

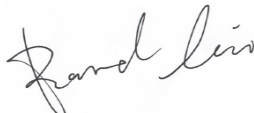
FCC PART 15.249 TEST REPORT

For

NoahYes robot (zhejiang) Co., Ltd.

2/F, Buliding A24, Geographic Information Town, Deqing County, Huzhou City, Zhejiang Province, China

FCC ID: 2A9ZR-BETREMOTE24

Report Type: Original Report	Product Name: Betta FSK Handheld Remote Control Device
Report Number:	RKSA240920002-00A
Report Date:	2024-12-05
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

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	RKSA240920002-00A	R1V1	2024-12-05	Initial Release

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	NoahYes robot (zhejiang) Co., Ltd.
Tested Model:	BETREMOTE24
Product Name:	Betta FSK Handheld Remote Control Device
Power Supply:	DC 3V from battery
RF Function:	LoRa
Operating Band/Frequency:	915 MHz
Modulation Type:	FSK
Antenna Type:	PCB Antenna

All measurement and test data in this report was gathered from production sample serial number: RKSA240920002-1 (Assigned by the BACL (Kunshan). The EUT supplied by the applicant was received on 2024-09-20.)

Objective

This type approval report is prepared for *NoahYes robot (zhejiang) Co., Ltd.* in accordance with Part 2-Subpart J, and Part 15-Subparts A and C of the Federal Communication Commission rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.209, 15.215 and 15.249 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.

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		3.19 dB
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**Justification**

Operation Frequency Details:

Channel	Frequency (MHz)
1	915

EUT Exercise Software

Engineer Mode was used during the test.

★Power level: Default

Note: The power level was declared by the applicant.

Support Equipment List and Details

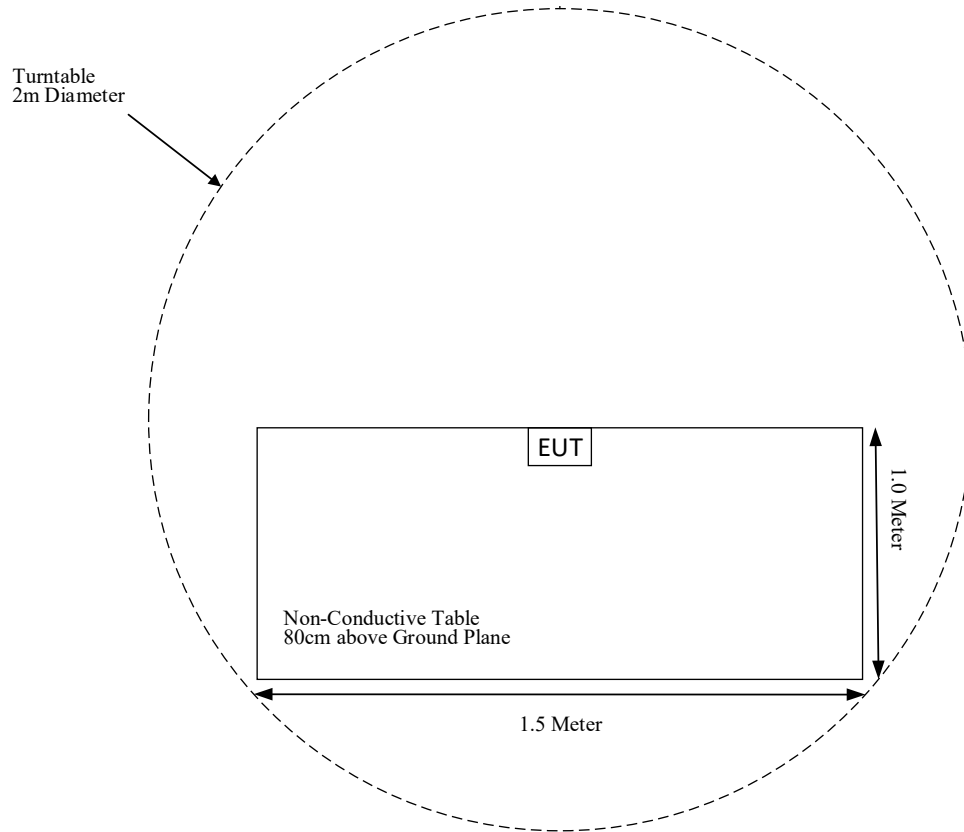
Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

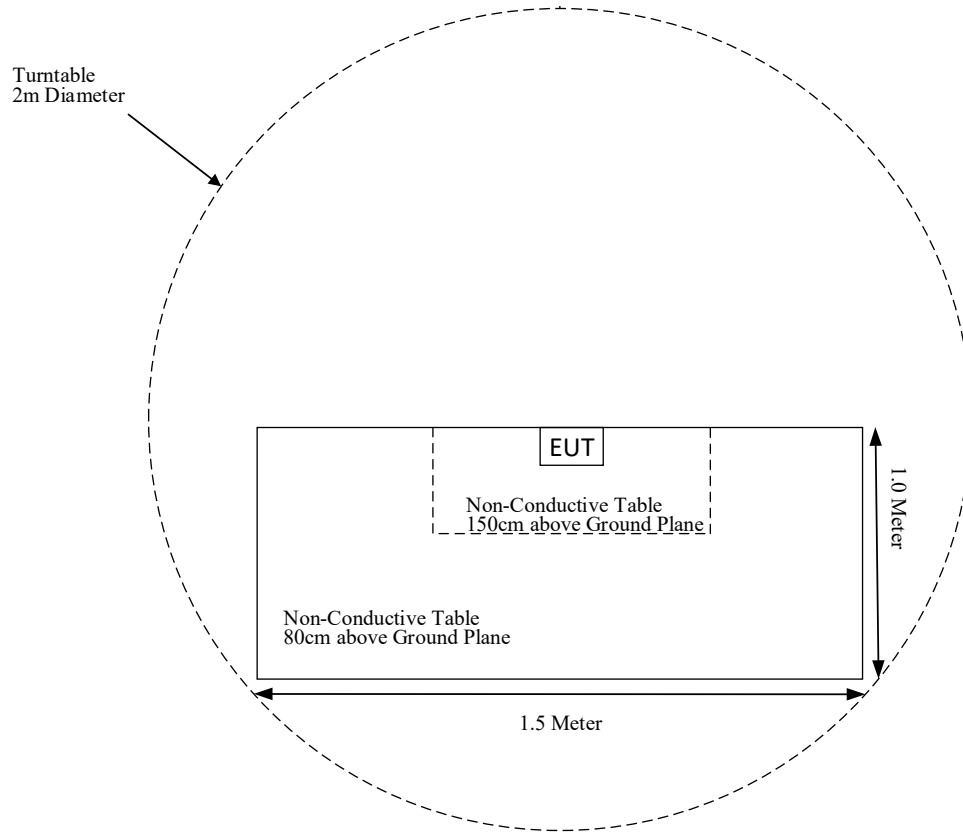
Cable Description	Length (m)	From Port	To Port
/	/	/	/

Block Diagram of Test Setup

For Radiated Emissions (Below 1 GHz):



For Radiated Emissions (Above 1 GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 (b)(3) & §2.1093	RF Exposure	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 (a)	AC Line Conducted Emissions	Not Applicable (See Note)
15.205, §15.209, §15.249	Radiated Emissions & Out of Band Emission	Compliant
§15.215 (c)	20 dB Bandwidth	Compliant

Note: The EUT is 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	2023-11-11	2024-11-10
ETS-LINDGREN	Loop Antenna	6512	108100	2023-11-03	2027-11-02
Narda	6dB Attenuator	773-6	10690812-2-1	2023-11-11	2024-11-10
Sonoma Instrument	Amplifier	310N	171205	2024-04-23	2025-04-22
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
Rohde & Schwarz	Test Software	EMC32	100361	N/A	N/A
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
A.H.Systems, inc	Amplifier	PAM-0118P	512	2024-04-25	2025-04-24
Oulitong	Band Reject Filter	OBSF-902-928-40S	OE02104362	2024-06-04	2025-06-03
Narda	Attenuator	10dB	010	2024-04-25	2025-04-24
Rohde & Schwarz	Auto test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-6	006	2024-04-25	2025-04-24
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					
R&S	Signal Analyzer	FSV40	101116	2024-04-24	2025-04-23
Narda	Attenuator	10dB	N/A	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).

§1.1307 & §2.1093 –RF EXPOSURE

Applicable Standard

§1.1307(b)(3)(i) For signal RF sources (*i.e.*, any signal fixed RF source, mobile device, or portable device, As defined in paragraph (b)(2) of this section): A signal RF source is exempt if.

(A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in Paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in Paragraph (b)(3)(ii)(A).

Mode	Frequency Range (MHz)	Maximum EIRP (dBm)	Maximum ERP		1-mW Test Exemption
			(dBm)	(mW)	
LoRa	915	-10.71	-12.86	0.05	Compliant

Note:

1. Chose the maximum power to do MPE analysis.
2. This device maximum E-Field level is 84.49 dBuV/m at 3m, so the EIRP power is -10.71 dBm.
3. Pout EIRP (dBm)= Field strength of Fundamental dBμV/m)-95.2

Result: Compliant. RF Exposure is exemption.

FCC§15.203 - ANTENNA REQUIREMENT

Applicable Standard

For intentional device, 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.

Antenna Connector Construction

The EUT has a PCB antenna for LoRa, which was permanently attached to the EUT, fulfill the requirement of this section, please refer to the EUT photos.

Result: Compliant.

FCC§15.205, §15.209&§15.249- RADIATED EMISSIONS& OUT OF BAND EMISSION

Applicable Standard

As per FCC§15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

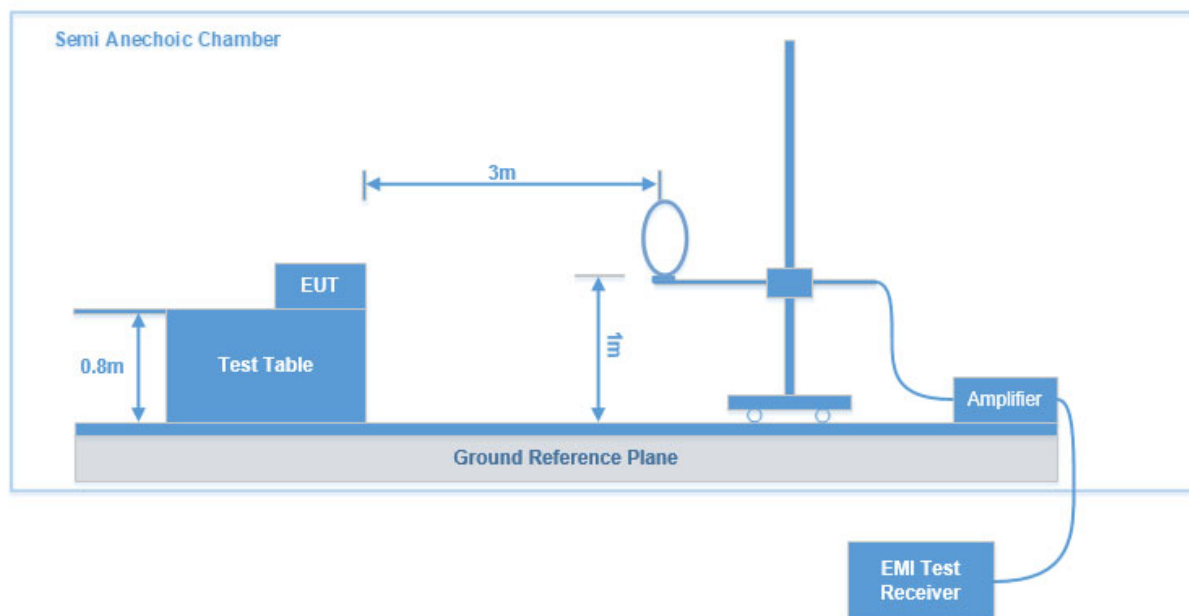
Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24GHz-24.25GHz	250	2500

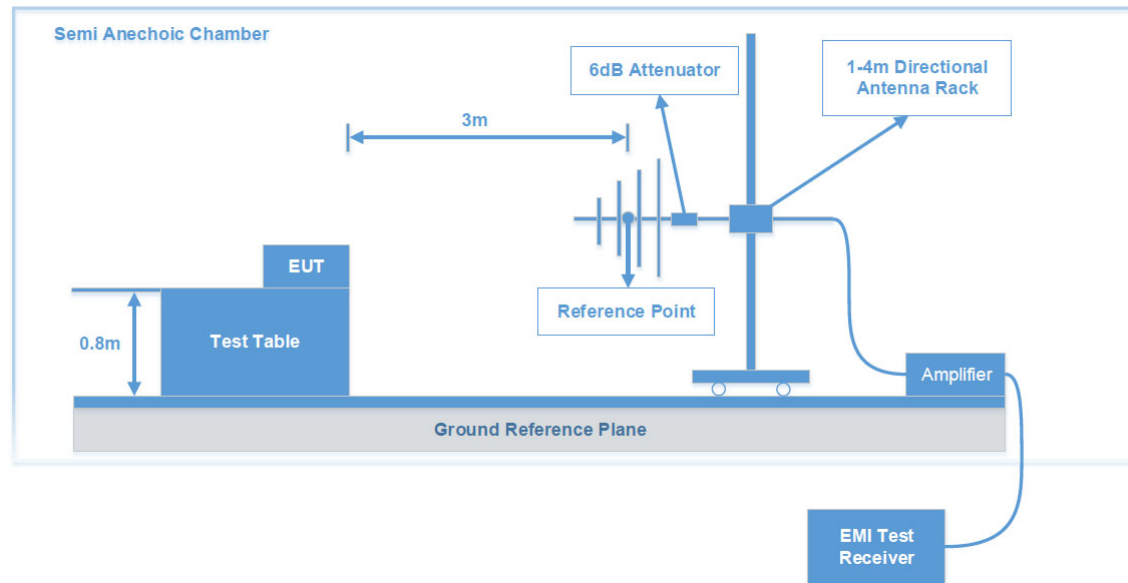
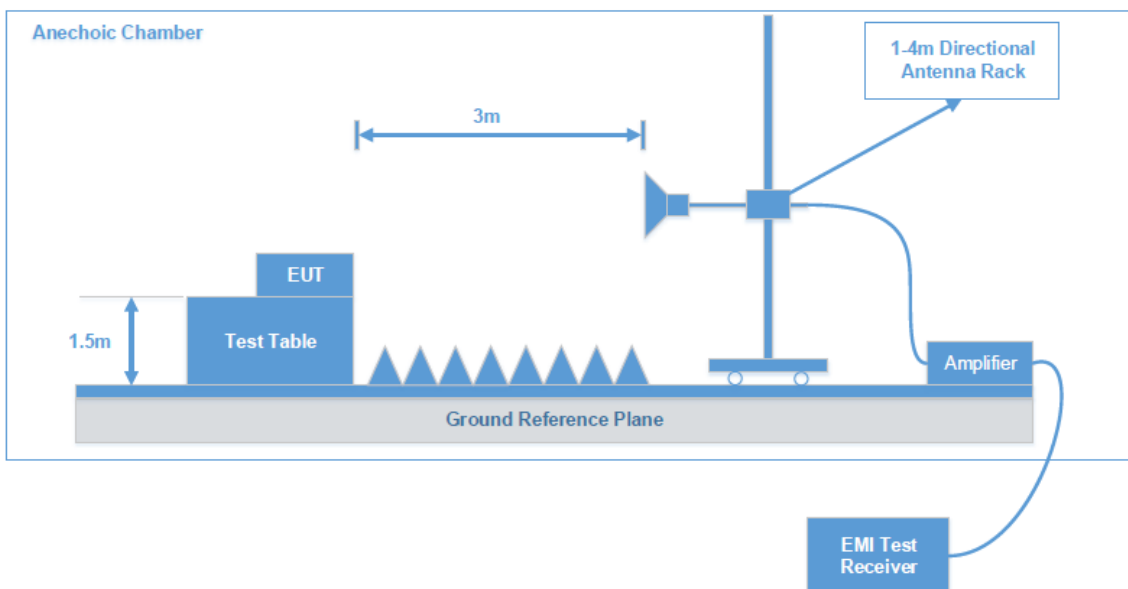
As per FCC§15.249 (c), Field strength limits are specified at a distance of 3 meters.

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Test System Setup

9 kHz - 30 MHz:



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

The radiated emission and out of band emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209/15.205 and FCC 15.249 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

Test Equipment Setup

The system was investigated from 9 kHz to 10 GHz.

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

Frequency Range	RBW	VBW	IF B/W	Detector
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

Note: If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform a QP/Average measurement.

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 10 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)

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

The “**Margin/ Over Limit**” 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)
Over Limit (dB) = Level (dBμV/m) - Limit (dBμV/m)

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209 &15.205 & 15.249.

Test Data: See Appendix

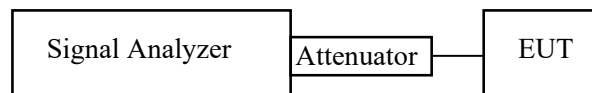
FCC §15.215(c) - 20 dB BANDWIDTH TESTING

Applicable Standard

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

Test Procedure

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 on the test table without connection to measurement instrument. Turn on the EUT. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.



Test Data: See Appendix

APPENDIX - TEST DATA

Environmental Conditions & Test Information

Test Item:	RADIATED EMISSIONS			20 DB BANDWIDTH TESTING
	9 kHz – 30MHz	30MHz – 1 GHz	1 GHz – 10 GHz	
Test Date:	2024-11-26	2024-10-11	2024-10-15	2024-11-29
Temperature:	21.3 °C	25.7 °C	24.3 °C	22.5 °C
Relative Humidity:	57 %	66 %	52 %	54 %
ATM Pressure:	102.1 kPa	101.9 kPa	101.5 kPa	102.4 kPa
Test Result:	Pass	Pass	Pass	Pass
Test Engineer:	Jerry Yan	Richard Wen	Destine Hu	Jason Lu

RADIATED EMISSIONS

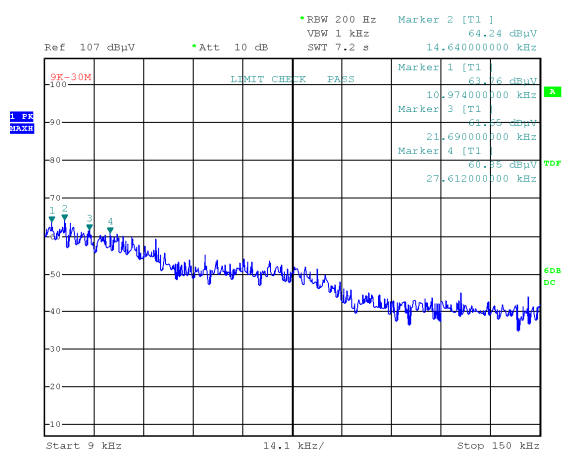
Test Result: Compliant

EUT operation mode: Transmitting

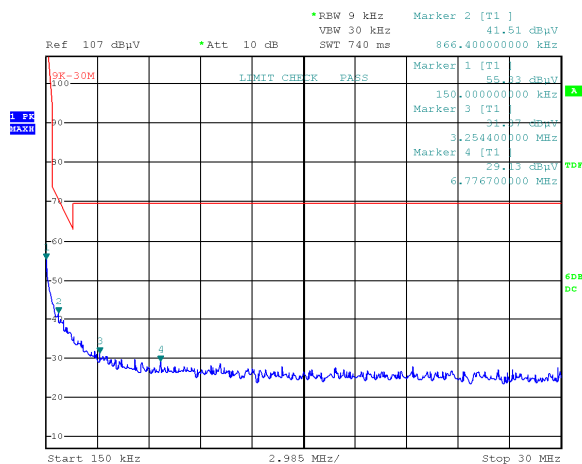
After pre-scan in the X, Y and Z axes of orientation, the worst case X axes is below:

**9 kHz-30 MHz:
Parallel (worst case):**

9 kHz-150kHz



150 kHz -30 MHz



Project No. RKSA240920002
Date: 26.NOV.2024 12:14:47

Tester: Jerry Yan

Project No. RKSA240920002
Date: 26.NOV.2024 12:18:51

Tester: Jerry Yan

9 kHz-150 kHz

Frequency (MHz)	Corrected Amplitude (dBμV/m) @3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m) @3m	Margin (dB)
0.01097	63.76	PK	55.74	126.80	63.04
0.01464	64.24	PK	53.41	124.29	60.05
0.02169	61.65	PK	49.53	120.88	59.23
0.02761	60.85	PK	47.87	118.78	57.93

150 kHz -30 MHz

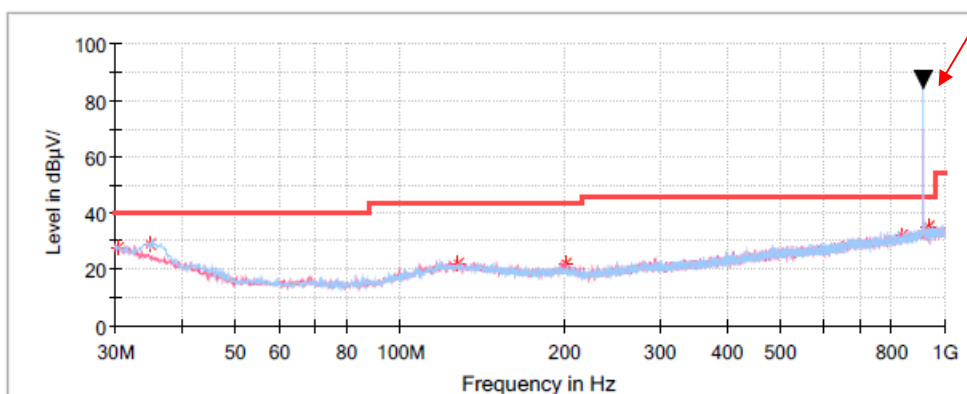
Frequency (MHz)	Corrected Amplitude (dBμV/m) @3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m) @3m	Margin (dB)
0.15000	55.33	PK	50.90	104.08	48.75
0.86640	41.51	PK	18.88	68.85	27.34
3.25440	31.37	PK	12.44	69.54	38.17
6.77670	29.13	PK	6.89	69.54	40.41

30 MHz - 1 GHz:

Frequency: 915 MHz

Common Information

Project No:	RKSA240920002
EUT Model:	BETREMOTE24
Test Mode:	Transmitting
Standard:	FCC Part 15.205 & FCC Part 15.209 & FCC Part 15.249
Test Equipment:	ESCI, JB3, 310N
Temperature:	25.7°C
Humidity:	66%
Barometric Pressure:	101.9kPa
Test Engineer:	Richard Wen
Test Date:	2024/10/11

**Critical Freqs**

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
30.485000	27.83	40.00	12.17	H	-5.1
34.850000	28.79	40.00	11.21	H	-8.0
128.091250	22.19	43.50	21.31	H	-11.1
201.205000	22.16	43.50	21.34	V	-12.3
834.857500	31.94	46.00	14.06	V	-0.2
936.465000	35.22	46.00	10.78	H	1.5

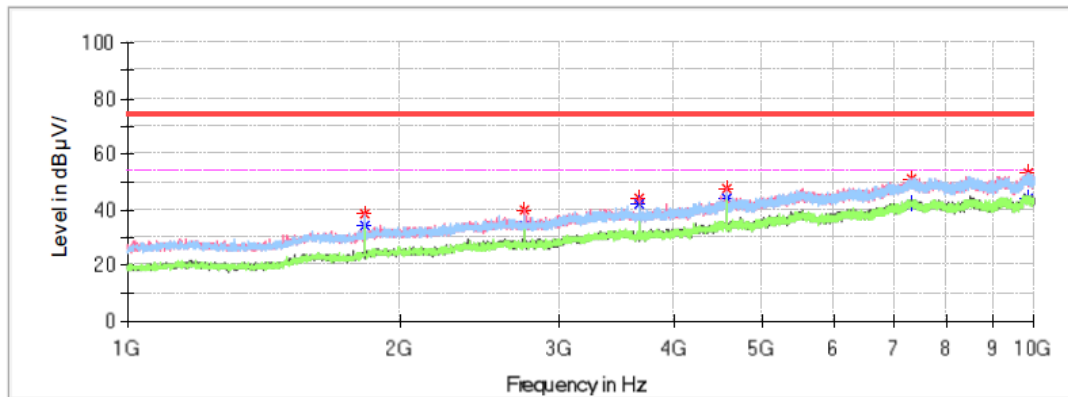
1-10 GHz:

Frequency: 915 MHz

Common Information

Project No.: RKSA240920002
 Test Mode: 915M
 Standard: FCC Part 15.249& FCC Part 15.205& FCC Part 15.209
 Test Engineer: Destine Hu

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)
1829.800000	38.37	---	74.00	35.63	V	-12.8
1829.800000	---	34.32	54.00	19.68	V	-12.8
2745.100000	39.97	---	74.00	34.03	V	-9.3
2745.100000	---	34.15	54.00	19.85	V	-9.3
3659.500000	43.84	---	74.00	30.16	V	-6.2
3659.500000	---	41.78	54.00	12.22	V	-6.2
4574.800000	47.28	---	74.00	26.72	V	-4.0
4574.800000	---	44.26	54.00	9.74	V	-4.0
7321.600000	50.92	---	74.00	23.08	H	3.4
7321.600000	---	42.28	54.00	11.72	H	3.4
9829.900000	---	43.78	54.00	10.22	H	6.6
9829.900000	53.39	---	74.00	20.61	H	6.6

Fundamental and Band Edge:

Common Information

Project No:RKSA240920002

EUT Model:BETREMOTE24

Test Mode:Transmitting

Standard:FCC Part 15.205 &FCC Part 15.209&FCC Part 15.249

Test Equipment:ESCI, JB3, 310N

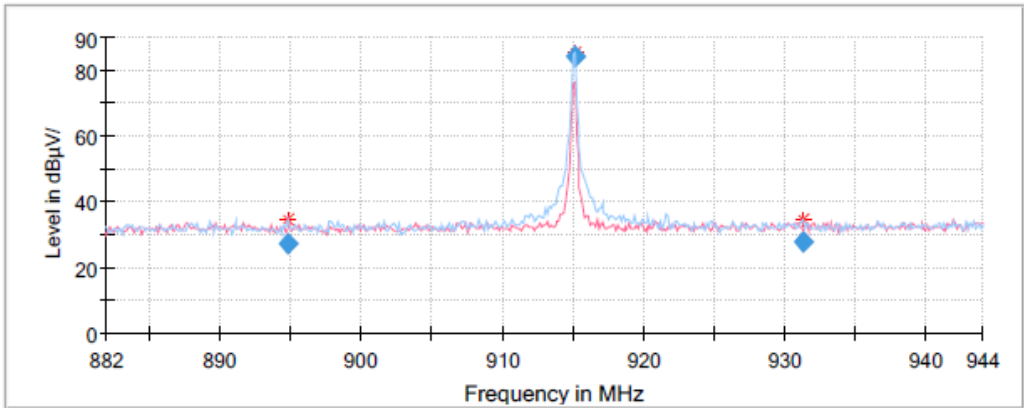
Temperature:25.7℃

Humidity:66%

Barometric Pressure:101.9kPa

Test Engineer:Richard Wen

Test Date:2024/10/11



Final Result

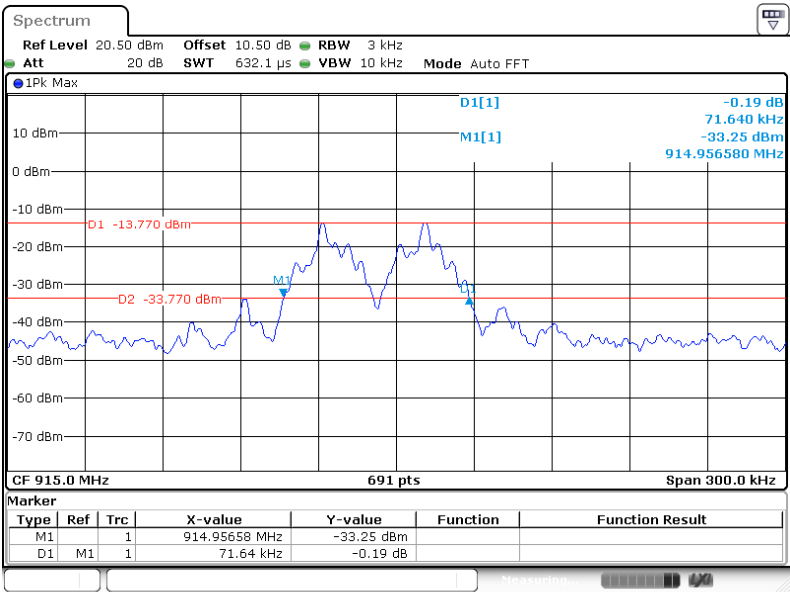
Frequency (MHz)	QuasiPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
894.870000	27.27	46.00	18.73	H	0.9
915.125000	84.49	94.00	9.51	H	1.2
931.250000	27.54	46.00	18.46	H	1.4

20 dB BANDWIDTH TESTING

Test Result: Compliant.

Test Mode: Transmitting

Frequency (MHz)	20 dB BANDWIDTH (MHz)
915	0.072



ProjectNo.: RKSA240920002 Tester: Jason Lu
Date: 29 NOV. 2024 09:31:31

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*******