FCC PART 15.247

TEST REPORT

For

Hangzhou YuShu Technology Co., Ltd.

306 Room, Building 1, 88 Dongliu Rd, XiXing Street, Binjiang District, Hangzhou, Zhejiang, China

FCC ID: 2A5PE-YUSHU008

Report Type:	**Product Name:**
Original Report	Humanoid robot

Report Number:	RKSA241202004-00D
Report Date:	2025-02-27
Reviewed By:	Bard Liu
Approved By:	Kyle Xu
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road, Kunshan, Jiangsu province, China Tel: +86-512-86175000 Fax: +86-512-88934268 www.baclcorp.com.cn

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REPORT REVISION HISTORY

Number of Revisions	Report No.	Version	Issue Date	Description
0	RKSA241202004-00D	R1V1	2025-02-27	Initial Release

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	Hangzhou YuShu Technology Co., Ltd.
Product Name:	Humanoid robot
Tested Model:	G1
Power Supply:	DC 46.8 V from battery
RF Function:	LoRa
Operating Band/Frequency:	2400.8-2480 MHz
Maximum Peak Output Power:	5.42 dBm
Channel Number:	100
Channel Separation:	0.8 MHz
Modulation Type:	BPSK
Antenna Type:	Chip Antenna
★Maximum Antenna Gain:	3.0 dBi

Note: The maximum antenna gain was provided by the applicant.

All measurement and test data in this report was gathered from production sample serial number: RKSA241202004-1 (Assigned by the BACL (Kunshan). The EUT supplied by the applicant was received on 2024-12-02.)

Objective

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

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

Test channel list as below:

EUT was tested with Channel 1, 50 and 100.

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2400.8	50	2440	94	2475.2
2	2401.6	51	2440.8	95	2476.0
3	2402.4	52	2441.6	96	2476.8
4	2403.2	53	2442.4	97	2477.6
5	2404.0	54	2443.2	98	2478.4
6	2404.8	55	2444.0	99	2479.2
7	2405.6	56	2444.8	100	2480
8	2406.4	57	2445.6	/	/
…	…	…	…	/	/

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

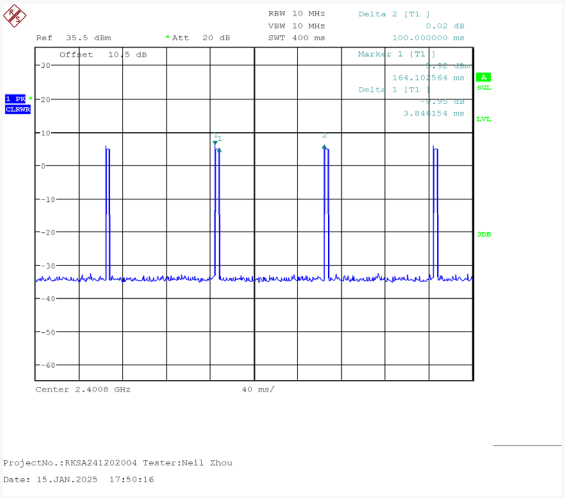
RF Test Software: XCOM V2.6

Mode	Channel	★Power Level
SRD	Low	10
	Middle	10
	High	10

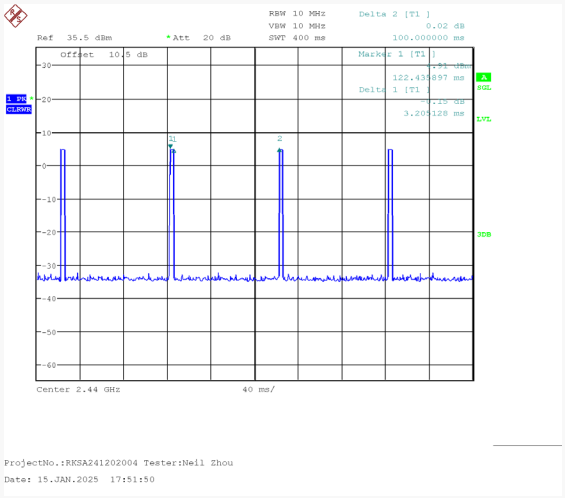
Note: The power level was declared by the applicant.

Duty Cycle:

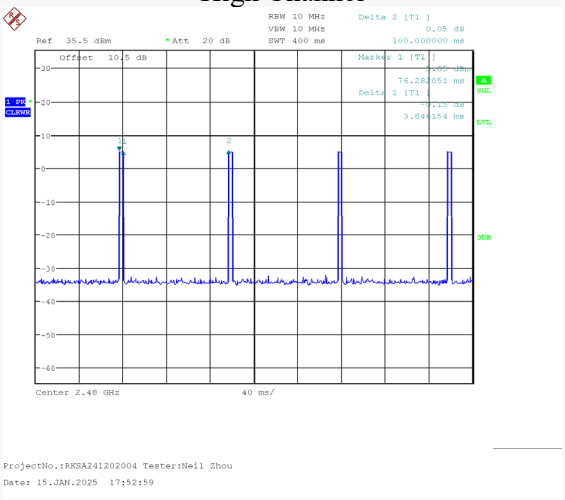
Low Channel



Middle Channel



High Channel



Channel	Duty Cycle (%)	Ton (ms)	Ton+off (ms)	10log(1/x) (dB)
Low	3.85	3.85	100	14.15
Middle	3.21	3.21	100	14.93
High	3.85	3.85	100	14.15

Note:
1. “x” means the Duty Cycle.
2. Offset (10.5dB) = Attenuator (10dB) + cable loss (0.5dB)

Support Equipment List and Details

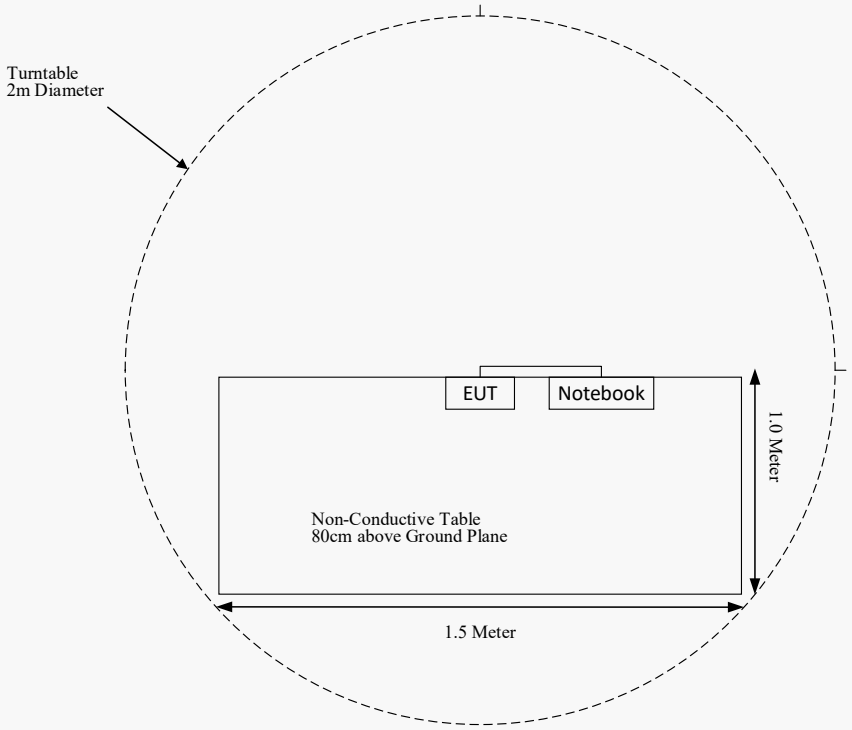
Manufacturer	Description	Model	Serial Number
HP	Notebook	4441s	2CE3130VWY

External I/O Cable

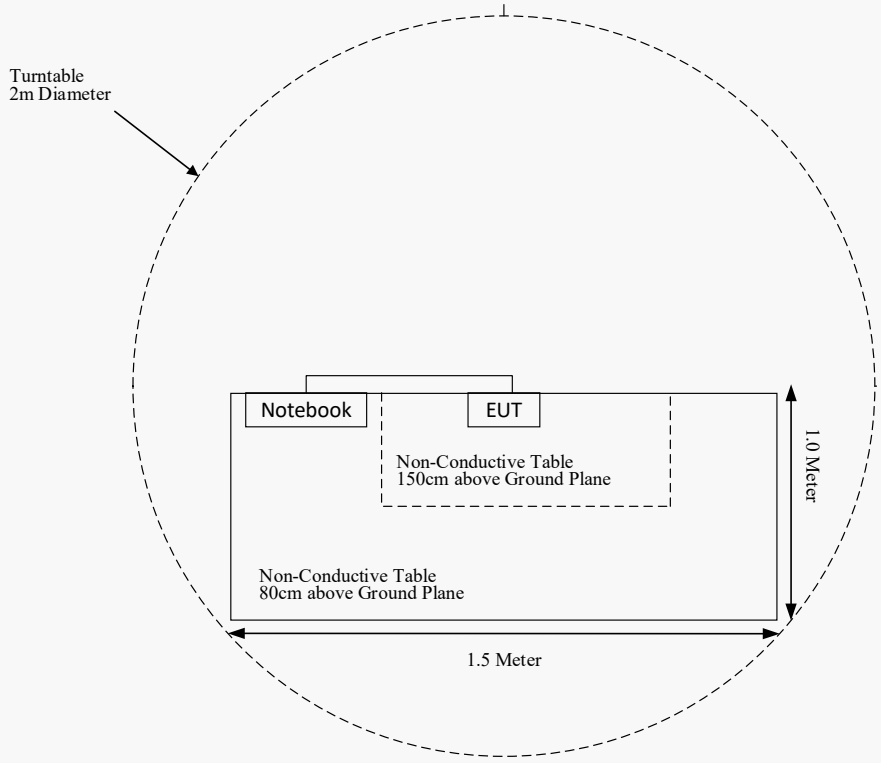
Cable Description	Length(m)	From Port	To Port
USB Cable	1.0	EUT	Notebook

Block Diagram of Test Setup

For Radiated Emissions(Below 1GHz):



For Radiated Emissions(Above 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (I), §1.1310 & §2.1091	Maximum Permissible Exposure (MPE)	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 (a)	AC Line Conducted Emissions	Not Applicable (See Note)
§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

Note: The EUT powered by battery.

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	Hybrid Antenna	JB3	A090314-1	2024-11-08	2027-11-07
BACL	Active Loop Antenna	1313-1A	4041511	2024-11-22	2027-11-21
Sonoma Instrument	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
Narda	6dB Attenuator	773-6	10690812-2-1	2024-11-08	2027-11-07
Radiated Emission Test (Chamber #2)					
Rohde & Schwarz	EMI Test Receiver	ESU40	100207/040	2024-04-25	2025-04-24
ETS-LINDGREN	Horn Antenna	3115	9207-3900	2024-11-03	2027-11-02
ETS-LINDGREN	Horn Antenna	3116	2516	2024-12-12	2027-12-11
A.H.Systems, inc	Amplifier	PAM-0118P	512	2024-04-25	2025-04-24
EM Electronics Corporation	Amplifier	EM18G40G	060726	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
Rohde & Schwarz	Auto test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-6	006	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-11	011	2024-04-25	2025-04-24
MICRO-COAX	Coaxial Cable	Cable-12	012	2024-04-25	2025-04-24
MICRO-COAX	Coaxial Cable	Cable-13	013	2024-04-25	2025-04-24
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSU26	200103	2024-04-24	2025-04-23
N/A	Attenuator	10 dB	N/A	2024-04-23	2025-04-22
XHFDZ	RG316 Coaxial Cable	SMA-316	XHF-1175	Each time	N/A

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

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

Applicable Standard

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

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

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

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

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

Calculated Formulary

Predication of MPE limit at a given distance
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
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);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

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)	MPE ratio
		(dBi)	(numeric)	(dBm)	(mW)				
LoRa	2400.8-2480	3.0	2.0	5.5	3.55	20	0.0014	1.0	0.0014
2.4G Wi-Fi	2412-2462	3.0	2.0	29	794.33	20	0.3160	1.0	0.3160
5G Wi-Fi	5150-5250	4.2	2.63	22.5	177.83	20	0.0930	1.0	0.0930
	5250-5350	4.2	2.63	22.0	158.49	20	0.0829	1.0	0.0829
	5470-5725	4.2	2.63	22.0	158.49	20	0.0829	1.0	0.0829
	5725-5850	4.2	2.63	23.5	223.87	20	0.1171	1.0	0.1171
BLE	2402-2480	1.5	1.41	7.0	5.01	20	0.0014	1.0	0.0014
Classic BT	2402-2480	1.5	1.41	8.5	7.08	20	0.0020	1.0	0.0020

Note:
1. For the above tune up power were declared by the manufacturer.
2. LoRa and 2.4G Wi-Fi/5G WIFI/BT/BLE can transmit simultaneously.

$$\sum_i \frac{S_i}{S_{Limit,i}}$$

$= S_{LoRa}/S_{limitLoRa} + S_{2.4G\ Wi\text{-}Fi}/S_{limit2.4G\ Wi\text{-}Fi}$

$=0.0014+0.3160$

$=0.3174$

< 1.0

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

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

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

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.
c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.
And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has a Chip Antenna and the antenna gain is 3.0 dBi, the antenna was permanently attached, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliant.

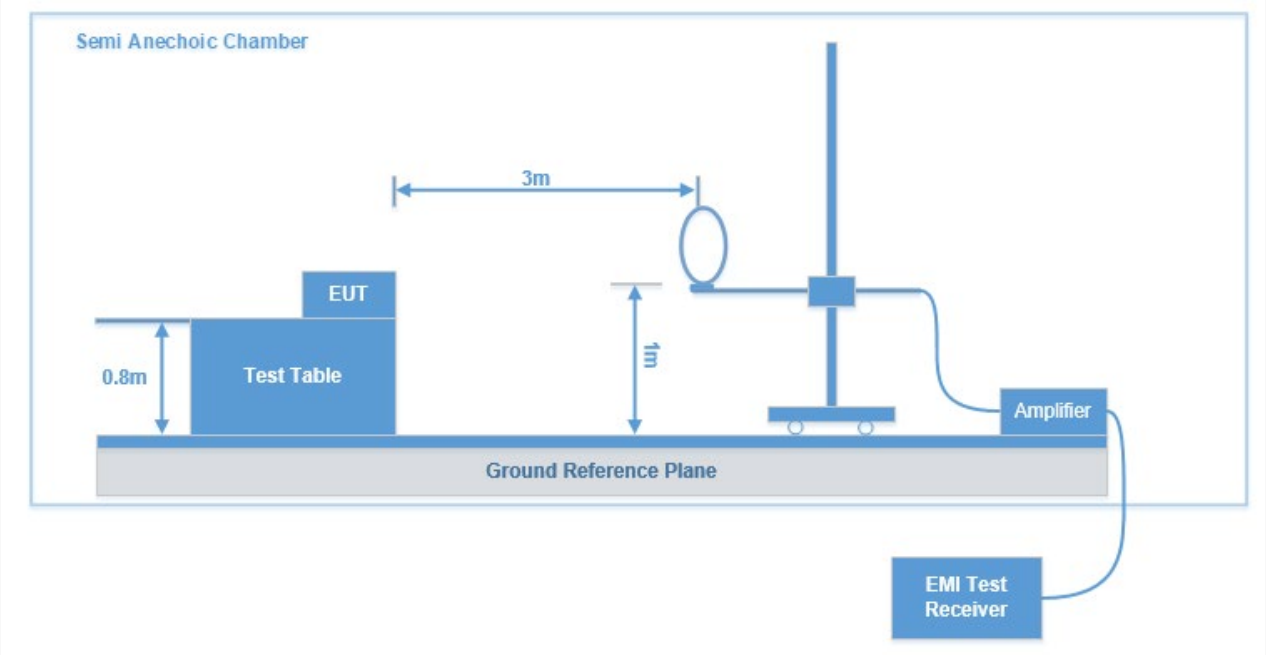
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

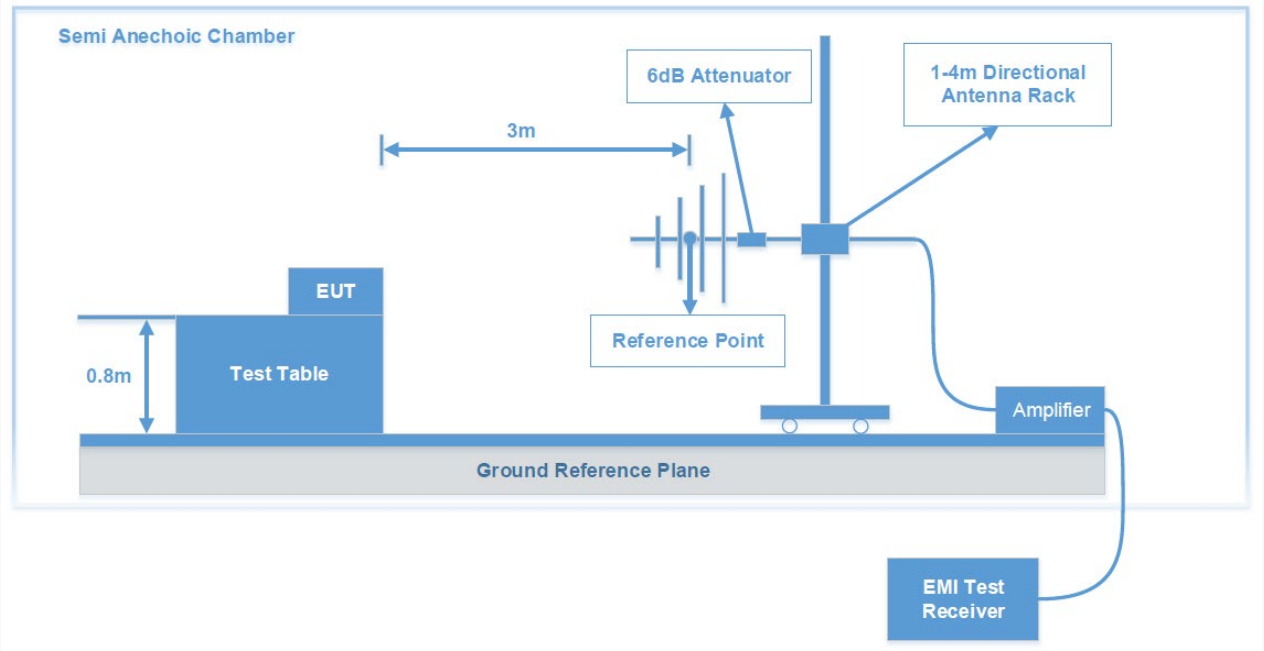
FCC §15.247 (d); §15.209; §15.205;

Test System Setup

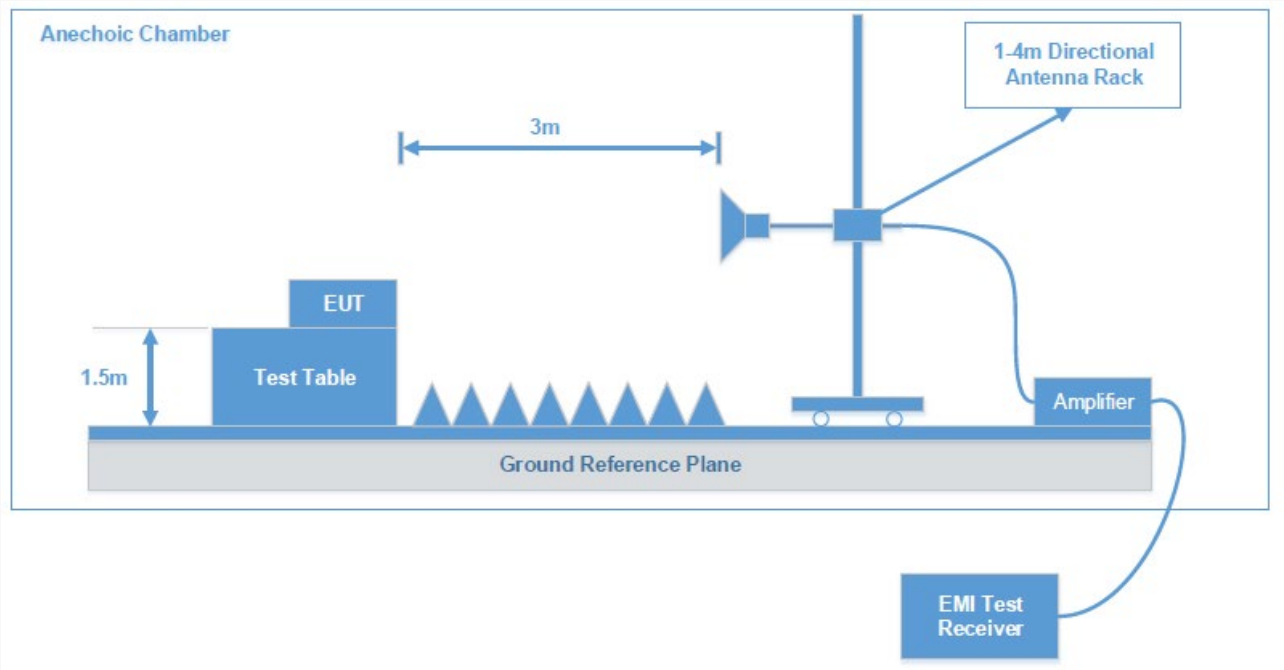
9 kHz - 30 MHz:



30 MHz - 1 GHz:



1 GHz - 25 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

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

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.

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.

Data was recorded in Quasi-peak detection mode for frequency range of 9 kHz - 1GHz, peak and Average detection mode for frequencies above 1 GHz.

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)

Note: The QuasiPeak (dBμV/m), MaxPeak (dBμV/m), Average (dBμV/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

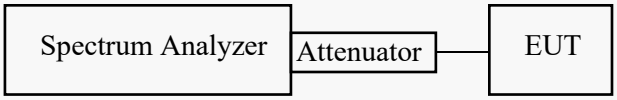
Applicable Standard

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) ≥ 3 * 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.



Note: Offset (10.5dB) = Attenuator (10dB) + cable loss (0.5dB)

Test Data: See Appendix

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

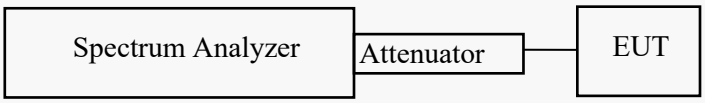
Applicable Standard

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

Test Procedure

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

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



Note: Offset (10.5dB)=Attenuator (10dB)+Cable loss (0.5dB)

Test Data: See Appendix

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

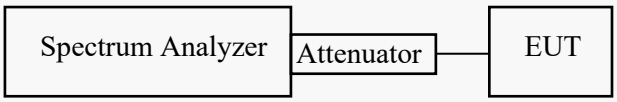
Applicable Standard

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.



Note: Offset (10.5dB) = Attenuator (10dB) + cable loss (0.5dB)

Test Data: See Appendix

FCC §15.247(E) - POWER SPECTRAL DENSITY

Applicable Standard

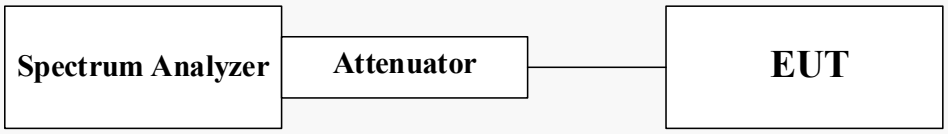
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of 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: 3kHz≤ RBW≤100 kHz.
2. Set the VBW ≥ 3*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.



Note: Offset (10.5dB) = Attenuator (10dB) + cable loss (0.5dB)

Test Data: See Appendix

.

APPENDIX - TEST DATA

Environmental Conditions & Test Information

Test Item:	SPURIOUS EMISSIONS				DUTY CYCLE
	9 kHz – 30MHz	30MHz - 1GHz	1 GHz - 18 GHz	18 GHz - 25 GHz	
Test Date:	2025-01-14	2024-12-16	2024-12-18	2025-02-27	2025-01-15
Temperature:	16.3 ℃	15.4℃	22.8 ℃	22.6 ℃	23.4 ℃
Relative Humidity:	35 %	40 %	53 %	52 %	52 %
ATM Pressure:	102.4 kPa	102.4 kPa	100.5kPa	100.7kPa	100.7kPa
Test Result:	Pass	Pass	Pass	Pass	/
Test Engineer:	Jerry Yan	Jerry Yan	Klein Zhu	Hugh Wu	Neil Zhou

Test Item:	6 DB EMISSION BANDWIDTH	MAXIMUM CONDUCTED OUTPUT POWER	100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE	POWER SPECTRAL DENSITY
Test Date:	2025-01-15	2025-01-15	2025-01-15	2025-01-15
Temperature:	23.4 ℃	23.4 ℃	23.4 ℃	23.4 ℃
Relative Humidity:	52 %	52 %	52 %	52 %
ATM Pressure:	100.7kPa	100.7kPa	100.7kPa	100.7kPa
Test Result:	Pass	Pass	Pass	Pass
Test Engineer:	Neil Zhou	Neil Zhou	Neil Zhou	Neil Zhou

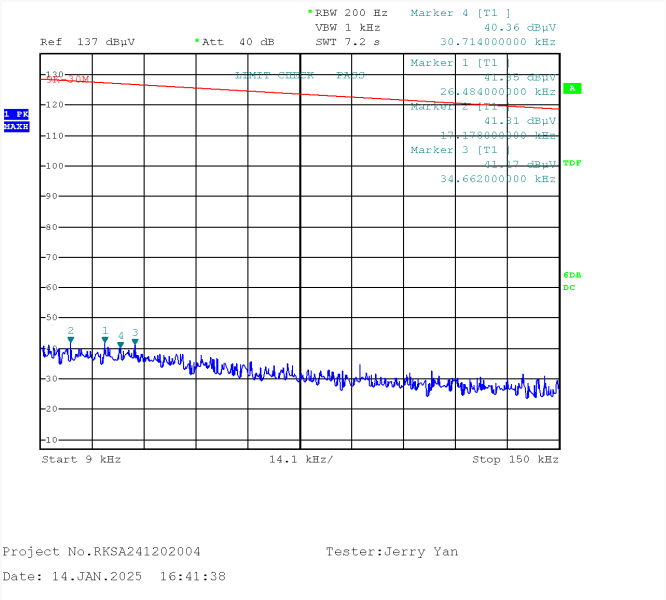
SPURIOUS EMISSIONS

EUT operation mode: Transmitting

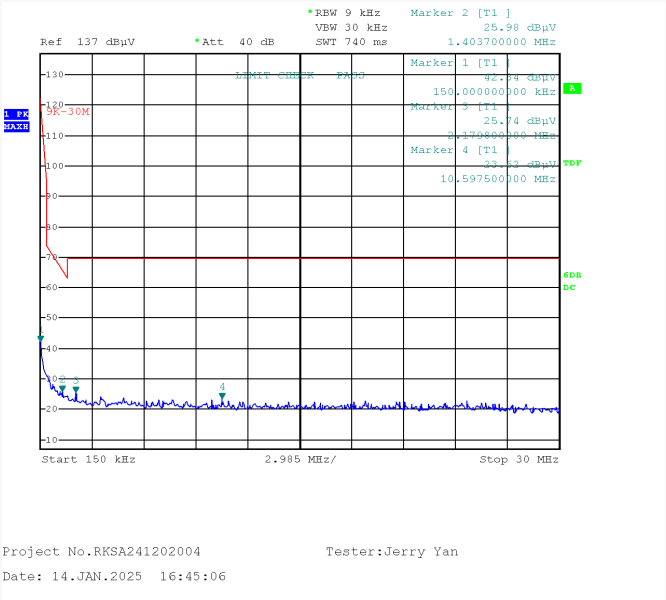
After pre-scan in the X, Y and Z axes of orientation, the worst case is below:

9 kHz-30 MHz: (*Transmitting in maximum output power SRD mode low channel)*
Parallel(worst case)

9kHz-150kHz



150kHz-30MHz



9kHz-150kHz

Frequency (MHz)	Corrected Amplitude (dBµV/m) @3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBµV/m) @3m	Margin (dB)
0.017178	41.81	PK	-0.55	122.91	81.10
0.026484	41.85	PK	-0.59	119.15	77.30
0.030714	40.36	PK	-0.72	117.86	77.50
0.034662	41.17	PK	-1.36	116.81	75.64

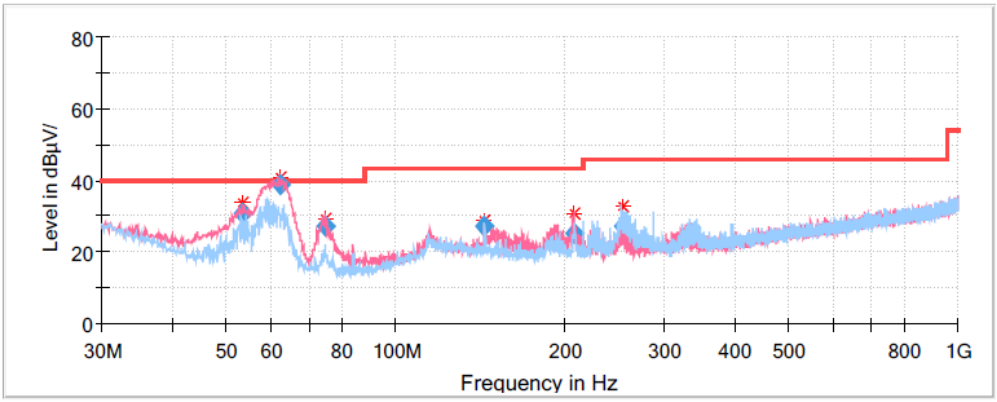
150kHz-30MHz

Frequency (MHz)	Corrected Amplitude (dBµV/m) @3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBµV/m) @3m	Margin (dB)
0.15000	42.34	PK	-11.34	104.08	61.74
1.40370	25.98	PK	-28.94	104.08	78.10
2.17980	25.74	PK	-31.00	69.54	43.80
10.59750	23.62	PK	-32.87	69.54	45.92

30MHz - 1GHz
Low Channel: 2400.8 MHz

Common Information

Project No:	RKSA241202004
EUT Model:	G1
Test Mode:	Transmitting in low channel
Standard:	FCC Part 15.205 &FCC Part 15.209&FCC Part 15.247
Test Equipment:	ESCI, JB3, 310N
Receiver Setting:	RBW:120 kHz, VBW: 300 kHz, Sweep Time: Auto
Temperature:	15.4℃
Humidity:	40%
Barometric Pressure:	102.4kPa
Test Engineer:	Jerry Yan
Test Date:	2024/12/16



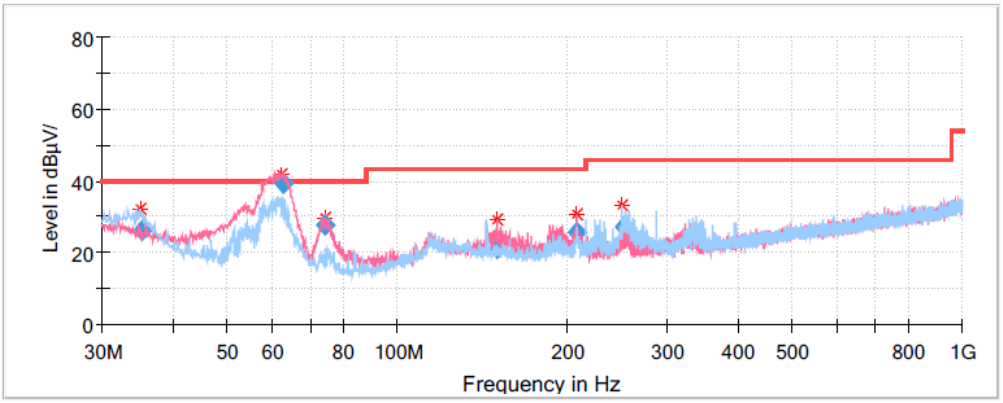
Final_Result

Frequency (MHz)	QuasiPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
53.456450	30.58	40.00	9.42	V	-17.0
62.136300	38.52	40.00	1.48	V	-17.0
74.683800	27.09	40.00	12.91	V	-16.8
144.007100	27.18	43.50	16.32	H	-11.4
207.540450	25.26	43.50	18.24	V	-12.5
252.541850	27.41	46.00	18.59	H	-12.1

Middle Channel: 2440 MHz

Common Information

Project No:	RKSA241202004
EUT Model:	G1
Test Mode:	Transmitting in middle channel
Standard:	FCC Part 15.205 &FCC Part 15.209&FCC Part 15.247
Test Equipment:	ESCI, JB3, 310N
Receiver Setting:	RBW:120 kHz, VBW: 300 kHz, Sweep Time: Auto
Temperature:	15.4℃
Humidity:	40%
Barometric Pressure:	102.4kPa
Test Engineer:	Jerry Yan
Test Date:	2024/12/16



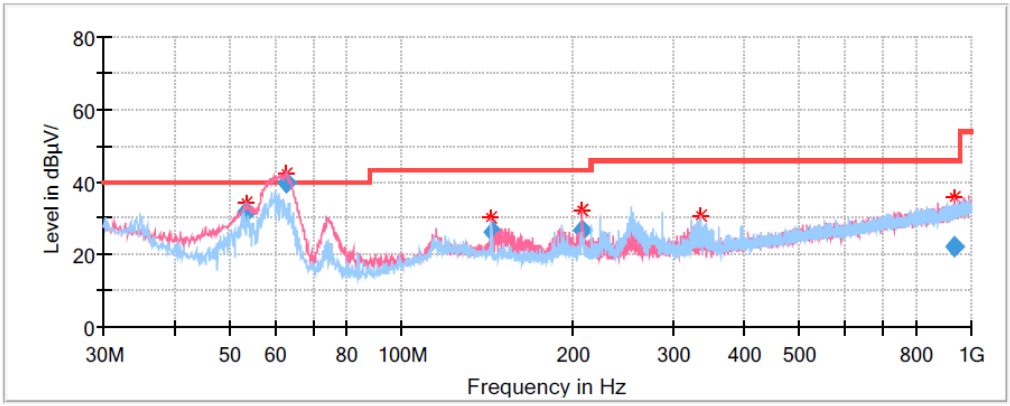
Final_Result

Frequency (MHz)	QuasiPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
35.258950	26.21	40.00	13.79	H	-8.2
62.542650	39.23	40.00	0.77	V	-16.9
74.346300	27.90	40.00	12.10	V	-16.8
149.689500	21.35	43.50	22.15	V	-11.6
207.035300	25.70	43.50	17.80	V	-12.5
251.013150	27.23	46.00	18.77	H	-12.1

High Channel: 2480 MHz

Common Information

Project No:	RKSA241202004
EUT Model:	G1
Test Mode:	Transmitting in high channel
Standard:	FCC Part 15.205 &FCC Part 15.209&FCC Part 15.247
Test Equipment:	ESCI, JB3, 310N
Receiver Setting:	RBW:120 kHz, VBW: 300 kHz, Sweep Time: Auto
Temperature:	15.4℃
Humidity:	40%
Barometric Pressure:	102.4kPa
Test Engineer:	Jerry Yan
Test Date:	2024/12/16



Final_Result

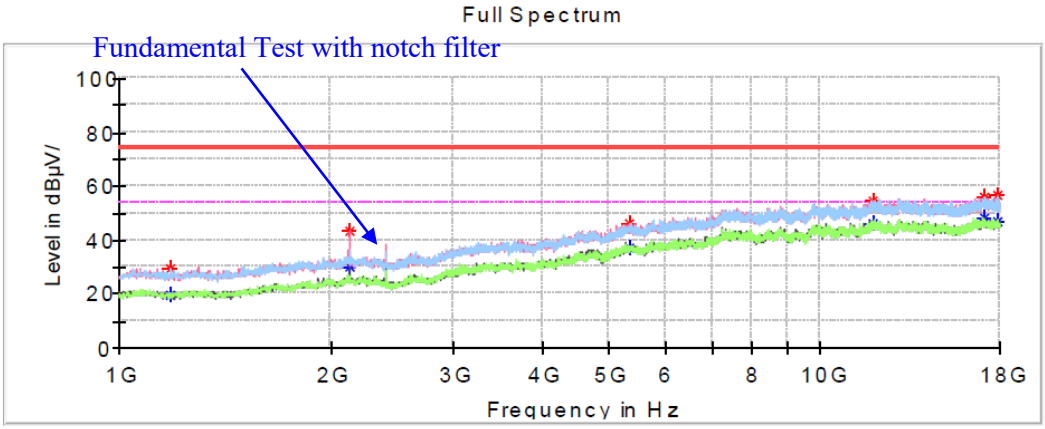
Frequency (MHz)	QuasiPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
53.441450	31.51	40.00	8.49	V	-17.0
62.610000	39.50	40.00	0.50	V	-17.0
144.025100	26.01	43.50	17.49	V	-11.4
207.386200	26.75	43.50	16.75	V	-12.5
333.917500	24.84	46.00	21.16	H	-9.5
937.361950	22.29	46.00	23.71	V	1.1

1GHz - 18GHz:

Low Channel: 2400.8 MHz

Common Information

Project No.:	RKSA241202004
Test Mode:	Transmitting
Standard:	FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Receiver Setting:	RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
Test Engineer:	Klein Zhu



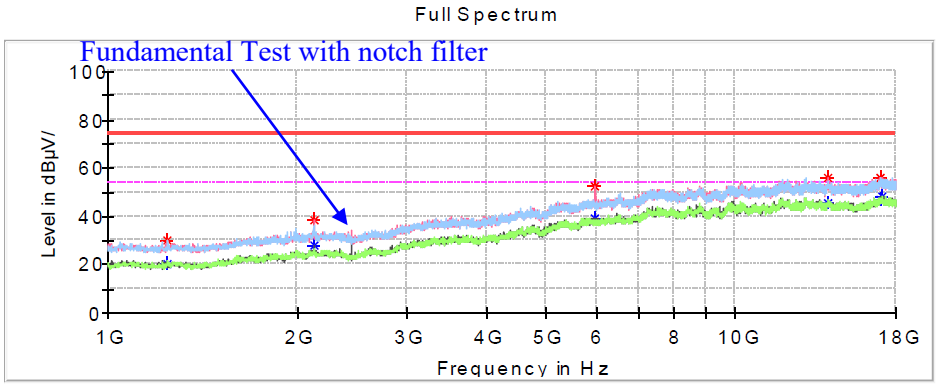
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1185.300000	---	19.77	54.00	34.23	H	-15.2
1185.300000	29.21	---	74.00	44.79	H	-15.2
2130.500000	---	30.26	54.00	23.74	V	-11.3
2130.500000	43.26	---	74.00	30.74	V	-11.3
5343.500000	---	37.36	54.00	16.64	V	-1.0
5343.500000	46.46	---	74.00	27.54	V	-1.0
11854.500000	---	46.16	54.00	7.84	H	8.9
11854.500000	54.86	---	74.00	19.14	H	8.9
17083.700000	55.73	---	74.00	18.27	V	12.2
17083.700000	---	48.41	54.00	5.59	V	12.2
17841.900000	56.38	---	74.00	17.62	V	11.8
17841.900000	---	46.50	54.00	7.50	V	11.8

Middle Channel: 2440 MHz

Common Information

Project No.:	RKSA241202004
Test Mode:	Transmitting
Standard:	FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Receiver Setting:	RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
Test Engineer:	Klein Zhu



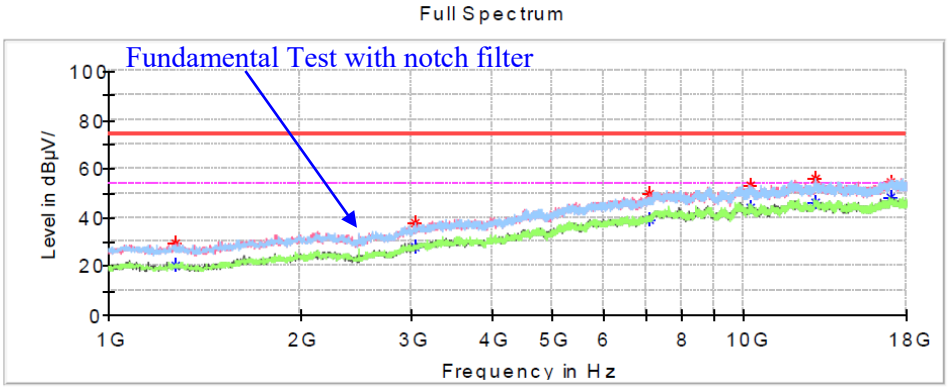
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1244.800000	---	20.26	54.00	33.74	H	-15.1
1244.800000	30.38	---	74.00	43.62	H	-15.1
2128.800000	---	27.88	54.00	26.12	V	-11.3
2128.800000	38.14	---	74.00	35.86	V	-11.3
5984.400000	---	39.04	54.00	14.96	V	0.0
5984.400000	52.57	---	74.00	21.43	V	0.0
14010.100000	---	45.51	54.00	8.49	V	9.8
14010.100000	55.82	---	74.00	18.18	V	9.8
17005.500000	55.94	---	74.00	18.06	V	12.3
17005.500000	---	46.86	54.00	7.14	V	12.3
17165.300000	53.91	---	74.00	20.09	H	12.0
17165.300000	---	48.38	54.00	5.62	H	12.0

High Channel: 2480 MHz

Common Information

Project No.:	RKSA241202004
Test Mode:	Transmitting
Standard:	FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Receiver Setting:	RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
Test Engineer:	Klein Zhu



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)
1277.100000	---	20.21	54.00	33.79	H	-15.1
1277.100000	29.27	---	74.00	44.73	H	-15.1
3036.600000	---	27.94	54.00	26.06	H	-8.3
3036.600000	37.42	---	74.00	36.58	H	-8.3
7120.000000	---	39.44	54.00	14.56	V	2.9
7120.000000	49.86	---	74.00	24.14	V	2.9
10224.200000	---	43.86	54.00	10.14	H	7.1
10224.200000	53.01	---	74.00	20.99	H	7.1
12962.900000	56.21	---	74.00	17.79	H	9.7
12962.900000	---	46.32	54.00	7.68	H	9.7
17070.100000	---	48.53	54.00	5.47	V	12.2
17070.100000	54.58	---	74.00	19.42	V	12.2

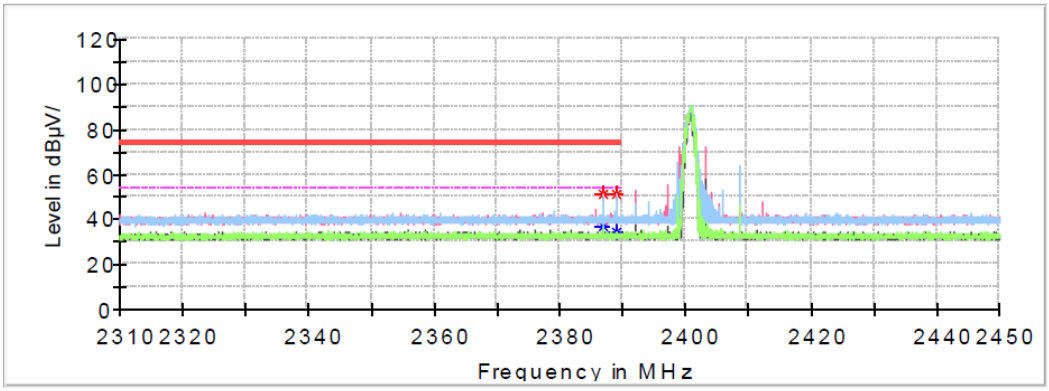
Band Edge:

Low Channel

Common Information

Project No.:	RKSA241202004
Test Mode:	Transmitting
Standard:	FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Receiver Setting:	RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
Test Engineer:	Klein Zhu

Full Spectrum



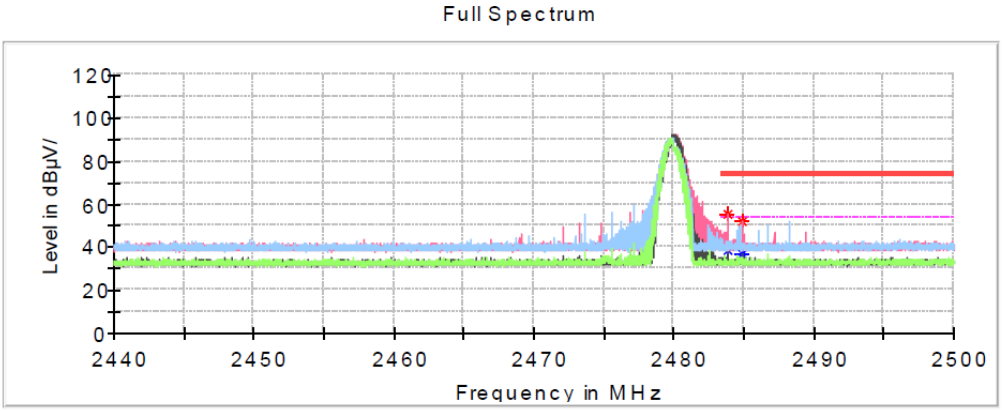
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2386.874000	51.06	---	74.00	22.94	H	-4.6
2386.874000	---	37.09	54.00	16.91	H	-4.6
2389.030000	51.15	---	74.00	22.85	H	-4.6
2389.030000	---	34.58	54.00	19.42	H	-4.6

High Channel

Common Information

Project No.:	RKSA241202004
Test Mode:	Transmitting
Standard:	FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Receiver Setting:	RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
Test Engineer:	Klein Zhu

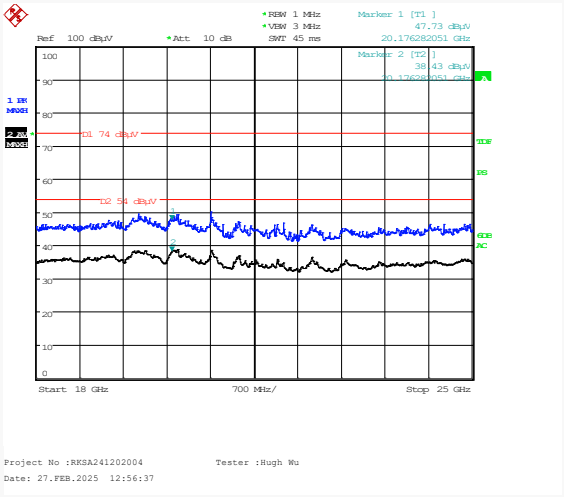


Critical_Freqs

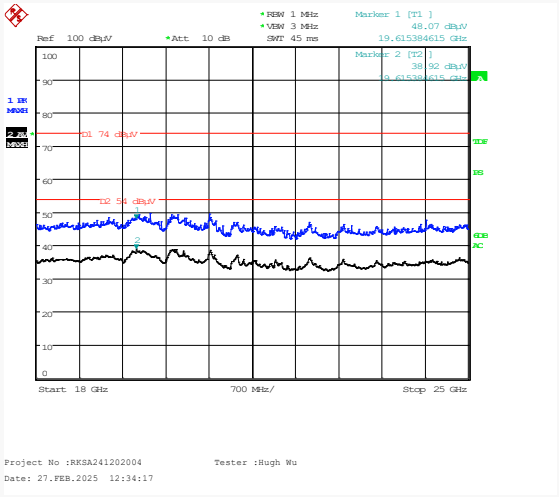
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2483.806000	---	38.31	54.00	15.69	V	-4.3
2483.806000	55.41	---	74.00	18.59	V	-4.3
2484.838000	---	36.87	54.00	17.13	V	-4.3
2484.838000	52.36	---	74.00	21.64	V	-4.3

18GHz-25GHz: (Transmitting in maximum output power low channel)

Horizontal



Vertical



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

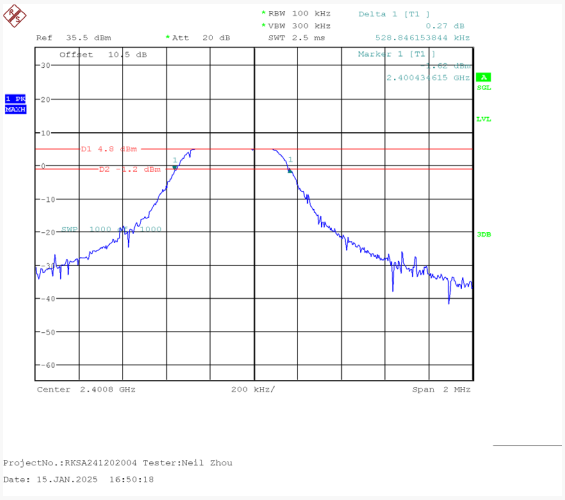
Frequency (GHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)
19.62	---	38.92	54	15.08	V	11.72
19.62	48.07	---	74	25.93	V	11.72
20.18	---	38.43	54	15.57	H	12.65
20.18	47.73	---	74	26.27	H	12.65

6 dB EMISSION BANDWIDTH

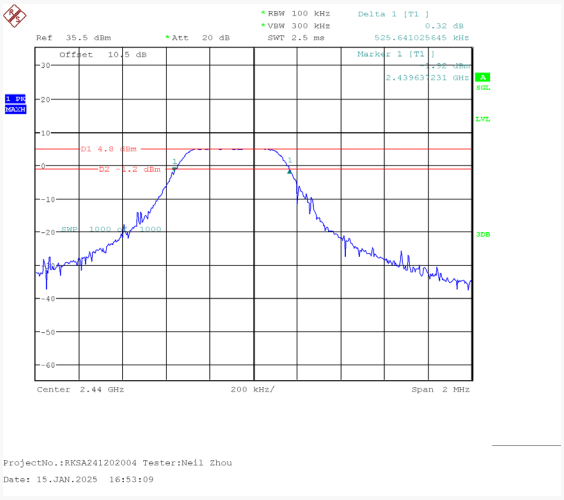
EUT operation mode: Transmitting

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (MHz)
Low	2400.8	0.53	≥ 0.5
Middle	2440	0.53	≥ 0.5
High	2480	0.52	≥ 0.5

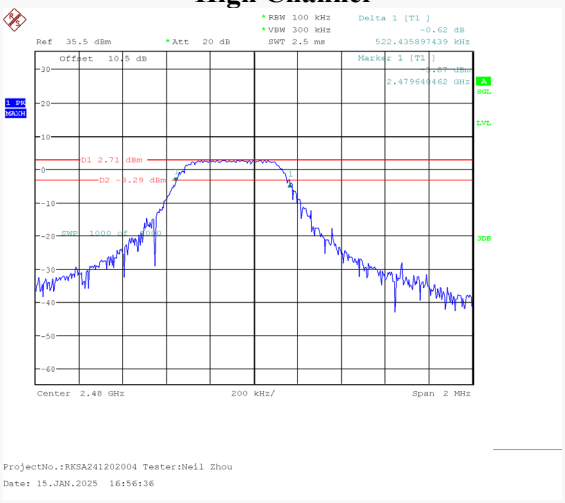
Low Channel



Middle Channel



High Channel



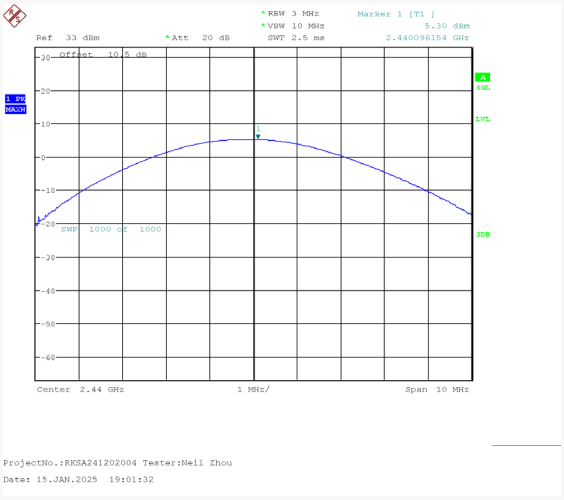
MAXIMUM CONDUCTED OUTPUT POWER

EUT operation mode: Transmitting

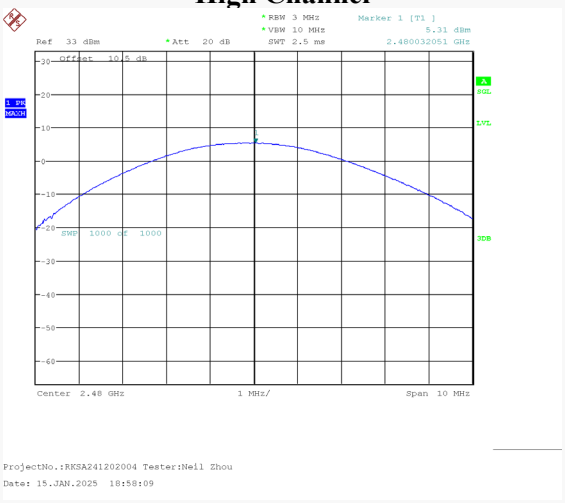
Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Limit (dBm)	Result
Low	2400.8	5.42	30	Pass
Middle	2440	5.30	30	Pass
High	2480	5.31	30	Pass

Low Channel

Middle Channel



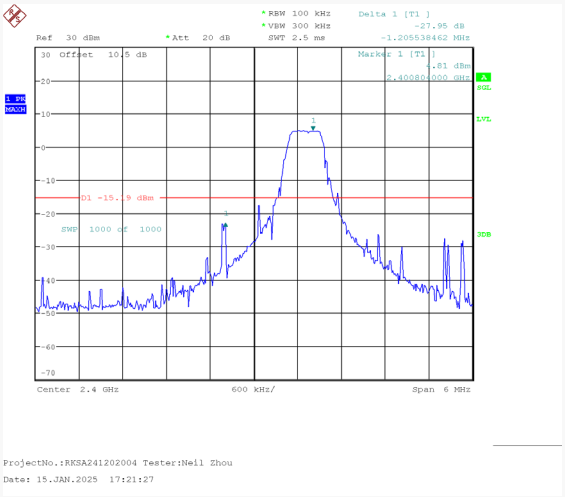
High Channel



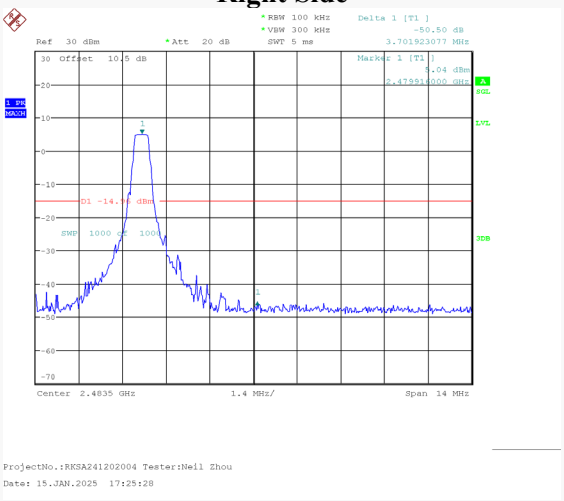
100 kHz Bandwidth of Frequency Band Edge

EUT operation mode: Transmitting

Left Side



Right Side

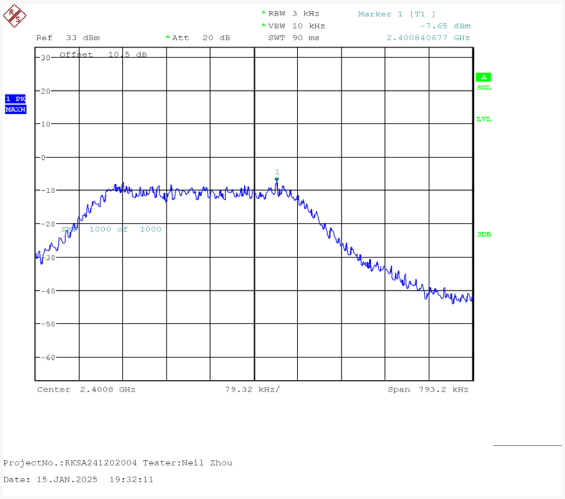


Power Spectral Density

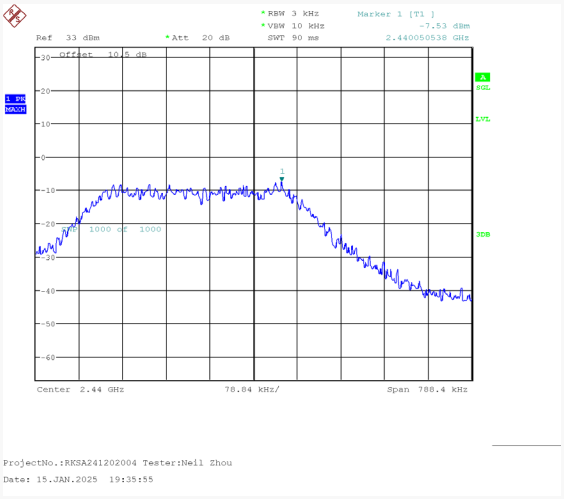
EUT operation mode: Transmitting

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
Low	2400.8	-7.65	≤ 8
Middle	2440	-7.53	≤ 8
High	2480	-7.13	≤ 8

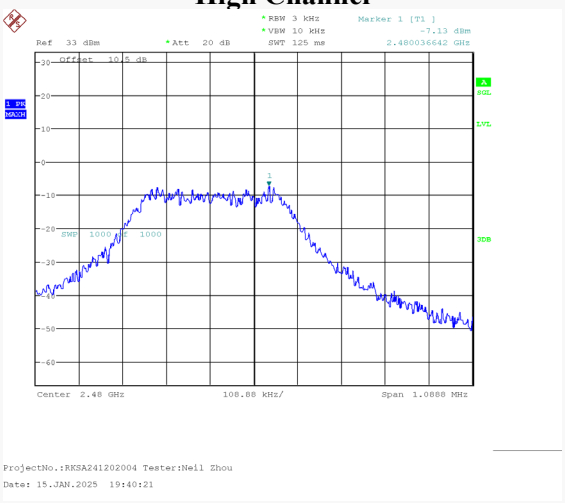
Low Channel



Middle Channel



High Channel



EUT PHOTOGRAPHS

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

TEST SETUP PHOTOGRAPHS

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

Declarations

1. The laboratory is not responsible for the authenticity of any information provided by the applicant. Information from the applicant that may affect test results is marked with "★".

2. The test data was only valid for the test sample(s).

3. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

4. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

5. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor k=2 with the 95.45% confidence interval.

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