024-04-23	2025-04-22
Anritsu	Power Sensor	MA24418A	12621	2023-09-27	2024-09-26
Rohde & Schwarz	Spectrum Analyzer	FSV40-N	103298	2024-04-24	2025-04-23
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	2024-04-23	2025-04-22

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 §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 an FPC for 2.4G Wi-Fi & BLE, and the antenna gain is 0.9 dBi, which permanently attached to the unit, fulfill the requirement of this section. Please refer to the EUT photos.

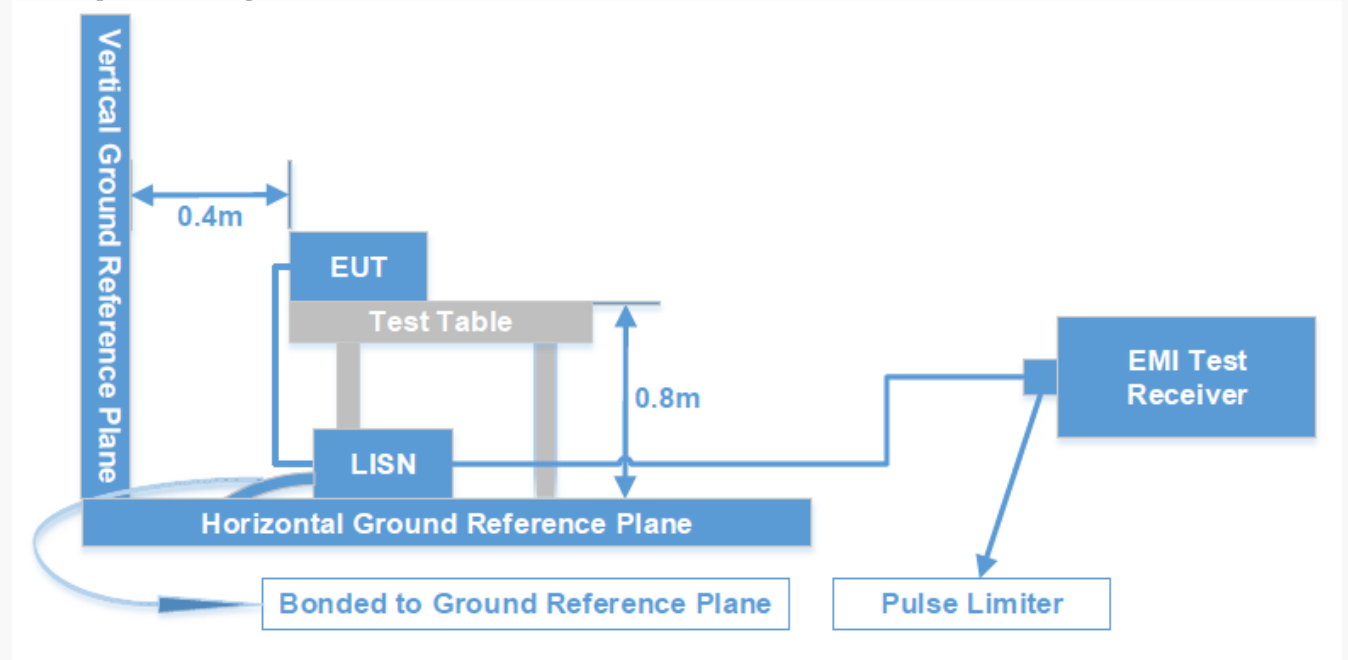
Result: Compliant.

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

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)

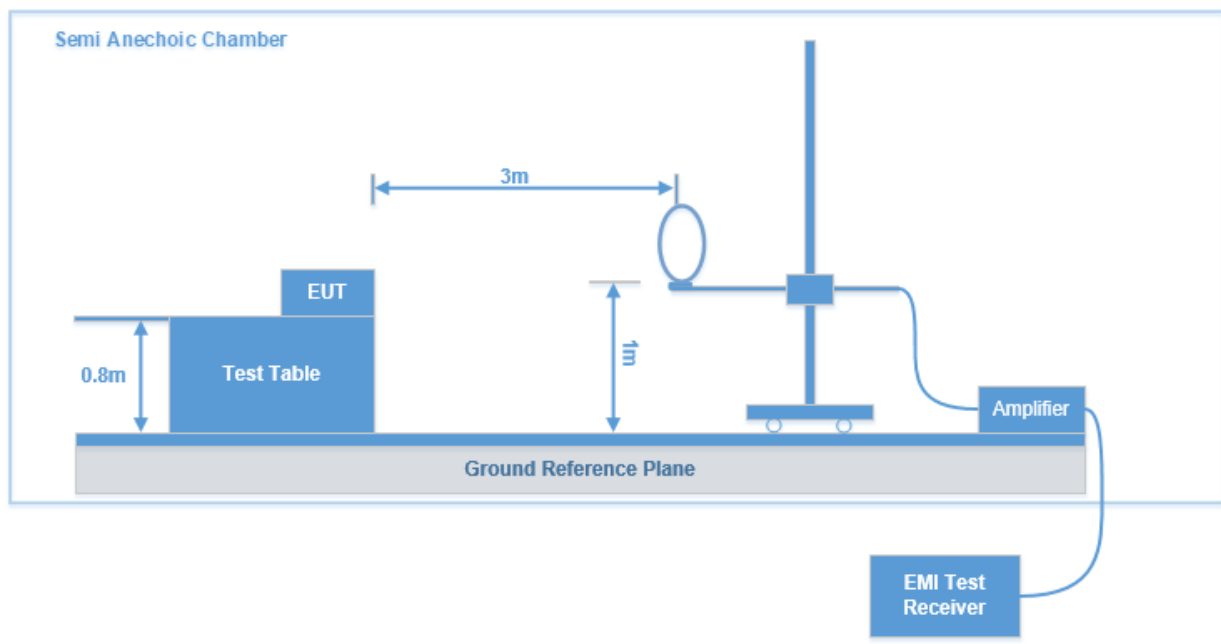
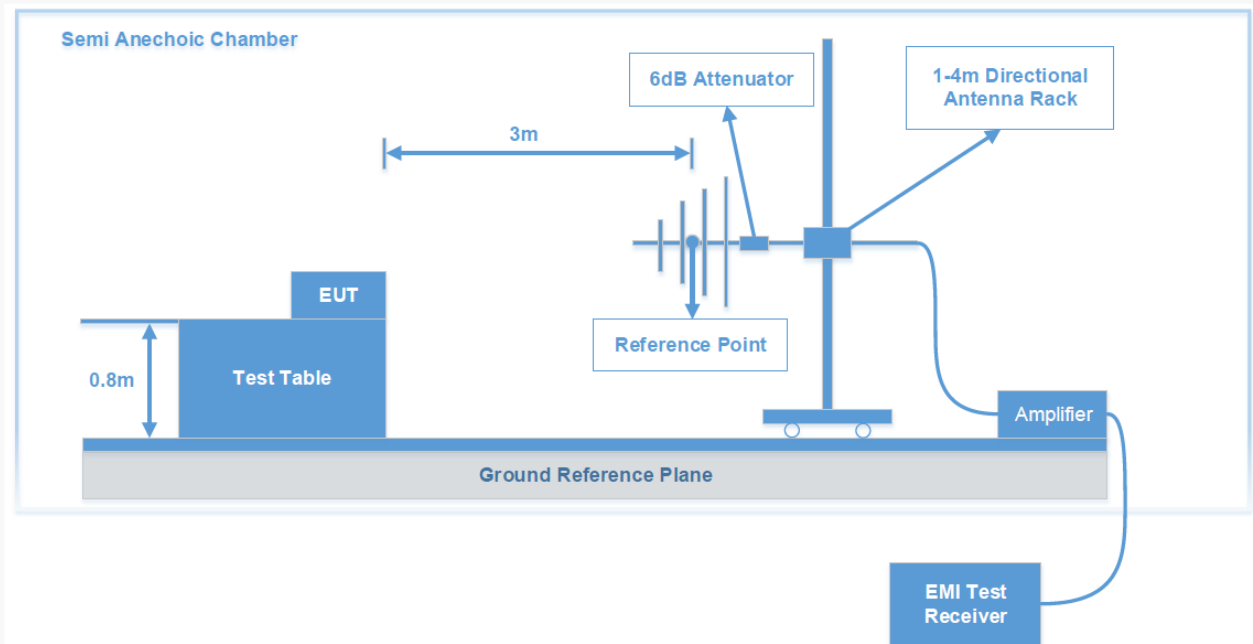
Test Results Summary

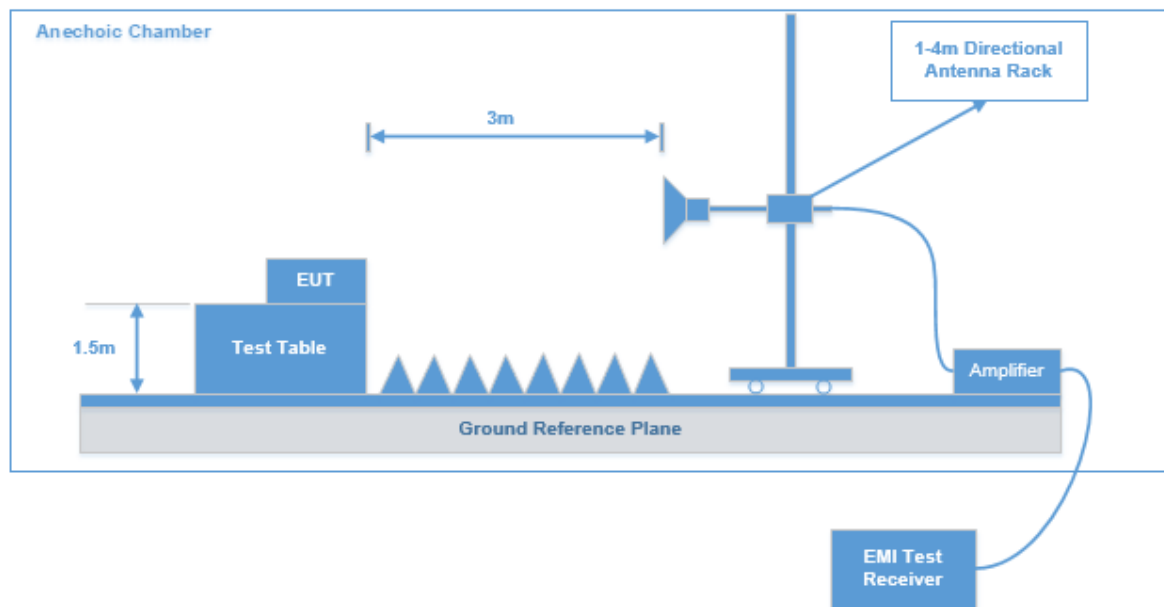
According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

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**9 kHz-30MHz:****30MHz-1GHz:**

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

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 (dBμV/m) = Meter Reading (dBμV) + 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 (dBμV/m) – Corrected Amplitude (dBμV/m)

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

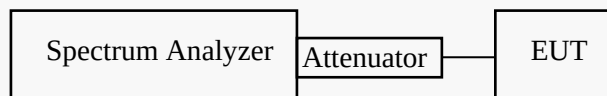
Applicable Standard

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

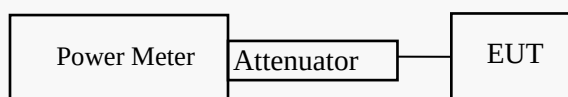
For 2.4G Wi-Fi:

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.

11.9.2.3.2 Method AVGPM-G

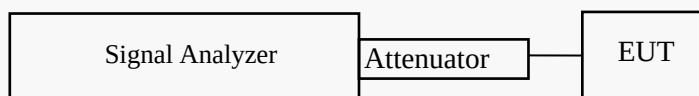
Method AVGPM-G is a measurement using a gated RF average power meter. Alternatively, measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.



For BLE:

According to ANSI C63.10-2013 sub-clause 11.9.1.1

1. Set the RBW $\geq$ DTS bandwidth.
2. Set VBW $\geq 3 \times$ RBW.
3. Set span $\geq 3 \times$ 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

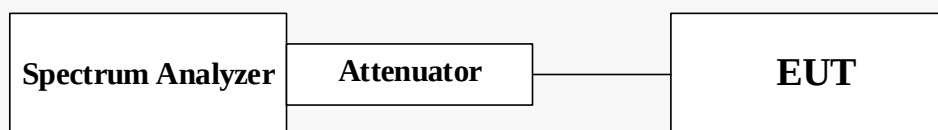
Applicable Standard

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

The following procedure shall be used if maximum peak conducted output power was used to determine Compliant, and it is optional if the maximum conducted (average) output power was used to determine Compliant:

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

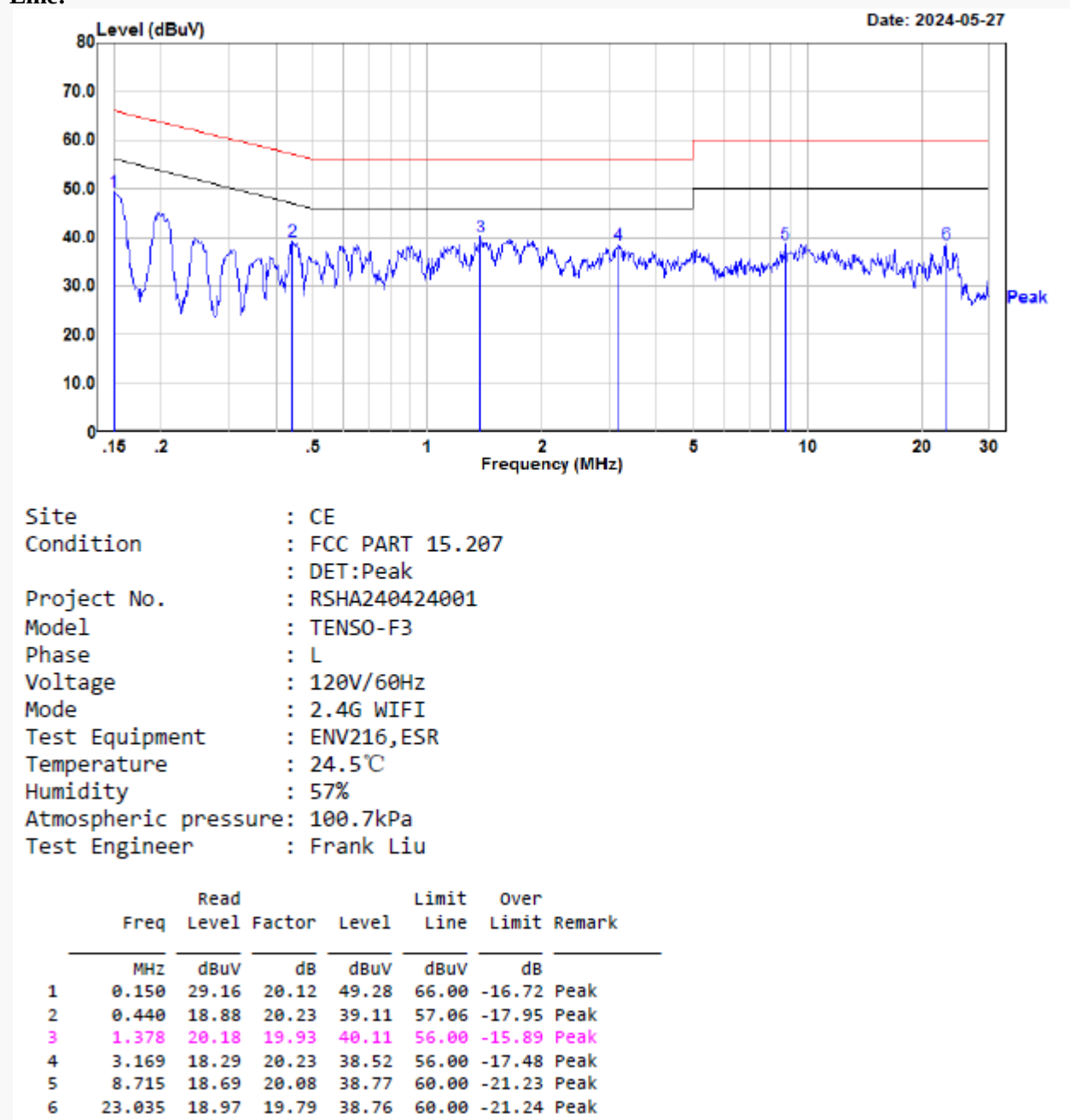
APPENDIX - TEST DATA

Environmental Conditions & Test Information

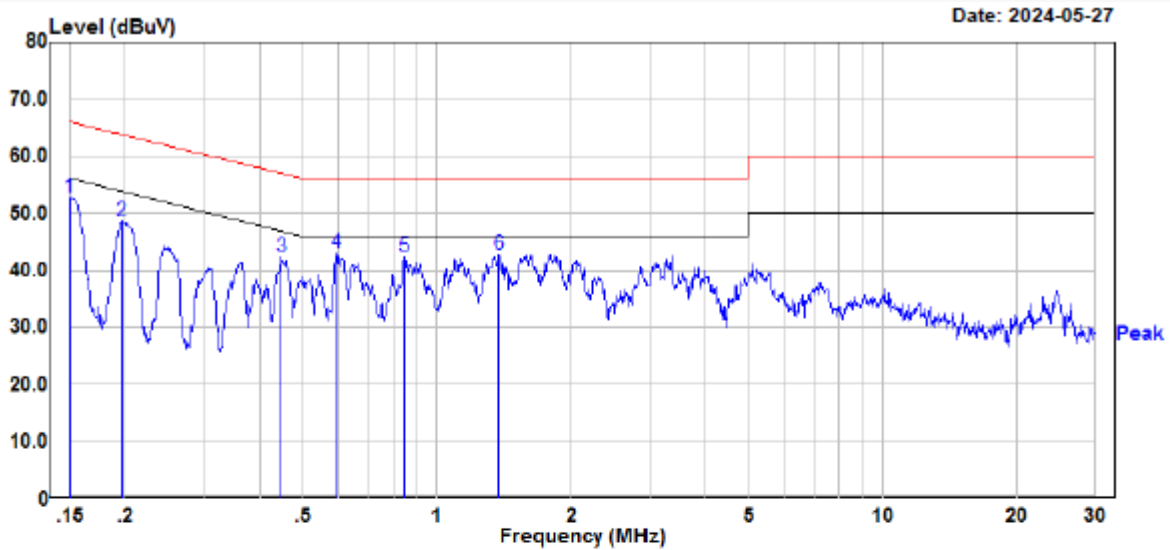
Test Item:	DUTY CYCLE	AC LINE CONDUCTED EMISSIONS
Test Date:	2024-06-14&2024-07-29	2024-05-27
Temperature:	20 °C~20.3°C	24.5 °C
Relative Humidity:	42 %~52%	57 %
ATM Pressure:	101.1kPa ~100.9kPa	100.7kPa
Test Result:	/	Pass
Test Engineer:	Bard Liu& Jason Lu	Frank Liu

Test Item:	UNWANTED EMISSIONS & BAND EDGE EMISSIONS			6 DB EMISSION BANDWIDTH
	9kHz - 1GHz	1 GHz – 18 GHz	18 GHz – 25 GHz	
Test Date:	2024-06-03 to 2024-06-12	2024-05-11	2024-05-24	2024-05-15 to 2024-06-14
Temperature:	23.4 °C - 23.8 °C	22.9 °C	25.5 °C	20.4 °C - 22.8 °C
Relative Humidity:	50 % - 57 %	50 %	52 %	50 % - 52 %
ATM Pressure:	100.5kPa - 101.2kPa	101.2kPa	100.5kPa	100.5kPa - 101.5kPa
Test Result:	Pass	Pass	Pass	Pass
Test Engineer:	Leah Li	Peter Wang/Hugh Wu	Hugh Wu	Bard Liu/Jason Lu

Test Item:	OCCUPIED BANDWIDTH	POWER SPECTRAL DENSITY	TRANSMITTER OUTPUT POWER MEASUREMENT	OUT OF BAND EMISSIONS
Test Date:	2024-05-15 to 2024-06-14	2024-05-15 to 2024-06-14	2024-06-14	2024-05-15 to 2024-06-14
Temperature:	20.4 °C - 22.8 °C	20.4 °C - 22.8 °C	20.3 °C	20.4 °C - 22.8 °C
Relative Humidity:	50 % - 52 %	50 % - 52 %	52 %	50 % - 52 %
ATM Pressure:	100.5kPa - 101.5kPa	100.5kPa - 101.5kPa	101.1kPa	100.5kPa - 101.5kPa
Test Result:	Pass	Pass	Pass	/
Test Engineer:	Bard Liu/Jason Lu	Bard Liu/Jason Lu	Jason Lu	Bard Liu/Jason Lu

AC LINE CONDUCTED EMISSIONS**For Wi-Fi Mode:***EUT operation mode: Transmitting in maximum output power 802.11n-HT20 mode low channel***Line:**

Neutral:

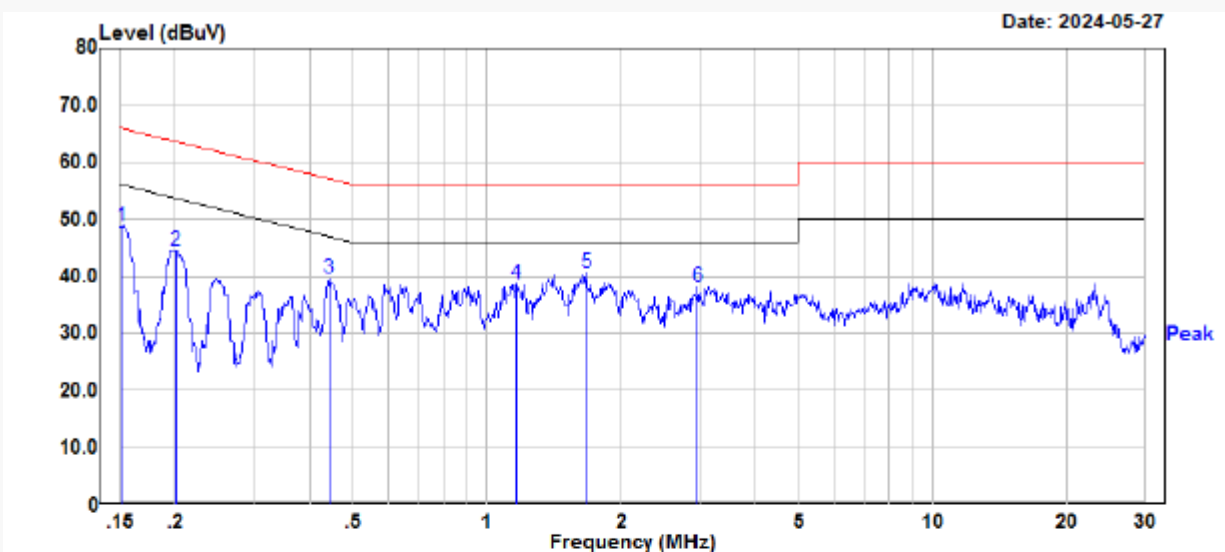


Site : CE
Condition : FCC PART 15.207
Project No. : RSHA240424001
Model : TENSO-F3
Phase : N
Voltage : 120V/60Hz
Mode : 2.4G WIFI
Test Equipment : ENV216,ESR
Temperature : 24.5℃
Humidity : 57%
Atmospheric pressure: 100.7kPa
Test Engineer : Frank Liu

	Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit Remark
	MHz	dBuV	dB	dBuV	dBuV	dB
1	0.150	32.64	20.12	52.76	66.00	-13.24 Peak
2	0.196	28.45	20.11	48.56	63.76	-15.20 Peak
3	0.447	22.14	20.23	42.37	56.93	-14.56 Peak
4	0.597	23.02	20.10	43.12	56.00	-12.88 Peak
5	0.846	22.35	19.88	42.23	56.00	-13.77 Peak
6	1.378	22.95	19.93	42.88	56.00	-13.12 Peak

For BLE Mode:

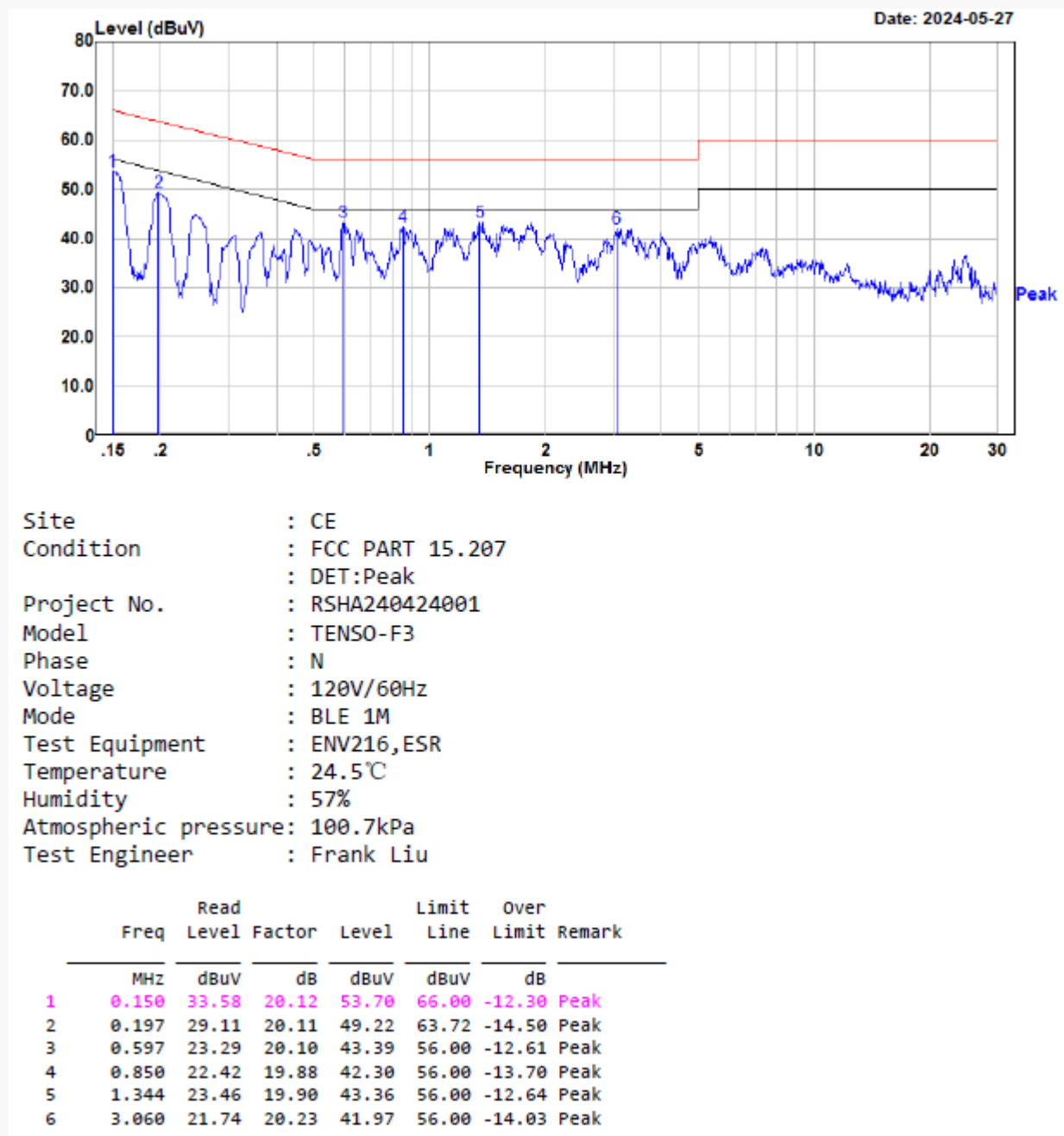
Transmitting in maximum output power channel (Low channel)

Line

Site : CE
Condition : FCC PART 15.207
: DET:Peak
Project No. : RSHA240424001
Model : TENS0-F3
Phase : L
Voltage : 120V/60Hz
Mode : BLE 1M
Test Equipment : ENV216,ESR
Temperature : 24.5℃
Humidity : 57%
Atmospheric pressure: 100.7kPa
Test Engineer : Frank Liu

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.152	28.71	20.12	48.83	65.92	-17.09	Peak
2	0.200	24.43	20.11	44.54	63.60	-19.06	Peak
3	0.442	19.48	20.23	39.71	57.02	-17.31	Peak
4	1.163	18.96	19.82	38.78	56.00	-17.22	Peak
5	1.666	20.47	20.04	40.51	56.00	-15.49	Peak
6	2.970	18.03	20.22	38.25	56.00	-17.75	Peak

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 is below:

9 kHz – 30 MHz: (Transmitting in maximum output power mode and channel)

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

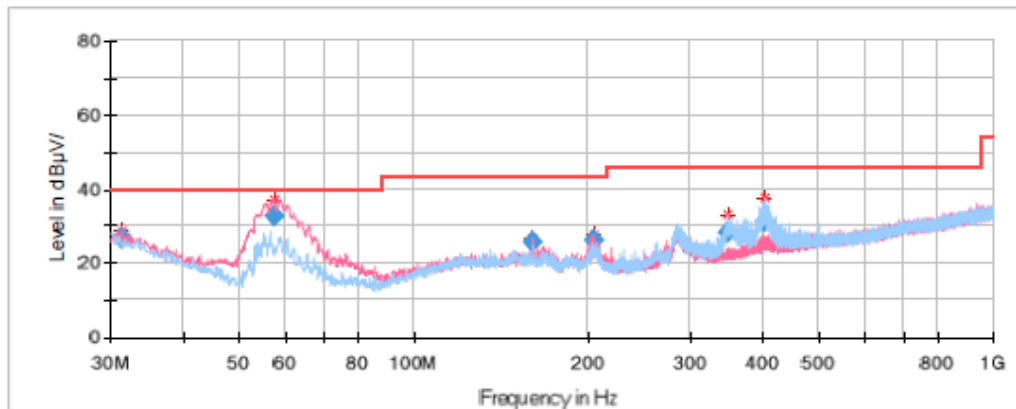
For Wi-Fi Mode: (802.11b mode is worst case)

30MHz-1GHz:

Low channel: 2412MHz

Common Information

Project No:	RSHA240424001
EUT Model:	TENSO-F3
Test Mode:	2.4G WIFI
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Equipment:	ESCI, JB3, 310N
Temperature:	23.8°C
Humidity:	50%
Barometric Pressure:	101.2kPa
Test Engineer:	Leah Li
Test Date:	2024/6/3

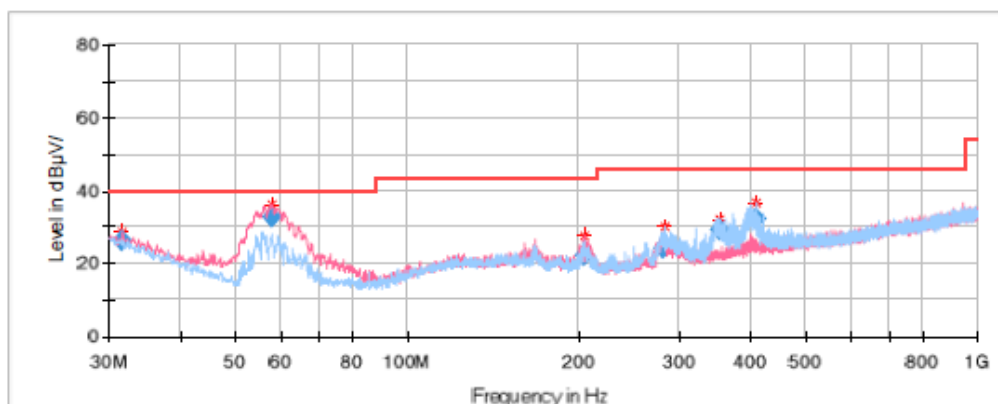


Final Result

Frequency (MHz)	QuasiPeak (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Pol	Corr. (dB/m)
31.330000	26.58	40.00	13.42	V	-4.9
57.280000	32.58	40.00	7.42	V	-17.4
160.016600	25.90	43.50	17.60	V	-12.2
204.330450	26.01	43.50	17.49	V	-12.5
347.892550	27.98	46.00	18.02	H	-9.3
404.700300	31.12	46.00	14.88	H	-7.9

Middle channel: 2437MHz**Common Information**

Project No: RSHA240424001
EUT Model: TENSO-F3
Test Mode: 2.4G WIFI
Standard: FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Equipment: ESCI, JB3, 310N
Temperature: 23.8°C
Humidity: 50%
Barometric Pressure: 101.2kPa
Test Engineer: Leah Li
Test Date: 2024/6/3

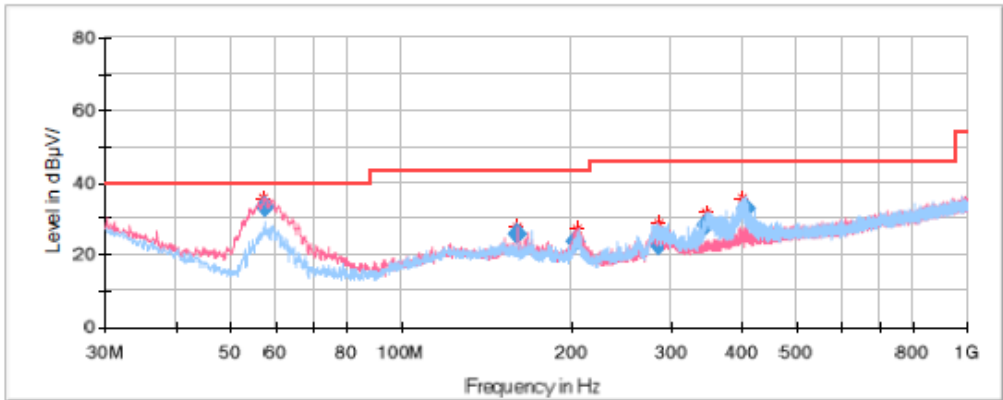
**Final Result**

Frequency (MHz)	QuasiPeak (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Pol	Corr. (dB/m)
31.690000	26.17	40.00	13.83	V	-5.4
57.760000	32.73	40.00	7.27	V	-17.3
204.021350	22.04	43.50	21.46	V	-12.5
281.694150	24.07	46.00	21.93	H	-10.6
354.005200	28.94	46.00	17.06	H	-9.2
408.780000	32.18	46.00	13.82	H	-7.8

High Channel: 2462MHz

Common Information

Project No: RSHA240424001
 EUT Model: TENSO-F3
 Test Mode: 2.4G WIFI
 Standard: FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
 Test Equipment: ESCI, JB3, 310N
 Temperature: 23.8°C
 Humidity: 50%
 Barometric Pressure: 101.2kPa
 Test Engineer: Leah Li
 Test Date: 2024/6/3



Final Result

Frequency (MHz)	QuasiPeak (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Pol	Corr. (dB/m)
57.463550	33.27	40.00	6.73	V	-17.4
159.991100	25.62	43.50	17.88	V	-12.2
203.639750	23.63	43.50	19.87	V	-12.4
284.986150	22.49	46.00	23.51	V	-10.6
345.730000	28.05	46.00	17.95	H	-9.3
405.298700	32.50	46.00	13.50	H	-7.8

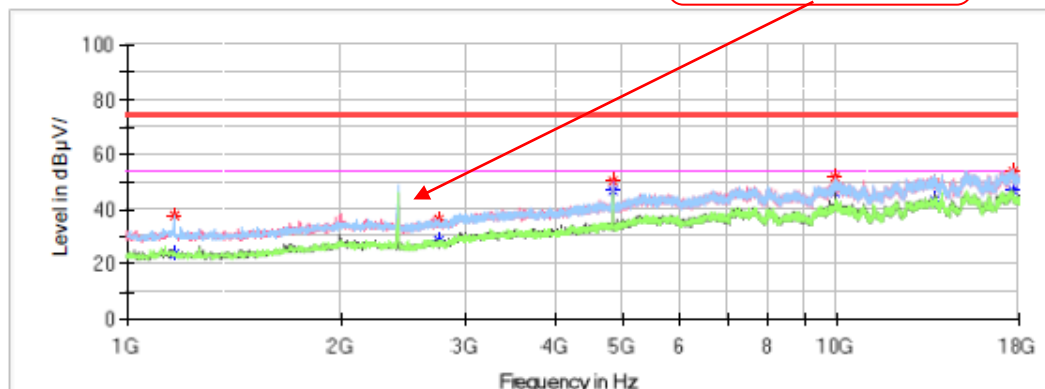
1GHz-18GHz:
802.11b Mode:

Low Channel: 2412MHz

Common Information

Project No.: RSHA240424001
 Test Mode: 2.4G Wi-Fi
 Standard: FCC Part 15.247&FCC Part 15.209&FCC Part 15.205
 Test Engineer: Peter Wang

Full Spectrum



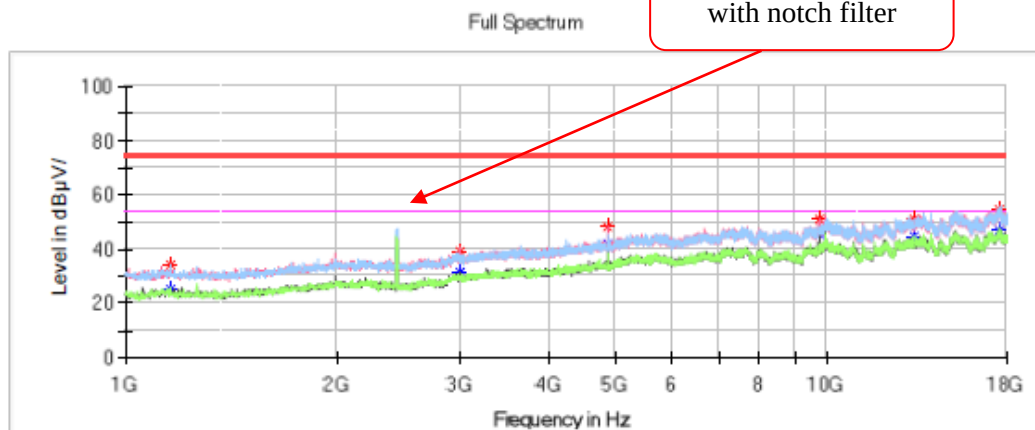
Critical Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1164.900000	37.96	---	74.00	36.04	H	-15.0
1164.900000	---	24.09	54.00	29.91	H	-15.0
2756.100000	---	28.87	54.00	25.13	V	-8.9
2756.100000	36.22	---	74.00	37.78	V	-8.9
4823.300000	---	46.86	54.00	7.14	V	-2.1
4823.300000	50.07	---	74.00	23.93	V	-2.1
9908.000000	---	45.91	54.00	8.09	V	7.5
9908.000000	51.64	---	74.00	22.36	V	7.5
13670.100000	---	43.69	54.00	10.31	V	10.8
13670.100000	49.44	---	74.00	24.56	V	10.8
17651.500000	---	46.94	54.00	7.06	V	13.0
17651.500000	53.56	---	74.00	20.44	V	13.0

Middle Channel: 2437MHz**Common Information**

Project No.: RSHA240424001
 Test Mode: 2.4G Wi-Fi
 Standard: FCC Part 15.247&FCC Part 15.209&FCC Part 15.205
 Test Engineer: Peter Wang

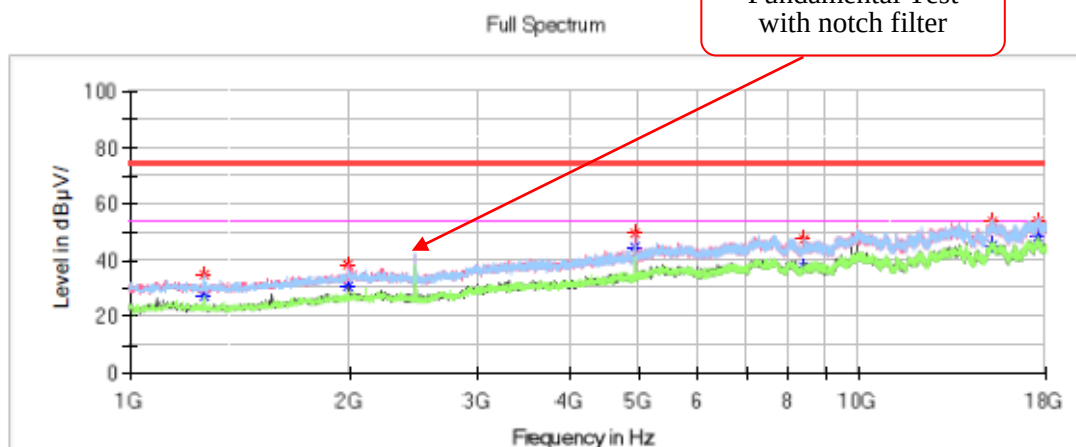
Fundamental Test
with notch filter

**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)
1159.800000	---	25.33	54.00	28.67	H	-15.0
1159.800000	34.23	---	74.00	39.77	H	-15.0
2992.400000	---	31.43	54.00	22.57	V	-8.0
2992.400000	39.39	---	74.00	34.61	V	-8.0
4872.600000	---	41.69	54.00	12.31	V	-1.9
4872.600000	48.32	---	74.00	25.68	V	-1.9
9727.800000	---	45.14	54.00	8.86	V	6.9
9727.800000	50.88	---	74.00	23.12	V	6.9
13318.200000	---	44.69	54.00	9.31	H	10.3
13318.200000	51.07	---	74.00	22.93	H	10.3
17603.900000	---	46.92	54.00	7.08	H	13.2
17603.900000	54.29	---	74.00	19.71	H	13.2

High Channel: 2462MHz**Common Information**

Project No.: RSHA240424001
 Test Mode: 2.4G Wi-Fi
 Standard: FCC Part 15.247&FCC Part 15.209&FCC Part 15.205
 Test Engineer: Peter Wang

**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)
1263.500000	---	27.15	54.00	26.85	H	-14.7
1263.500000	34.68	---	74.00	39.32	H	-14.7
1996.200000	---	30.69	54.00	23.31	V	-10.6
1996.200000	38.17	---	74.00	35.83	V	-10.6
4923.600000	---	44.47	54.00	9.53	V	-1.6
4923.600000	49.34	---	74.00	24.66	V	-1.6
8386.500000	---	37.54	54.00	16.46	H	3.9
8386.500000	47.85	---	74.00	26.15	H	3.9
15188.200000	---	45.72	54.00	8.28	H	10.8
15188.200000	53.50	---	74.00	20.50	H	10.8
17576.700000	---	48.11	54.00	5.89	H	13.3
17576.700000	53.87	---	74.00	20.13	H	13.3

802.11g Mode

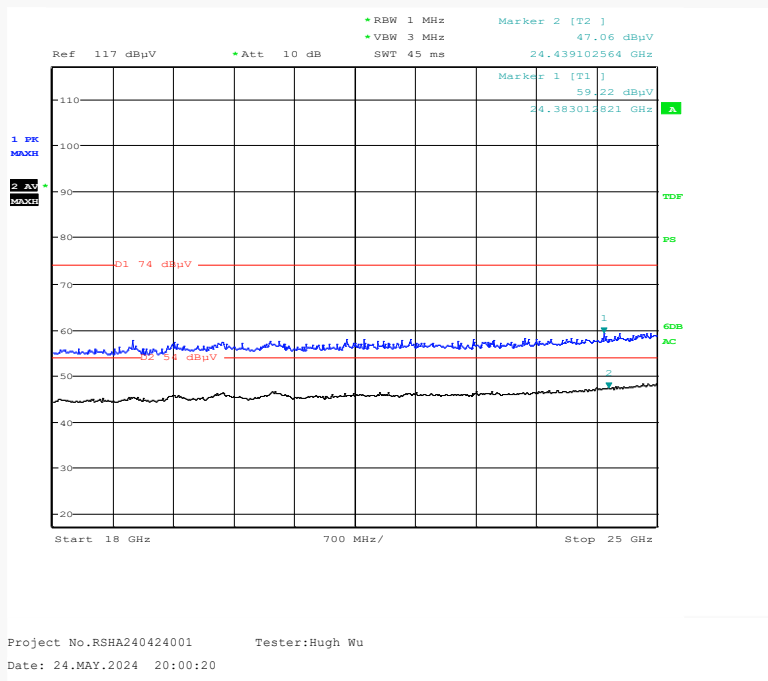
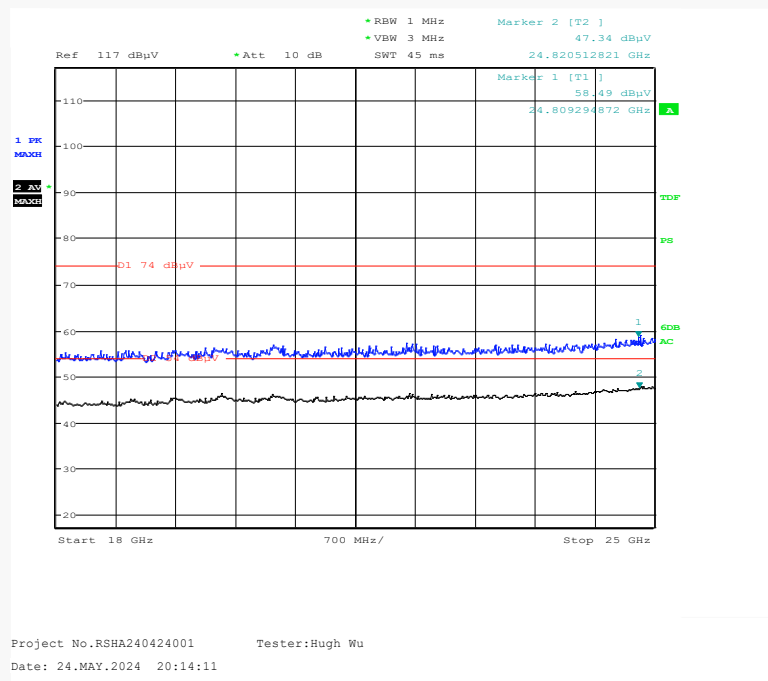
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
Low Channel: 2412 MHz						
1263.500000	---	27.26	54.00	26.74	V	-14.7
1263.500000	33.61	---	74.00	40.39	V	-14.7
2671.100000	---	27.65	54.00	26.35	V	-9.2
2671.100000	36.01	---	74.00	37.99	V	-9.2
4824.000000	---	41.73	54.00	12.27	H	-2.1
4824.000000	45.76	---	74.00	28.24	H	-2.1
7976.800000	---	38.91	54.00	15.09	H	3.8
7976.800000	47.29	---	74.00	26.71	H	3.8
9908.000000	---	48.69	54.00	5.31	H	7.5
9908.000000	53.42	---	74.00	20.58	H	7.5
15223.900000	---	45.32	54.00	8.68	V	10.9
15223.900000	53.28	---	74.00	20.72	V	10.9
Middle Channel: 2437 MHz						
1263.500000	---	27.08	54.00	26.92	H	-14.7
1263.500000	31.97	---	74.00	42.03	H	-14.7
3301.800000	---	32.90	54.00	21.10	H	-6.9
3301.800000	41.40	---	74.00	32.60	H	-6.9
4874.000000	---	40.28	54.00	13.72	V	-1.9
4874.000000	45.18	---	74.00	28.82	V	-1.9
9848.500000	---	42.77	54.00	11.23	V	7.3
9848.500000	51.26	---	74.00	22.74	V	7.3
13535.800000	---	41.85	54.00	12.15	H	11.0
13535.800000	52.01	---	74.00	21.99	H	11.0
17600.500000	---	47.32	54.00	6.68	H	13.2
17600.500000	53.68	---	74.00	20.32	H	13.2
High Channel: 2462 MHz						
1263.500000	---	27.82	54.00	26.18	H	-14.7
1263.500000	33.56	---	74.00	40.44	H	-14.7
3041.700000	---	28.92	54.00	25.08	V	-7.9
3041.700000	37.87	---	74.00	36.13	V	-7.9
4923.600000	---	41.48	54.00	12.52	H	-1.6
4923.600000	45.70	---	74.00	28.30	H	-1.6
7545.000000	---	39.68	54.00	14.32	V	4.2
7545.000000	49.45	---	74.00	24.55	V	4.2
13093.800000	---	43.16	54.00	10.84	H	9.4
13093.800000	52.54	---	74.00	21.46	H	9.4
17580.100000	---	46.81	54.00	7.19	H	13.3
17580.100000	54.28	---	74.00	19.72	H	13.3

802.11n20 Mode

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
Low Channel: 2412 MHz						
1263.500000	---	28.19	54.00	25.81	V	-14.7
1263.500000	33.40	---	74.00	40.60	V	-14.7
2864.900000	---	27.90	54.00	26.10	H	-8.5
2864.900000	37.05	---	74.00	36.95	H	-8.5
4824.000000	---	41.64	54.00	12.36	H	-2.1
4824.000000	47.79	---	74.00	26.21	H	-2.1
9727.800000	---	44.21	54.00	9.79	V	6.9
9727.800000	50.18	---	74.00	23.82	V	6.9
13724.500000	---	44.22	54.00	9.78	V	10.8
13724.500000	53.38	---	74.00	20.62	V	10.8
17597.100000	---	46.97	54.00	7.03	H	13.2
17597.100000	54.23	---	74.00	19.77	H	13.2
Middle Channel: 2437 MHz						
1263.500000	33.73	---	74.00	40.27	H	-14.7
1263.500000	---	28.32	54.00	25.68	H	-14.7
2878.500000	36.49	---	74.00	37.51	V	-8.4
2878.500000	---	29.09	54.00	24.91	V	-8.4
4874.000000	45.87	---	74.00	28.13	V	-1.9
4874.000000	---	40.69	54.00	13.31	V	-1.9
9406.500000	49.01	---	74.00	24.99	H	5.7
9406.500000	---	39.65	54.00	14.35	H	5.7
13522.200000	52.24	---	74.00	21.76	V	11.0
13522.200000	---	43.43	54.00	10.57	V	11.0
17597.100000	---	46.20	54.00	7.80	H	13.2
17597.100000	54.74	---	74.00	19.26	H	13.2
High Channel: 2462 MHz						
1198.900000	31.73	---	74.00	42.27	H	-14.9
1198.900000	---	24.80	54.00	29.20	H	-14.9
2739.100000	34.46	---	74.00	39.54	H	-8.9
2739.100000	---	28.11	54.00	25.89	H	-8.9
4923.600000	46.24	---	74.00	27.76	V	-1.6
4923.600000	---	40.92	54.00	13.08	V	-1.6
9668.300000	49.14	---	74.00	24.86	H	6.8
9668.300000	---	42.41	54.00	11.59	H	6.8
12757.200000	51.70	---	74.00	22.30	V	8.7
12757.200000	---	43.10	54.00	10.90	V	8.7
17592.000000	---	45.90	54.00	8.10	H	13.2
17592.000000	55.63	---	74.00	18.37	H	13.2

802.11n40 Mode

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
Low Channel: 2422MHz						
1263.500000	32.73	---	74.00	41.27	V	-14.7
1263.500000	---	27.35	54.00	26.65	V	-14.7
2931.200000	37.52	---	74.00	36.48	H	-8.3
2931.200000	---	30.59	54.00	23.41	H	-8.3
4844.000000	47.00	---	74.00	27.00	V	-2.0
4844.000000	---	41.64	54.00	12.36	V	-2.0
8726.500000	48.18	---	74.00	25.82	V	3.8
8726.500000	---	38.66	54.00	15.34	V	3.8
12614.400000	49.88	---	74.00	24.12	H	8.6
12614.400000	---	43.15	54.00	10.85	H	8.6
17564.800000	53.47	---	74.00	20.53	H	13.3
17564.800000	---	48.13	54.00	5.87	H	13.3
Middle Channel: 2437 MHz						
1176.800000	---	21.13	54.00	32.87	V	-15.2
1176.800000	29.82	---	74.00	44.18	V	-15.2
3759.100000	---	30.45	54.00	23.55	V	-6.1
3759.100000	39.25	---	74.00	34.75	V	-6.1
6727.300000	---	36.53	54.00	17.47	V	1.5
6727.300000	46.80	---	74.00	27.20	V	1.5
9916.500000	---	41.40	54.00	12.60	V	6.9
9916.500000	51.57	---	74.00	22.43	V	6.9
14005.000000	52.65	---	74.00	21.35	H	9.8
14005.000000	---	44.67	54.00	9.33	H	9.8
17622.600000	---	45.97	54.00	8.03	V	11.6
17622.600000	54.46	---	74.00	19.54	V	11.6
High Channel: 2452 MHz						
1158.100000	---	27.03	54.00	26.97	H	-15.0
1158.100000	34.41	---	74.00	39.59	H	-15.0
2907.400000	---	30.23	54.00	23.77	H	-8.3
2907.400000	38.02	---	74.00	35.98	H	-8.3
4904.000000	---	41.51	54.00	12.49	H	-1.6
4904.000000	47.04	---	74.00	26.96	H	-1.6
9908.000000	---	47.81	54.00	6.19	V	7.5
9908.000000	52.45	---	74.00	21.55	V	7.5
13258.700000	50.94	---	74.00	23.06	V	10.0
13258.700000	---	42.48	54.00	11.52	V	10.0
17563.100000	---	45.84	54.00	8.16	H	13.4
17563.100000	54.86	---	74.00	19.14	H	13.4

18GHz-25GHz: Transmitting in maximum output power 802.11n-HT20 mode low channel**Horizontal****Vertical**

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

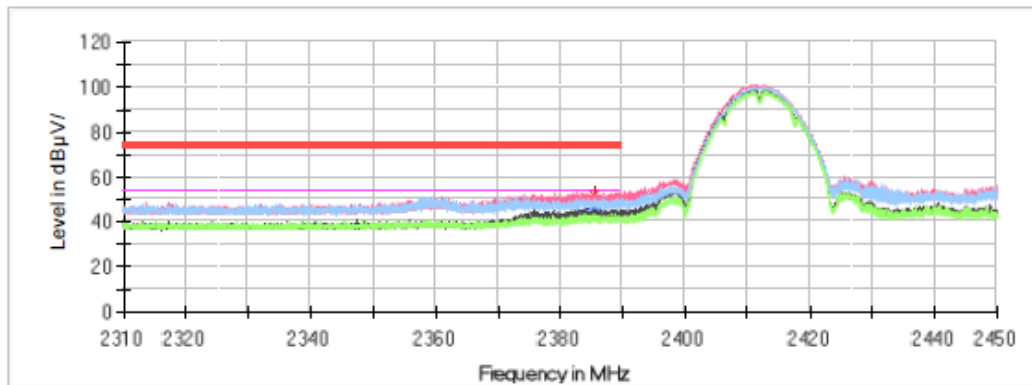
Band Edge:
802.11b Mode:

Low Channel

Common Information

Project No.: RSHA240424001
Test Mode: 2.4G Wi-Fi
Standard: FCC Part 15.247&FCC Part 15.209&FCC Part 15.205
Test Engineer: Peter Wang

Full Spectrum



Critical Freqs

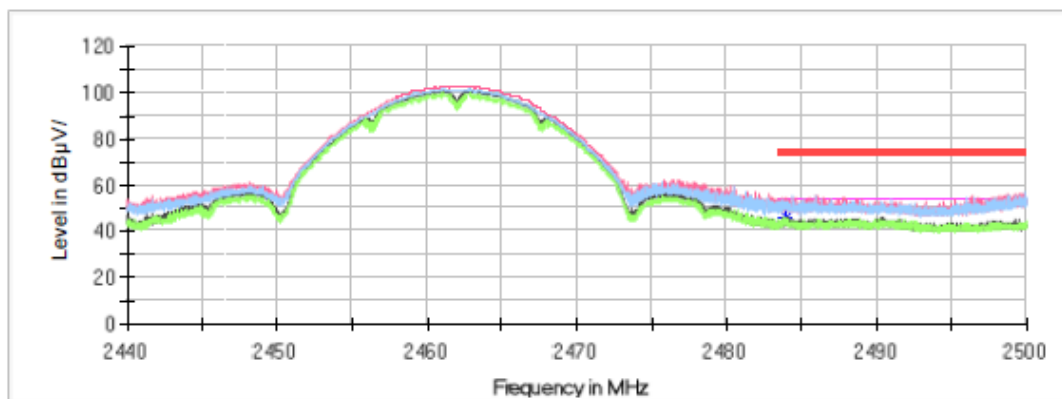
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2385.320000	51.62	---	74.00	22.38	V	0.1
2385.320000	---	46.27	54.00	7.73	V	0.1

High Channel

Common Information

Project No.: RSHA240424001
Test Mode: 2.4G Wi-Fi
Standard: FCC Part 15.247&FCC Part 15.209&FCC Part 15.205
Test Engineer: Peter Wang

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)
2483.986000	50.62	---	74.00	23.38	V	0.2
2483.986000	---	46.39	54.00	7.61	V	0.2

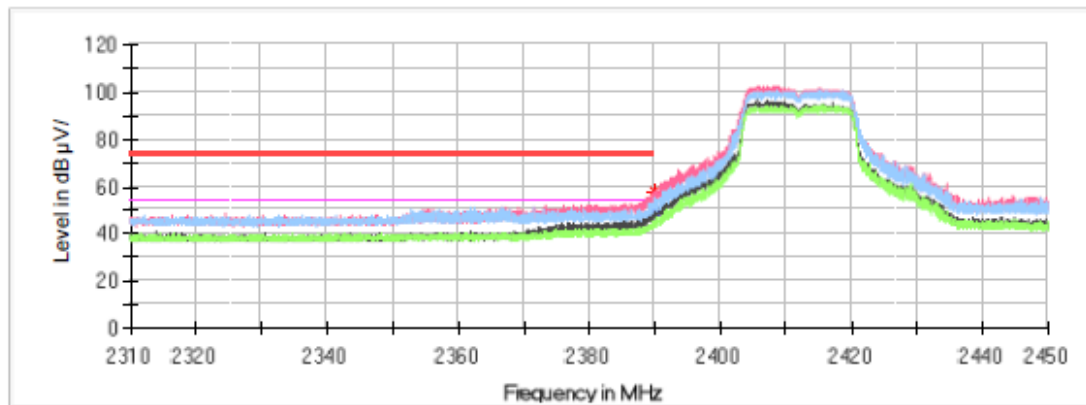
802.11g Mode :

Low Channel

Common Information

Project No.: RSHA240424001
Test Mode: 2.4G Wi-Fi
Standard: FCC Part 15.247&FCC Part 15.209&FCC Part 15.205
Test Engineer: Peter Wang

Full Spectrum



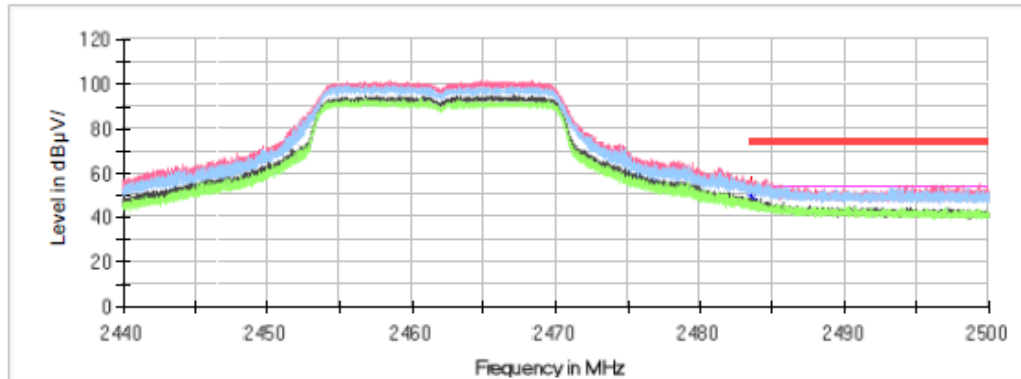
Critical Freqs

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2389.856000	57.94	---	74.00	16.06	V	0.1
2389.856000	---	49.30	54.00	4.70	V	0.1

High Channel**Common Information**

Project No.: RSHA240424001
Test Mode: 2.4G Wi-Fi
Standard: FCC Part 15.247&FCC Part 15.209&FCC Part 15.205
Test Engineer: Peter Wang

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	54.39	---	74.00	19.61	H	0.2
2483.542000	---	50.89	54.00	3.11	V	0.2

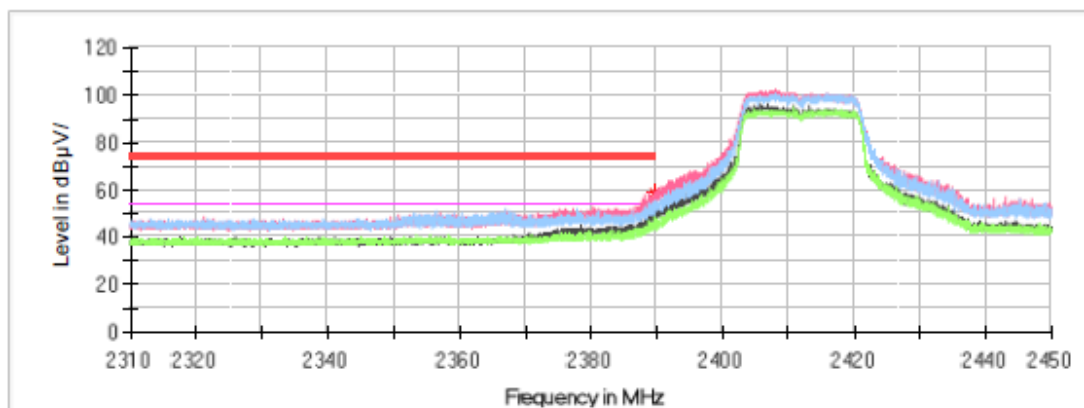
802.11n-HT20 Mode:

Low Channel

Common Information

Project No.: RSHA240424001
Test Mode: 2.4G Wi-Fi
Standard: FCC Part 15.247&FCC Part 15.209&FCC Part 15.205
Test Engineer: Peter Wang

Full Spectrum



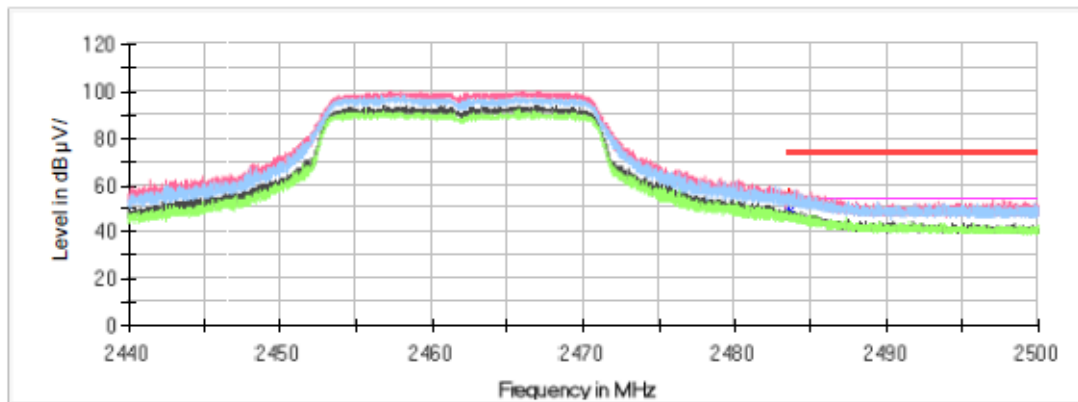
Critical Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2389.688000	59.02	---	74.00	14.98	V	0.1
2389.688000	---	51.12	54.00	2.88	V	0.1

High Channel**Common Information**

Project No.: RSHA240424001
Test Mode: 2.4G Wi-Fi
Standard: FCC Part 15.247&FCC Part 15.209&FCC Part 15.205
Test Engineer: Peter Wang

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)
2483.530000	55.41	---	74.00	18.59	V	0.2
2483.530000	---	49.00	54.00	5.00	V	0.2

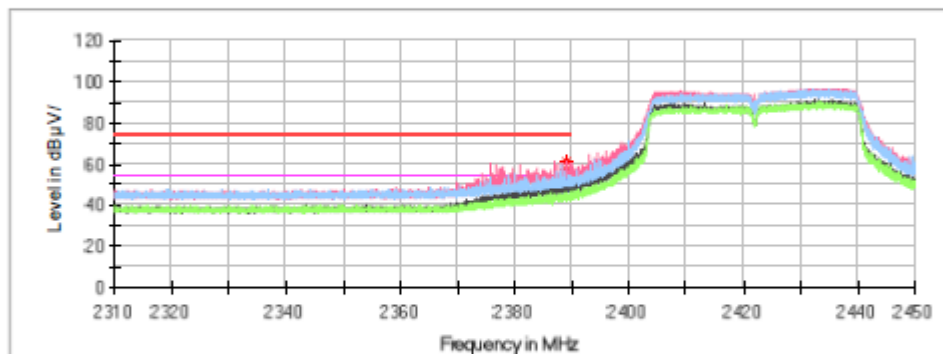
802.11n-HT40 Mode:

Low Channel

Common Information

Project No.: RSHA240424001
Test Mode: 2.4G Wi-Fi
Standard: FCC Part 15.247&FCC Part 15.209&FCC Part 15.205
Test Engineer: Peter Wang

Full Spectrum



Critical Freqs

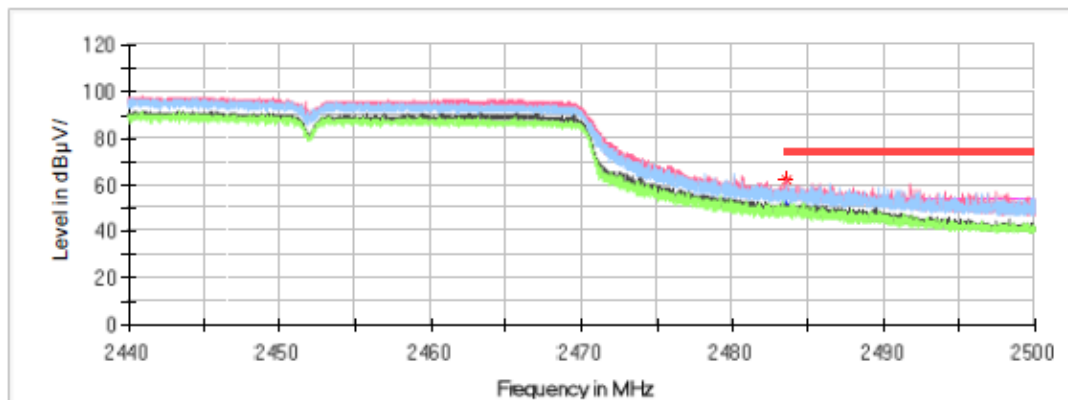
Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2389.086000	—	47.55	54.00	6.45	V	0.1
2389.086000	61.63	—	74.00	12.37	V	0.1
2389.142000	—	50.54	54.00	3.46	V	0.1
2389.142000	57.00	—	74.00	17.00	V	0.1

High Channel

Common Information

Project No.: RSHA240424001
Test Mode: 2.4G Wi-Fi
Standard: FCC Part 15.247&FCC Part 15.209&FCC Part 15.205
Test Engineer: Peter Wang

Full Spectrum



Critical Freqs

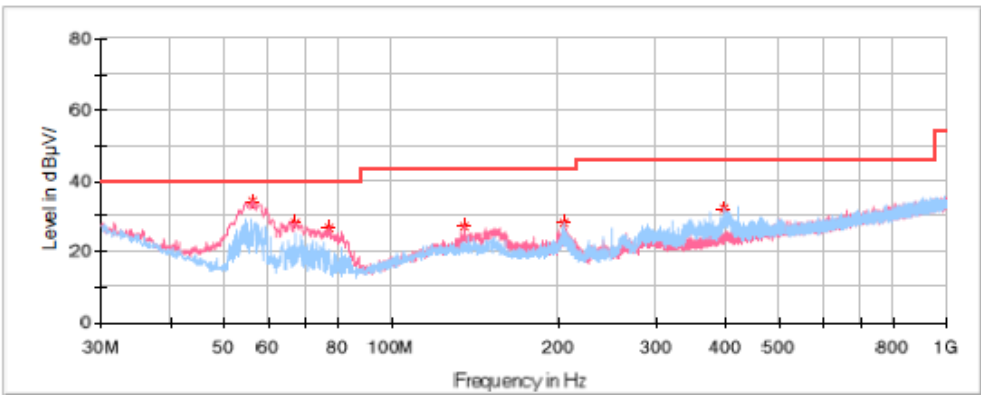
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2483.614000	62.42	---	74.00	11.58	V	0.2
2483.614000	---	51.54	54.00	2.46	V	0.2

**For BLE Mode:
30MHz-1GHz**

Low Channel: 2402MHz

Common Information

Project No:	RSHA240424001
EUT Model:	TENSO-F3
Test Mode:	BLE 1M
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Equipment:	ESCI, JB3, 310N
Temperature:	23.4°C
Humidity:	57%
Barometric Pressure:	100.5kPa
Test Engineer:	Leah Li
Test Date:	2024/6/12



Critical Freqs

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
56.190000	33.99	40.00	6.01	V	-17.3
67.102500	28.19	40.00	11.81	V	-17.2
77.166250	26.55	40.00	13.45	V	-17.3
135.487500	27.07	43.50	16.43	V	-11.3
203.751250	28.23	43.50	15.27	H	-12.4
397.387500	32.30	46.00	13.70	H	-8.0

Middle Channel: 2440MHz

Common Information

Project No: RSHA240424001

EUT Model: TENSO-F3

Test Mode: BLE 1M

Standard: FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209

Test Equipment: ESCI, JB3, 310N

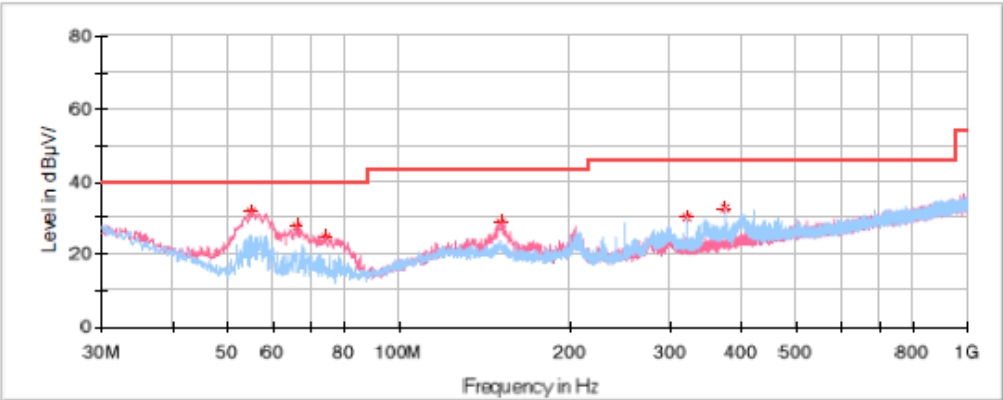
Temperature: 23.4°C

Humidity: 57%

Barometric Pressure: 100.5kPa

Test Engineer: Leah Li

Test Date: 2024/6/12



Critical Freqs

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
54.977500	31.51	40.00	8.49	V	-17.2
65.890000	27.52	40.00	12.48	V	-17.3
74.135000	24.58	40.00	15.42	V	-17.2
151.613750	28.56	43.50	14.94	V	-11.8
320.030000	30.41	46.00	15.59	H	-10.0
375.077500	32.52	46.00	13.48	H	-8.6

High Channel: 2480MHz

Common Information

Project No:

EUT Model:

Test Mode:

Standard:

Test Equipment:

Temperature:

Humidity:

Barometric Pressure:

Test Engineer:

Test Date:

RSHA240424001

TENSO-F3

BLE 1M

FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209

ESCI, JB3, 310N

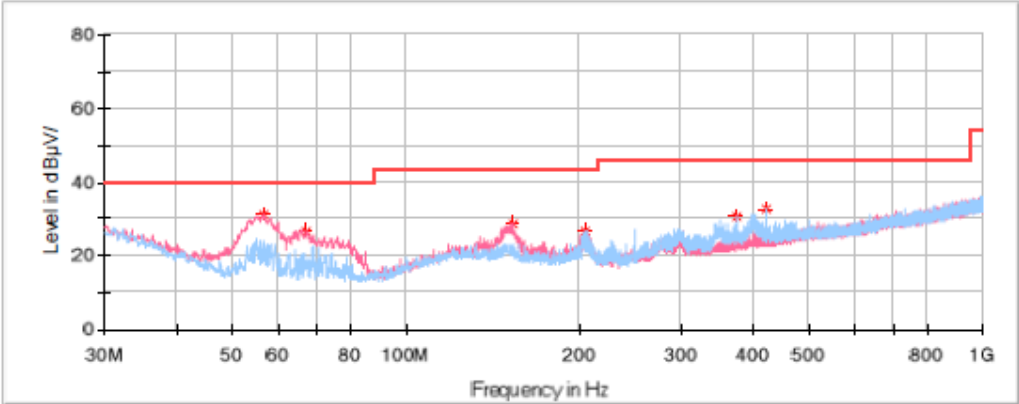
23.4℃

57%

100.5kPa

Leah Li

2024/6/12



Critical Freqs

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
56.553750	31.17	40.00	8.83	V	-17.3
67.223750	26.86	40.00	13.14	V	-17.2
153.068750	28.57	43.50	14.93	V	-11.9
204.600000	26.60	43.50	16.90	H	-12.5
374.956250	30.78	46.00	15.22	H	-8.6
421.637500	32.65	46.00	13.35	H	-7.4

1GHz-18GHz:

Low Channel: 2402MHz

Common Information

Project No.:

RSHA240424001

Test Mode:

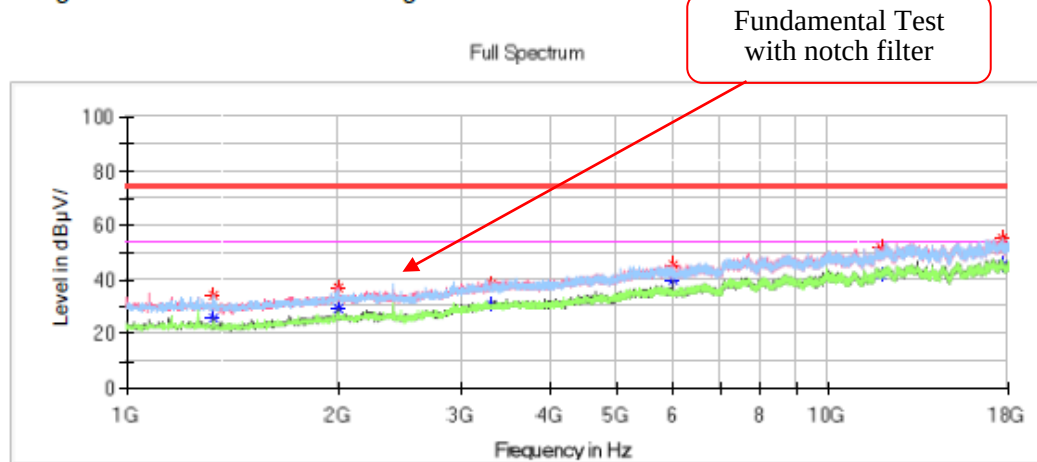
BLE 1M

Standard:

FCC Part 15.247&FCC Part 15.209&FCC Part 15.205

Test Engineer:

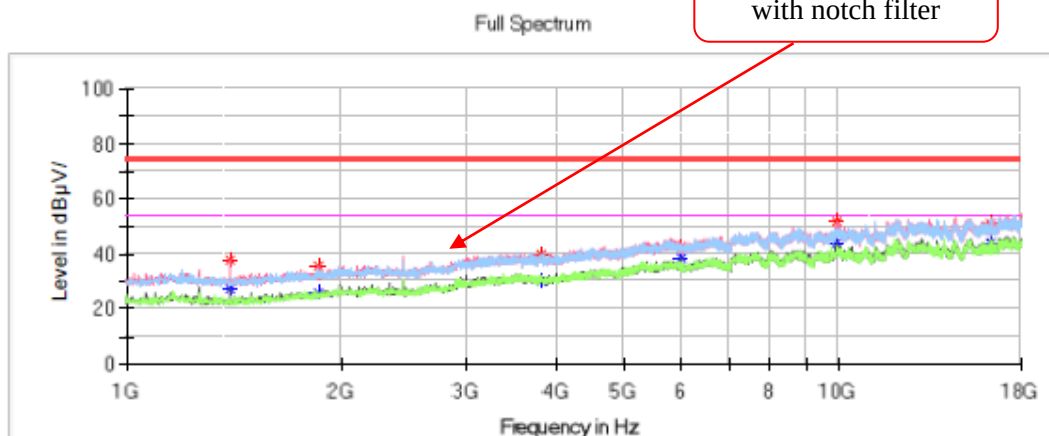
Hugh Wu

**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)
1326.400000	---	25.73	54.00	28.27	V	-15.0
1326.400000	33.96	---	74.00	40.04	V	-15.0
1997.900000	---	29.28	54.00	24.72	V	-11.8
1997.900000	37.11	---	74.00	36.89	V	-11.8
3318.800000	---	30.64	54.00	23.36	V	-7.1
3318.800000	38.57	---	74.00	35.43	V	-7.1
5999.700000	45.43	---	74.00	28.57	V	0.0
5999.700000	---	39.87	54.00	14.13	V	0.0
11847.700000	---	42.21	54.00	11.79	V	8.9
11847.700000	51.60	---	74.00	22.40	V	8.9
17643.000000	---	45.47	54.00	8.53	H	11.7
17643.000000	54.95	---	74.00	19.05	H	11.7

Middle Channel: 2440MHz**Common Information**

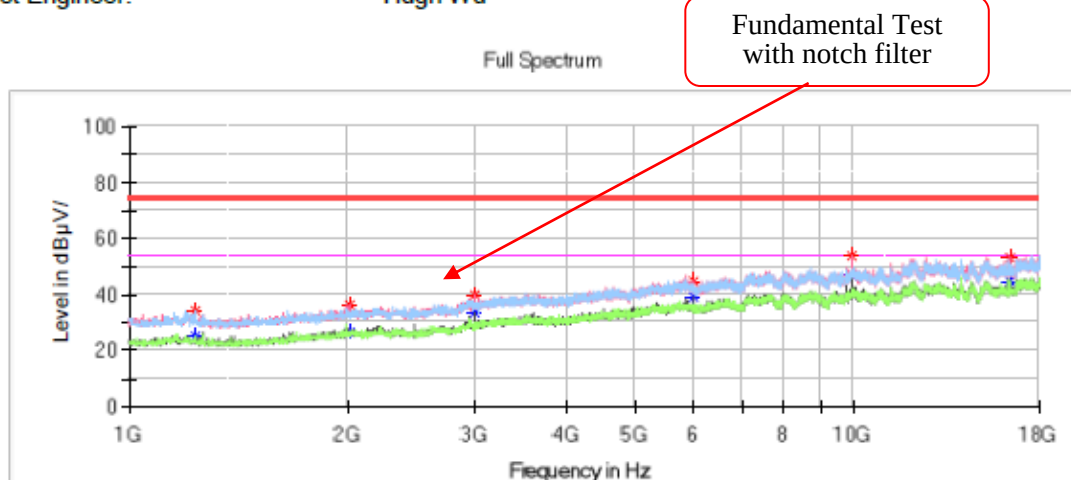
Project No.: RSHA240424001
 Test Mode: BLE 1M
 Standard: FCC Part 15.247&FCC Part 15.209&FCC Part 15.205
 Test Engineer: Hugh Wu

**Critical Freqs**

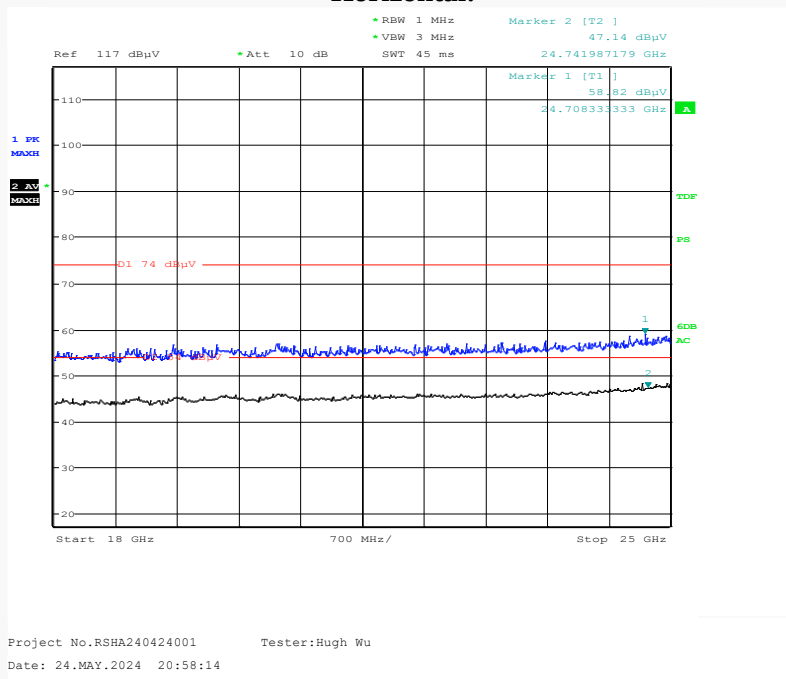
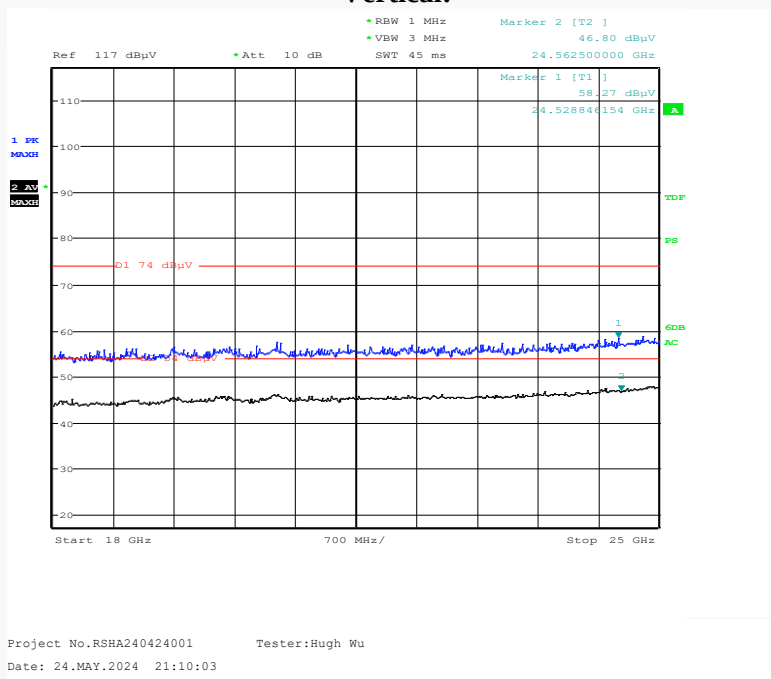
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1399.500000	38.00	---	74.00	36.00	V	-14.9
1399.500000	---	27.10	54.00	26.90	V	-14.9
1860.200000	35.97	---	74.00	38.03	V	-12.6
1860.200000	---	25.59	54.00	28.41	V	-12.6
3810.100000	39.89	---	74.00	34.11	H	-6.1
3810.100000	---	30.22	54.00	23.78	H	-6.1
5999.700000	---	38.33	54.00	15.67	V	0.0
5999.700000	42.95	---	74.00	31.05	V	0.0
9908.000000	51.55	---	74.00	22.45	V	6.7
9908.000000	---	44.32	54.00	9.68	V	6.7
16315.300000	51.21	---	74.00	22.79	V	10.3
16315.300000	---	44.01	54.00	9.99	V	10.3

High Channel: 2480MHz**Common Information**

Project No.: RSHA240424001
 Test Mode: BLE 1M
 Standard: FCC Part 15.247&FCC Part 15.209&FCC Part 15.205
 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)
1231.200000	---	25.00	54.00	29.00	H	-15.1
1231.200000	34.50	---	74.00	39.50	H	-15.1
2014.900000	---	26.84	54.00	27.16	V	-11.7
2014.900000	36.14	---	74.00	37.86	V	-11.7
2990.700000	---	33.27	54.00	20.73	V	-8.5
2990.700000	40.14	---	74.00	33.86	V	-8.5
5999.700000	---	39.00	54.00	15.00	V	0.0
5999.700000	44.47	---	74.00	29.53	V	0.0
9908.000000	---	47.02	54.00	6.98	V	6.7
9908.000000	53.50	---	74.00	20.50	V	6.7
16356.100000	---	44.79	54.00	9.21	V	10.4
16356.100000	52.97	---	74.00	21.03	V	10.4

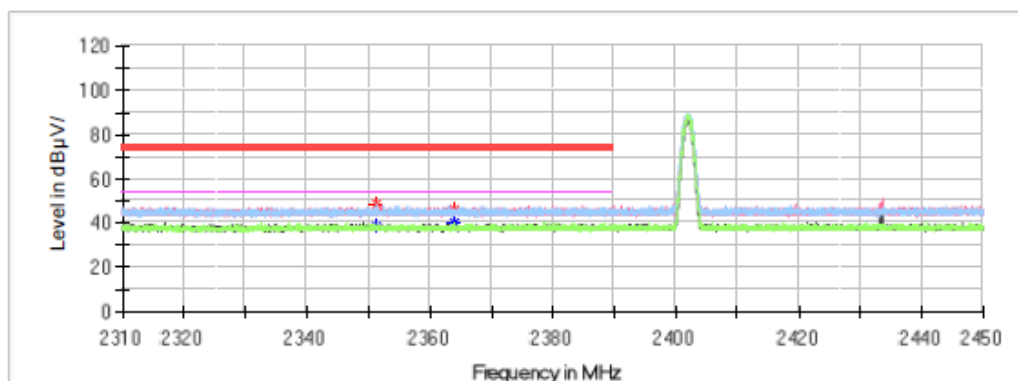
18GHz-25GHz: (Transmitting in maximum output power mode low channel)**Horizontal:****Vertical:**

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

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

Project No.: RSHA240424001
Test Mode: BLE 1M
Standard: FCC Part 15.247&FCC Part 15.209&FCC Part 15.205
Test Engineer: Hugh Wu

Full Spectrum

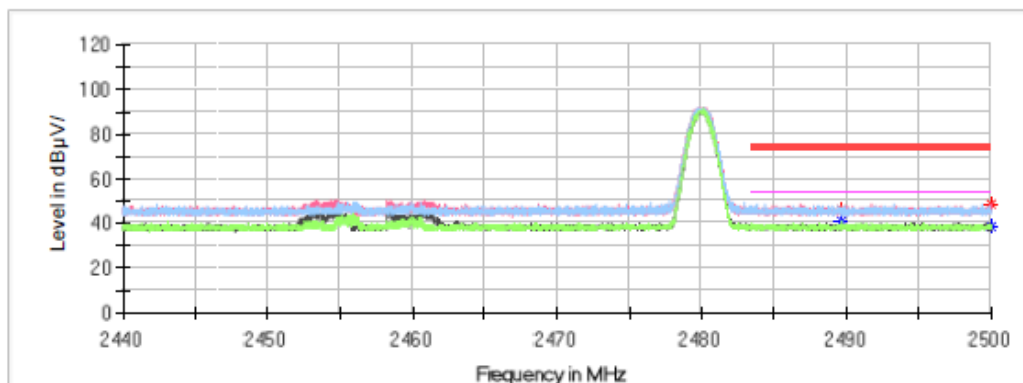
**Critical Freqs**

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2351.258000	48.55	---	74.00	25.45	H	-0.7
2351.258000	---	38.30	54.00	15.70	H	-0.7
2364.026000	45.84	---	74.00	28.16	H	-0.7
2364.026000	---	40.34	54.00	13.66	H	-0.7

High Channel**Common Information**

Project No.: RSHA240424001
Test Mode: BLE 1M
Standard: FCC Part 15.247&FCC Part 15.209&FCC Part 15.205
Test Engineer: Hugh Wu

Full Spectrum

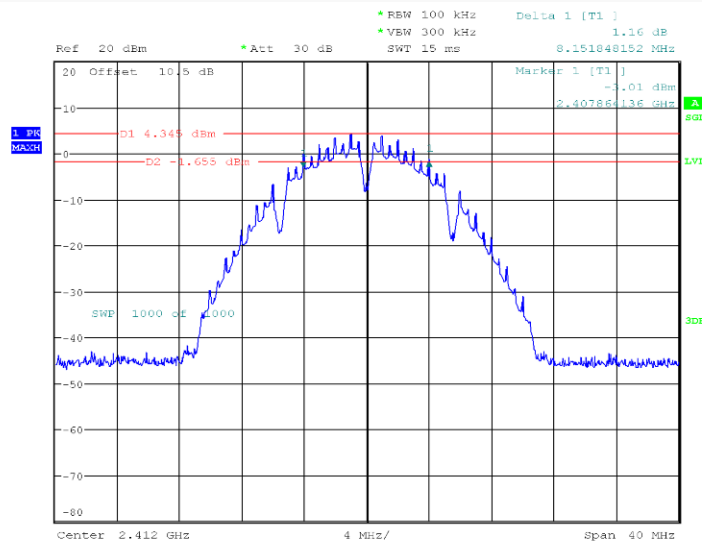
**Critical Freqs**

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2489.602000	---	40.84	54.00	13.16	H	-0.2
2489.602000	46.14	---	74.00	27.86	H	-0.2
2499.946000	---	38.43	54.00	15.57	V	-0.2
2499.946000	49.02	---	74.00	24.98	V	-0.2

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

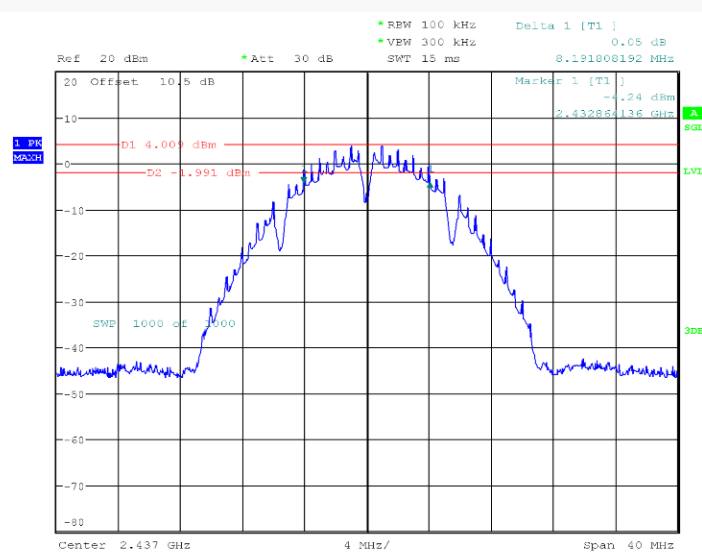
Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (MHz)
802.11b Mode			
Low	2412	8.152	≥ 0.5
Middle	2437	8.192	≥ 0.5
High	2462	8.152	≥ 0.5
802.11g Mode			
Low	2412	15.824	≥ 0.5
Middle	2437	16.024	≥ 0.5
High	2462	15.824	≥ 0.5
802.11n-HT20 Mode			
Low	2412	16.184	≥ 0.5
Middle	2437	16.743	≥ 0.5
High	2462	16.424	≥ 0.5
802.11n-HT40 Mode			
Low	2422	36.124	≥ 0.5
Middle	2437	35.564	≥ 0.5
High	2452	35.325	≥ 0.5

802.11b Mode Low Channel



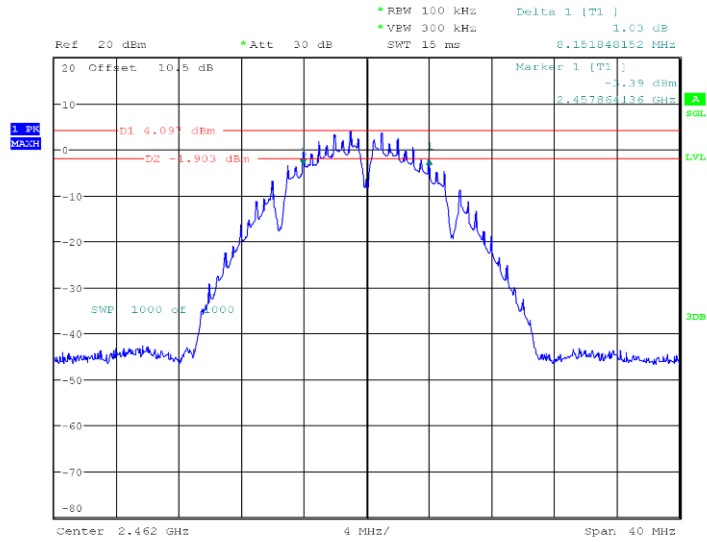
ProjectNo.:RSHA240424001 Tester:Bard Liu
 Date: 15.MAY.2024 10:15:01

802.11b Mode Middle Channel



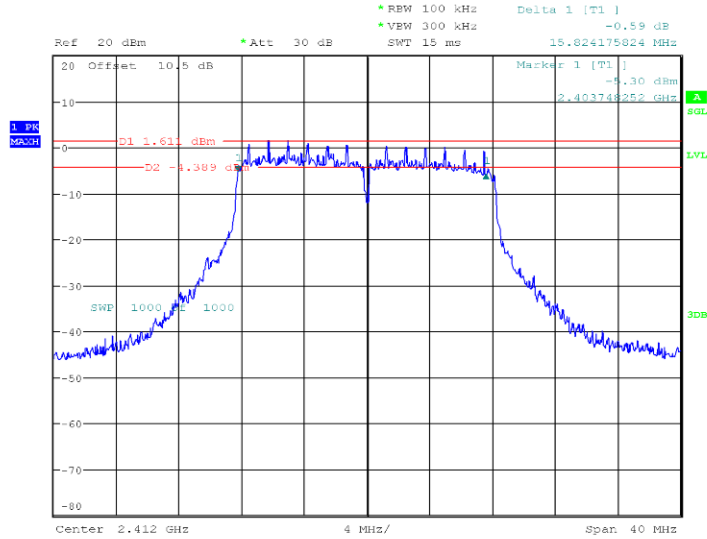
ProjectNo.:RSHA240424001 Tester:Bard Liu
 Date: 15.MAY.2024 10:25:11

802.11b Mode High Channel



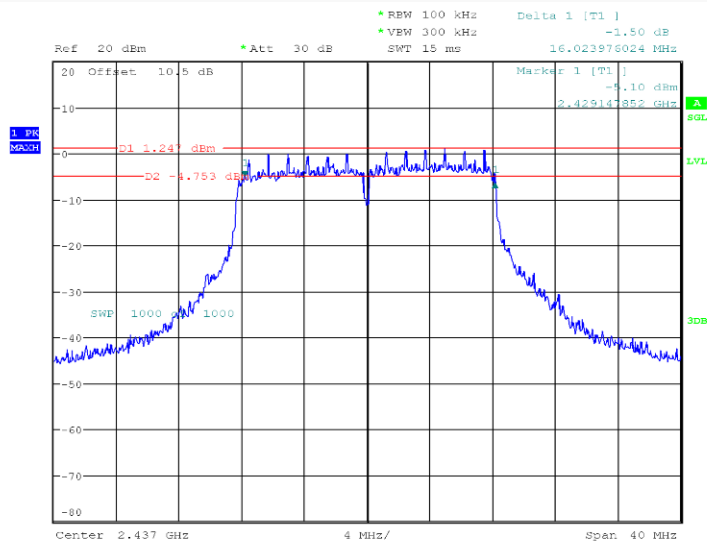
ProjectNo.:RSHA240424001 Tester:Bard Liu
 Date: 15.MAY.2024 10:56:56

802.11g Mode Low Channel



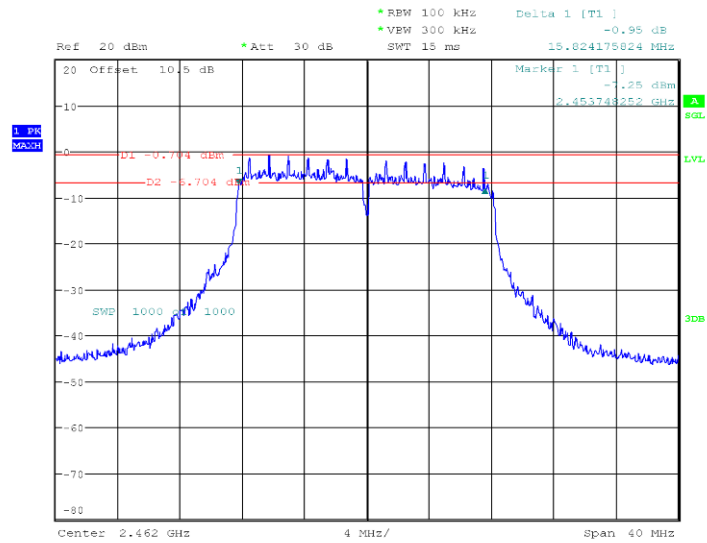
ProjectNo.:RSHA240424001 Tester:Bard Liu
 Date: 15.MAY.2024 11:03:26

802.11g Mode Middle Channel



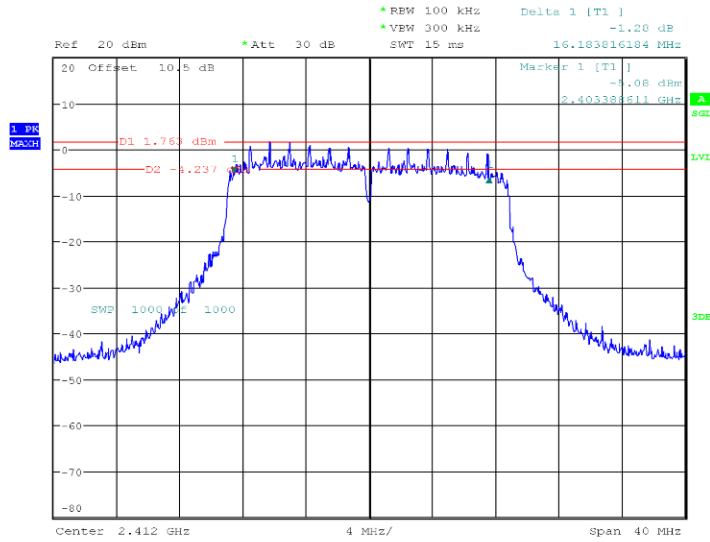
ProjectNo.:RSHA240424001 Tester:Bard Liu
 Date: 15.MAY.2024 11:18:34

802.11g Mode High Channel



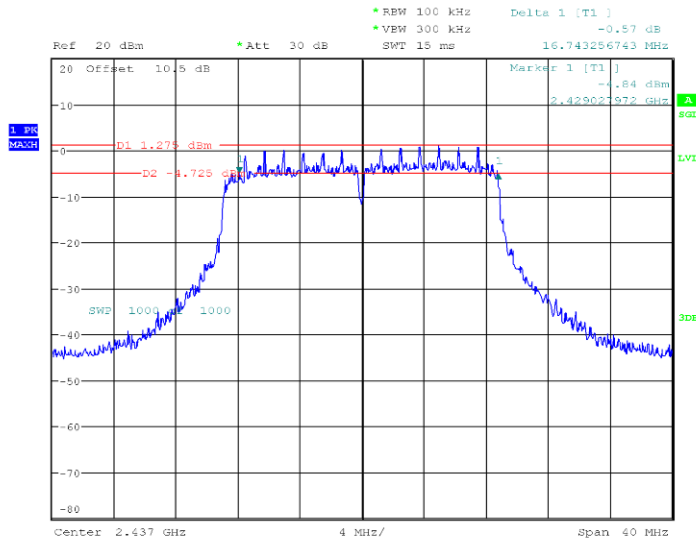
ProjectNo.:RSHA240424001 Tester:Bard Liu
 Date: 15.MAY.2024 11:28:09

802.11n-HT20 Mode Low Channel



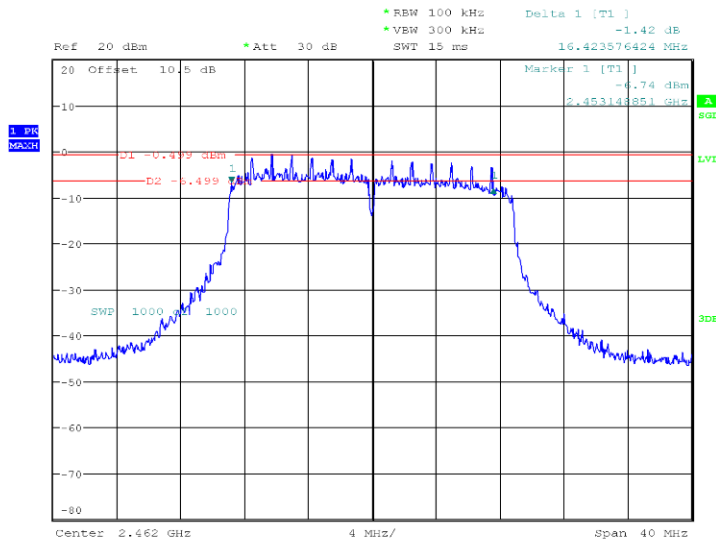
ProjectNo.:RSHA240424001 Tester:Bard Liu
 Date: 15.MAY.2024 11:55:05

802.11n-HT20 Mode Middle Channel



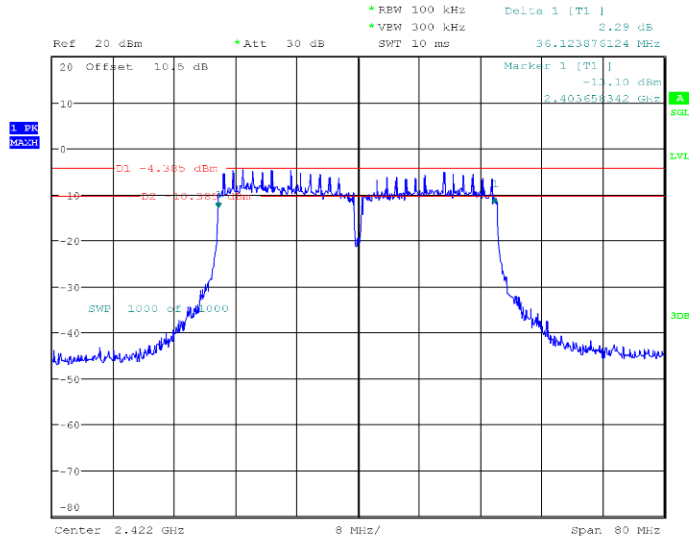
ProjectNo.:RSHA240424001 Tester:Bard Liu
 Date: 15.MAY.2024 13:13:39

802.11n-HT20 Mode High Channel



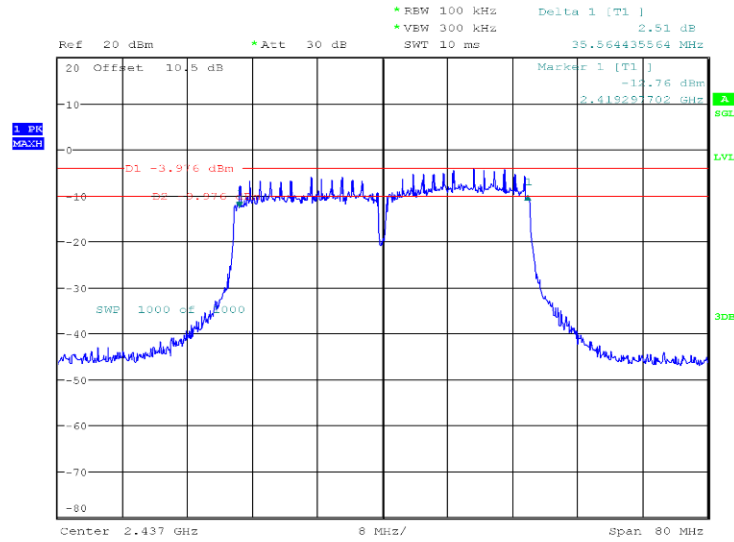
ProjectNo.:RSHA240424001 Tester:Bard Liu
 Date: 15.MAY.2024 13:22:23

802.11n-HT40 Mode Low Channel



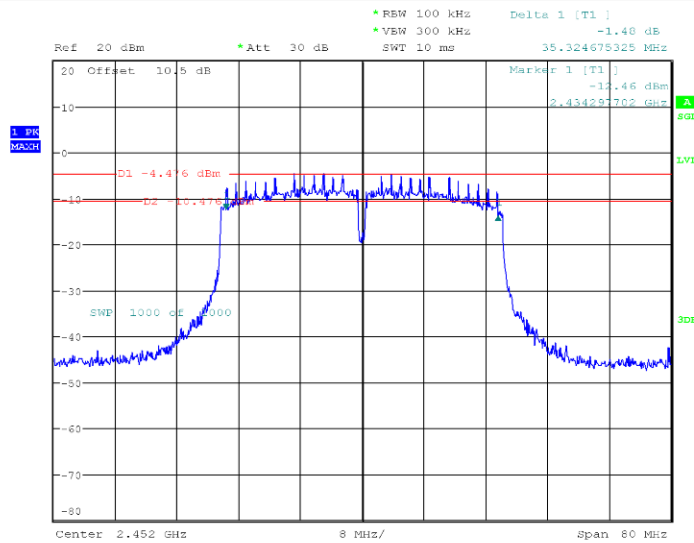
ProjectNo.:RSHA240424001 Tester:Bard Liu
 Date: 15.MAY.2024 13:34:22

802.11n-HT40 Mode Middle Channel



ProjectNo.:RSHA240424001 Tester:Bard Liu
 Date: 15.MAY.2024 14:01:36

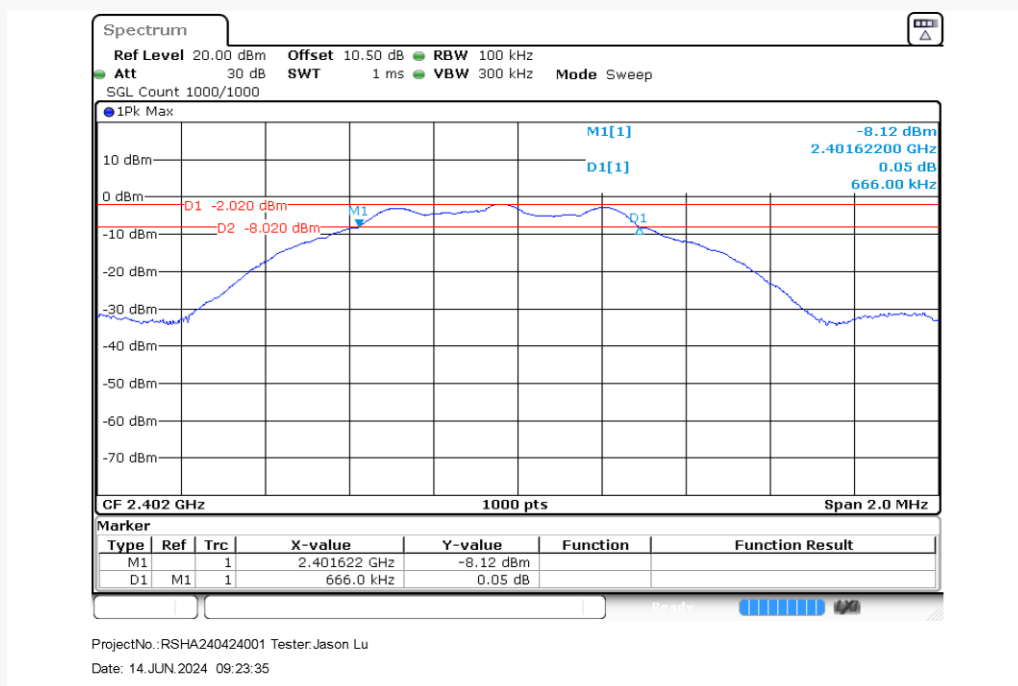
802.11n-HT40 Mode High Channel



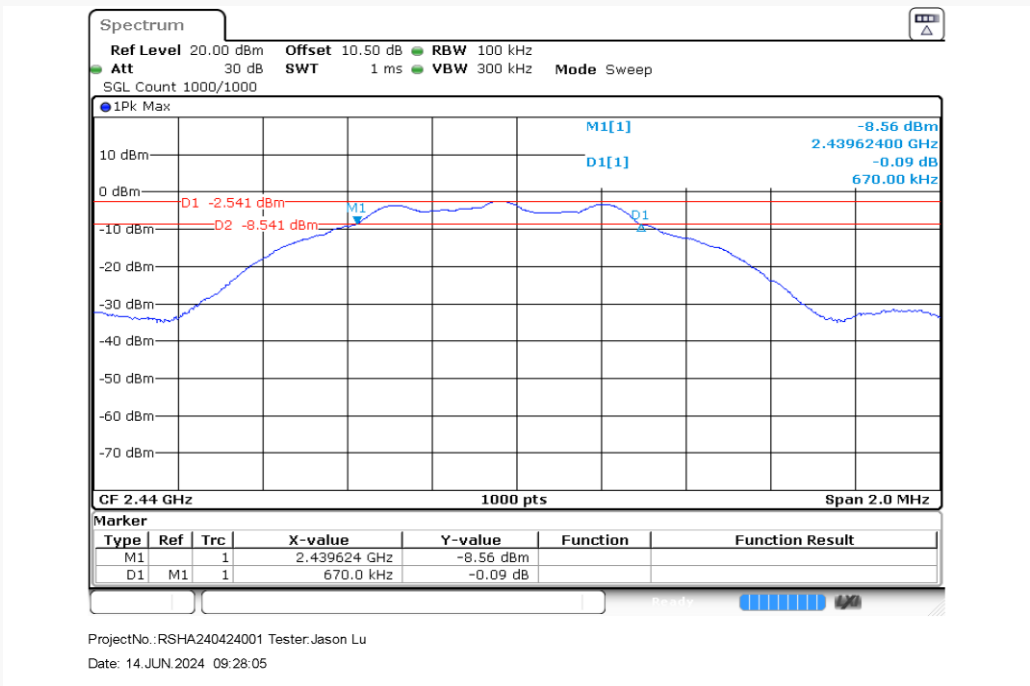
ProjectNo.:RSHA240424001 Tester:Bard Liu
 Date: 15.MAY.2024 14:17:36

For BLE Mode:

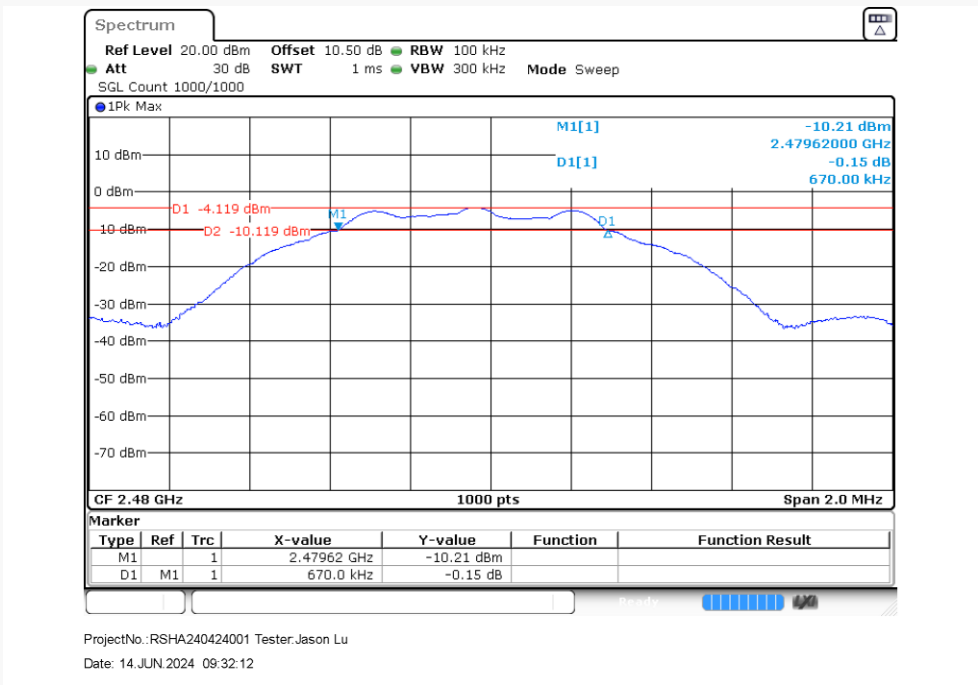
Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (MHz)
Low	2402	0.666	≥0.5
Middle	2440	0.670	≥0.5
High	2480	0.670	≥0.5

Low Channel

Middle Channel



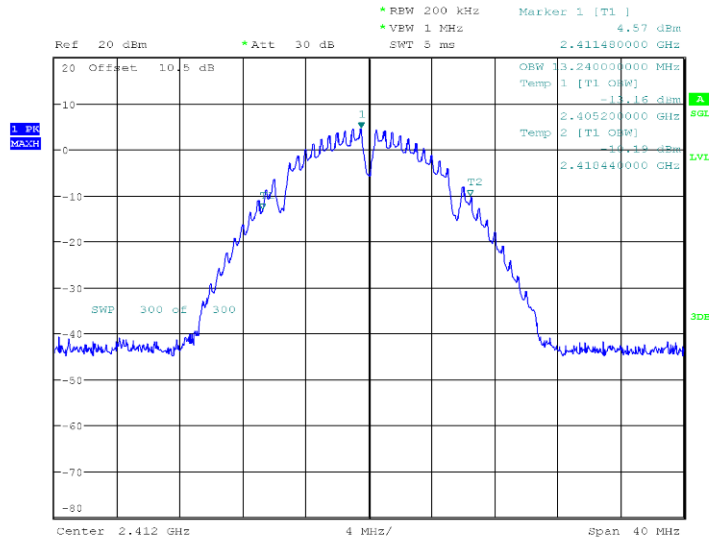
High Channel



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

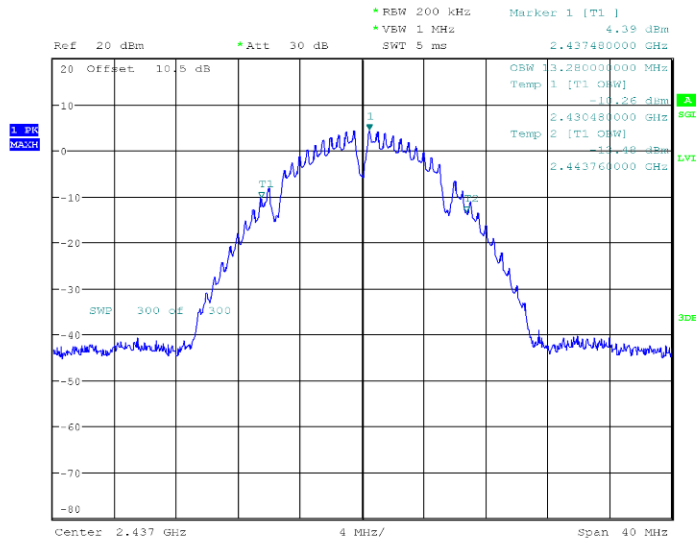
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
802.11b Mode		
Low	2412	13.240
Middle	2437	13.280
High	2462	13.280
802.11g Mode		
Low	2412	16.440
Middle	2437	16.440
High	2462	16.400
802.11n-HT20 mode		
Low	2412	17.600
Middle	2437	17.600
High	2462	17.600
802.11n-HT40 mode		
Low	2422	36.560
Middle	2437	36.320
High	2452	36.000

802.11b Mode Low Channel



ProjectNo.:RSHA240424001 Tester:Bard Liu
 Date: 15.MAY.2024 10:15:34

802.11b Mode Middle Channel



ProjectNo.:RSHA240424001 Tester:Bard Liu
 Date: 15.MAY.2024 10:25:39