

FCC PART 15.247

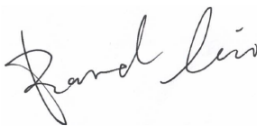
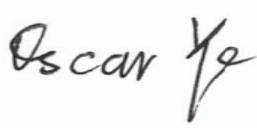
TEST REPORT

For

Sengled Co.,Ltd.

Room 103/02-B, Floor 1, Building 1, No. 498, Guoshoujing Road, Pilot Free Trade Zone, Shanghai, China

FCC ID: 2AGN8-B21N1E

Report Type: Original Report	Product Name: Sengled SIMPLY SMART LED
Report Number:	RSHA240826001-00A
Report Date:	2024-11-11
Reviewed By:	Bard Liu 
Approved By:	Oscar Ye 
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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.

TABLE OF CONTENTS

REPORT REVISION HISTORY.....	4
GENERAL INFORMATION.....	5
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	5
OBJECTIVE	6
TEST METHODOLOGY	6
MEASUREMENT UNCERTAINTY	6
TEST FACILITY	6
SYSTEM TEST CONFIGURATION.....	7
DESCRIPTION OF TEST CONFIGURATION	7
EUT EXERCISE SOFTWARE	7
SPECIAL ACCESSORIES	7
EQUIPMENT MODIFICATIONS	7
SUPPORT EQUIPMENT LIST AND DETAILS	9
EXTERNAL I/O CABLE.....	9
BLOCK DIAGRAM OF TEST SETUP	9
TEST EQUIPMENT LIST	11
SUMMARY OF TEST RESULTS	12
FCC §1.1310 & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE).....	13
FCC §15.203 – ANTENNA REQUIREMENT	14
APPLICABLE STANDARD	14
ANTENNA CONNECTOR CONSTRUCTION	14
FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS	15
APPLICABLE STANDARD	15
TEST SYSTEM SETUP.....	15
EMI TEST RECEIVER SETUP.....	15
TEST PROCEDURE	16
TEST RESULTS SUMMARY	16
TEST DATA: SEE APPENDIX	16
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS.....	17
APPLICABLE STANDARD	17
TEST SYSTEM SETUP.....	17
EMI TEST RECEIVER SETUP.....	18
TEST PROCEDURE	18
TEST RESULTS SUMMARY	19
TEST DATA: SEE APPENDIX	19
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH.....	20
APPLICABLE STANDARD	20
TEST PROCEDURE	20
TEST DATA: SEE APPENDIX	20
FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER.....	21
APPLICABLE STANDARD	21
TEST PROCEDURE	21
TEST DATA: SEE APPENDIX	21
FCC §15.247(d) – BAND EDGE.....	22

APPLICABLE STANDARD	22
TEST PROCEDURE	22
TEST DATA: SEE APPENDIX	22
FCC §15.247(e) - POWER SPECTRAL DENSITY	23
APPLICABLE STANDARD	23
TEST PROCEDURE	23
TEST DATA: SEE APPENDIX	23
EUT PHOTOGRAPHS	24
TEST SETUP PHOTOGRAPHS	25
Appendix - TEST DATA.....	26
ENVIRONMENTAL CONDITIONS & TEST INFORMATION	26
AC LINE CONDUCTED EMISSIONS	27
SPURIOUS EMISSIONS.....	35
6 dB EMISSION BANDWIDTH	57
MAXIMUM CONDUCTED OUTPUT POWER.....	59
BAND EDGE	61
POWER SPECTRAL DENSITY	62

REPORT REVISION HISTORY

Number of Revisions	Report No.	Version	Issue Date	Description
0	RSHA240826001-00A	R1V1	2024-11-11	Initial Release

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	Sengled Co.,Ltd.
Product Name:	Sengled SIMPLY SMART LED
Tested Model:	B21-N1E
Series Model:	B21-N11, B21-N12, B21-N13
Model Difference:	Lamp beads
Power Supply:	AC 120V
RF Function:	BLE 1Mbps
Operating Band/Frequency:	2402-2480MHz
Maximum Peak Output Power:	8.61 dBm
Channel Number:	40
Channel Separation:	2 MHz
Modulation Type	GFSK
Antenna Type:	PCB Antenna
★Maximum Antenna Gain:	2.0 dBi

Note:

1. The maximum antenna gain was provided by the applicant.
2. The differences are as follows:

LED Board& Lamp beads	B21-N1E	A19 RGB+CCT
	B21-N11	A19 2700K
	B21-N12	A19 5000K
	B21-N13	A19 CCT 2700K-6500K

All measurement and tested data in this report was gathered from production sample serial number: RSHA240826001-1 (B21-N1E), RSHA240826001-2 (B21-N11), RSHA240826001-3 (B21-N12), RSHA240826001-4 (B21-N13),. Based on the above differences, we chose B21-N1E for full test, others for AC Line Conducted Emissions and Spurious Emissions below 1GHz. (Assigned by BACL (Kunshan). The EUT supplied by the applicant was received on 2024-08-26.)

Objective

This report is prepared for *Sengled Co.,Ltd.* in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communications Commission 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 Compliance Testing of Unlicensed Wireless Devices and FCC KDB 558074 D01 15.247 Meas Guidance v05r02.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

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

EUT Exercise Software

RF Test Tool: Sockit

★Power level: 3F

Note: The power level was declared by the applicant.

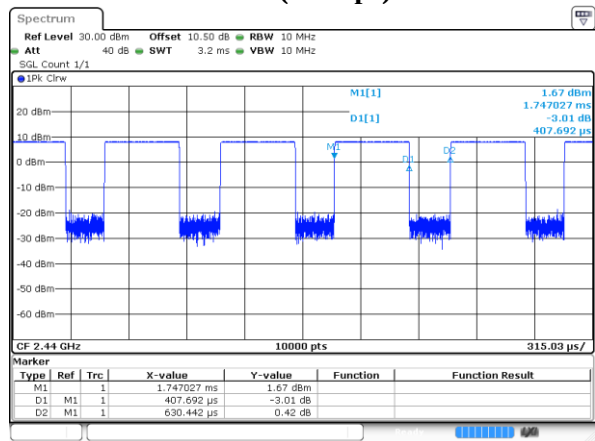
Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Duty Cycle:
BLE (1 Mbps)



ProjectNo: RSHA240826001 Tester:Neil Zhou
Date: 12.SEP.2024 19:08:07

Mode	Duty Cycle (%)	T _{on} (ms)	T _{on+off} (ms)	10log(1/x)	Duty Cycle Factor(dB)
BLE (1 Mbps)	64.76	0.408	0.630	1.89	1.89

Note: “x” means the Duty Cycle.

Support Equipment List and Details

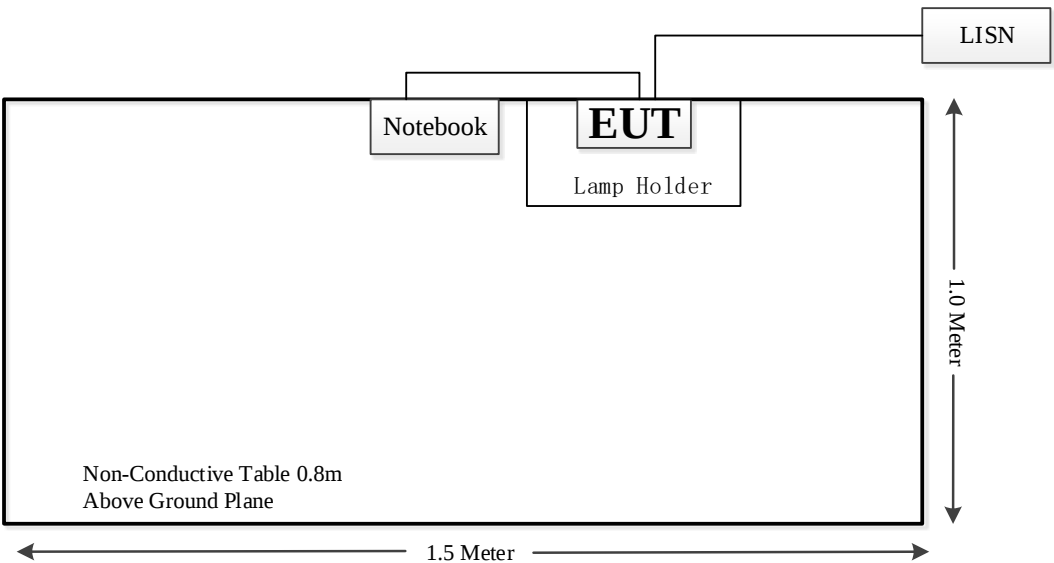
Manufacturer	Description	Model	Serial Number
HP	Notebook	4441s	2CE3130VWY

External I/O Cable

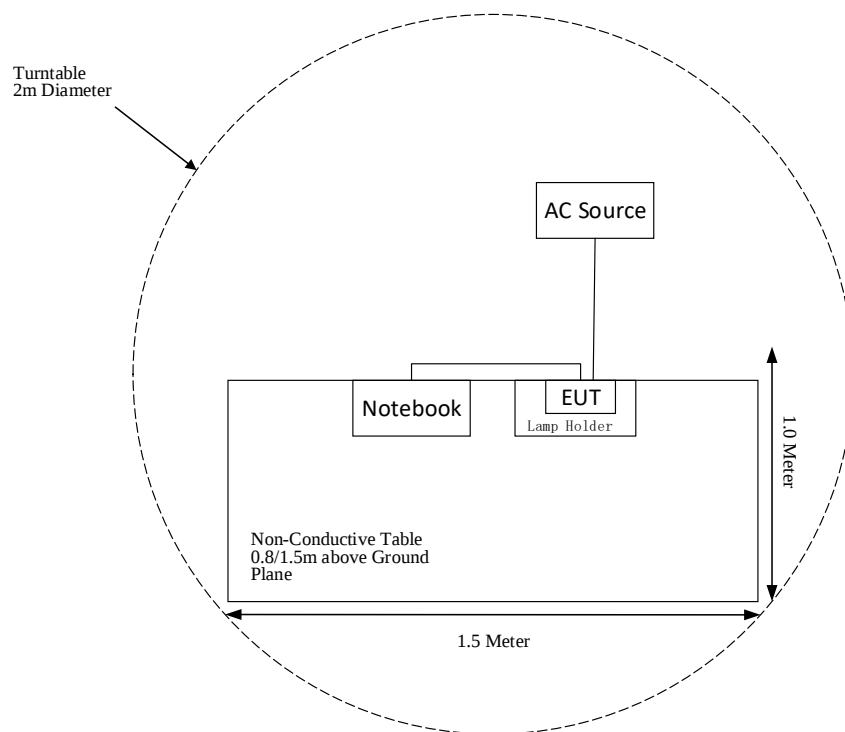
Cable Description	Length (m)	From Port	To
Power Cable 1	1.0	AC Source/LISN	Lamp Holder
Power Cable 2	0.2	Lamp Holder	Notebook

Block Diagram of Test Setup

For Conducted Emissions:



For Radiated Emissions(Below 1GHz& Above 1GHz):



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
ETS-LINDGREN	Loop Antenna	6512	108100	2023-11-09	2024-11-08
Narda	6 dB Attenuator	773-6	10690812-2-1	2023-11-11	2024-11-10
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
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
MICRO-TRONICS	Band Reject Filter	BRM50702	G024	2024-04-23	2025-04-22
Narda	Attenuator	10dB	010	2024-04-23	2025-04-22
SELECTOR	Amplifier	EM18G40G	60726	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
RF Conducted Test					
Rohde & Schwarz	Signal Analyzer	FSV40-N	103298	2024-04-24	2025-04-23
Narda	Attenuator	10dB	010	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	0357.8810.54	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).

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)	Band Edge	Compliant
§15.247(e)	Power Spectral Density	Compliant

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	2.0	1.58	9.0	7.94	20	0.0025	1.0

Note:

1. For the above tune up power were declared by the manufacturer.

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

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to FCC § 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 use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

The EUT has a PCB antenna for BLE, and the antenna gain is 2.0 dBi, which is permanently attached to the unit, fulfill the requirement of this section. Please refer to the EUT photos.

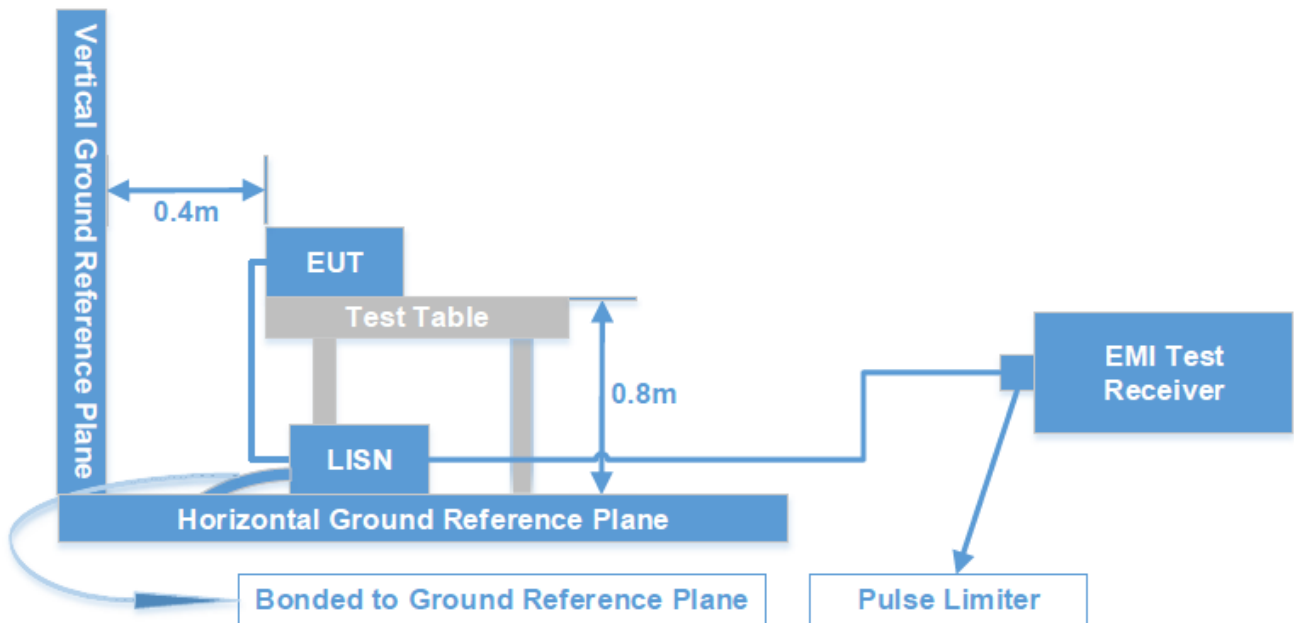
Result: Compliant.

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.

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 adapter 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)

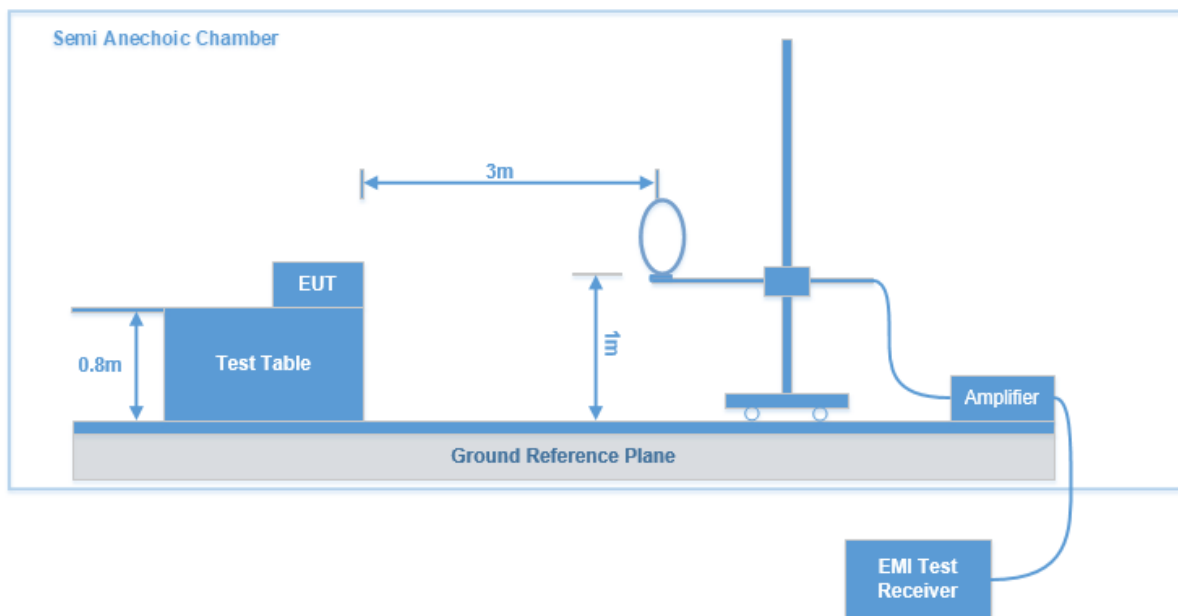
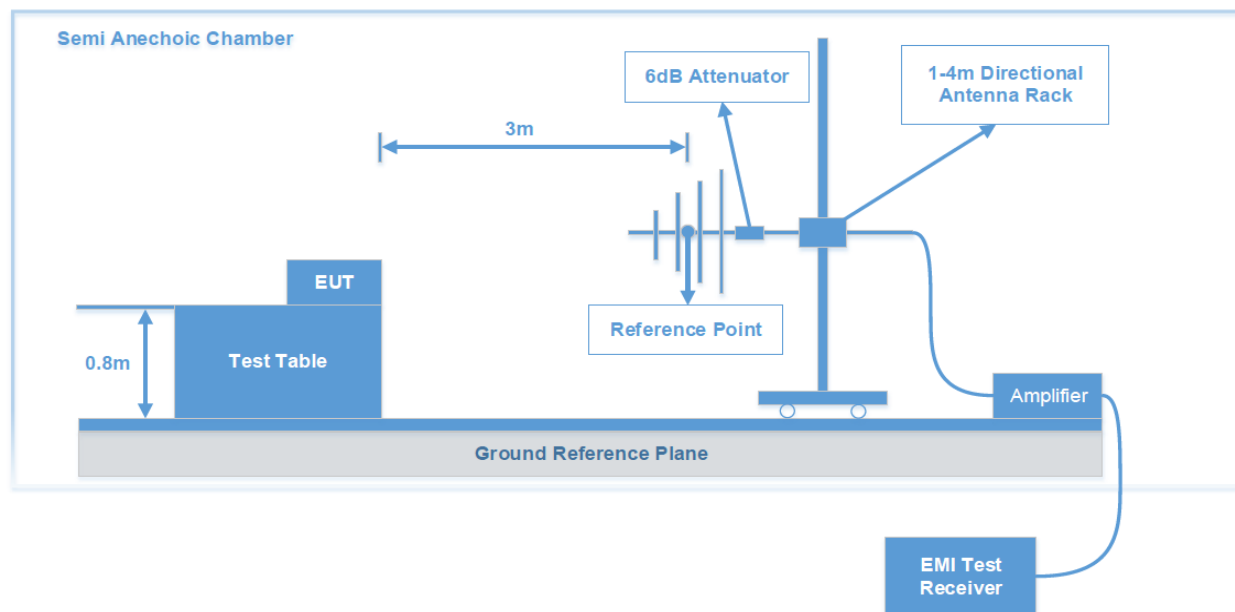
Test Results Summary

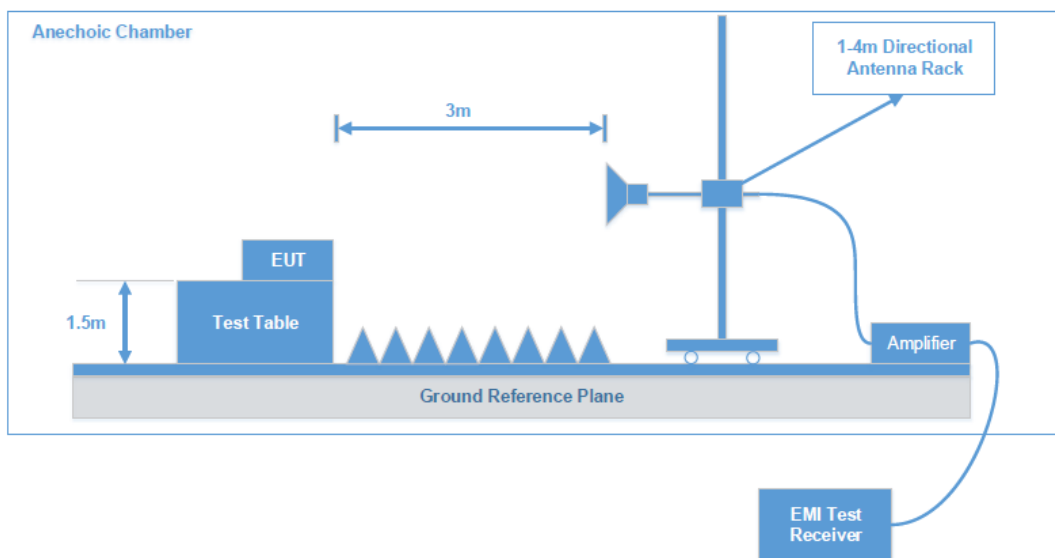
According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

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 - 30 MHz:****30 MHz - 1 GHz:**

Above 1 GHz:

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

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

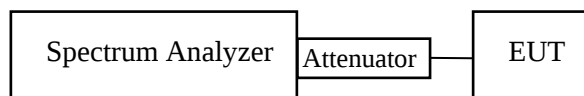
Applicable Standard

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, compliance 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 11.9.1.1

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) – BAND EDGE

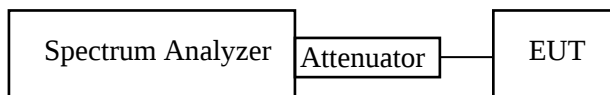
Applicable Standard

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 compliance 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

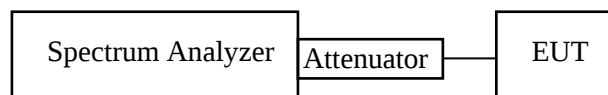
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of 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 compliance, and it is optional if the maximum conducted (average) output power was used to determine compliance:

1. Set the RBW to: $3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}$.
2. Set the VBW $\geq 3 * \text{RBW}$.
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

EUT PHOTOGRAPHS

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

TEST SETUP PHOTOGRAPHS

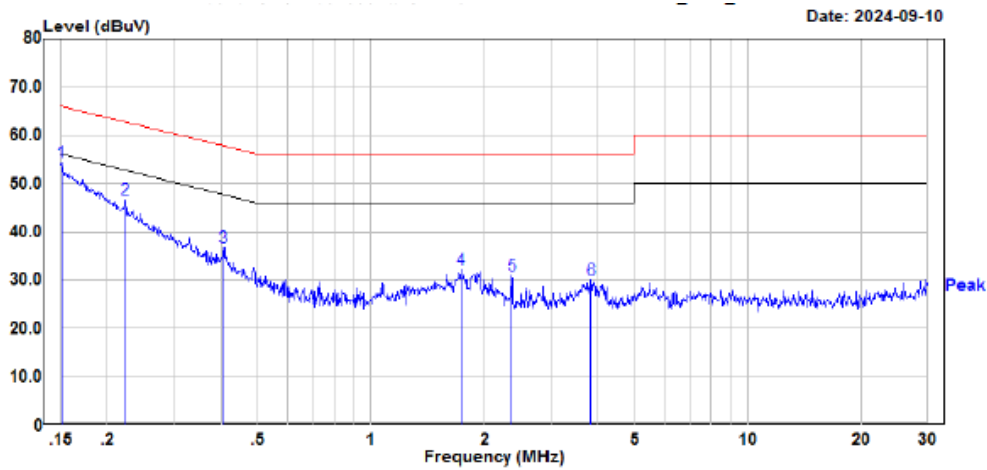
Please refer to the attachment EXHIBIT C-TEST SETUP PHOTOGRAPHS.

Appendix - TEST DATA

Environmental Conditions & Test Information

Test Item:	AC LINE CONDUCTED EMISSIONS	SPURIOUS EMISSIONS			DUTY CYCLE
		9kHz - 1GHz	1 GHz - 18 GHz	18 GHz - 25 GHz	
Test Date:	2024-09-10 to 2024-11-06	2024-09-13 to 2024-11-07	2024-09-11	2024-09-19	2024-09-12
Temperature:	20.1-28.1 °C	20.3-25.8 °C	25.3 °C	49 °C	25.6 °C
Relative Humidity:	53-70 %	52-64 %	53 %	25.6 °C	52%
ATM Pressure:	101.1-103kPa	101.0-102.8 kPa	100.4 kPa	100.3 kPa	100.6 kPa
Test Result:	Pass	Pass	Pass	Pass	/
Test Engineer:	Leah Li & Myles Miao	Grace Luo & Jerry Yan	Destine Hu/ Klein Zhu	Hugh Wu	Neil Zhou

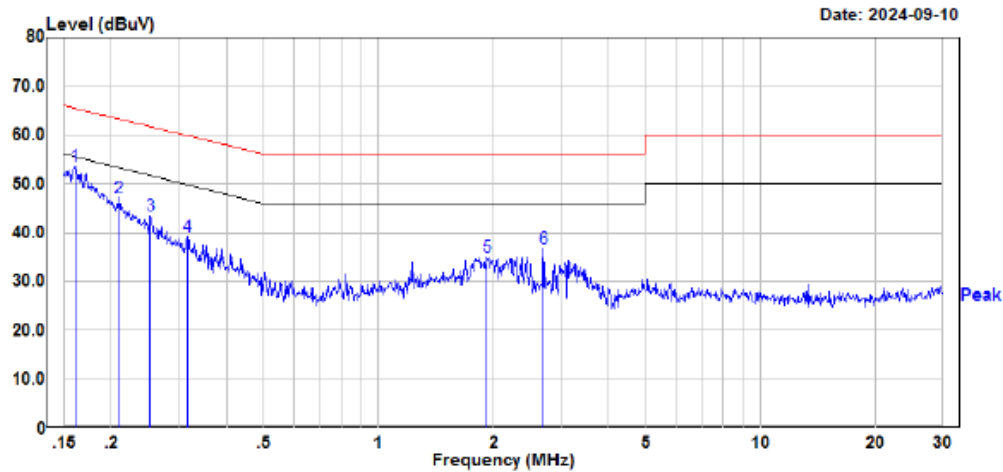
Test Item:	6 DB EMISSION BANDWIDTH	MAXIMUM CONDUCTED OUTPUT POWER	BAND EDGE	POWER SPECTRAL DENSITY
2024-09-12	2024-09-12	2024-09-12	2024-09-12	2024-09-12
25.6 °C	25.6 °C	25.6 °C	25.6 °C	25.6 °C
52 %	52 %	52 %	52 %	52 %
100.6 kPa	100.6 kPa	100.6 kPa	100.6 kPa	100.6 kPa
Pass	Pass	Pass	Pass	Pass
Neil Zhou	Neil Zhou	Neil Zhou	Neil Zhou	Neil Zhou

AC LINE CONDUCTED EMISSIONS*EUT operation mode: Transmitting in BLE (1 Mbps) low channel (maximum output power)***AC 120V/60 Hz, Line****Model: B21-N1E**

Site : CE
Condition : limit\FCC PART 15.207
Project No. : RSHA240826001
Model : B21-N1E
Phase : L
Voltage : 120V/60Hz
Mode : BLE 1M
Test Equipment : ENV216,ESR
Temperature : 28.1°C
Humidity : 55%
Atmospheric pressure: 101.1kPa
Test Engineer : Leah Li

	Freq	Read		Level	Limit	Over	Remark
		Level	Factor		Line	Limit	
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.151	34.26	20.12	54.38	65.96	-11.58	Peak
2	0.222	26.55	20.13	46.68	62.73	-16.05	Peak
3	0.406	16.57	20.21	36.78	57.72	-20.94	Peak
4	1.734	12.19	20.07	32.26	56.00	-23.74	Peak
5	2.361	10.85	20.19	31.04	56.00	-24.96	Peak
6	3.829	9.64	20.24	29.88	56.00	-26.12	Peak

AC 120V/60 Hz, Neutral



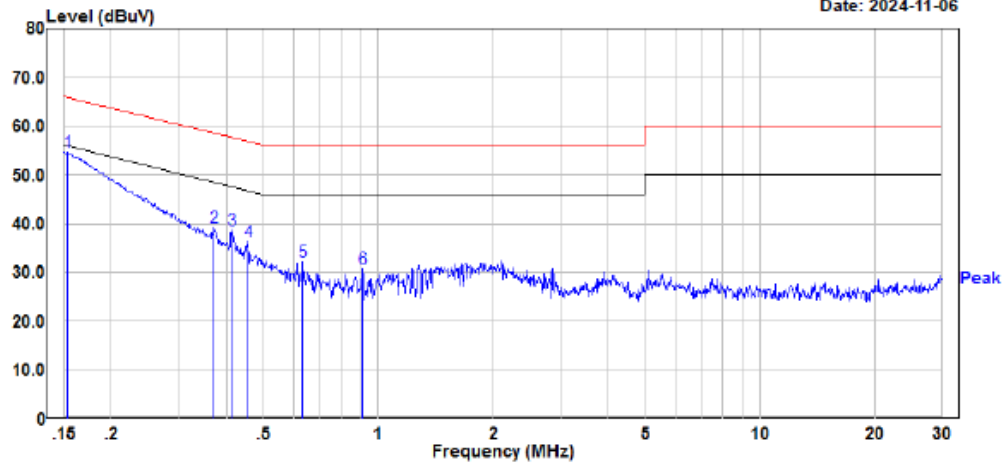
Site : CE
Condition : limit\FCC PART 15.207
: DET:Peak
Project No. : RSHA240826001
Model : B21-N1E
Phase : N
Voltage : 120V/60Hz
Mode : BLE 1M
Test Equipment : ENV216,ESR
Temperature : 28.1℃
Humidity : 55%
Atmospheric pressure: 101.1kPa
Test Engineer : Leah Li

		Read		Limit	Over	
	Freq	Level	Factor	Level	Line	Limit Remark
	MHz	dBuV	dB	dBuV	dBuV	dB
1	0.161	33.46	20.11	53.57	65.42	-11.85 Peak
2	0.208	26.97	20.12	47.09	63.27	-16.18 Peak
3	0.253	23.30	20.14	43.44	61.65	-18.21 Peak
4	0.317	18.93	20.18	39.11	59.79	-20.68 Peak
5	1.925	14.94	20.14	35.08	56.00	-20.92 Peak
6	2.701	16.53	20.20	36.73	56.00	-19.27 Peak

AC 120V/60 Hz, Line

Model: B21-N11

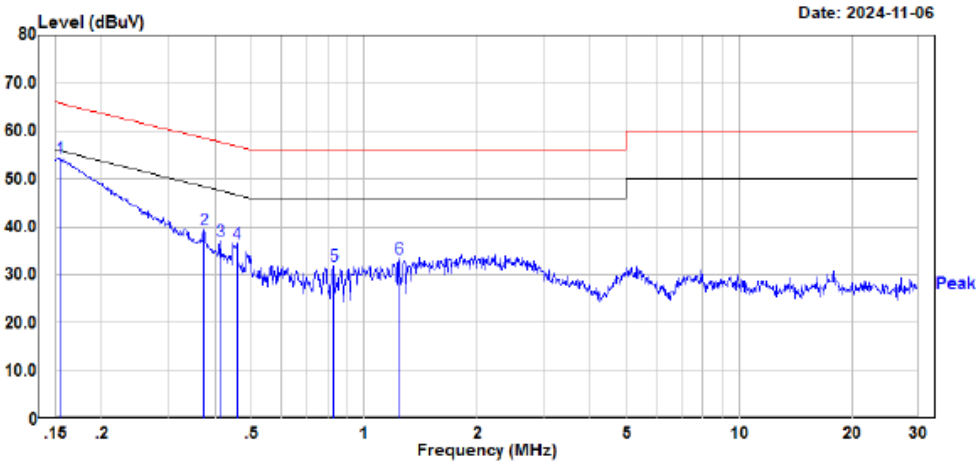
Date: 2024-11-06



Site : CE
Condition : limit\FCC PART 15.207
: DET:Peak
Project No. : RSHA240826001
Model : B21-N11
Phase : L
Voltage : 120V/60Hz
Mode : BLE 1M
Test Equipment : ENV216,ESR
Temperature : 20.1℃
Humidity : 53%
Atmospheric pressure: 103.0kPa
Test Engineer : Myles Miao

	Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit Remark
	MHz	dBuV	dB	dBuV	dBuV	dB
1	0.154	34.60	20.12	54.72	65.79	-11.07 Peak
2	0.372	18.87	20.20	39.07	58.47	-19.40 Peak
3	0.413	18.45	20.21	38.66	57.60	-18.94 Peak
4	0.456	16.01	20.22	36.23	56.77	-20.54 Peak
5	0.633	12.00	20.09	32.09	56.00	-23.91 Peak
6	0.911	11.00	19.81	30.81	56.00	-25.19 Peak

AC 120V/60 Hz, Neutral



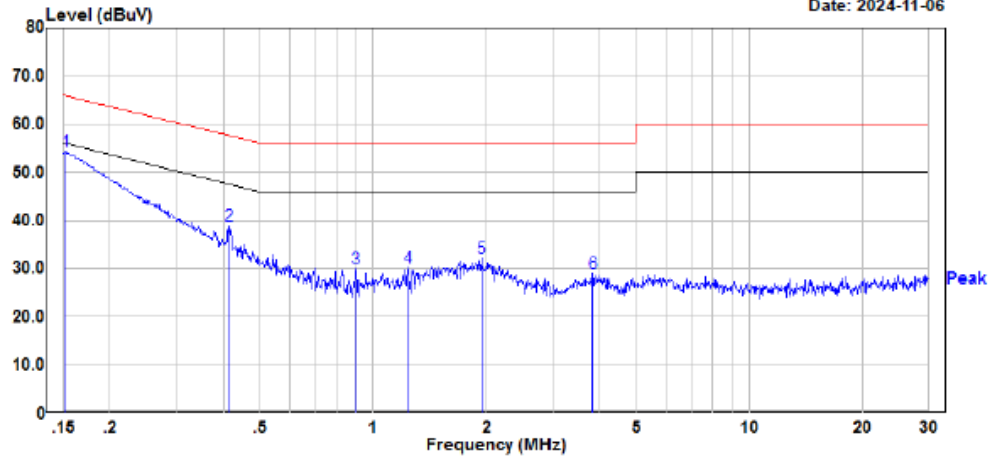
Site : CE
Condition : limit\FCC PART 15B.207
 : DET:Peak
Project No. : RSHA240826001
Model : B21-N11
Phase : N
Voltage : 120V/60Hz
Mode : BLE 1M
Test Equipment : ENV216,ESR
Temperature : 20.1℃
Humidity : 53%
Atmospheric pressure: 103.0kPa
Test Engineer : Myles Miao

	Freq	Read		Limit	Over		Remark
		Level	Factor		Line	Limit	
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.155	34.24	20.11	54.35	65.75	-11.40	Peak
2	0.373	19.24	20.20	39.44	58.42	-18.98	Peak
3	0.415	16.67	20.21	36.88	57.55	-20.67	Peak
4	0.458	16.20	20.22	36.42	56.73	-20.31	Peak
5	0.829	11.92	19.90	31.82	56.00	-24.18	Peak
6	1.235	13.49	19.85	33.34	56.00	-22.66	Peak

AC 120V/60 Hz, Line

Model: B21-N12

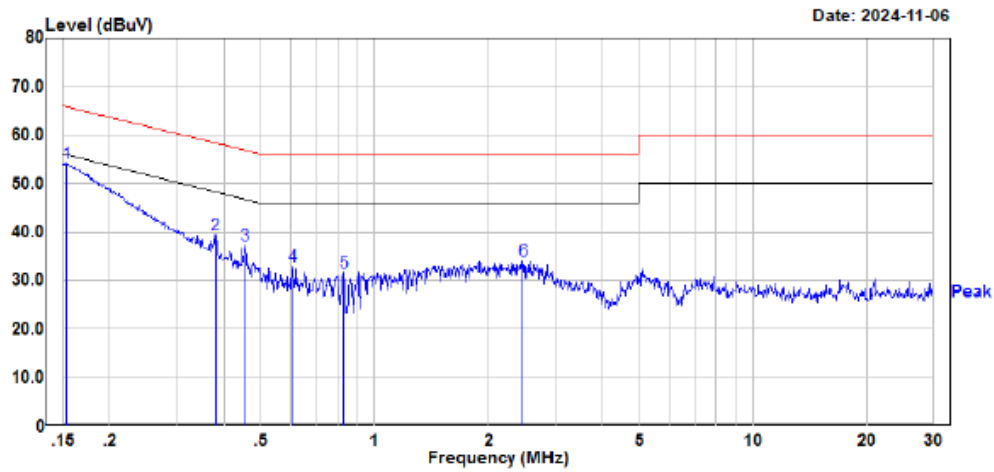
Date: 2024-11-06



Site : CE
Condition : limit\FCC PART 15.207
: DET:Peak
Project No. : RSHA240826001
Model : B21-N12
Phase : L
Voltage : 120V/60Hz
Mode : BLE 1M
Test Equipment : ENV216,ESR
Temperature : 20.1℃
Humidity : 53%
Atmospheric pressure: 103.0kPa
Test Engineer : Myles Miao

	Freq	Read		Limit	Over	Remark
		Level	Factor	Level	Line	Limit
	MHz	dBuV	dB	dBuV	dBuV	dB
1	0.152	34.18	20.12	54.30	65.88	-11.58 Peak
2	0.413	18.62	20.21	38.83	57.60	-18.77 Peak
3	0.898	10.07	19.83	29.90	56.00	-26.10 Peak
4	1.241	10.28	19.85	30.13	56.00	-25.87 Peak
5	1.944	12.00	20.14	32.14	56.00	-23.86 Peak
6	3.829	8.83	20.24	29.07	56.00	-26.93 Peak

AC 120V/60 Hz, Neutral

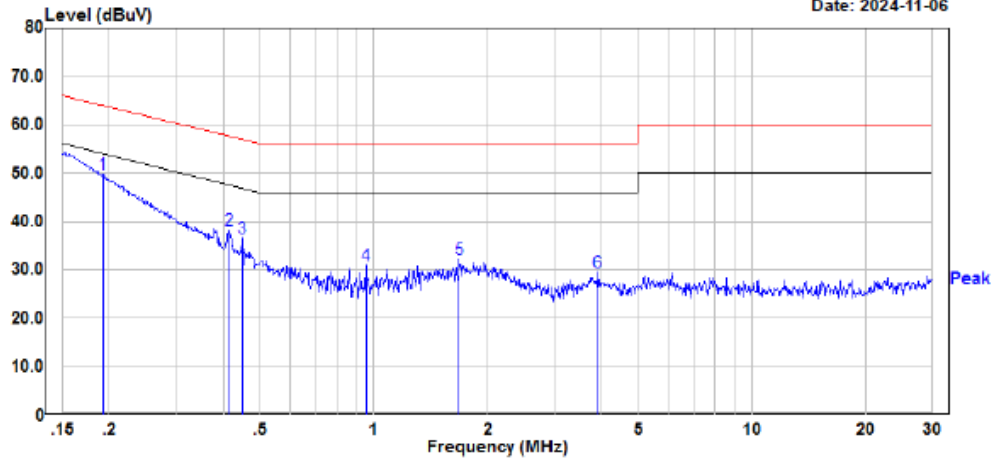


Site : CE
Condition : limit\FCC PART 15.207
Project No. : RSHA240826001
Model : B21-N12
Phase : N
Voltage : 120V/60Hz
Mode : BLE 1M
Test Equipment : ENV216,ESR
Temperature : 20.1°C
Humidity : 53%
Atmospheric pressure: 103.0kPa
Test Engineer : Myles Miao

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.154	34.14	20.12	54.26	65.79	-11.53	Peak
2	0.381	19.15	20.20	39.35	58.26	-18.91	Peak
3	0.454	17.01	20.22	37.23	56.81	-19.58	Peak
4	0.609	12.69	20.09	32.78	56.00	-23.22	Peak
5	0.829	11.72	19.90	31.62	56.00	-24.38	Peak
6	2.470	13.81	20.19	34.00	56.00	-22.00	Peak

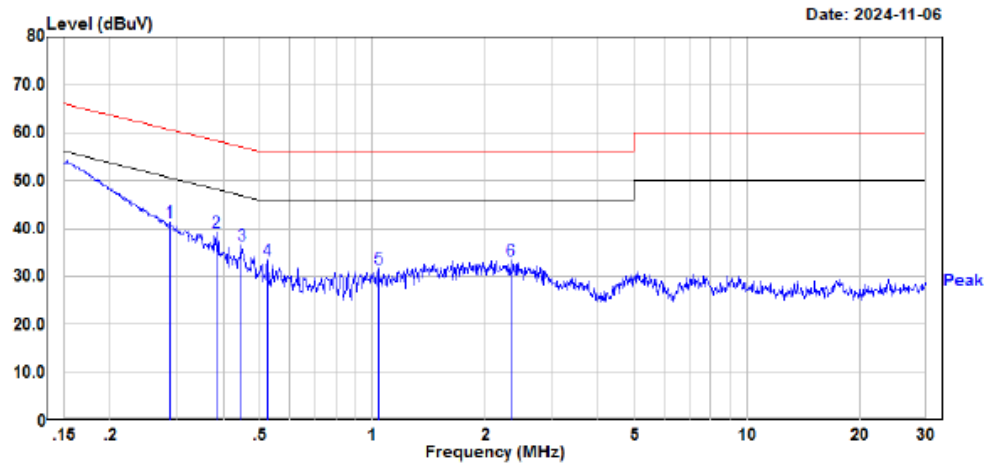
AC 120V/60 Hz, Line**Model: B21-N13**

Date: 2024-11-06



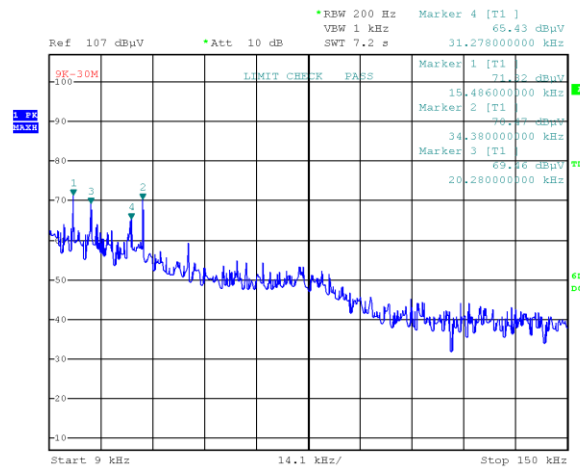
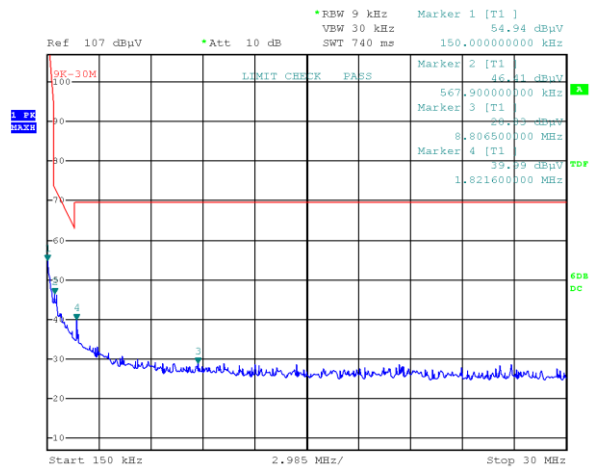
Site : CE
Condition : limit\FCC PART 15.207
Project No. : RSHA240826001
Model : B21-N13
Phase : L
Voltage : 120V/60Hz
Mode : BLE 1M
Test Equipment : ENV216,ESR
Temperature : 20.1℃
Humidity : 53%
Atmospheric pressure: 103.0kPa
Test Engineer : Myles Miao

	Read		Limit	Over	
Freq	Level	Factor	Level	Line	Limit Remark
MHz	dBuV	dB	dBuV	dBuV	dB
1	0.192	29.63	20.11	49.74	63.93 -14.19 Peak
2	0.413	18.10	20.21	38.31	57.60 -19.29 Peak
3	0.449	16.17	20.23	36.40	56.89 -20.49 Peak
4	0.953	11.24	19.77	31.01	56.00 -24.99 Peak
5	1.682	12.10	20.05	32.15	56.00 -23.85 Peak
6	3.906	9.26	20.24	29.50	56.00 -26.50 Peak

AC 120V/60 Hz, Neutral

Site : CE
Condition : limit\FCC PART 15.207
: DET:Peak
Project No. : RSHA240826001
Model : B21-N13
Phase : N
Voltage : 120V/60Hz
Mode : BLE 1M
Test Equipment : ENV216,ESR
Temperature : 20.1°C
Humidity : 53%
Atmospheric pressure: 103.0kPa
Test Engineer : Myles Miao

	Freq	Read		Limit	Over	Remark
		Level	Factor	Level	Line	
	MHz	dBuV	dB	dBuV	dBuV	dB
1	0.288	21.20	20.16	41.36	60.58	-19.22 Peak
2	0.383	18.87	20.20	39.07	58.22	-19.15 Peak
3	0.447	16.26	20.23	36.49	56.93	-20.44 Peak
4	0.524	13.16	20.12	33.28	56.00	-22.72 Peak
5	1.037	11.86	19.74	31.60	56.00	-24.40 Peak
6	2.338	13.16	20.19	33.35	56.00	-22.65 Peak

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:***Model: B21-N1E****9 kHz-30 MHz:** (Transmitting in maximum output power BLE (1 Mbps) low channel)**Parallel(worst case)****9kHz-150kHz****150kHz-30MHz**Project No.RSHA240826001
Date: 13.SEP.2024 19:51:07

Tester:Grace Luo

Project No.RSHA240826001
Date: 13.SEP.2024 19:36:13

Tester:Grace Luo

9kHz-150kHz

Frequency (MHz)	Corrected Amplitude (dBμV/m) @3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m) @3m	Margin (dB)
0.015486	71.32	PK	52.87	123.81	52.49
0.03438	70.47	PK	46.06	116.88	46.41
0.02028	69.46	PK	49.92	121.46	52.00
0.031278	65.43	PK	46.87	117.70	52.27

150kHz-30MHz

Frequency (MHz)	Corrected Amplitude (dBμV/m) @3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m) @3m	Margin (dB)
0.15000	54.94	PK	40.90	104.08	49.14
0.56790	46.41	PK	22.25	72.52	26.11
8.80650	28.33	PK	6.40	69.54	41.21
1.82160	39.99	PK	12.08	69.54	29.55

BLE (1 Mbps)
30 MHz - 1 GHz:

Low Channel: 2402 MHz

Common Information

Project No:

EUT Model:

Test Mode:

Standard:

Test Equipment:

Temperature:

Humidity:

Barometric Pressure:

Test Engineer:

Test Date:

RSHA240826001

B21-N1E

Transmitting in BLE-1M mode low channel

FCC Part 15.205 & FCC Part 15.209&FCC Part 15.247

ESCI, JB3, 310N

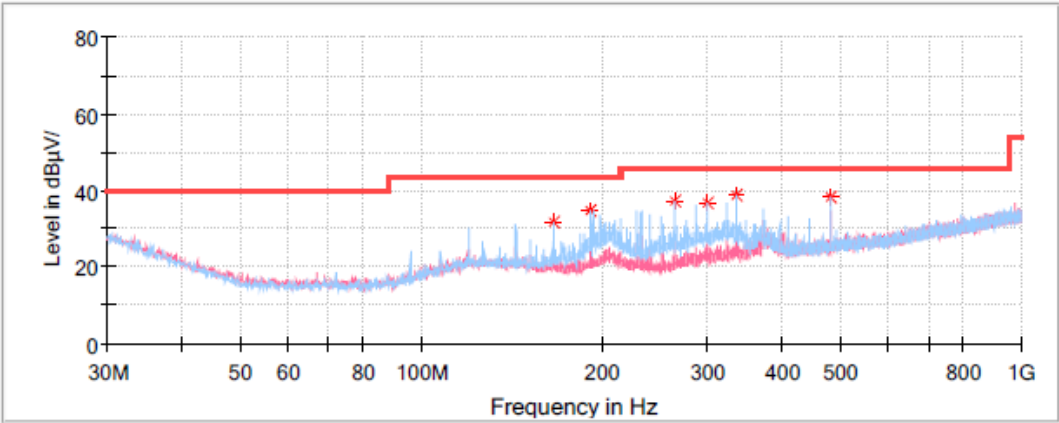
25.8℃

52%

101.0kPa

Grace Luo

2024/9/13



Critical Freqs

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
166.527500	31.80	43.50	11.70	H	-12.4
191.990000	34.83	43.50	8.67	H	-12.5
264.012500	37.48	46.00	8.52	H	-11.7
300.023750	36.66	46.00	9.34	H	-10.5
336.035000	38.63	46.00	7.37	H	-9.6
480.080000	38.45	46.00	7.55	H	-5.9

Middle Channel: 2440 MHz

Common Information

Project No:

EUT Model:

Test Mode:

Standard:

Test Equipment:

Temperature:

Humidity:

Barometric Pressure:

Test Engineer:

Test Date:

RSHA240826001

B21-N1E

Transmitting in BLE-1M mode middle channel

FCC Part 15.205 &FCC Part 15.209&FCC Part 15.247

ESCI, JB3, 310N

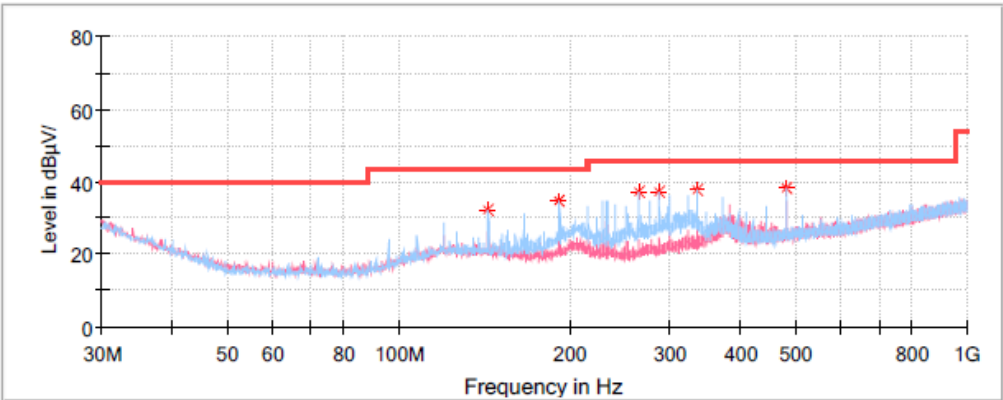
25.8℃

52%

101.0kPa

Grace Luo

2024/9/13

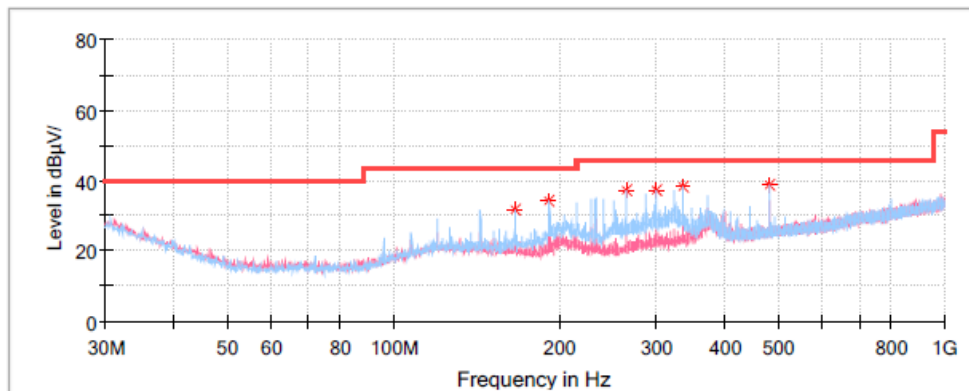


Critical Freqs

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
143.975000	32.31	43.50	11.19	H	-11.6
191.990000	34.64	43.50	8.86	H	-12.5
264.012500	37.21	46.00	8.79	H	-11.7
288.020000	37.32	46.00	8.68	H	-10.6
336.035000	37.92	46.00	8.08	H	-9.6
480.080000	38.21	46.00	7.79	H	-5.9

High Channel:2480 MHz**Common Information**

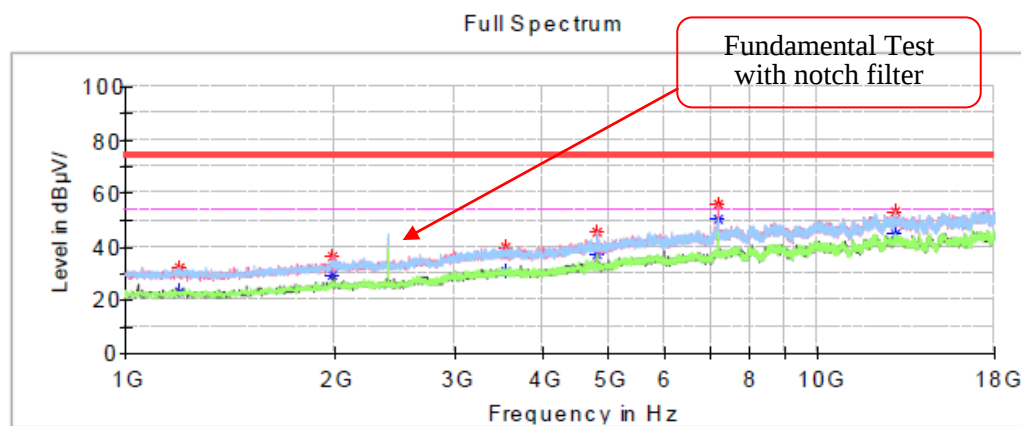
Project No: RSHA240826001
EUT Model: B21-N1E
Test Mode: Transmitting in BLE-1M mode low channel
Standard: FCC Part 15.205 & FCC Part 15.209 & FCC Part 15.247
Test Equipment: ESCI, JB3, 310N
Temperature: 25.8℃
Humidity: 52%
Barometric Pressure: 101.0kPa
Test Engineer: Grace Luo
Test Date: 2024/9/13

**Critical Freqs**

Frequency (MHz)	MaxPeak (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Pol	Corr. (dB/m)
165.921250	31.76	43.50	11.74	H	-12.4
191.990000	34.04	43.50	9.46	H	-12.5
264.012500	37.27	46.00	8.73	H	-11.7
300.023750	37.16	46.00	8.84	H	-10.5
336.035000	37.99	46.00	8.01	H	-9.6
480.080000	38.58	46.00	7.42	H	-5.9

**BLE (1 Mbps)
1 GHz-18 GHz:****Low Channel: 2402 MHz****Common Information**

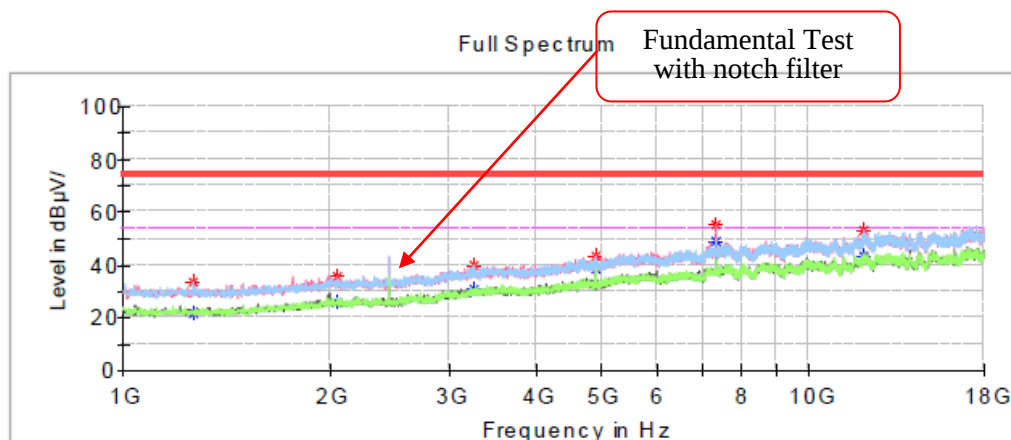
Project No.:	RSHA240826001
Test Mode:	BLE 1M
Standard:	FCC Part 15.247&FCC Part 15.205&FCC Part 15.209
Test Engineer:	Destine Hu

**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	---	23.09	54.00	30.91	H	-15.2
1197.200000	32.08	---	74.00	41.92	H	-15.2
1996.200000	---	29.62	54.00	24.38	V	-11.8
1996.200000	36.57	---	74.00	37.43	V	-11.8
3541.500000	---	30.49	54.00	23.51	H	-6.3
3541.500000	40.13	---	74.00	33.87	H	-6.3
4802.900000	---	37.29	54.00	16.71	V	-3.2
4802.900000	45.56	---	74.00	28.44	V	-3.2
7206.700000	---	50.31	54.00	3.69	V	3.2
7206.700000	55.87	---	74.00	18.13	V	3.2
12961.200000	---	44.55	54.00	9.45	H	9.7
12961.200000	52.98	---	74.00	21.02	H	9.7

Middle Channel: 2440 MHz**Common Information**

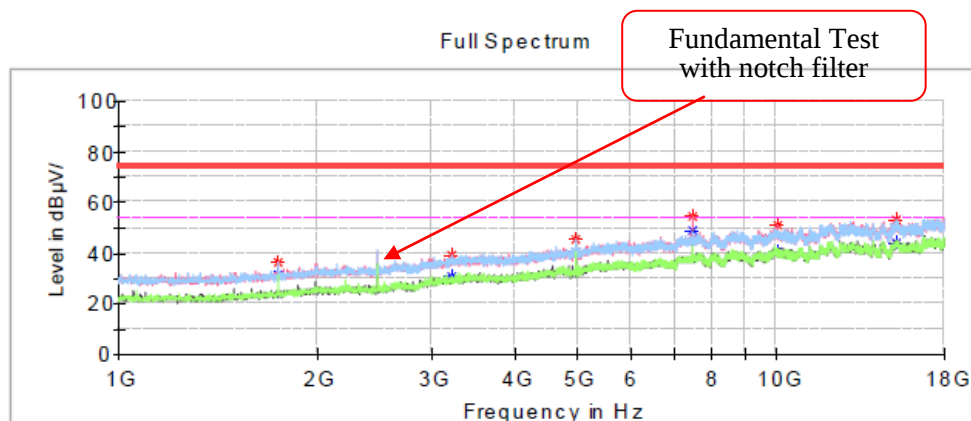
Project No.: RSHA240826001
 Test Mode: BLE 1M
 Standard: FCC Part 15.247&FCC Part 15.205&FCC Part 15.209
 Test Engineer: Destine Hu

**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)
1266.900000	33.24	---	74.00	40.76	H	-15.1
1266.900000	---	21.56	54.00	32.44	H	-15.1
2047.200000	35.60	---	74.00	38.40	V	-11.6
2047.200000	---	25.60	54.00	28.40	V	-11.6
3254.200000	39.81	---	74.00	34.19	H	-7.4
3254.200000	---	30.92	54.00	23.08	H	-7.4
4879.400000	---	38.76	54.00	15.24	H	-2.9
4879.400000	43.59	---	74.00	30.41	H	-2.9
7318.900000	---	49.09	54.00	4.91	V	3.4
7318.900000	55.27	---	74.00	18.73	V	3.4
12060.200000	---	43.17	54.00	10.83	H	9.1
12060.200000	53.29	---	74.00	20.71	H	9.1

High Channel: 2480 MHz**Common Information**

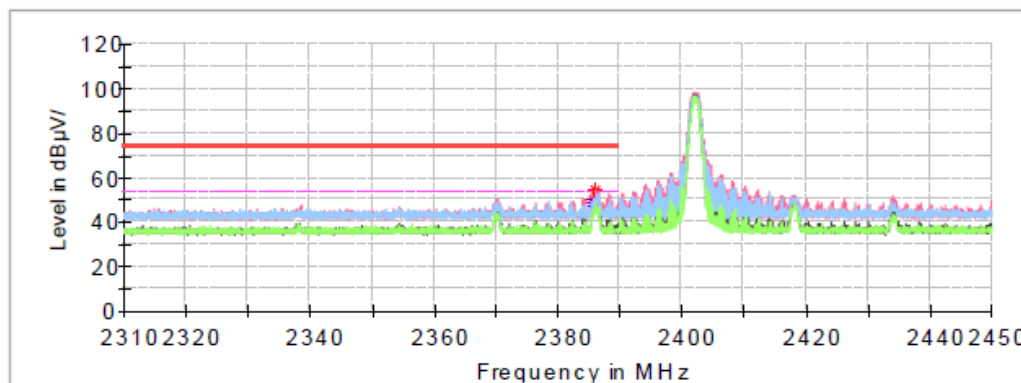
Project No.: RSHA240826001
Test Mode: BLE 1M
Standard: FCC Part 15.247&FCC Part 15.205&FCC Part 15.209
Test Engineer: Destine Hu

**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)
1746.300000	---	31.13	54.00	22.87	H	-13.3
1746.300000	36.06	---	74.00	37.94	H	-13.3
3218.500000	---	30.86	54.00	23.14	H	-7.5
3218.500000	39.42	---	74.00	34.58	H	-7.5
4959.300000	---	40.55	54.00	13.45	H	-2.6
4959.300000	45.21	---	74.00	28.79	H	-2.6
7439.600000	54.62	---	74.00	19.38	V	3.7
7439.600000	---	48.80	54.00	5.20	V	3.7
10020.200000	---	40.55	54.00	13.45	V	7.2
10020.200000	50.81	---	74.00	23.19	V	7.2
15200.100000	---	44.16	54.00	9.84	H	9.5
15200.100000	52.84	---	74.00	21.16	H	9.5

Restricted Bands Emission:**Left Side****Common Information**

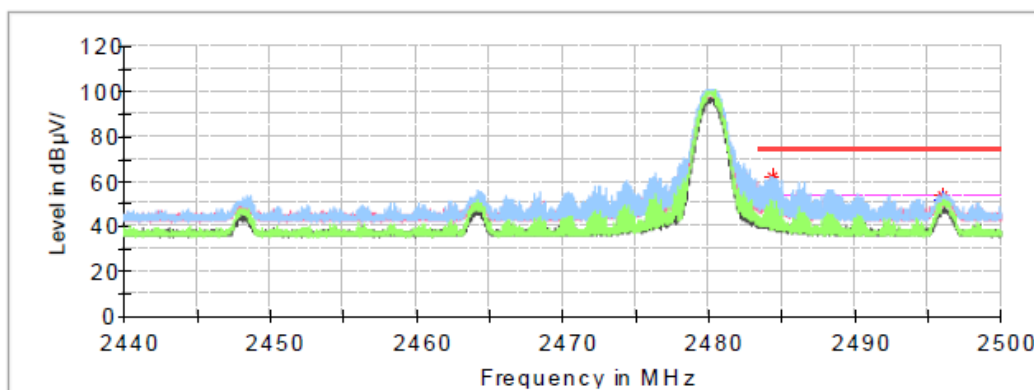
Project No.:	RSHA240826001
Test Mode:	BLE 1M
Standard:	FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Test Engineer:	Klein Zhu

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)
2385.880000	---	49.08	54.00	4.92	V	-0.6
2385.880000	50.32	---	74.00	23.68	V	-0.6
2386.174000	---	48.10	54.00	5.90	V	-0.6
2386.174000	54.17	---	74.00	19.83	V	-0.6

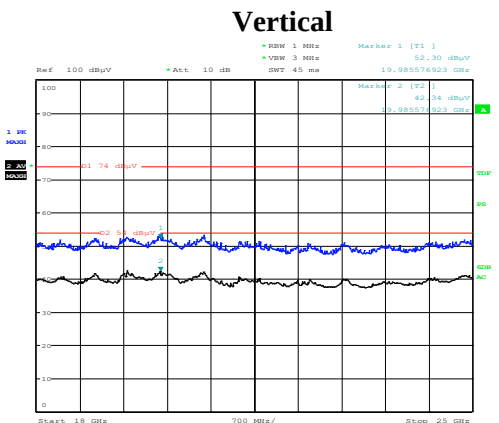
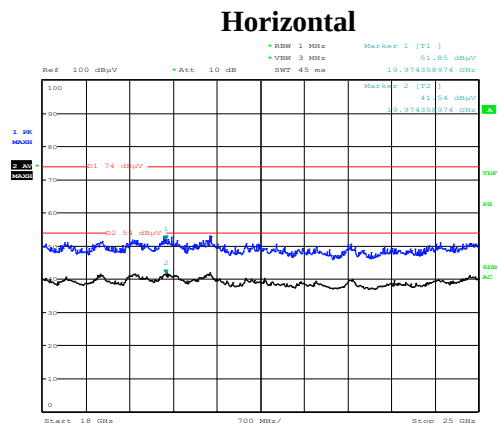
Right Side**Common Information**

Project No.: RSHA240826001
Test Mode: BLE 1M
Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Test Engineer: Klein Zhu

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)
2484.304000	62.34	---	74.00	11.66	H	-0.3
2484.304000	---	51.57	54.00	2.43	H	-0.3
2496.052000	53.85	---	74.00	20.15	H	-0.2
2496.052000	---	52.20	54.00	1.80	H	-0.2

18 GHz - 25 GHz (middle channel was worst):



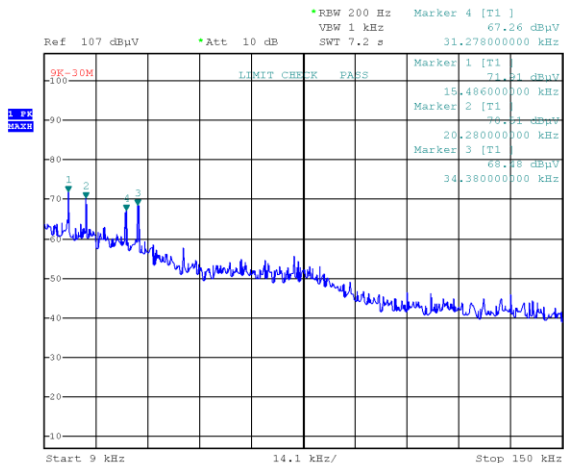
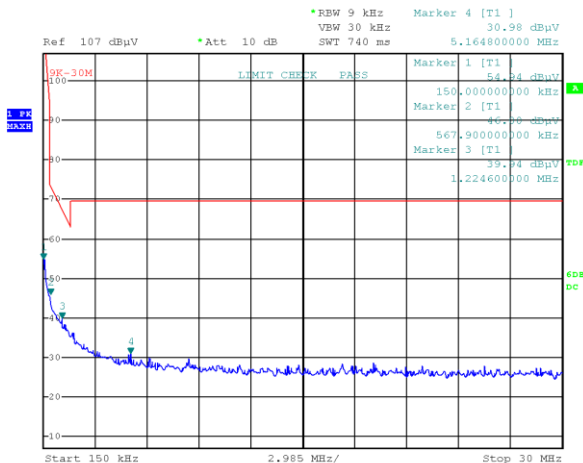
Project No :RSHA240826001
Date: 19.SEP.2024 20:53:19

Tester :Hugh Wu

Project No :RSHA240826001
Date: 19.SEP.2024 21:14:42

Tester :Hugh Wu

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

Model: B21-N11**9 kHz-30 MHz: (Transmitting in maximum output power BLE (1 Mbps) low channel)****Parallel(worst case)****9kHz-150kHz****150kHz-30MHz**Project No.RSHA240826001
Date: 7.NOV.2024 11:31:53

Tester:Jerry Yan

Project No.RSHA240826001
Date: 7.NOV.2024 12:08:37

Tester:Jerry Yan

9kHz-150kHz

Frequency (MHz)	Corrected Amplitude (dBμV/m) @3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m) @3m	Margin (dB)
0.015486	71.91	PK	52.87	123.81	51.90
0.02028	70.51	PK	49.92	121.46	50.95
0.03438	68.48	PK	46.06	116.88	48.40
0.031278	67.26	PK	46.87	117.70	50.44

150kHz-30MHz

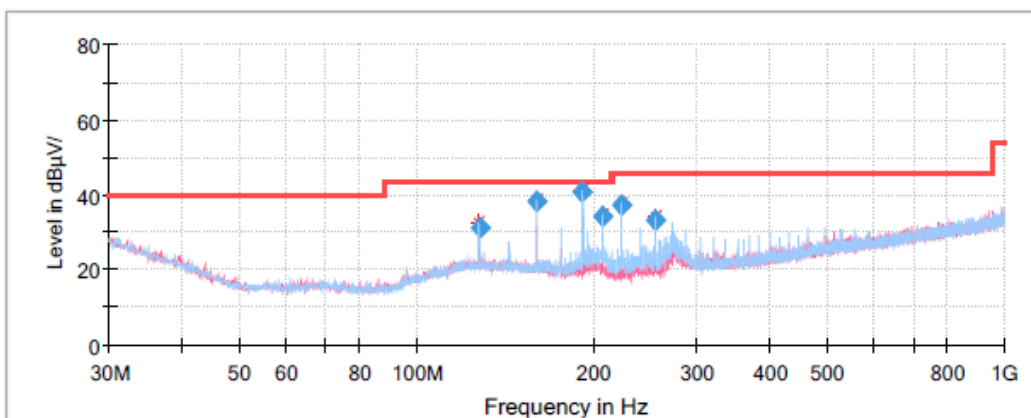
Frequency (MHz)	Corrected Amplitude (dBμV/m) @3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m) @3m	Margin (dB)
0.15000	54.94	PK	40.90	104.08	49.14
0.56790	46.00	PK	22.25	72.52	26.52
1.22460	39.94	PK	4.32	65.84	25.90
5.16480	30.98	PK	8.12	69.54	38.56

30 MHz - 1 GHz:

Low Channel: 2402 MHz

Common Information

Project No:	RSHA240826001
EUT Model:	B21-N11
Test Mode:	Transmitting in BLE-1M mode low channel
Standard:	FCC Part 15.205 & FCC Part 15.209 & FCC Part 15.247
Test Equipment:	ESCI, JB3, 310N
Temperature:	20.4℃
Humidity:	52%
Barometric Pressure:	102.8kPa
Test Engineer:	Jerry Yan
Test Date:	2024/11/06

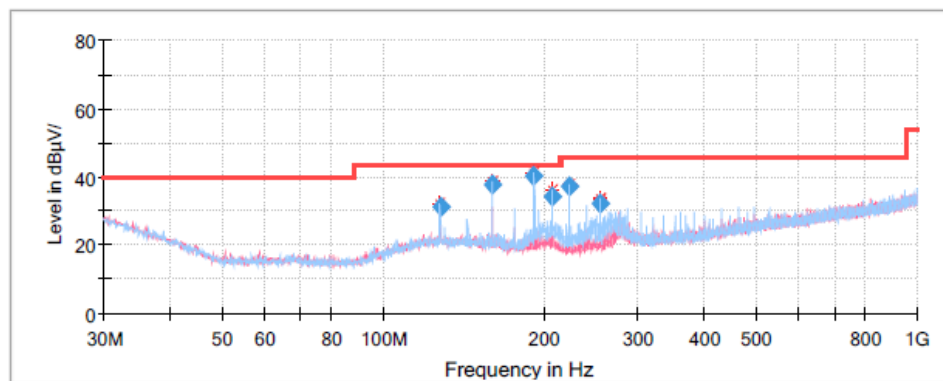


Final Result

Frequency (MHz)	QuasiPeak (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Pol	Corr. (dB/m)
128.007800	31.25	43.50	12.25	H	-11.0
160.009100	38.15	43.50	5.35	H	-12.1
192.014000	40.63	43.50	2.87	H	-12.4
207.995000	34.23	43.50	9.27	H	-12.6
224.006300	37.29	46.00	8.71	H	-13.2
256.010000	33.41	46.00	12.59	H	-12.0

Middle Channel: 2440 MHz**Common Information**

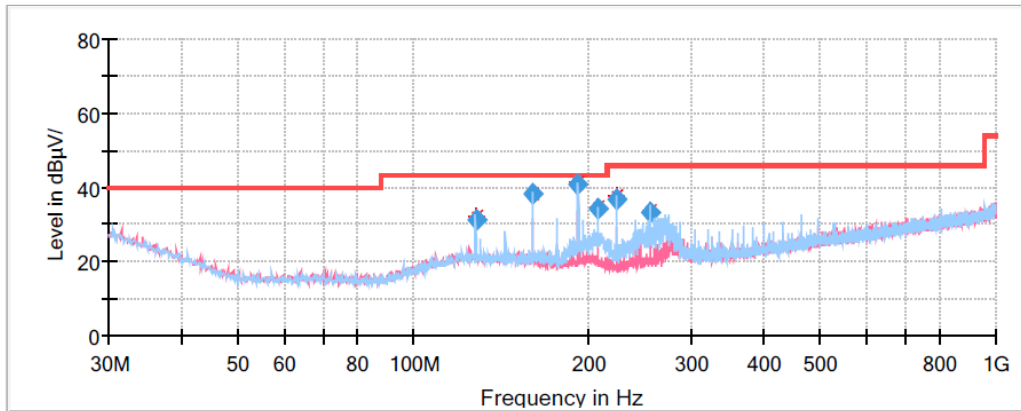
Project No: RSHA240826001
EUT Model: B21-N11
Test Mode: Transmitting in BLE-1M mode middle channel
Standard: FCC Part 15.205 & FCC Part 15.209 & FCC Part 15.247
Test Equipment: ESCI, JB3, 310N
Temperature: 20.4°C
Humidity: 52%
Barometric Pressure: 102.8kPa
Test Engineer: Jerry Yan
Test Date: 2024/11/06

**Final Result**

Frequency (MHz)	QuasiPeak (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Pol	Corr. (dB/m)
128.009000	31.40	43.50	12.10	H	-11.0
160.008800	37.93	43.50	5.57	H	-12.1
191.996900	40.47	43.50	3.03	H	-12.4
208.007300	34.14	43.50	9.36	H	-12.6
224.017400	37.06	46.00	8.94	H	-13.2
256.009100	32.42	46.00	13.58	H	-12.0

High Channel:2480 MHz**Common Information**

Project No:	RSHA240826001
EUT Model:	B21-N11
Test Mode:	Transmitting in BLE-1M mode high channel
Standard:	FCC Part 15.205 & FCC Part 15.209 & FCC Part 15.247
Test Equipment:	ESCI, JB3, 310N
Temperature:	20.4℃
Humidity:	52%
Barometric Pressure:	102.8kPa
Test Engineer:	Jerry Yan
Test Date:	2024/11/06

**Final Result**

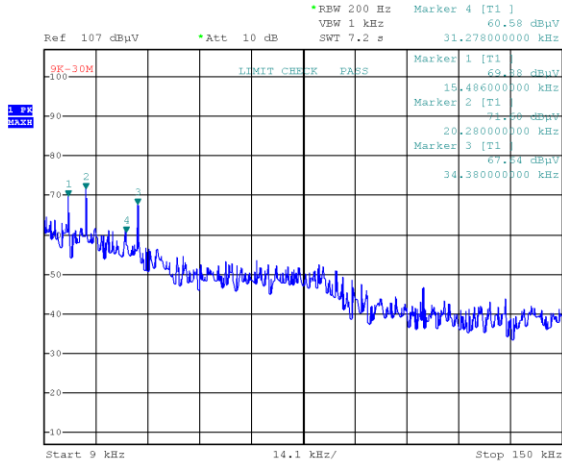
Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
128.001500	31.17	43.50	12.33	H	-11.0
159.997700	38.18	43.50	5.32	H	-12.1
192.005000	40.72	43.50	2.78	H	-12.4
208.021700	33.97	43.50	9.53	H	-12.6
223.988900	36.68	46.00	9.32	H	-13.2
256.016000	33.01	46.00	12.99	H	-12.0

Model: B21-N12

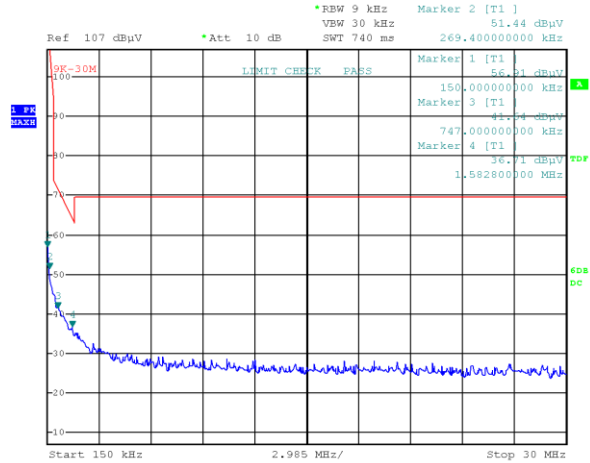
9 kHz-30 MHz: (Transmitting in maximum output power BLE (1 Mbps) low channel)

Parallel(worst case)

9kHz-150kHz



150kHz-30MHz



Project No.RSHA240826001
 Date: 7.NOV.2024 11:41:23

Tester:Jerry Yan

Project No.RSHA240826001
 Date: 7.NOV.2024 12:24:03

Tester:Jerry Yan

9kHz-150kHz

Frequency (MHz)	Corrected Amplitude (dBμV/m) @3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m) @3m	Margin (dB)
0.015486	69.88	PK	52.87	123.81	53.93
0.02028	71.6	PK	49.92	121.46	49.86
0.03438	67.64	PK	46.06	116.88	49.24
0.031278	60.58	PK	46.87	117.70	57.12

150kHz-30MHz

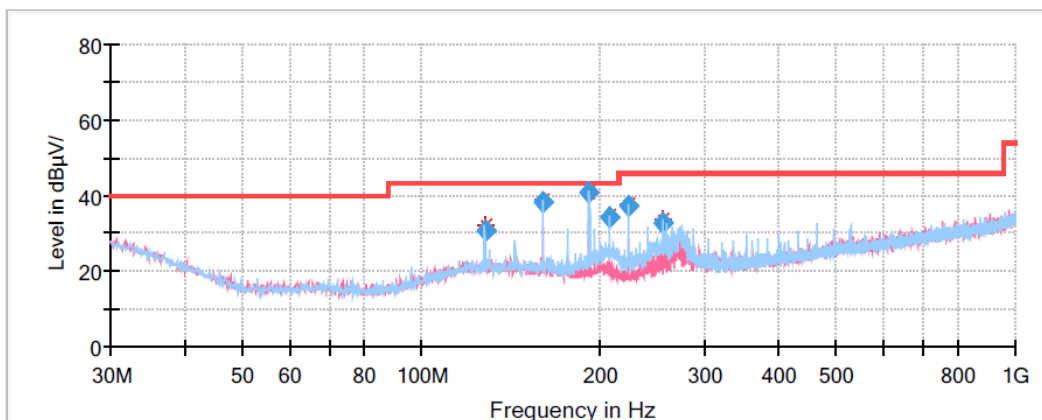
Frequency (MHz)	Corrected Amplitude (dBμV/m) @3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m) @3m	Margin (dB)
0.15000	56.91	PK	40.90	104.08	47.17
0.26940	51.44	PK	35.64	99.00	47.56
0.74700	41.64	PK	20.11	70.14	28.50
1.58250	36.71	PK	8.97	63.62	26.91

30 MHz - 1 GHz:

Low Channel: 2402 MHz

Common Information

Project No:	RSHA240826001
EUT Model:	B21-N12
Test Mode:	Transmitting in BLE-1M mode low channel
Standard:	FCC Part 15.205 & FCC Part 15.209 & FCC Part 15.247
Test Equipment:	ESCI, JB3, 310N
Temperature:	20.4℃
Humidity:	52%
Barometric Pressure:	102.8kPa
Test Engineer:	Jerry Yan
Test Date:	2024/11/06

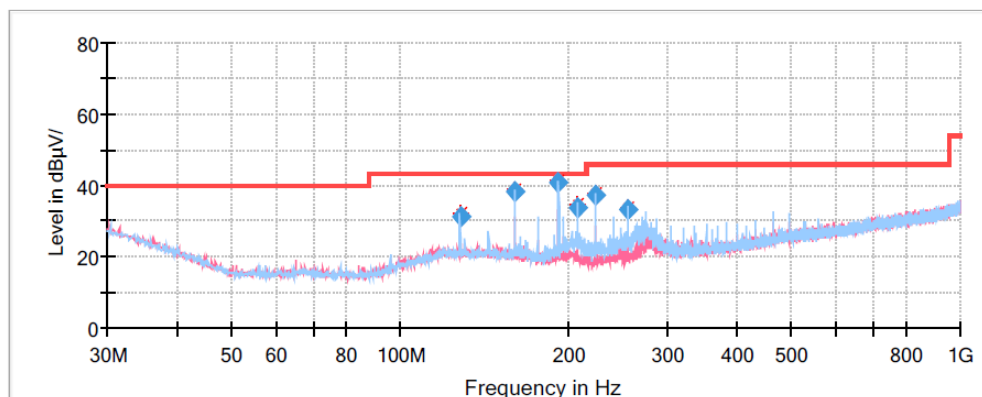


Final Result

Frequency (MHz)	QuasiPeak (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Pol	Corr. (dB/m)
127.988000	30.60	43.50	12.90	H	-11.0
160.003700	38.16	43.50	5.34	H	-12.1
192.011000	40.68	43.50	2.82	H	-12.4
208.012700	34.38	43.50	9.12	H	-12.6
224.014100	37.19	46.00	8.81	H	-13.2
256.021400	32.88	46.00	13.12	H	-12.0

Middle Channel: 2440 MHz**Common Information**

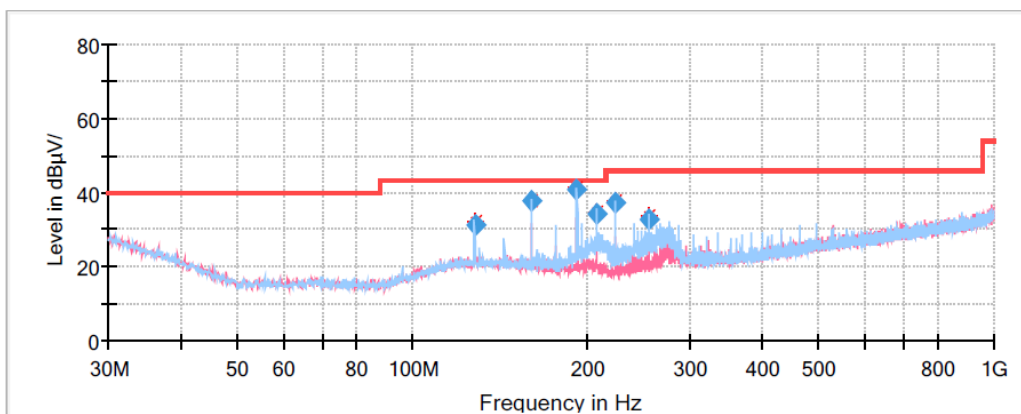
Project No: RSHA240826001
EUT Model: B21-N12
Test Mode: Transmitting in BLE-1M mode middle channel
Standard: FCC Part 15.205 & FCC Part 15.209 & FCC Part 15.247
Test Equipment: ESCI, JB3, 310N
Temperature: 20.4°C
Humidity: 52%
Barometric Pressure: 102.8kPa
Test Engineer: Jerry Yan
Test Date: 2024/11/06

**Final Result**

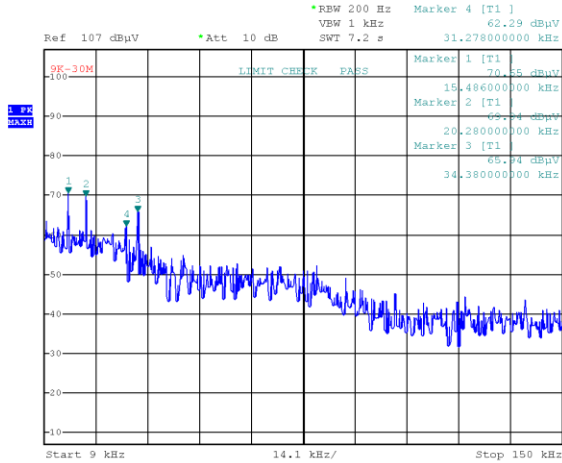
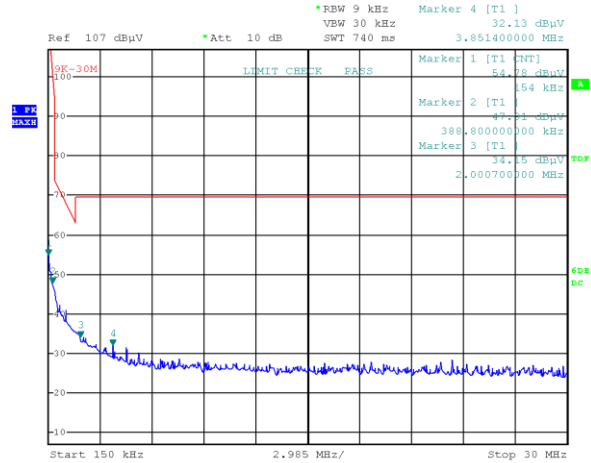
Frequency (MHz)	QuasiPeak (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Pol	Corr. (dB/m)
128.012600	31.24	43.50	12.26	H	-11.0
160.004000	38.14	43.50	5.36	H	-12.1
191.996300	40.57	43.50	2.93	H	-12.4
208.027700	33.70	43.50	9.80	H	-12.6
224.010200	37.21	46.00	8.79	H	-13.2
256.001900	33.34	46.00	12.66	H	-12.0

High Channel:2480 MHz**Common Information**

Project No: RSHA240826001
EUT Model: B21-N12
Test Mode: Transmitting in BLE-1M mode high channel
Standard: FCC Part 15.205 & FCC Part 15.209 & FCC Part 15.247
Test Equipment: ESCI, JB3, 310N
Temperature: 20.4℃
Humidity: 52%
Barometric Pressure: 102.8kPa
Test Engineer: Jerry Yan
Test Date: 2024/11/06

**Final Result**

Frequency (MHz)	QuasiPeak (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Pol	Corr. (dB/m)
128.011400	31.37	43.50	12.13	H	-11.0
160.007600	37.55	43.50	5.95	H	-12.1
192.009200	40.72	43.50	2.78	H	-12.4
208.015400	34.22	43.50	9.28	H	-12.6
224.007200	37.24	46.00	8.76	H	-13.2
255.992300	32.82	46.00	13.18	H	-12.0

Model: B21-N13**9 kHz-30 MHz: (Transmitting in maximum output power BLE (1 Mbps) low channel)****Parallel(worst case)****9kHz-150kHz****150kHz-30MHz**

Project No.RSHA240826001

Tester:Jerry Yan

Date: 7.NOV.2024 11:47:48

Project No.RSHA240826001

Tester:Jerry Yan

Date: 7.NOV.2024 12:33:53

9kHz-150kHz

Frequency (MHz)	Corrected Amplitude (dBuV/m) @3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBuV/m) @3m	Margin (dB)
0.015486	70.65	PK	52.87	123.81	53.16
0.02028	69.94	PK	49.92	121.46	51.52
0.03438	65.94	PK	46.06	116.88	50.94
0.031278	62.29	PK	46.87	117.70	55.41

150kHz-30MHz

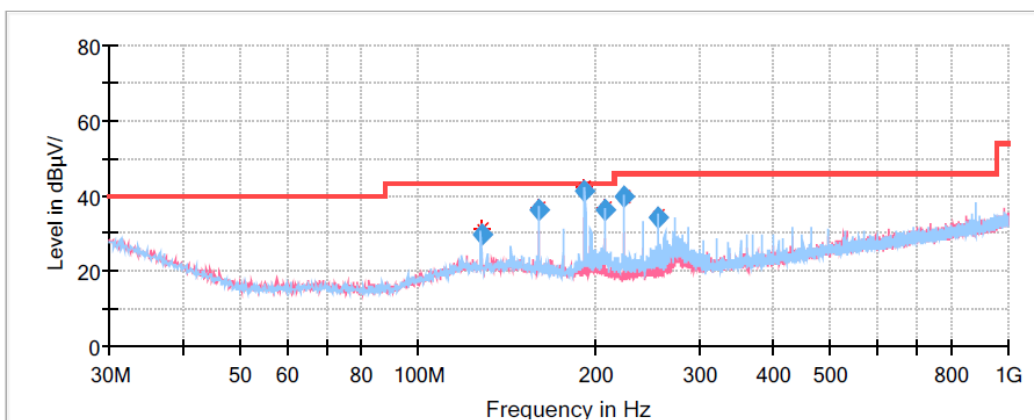
Frequency (MHz)	Corrected Amplitude (dBuV/m) @3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBuV/m) @3m	Margin (dB)
0.15400	54.78	PK	40.96	103.85	49.07
0.38880	47.91	PK	26.18	95.81	47.90
2.00070	34.15	PK	14.40	69.54	35.39
3.85140	32.13	PK	17.69	69.54	37.41

30 MHz - 1 GHz:

Low Channel: 2402 MHz

Common Information

Project No:	RSHA240826001
EUT Model:	B21-N13
Test Mode:	Transmitting in BLE-1M mode low channel
Standard:	FCC Part 15.205 & FCC Part 15.209 & FCC Part 15.247
Test Equipment:	ESCI, JB3, 310N
Temperature:	19.2°C
Humidity:	55%
Barometric Pressure:	103.1kPa
Test Engineer:	Jerry Yan
Test Date:	2024/11/07



Final Result

Frequency (MHz)	QuasiPeak (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Pol	Corr. (dB/m)
127.999100	29.68	43.50	13.82	H	-11.0
160.007000	36.18	43.50	7.32	H	-12.1
191.993000	41.49	43.50	2.01	H	-12.4
207.998000	36.22	43.50	7.28	H	-12.6
224.003900	39.57	46.00	6.43	H	-13.2
256.001000	34.37	46.00	11.63	H	-12.0

Middle Channel: 2440 MHz

Common Information

Project No:

EUT Model:

Test Mode:

Standard:

Test Equipment:

Temperature:

Humidity:

Barometric Pressure:

Test Engineer:

Test Date:

RSHA240826001

B21-N13

Transmitting in BLE-1M mode middle channel

FCC Part 15.205 & FCC Part 15.209&FCC Part 15.247

ESCI, JB3, 310N

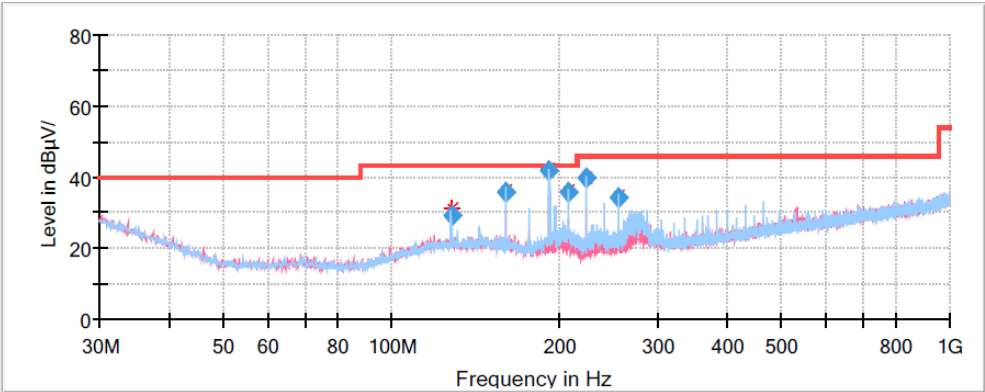
19.2℃

55%

103.1kPa

Jerry Yan

2024/11/07

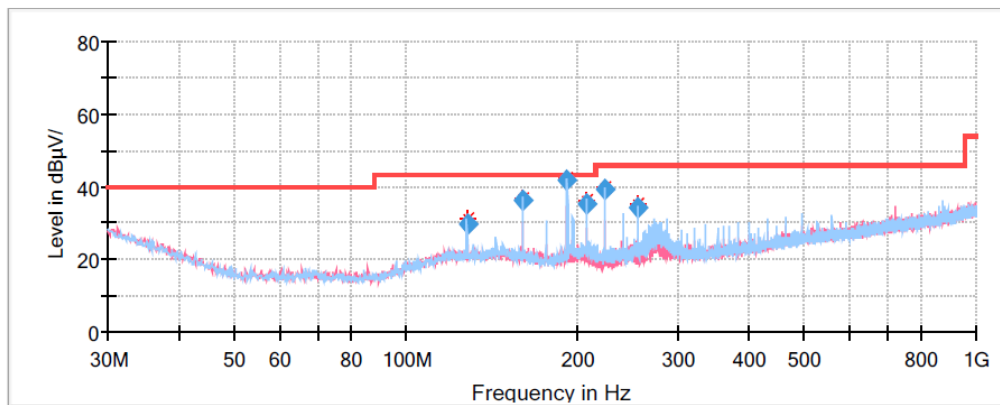


Final Result

Frequency (MHz)	QuasiPeak (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Pol	Corr. (dB/m)
128.015600	29.41	43.50	14.09	H	-11.0
160.009400	35.64	43.50	7.86	H	-12.1
192.001700	41.81	43.50	1.69	H	-12.4
208.015400	35.87	43.50	7.63	H	-12.6
224.012600	39.50	46.00	6.50	H	-13.2
256.006100	34.36	46.00	11.64	H	-12.0

High Channel:2480 MHz**Common Information**

Project No: RSHA240826001
EUT Model: B21-N13
Test Mode: Transmitting in BLE-1M mode high channel
Standard: FCC Part 15.205 & FCC Part 15.209 & FCC Part 15.247
Test Equipment: ESCI, JB3, 310N
Temperature: 19.2°C
Humidity: 55%
Barometric Pressure: 103.1kPa
Test Engineer: Jerry Yan
Test Date: 2024/11/07

**Final Result**

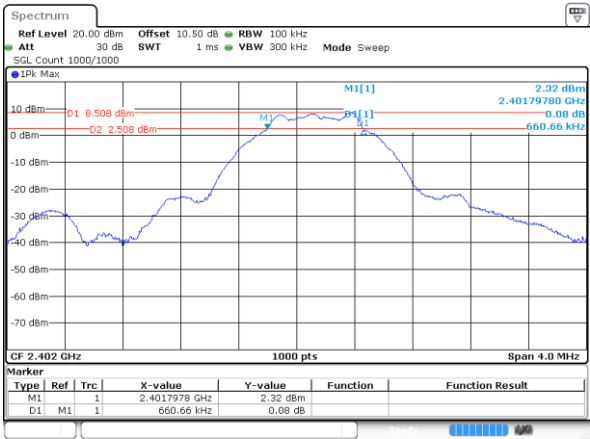
Frequency (MHz)	QuasiPeak (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Pol	Corr. (dB/m)
127.997900	29.75	43.50	13.75	H	-11.0
160.006700	36.05	43.50	7.45	H	-12.1
192.010100	41.71	43.50	1.79	H	-12.4
208.000400	35.46	43.50	8.04	H	-12.6
224.015300	39.35	46.00	6.65	H	-13.2
256.007300	34.30	46.00	11.70	H	-12.0

6 dB EMISSION BANDWIDTH

Mode	Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (MHz)	Result
BLE (1 Mbps)	Low	2402	0.661	≥ 0.5	Pass
	Middle	2440	0.673	≥ 0.5	Pass
	High	2480	0.685	≥ 0.5	Pass

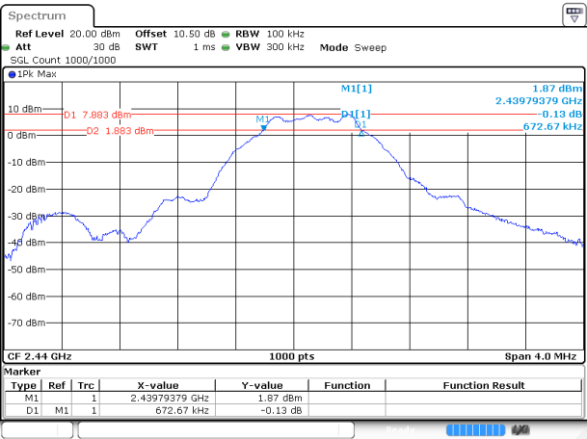
BLE (1 Mbps)

Low Channel



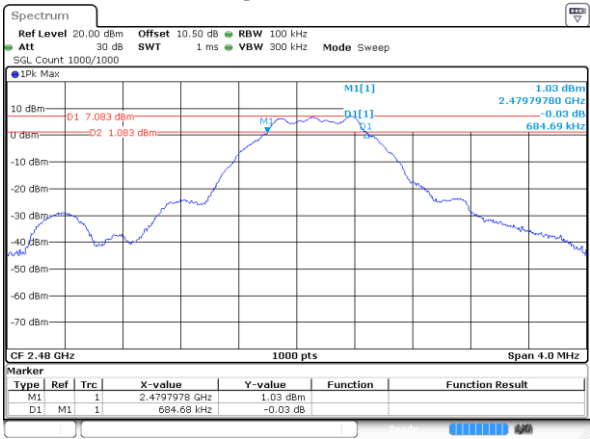
ProjectNo: RSHA240826001 Tester:Neil Zhou
Date: 12.SEP.2024 19:02:08

Middle Channel



ProjectNo: RSHA240826001 Tester:Neil Zhou
Date: 12.SEP.2024 19:06:35

High Channel



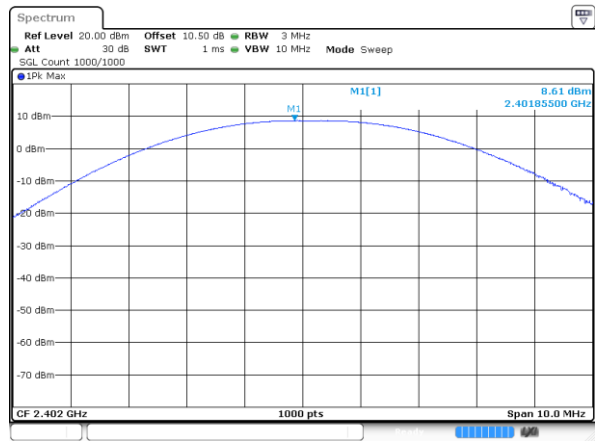
ProjectNo: RSHA240826001 Tester:Neil Zhou
Date: 12.SEP.2024 19:09:29

MAXIMUM CONDUCTED OUTPUT POWER**Test Result:** Compliant.*EUT operation mode: Transmitting*

Mode	Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Limit (dBm)	Result
BLE (1 Mbps)	Low	2402	8.61	30	Pass
	Middle	2440	8.01	30	Pass
	High	2480	7.17	30	Pass

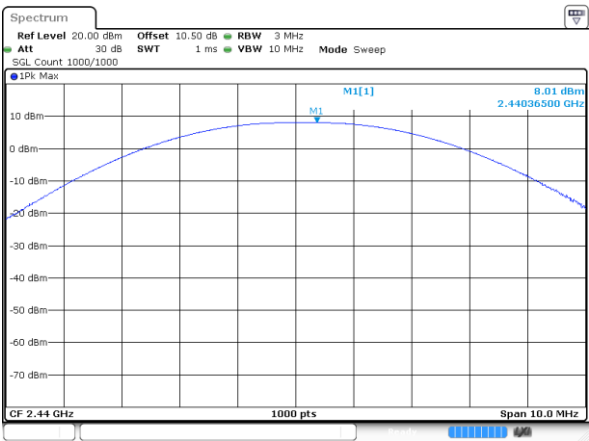
BLE (1 Mbps)

Low Channel



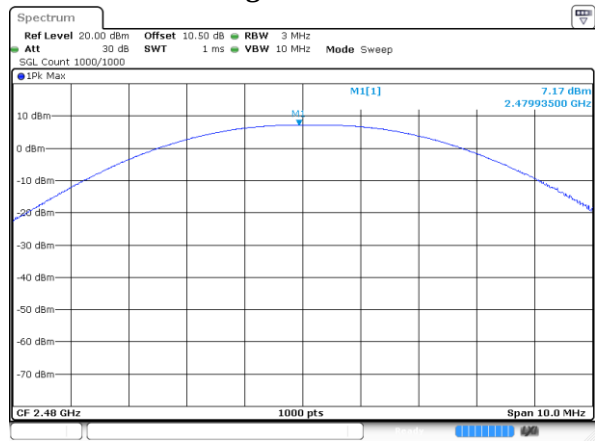
ProjectNo.: RSHA240826001 Tester: Neil Zhou
Date: 12 SEP 2024 19:05:16

Middle Channel



ProjectNo.: RSHA240826001 Tester: Neil Zhou
Date: 12 SEP 2024 19:08:27

High Channel



ProjectNo.: RSHA240826001 Tester: Neil Zhou
Date: 12 SEP 2024 19:12:00

BAND EDGE

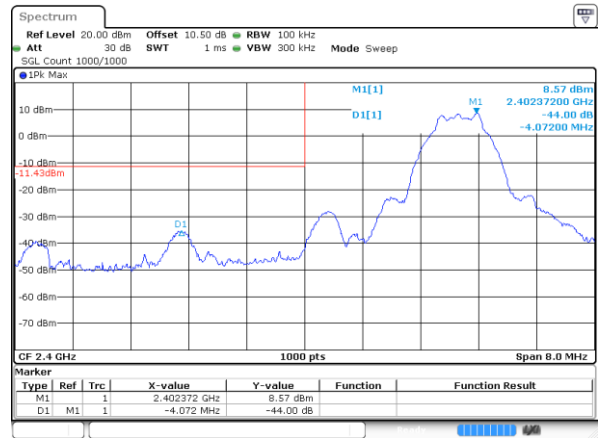
Test Result: Compliant.

EUT operation mode: Transmitting

Mode	Channel	Frequency (MHz)	Result (dBc)	Limit (dBc)
BLE (1 Mbps)	Low	2402	44.00	20
	High	2480	46.60	

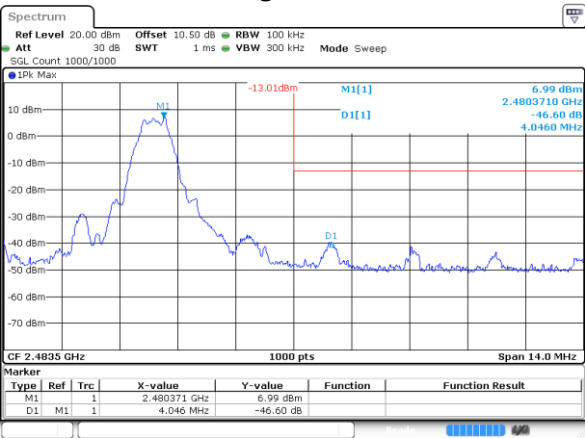
BLE (1 Mbps)

Left Side



ProjectNo: RSHA240826001 Tester: Neil Zhou
Date: 12 SEP 2024 19:01:58

Right Side



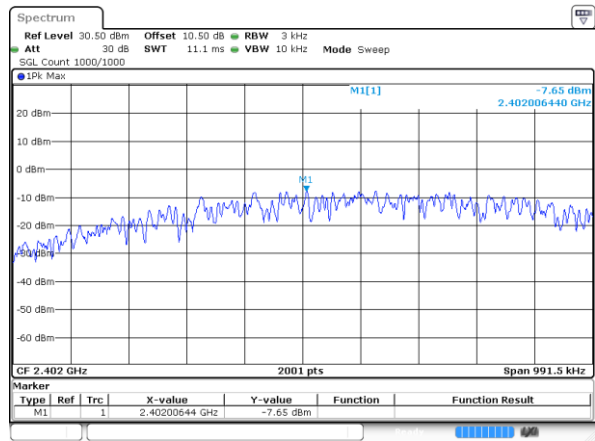
ProjectNo: RSHA240826001 Tester: Neil Zhou
Date: 12 SEP 2024 19:09:18

POWER SPECTRAL DENSITY**Test Result:** Compliant.*EUT operation mode: Transmitting*

Mode	Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
BLE (1 Mbps)	Low	2402	-7.65	≤8
	Middle	2440	-8.10	≤8
	High	2480	-8.66	≤8

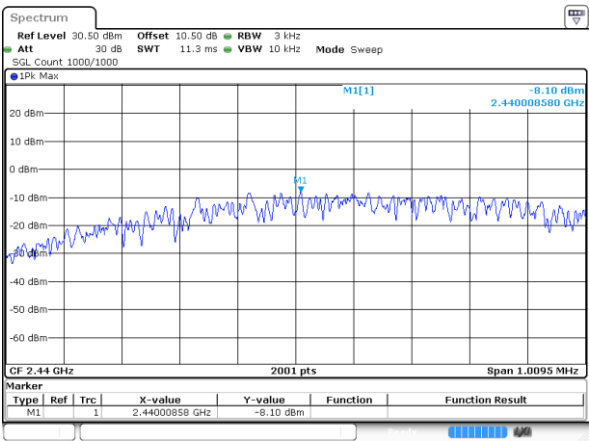
BLE (1 Mbps)

Low Channel



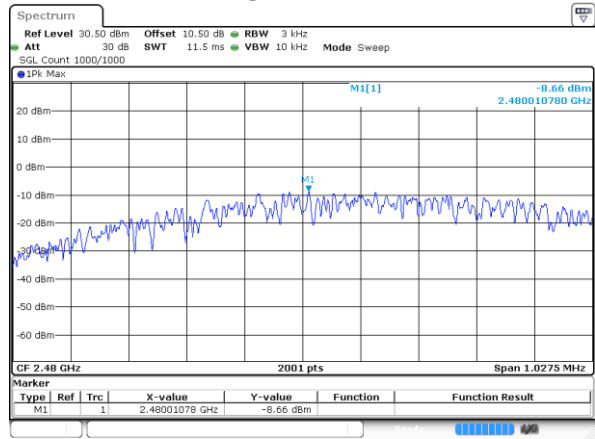
ProjectNo: RSHA240826001 Tester:Neil Zhou
Date: 12.SEP.2024 19:05:38

Middle Channel



ProjectNo: RSHA240826001 Tester:Neil Zhou
Date: 12.SEP.2024 19:08:51

High Channel



ProjectNo: RSHA240826001 Tester:Neil Zhou
Date: 12.SEP.2024 19:12:55

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 *******